NOISE
TECHNICAL REPORT

Sandpiper Villa Residential Care Facility for the Elderly
Oceanside, California

Prepared For

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Summary

This report analyzes the noise impacts from the proposed project and is prepared in a format to answer the noise issues identified in the Initial Study Environmental Checklist Form in Appendix G of the CEQA Guidelines. This report provides an overview of existing noise levels measured at the project site, local noise regulatory framework, and an analysis of potential noise impacts that would result from implementation of the proposed project. Noise from the construction and operation of the proposed project is evaluated.

	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
NOISE -- Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Background:

Noise Descriptors

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise is defined as unwanted sound. Sound pressure level has become the most common descriptor used to characterize the "loudness" of an ambient sound level. Sound pressure level is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. Decibels are measured using different scales, and it has been found that A-weighting of sound levels best reflects the human ear's reduced sensitivity to low frequencies, and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale

(dBA)[1] is cited in most noise criteria. All references to decibels (dB) in this report will be A-weighted unless noted otherwise.

Several time-averaged scales represent noise environments and consequences of human activities. The most commonly used noise descriptors are the equivalent sound level over a given time period (Leq);[2] average day–night 24-hour average sound level (Ldn)[3]; and community noise equivalent level (CNEL),[4]

Noise Attenuation

Stationary point sources of noise, including construction equipment, attenuate (lessen) at a rate of 6 to 7.5 dB per doubling of distance from the source, depending on ground absorption. Soft sites attenuate at 7.5 dB per doubling because they have an absorptive ground surface such as soft dirt, grass, or scattered bushes and trees. Hard sites have reflective surfaces (e.g., parking lots or smooth bodies of water) and therefore have less attenuation (6.0 dB per doubling). A street or roadway with moving vehicles (known as a "line" source), would typically attenuate at a lower rate, approximately 3 to 4.5 dB each time the distance doubles from the source, which also depends on ground absorption (CalTrans, 1998). Physical barriers located between a noise source and the noise receptor, such as berms or sound walls, will also reduce the noise levels.

Regulatory Setting:

City of Oceanside General Plan

The Noise Element of the City of Oceanside General Plan establishes the following controls on construction noise:

1. It should be unlawful for any person within any residential zone or 500' therefrom to operate any pile driver, power shovel, pneumatic, power hoist, or other construction equipment between 8:00 p.m. and 7:00 a.m. generating an ambient noise level of 50 dB at any property line, unless an emergency exists.
2. It should be unlawful for any person to operate any construction equipment at a level in excess of 85 dB at 100' from the source.
3. It should be unlawful for any person to engage in construction activities between 6:00 p.m. and 7:00 a.m. when such activities exceed the ambient noise level by 5 dB. A special permit may be granted by the Director of Public Works if extenuating circumstances exist.

The Noise Element does not explicitly identify noise level limits for specific land use types. The State of California noise and land use compatibility guidelines indicate that exterior noise levels up to 70 dB Ldn or CNEL are considered acceptable for nursing homes (OPR, 2003). Additionally, an interior noise level of 45 dB Ldn or CNEL is required by the California Building Code Title 24 (Title 24, CCR, Section 1207).

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[1]A decibel (dB) is a unit of sound energy intensity. Sound waves, traveling outward from a source, exert a sound pressure level (commonly called "sound level") measured in dB. An A–weighted decibel (dBA) is a decibel corrected for the variation in frequency response to the typical human ear at commonly encountered noise levels.

[2]The Equivalent Sound Level (Leq) is a single value of a constant sound level for the same measurement period duration, which has sound energy equal to the time–varying sound energy in the measurement period.

[3]Ldn is the day–night average sound level that is equal to the 24-hour A-weighted equivalent sound level with a 10-decibel penalty applied to night between 10:00 p.m. and 7:00 a.m.

[4]CNEL is the average A-weighted noise level during a 24-hour day, obtained by addition of 5 decibels in the evening from 7:00 to 10:00 p.m., and an addition of a 10–decibel penalty in the night between 10:00 p.m. and 7:00 a.m.

City of Oceanside Noise Ordinance

Non-transportation or stationary sources of noise are regulated by Section 38.12 of the Noise Ordinance. According to Section 38.12 of the Noise Ordinance, it is unlawful for any person to cause or allow the creation of any noise to the extent that the one-hour average sound level, at any point on or beyond the boundaries of the property in the applicable base district zone on which the sound is produced to exceed the applicable limits shown in **Table N-1**. The sound level limit for residential and medium density residential areas is 50 dB Leq from 7:00 a.m. to 9:59 p.m. and 45 dB Leq from 10:00 p.m. to 6:59 a.m.

Table N-1: Oceanside Sound Level Limits (dB)

Base District Zone	7:00 a.m. to 9:59 p.m.	10:00 p.m. to 6:59 a.m.
Residential Estate, Single-Family Residential, Medium Density Residential	50	45
High Density Residential, Residential Tourist	55	50
Commercial	65	60
Industrial	70	65
Downtown	65	55
Agricultural	50	45
Open Space	50	45

Source: Oceanside Noise Ordinance

Section 38.16 of the Noise Ordinance states It shall be unlawful for any person to make, continue, or cause to be made or continued, within the limits of the City of Oceanside, any disturbing, excessive, or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity.

Section 38.17 of the Noise Ordinance prohibits the operation of any pneumatic or air hammer, pile driver, steam shovel, derrick, steam, or electric hoist, parking lot cleaning equipment or other appliance, the use of which is attended by loud or unusual noise between the hours of 10:00 p.m. and 7:00 a.m.

Significance Criteria

Operational noise impacts of the proposed project would be significant if stationary sources at the project site exceed the sound level limits contained in the City of Oceanside Noise Ordinance. Proposed project operations that result in an increase in ambient noise levels of five decibels or more (Ldn, CNEL, or hourly Leq) would also result in a significant impact[5]. Noise generated by the construction of the proposed project would result in a significant impact if it were to conflict with the construction noise limits and hours contained in the Oceanside General Plan Noise Element and Oceanside Noise Ordinance.

[5] The Federal Interagency Committee on Noise (FICON) developed noise guidance to be used for the assessment of project-generated increases in noise levels that take into account the ambient noise level. An increase of 5 dB or greater would typically be considered to result in increased levels of annoyance where existing noise levels are less than 60 dB. Within areas where the ambient noise level ranges from 60 to 65 dB, increased levels of annoyance would be anticipated at increases of 3 dB or greater (FICON, 2000). Since noise levels at the project site are less than 60 dB, an increase of 5 dB will be used as the significance criteria.

Existing Noise Sources and Levels

RCH Group conducted short- term (10 to 15- minute) measurements at the project site to measure existing background noise levels in the project vicinity. Noise measurements were made using Metrosonics db308 Sound Level Meters calibrated before and after the measurements. The noise measurement locations are shown in **Figure N-1**, and the noise measurements are summarized in **Table N-2** below. The dominant noise sources during the noise measurements included traffic on Dixie Street and Grace Street as well as aircraft noise from Oceanside Municipal Airport. Noise sources also included pedestrians, train horns and noise from tools at a construction site located approximately 500 feet west of the project site.

As shown in **Table N-2,** noise measurements were conducted at several locations at the project site during the early afternoon. The average noise level (Leq) for the five-minute periods measured on the project site ranged from 48 to 58 dB. Additional measurements were conducted between 4:00 p.m. and 5:00 p.m. at Locations 3 and 4 to measure the average noise level of afternoon peak-hour traffic on Grace Street and Dixie Street. The noise meters at Locations 3 and 4 were placed at the approximate distance from each street at which the buildings of the proposed project would be located. The average noise level measured near Grace Street (Location 3) during peak-hour traffic was 56 to 59 dB. The average noise level measured near Dixie Street (Location 4) during peak-hour traffic was 56 dB.

Existing Sensitive Receptors

Noise-sensitive receptors (land uses associated with indoor and/or outdoor activities that may be subject to stress and/or significant interference from noise) typically include residential dwellings, hotels, motels, hospitals, nursing homes, educational facilities, churches, and libraries. The closest noise-sensitive land uses to the project site include single-family residences adjacent to the proposed project on the north and west. The residence adjacent to the project site on the west is approximately 10 feet from the project boundary, and the residences to the north are approximately 20 to 60 feet from the project boundary. Additional single-family residences across Dixie Street are approximately 65 feet south of the project boundary. There are also multi-family residences located 80 feet northwest of the project boundary. First Baptist Church of Oceanside is located 250 feet east of the project boundary and Friendly Church of God in Christ is 150 feet west of the project boundary. The Friendly Church of God in Christ also includes a preschool 65 feet west of the project boundary with an outdoor play area located adjacent to the project site on the west.

Sandpiper Villa Noise Measurement Locations

RCH Group		LEGEND (#) NOISE MEASUREMENT LOCATION	0 100 300 Feet	**Drawn By: DJ** **Date: 12/18/2015**	**FIGURE N-1**

Table N-2: Existing Noise Levels in the Project Area

Location	Time Period	Noise Levels (dB)	Noise Sources
Location 1. Center of the project site	Tuesday December 15, 2015 12:38 p.m. to 12:48 p.m.	5-minute Leqs: 53 ,54 5-Minute Lmaxs: 56, 61	Distant traffic noise is 52 dB. Tools at construction site to the west range from 53-55 dB. Cars passing on Dixie Street and Grace Street are 51 to 55 dB. Siren on street to the north reaches 62 dB.
Location 2: Northern project boundary, approximately 30 feet from residence adjacent to the site on the north.	Tuesday December 15, 2015 12:55 p.m. to 1:05 p.m.	5-minute Leqs: 53 ,54 5-Minute Lmaxs: 57,59	Distant traffic noise is 54 dB. Overhead plane is 57 dB. Cars on Grace Street are 54 to 59 dB. Wind in trees and birds are 52 dB.
Location 3. Eastern project boundary, approximately 20 feet west of Grace Street.	Tuesday December 15, 2015 1:11 p.m. to 1:21 p.m.	5-minute Leqs: 58,57 5-Minute Lmaxs: 73,68	Traffic on Grace Street is 56 to 68 dB. Passing delivery truck is 72 dB. Tools and backup beepers at distant construction site are 53 dB. Siren on a street to the north is 57 dB and tool noise at a home to the north is 54 dB.
Location 3. Eastern project boundary, approximately 20 feet west of Grace Street	Tuesday December 15, 2015 4:25 p.m. to 4:40 p.m.	5-minute Leqs: 59, 56, 56 5-Minute Lmaxs: 74, 65, 63	Background noise from distant traffic is 52 dB. Cars passing on Grace Street range from 56 to 65 dB. Large pickup trucks passing on Grace Street are 70 to 74 dB.
Location 4. Southern project boundary, approximately 25 feet north of Dixie Street.	Tuesday December 15, 2015 1:28 p.m. to 1:38 p.m.	5-minute Leqs: 55, 55 5-Minute Lmaxs: 60,65	Cars passing on Dixie Street are 51 to 65 dB. Overhead planes are 56 to 60 dB. Background beepers from distant construction reach 56 dB. Ambient level is 52 dB when there are no passing cars or construction noise.
Location 4. Southern project boundary, approximately 25 feet north of Dixie Street	Tuesday December 15, 2015 4:44 p.m. to 4:59 p.m.	5-minute Leqs: 56,56,56 5-Minute Lmaxs: 67,69,67	Cars passing on Dixie Street range from 57 to 64 dB. Trucks passing on Grace Street are 57 and 66 dB and car on Grace street is 55 dB.
Location 5. Western project boundary, approximately 25 feet east of adjacent residence	Tuesday December 15, 2015 12:11 p.m. to 12:26 p.m.	5-minute Leqs: 48,51,51 5-Minute Lmaxs: 58, 63 ,64	Cars passing on Dixie street are 48 to 64 dB. Airplanes passing overhead are 49 to 61 dB, helicopter is 57 dB. Wind chimes at residence is 49 dB. Train horn is 48 to 49 dB. Tools at distant construction site are 47-49 dB. Freeway noise from I-5 is audible at the site. Woman pushing shopping cart by is 50 dB.

Source: RCH Group, 2015

Impact Analysis:

a) Less-Than-Significant Impact with Mitigation Incorporated.

Impacts to On-Site Uses
The main source of noise on the project site is traffic noise. As shown in **Table N-2** the average noise level measured during afternoon peak-hour traffic next to Grace Street ranged from 56 to 59 dB at a distance of 20 feet from the edge of the road. The average sound level measured during peak-hour traffic on Dixie Street was measured to be 56 dB at a distance of 25 feet from the road.

Under normal traffic conditions, the day-night average sound level (Ldn) is within about two dB of average noise levels during peak-hour traffic (Caltrans, 2013). Using this factor, the Ldn at the location of the proposed building facades closest to Grace Avenue would be 54 to 61 dB, and the noise level at the building façades closest to Dixie Street would be 54 to 58 dB. Exterior noise levels at the project site would not exceed the normally acceptable noise standard of 70 dB Ldn for nursing homes. Exterior noise levels at the project site would comply with the State of California land use compatibility guidelines

Light frame and masonry buildings will provide an exterior-to interior noise level reduction of 20 to 30 dB when windows are closed (FHWA, 2011). Noise levels at the interior of the facility would be less than 45 dB Ldn and would comply with the California Building Code. Occupants of the facility would not be exposed to interior or exterior noise levels in excess of applicable standards, and impacts would be less than significant.

Construction
Construction of the proposed project would result in a temporary short-term increase of noise levels in the project vicinity. Construction activities would include excavation and grading of the site and construction of the facility, and would occur for a duration of approximately one year.

The noise levels generated by construction equipment would vary greatly depending upon factors such as the type and specific model of the equipment, the operation being performed, the condition of the equipment and the prevailing wind direction. The maximum noise levels for various types of construction equipment that would be required to build the proposed project are provided in **Table N-3**. As shown in **Table N-3**, construction equipment could generate maximum noise levels ranging from 76 to 85 dB at a distance of 50 feet.

Construction activities associated with the proposed project would result in a temporary increase in noise levels at noise-sensitive receptors in the project vicinity. The nearest residential receptor adjacent to the project site on the west could be exposed to a maximum exterior noise level up to 99 dB[6] for a short period of time when construction equipment is operating at the closest point to the receptor. Even when operating at the closest point, there would probably be no exterior exposure to these noise levels since residents would go inside when construction is so close. This noise level would only occur when the loudest piece of equipment (grader) is operated at the closest point to the residence. Noise from excavation and grading would fluctuate throughout the day because equipment would not be used at any one location for an extended period of time. Construction noise levels at other nearby sensitive receptors would be lower since they are located further from the project site.

[6] The maximum noise level was calculated using a reference noise level of 85 dB at 50 feet and an attenuation rate of 6 dB per doubling of distance.

Table N-3: Typical Noise Levels from Construction Equipment (Lmax)

Construction Equipment	Noise Level (dB, L_{max} at 50 feet)
Dump Truck	76
Air Compressor	78
Concrete Mixer (Truck)	79
Scraper	84
Dozer	82
Paver	77
Generator	81
Front End Loader	79
Grader	85
Backhoe	78

Source: *Federal Highway Administration (FHWA) Roadway Construction Noise Model User's Guide,* 2006.

None of the equipment anticipated to be used during construction would exceed the maximum noise limit of 85 dB at a distance of 100 feet contained in the Oceanside General Plan Noise Element. Using a reference noise level of 85 dB at 50 feet, and an attenuation rate of 6 dB per doubling of distance, the loudest piece of equipment (grader) would generate a maximum noise level of 79 dB at a distance of 100 feet. Construction work covered by a building permit is prohibited before 7:00 and after 6:00 p.m. Monday through Saturday, and all day Sundays and major holidays. Construction of the proposed project is required to occur within the allowable hours of construction (7:00 a.m. to 6:00 p.m. Monday through Saturday). Construction activities would comply with the construction noise regulations contained in the Oceanside General Plan Noise Element and Oceanside Noise Ordinance, resulting in a less-than-significant impact.

Operation

In general convalescent homes are a quiet land use and noise from the facility would be considered compatible with the surrounding residences and churches. Any permanent increase in ambient noise levels from residents of the project would not be substantially greater than existing levels without the project.

The operation of the proposed project could potentially increase the ambient noise level in the project vicinity through the creation of additional traffic on roadways and through the operation of exterior mechanical equipment. The proposed project would result in a slight increase of traffic in the project vicinity. During morning and evening peak traffic hours, the proposed project would generate 10 and 19 vehicle trips, respectively (Chen Ryan, 2019). The proposed project would result in less than one trip per minute during peak-hour traffic, resulting in a minimal increase of traffic noise. Traffic related to the proposed project would not result in an increase in ambient noise levels greater than five decibels, and would result in a less-than-significant impact.

Noise generated by mechanical equipment used for heating, ventilation, and air-conditioning (HVAC) would be significant if it exceeds the sound level limits for residential land uses contained in the Oceanside Noise Ordinance. The implementation of **Mitigation Measure N-1** would reduce operational noise impacts to less than significant.

> **Mitigation Measure N-1**: To ensure compliance with the sound level limits contained in the Oceanside Noise Ordinance, the applicant shall employ the following mitigation measures:
>
> 1. The applicant shall locate or shield HVAC units so that the noise level generated by the units does not exceed the hourly average exterior nighttime noise standard of 45 dB at nearby residential land uses.

b) Less-than-Significant Impact

Construction operations have the potential to result in varying degrees of temporary ground vibration, depending on the specific construction equipment used and operations involved. The ground vibration levels associated with various types of construction equipment are summarized in **Table N-4**. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. The effects of ground vibration may be imperceptible at the lowest levels, low rumbling sounds and detectable vibrations at moderate levels, and slight damage to nearby structures at the highest levels.

At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in structural damage. For most structures, a peak particle velocity (ppv) threshold of 0.5 inch per second or less is sufficient to avoid structural damage. The Federal Transit Administration recommends a threshold of 0.5 ppv for residential and commercial structures, 0.25 ppv for historic buildings and archaeological sites, and 0.2 ppv for non-engineered timber and masonry building (FTA 2006).

Table N-4: Representative Vibration Source Levels for Construction Equipment

Equipment		Peak Particle Velocity at 25 Feet (in/sec)
Pile Driver (impact)	upper range	1.518
	typical	0.644
Pile Driver (sonic)	upper range	0.734
	typical	0.170
Vibratory Roller		0.210
Large Bulldozer		0.089
Loaded Trucks		0.076
Small Bulldozer		0.003

Source: Federal Transit Administration, 2006.

Construction of the proposed project would not involve the use of any equipment or processes that would result in potentially significant levels of ground vibration (i.e., pile drivers that could be above 0.5 ppv). Ground vibration generated by construction operations would be primarily associated with on-site trucks and bulldozers. As shown in **Table N-4**, loaded trucks and bulldozers would result in vibration levels of less than 0.1 ppv at 25 feet. The nearest building to the project site is a garage of the residence adjacent to

the site on the west which would be approximately 10 feet from construction of the proposed project. At a distance of 10 feet, bulldozers and loaded trucks would result vibration levels of .35 and .3 ppv. The predicted vibration levels at the nearest structure would not be anticipated to exceed the 0.5 ppv threshold for residential and commercial buildings, and vibrational impacts would be less than significant.

c) Less-than-Significant Impact with Mitigation Incorporated. As discussed in a) above, the operation of the proposed project would include traffic noise and stationary noise from HVAC equipment. Traffic from the proposed project would not result in a five dB increase of traffic noise levels. The implementation of **Mitigation Measure N-1** would ensure that noise from HVAC systems would not exceed 45 dB Leq at the nearest residences or result in a five dB increase in ambient noise levels. With the implementation of **Mitigation Measure N-1**, the proposed project would not result in a significant increase in ambient noise levels in the project vicinity. Impacts would be less than significant with mitigation.

d) Less-than-Significant Impact with Mitigation Incorporated. As discussed in a) above, construction activities would comply with the construction noise limits contained in the Noise Ordinance and Oceanside General Plan Noise Element, however construction activities would result in a temporary increase of ambient noise levels in the project vicinity, resulting in a potentially significant impact. The implementation of **Mitigation Measure N-2** would reduce temporary construction noise impacts to less than significant.

> **Mitigation Measure N-2**: To reduce temporary construction noise levels at nearby sensitive receptors, the applicant shall employ the following mitigation measures:
>
> 1. Notify all adjacent residents of the construction schedule in writing
> 2. Designate a "construction noise coordinator" who would be responsible for responding to any local complaints about construction noise. The construction noise coordinator shall determine the cause of the complaint and shall require that reasonable measures warranted to correct the problem be implemented. The telephone number for the construction noise coordinator shall be conspicuously posted at the construction site and included in the notice sent in the neighbors regarding the construction schedule.
> 3. Provide sound-control devices on equipment no less effective than those provided by the manufacturer.
> 4. Locate stationary equipment, material stockpiles, and vehicle staging areas as far as practicable from sensitive receptors.
> 5. Prohibit unnecessary idling of internal combustion engines
> 6. Temporary walls/barriers/enclosures shall be erected around stationary construction equipment when such equipment will be operated for an extended period of time and where there are noise sensitive receptors substantially affected. Noise barriers and enclosures will consist of absorptive material in order to prevent impacts upon other land uses due to noise reflection.

e) Less-than-Significant Impact. The project site is approximately one mile southwest of the Oceanside Municipal Airport. The proposed project is located outside of the 60-65 dB CNEL noise contour of the Oceanside Municipal Airport (San Diego Regional Airport Authority, 2010). The proposed project would not be exposed to excessive noise from the airfield and exposure to aircraft noise would be less than significant.

f) No Impact. There are no private airstrips located near the project site. Thus, no impact would occur with implementation of the proposed project.

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