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August 12, 2013

Ms. Janice Yeh, AIA,  
Adaptive Architecture  
20100 Stevens Creek Blvd – Suite 190  
Cupertino, CA 95014

RE: Noise Impact and Mitigation Study for the Little Tree Montessori School,  
420 S. Pastoria Avenue, Sunnyvale

Dear Ms. Yeh,

In response to your request I have evaluated the potential noise impacts that could be produced at nearby residential receptor locations by the proposed redevelopment the existing property at 420 S. Pastoria Avenue in Sunnyvale. The report discusses the present environment, the proposed project and its associated noise-related aspects, the potential new activities and operational noise impacts on the nearest receptors in the area, and compliance with Sunnyvale noise guidelines.

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

### **Project Description [1] [2]**

The Little Tree Montessori School of Sunnyvale proposes to provide weekday daytime care for toddler and preschool-age kids on the subject site. The property is zoned for commercial and school-type uses. The Little Tree Montessori School proposes to make internal modifications to the existing 16,587 square foot building to provide 9 classrooms plus several additional rooms for support activities and staff offices. Two outdoor play areas would be constructed, a 1400 square foot area in front and 7670 square foot area in back. Parking spaces now at the side of the building and in back, a total of 47, would be used, with other parking available near the Sunnyvale Library adjacent to the facility.

The facility would accommodate 188 kids and a full time staff of 17, on a normal workday schedule of 7:30 am to 5:30 pm, Monday through Friday. No evening or major holiday activities would be held on site. A few daytime Saturday events would be held during the year. Inside activities would include normal school educational, creative, and play activities in specially-designed rooms. The outdoor play areas would be constructed with age-appropriate climbing structures and play areas. During outdoor play periods there would be at least one staff person for every 6 infants/toddlers, and one staff person for every 12 preschoolers.

### **Sensitive Receptor Locations**

The project area is a mixed residential and city agency neighborhood on the east side of Pastoria Avenue at Sutter in Sunnyvale. The nearest sensitive receptor locations for noise generated by the project include several single-family dwellings along the north property line, and several across Pastoria Avenue. Other residential receptors would have less noise due to increased distance and building obstruction. Other uses in the area are associated with the Sunnyvale Library complex, which are not considered sensitive. Vehicle access to the school would be from Pastoria Avenue.

This study investigates the extent to which the adjacent residences could be impacted by noise from Little Tree Montessori School activities. The 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 Pastoria Avenue, a two-lane residential street bounding the project site on the west side. Typical vehicle passby noise levels are in the 60-70 dBA range at 25 feet. Trucks, buses, motorcycles, and poorly-muffled vehicles produce peak levels 5 to 15 dBA higher on passby. Large and small aircraft and helicopter overflights create infrequent noise incidents of 55 to 65 dBA. Other than typical sporadic neighborhood activities are garbage pickup and also SP commuter train horns (55-60 dBA). There are no other significant noise sources in the project area.

Field noise measurements were made during the mid-morning period of July 24, 2013 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 ambient levels at key receptor locations, as described below:

- Location 1 – near the northeast corner of the school building and adjacent to the residence facing Waverly Street
- Location 2 – in the parking lot on the north property line, adjacent to the residence facing Pastoria Avenue, 75 feet from Pastoria.
- Location 3 – adjacent to the residences across the street from the school, 20 feet from Pastoria Avenue

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 1 below. The DNL/Ldn 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 [4].

### EXHIBIT 1 AMBIENT NOISE LEVELS (dBA)

#### Little Tree Montessori School project area, Pastoria Avenue, Sunnyvale

Receptor location	$L_{90}$	$L_{50}$	$L_{eq}$	$L_1$	$L_{dn}$
1. northeast corner of building	41	43	46	54	51
2. north property line parking lot	40	46	53	68	55
3. across Pastoria from project	39	55	62	79	64

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 Pastoria Avenue, and the measurements reflect this relationship. The main outdoor play area for the school is located behind the building, partially shielding it from much of the direct traffic noise.

### Relevant Sunnyvale Noise Ordinance Limits [3]

Section 19.42.030 of the Sunnyvale Municipal Code applies to this project, which limits noise during daytime hours (8 am to 8 pm) produced by sources adjacent to a residential property to 60 dBA, or 50 dBA during night time hours. Note that there are no project-related activities during night time periods.

### Potential Little Tree Montessori School Noise Impacts

#### Outdoor playground activities

Most potentially noisy outdoor activities would occur behind the building, at the east end, where all classes except the toddlers will play. The toddlers will play in the smaller front grass play area. Several types of play activities are included in the back yard area, including two climbing structures, a sand box, and

a smooth rubberized surface appropriate for tricycle riding or group games. Outdoor kids' activities would include climbing on the play structure, and games with balls, and other typical outdoor play activities.

Between 9:30 am and noon from 24 to 48 preschool kids at a time will use the large back play area in several scheduled periods, and again in the afternoon between 2:20 and 5:30 pm. Most preschool kids have one morning and one afternoon outdoor play period of 30 minutes each day. The younger toddler class has a similar schedule in the front play yard. All of the project noise would be from sporadic voices of kids and staff. Activities of this type can create intermittent brief noise from voices of 50 to 60 dBA at a distance of 30-40 feet. The noise levels in the nearest residential yards from these activities are shown in Exhibit 2.

**EXHIBIT 2**  
**PROJECT NOISE LEVELS (dBA )**  
**Little Tree Montessori School Project – Pastoria Avenue, Sunnyvale**

Receptor location	Max Yard Noise Levels (dBA)
1. Waverly residence north of school	40-50
2. Pastoria residence north of school	Below ambient
3. Residences across Pastoria from school	Same as ambient

Noise levels from voices during outdoor play periods would be noticeable in the adjacent Waverly yards, but would be much below the 60 dBA City noise ordinance limits, and would not be considered disturbing with existing noise normal daytime noise levels, as shown in Exhibit 2.

Noise levels from voices during outdoor play periods would not be noticeable in receptor locations 2 or 3 -- the adjacent Pastoria residence or in the residences across the street, since the playground noise would be at or below existing ambient traffic noise levels. Note that project parking lot noise generated by school-related trips in both the north side parking lot and the east side parking lot would be similar to parking lot trips for previous uses at the location, but the number of school trips would be significantly less than for the previous employment and placement businesses that used the building.

**Conclusions and Summary**

Overall ambient noise levels in the project area now depend primarily on 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 young children playing in the area behind the building. With the informal type of play activities, the age of the kids, and the distances and/or fence protection involved, these activities would be within the City noise ordinance limits, and would not create any noise impacts in the adjacent residential areas.

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

CC: Ms. Chun Lin, Eva Investments, Cupertino

## REFERENCES

1. Project drawings: Site Plan A1.1 and Floor Plan A2.1; Little Tree Montessori - Sunnyvale Campus , 420 S. Pastoria Avenue, Sunnyvale; Adaptive Architecture, Cupertino; 6/24/13.
2. Daily Schedule, Little Tree Montessori International School; J. Yeh, Adaptive Architecture, Cupertino; 7/25/13.
3. Sunnyvale Municipal Code Section 19.42.030 (a), Noise or sound level; City of Sunnyvale.
4. 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).