NOISE ANALYSIS REPORT

3450 CLAIREMONT DRIVE

San Diego, CA

November 30, 2020 DRAFT

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EXECUTIVE SUMMARY

This analysis evaluates noise associated with the implementation of the proposed 3450 Clairemont Drive project. The project proposes redevelopment of an existing church property as a 40-unit multifamily residential development. The project site is located at 3450 Clairemont Drive, in the Bay Park neighborhood of the City of San Diego, California (Figure 1).

Future exterior noise levels would be lower than 65 dBA CNEL at all common open space areas in the project. Future exterior noise levels would exceed 60 dBA CNEL at some Building 1 and Building 8 façades. Therefore, interior noise levels in habitable rooms could exceed the City of San Diego General Plan Noise Compatibility Guidelines and CBC Section 1206.4 (Title 24) requirement of 45 dBA CNEL in residences. To comply with this requirement, upgraded building façade elements (windows, walls, doors, and/or exterior wall assemblies) with Sound Transmission Class (STC) ratings of 35 or higher may be necessary. If the interior noise limit can be achieved only with the windows closed, the building design must include mechanical ventilation that meets CBC requirements. Implementation of these measures would ensure that interior noise levels would be 45 dBA CNEL or below in residences, and the project would comply with the City of San Diego General Plan Noise Compatibility Guidelines and the CBC Section 1206.4 (Title 24) requirement. Transportation noise impacts affecting the project site would be less than significant.

Project traffic would result in a negligible noise increase at offsite land uses along Clairemont Drive. Project-generated traffic noise impacts would be less than significant.

Project operation would generate noise levels up to 39 dBA Leq at its property lines. Project-generated operational noise impacts would be less than significant.

Project construction would generate noise levels up to 75 dBA Leq at residential property lines. Project construction noise impacts would be less than significant.

3450 Clairemont Drive
Noise Analysis

dBF Associates, Inc.

FIGURE 1
Vicinity Map

1.0 PROJECT DESCRIPTION

The Clairemont Drive project encompasses approximately 3.28 acres and is located at 3450 Clairemont Drive in the Clairemont community of the City of San Diego. The project site is currently developed with the Holy Cross Lutheran Church and Banyan Tree Educational Services, which consist of two buildings, paved parking areas, and other associated improvements such as a playground, basketball court, and landscaping. The project site is bounded on the east by Clairemont Drive, on the north by an existing church facility, on the south by an asphalt paved parking area and open canyon space, and on the west by open canyon space. Surrounding land uses include St. Mark's United Methodist Church to the north, single-family residences to the west and south past the canyon space, and Whittier Special Education Center to the east across Clairemont Drive. The project site is in the Clairemont Mesa Community Plan Area, which designates the site as Low-Medium Residential. The City of San Diego General Plan designates the project site as Residential. The site is zoned RM-1-1 (Residential—Multiple Unit). The RM-1-1 zone allows residential development at a density of one dwelling unit per 3,000 square feet of site area. Under the RM-1-1 zone, a total of 47 dwelling units is permitted on the project site.

The Clairemont Drive project proposes redevelopment of the existing site as a townhome project. The project involves the demolition of 15,172 square feet of buildings, surface parking, and related facilities, and would redevelop the project site with 40 multi-family residential units across eight buildings. Buildings would be three stories with a maximum height of 30 feet, per the Clairemont Mesa height limit overlay. Parking would be provided as tuck-under garages with surface guest parking. Landscaped areas include the perimeter of the project site as well as walkways in order to provide sitewide coverage, parkway shade, and to accentuate the entry into the site. In addition, the project would also add street trees to the parkway along Clairemont Drive. Access to the townhome development would be via one driveway off Clairemont Drive.

The project would require the following discretionary actions: Tentative Map and Site Development Permit.

2.0 ENVIRONMENTAL NOISE BACKGROUND

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound typically associated with human activity and that interferes with or disrupts normal activities. The human environment is characterized by a certain consistent noise level which varies with each area. This is called ambient noise. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, perceived importance of the noise and its appropriateness in the setting, time of day and type of activity during which the noise occurs, and sensitivity of the individual.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the sound's pitch and is measured in cycles per second, or hertz (Hz), whereas intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually as pain at still higher levels. Studies have shown that the smallest perceptible change in sound level for a person with normal hearing sensitivity is approximately 3 dBA. A change of at least 5 dBA would be noticeable and would likely evoke a community reaction. A 10-dBA increase is subjectively heard as a doubling in loudness and would cause a community response [Caltrans 2013a]. Sound levels of typical noise sources and environments are provided in Table 2.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. A simple rule is useful, however, in dealing with sound levels. If a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example, 60 dB + 60 dB = 63 dB, and 80 dB + 80 dB = 83 dB. The normal human ear can detect sounds that range in frequency from about 20 Hz to 20,000 Hz.

However, all sounds in this wide range of frequencies are not heard equally well by the human ear, which is most sensitive to frequencies in the range of 1,000 Hz to 4,000 Hz. This frequency dependence can be taken into account by applying a correction to each frequency range to approximate the human ear's sensitivity within each range. This is called A-weighting and is commonly used in measurements of community environmental noise. The A-weighted sound pressure level (abbreviated as dBA) is the sound level with the "A-weighting" frequency correction. In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Table 1. Sound Levels of Typical Noise Sources and Noise Environments

Noise Source (at Given Distance)	Noise Environment	A-Weighted Sound Level	Human Judgment of Noise Loudness (Relative to Reference Loudness of 70 Decibels*)
Military Jet Takeoff with Afterburner (50 ft)	Carrier Flight Deck	140 Decibels	128 times as loud
Civil Defense Siren (100 ft)		130	64 times as loud
Commercial Jet Take-off (200 ft)		120	32 times as loud **Threshold of Pain**
Pile Driver (50 ft)	Rock Music Concert Inside Subway Station (New York)	110	16 times as loud
Ambulance Siren (100 ft) Newspaper Press (5 ft) Gas Lawn Mower (3 ft)		100	8 times as loud **Very Loud**
Food Blender (3 ft) Propeller Plane Flyover (1,000 ft) Diesel Truck (150 ft)	Boiler Room Printing Press Plant	90	4 times as loud
Garbage Disposal (3 ft)	Noisy Urban Daytime	80	2 times as loud
Passenger Car, 65 mph (25 ft) Living Room Stereo (15 ft) Vacuum Cleaner (10 ft)	Commercial Areas	70	Reference Loudness **Moderately Loud**
Normal Speech (5 ft) Air Conditioning Unit (100 ft)	Data Processing Center Department Store	60	1/2 as loud
Light Traffic (100 ft)	Large Business Office Quiet Urban Daytime	50	1/4 as loud
Bird Calls (distant)	Quiet Urban Nighttime	40	1/8 as loud **Quiet**
Soft Whisper (5 ft)	Library and Bedroom at Night Quiet Rural Nighttime	30	1/16 as loud
	Broadcast and Recording Studio	20	1/32 as loud Just Audible
		0	1/64 as loud Threshold of Hearing

Source: Compiled by dBF Associates, Inc.

Because community noise fluctuates over time, a single measure called the Equivalent Sound Level (Leq) is often used to describe the time-varying character of community noise. The Leq is the energy-averaged A-weighted sound level during a measured time interval, and is equal to the level of a continuous steady sound containing the same total acoustical energy over the averaging time period as the actual time-varying sound. Additionally, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the Lmax and Lmin indicators, which represent the root-mean-square maximum and minimum noise levels obtained during the measurement interval. The Lmin value obtained for a particular monitoring location is often called the "acoustic floor" for that location.

To describe the time-varying character of environmental noise, the statistical noise descriptors L10, L50, and L90 are commonly used. They are the noise levels equaled or exceeded during 10, 50, and 90 percent of a stated time, respectively. Sound levels associated with L10 typically describe transient or short-term events, whereas levels associated with L90 describe the steady-state (or most prevalent) noise conditions.

The Community Noise Equivalent Level (CNEL) is a descriptor representing a 24-hour, time-weighted, annual average noise level based on the "A-weighted" decibel. In the calculation process, noise occurring in the evening time period (7 p.m. to 10 p.m.) is penalized by adding 5 dB, while noise occurring in the nighttime period (10 p.m. to 7 a.m.) is penalized by adding 10 dB. These time periods and decibel increases are intended to reflect a typical person's increased sensitivity to noise during late-night and early morning hours. This descriptor is used by the State of California and the City of San Diego to evaluate land-use compatibility with regard to noise.

3.0 REGULATORY FRAMEWORK

3.1 City of San Diego

3.1.1 General Plan

The City of San Diego requires new projects to meet noise level standards as established in the Noise Element of the General Plan [City of San Diego 2008, Amended 2015: Policy NE-A.4]. These standards are shown in Table NE-3: Land Use – Noise Compatibility Guidelines (Table 2 of this report).

In the Residential – Multiple Dwelling Units land use category, noise levels up to 60 dBA CNEL are considered Compatible with outdoor use areas; noise levels up to 70 dBA CNEL are considered Conditionally Compatible. The building structure must attenuate exterior noise in occupied areas to 45 dBA CNEL or below.

Table 2. City of San Diego Land Use – Noise Compatibility Guidelines

Land Use Category	Exterior Noise Exposure (dBA CNEL)				
	60	65	70	75	
Parks and Recreational					
Parks, Active and Passive Recreation					
Outdoor Spectator Sports, Golf Courses; Water Recreational Facilities; Indoor Recreation Facilities					
Agricultural					
Crop Raising & Farming; Community Gardens, Aquaculture, Dairies; Horticulture Nurseries & Greenhouses; Animal Raising, Maintain & Keeping; Commercial Stables					
Residential					
Single Dwelling Units; Mobile Homes		45			
Multiple Dwelling Units **For uses affected by aircraft noise, refer to Policies NE-D.2. & NE-D.3.*		45	45*		
Institutional					
Hospitals; Nursing Facilities; Intermediate Care Facilities; Kindergarten through Grade 12Educational Facilities; Libraries; Museums; Child Care Facilities		45			
Other Educational Facilities including Vocational/Trade Schools and Colleges and Universities		45	45		
Cemeteries					
Retail Sales					
Building Supplies/Equipment; Food, Beverages & Groceries; Pets & Pet Supplies; Sundries Pharmaceutical, & Convenience Sales; Wearing Apparel & Accessories			50	50	
Commercial Services					
Building Services; Business Support; Eating & Drinking; Financial Institutions; Maintenance & Repair; Personal Services; Assembly & Entertainment (includes public and religious assembly); Radio & Television Studios; Golf Course Support			50	50	
Visitor Accommodations		45	45	45	
Offices					
Business & Professional; Government; Medical, Dental & Health Practitioner; Regional & Corporate Headquarters			50	50	
Vehicle and Vehicular Equipment Sales and Services Use					
Commercial or Personal Vehicle Repair & Maintenance; Commercial or Personal Vehicle Sales & Rentals; Vehicle Equipment & Supplies Sales & Rentals; Vehicle Parking					
Wholesale, Distribution, Storage Use Category					
Equipment & Materials Storage Yards; Moving & Storage Facilities; Warehouse; Wholesale Distribution					
Industrial					
Heavy Manufacturing; Light Manufacturing; Marine Industry; Trucking & Transportation Terminals; Mining & Extractive Industries					
Research & Development				50	

	Compatible	**Indoor Uses**	Standard construction methods should attenuate exterior noise to an acceptable indoor noise level. Refer to Section I.
		Outdoor Uses	Activities associated with the land use may be carried out.
45, 50	**Conditionally Compatible**	**Indoor Uses**	Building structure must attenuate exterior noise to the indoor noise level indicated by the number (45 or 50) for occupied areas. Refer to Section I.
		Outdoor Uses	Feasible noise mitigation techniques should be analyzed and incorporated t make the outdoor activities acceptable. Refer to Section I.
	Incompatible	**Indoor Uses**	New construction should not be undertaken.
		Outdoor Uses	Severe noise interference makes outdoor activities unacceptable.

3.1.2 CEQA Significance Thresholds

The Development Services Department (DSD) California Environmental Quality Act (CEQA) Significance Determination Thresholds [City of San Diego 2011] addresses traffic noise, as specified in Table K-2: Traffic Noise Significance Thresholds (dB(A) CNEL). Relevant portions are reproduced in Table 3.

Table 3. City of San Diego Traffic Noise Significance Thresholds (dBA CNEL)

Structure or Proposed Use that would be impacted by Traffic Noise	Interior Space	Exterior Useable Space†
Single-family detached	45 dB	65 dB
Multi-family, schools, libraries, hospitals, day care, hotels, motels, parks, convalescent homes	Development Services Department (DSD) ensures 45 dB pursuant to Title 24	65 dB
Offices, Churches, Business, Professional Uses	n/a	70 dB
Commercial, Retail, Industrial, Outdoor Spectator Sports Uses	n/a	75 dB

† If a project is currently at or exceeds the significance thresholds for traffic noise described above and noise levels would result in less than a 3 dB increase, then the impact is not considered significant.

Table K-4 specifies noise land use compatibility. In the residential land use category, noise levels up to 65 dBA CNEL are considered compatible.

3.1.3 Municipal Code

3.1.3.1 Operational Noise

Operational noise within the City is governed by Municipal Code Section 59.5.401: Sound Level Limits.

> It shall be unlawful for any person to cause noise by any means to the extent that the one–hour average sound level exceeds the applicable limit given in the following table, at any location in the City of San Diego on or beyond the boundaries of the property on which the noise is produced. The noise subject to these limits is that part of the total noise at the specified location that is due solely to the action of said person.
>
> **TABLE OF APPLICABLE LIMITS**
>
Land Use	Time of Day	One-Hour Average Sound Level (decibels)
1. Single Family Residential	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	50 45 40
2. Multi-Family Residential (up to a maximum density of 1/2000)	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	55 50 45
3. All other Residential	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55 50
4. Commercial	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	65 60 60
5. Industrial or Agricultural	any time	75
>
> The sound level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts. Permissible construction noise level limits shall be governed by Section 59.5.0404 of this article.
> …
> *(Amended 9-11-1989 by O-17337 N.S.)*
> *(Amended 11-28-2005 by O-19446 N.S.; effective 2-9-2006.)*

The project site would include multi-family residences. Surrounding land uses include single-family residences, churches, and a school. The "Commercial" noise limits were considered applicable to the churches. The "All other Residential" noise limits were considered applicable to the school.

At project property lines shared with single-family residences, the operational sound level limits are:

- 52.5 dBA Leq during daytime hours (7:00 a.m. to 7:00 p.m.),
- 47.5 dBA Leq during evening hours (7:00 p.m. to 10:00 p.m.), and
- 42.5 dBA Leq during nighttime hours (10:00 p.m. to 7:00 a.m.).

At project property lines shared with churches, the operational sound level limits are:

- 60 dBA Leq during daytime hours (7:00 a.m. to 7:00 p.m.),
- 55 dBA Leq during evening hours (7:00 p.m. to 10:00 p.m.), and
- 52.5 dBA Leq during nighttime hours (10:00 p.m. to 7:00 a.m.).

At the project property line oriented toward the YMCA facility, the operational sound level limits are:

- 57.5 dBA Leq during daytime hours (7:00 a.m. to 7:00 p.m.),
- 52.5 dBA Leq during evening hours (7:00 p.m. to 10:00 p.m.), and
- 47.5 dBA Leq during nighttime hours (10:00 p.m. to 7:00 a.m.).

3.1.3.2 Construction Noise

Construction noise within the City is governed by Municipal Code Section 59.5.0404: Construction Noise.

> It shall be unlawful for any person, between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on legal holidays as specified in Section 21.04 of the San Diego Municipal Code, with exception of Columbus Day and Washington's Birthday, or on Sundays, to erect, construct, demolish, excavate for, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise unless a permit has been applied for and granted beforehand by the Noise Abatement and Control Administrator. In granting such permit, the Administrator shall consider whether the construction noise in the vicinity of the proposed work site would be less objectionable at night than during the daytime because of different population densities or different neighboring activities; whether obstruction and interference with traffic particularly on streets of major importance, would be less objectionable at night than during the daytime; whether the type of work to be performed emits noises at such a low level as to not cause significant disturbances in the vicinity of the work site; the character and nature of the neighborhood of the proposed work site; whether great economic hardship would occur if the work were spread over a longer time; whether proposed night work is in the general public interest; and he shall prescribe such conditions, working times, types of construction equipment to be used, and permissible noise levels as he deems to be required in the public interest.
>
> Except as provided in subsection C. hereof, it shall be unlawful for any person, including The City of San Diego, to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12-hour period from 7:00 a.m. to 7:00 p.m.
>
> The provisions of subsection B. of this section shall not apply to construction equipment used in connection with emergency work, provided the Administrator is notified within 48 hours after commencement of work.
>
> *(Amended 1-3-1984 by O-16100 N.S.)*

3.1.3.3 Refuse Vehicles and Parking Lot Sweepers

Refuse vehicle and parking lot sweeper noise within the City is governed by Municipal Code Section 59.5.0406: Refuse Vehicles and Parking Lot Sweepers.

> No person shall operate or permit to be operated a refuse compacting, processing, or collection vehicle between the hours of 7:00 p.m. to 6:00 a.m. or a parking lot sweeper between the hours of 7:00 p.m. to 7:00 a.m. in any residential area unless a permit has been applied for and granted by the Administrator.
>
> ("Refuse Vehicles" added 9-18-1973 by O-11122 N.S.; amended 9-22-1976 by O-11916 N.S.) (Amended 6-9-2010 by O-19960 N.S.; effective 7-9-2010.)

3.2 State of California

3.2.1 Residential

California Building Code (CBC), Chapter 12: Interior Environment, Section 1206: Sound Transmission regulates noise levels in buildings with multiple habitable units [State of California 2019]. Relevant portions are reproduced below.

> 1206.4 Allowable interior noise levels. Interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room. The noise metric shall be either the day-night average sound level (Ldn) or the community noise equivalent level (CNEL), consistent with the noise element of the local general plan.

4.0 ENVIRONMENTAL SETTING AND EXISTING CONDITIONS

Noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise-sensitive and may warrant unique measures for protection from intruding noise.

4.1 Existing Conditions

The project site is currently developed with two buildings. Noise-sensitive land uses in the project area include the church to the north, the school to the east, and the residences to the west. The primary existing noise source in the vicinity of the project is vehicular traffic on Clairemont Drive.

Clairemont Drive is a four-lane Major Arterial, divided by a two-way left-turn lane. Clairemont Drive carries an existing (year 2015) average daily traffic (ADT) volume of 17,900 vehicles between Balboa Avenue and Burgener Boulevard [SANDAG 2020a]. Its posted speed limit is 35 miles per hour (mph). The vehicle mix is assumed to be 3% medium trucks and 1% buses, based on observations conducted during the site visit.

4.2 Ambient Sound Level Measurements

An ambient sound level measurement was conducted to estimate the existing acoustical environment on the project site. A RION Model NL-31 American National Standards Institute (ANSI) Type 1 Integrating Sound Level Meter (SLM) was used as the data-collection device. The meter was mounted on a tripod roughly 5 feet above ground to simulate the average height of the human ear. The microphone was fitted with a windscreen. The measurements were performed on Wednesday, October 21, 2020. The sound level meter was calibrated before the measurement period. Simultaneous traffic counts were conducted during the measurement period. The measurement results are summarized in Table 4 and correspond to the location depicted on Figure 2.

Table 4. Sound Level Measurement (dBA)

Measurement Location		Date / Time	Leq	Lmin	Lmax	L10	L50	L90	Traffic (C / MT / HT / B / MC) & Other Noise Sources
ML1	Clairemont Drive 50' southwest of centerline	10/21/2020 10:00 a.m. – 10:10 a.m.	67.2	42.7	77.7	71.8	63.7	48.9	46 / 1 / 0 / 1 / 0 northbound and 50 / 2 / 0 / 0 / 0 southbound.

Notes:

See Figure 3.

C = cars, MT = medium trucks, HT = heavy trucks, B = Buses, MC = Motorcycles.

dBF Associates, Inc.

FIGURE 2
Sound Level Measurement Location

5.0 POTENTIAL NOISE IMPACTS

5.1 Vehicular Traffic Noise

The Federal Highway Administration (FHWA) Traffic Noise Model (TNM) version 2.5 was used to estimate traffic noise levels. The modeling effort considered the peak-hour traffic volume, average estimated vehicle speed, and estimated vehicle mix, i.e., percentage of cars, medium trucks, heavy trucks, buses, and motorcycles. The peak hour traffic noise level was considered equivalent to the CNEL [24 CFR §51.106]. The model was calibrated using actual traffic counts and sound level measurements; modeled sound levels were within 1 dBA of measured sound levels. Future vehicular traffic calculations are summarized in Appendix A.

Sound levels caused by line sources (i.e., variable or moving sound sources such as traffic) generally decrease at a rate of 3 to 4.5 dBA when the distance from the road is doubled, depending on the ground surface hardness between the source and the receiving property [Caltrans 2013a]. The model assumed "hard soil" propagation conditions, which corresponds to a drop-off rate of approximately 3 dBA per doubling of distance. The actual sound level at any receptor location is dependent upon such factors as the source-to-receptor distance and the presence of intervening structures (walls and buildings), barriers, and topography. The noise attenuating effects of changes in elevation, topography, and intervening structures were not included in the model. Therefore, the modeling effort is considered a worst-case representation of the roadway noise.

5.1.1 Traffic Noise Affecting the Project Site

TNM was used to estimate noise levels on the project site as a result of vehicular traffic on Clairemont Drive.

The future ADT volume on Clairemont Drive is projected to be 10,000 vehicles or less [SANDAG 2020b]. Therefore, the existing ADT volume of 17,900 vehicles is the worst-case condition.

There are three common open space areas in the project: The paseo south of Buildings 2 & 3; the paseo west of Building 4; and the courtyard between Buildings 5, 6, & 7. Noise levels on the project site would range from below 60 dBA CNEL at the western buildings to approximately 70 dBA CNEL at the eastern façades. Noise levels in the paseos and courtyard would be less than 65 dBA CNEL. Refer to Figure 3 for details.

The impact of traffic noise affecting the outdoor areas of the project site would be less than significant.


CLAIREMONT DRIVE
PRIMARY ENTRY
70
70
58
58
60
62
58
60
<60
<60
<60
BLDG 8 TYPE-300
BLDG 1 TYPE-610
BLDG 7 TYPE-620
BLDG 2 TYPE-600
BLDG 5 TYPE-400
BLDG 3 TYPE-500
BLDG 4 TYPE-600
RETAIN
DRIVE AISLE
PASEO

5.1.2 Interior Noise

Because future exterior noise levels would exceed 60 dBA CNEL at some Building 1 and Building 8 façades, interior noise levels in habitable rooms could exceed the City of San Diego General Plan Noise Compatibility Guidelines and CBC Section 1206.4 requirement of 45 dBA CNEL in residences.

To comply with this requirement, upgraded building façade elements (windows, walls, doors, and/or exterior wall assemblies) with Sound Transmission Class (STC) ratings of 35 or higher may be necessary for Building 1 and Building 8.

If the interior noise limit can be achieved only with the windows closed, the building design must include mechanical ventilation that meets CBC requirements.

Implementation of these measures would ensure that interior noise levels would be 45 dBA CNEL or below in residences, and the project would comply with the City of San Diego General Plan Noise Compatibility Guidelines and the CBC Section 1206.4 requirement.

The project would result in a less than significant interior noise impact with project features incorporated in accordance with the interior noise analysis.

5.1.3 Project-Generated Traffic

The proposed project would generate a net ADT increase of 233 vehicles on Clairmont Drive. This increase would result in a negligible traffic noise increase. The impact of project-generated traffic noise would be less than significant.

5.2 Operational (Non-Construction) Noise

The project buildings are expected to have rooftop HVAC units. There would be one unit per residence. I was assumed that the units would be screened with parapet walls at least as tall as the units. The unit sizes are not currently specified; however, it was assumed that 3-ton units would be used. A typical 3-ton HVAC condenser produces a sound power level of approximately 68-76 dBA [Carrier].

The Datakustik Cadna/A industrial noise prediction model was used to estimate operational noise levels. The locations of project buildings were imported from the project CAD files [Rick Engineering 2020]. It was assumed that the units could operate continuously.

The project would produce operational noise levels of approximately 33 dBA Leq at the property lines of the residences to the east, approximately 33-39 dBA Leq at the property lines of the residences to the south, 33-38 dBA Leq at the property line of the church to the north, 31-39 dBA Leq at the property line of the church to the south, and 32-36 dBA Leq at the west property line, toward the school.

Project operation would not exceed the property line sound levels allowed by the City of San Diego Municipal Code. Project operation noise impacts would be less than significant.

5.3 Construction Noise

The primary noise source from project construction would be from site preparation. Grading could require the use of heavy equipment such as bulldozers, loaders, and scrapers. No blasting would be necessary. Haul trucks could be used to import or export fill to or from the project sites.

Construction of the project would generate a short-term temporary increase in noise in the project area. The increase in noise level would be primarily experienced close to the noise source. The magnitude of the impact would depend on the type of construction activity, noise level generated by various pieces of construction equipment, duration of the construction phase, acoustical shielding and distance between the noise source and receiver.

Construction activity and delivery of construction materials and equipment would be limited to between 7:00 a.m. and 7:00 p.m., except on Sundays or holidays.

This project would implement conventional construction techniques and equipment. Standard equipment such as scrapers, graders, backhoes, loaders, tractors, cranes, and miscellaneous trucks would be used for construction of most project facilities. Sound levels of typical construction equipment range from approximately 65–95 dBA at 50 feet from the source (U.S. Environmental Protection Agency [U.S. EPA] 1971). Worst-case noise levels are typically associated with grading. Noise sources associated with grading of the proposed project, and associated noise levels, are shown in Table 5.

Table 5. Grading Noise Source Levels

Noise Source	Noise Level	Number
Bulldozer	86 dBA at 10 meters	1
Scraper	82 dBA at 10 meters	1
Backhoe	69 dBA at 10 meters	1
Water Truck	81 dBA at 10 meters	1
Roller	84 dBA at 10 meters	1

Source: DEFRA 2005

The Datakustik Cadna/A industrial noise prediction model was used to estimate construction noise levels. Elevations of the project site and surrounding areas were imported from the project grading CAD files [Rick Engineering 2020]. It was assumed that up to two pieces of equipment at any given time would operate continuously within the grading area boundary. No correction was applied for downtime associated with equipment maintenance, breaks, or similar situations.

The closest occupied residential properties are located adjacent to the project site on the south and west. Construction of the project would produce noise levels ranging from approximately 63-75 dBA Leq (12 hours) at the property lines of the residences.

Construction would occur during the days and hours proscribed by the City of San Diego Municipal Code. Construction noise levels at residential property lines would not exceed the 75 dBA Leq (12 hour) sound level allowed by the City of San Diego Municipal Code. Project construction noise impacts would be less than significant.

6.0 RECOMMENDATIONS

6.1 Vehicular Traffic Noise

No recommendations are required.

6.2 Operational (Non-Construction) Noise

No recommendations are required.

6.3 Construction Noise

No recommendations are required. However, minimization of disturbance from construction noise is often desired. The following measures should be considered:

- Select equipment capable of performing the necessary tasks with the lowest sound level and the lowest acoustic height possible.
- Implement alternatives to the standard backup beepers as feasible. These alternatives include strobe lights or products such as the Brigade Electronics, Inc. Broadband Sound system, which is equally effective while generating a lower noise level.
- Use specially-quieted equipment, such as quieted and enclosed air compressors and properly-working manufacturer-recommended mufflers on all engines.
- Construct enclosures around noise-producing stationary sources such as generators used for night lighting.
- Perform construction vehicle maintenance as far from any residential land use as possible.
- Place the laydown area as far as possible from the closest noise sensitive receptors.
- Limit the delivery of material to the hours between 7:00 a.m. and 7:00 p.m.

7.0 REFERENCES

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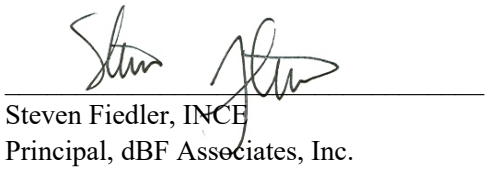
8.0 LIST OF PREPARERS



Steven Fiedler, INCE
Principal, dBF Associates, Inc.

APPENDICES

APPENDIX A
ROADWAY TRAFFIC CALCULATIONS

dBF Associates, Inc.					20 November 2020						
SPF					TNM 2.5						
INPUT: ROADWAYS							Average pavement type shall be used unless				
PROJECT/CONTRACT:	3450 Clairemont Drive						a State highway agency substantiates the use				
RUN:	Measured						of a different type with the approval of FHWA				
Roadway		Points									
Name	Width	Name	No.	Coordinates (pavement)			Flow Control			Segment	
				X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
SB2	12.0	point11	11	6,268,637.5	1,875,236.9	0.00				Average	
		point12	12	6,272,846.0	1,869,961.8	0.00					
SB1	12.0	point13	13	6,268,648.0	1,875,242.8	0.00				Average	
		point14	14	6,272,855.5	1,869,969.2	0.00					
NB1	12.0	point15	15	6,268,671.5	1,875,255.5	0.00				Average	
		point16	16	6,272,858.5	1,870,026.9	0.00					
NB2	12.0	point17	17	6,268,682.5	1,875,261.4	0.00				Average	
		point18	18	6,272,868.0	1,870,034.4	0.00					

dBF Associates, Inc. **20 November 2020**
SPF **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **3450 Clairemont Drive**
RUN: **Measured**

Roadway Name	Points Name	No.	Segment Autos V	Autos S	MTrucks V	MTrucks S	HTrucks V	HTrucks S	Buses V	Buses S	Motorcycles V	Motorcycles S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
SB2	point11	11	150	45	6	45	0	0	0	0	0	0
	point12	12										
SB1	point13	13	150	45	6	45	0	0	0	0	0	0
	point14	14										
NB1	point15	15	138	45	3	45	0	0	3	45	0	0
	point16	16										
NB2	point17	17	138	45	3	45	0	0	3	45	0	0
	point18	18										

dBF Associates, Inc.						**20 November 2020**					
SPF						**TNM 2.5**					
INPUT: RECEIVERS											
PROJECT/CONTRACT:	**3450 Clairemont Drive**										
RUN:	**Measured**										
Receiver											
Name	**No.**	**#DUs**	**Coordinates (ground)**			**Height**	**Input Sound Levels and Criteria**				**Active**
			X	**Y**	**Z**	**above**	**Existing**	**Impact Criteria**		**NR**	**in**
						Ground	**LAeq1h**	**LAeq1h**	**Sub'l**	**Goal**	**Calc.**
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ML1	3	1	6,270,027.0	1,873,458.6	0.00	4.92	67.20	66	10.0	8.0	Y

dBF Associates, Inc. 20 November 2020
SPF TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 3450 Clairemont Drive
RUN: Measured
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
ML1	3	1	67.2	66.8	66	-0.4	10	Snd Lvl	66.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	1	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

dBF Associates, Inc. **20 November 2020**
SPF **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **3450 Clairemont Drive**
RUN: **Existing**

Roadway Name	Points Name	No.	Segment Autos V	Autos S	MTrucks V	MTrucks S	HTrucks V	HTrucks S	Buses V	Buses S	Motorcycles V	Motorcycles S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
SB2	point11	11	434	45	14	45	0	0	5	45	0	0
	point12	12										
SB1	point13	13	434	45	13	45	0	0	4	45	0	0
	point14	14										
NB1	point15	15	434	45	14	45	0	0	5	45	0	0
	point16	16										
NB2	point17	17	434	45	13	45	0	0	4	45	0	0
	point18	18										

dBF Associates, Inc.						**20 November 2020**					
SPF						**TNM 2.5**					
INPUT: RECEIVERS											
PROJECT/CONTRACT:	**3450 Clairemont Drive**										
RUN:	**Existing**										
Receiver											
Name	**No.**	**#DUs**	**Coordinates (ground)**			**Height**	**Input Sound Levels and Criteria**				**Active**
			X	**Y**	**Z**	**above**	**Existing**	**Impact Criteria**		**NR**	**in**
						Ground	**LAeq1h**	**LAeq1h**	**Sub'l**	**Goal**	**Calc.**
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Receiver5	5	1	6,269,820.5	1,873,690.5	0.00	4.92	0.00	66	10.0	8.0	Y
Receiver6	6	1	6,269,889.5	1,873,602.6	0.00	4.92	0.00	66	10.0	8.0	Y
Receiver7	7	1	6,269,926.5	1,873,559.1	0.00	4.92	0.00	66	10.0	8.0	Y
Receiver8	8	1	6,270,007.0	1,873,456.4	0.00	4.92	0.00	66	10.0	8.0	Y
Receiver9	9	1	6,269,806.0	1,873,594.4	0.00	4.92	0.00	66	10.0	8.0	Y
Receiver10	10	1	6,269,810.0	1,873,544.0	0.00	4.92	0.00	66	10.0	8.0	Y
Receiver11	11	1	6,269,847.5	1,873,528.0	0.00	4.92	0.00	66	10.0	8.0	Y
Receiver12	12	1	6,269,905.5	1,873,467.6	0.00	4.92	0.00	66	10.0	8.0	Y
Receiver13	13	1	6,269,909.5	1,873,425.8	0.00	4.92	0.00	66	10.0	8.0	Y

dBF Associates, Inc. 20 November 2020
SPF TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: 3450 Clairemont Drive
RUN: Existing

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per Unit Area	$ per Unit Vol.	Top Width	Run:Rise	$ per Unit Length			X	Y	Z	at Point	Seg Ht Increment	Perturbs #Up	#Dn	On Struct?	Important Reflections?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Barrier2	W	0.00	99.99	0.00				0.00	point3	3	6,269,821.0	1,873,685.9	0.00	25.00	0.00	0	0		
									point4	4	6,269,792.5	1,873,660.4	0.00	25.00	0.00	0	0		
									point5	5	6,269,855.5	1,873,581.6	0.00	25.00	0.00	0	0		
									point6	6	6,269,886.5	1,873,603.8	0.00	25.00	0.00	0	0		
									point7	7	6,269,821.0	1,873,685.9	0.00	25.00					
Barrier3	W	0.00	99.99	0.00				0.00	point8	8	6,269,925.5	1,873,555.2	0.00	25.00	0.00	0	0		
									point9	9	6,269,896.5	1,873,530.2	0.00	25.00	0.00	0	0		
									point10	10	6,269,972.5	1,873,435.1	0.00	25.00	0.00	0	0		
									point11	11	6,270,004.0	1,873,457.1	0.00	25.00	0.00	0	0		
									point12	12	6,269,925.5	1,873,555.2	0.00	25.00					
Barrier4	W	0.00	99.99	0.00				0.00	point13	13	6,269,709.5	1,873,521.6	0.00	25.00	0.00	0	0		
									point14	14	6,269,774.0	1,873,573.2	0.00	25.00	0.00	0	0		
									point15	15	6,269,790.5	1,873,553.9	0.00	25.00	0.00	0	0		
									point16	16	6,269,817.5	1,873,575.1	0.00	25.00	0.00	0	0		
									point17	17	6,269,791.0	1,873,608.0	0.00	25.00	0.00	0	0		
									point18	18	6,269,764.5	1,873,585.6	0.00	25.00	0.00	0	0		
									point19	19	6,269,754.0	1,873,599.8	0.00	25.00	0.00	0	0		
									point20	20	6,269,688.0	1,873,547.9	0.00	25.00					
Barrier5	W	0.00	99.99	0.00				0.00	point21	21	6,269,786.5	1,873,484.5	0.00	25.00	0.00	0	0		
									point22	22	6,269,849.0	1,873,492.0	0.00	25.00	0.00	0	0		
									point23	23	6,269,844.5	1,873,529.0	0.00	25.00	0.00	0	0		
									point24	24	6,269,782.0	1,873,521.5	0.00	25.00	0.00	0	0		
									point25	25	6,269,786.5	1,873,484.5	0.00	25.00					
Barrier6	W	0.00	99.99	0.00				0.00	point26	26	6,269,799.0	1,873,453.6	0.00	25.00	0.00	0	0		
									point27	27	6,269,803.0	1,873,416.1	0.00	25.00	0.00	0	0		
									point28	28	6,269,908.0	1,873,429.2	0.00	25.00	0.00	0	0		
									point29	29	6,269,903.5	1,873,466.2	0.00	25.00	0.00	0	0		
									point30	30	6,269,799.0	1,873,453.6	0.00	25.00					

dBF Associates, Inc. 20 November 2020
SPF TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 3450 Clairemont Drive
RUN: Existing
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver5	5	1	0.0	69.7	66	69.7	10	Snd Lvl	69.7	0.0	8	-8.0
Receiver6	6	1	0.0	69.7	66	69.7	10	Snd Lvl	69.7	0.0	8	-8.0
Receiver7	7	1	0.0	69.8	66	69.8	10	Snd Lvl	69.8	0.0	8	-8.0
Receiver8	8	1	0.0	69.7	66	69.7	10	Snd Lvl	69.7	0.0	8	-8.0
Receiver9	9	1	0.0	58.4	66	58.4	10	----	58.4	0.0	8	-8.0
Receiver10	10	1	0.0	58.4	66	58.4	10	----	58.4	0.0	8	-8.0
Receiver11	11	1	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0
Receiver12	12	1	0.0	57.6	66	57.6	10	----	57.6	0.0	8	-8.0
Receiver13	13	1	0.0	60.6	66	60.6	10	----	60.6	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	9	0.0	0.0	0.0
All Impacted	4	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0