Appendix D:

Noise Assessment

APPENDIX D:

ASSESSMENT OF ENVIRONMENTAL NOISE

ROSSMOOR HEALTH CLUB SEAL BEACH CEQA NOISE REPORT

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ASSESSMENT OF ENVIRONMENTAL NOISE

1.0 INTRODUCTION

This report evaluates potential impacts associated with the construction and operation noise of the Rossmoor Health Club project in Seal Beach, California.

1.1 Project Description

The proposed project consists of a standalone commercial building in a retail parking lot currently used for the Shops at Rossmoor. The project site is bounded by Rossmoor Center Way to the north and commercial parking spots immediately to the south, east, and west. There are commercial buildings across parking spaces to the south and east, and 3-story residential buildings across parking spaces to the west as well as across Rossmoor Center Way to the north. The closest major freeways are over 3,000 feet away from the project site.

1.2 Characteristics of Noise

Noise is usually defined as unwanted sound and can be an undesirable by-product of society's normal day-to-day activities. Sound becomes unwanted when it interferes with normal activities, causes actual physical harm, or has an adverse effect on health.

People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness." However, the sound pressure magnitude can be objectively measured and quantified using a logarithmic ratio of pressures which yields the level of sound, utilizing the measurement scale of decibels (dB). The decibel is generally adjusted to the A-weighted level (dBA) which de-emphasizes very low frequencies to better approximate the human ear's range of sensitivity. In practice, the noise level of a sound source is measured using a sound level meter that includes an electronic filter corresponding to the A-weighting curve. Table A.1 in Appendix A of this report defines the decibel along with other technical terms used in this analysis.

Even though the A-weighted scale accounts for the relative loudness perceived by the human ear and, therefore, is commonly used to quantify individual events or general community sound levels, the degree of annoyance or other response effects also depends on several other perceptibility factors, including:

- Ambient (background) sound level
- Magnitude of the event sound level relative to the background noise
- Spectral (frequency) composition (e.g. presence of tones)
- Duration of the sound event
- Number of event occurrences, repetitiveness, and intermittency
- Time of day the event occurs.

In determining the daily level of environmental noise, it is important to account for the difference in human responses to daytime and nighttime noises. At night, exterior background noise levels are generally lower than daytime levels. However, most household noise also decreases at night, and exterior noise may become increasingly noticeable. Further, most people sleep at night and have greater sensitivity to noise intrusion. To account for human sensitivity to nighttime noise levels, a 24-hour descriptor, the Community Noise Equivalent Level (CNEL) has been developed. The CNEL divides the 24-hour day into a daytime period of 7:00 a.m. to 7:00 p.m., an evening period from 7:00 p.m. to 10:00 p.m., and a nighttime period of 10:00 p.m. to 7:00 a.m. In determining the CNEL, noise levels occurring during the evening period are increase by 5 dB, while noise levels occurring during the nighttime period are increased by 10 dB to account for the greater sensitivity during the evening and nighttime periods.

The effects of noise on people fall into three general categories:

- Subjective effects of annoyance and nuisance
- Interference with activities such as speech, sleep and learning
- Physiological effects such as hearing loss

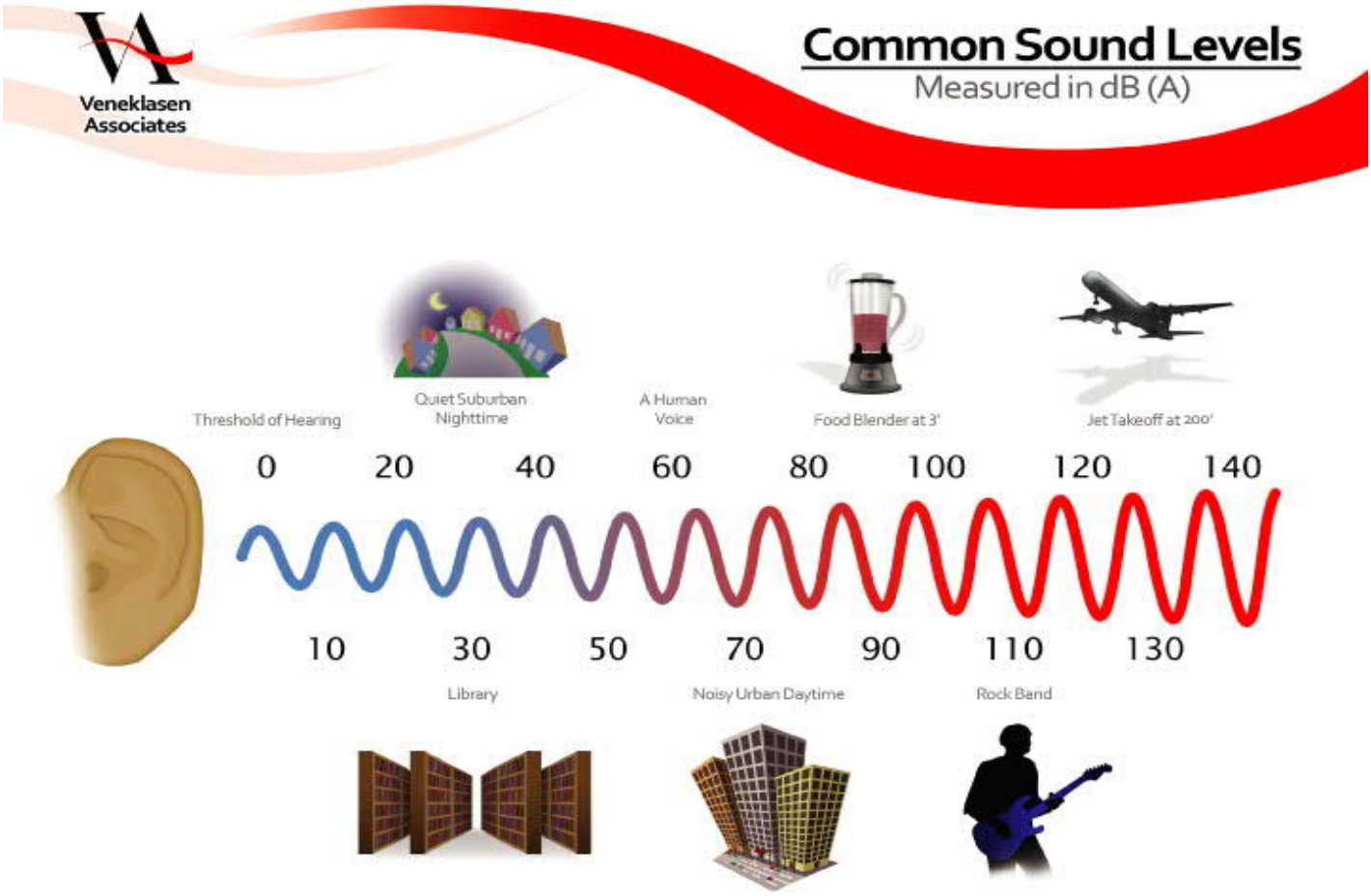
In most cases, the levels associated with environmental noise produce effects only in the first two categories. However, workers in industrial plants may experience noise effects in the last category. There is no completely effective way to measure the subjective effects of noise or the corresponding reactions of annoyance, because of the wide variation in individual thresholds of annoyance and degrees to which people become acclimated to noise. Thus, an important way of determining a person's subjective reaction to a new noise source is by comparison to the existing environment to which they are accustomed (the “ambient environment”). In general, the more the level of a noise event exceeds the prevailing ambient noise level, the less acceptable the noise source will be to those exposed to it.

With regard to increases in A-weighted noise levels, the following relationships are applicable to this analysis:

- Except in carefully controlled laboratory experiments, a 1 dB change cannot be perceived.
- Outside of a laboratory, a 3 dBA change will be generally perceivable by most people.
- A change in level of at least 5 dBA is considered a noticeable change by most people.
- A 10 dBA change will result in the perception of doubling or halving the loudness of the noise.

Common noise levels associated with various activities are shown on Figure 1, Common Noise Levels.

Figure 1 - Common Noise Levels



Noise sources are either "point sources", such as stationary equipment or individual motor vehicles, or "line sources", such as a roadway with a large number of mobile point sources (motor vehicles). Sound generated by a stationary point source typically diminishes (attenuates) at a rate of 6 dBA for each doubling of distance from the source to the receptor at acoustically "hard" sites, and at a rate of 7.5 dBA at acoustically "soft" sites.[1] For example, a 60 dBA noise level measured at 50 feet from a point source at an acoustically hard site would be 54 dBA at 100 feet from the source and it would be 48 dBA at 200 feet from the source. Sound generated by a line source typically attenuates at a rate of 3 dBA and 4.5 dBA per doubling of distance from the source to the receptor for hard and soft sites, respectively.[2] Man-made or natural barriers can also attenuate sound levels.

1 U.S. Department of Transportation, Federal Highway Administration, Highway Noise Fundamentals, (Springfield, Virginia: U.S. Department of Transportation, Federal Highway Administration, September 1980), p. 97. A "hard" or reflective site does not provide any excess ground-effect attenuation and is characteristic of asphalt, concrete, and very hard packed soils. An acoustically "soft" or absorptive site is characteristic of normal earth and most ground with vegetation.

2 U.S. Department of Transportation, Federal Highway Administration, Highway Noise Fundamentals, (Springfield, Virginia: U.S. Department of Transportation, Federal Highway Administration, September 1980), p. 97.

The minimum attenuation of exterior to interior noise provided by typical structures is provided in Table 1, Outside to Inside Noise Attenuation.

Table 1
Outside to Inside Noise Attenuation (dBA)

Building Type	Open Windows	Closed Windows[1]
Residences	17	25
Schools	17	25
Churches	20	30
Hospitals/Convalescent Homes	17	25
Offices	17	25
Theaters	20	30
Hotels/Motels	17	25

Source: Transportation Research Board, National Research Council, Highway Noise: A Design Guide for Highway Engineers, National Cooperative Highway Research Program Report 117.
[1] As shown, structures with closed windows can attenuate exterior noise by a minimum of 25 to 30 dBA.

1.3 Characteristics of Vibration

Vibration is minute variation in pressure through structures and the earth, whereas, noise is minute variation in pressure through air. Some vibration effects can be caused by noise; e.g., the rattling of windows from truck pass-bys. This phenomenon is related to the coupling of the acoustic energy at frequencies that are close to the resonant frequency of the material being vibrated. Ground-borne vibration attenuates rapidly as distance from the source of the vibration increases. Vibration amplitude can be measured as peak particle velocity (PPV), the maximum instantaneous peak amplitude in inches per second, or root-mean-square (RMS) velocity in inches per second or as vibration level in decibels (VdB) referenced to 1 micro-inch per second. The ratio between the PPV and the maximum RMS amplitude is termed the "crest factor." According to the Federal Transit Administration (FTA), the PPV level for construction equipment is typically 1.7 to 6 times greater than the RMS vibration level. The FTA uses a crest factor of 4 for the conversion of PPV levels to RMS vibration levels. For the purposes of ground-borne vibration analysis of impacts to existing structures, vibration velocity is described in terms of PPV. For the analysis of the human response to vibration, VdB is utilized.

The vibration velocity threshold of perception for humans is approximately 65 VdB, and a vibration velocity of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people[3]. Most perceptible indoor vibration is caused by sources within buildings such as operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. Common ground-induced vibrations related to roadway traffic and construction activities pose no threat to buildings or structures. If a roadway is

[3] – U.S. Department of Transportation, Federal Transit Administration, Transit Noise and Vibration Impact Assessment, (Washington, DC: U.S. Department of Transportation, Federal Transit Administration, May 2006), p. 7-8.

smooth, the ground-borne vibration from traffic is barely perceptible. The range of interest is from approximately 50 VdB, which is typically the background vibration velocity, to 94 VdB. This 94 VdB vibration level corresponds to 0.2 PPV, which is the general threshold where minor damage can occur in non-engineered timber and masonry buildings.

2.0 REGULATORY FRAMEWORK

Many government agencies have established noise regulations and policies to protect citizens from potential hearing damage and various other adverse physiological and social effects associated with noise and ground-borne vibration. The City of Seal Beach has adopted the General Plan Noise Element and a Noise Ordinance which are based in part on Federal and State regulations and are intended to control, minimize, or mitigate environmental noise effects. The regulations and policies that are relevant to project construction and operation noise are discussed below.

2.1 Applicable State Noise Standards

The California Environmental Quality Act (CEQA) Guidelines establishes guidelines for the evaluation of significant impacts of environmental noise attributable to a proposed project. The guidelines ask whether the project would result in:

1. 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.

2. Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.

3. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

4. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

5. 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?

6. 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?

The CEQA Guidelines and the City's Noise Element provide no definition of what constitutes a substantial noise increase. Typically, in high noise environments, if the CNEL due to the project would increase by 3 dBA at noise sensitive receptors, the impact is considered significant.

2.2 City of Seal Beach Noise Element & Municipal Code – Noise Ordinance

The City of Seal Beach Noise Element establishes noise/land use compatibility criteria. Multifamily residential uses can be considered normally acceptable within noise environments of up to 65 CNEL.

Section 7.15.015 of the Seal Beach Municipal Code states that the noise level in a residential zone cannot exceed 55 dBA between 7:00 A.M. and 10:00 P.M. and 50 dBA between 10:00 P.M. and 7:00 A.M. These limits apply to cumulative period of more than 30 minutes in an hour. The limits increase by 5 dBA for a cumulative period of more than 15 minutes in an hour; 10 dBA for 5 minutes of an hour; 15 dBA for 1 minute in an hour, and 20 dBA for any period of time.

Section 7.15.025 states that noise related to construction performed between 7:00 A.M. and 8:00 P.M. on weekdays and between 8:00 A.M. and 8:00 P.M. on Saturdays is exempt from Code limits.

The Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment document offers guidelines for assessment of construction noise that take into account the existing environment, absolute noise levels of construction activity, duration of construction activity, and adjacent land uses. Recognizing that construction activity is noisy, the FTA document provides the following mitigation measures, which are required by other city general plans:

1. When adjacent to occupied noise-sensitive land uses, implement a construction-related noise mitigation plan. This plan would depict the location of construction equipment storage and maintenance areas, and document methods to be employed to minimize noise impacts on adjacent noise-sensitive land uses.

2. Construction equipment shall utilize noise-reduction features (e.g. mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

3. Haul truck deliveries are subject to the same hours specified for construction. Additionally, the plan shall denote any construction traffic haul routes where heavy trucks would exceed 100 daily trips (counting those both to and from the construction site). To the extent feasible, the plan shall denote haul routes that do not pass sensitive land uses or residential dwellings.

Section 7.15.035 states that building permits will not be issued if HVAC equipment noise exceeds 50 dBA at adjacent residential areas. It further states that building permits may be issued if a timing device deactivates the HVAC equipment between 10:00 P.M. and 7:00 A.M. and equipment noise does not exceed 55 dBA.

2.3 City of Seal Beach Noise Element – Ground-Borne Vibration

The City's Noise Element requires construction activity to comply with the local Noise Ordinance, which does not provide limits on ground-borne vibration. The FTA Transit Noise and Vibration Impact Assessment document referenced above offers the following vibration criteria:

Table 2
Groundborne Vibration Impact Criteria for General Assessment

Land Use Category	Impact Levels (VdB)		
	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
Category 1: Buildings where vibration would interfere with interior operations	65[d]	65[d]	65[d]
Category 2: Residences and buildings where people normally sleep	72	75	80
Category 3: Institutional land uses with primarily daytime uses	75	78	83

Vibration levels are measured in or near the vibration-sensitive use.

a. "Frequent Events" is defined as more than 70 vibration events of the same source per day.

b. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.

c. "Infrequent Events" is defined as fewer than 30 vibration events of the same source per day.

d. 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.

Source: Federal Transit Administration, Transit Noise Impact and Vibration Assessment, May 2006.

2.4 Project Requirements

The above requirements for the project are summarized in the following Table 3.

Table 3
Project Requirements

Activity	Standard
Exterior Noise at Multi-Family Residences	65 CNEL
Construction Noise	- Limited to the hours of: 7:00am – 8:00pm Weekdays 8:00am – 8:00pm Saturdays
Operational Noise	At residential property, more than 30-minute duration: 55 dBA from 7:00 a.m. to 10:00 p.m. 50 dBA from 10:00 p.m. to 7:00 a.m. At residential property, 15 to 30-minute duration: 60 dBA from 7:00 a.m. to 10:00 p.m. 55 dBA from 10:00 p.m. to 7:00 a.m. At residential property, 5 to 15-minute duration: 65 dBA from 7:00 a.m. to 10:00 p.m. 60 dBA from 10:00 p.m. to 7:00 a.m. At residential property, 1 to 5-minute duration: 70 dBA from 7:00 a.m. to 10:00 p.m. 65 dBA from 10:00 p.m. to 7:00 a.m. At residential property, less than 1-minute duration: 75 dBA from 7:00 a.m. to 10:00 p.m. 70 dBA from 10:00 p.m. to 7:00 a.m.

HVAC Equipment Noise	At residential property,: 50 dBA anytime 55 dBA if non-operational from 10:00 p.m. to 7:00 a.m.
Vibration	Developments which are to generate a significant amount of vibration must ensure acceptable interior vibration levels within limits of Groundborne Vibration Impact Criteria for General Assessment.

3.0 ENVIRONMENTAL IMPACTS AND SIGNIFICANCE

3.1 Significance Thresholds

The following significance thresholds are used in this report to evaluate the significance of the project noise impacts:

- Project would expose persons to or generate noise levels in excess of standards established in the City's Noise Element or Noise Ordinance.
- Project would result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. A substantial permanent increase in traffic noise would occur if the project would result in an increase of 3 dBA CNEL or more.
- Project would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. Construction noise would be considered significant if it would take place outside of the allowable hours set forth in Table 4 or exceed the guidelines set forth by the FTA.

3.2 Impact 1. Noise levels in excess of standards

Would the project result in 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?

3.2.1 Methodology

Analysis of the existing and future noise environments presented in this section is based on technical reports, long and short-term noise monitoring, and noise prediction modeling. Traffic volumes utilized for future traffic noise calculations were based on information provided in the traffic study prepared by LSA Associates in December 2016 for this project.

3.2.2 Existing Ambient Monitored Noise Levels

Vehicular traffic on Rossmoor Center Way was noted by the public as one of the main noise sources. Since the proposed project site is currently used as parking for the Shops at Rossmoor, it currently experiences frequent automobile arrivals and departures associated with use of the retail shops. While arrivals and departures associated

with the retail uses occur during the posted store operating hours, arrivals and departures associated with unauthorized use of the lot during nighttime hours also may occur. The project site is located on the rear/service side of existing retail stores to the east, meaning truck trailer loading docks are located in this area. Thus, this area experiences sporadic semi-truck deliveries during the daytime store operating hours, as observed during site visits. Truck trailer deliveries create temporary noise spikes with opening of trailer gates, extending of delivery ramps, and cold starting of diesel engines. The project building will shield the majority of the existing retail delivery area from the nearby residential complexes.

To establish existing ambient noise levels in residential areas surrounding the project site, a field monitoring study was conducted. Measurements were performed near the project site (see Figure 2, below) for documenting the ambient conditions. A Bruel & Kjaer Model 2270 Sound Level Meter, which satisfies the American National Standards Institute (ANSI) for general environmental noise measurement instrumentation, was located on the property line of the residential complex to the west of the project site from 9:00 P.M. November 5 through 9:00 P.M November 7, 2016. This captured both a full weekend 24 hours and weekday 24 hours. Noise readings were measured over 5-minute intervals with "A" frequency fast time weighting. Table B.1 in Appendix B of this report lists the results from the long-term monitoring.

Figure 2 – Project Site and Noise Monitoring Location

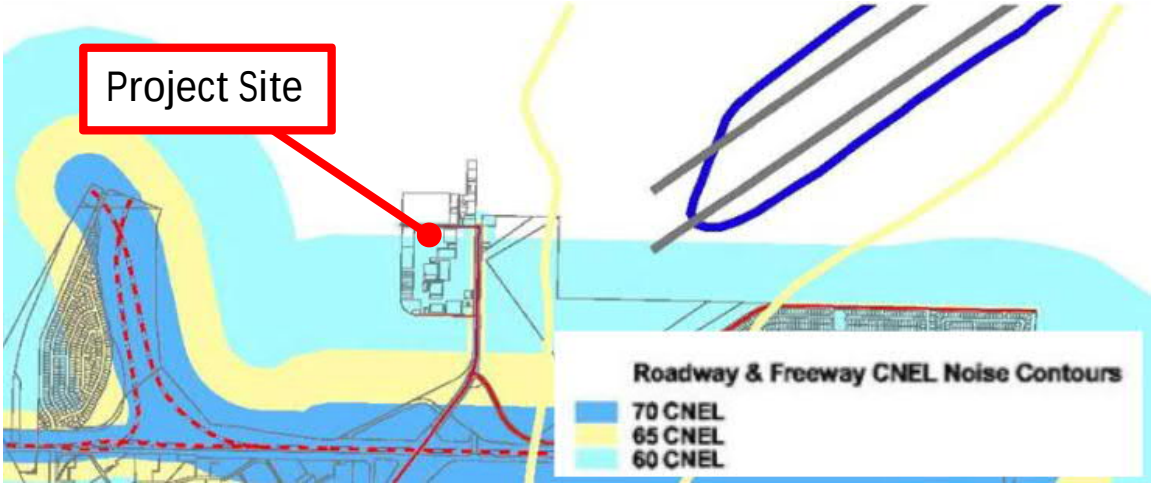
In general, the weather conditions were normal for the field monitoring study. The first night, there was a delivery truck stationed at the easternmost parking slots near Home Goods that skewed the results higher than what is expected on most nights. The results cited below, and used for analysis, are the lower of the two nights; lower ambient levels provide less masking to any noise specifically from the project or its parking lot. The measurement

location itself was also highly suited to measuring levels with the quietest ambient (most susceptible to disturbances) as it was away from any local street noise (parking lot car routes) and shielded from direct street noise.

Typical noise levels generated for the measurements were vehicular noise from local parking traffic and streets. Any human noises from the existing commercial neighbors or residential neighbors were averaged out of the levels reported.

Based on the long-term monitor measurements at the residences, the loudest 1-hour L_{EQ} was 53 dBA. In addition, a 56 CNEL was calculated at the residential units to the west. This is consistent with the Noise Element which shows that the residential complexes are located partially within the 60 CNEL noise contour for roadway and freeway noise (reference Figure 3, below).

Figure 3 – Project Site and Nearby Road CNEL Contours



3.2.3 Future Project Noise Levels

Using the December 2016 traffic study information, the changes in dBA levels were calculated for potential future noise conditions due to future traffic volumes associated with the proposed project and increases in background traffic. At approximately 1,000 feet from Seal Beach Boulevard, the residential neighbors are barely affected by traffic noise. Effects are similar for Montecito Boulevard at approximately 450 feet away. Rossmoor Center Way traffic will have a greater influence due to its proximity. The calculated decibel effects due to traffic changes are shown below, regardless of distance to the residential complexes.

Table 4
Traffic Noise Levels (dBA) Increases over Time vs. 2016

Road	Opening Year (2018) No Project	Opening Year (2018) with Project	Future Year No Project	Future Year with Project
Seal Beach Blvd (avg. of segments north and south of Rossmoor Center Way) – Weekday/Saturday	0.20/0.24	0.27/0.29	0.54/0.58	0.60/0.62
Rossmoor Center Drive between Eastern and Western Internal Drives – Weekday/Saturday	0.04/0.04	1.30/0.79	0.39/0.39	1.56/1.09
Rossmoor Center Drive between Western Internal Drive and West Road – Weekday/Saturday	0.04/0.04	0.04/0.04	0.39/0.39	0.39/0.39
Rossmoor Center Drive between West Road and Montecito – Weekday/ Saturday	0.04/0.04	0.24/0.17	0.39/0.39	0.58/0.51
Montecito Blvd (avg. of segments north and south of Rossmoor Center Way) – Weekday/Saturday	0.07/0.09	0.11/0.12	0.42/0.44	0.45/0.46

With decibel increases of at most 1.5, the proposed project will not result in any new uses or traffic generation that would increase noise levels in the vicinity or expose the residential neighbors to levels above those that are deemed normally acceptable in the noise ordinance, or less than 60 CNEL.

This impact is less than significant.

3.3 Impact 2. Excessive ground-borne vibration

Would the project result in exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?

The proposed project site is currently used as parking for retail development within the Shops at Rossmoor. Construction equipment associated with building the project would be the only vibration generating sources introduced by the project. The City of Seal Beach Municipal Code limits construction to specific hours of the day, with no construction activity permitted on Sundays.

The FTA document provides vibration criteria due to construction equipment as shown in Table 2, above, and Table 5, below. Using vibration levels of typical construction equipment given in the FTA document, vibration levels at

receivers nearest the project site were calculated to be as indicated in Table 5. The distance loss was calculated using equations for ground-borne vibration published by the FTA, and the distance used was from the center of the building in the development that is closest to a sensitive receptor.

Table 5
Calculated Vibration Levels of Typical Construction Equipment to Nearest Sensitive Receptor

Equipment	Vibration Level at 25ft (VdB)	Vibration Level at Nearest Sensitive Receptor (VdB)	Vibration Criteria for Frequent Events (VdB)
Jack Hammer	79	49	72
Loaded Trucks	86	56	72
Large Bulldozer	87	57	72
Vibratory Roller	94	64	72

Based on calculations to the nearest sensitive receptor, the construction of the development is not anticipated to generate vibration levels that exceed criteria given by FTA document. This impact is less than significant.

3.4 Impact 3. Permanent increase in ambient noise levels

Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

3.4.1 Increase due to Project Traffic

As indicated in Table 4, which shows decibel increases of no more than 1.5 dBA, the proposed project would not result in any new uses or traffic generation that would increase noise levels in the vicinity or expose residential neighbors to levels above those that are deemed normally acceptable in the noise ordinance.

Impact would be less than significant due to project traffic.

3.4.2 Operational Noise, Indoor Fitness Activity

The proposed health club would host various exercise activities (e.g., treadmill running, weight lifting, basketball playing, and swimming), as well as classes (e.g., aerobics and cycling). Project floor plans shows that the basketball court and swimming pool will be located on the west side of the project building closest to the nearest residences. Rooms for exercise classes are shown on the east side of the building. Depending on the specific exercise activity, interior health club sound levels can range from 65 dBA to over 85 dBA with amplified music. Exterior wall and roof elements (e.g. stucco, metal decking, gypsum board or plywood sheathing) typically offer at least 40 dBA of sound reduction. Exterior doors and windows normally underperform walls and roofs by only offering 30 dBA of reduction. This assumes that doors include full perimeter weather stripping, which is typical for exterior doors. Plans show that the basketball court—as well as swimming pool and aerobics rooms—will have single doors that lead to the exterior.

These exterior doors are emergency exits that would not be used for normal entry into the health club. The plans show a vestibule at the main entrance to the health club. Based on expected noise reductions from exterior building elements, doors, and windows, noise levels due to exercise activity within the health club are calculated to be below Municipal Code limits during the day (55 dBA) and nighttime/early morning (50 dBA) at less than 40 dBA at the residences.

Noise associated with indoor fitness activity would be less than significant.

3.4.3 Operational Noise, Outdoor Parking Lot Activities

Operation of the proposed project would produce noise associated with such activities as vehicle traffic, delivery trucks, loud conversations, opening and closing of car doors, car horns, etc. in the adjacent parking lot. Since the project does not include a loading dock, it is assumed that delivery trucks will be relatively small, such as for delivering packages, rather than large tractor trailers used for transporting palletized goods. The mentioned noise sources above are typical of commercial/retail uses, including those existing today on site within the Shops at Rossmoor center. To understand how these activities generate noise, similar health clubs were observed in Culver City and Garden Grove as early as the 5:00 A.M. hour. At both sites the fitness lot was unshielded from the highways, unlike the project site; the city street noise (not the fitness center or its respective parking lot activity) controlled both the constant and loud sporadic noise even at the early hour. While useful to observe these activities to apply to the project, the strong influence of the city streets made the data measured not clean enough to use in analysis for the new project site. To isolate offending noise sources for analysis, each of the anticipated noise sources within the project parking lot and listed above was individually measured separately.

Each isolated measured noise source was calibrated to the distance it was measured in a noise propagation model in Bruel & Kjaer Predictor 11.0. Then, the noise level reaching the residences to the west and north were calculated. The loudest noise source that was closest to thresholds in the Noise Ordinance was the car horn, which achieved 47 dBA at the west residential complex and 50 dBA at the north residential complex, assuming the noise would occur at parking lot locations as close as possible to the residences. Both these levels are well below the limit of 50 dBA (Noise Ordinance) + 20 dBA, as well as 41 dBA (actual quietest ambient level at the site) + 20 dBA. The horn noise would be audible at the residences compared to the ambient levels but would not exceed City-established noise thresholds.

Noise associated with outdoor activity in the parking lot would be less than significant.

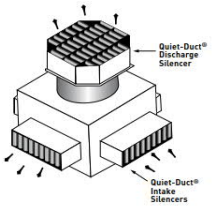
3.4.4 HVAC Equipment Noise

The health club will be served by thirteen (13) HVAC units located on the rooftop. Approximately one-half of the rooftop units will be located on the western half the building, and the remaining will sit on the eastern half. No

screening is proposed. Based on manufacturer's sound data for the basis of design RTUs, cumulative noise levels due to the project RTUs are calculated to be 53 dBA at the nearest residential property line; this is calculated at maximum equipment operation, which is the worst case scenario. At least one of three mitigation options will be applied so the Municipal Code limit of 50 dBA is not exceeded: an equipment screen or taller parapet on the roof, baffles/silencers/attenuators on the equipment, or quieter equipment that can be shown to achieve the requirement.

Mitigation 1: Screen or Parapet. To be an effective noise barrier, the screen or parapet should extend at least one (1) foot above the tallest RTU and should be continuous at the north and west edges of the health club building.

or Mitigation 2: Baffles/Silencers/Attenuators. RTU's would need to be fully enclosed with noise control devices located at air ventilation to lessen the noise radiating from the equipment. A representative figure of this concept is shown to the right.



or Mitigation 3: Quieter Units. Once specific RTU's are selected, sound data from their manufacturer can be used to show that the Code limit of 50 dBA at nearby property lines would not be exceeded.

This impact is anticipated to be less than significant with mitigation.

3.5 Impact 4. Temporary increase in ambient noise levels

Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction of the project will generate temporary increased noise levels at the property line of the project site. While construction activity will occur within the time periods established in the Noise Ordinance, peaks in construction equipment work could be considered objectionable by some residents in adjacent units. The following measures are identified to reduce the potential effects of construction noise on adjacent properties. They have been separated via the City of Seal Beach General Plan requirements for construction and standard practices for acoustical control.

Mitigation 4.
Seal Beach Municipal Code limits construction activity to the hours listed in Table 3.

Standard Practices for Mitigating Construction Noise include the following:

- Implement a construction-related noise mitigation plan. This plan would depict the location of construction equipment storage and maintenance areas and document methods to be employed to minimize noise impacts on adjacent noise-sensitive land uses. Additionally, the plan shall denote any construction traffic haul routes where heavy trucks would exceed 100 daily trips (counting those both to and from the

construction site). To the extent feasible, the plan shall denote haul routes that do not pass sensitive land uses or residential dwellings.

- Equip internal combustion engine-driven equipment with original factory (or equivalent) intake and exhaust mufflers which are maintained in good condition.
- Prohibit and post signs prohibiting unnecessary idling of internal combustion engines.
- Locate all stationary noise-generating equipment such as air compressors and portable generators as far as practicable from noise-sensitive land uses.
- Utilize "quiet" air compressors and other stationary equipment where feasible and available.
- Designate a noise disturbance coordinator who would respond to neighborhood complaints about construction noise by determining the cause of the noise complaints, and require implementation of reasonable measures to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site.

The General Plan and Noise Ordinance exempts construction noise from the guidelines, provided the construction activities are limited to the allowable hours indicated in Table 3. If construction outside of the hours indicated is desired, the appropriate permitting must be obtained.

The construction will be limited to the hours indicated in Table 3, unless appropriate permitting is obtained. In order to ensure a less than significant impact of noise to neighboring noise-sensitive areas, the previously noted mitigation measures shall be required of the project. This impact is less than significant with the mitigation measures presented.

3.6 Impact 5. Airport noise exposure

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?

The project is not within two miles of a public airport or public use airport. Therefore, there is no noise impact.

3.7 Impact 6. Private airstrip noise exposure

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?

The project is not within the vicinity of a private airstrip. Therefore, there is no impact.

4.0 SUMMARY

4.1 Summary of significance of impacts

CEQA Noise Impact Question		No Impact	Less Than Significant	Less Than Significant with Mitigation	Potentially Significant
1	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?		**X**		
2	Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?		**X**		
3	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			**X**	
4	A substantial temporary or periodic increase in ambient noise levels in the project vicinity about levels existing without the project?			**X**	
5	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?	**X**			
6	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?	**X**			

4.2 Summary of Mitigation Measures

At least one of the three mitigation measures as described in section 3.4.4 will be enacted to reduce the noise levels from the rooftop mechanical equipment to the residences.

Standard Practices for Mitigating Construction Noise as described in section 3.5 will be enacted as needed for the construction equipment to be used.

APPENDIX A

Table A.1 – Definitions of Noise-Related Terms

Term	Definition
Decibel, dB	A unit describing the amplitude of sound equivalent to 20 times the logarithm, to the base 10, of the ratio of the pressure of the sound to the reference pressure of 20 μPa.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured in an A-weighting filter network. The A-weighting de-emphasizes the very low frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are in the A-weighted scale.
L_0 (L_{max}), L_2, L_8, L_{25}, L_{50}	The A-weighted noise levels that are exceeded 0 percent (maximum noise level), 2 percent, 8 percent, 25 percent, and 50 percent of the time during the measurement period.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the stated measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 P.M. to 10:00 P.M., and after addition of 10 decibels to noise levels in the night between 10:00 P.M. and 7:00 A.M.
Day-Night Noise Level, DNL, Ldn	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 P.M. and 7:00 A.M.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Impulsive Noise	Sound of short duration. Typically associated with an abrupt onset and rapid decay (i.e., gun-shots, etc.).
Pure Tones	A sound wave, residing over a small range of frequencies, which has a sinusoidal behavior over time.
VdB	Unit of measurement used by FHWA to describe ground-borne vibration. Equivalent to 20 times the logarithm, to the base 10, of the ratio of the root mean square ground-borne velocity to the reference of reference of $1x10^{-6}$ in/sec.

APPENDIX B

Table B.1 – Summary of Measured Long-Term Sound Levels

Measurement Date	Measurement Time	Exterior Sound Level, 1-hour LAeq	CNEL
1/6/2016	9:00	52	56
	10:00	51	
	11:00	52	
	12:00	52	
	13:00	53	
	14:00	52	
	15:00	53	
	16:00	52	
	17:00	52	
	18:00	53	
	19:00	52	
	20:00	52	
	21:00	53	
	22:00	53	
	23:00	51	
1/7/2016	0:00	47	
	1:00	48	
	2:00	48	
	3:00	44	
	4:00	43	
	5:00	43	
	6:00	46	
	7:00	47	
	8:00	53	