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October 1, 2018

Ms. Hsi Liu  
Sunny Chinese Learning Center  
1025 The Dallas  
Sunnyvale, CA 94087

RE: Noise Impact and Mitigation Study for the Sunny Chinese Learning Center Project,  
St. Luke Lutheran Church, 1025 The Dallas, Sunnyvale

Dear Ms. Liu,

In response to your request I have evaluated the potential noise impacts that could be produced at nearby residential receptor locations by the proposed changes in activities at your school at St. Luke Lutheran Church in Sunnyvale. The report discusses the present environment, the proposed new activities and their associated noise-related aspects at the nearest receptors in the area, and compliance with Sunnyvale noise guidelines.

To summarize the conclusions of the report, the proposed changes to the on-site activities would meet the City noise ordinance limitations and would not produce any significant noise disturbance in the vicinity of the site.

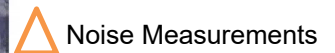
### **Project Description [1]**

The school program serves up to 84 kindergarten-through-sixth grade kids, with a staff of up to 7 at a time on site. The school proposes slightly modified operating times to match local school operation times, as well as several outdoor activity areas on site for the elementary-age kids. To match times that the local school districts are not in session for K-6, such as early dismissal days, as well as breaks (spring/summer/winter), the proposed hours of operation are 11:30 AM to 6:30 PM during regular school days, and 8:30 AM to 6:30 PM while students are on holidays, and spring, summer or winter breaks.

A total of four 30-minute periods of outdoor play time is proposed, with up to 24 kids at a time within the fenced area, divided into two groups, and 12 to 15 kids at a time in the unfenced areas on grass and concrete adjacent to the church, as shown in Exhibit 1. No changes are proposed for the actual operation of the school except for the slightly modified operational times and the new outside play areas proposed.

### **Sensitive Receptor Locations**

The project area is a residential neighborhood on the north side of The Dallas Avenue and west of Wright Avenue in Sunnyvale. The nearest sensitive receptor locations for noise generated by the project includes several single-family dwellings on Enderby Way adjacent to the parking lot along the north property line of the church. The closest residential property lines across the parking lot are 76 feet from the fenced play areas and 100 feet from the unfenced play areas adjacent to the church building. Other residential receptors in the area would have less noise due to increased distance and intervening building obstructions.



**Exhibit 1 – Sunny Chinese Learning Center and church site plan**

This study investigates the extent to which the closest adjacent residences could be impacted by noise from outdoor school activities. The existing ambient noise environment and potential noise impacts are discussed in the following sections.

### Ambient Noise Levels and Noise Sources in the Area

The primary source of ambient noise in the project area is traffic on Route 85 freeway, about one quarter mile west of the Church site. Only sporadic cars using the church parking lot create significant noise above the ambient in the 55-70 dBA range at the property line. Large and small aircraft and helicopter overflights create infrequent noise incidents of 55 to 65 dBA. There are no other significant noise sources in the project area.

Field noise measurements were made during the afternoon period of July 20, 2018 with a CEL-440 Precision Noise Meter and Analyzer, calibrated with a B & K Model 4230 Sound Level Calibrator. Measurement locations were chosen to represent typical noise levels adjacent to the key receptor locations, as shown in Exhibit 1 and described below. During all three measurement periods there were about a dozen Chinese school kids engaged in normal outdoor play activities in an area closest to the measurement location.

- Location 1 – next to the residential fence across from the concrete play area directly adjacent to the church, where approximately a dozen kids were playing
- Location 2 -- next to the residential fence across from the enclosed play area adjacent to the Learning Center structure, where approximately a dozen kids were playing
- Location 3 - next to the residential fence across from the grassy area, where approximately a dozen kids were playing

Noise levels were measured and are reported using percentile noise descriptors, as follows:  $L_{90}$  (the background noise level exceeded 90 % of the time),  $L_{50}$  (the median noise level exceeded 50% of the time),  $L_1$  (the peak level exceeded 1% of the time), and  $L_{eq}$  (the average energy-equivalent noise level). Measured noise levels are presented in Exhibit 2 below. The  $L_{dn}$  noise levels were computed as the long-term average of the  $L_{eq}$  using the daily traffic distribution in the area, with standard weighted penalties for the nighttime hours, and modeled with an enhanced version of the National Cooperative Highway Research Board traffic noise model [2].

### EXHIBIT 2 AMBIENT NOISE LEVELS (dBA) Sunny Chinese Learning Center

Receptor location	$L_{90}$	$L_{50}$	$L_{eq}$	$L_1$	$L_{dn}$
1. At fence across from concrete play area	46	51	49	58	49
2. At fence across from fenced play area	47	54	52	62	50
3. At fence across from grassy play area	47	53	51	59	50

Traffic is the dominant noise source near the project site, with noise levels at any location in the area depending upon volume, speed and distance to traffic. In this particular area the noise on the 85 freeway provides the most noticeable consistent noise level, with sporadic cars using the church parking lot creating peak levels between 55 and 65 dBA while parking and leaving the lot. With the church providing a noise barrier to most of the traffic on The Dallas, and some distance to Wright Avenue, general noise levels from these traffic sources around the school are low. Aircraft overflights also can raise noise levels above 60 for a minute or two. It should be noted that noise levels from kids playing in all three locations were below 60 dBA.

### Relevant Sunnyvale Noise Ordinance Limits [3]

Section 19.42.030 of the Sunnyvale Code is applicable to this project, which limits noise on residential property to 60 dBA during daytime hours, and 50 dBA during evening hours.

**Potential Sunny Chinese Learning Center Noise Impacts****Outdoor play activities**

All outdoor activities would occur in the fenced play areas adjacent to the school and in the unfenced play areas next to the church building, as shown in Exhibit 1. Several types of play activities would be included in the different areas, including climbing structure play, use of riding toys, group games, games with balls, and other appropriate outdoor play activities.

Outdoor play time will be a total of four 30-minute periods, with up to 24 kids at a time within the fenced area, divided into two groups, and 12 to 15 kids at a time in the unfenced areas on grass and concrete adjacent to the church, as shown in Exhibit 1. Each play group of 12-15 kids would be supervised by at least one adult.

All of the project noise would be from sporadic voices of the K-6 age kids and staff during outdoor play periods. Activities of this type create intermittent brief noise from voices of 50 to 60 dBA at a distance of 50-75 feet. Since the closest adjacent residential fence is approximately 75 feet from the enclosed play yard, there are two fences between the enclosed play area and the nearest backyards. The other play areas that are unfenced, the concrete areas and grassy areas, are at least 100 feet from the residential property lines. Distance and the property line wood fences reduce the play yard noise at all of the nearest residences by 12 to 15 dBA. Hence the highest backyard noise levels from kids play would be in the range of 45 to 48 dBA, significantly below the 60 dBA City daytime noise limits, and would not be noticeable with existing ambient daytime noise levels from traffic in the same range.

**Conclusions and Summary**

Overall ambient noise levels in the immediate project area now depend primarily on freeway traffic noise, and this will continue to be the dominant noise source in the area in the foreseeable future. The primary noticeable noise would be intermittent and brief voice incidents from kids playing in the areas adjacent to the church building. With the informal type of play activities and the distances and/or fence protection involved, these activities would be within City noise ordinance limits, and would not create any noise impacts in the adjacent residential areas. Thus the new school play areas would not create any noticeable noise impact.

If I may be of further assistance on this project, please do not hesitate to contact me.

Respectfully submitted,

*Stan Shelly*

H. Stanton Shelly  
Acoustical Consultant  
Board Certified Member (1982)  
Institute of Noise Control Engineering

**REFERENCES**

1. Project description and Learning Center school schedules, Ms. Hsi Liu, Co-owner, July 2018.
2. *Highway Noise - A Design Guide for Highway Engineers*, National Cooperative Highway Research Program Report 117, Highway Research Board, National Academy of Sciences, Washington, D.C., 1971 (model enhanced and field validated by ECS).
3. Municipal Code Section 19.42.030, Noise levels for residential and commercial zones; City of Sunnyvale.