

Church of the Redeemer
Los Altos Hills, California

Environmental Noise Assessment

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Prepared for:

Church of the Redeemer, Los Altos

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INTRODUCTION

This report summarizes our environmental noise assessment for the Church of the Redeemer New Fellowship Hall and Classroom Building project in Los Altos, California. The project consists of a 2-story building with 9 classrooms and a 5429 square foot Fellowship Hall. The existing lawn will be utilized as an outdoor activity space associated with the classroom building. The site is located on Magdalena Avenue and is adjacent to an off-ramp for I-280. Following is a summary of our findings:

1. Estimated future noise levels at the setback of future buildings are CNEL 65 dB and below, which are below the City's CNEL 70 dB acceptable limit for schools and churches.
2. Standard building construction is expected to provide interior noise levels of CNEL 45 dB or below, due to exterior sources.
3. Estimated noise from children playing in the central lawn is expected to meet the City's Municipal Code limits and not provide an impact to the CNEL at neighboring properties.
4. Noise from mechanical equipment should be designed to meet the limits provided in the City's Municipal Code.

ACOUSTICAL CRITERIA

Los Altos General Plan

The Noise Element, Chapter 7 of the Los Altos General Plan, includes environmental noise compatibility guidelines for various land uses in the community and interior noise goals. The policies are summarized as follows:

- Policy 7.2: A maximum acceptable outdoor noise exposure level CNEL¹ 70 dB for churches and schools
- Policy 7.3: An interior noise goal of CNEL 45 dB if outdoor noise levels cannot be mitigated to CNEL 70 dB

Los Altos Municipal Code

Section 6.16.050 of the Los Altos Municipal Code limits exterior noise levels at a property line and are summarized in Table 1, below.

Table 1: Los Altos Municipal Code exterior noise limits

	Daytime (7 am - 10pm)	Nighttime (10 pm -7 am)
Noise occurring over 30 minutes per hour	55 dB	45 dB
Instantaneous noise	75 dB	65 dB

California Code of Regulations

The 2013 California Green Building Standards Code (CALGreen)² contains acoustic requirements for non-residential developments where CNEL, or hourly average ($L_{eq}(h)$ ³), sound levels exceed 65 dB. These are summarized as follows:

¹ CNEL (Community Noise Equivalent Level) – A descriptor for a 24-hour A-weighted average noise level. CNEL accounts for the increased acoustical sensitivity of people to noise during the evening and nighttime hours. CNEL penalizes sound levels by 5 dB during the hours from 7 PM to 10 PM and by 10 dB during the hours from 10 PM to 7 AM.

² California Code of Regulations, Part 11: 2013 California Green Building Standards Code, Nonresidential Mandatory Measures, Section 5.507.4.

³ $L_{eq}(h)$ – The equivalent steady-state A-weighted sound level that, in an hour, would contain the same acoustic energy as the time-varying sound level during the same hour.

- Prescriptive method: Wall and roof-ceiling assemblies exposed to the noise source shall have a composite STC rating of at least 50, with exterior windows having a minimum STC rating of 40
- Performance method: Wall and roof-ceiling assemblies shall reduce average hourly noise levels to $L_{eq}(h)$ 50 dB, or lower, in occupied areas during any hour of operation

NOISE ENVIRONMENT

The noise environment at the site is most impacted by traffic on I-280 and Magdalena Avenue. The western edge of the site is approximately 220 feet from the centerline of I-280.

To quantify the existing noise environment, two 24-hour monitors continuously measured noise levels at the site between 18 and 19 August 2015. In addition, two short-term "spot" measurements were conducted at additional locations and compared with corresponding time periods of the multi-day monitors to determine how noise levels vary across the site and at different elevations. Table 2 summarizes existing noise levels at the site. Figure 1, attached, shows the approximate measurement locations.

Table 2: Existing Noise Environment

Site	Location	Date / Time	CNEL
L1	Magdalena Avenue Monitor Approximately 45' southeast of Magdalena Avenue centerline, 500' east of I-280 centerline, 12' above grade	18 – 19 August 2015	69 dB
L2	South Site Monitor Approximately 330' east of I-280 centerline, 15' north of south property line, 10' above grade		62 dB
S1	Future Classroom Building Facade Spot Approximately 245' east of I-280 centerline, 155' south of Magdalena Avenue centerline, 5'/ 16' above grade	10:25-10:40 18 August 2015	62/ 63 dB
S2	East Site Spot Approximately 485' east of I-280 centerline, 5' north of south property line, 5' above grade	10:35-10:50 19 August 2015	53 dB

Based on the CNEL contour tables NEH-2 and NEH-3 in the Los Altos Noise Element, the City projects less than a 2 dB increase in traffic noise from I-280 by 2025.

Expected project-generated noise consists of mechanical equipment and children playing in the central lawn. We understand that up to approximately 40 children will be playing at a time, and the lawn is a distance of approximately 140 feet from the south property line. The existing church and new fellowship hall will provide shielding to the south property line. We have assumed that outdoor play activity will last for 2 hours per day and only occur during the daytime.

ANALYSIS AND RECOMMENDATIONS

Land Use Compatibility

Estimated future noise levels at the setback of future buildings are CNEL 65 dB and below and $L_{eq}(h)$ 65 dB and below. This meets the City's CNEL 70 dB limit for acceptable noise levels for schools and churches. Since these levels do not exceed $L_{eq}(h)$ 65 dB, the CALGreen exterior noise intrusion criteria does not apply.

Based on estimated future noise levels, standard building construction is expected to provide interior levels of CNEL 45 dB and below.

Property Line Noise

Measurements at a prior site indicated that hourly average noise levels from 24 children playing were 69 dB at a distance of 30 feet. Based on these measurements and adjusting for an increase in children, an increase in distance to a receiver at the property line, and shielding provided by the project buildings, we anticipate hourly average noise levels at the property line to be 50 dB or less, which is projected to meet the Los Altos Municipal Code limits.

Based on our estimates, project generated noise from children playing is not expected to impact the CNEL at the property line. However, receivers can expect the noise from children playing to still be audible at times.

Mechanical equipment and locations have not currently been selected, but they should be designed to meet the property line noise limit of 55 dB, or 45 dB if they will operate at night. Equipment selection, and mitigation, such as noise barriers, should be incorporated into the design to meet these limits.

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CHURCH OF THE REDEEMER LOS ALTOS APPROX. NOISE MEASUREMENT LOCATIONS

FIGURE 1

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