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An Employee-Owned Company

October 30, 2023

Ms. Catherine George
St. John the Baptizer Ukrainian Catholic Church
P.O. Box 3116
La Mesa, CA 91941

Reference: Noise Analysis for the St. John the Baptizer Ukrainian Catholic Church Project (RECON Number 10066)

Dear Ms. George:

The purpose of this report is to assess potential noise impacts from construction and operation of the St. John the Baptizer Ukrainian Catholic Church Project (project). Impacts are assessed in accordance with standards established in the City of Santee's (City's) General Plan Noise Element and the City's Municipal Code.

1.0 Introduction

1.1 Project Description

The project site is located at 9308 Carlton Oaks Drive (Assessor's Parcel Number 380-112-08-00) in the city of Santee, California. The project site is located at the northwest corner of the intersection of Carlton Oaks Drive and Pike Road. The 0.61-acre project site is currently undeveloped. Surrounding land uses include residential development to the northwest, north, east, and southeast, and commercial uses to the south and west. Figure 1 shows the regional location of the project. Figure 2 shows an aerial photograph of the project site and vicinity.

The project involves the construction of a 4,415-square-foot church. Grading would consist of excavating 1,038 cubic yards and exporting 873 cubic yards, with the remaining 165 cubic yards to be reused on the project site.

The project would include a sanctuary with 76 fixed seats that connects to a social hall with an office, kitchen, bathrooms, and mechanical room. The social hall would be used for small church gatherings and events such as weddings, funerals, and baptisms. Gatherings and events would be contained within the building and would not use the parking lot for event space. The project would not have amplified music or musical instruments. However, an acapella choir would perform in the sanctuary. In addition, the proposed building does not include outdoor bells and the sanctuary windows would be fixed to minimize potential noise effects.

The project proposes 19 parking spaces, which meets the required standards specified in Section 13.24.040 of the Santee Municipal Code (churches: 1 space/4 fixed seats within the main auditorium). The main auditorium would contain 76 fixed seats (76 fixed seats/4 fixed seats = 19 spaces). In addition, parking lot screening would be constructed in accordance with Santee Municipal Code Section 13.24.030.A.8. and the project would provide one clean air vehicle space per Table 13.24.040.A. of the Santee Municipal Code. If necessary, the proposed project would secure additional parking at a nearby parking lot. Construction of the proposed project is anticipated to take approximately 12 months. Figure 3 shows the proposed site plan.

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FIGURE 1
Regional Location

Image Source: NearMap (flown April 2022)

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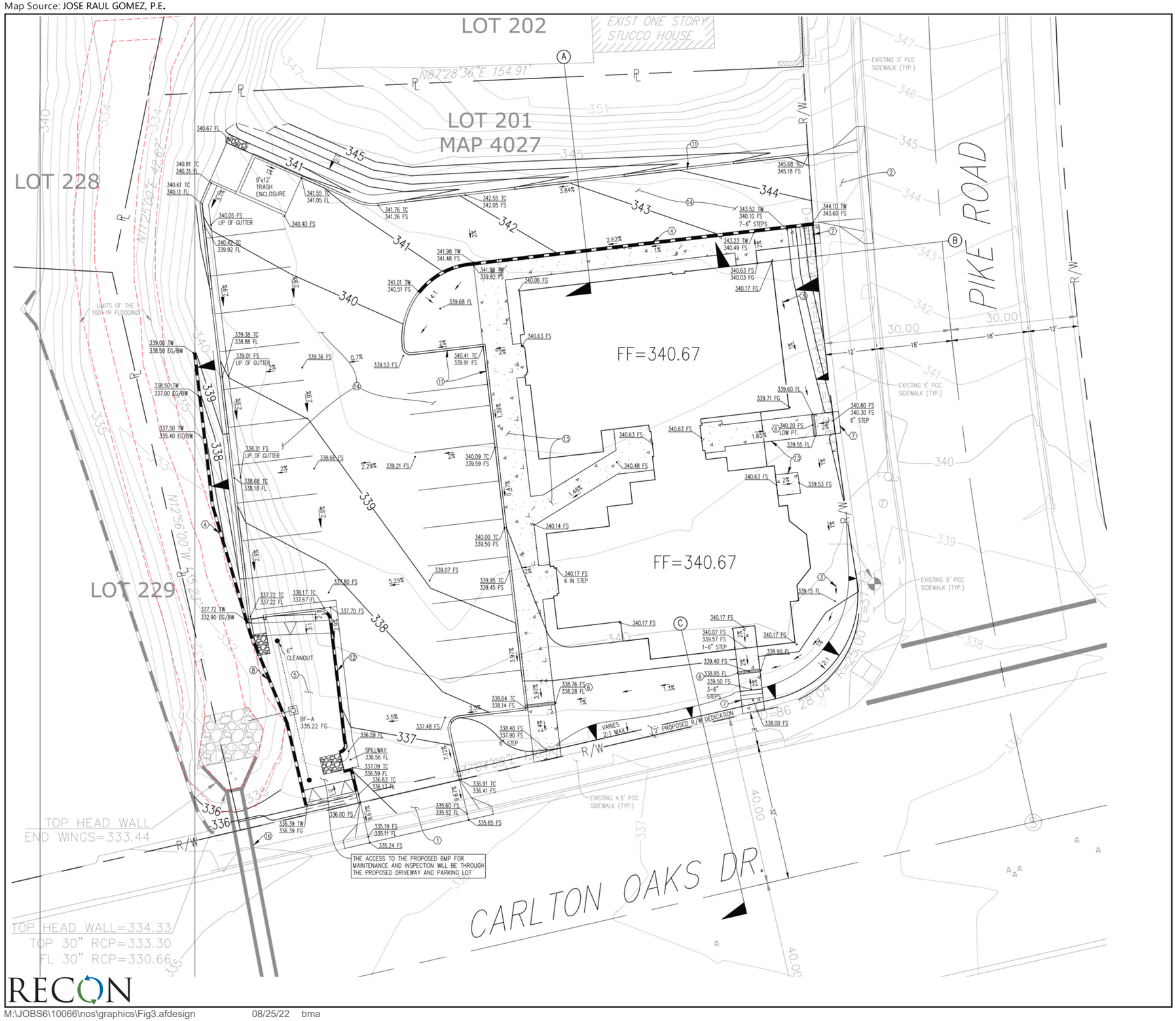
FIGURE 2
Project Location on Aerial Photograph

Map Source: JOSE RAUL GOMEZ, P.E.



CONSTRUCTION KEY NOTES

1. INSTALL NEW 24' PCC DRIVEWAY PER G-14C.
2. INSTALL NEW 16' PCC DRIVEWAY PER G-14C.
3. INSTALL GRADED EARTHEN SWALE AT 1% MINIMUM
4. INSTALL NEW RETAINING WALL PER SDRSD C-02
5. INSTALL NEW BIOFILTRATION PER DETAIL 2 AND DETAIL 3, SHEET 3
6. INSTALL TRENCH DRAIN 8" WIDE (DEPTH VARIES PER PLAN)
7. INSTALL 6" CONCRETE STAIRS PER SDRSD M-27
8. INSTALL NEW RETAINING WALL PER SDRSD C-03
9. -----
10. REMOVE EXISTING RIPRAP AND RELOCATE TO PROPOSED RETAINING WALL
11. INSTALL 6" PVC CURB PER SDRSD G-1
12. INSTALL 6" CURB & GUTTER PER SDRSD G-2, TYPE G.
13. INSTALL 4" PCC SIDEWALK, WIDTH AS SHOWN ON PLAN.
14. INSTALL NEW PAVEMENT, 4" ASPHALT OVER 6" OF AGGREGATE BASE.
15. -----
16. EXISTING CULVERT TO REMAIN & PROTECTED IN PLACE

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FIGURE 3
Site Plan

1.2 Fundamentals of Noise

Sound levels are described in units called the decibel (dB). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; a halving of the energy would result in a 3 dB decrease.

Additionally, in technical terms, sound levels are described as either a "sound power level" or a "sound pressure level," which while commonly confused are two distinct characteristics of sound. Both share the same unit of measure, the dB. However, sound power, expressed as L_{pw}, is the energy converted into sound by the source. The L_{pw} is used to estimate how far a noise will travel and to predict the sound levels at various distances from the source. As sound energy travels through the air, it creates a sound wave that exerts pressure on receivers such as an eardrum or microphone and is the sound pressure level. Noise measurement instruments only measure sound pressure, and noise level limits used in standards are generally sound pressure levels.

The human ear is not equally sensitive to all frequencies within the sound spectrum. To accommodate this phenomenon, the A-scale, which approximates the frequency response of the average young ear when listening to most ordinary everyday sounds, was devised. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Therefore, the "A-weighted" noise scale is used for measurements and standards involving the human perception of noise. Noise levels using A-weighted measurements are designated with the notation dB(A). The impact of noise is not a function of loudness alone. The time of day when noise occurs and the duration of the noise are also important. In addition, most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors has been developed. The noise descriptors used for this study are the one-hour equivalent noise level (L_{eq}), the community noise equivalent level (CNEL), and the day night equivalent level (L_{DN}). The CNEL is a 24-hour equivalent sound level. The CNEL calculation applies an additional 5 dB(A) penalty to noise occurring during evening hours, between 7:00 p.m. and 10:00 p.m., and an additional 10 dB(A) penalty is added to noise occurring during the night, between 10:00 p.m. and 7:00 a.m. These increases for certain times are intended to account for the added sensitivity of humans to noise during the evening and night. Similar to the CNEL, the L_{DN} is a 24-hour equivalent level that applies an additional 10 dB(A) penalty to noise occurring during the night.

Sound from a small, localized source (approximating a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern, known as geometric spreading. The sound level decreases or drops off at a rate of 6 dB(A) for each doubling of the distance.

Traffic noise is not a single, stationary point source of sound. The movement of vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point when viewed over some time interval. The drop-off rate for a line source is 3 dB(A) for each doubling of distance.

The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site (such as parking lots or smooth bodies of water) receives no additional ground attenuation, and the changes in noise levels with distance (drop-off rate) are simply the geometric spreading of the source. A soft site (such as soft dirt, grass, or scattered bushes and trees) receives an additional ground attenuation value of 1.5 dB(A) per doubling of distance. Thus, a point source over a soft site would attenuate at 7.5 dB(A) per doubling of distance.

Human perception of noise has no simple correlation with acoustical energy. A change in noise levels is generally perceived as follows: 3 dB(A) barely perceptible, 5 dB(A) readily perceptible, and 10 dB(A) perceived as a doubling or halving of noise (California Department of Transportation 2013).

2.0 Applicable Standards

2.1 General Plan

The City's General Plan Noise Element includes various goals, objectives, and policies related to noise standards and protections against excessive noise exposure, including the following:

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

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

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

- Policy 1.4: The City shall promote alternative sound attenuation measures rather than traditional wall barrier wherever feasible; these may include glass or polycarbonate walls, berms, landscaping, and the siting of noise-sensitive uses on a parcel away from the roadway or other noise source.

- Policy 1.5: The City shall review future projects with particular scrutiny regarding the reduction of unnecessary noise near noise-sensitive areas such as hospitals, schools, parks, etc.

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

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

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

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

The Noise Element also provides guidelines for determining acceptable and unacceptable community noise exposure limits for various land use categories (Table 1). Normally acceptable noise levels are defined as satisfactory, based on the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements. Conditionally acceptable noise levels indicate that new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features have been included in the design. Conventional construction with closed windows and fresh air supply systems or air conditioning will normally suffice. The City's General Plan states that these compatibility guidelines are not prohibitive but should be used as a guide and a resource (City of Santee 2003).

Table 1 Noise/Land Use Compatibility Guide							
	Community Noise Exposure (CNEL)						
	55	60	65	70	75	80	
Residential – Low Density Single Family, Duplex, Mobile Homes							
Residential – Multiple Family							
Transient Lodging – Motels, Hotels							
Schools, Libraries, Churches, Hospitals, Nursing Homes[1]							
Auditoriums, Concert Halls, Amphitheaters							
Sports Arena, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Business Commercial and Professional							
Industrial, Manufacturing, Utilities, Agriculture							

Table 1 Noise/Land Use Compatibility Guide	
[1]Applies to noise sensitive areas which serve a significant function for the use which could be adversely affected by noise; such as, outside areas used primarily for instruction, meditation areas, rest and relaxation areas, and other areas where general peace and quiet are important.	
	Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
	Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
	Clearly Unacceptable: New construction or development should generally not be undertaken.

The Noise Element further states that when new development may result in the exposure of existing or future noise-sensitive uses to noise levels in excess of 65 dB(A) L_{dn}, an acoustical study will be required. If the acoustical study shows that the noise levels at any noise-sensitive area will exceed 65 dB(A) L_{dn}, the development should not be approved unless the following findings are made:

1. Modifications to the development have been, or will be made, which will reduce the exterior noise levels in noise-sensitive areas to 65 dB(A) L_{dn} or less, or

2. If, with current noise abatement technology, it is not feasible to reduce the exterior noise levels to 65 dB(A) L_{dn} or less, then modifications to the development have been, or will be made, which reduce the exterior noise level to the maximum extent feasible and the interior noise level to 45 dB(A) L_{dn} or less. Particular attention shall be given to noise-sensitive spaces such as bedrooms.

3. For rooms in noise-sensitive areas which are occupied only for a part of the day (schools, libraries, or similar), the interior 1-hour average sound level during occupation, due to noise outside, should not exceed 45 dB(A) L_{eq}.

Further, noise impacts shall be considered significant if any of the following occur as a result of the project:

1. If, as a direct result of the project, noise levels for any existing or planned development will exceed the noise levels considered compatible for that use as identified in Table 1.

2. If, as a direct result of the proposed development, noise levels which already exceed the levels considered compatible for that use are increased by 3 dB or more.

Section 8.0, Implementation, of the Noise Element lists the following measures that may be incorporated into a proposed project as mitigation measures. The following measures are not always required, and mitigation is not limited to this list:

1. The use of site design techniques, such as the provision of buffers to increase distances between the noise source and receiver, siting of buildings and parking areas, and the careful siting of noise-sensitive outdoor features to minimize noise impacts.

2. Provision of berms, landscaping, and other sound barriers, without the exclusive use of walls (e.g., a combination of a small wall and a berm in concert with the overall streetscape in the area could be appropriate).

3. Insulation of buildings against noise, including thicker-than-standard glazing and mechanical ventilation.

4. Improvement of traffic circulation to "smooth" flow by such measures as interconnecting traffic signals.

5. Consideration of the use of innovative construction technologies and materials in constructing or reconstructing streets.

6. Setting of time limits on certain noisy activities.

7. Purchasing of demonstrably quiet equipment for City use.

2.2 Municipal Code

Title 5 - Health and Safety

Chapter 5.04 Noise Abatement and Control Ordinance

On-site generated noise is regulated by the City's Municipal Code, Title 5 Health and Safety, Chapter 5.04 Noise Abatement and Control. The sections applicable to the project are as follows:

Section 5.04.040 General Noise Regulations

A. General Prohibitions. It is unlawful for any person to make, continue, or cause to be made or continued, within the limits of the City, any disturbing, excessive or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity residing in the area. The characteristics and conditions which should be considered in determining whether a violation of the provisions of this section exists, include, but are not limited to, the following:

    1. The level of the noise;
    2. Whether the nature of the noise is usual or unusual;

3. Whether the origin of the noise is natural or unnatural;
4. The level of the background noise;
5. The proximity of the noise to sleeping facilities;
6. The nature and zoning of the area within which the noise emanates;
7. The density of the inhabitation of the area within which the noise emanates;
8. The time of day or night the noise occurs;
9. The duration of the noise;
10. Whether the noise is recurrent, intermittent, or constant; and
11. Whether the noise is produced by a commercial or noncommercial activity.

B. Disturbing, Excessive or Offensive Noises. The following acts, among others, are declared to be disturbing, excessive and offensive noises in violation of this section:

1. Heating and Air Conditioning Equipment and Generators.

a. It is unlawful for any person to operate or allow the operation of any generator, air conditioning, refrigeration or heating equipment in such manner as to create a noise disturbance on the premises of any other occupied property, or if a condominium, apartment house, duplex, or attached business, within any adjoining unit.

b. All generators, heating, air conditioning, or refrigeration equipment are subject to the setback and screening requirements in this code.

Section 5.04.070 Motorized Equipment

It is unlawful to operate any lawn mower, backpack blower, lawn edger, leaf blower, riding tractor, or any other machinery, equipment, or other device, or any hand tool which creates a loud, raucous or impulsive sound, within or adjacent to any residential zone between the hours of 10:00 p.m. and 7:00 a.m. of the following day.

Section 5.04.130 Loading and Unloading Operations

A. It is unlawful for any person to engage in loading, unloading, opening, idling of trucks, closing or other handling of boxes, crates, containers, building materials, garbage cans, dumpsters or similar objects between the hours of 10:00 p.m. and 7:00 a.m. in such a manner as to cause a noise disturbance within or adjacent to a residential district.

Section 5.04.160 Limitations on sources of noise not otherwise addressed:

A. Between 10:00 p.m. and 7:00 a.m., it is unlawful for any person to generate any noise on the public way that is louder than average conversational level at a distance of 50 feet or more, vertically or horizontally, from the source.

B. Between 10:00 p.m. and 7:00 a.m., no person is permitted to generate any noise on any private open space that is louder than average conversational level at a distance of 50 feet or more, measured from the property line of the property from which the noise is being generated.

The Noise Abatement and Control Ordinance establishes the City's noise regulation, generally prohibits nuisance noise and states that it is unlawful for any person to make, continue, or cause to be made or continued within the City limits any disturbing, excessive, or offensive noise that causes discomfort or annoyance to reasonable persons of normal sensitivity residing in the area [Municipal Code Section 5.04.040(A)].

Municipal Code Section 5.04.090, which specifically pertains to construction equipment, makes operation of any construction equipment outside the hours of 7:00 a.m. through 7:00 p.m., Monday through Saturday, except holidays, unlawful unless the operation is expressly approved by the Director of Development Services. Construction equipment with a manufacturer's noise rating of 85 dBA L_{max} or greater may only operate at a specific location for 10 consecutive workdays. If work involving such equipment would involve more than 10 consecutive workdays, a notice must be provided to all property owners and residents within 300 feet of the site no later than 10 days before the start of construction. The notice must be approved by the City and describe the proposed project and the expected duration of work and provide a point of contact to resolve noise complaints.

Title 13 - Zoning

Chapter 13.30 General Development and Performance Standards

The intent of this section is to protect properties in all districts and the health and safety of persons from environmental nuisances and hazards and to provide a pleasing environment in keeping with the nature of the district character. Section 13.30.030 applies to operation of land uses and states that no operation or activity is permitted which will create vibration noticeable without instruments at the perimeter of the subject property.

3.0 Existing Conditions

Existing noise levels in the vicinity of the project site were measured on February 25, 2022, using one Larson-Davis Model LxT, Type 1 Integrating Sound Level Meter, serial number 3829. The following parameters were used:

Filter:	A-weighted
Response:	Slow
Interval Period	1 minute
Time History Period:	5 seconds

The meter was calibrated before measurement. The meter was set 5 feet above the ground level for each measurement. The weather was clear with a slight breeze during the measurement period. Figure 4 shows the noise measurement locations. Noise measurement data is provided in Attachment 1.

Measurement 1 was located 50 feet north of Carlton Oaks Drive. The main source of noise was vehicle traffic on Carlton Oaks Drive and Carlton Hill Boulevard, and secondary sources of noise included vehicle traffic on Pike Road and aircraft flyovers. Noise levels were measured for 15 minutes, and vehicle traffic on Carlton Oaks Drive was counted. The average measured noise level was 60.3 dB(A) L_{eq}.

Measurement 2 was located 50 west north of Pike Road. The main source of noise was vehicle traffic on Carlton Oaks Drive, and secondary sources of noise included vehicle traffic on Pike Road and Carlton Hill Boulevard and aircraft flyovers. Noise levels were measured for 15 minutes, and vehicle traffic on Pike Road was counted. The average measured noise level was 54.0 dB(A) L_{eq}.

Table 2 summarizes the measured noise levels. Table 3 summarizes the traffic counts taken during Measurements 1 and 3.

Image Source: NearMap (flown April 2022)

Parcel Boundary

Noise Measurement

0 Feet 100

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FIGURE 4
Noise Measurement Locations

Table 2 Noise Measurements				
Measurement	Location	Time	Main Noise Sources	L_{eq}
1	50 feet north of Carlton Oaks Drive	1:06 p.m. – 1:21 p.m.	Vehicle traffic on Carlton Oaks Drive and Carlton Hills Boulevard	60.3
2	50 feet west of Pike Road	12:49 p.m. – 1:04 p.m.	Vehicle traffic on Carlton Oaks Drive	54.0
L_{eq} = equivalent noise level NOTE: Noise measurement data is contained in Attachment 1.				

Table 3 15-minute Traffic Counts							
Measurement	Road	Direction	Autos	Medium Trucks	Heavy Trucks	Buses	Motorcycles
1	Carlton Oaks Drive	Eastbound	58	2	0	0	0
		Westbound	54	0	0	0	1
2	Pike Road	Northbound	16	0	0	0	0
		Southbound	4	0	0	0	0

4.0 Methodology

Noise level predictions and contour mapping were developed using noise modeling software, SoundPlan Essential, version 4.1 (Navcon Engineering 2018). SoundPLAN calculates noise propagation based on the International Organization for Standardization method (ISO 9613-2 – Acoustics, Attenuation of Sound during Propagation Outdoors). The model calculates noise levels at selected receiver locations using input parameter estimates such as total noise generated by each noise source; distances between sources, barriers, and receivers; and shielding provided by intervening terrain, barriers, and structures. The model outputs can be developed as noise level contour maps or noise levels at specific receivers. In all cases, receivers were modeled at 5 feet above ground elevation, which represents the average height of the human ear.

4.1 Construction Noise Analysis

Project construction noise would be generated by diesel engine-driven construction equipment used for site preparation and grading, building construction, loading, unloading, and placing materials and paving. Diesel engine-driven trucks also would bring materials to the site and remove the soils from excavation.

Construction equipment with a diesel engine typically generates maximum noise levels from 70 to 95 dB(A) L_{eq} at a distance of 50 feet (Federal Highway Administration [FHWA] 2006 and 2008; Federal Transit Authority 2006). During construction, equipment moves to different locations and goes through varying load cycles, and there are breaks for the operators and for non-equipment tasks, such as measurement. Table 4 summarizes typical construction equipment noise levels and duty cycles.

Due to the small size of the project site, only a minimal amount of heavy construction equipment would be used. The loudest piece of construction equipment would be a backhoe. As shown in Table 4, a backhoe generates a noise level of 80 dB(A) L_{eq} with a duty cycle of 40 percent. This results in an average hourly noise level of 76 dB(A) L_{eq} at 50 feet which is equivalent to a sound power level of 108 dB(A) L_{pw}. Noise levels were modeled as an area source over the footprint of the project.

Table 4 Typical Construction Equipment Noise Levels		
Equipment	Noise Level at 50 Feet [dB(A) L_{eq}]	Typical Duty Cycle
Auger Drill Rig	85	20%
Backhoe	80	40%
Blasting	94	1%
Chain Saw	85	20%
Clam Shovel	93	20%
Compactor (ground)	80	20%
Compressor (air)	80	40%
Concrete Mixer Truck	85	40%
Concrete Pump	82	20%
Concrete Saw	90	20%
Crane (mobile or stationary)	85	20%
Dozer	85	40%
Dump Truck	84	40%
Excavator	85	40%
Front End Loader	80	40%
Generator (25 kilovolt amps or less)	70	50%
Generator (more than 25 kilovolt amps)	82	50%
Grader	85	40%
Hydra Break Ram	90	10%
Impact Pile Driver (diesel or drop)	95	20%
In situ Soil Sampling Rig	84	20%
Jackhammer	85	20%
Mounted Impact Hammer (hoe ram)	90	20%
Paver	85	50%
Pneumatic Tools	85	50%
Pumps	77	50%
Rock Drill	85	20%
Roller	74	40%
Scraper	85	40%
Tractor	84	40%
Vacuum Excavator (vac-truck)	85	40%
Vibratory Concrete Mixer	80	20%
Vibratory Pile Driver	95	20%
dB(A) L_{eq} = A-weighted decibels average noise level SOURCE: Federal Highway Administration 2006 and 2008; Federal Transit Authority 2006.		

4.2 Traffic Noise Analysis

The SoundPLAN program uses the FHWA Traffic Noise Model algorithms and reference levels to calculate traffic noise levels at selected receiver locations. The model uses various input parameters, such as projected hourly average traffic rates; vehicle mix, distribution, and speed; roadway lengths and gradients; distances between sources, barriers,

and receivers; and shielding provided by intervening terrain, barriers, and structures. Receivers, roadways, and barriers were input into the model using three-dimensional coordinates.

The main source of traffic noise at the project site is vehicle traffic on Carlton Oaks Drive and Carlton Hills Boulevard. Existing and future (year 2050) were obtained from San Diego Association of Governments (SANDAG) Series 14 traffic projections (SANDAG 2022). The existing vehicle traffic volumes were used to determine if the project would result in a significant increase in ambient noise levels. The future (year 2050) vehicle traffic volumes were used to model future noise levels and determine compatibility with the City's noise standards. A vehicle classification mix of 93 percent automobiles, 3 percent medium trucks, 2 percent heavy trucks, 1 percent buses, and 1 percent motorcycles was modeled. Based on field traffic counts conducted during the noise measurements, this vehicle classification mix is conservative. Table 5 summarizes the modeled future vehicle traffic parameters.

Table 5
Vehicle Traffic Parameters

Roadway Segment	Existing ADT*	Future (Year 2050) ADT	Speed (mph)
Carlton Oaks Drive	13,133	13,500	35
Carlton Hills Boulevard			
South of Carlton Oaks Drive	22,400	23,600	35
North of Carlton Oaks Drive	6,433	7,600	35

ADT = Average Daily Trips; mph = miles per hour
SOURCE: San Diego Association of Governments2022
*The San Diego Association of Governments Transportation Forecast Information Center provides traffic volumes for years 2016, 2025, 2035, and 2050. Existing year 2022 volume was obtained by extrapolation between the year 2016 and year 2025 volumes.

4.3 On-Site Noise Analysis

The operational noise sources on the project site are anticipated to be those that would be typical of church, and would include heating, ventilations, and air conditioning (HVAC) units, people gathering, vehicles arriving and leaving, and landscaping equipment. All other noise generating activities would occur within the buildings. There would be no outdoor sound amplification or music outside the church. Due to the limited size of the project, noise levels due to people gathering, vehicles, and landscaping activities would be minimal and would be similar to the surrounding environment, and are not anticipated to exceed the Noise Abatement and Control Ordinance requirements. However, noise levels due to the operation of HVAC units were modeled using SoundPLAN.

HVAC equipment was modeled on the ground between the two buildings. It is not known at this time which manufacturer, brand, or model of unit or units will be selected for use in the project. Typically, a capacity of 1 ton per 340 square feet would be required for large office buildings. This ratio was used to determine the total HVAC capacity required for the project. Based on this ratio, the buildings would each require an HVAC unit with an approximate capacity of 6 tons. Based on the review of manufacturer specifications for a sample unit (Trane Model WSC072ED), a representative noise level for a 6-ton unit would be a sound power level of 83 dB. Noise specifications are contained in Attachment 2. The units were modeled at full capacity during the daytime hours, and at 50 percent capacity during the nighttime hours when the church would not be occupied.

5.0 Noise Impacts

5.1 Construction Noise Analysis

Noise level limits for construction activities are established in Section 5.04.090 of the City's Municipal Code. These limits state that a notice must be provided to all owners and occupants within 300 feet of the project site if the construction equipment has a manufacturer's noise rating of 85 dB and operates at a specific location for 10 consecutive workdays.

In addition, Section 5.04.090 of the City's Municipal Code states that no construction equipment is permitted before 7:00 a.m. or after 7:00 p.m. on Mondays through Saturdays and all times on Sundays and holidays.

Surrounding land uses include residential development to the northwest, north, east, and southeast, and commercial uses to the south and west. Noise associated with the construction of the project was modeled at a series of 12 receivers located at the adjacent properties. Construction noise is considered a point source and would attenuate at approximately 6 dB(A) for every doubling of distance. Construction activities were modeled as an area source distributed over the project footprint. The results are summarized in Table 6. Construction noise contours are shown in Figure 5. SoundPLAN data is contained in Attachment 3.

Table 6
Construction Noise Levels at Off-Site Receivers
[dB(A) L_{eq}]

Receiver	Land Use	Construction Noise Level
1	Commercial	70
2	Commercial	66
3	Single Family Residential	69
4	Single Family Residential	67
5	Single Family Residential	64
6	Single Family Residential	73
7	Single Family Residential	72
8	Multi-Family Residential	65
9	Multi-Family Residential	65
10	Multi-Family Residential	58
11	Commercial	63
12	Commercial	60

dB(A) L_{eq} = A-weighted decibels equivalent noise level

As shown, construction noise levels are anticipated to range from 58 to 73 dB(A) L_{eq} at the adjacent properties. Although the existing adjacent uses would be exposed to construction noise levels that could be heard above ambient conditions, the exposure would be temporary. The project would not require construction equipment that has a manufacturer's noise rating of 85 dB or higher. In accordance with Section 5.04.090 of the City's Municipal Code, construction activities would not occur before 7:00 a.m. or after 7:00 p.m. on Mondays through Saturdays and would not occur any time on Sundays and holidays. As construction activities associated with the project would comply with requirements of the Noise Abatement and Control Ordinance, temporary increases in noise levels from construction activities would be less than significant.

Image Source: NearMap (flown April 2022)

Parcel Boundary

Receivers

Construction Noise

60 dB(A) L_{eq}

65 dB(A) L_{eq}

70 dB(A) L_{eq}

75 dB(A) L_{eq}

0 Feet 100

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FIGURE 5

Construction Noise Contours

5.2 Traffic Noise Analysis

5.2.1 On-site Noise Compatibility

Noise and land use compatibility is regulated by the Noise Element of the City's General Plan. As shown in Table 1, churches are normally acceptable with noise levels up to 65 CNEL, conditionally acceptable with noise levels from 65 to 70 CNEL, normally unacceptable with noise levels from 70 CNEL to 80 CNEL, and clearly unacceptable with noise levels above 80 CNEL.

Vehicle traffic noise level contours across the project site were calculated using SoundPLAN. These contours take into account the project area topography and buildings west of the project site but do not take into account any shielding provided by proposed buildings or barriers. These noise contours are shown in Figure 6. SoundPLAN data are provided in Attachment 4.As shown, future exterior noise levels are projected to be less than 65 CNEL at the proposed church, and are considered "normally acceptable." Thus, the project could be compatible with City standards.

The interior noise level standard for noise sensitive land uses is 45 CNEL. Interior noise levels can be reduced through standard construction techniques. When windows are closed, standard construction techniques provide various exterior-to-interior noise level reductions depending on the type of structure and window. According to the FHWA's Highway Traffic Noise Analysis and Abatement Guidance, buildings with masonry façades and double-glazed windows can be estimated to provide a noise level reduction of 35 dB, while light-frame structures with standard windows may provide noise level reductions of at least 20 dB (FHWA 2011). Because exterior noise levels are projected to be 65 CNEL or less, assuming a 20 dB exterior-to-interior noise reduction would result in interior noise levels that are 45 CNEL or less. Thus, interior noise levels would not exceed the standard of 45 CNEL. Exterior and interior noise impacts would be less than significant.

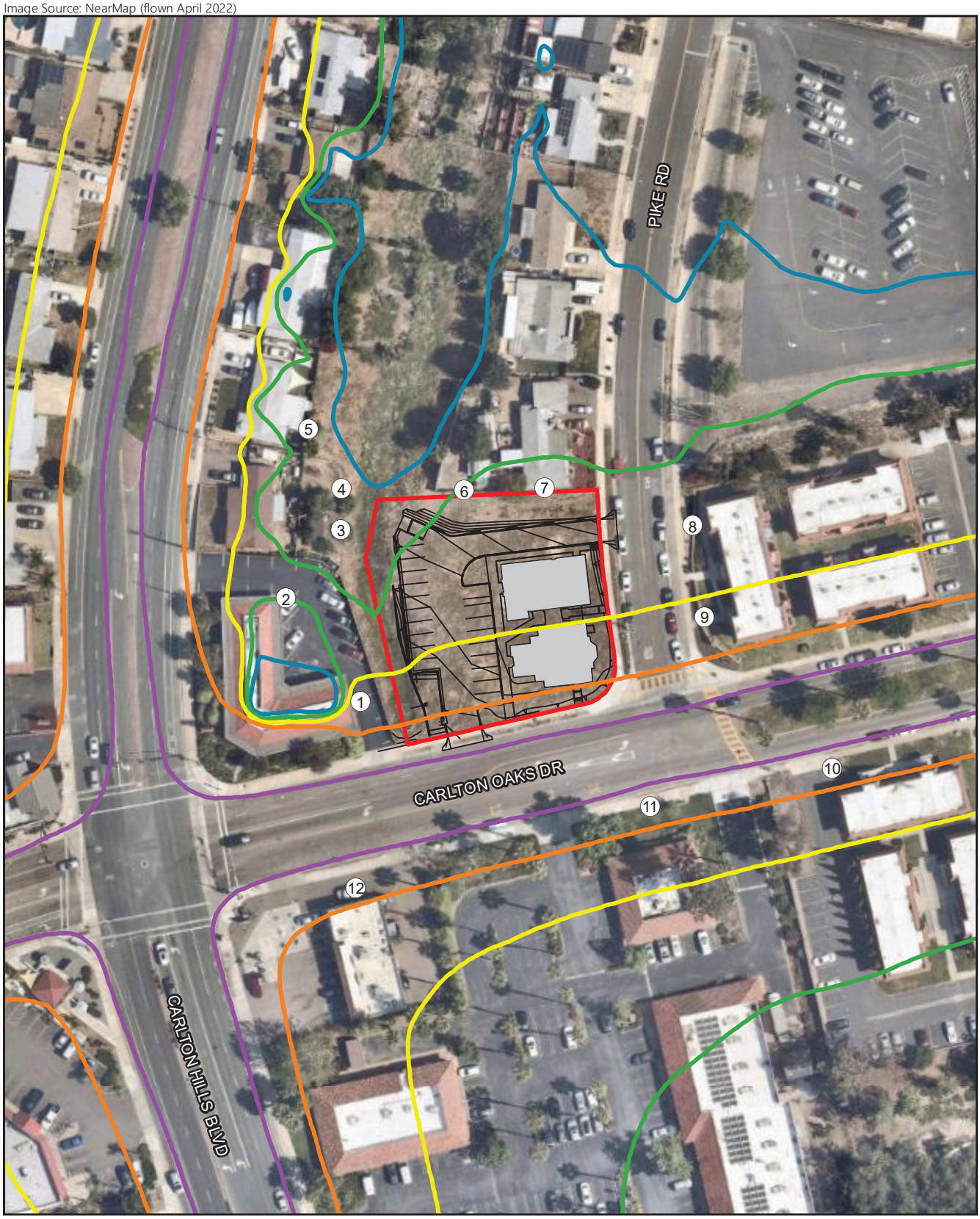
The calculations in this Noise Analysis are conservative because they do not account for the six-foot-high wall on the northern edge of the property, and for the acapella choir which would be located inside the sanctuary which has fixed windows. Thus, impacts would remain less than significant.

5.2.2 Off-Site Vehicle Traffic Noise

The project would contribute traffic to the local roadways. However, the project would not substantially alter the vehicle classifications mix on local or regional roadways nor would the project alter the speed on an existing roadway or create a new roadway. Thus, the primary factor affecting off-site noise levels would be increased traffic volumes. While changes in noise levels would occur along any roadway where project-related traffic occurs, for noise assessment purposes, noise level increases are assumed to be greatest nearest the project site, as this location would represent the greatest concentration of project-related traffic. As discussed in Section 2.1, noise impacts would be significance if, as a direct result of the project, (1) noise levels for any existing or planned development will exceed the noise levels considered compatible for that use as identified in Table 1, or (2) noise levels which already exceed the levels considered compatible for that use are increased by 3 dB or more.

Churches generated 9 trips per 1,000 square feet (SANDAG 2002) for a total of 40 ADT. A 3 dB increase in noise levels would occur when there is a doubling of traffic volumes on a roadway. Typically, a project would have to double the traffic volume on a roadway in order to have a significant direct noise increase of 3 dB or more or to be major contributor to the cumulative traffic volumes. Table 7 summarizes the existing and future traffic noise levels and the associated increase in noise.

Image Source: NearMap (flown April 2022)



Parcel Boundary
Receivers
Site Plan
Church Buildings

Traffic Noise
50 CNEL
55 CNEL
60 CNEL
65 CNEL
70 CNEL

0 Feet 100

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FIGURE 6
Vehicle Traffic Noise Contours

Table 7 Off-Site Vehicle Traffic Noise Levels						
	Existing (CNEL)			Year 2050 (CNEL)		
Roadway Segment	Without Project	With Project	Increase	Without Project	With Project	Increase
Carlton Oaks Drive	68.4	68.4	0.0	68.6	68.6	0.0
Carlton Hills Boulevard						
South of Carlton Oaks Drive	70.8	70.8	0.0	71.0	71.0	0.0
North of Carlton Oaks Drive	65.3	65.4	0.1	66.1	66.1	0.0
CNEL = Community Noise Equivalent Level Note: Noise levels are modeled at 50 feet from the roadway.						

As shown, an increase of 40 trips on Carlton Oaks Drive and Carlton Hills Boulevard would result in a noise increase of 0.1 dB or less, which would not be an audible change in noise levels. Therefore, the project would not result in the exposure of noise sensitive land uses to significant noise levels, and impacts would be less than significant. FHWA calculations are shown in Attachment 5.

5.3 On-Site Noise Analysis

On-site generated noise is regulated by the City's Municipal Code, Title 5 Health and Safety, Chapter 5.04 Noise Abatement and Control. Section 5.04.040 of the City's Municipal Code states that "it is unlawful for any person to make, continue, or cause to be made or continued, within the limits of the City, any disturbing, excessive or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity residing in the area." Section 5.04.040 also provides the following requirements for HVAC units:

4. Heating and Air Conditioning Equipment and Generators.

    a. It is unlawful for any person to operate or allow the operation of any generator, air conditioning, refrigeration or heating equipment in such manner as to create a noise disturbance on the premises of any other occupied property, or if a condominium, apartment house, duplex, or attached business, within any adjoining unit.

    b. All generators, heating, air conditioning, or refrigeration equipment are subject to the setback and screening requirements in this code.

Operational noise sources after construction would include vehicles arriving and leaving and landscape maintenance machinery, and would be similar to noise sources from adjacent land uses. With the exception of HVAC units, none of these noise sources would have the potential to produce excessive noise or result in a substantial permanent increase in existing noise level. HVAC units would be located on the ground between the two buildings. Using the parameters discussed in Section 4.3, property line noise levels due to HVAC units were modeled using SoundPLAN. The modeling results are summarized in Table 8. Daytime and nighttime HVAC noise contours are shown in Figures 7 and 8, respectively. SoundPLAN data is contained in Attachment 6.

As shown, property line noise levels would range from 27 to 46 dB(A) L_{eq} during the daytime hours and 24 to 43 dB(A) L_{eq} during the nighttime hours. Noise at this level would not be considered a noise disturbance. The units would be operated in accordance with the requirements of the City's Municipal Code. Therefore, impacts due to on-site noise sources would be less than significant.

Image Source: NearMap (flown April 2022)

Parcel Boundary
Receivers
HVAC
Site Plan
Church Buildings

Daytime HVAC Noise

40 dB(A) L_{eq}
45 dB(A) L_{eq}
50 dB(A) L_{eq}
55 dB(A) L_{eq}

0 Feet 75

RECON

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FIGURE 7
Daytime HVAC Noise Contours

Image Source: NearMap (flown April 2022)

Parcel Boundary
Receivers
HVAC
Site Plan
Church Buildings

Nighttime HVAC Noise

40 dB(A) L_{eq}
45 dB(A) L_{eq}
50 dB(A) L_{eq}
55 dB(A) L_{eq}

0 Feet 75

RECON

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FIGURE 8
Nighttime HVAC Noise Contours

Table 8 HVAC Noise Levels at Off-Site Receivers [dB(A) L_{eq}]			
		HVAC Noise Level	
Receiver	Land Use	Daytime	Nighttime
1	Commercial	43	40
2	Commercial	38	35
3	Single Family Residential	32	29
4	Single Family Residential	29	26
5	Single Family Residential	27	24
6	Single Family Residential	32	29
7	Single Family Residential	29	26
8	Multi-Family Residential	44	41
9	Multi-Family Residential	46	43
10	Multi-Family Residential	28	25
11	Commercial	27	24
12	Commercial	37	34
dB(A) L_{eq} = A-weighted decibels equivalent noise level; HVAC = heating, ventilation, and air conditioning			

6.0 Conclusions

Noise impacts due to construction and operation of the project were assessed in accordance with standards established in the City's General Plan Noise Element and the City's Municipal Code. As discussed in this analysis, construction noise levels are anticipated to range from 58 to 73 dB(A) L_{eq} at the adjacent properties. Although the existing adjacent uses would be exposed to construction noise levels that could be heard above ambient conditions, the exposure would be temporary. As construction activities associated with the project would comply with requirements of the Noise Abatement and Control Ordinance, temporary increases in noise levels from construction activities would be less than significant.

Future exterior noise levels are projected to be less than 65 CNEL at the proposed church, and are considered "normally acceptable." Thus, the project could be compatible with City standards. Because exterior noise levels are projected to be 65 CNEL or less, assuming a 20 dB exterior-to-interior noise reduction would result in interior noise levels that are 45 CNEL or less. Thus, interior noise levels would not exceed the standard of 45 CNEL. Exterior and interior noise impacts would be less than significant.

The project would contribute traffic to the local roadways. As calculated in this analysis, an increase of 40 project-generated trips on Carlton Oaks Drive and Carlton Hills Boulevard would result in a noise increase of 0.1 dB or less, which would not be an audible change in noise levels. Therefore, the project would not result in the exposure of noise sensitive land uses to significant noise levels, and impacts would be less than significant.

Property line noise levels due to on-site HVAC equipment would range from 27 to 46 dB(A) L_{eq} during the daytime hours and 24 to 43 dB(A) L_{eq} during the nighttime hours. Noise at this level would not be considered a noise disturbance. The units would be operated in accordance with the requirements of the City's Municipal Code. Therefore, impacts due to on-site noise sources would be less than significant.

If you have any questions about the results of this analysis, please contact me at jfleming@reconenvironmental.com or (619) 308-9333 extension 177.

Sincerely,

Jessica Fleming
Senior Noise Analyst

JLF:jg:sh

Attachments

References Cited

California Department of Transportation (Caltrans)
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ATTACHMENTS

ATTACHMENT 1

Noise Measurement Data

Summary	
Filename	LxT_Data.002
Serial Number	3829
Model	SoundExpert™ LxT
Firmware Version	2.301
User	Morgan
Location	Measurement 1
Job Description	10066.0
Note	
Measurement Description	
Start	2022/02/25 13:06:25
Stop	2022/02/25 13:21:26
Duration	0:15:00.9
Run Time	0:15:00.9
Pause	0:00:00.0
Pre Calibration	2022/02/25 12:48:14
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamp	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	None
OBA Freq. Weighting	A Weighting
OBA Max Spectrum	At Lmax
Overload	122.1 dB

	A	C	Z
Under Range Peak	**78.3**	75.3	80.3 dB
Under Range Limit	**26.2**	25.3	32.2 dB
Noise Floor	16.3	16.2	22.1 dB

Results		
LAeq	60.3 dB	
LAE	89.8 dB	
EA	106.247 µPa²h	
LApeak (max)	2022/02/25 13:17:03	97.0 dB
LASmax	2022/02/25 13:19:48	76.9 dB
LASmin	2022/02/25 13:08:59	46.7 dB
SEA	-99.9 dB	

LAS > 60.0 dB (Exceedence Counts / Duration)	18	155.2 s
LAS > 70.0 dB (Exceedence Counts / Duration)	4	20.9 s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0	0.0 s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0	0.0 s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00	LNight 22:00-07:00
	60.3	60.3	-99.9	60.3	60.3	-99.9	-99.9

LCeq	73.5 dB
LAeq	60.3 dB
LCeq - LAeq	13.2 dB
LAleq	62.9 dB
LAeq	60.3 dB
LAleq - LAeq	2.7 dB
# Overloads	0
Overload Duration	0.0 s

Statistics	
LAS5.00	66.5 dB
LAS10.00	61.9 dB
LAS33.30	56.4 dB
LAS50.00	54.6 dB
LAS66.60	53.1 dB
LAS90.00	50.6 dB

Summary							
Filename	LxT_Data.001						
Serial Number	3829						
Model	SoundExpert™ LxT						
Firmware Version	2.301						
User	Morgan						
Location	Measurement 2						
Job Description	10066.0						
Note							
Measurement Description							
Start	2022/02/25 12:49:08						
Stop	2022/02/25 13:04:08						
Duration	0:15:00.3						
Run Time	0:15:00.3						
Pause	0:00:00.0						
Pre Calibration	2022/02/25 12:48:16						
Post Calibration	None						
Calibration Deviation	---						
Overall Settings							
RMS Weight	A Weighting						
Peak Weight	A Weighting						
Detector	Slow						
Preamp	PRMLxT1L						
Microphone Correction	Off						
Integration Method	Linear						
OBA Range	Normal						
OBA Bandwidth	None						
OBA Freq. Weighting	A Weighting						
OBA Max Spectrum	At Lmax						
Overload	122.1 dB						
	A		**C**		**Z**		
Under Range Peak	**78.3**		75.3		80.3	dB	
Under Range Limit	**26.2**		25.3		32.2	dB	
Noise Floor	16.3		16.2		22.1	dB	
Results							
LAeq	54.0 dB						
LAE	83.5 dB						
EA	25.153 µPa²h						
LApeak (max)	2022/02/25 13:03:51		90.6 dB				
LASmax	2022/02/25 12:52:44		69.8 dB				
LASmin	2022/02/25 12:59:07		46.5 dB				
SEA	-99.9 dB						
LAS > 60.0 dB (Exceedence Counts / Duration)	6		36.2 s				
LAS > 70.0 dB (Exceedence Counts / Duration)	0		0.0 s				
LApeak > 135.0 dB (Exceedence Counts / Duration)	0		0.0 s				
LApeak > 137.0 dB (Exceedence Counts / Duration)	0		0.0 s				
LApeak > 140.0 dB (Exceedence Counts / Duration)	0		0.0 s				

Community Noise	Ldn	7:00-22:00	LNight	22:00-07:00	Lden	LDay 07:00-19:00	LEvening	19:00-22:00	LNight	22:00-07:00
	54.0	54.0	-99.9		54.0	54.0	-99.9		-99.9	
LCeq	69.5 dB									
LAeq	54.0 dB									
LCeq - LAeq	15.5 dB									
LAleq	56.7 dB									
LAeq	54.0 dB									
LAleq - LAeq	2.7 dB									
# Overloads	0									
Overload Duration	0.0 s									
Statistics										
LAS5.00	58.5 dB									
LAS10.00	55.7 dB									
LAS33.30	52.4 dB									
LAS50.00	51.4 dB									
LAS66.60	50.5 dB									
LAS90.00	48.8 dB									

ATTACHMENT 2

HVAC Specifications

Fan Performance

Table 6. Standard motor & low static drive accessory sheave/fan speed (rpm)

Tons	Unit Model Number	Fan Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Closed
5	WSC060ED	AK44x3/4"	N/A	720	791	861	931	1002	1072
6	WSC072ED	AK56x1"	N/A	558	612	665	718	772	825
7½	WSC090ED	AK57x1"	N/A	688	737	787	837	887	N/A
10	WSC120ED	AK105X1"	N/A	724	776	828	880	932	984

Note: Factory set at 3 turns open.

Table 7. Standard motor & high static drive accessory sheave/fan speed (rpm)

Tons	Unit Model Number	Fan Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Closed
6	WSC072ED	AK56x1"	N/A	968	1018	1068	1118	1169	1219
7½	WSC090ED	AK57x1"	1053	1091	1129	1166	1204	1242	N/A
10	WSC120ED	AK105X1"	1110	1159	1209	1258	1308	1357	N/A

Note: Factory set at 3 turns open.

Table 8. Oversized motor & high static drive accessory sheave/fan speed (rpm)

Tons	Unit Model Number	Fan Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Closed
7½	WSC090ED	AK85x1"	1186	1249	1311	1373	1436	N/A	N/A

Note: Factory set at 3 turns open.

Table 9. Outdoor sound power level—dB (ref. 10—2 W)

Tons	Unit Model Number	Octave Center Frequency								Overall dBA
		63	125	250	500	1000	2000	4000	8000	
5	T/YSC060ED	84	91	79	77	74	71	68	63	80
6	T/YSC072ED	83	90	86	82	79	75	70	63	85
7½	T/YSC090ED	83	90	86	83	80	75	71	64	85
8.5	T/YSC102ED	83	89	84	81	77	72	69	62	83
10	T/YSC120ED	83	86	80	77	73	69	66	60	79

Note: Tests follow ARI270-95.

Table 10. Outdoor sound power level—dB (ref. 10—12 W)

Tons	Unit Model Number	Octave Center Frequency								Overall dBA
		63	125	250	500	1000	2000	4000	8000	
5	WSC060ED	84	91	79	77	74	71	68	63	80
6	WSC072ED	83	90	86	82	79	75	70	63	85
7½	WSC090ED	83	90	86	83	80	75	71	64	85
10	WSC120ED	83	86	80	77	73	69	66	60	79

Note: Tests follow ARI270-95.

ATTACHMENT 3

SoundPLAN Data – Construction Noise

10066 St. John the Baptizer Ukrainian Catholic Church

SoundPLAN Data - Construction

		Level	Corrections		
Source name	Reference	Leq1	Cwall	CI	CT
		dB(A)	dB(A)	dB(A)	dB(A)
Construction	Lw/unit	107.7	-	-	-

10066 St. John the Baptizer Ukrainian Catholic Church

SoundPLAN Data - Construction

	Coordinates			Noise Level
No.	X	Y	Height	Leq
	meters		meters	dB(A)
1	500201.88	3634211.04	104.92	70.0
2	500185.63	3634233.21	105.13	65.8
3	500197.45	3634248.09	105.14	68.9
4	500197.45	3634257.07	105.42	67.2
5	500190.19	3634269.90	108.15	63.8
6	500223.92	3634256.80	108.15	72.7
7	500241.39	3634257.59	108.79	71.8
8	500273.41	3634249.54	105.83	64.6
9	500276.11	3634229.85	105.28	65.4
10	500303.89	3634197.47	104.95	58.1
11	500264.68	3634188.90	104.52	63.0
12	500201.18	3634170.80	103.54	60.4

ATTACHMENT 4

SoundPLAN Data – Vehicle Traffic Noise

Station	ADT	Traffic values Vehicles type	Vehicle name	day	evening	night	Speed	Control device	Constr. Speed	Affect. veh.	Road surface	Gradient Min / Max
km	Veh/24h			Veh/h	Veh/h	Veh/h	km/h		km/h	%		%
Carlton Oaks Drive		Traffic direction:	In entry direction									
0+000	13,497	Total	-	866	450	195	-	none	-	-	Average (of DGAC and PCC)	-3.6
0+000	13,497	Automobiles	-	805	419	181	56	none	-	-	Average (of DGAC and PCC)	-3.6
0+000	13,497	Medium trucks	-	26	14	6	56	none	-	-	Average (of DGAC and PCC)	-3.6
0+000	13,497	Heavy trucks	-	17	9	4	56	none	-	-	Average (of DGAC and PCC)	-3.6
0+000	13,497	Buses	-	9	5	2	56	none	-	-	Average (of DGAC and PCC)	-3.6
0+000	13,497	Motorcycles	-	9	5	2	56	none	-	-	Average (of DGAC and PCC)	-3.6
0+000	13,497	Auxiliary vehicle	-	-	-	-	-	none	-	-	Average (of DGAC and PCC)	-3.6
0+455	-	-	-	-	-	-						

ATTACHMENT 5

FHWA RD-66-108 Off-Site Traffic Noise

FHWA RD-77-108

Traffic Noise Prediction Model

Data Input Sheet

Project Name : St. John the Baptizer Ukrainian Catholic Church
Project Number : 10066
Modeled Condition : 2022

Surface Refelction: CNEL
Assessment Metric: Hard
Peak ratio to ADT: 10.0
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	K-Factor
WITHOUT PROJECT												
1	Carlton Oaks Drive	East of Carlton Hills Bouelvard	13,133	35	50	95.00	3.00	2.00	77.00	10.00	13.00	
2	Carton Hills Boulevard	South of Carlton Oaks Drive	22,400	35	50	95.00	3.00	2.00	77.00	10.00	13.00	
3	Carton Hills Boulevard	North of Carlton Oaks Drive	6,433	35	50	95.00	3.00	2.00	77.00	10.00	13.00	
WITH PROJECT												
1	Carlton Oaks Drive	East of Carlton Hills Bouelvard	13,173	35	50	95.00	3.00	2.00	77.00	10.00	13.00	
2	Carton Hills Boulevard	South of Carlton Oaks Drive	22,440	35	50	95.00	3.00	2.00	77.00	10.00	13.00	
3	Carton Hills Boulevard	North of Carlton Oaks Drive	6,473	35	50	95.00	3.00	2.00	77.00	10.00	13.00	

FHWA RD-77-108

Traffic Noise Prediction Model

Predicted Noise Levels

Project Name : St. John the Baptizer Ukrainian Catholic Church
Project Number : 10066
Modeled Condition : 2022
Assessment Metric: Hard

			Noise Levels, dBA Hard				Distance to Traffic Noise Level Contours, Feet					
Segment	Roadway	Segment	Auto	MT	HT	Total	75 dB	70 dB	65 dB	60 dB	55 dB	50 dB
WITHOUT PROJECT												
1	Carlton Oaks Drive	East of Carlton Hills Bouelvard	65.5	60.2	63.7	68.4	11	35	109	346	1,094	3,459
2	Carton Hills Boulevard	South of Carlton Oaks Drive	67.9	62.6	66.0	70.8	19	60	190	601	1,901	6,011
3	Carton Hills Boulevard	North of Carlton Oaks Drive	62.4	57.1	60.6	65.3	5	17	54	169	536	1,694
WITH PROJECT												
1	Carlton Oaks Drive	East of Carlton Hills Bouelvard	65.6	60.2	63.7	68.4	11	35	109	346	1,094	3,459
2	Carton Hills Boulevard	South of Carlton Oaks Drive	67.9	62.6	66.0	70.8	19	60	190	601	1,901	6,011
3	Carton Hills Boulevard	North of Carlton Oaks Drive	62.5	57.2	60.6	65.4	5	17	55	173	548	1,734

FHWA RD-77-108

Traffic Noise Prediction Model

Data Input Sheet

Project Name : St. John the Baptizer Ukrainian Catholic Church
Project Number : 10066
Modeled Condition : 2050

Surface Refelction: CNEL
Assessment Metric: Hard
Peak ratio to ADT: 10.0
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	K-Factor
WITHOUT PROJECT												
1	Carlton Oaks Drive	East of Carlton Hills Bouelvard	13,500	35	50	95.00	3.00	2.00	77.00	10.00	13.00	
2	Carton Hills Boulevard	South of Carlton Oaks Drive	23,600	35	50	95.00	3.00	2.00	77.00	10.00	13.00	
3	Carton Hills Boulevard	North of Carlton Oaks Drive	7,600	35	50	95.00	3.00	2.00	77.00	10.00	13.00	
WITH PROJECT												
1	Carlton Oaks Drive	East of Carlton Hills Bouelvard	13,540	35	50	95.00	3.00	2.00	77.00	10.00	13.00	
2	Carton Hills Boulevard	South of Carlton Oaks Drive	23,640	35	50	95.00	3.00	2.00	77.00	10.00	13.00	
3	Carton Hills Boulevard	North of Carlton Oaks Drive	7,640	35	50	95.00	3.00	2.00	77.00	10.00	13.00	

FHWA RD-77-108

Traffic Noise Prediction Model

Predicted Noise Levels

Project Name : St. John the Baptizer Ukrainian Catholic Church
Project Number : 10066
Modeled Condition : 2050
Assessment Metric: Hard

			Noise Levels, dBA Hard				Distance to Traffic Noise Level Contours, Feet					
Segment	Roadway	Segment	Auto	MT	HT	Total	75 dB	70 dB	65 dB	60 dB	55 dB	50 dB
WITHOUT PROJECT												
1	Carlton Oaks Drive	East of Carlton Hills Bouelvard	65.7	60.4	63.8	68.6	11	36	115	362	1,145	3,622
2	Carton Hills Boulevard	South of Carlton Oaks Drive	68.1	62.8	66.2	71.0	20	63	199	629	1,991	6,295
3	Carton Hills Boulevard	North of Carlton Oaks Drive	63.2	57.9	61.3	66.1	6	20	64	204	644	2,037
WITH PROJECT												
1	Carlton Oaks Drive	East of Carlton Hills Bouelvard	65.7	60.4	63.8	68.6	11	36	115	362	1,145	3,622
2	Carton Hills Boulevard	South of Carlton Oaks Drive	68.1	62.8	66.2	71.0	20	63	199	629	1,991	6,295
3	Carton Hills Boulevard	North of Carlton Oaks Drive	63.2	57.9	61.3	66.1	6	20	64	204	644	2,037

ATTACHMENT 6

SoundPLAN Data – HVAC Noise

10066 St. John the Baptizer Ukrainian Catholic Church

SoundPLAN Data - HVAC

		Noise Level		Corrections		
Source name	Reference	Daytime	Nighttime	Cwall	CI	CT
		dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
HVAC1	Lw/unit	83	80	-	-	-
HVAC2	Lw/unit	83	80	-	-	-

10066 St. John the Baptizer Ukrainian Catholic Church

SoundPLAN Data - HVAC

	Coordinates			Noise Level	
No.	X	Y	Height	Daytime	Nighttime
	meters		meters	dB(A) Leq	
1	500201.88	3634211.04	104.92	43.4	40.4
2	500185.63	3634233.21	105.13	38.1	35.1
3	500197.45	3634248.09	105.14	32.3	29.3
4	500197.45	3634257.07	105.42	29.3	26.3
5	500190.19	3634269.90	108.15	26.6	23.6
6	500223.92	3634256.80	108.15	31.5	28.5
7	500241.39	3634257.59	108.79	29.2	26.2
8	500273.41	3634249.54	105.83	44.2	41.2
9	500276.11	3634229.85	105.28	45.5	42.5
10	500303.89	3634197.47	104.95	28.4	25.4
11	500264.68	3634188.90	104.52	26.5	23.5
12	500201.18	3634170.80	103.54	37.1	34.1

10066 St. John the Baptizer Ukrainian Catholic Church

SoundPLAN Data - HVAC

Source name				Noise Level Daytime	Nighttime
				dB(A) Leq	
1	1.Fl	43.4	40.4		
HVAC1				29.2	26.2
HVAC2				43.2	40.2
2	1.Fl	38.1	35.1		
HVAC1				29.0	26.0
HVAC2				37.6	34.6
3	1.Fl	32.3	29.3		
HVAC1				23.7	20.7
HVAC2				31.6	28.6
4	1.Fl	29.3	26.3		
HVAC1				21.6	18.6
HVAC2				28.5	25.5
5	1.Fl	26.6	23.6		
HVAC1				19.7	16.7
HVAC2				25.6	22.6
6	1.Fl	31.5	28.5		
HVAC1				24.3	21.3
HVAC2				30.5	27.5
7	1.Fl	29.2	26.2		
HVAC1				26.4	23.4
HVAC2				25.9	22.9
8	1.Fl	44.2	41.2		
HVAC1				44.2	41.2
HVAC2				25.2	22.2
9	1.Fl	45.5	42.5		
HVAC1				44.2	41.2
HVAC2				39.7	36.7
10	1.Fl	28.4	25.4		
HVAC1				27.7	24.7
HVAC2				20.4	17.4
11	1.Fl	26.5	23.5		
HVAC1				24.4	21.4
HVAC2				22.2	19.2
12	1.Fl	37.1	34.1		
HVAC1				18.3	15.3
HVAC2				37.0	34.0

Contributions