MEMORANDUM

date: 12 October 2015

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cc: Demetri Loukas	**David J. Powers & Associates**	dloukas@davidjpowers.com

from: Joshua M. Roper, PE, LEED® AP

subject: **Canyon Creek Plaza – San Jose, California**
Retail/Office Building Environmental Noise Review
CSA project number: 15-0548

This memo summarizes our environmental noise review of the planned 8,413 square-foot retail and office building to be located in the existing parking lot at the Canyon Creek Plaza shopping center along Silver Creek Valley Road in San Jose, California (see Figure 1, attached).

DESCRIPTION

The retail and office building will be single-story and the height will not to exceed 28 feet. It will be located approximately 130 feet from the centerline of Silver Creek Valley Road, and approximately 90 feet from the Silver Creek Valley Trail. Silver Creek is located on the other side of the trail, and the nearest residences are located more than 400 feet to the north and south (at higher elevations). Parking for the project will be in the existing parking lot (at-grade). Planned operational hours for the businesses and building systems are between 6:00 AM and 12:00 AM.

ACOUSTIC CRITERIA

San Jose General Plan and Municipal Code

- Policy EC-1.1 of the General Plan (GP) provides land use compatibility guidelines for environmental noise, based on exterior noise levels. It identifies Day/Night Average Sound Levels[1] (DNL) of up to 70 dB[2] as *normally acceptable* for commercial projects.[3]
- Policy EC-1.2 of the GP considers noise impacts to be significant if a project would increase noise levels on adjacent sensitive land uses, including residences, as follows:
  - Cause the DNL at noise sensitive receptors to increase by 5 dB or more where the noise levels would remain *normally acceptable*; or
  - Cause the DNL at noise sensitive receptors to increase by 3 dB or more where noise levels

[1] Day-Night Average Sound Level (DNL) – A descriptor established by the U.S. Environmental Protection Agency to describe the average day-night level with a penalty applied to noise occurring during the nighttime hours (10 pm - 7 am) to account for the increased sensitivity of people during sleeping hours.

[2] dB – A-Weighted sound pressure level (or noise level) represents the noisiness or loudness of a sound by weighting the amplitudes of various acoustical frequencies to correspond more closely with human hearing. A 10-dB (decibel) increase in noise level is perceived to be a doubling of loudness. A-Weighting is specified by the U.S. EPA, OSHA, Caltrans, and others for use in noise measurements.

[3] For reference, the San Jose General Plan identifies DNL 60 dB as normally acceptable for residences, and DNL 65 dB as normally acceptable for recreational areas (neighborhood parks).

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would equal or exceed the *normally acceptable* level.

- Policy EC-1.3 of the GP limits noise generation of new nonresidential land uses to DNL 55 dB at the property line when located adjacent to residential properties.
- Policy EC-1.6 of the GP limits operational noise from commercial sites to the noise standards in the City's Municipal Code. Section 20.40.600 of the Municipal Code limits noise levels from commercial site to 55 and 60 dB at adjacent residential and commercial property lines, respectively, except upon issue of a conditional use permit.

Riparian Corridor Policy Study

A document titled Riparian Corridor Policy Study, prepared for the City of San Jose with a revision date of March 1999, states the following:

- The operation of mechanical equipment within or adjacent to riparian corridors should not exceed noise levels for open space as specified in the General Plan, or exceed background noise levels.
- Noise producing stationary mechanical equipment should be located as far as necessary from riparian corridors to preclude exceeding the ambient noise level in the corridors.

California Building Code

The 2013 California Green Building Standards Code (CALGreen)[4] contains acoustic requirements for non-residential developments where 24-hour day/night average (DNL), or hourly average ($L_{eq}(h)$[5]), sound levels exceed 65 dB. These are summarized as follows:

- 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 Leq(h) 50 dB, or lower, in occupied areas during any hour of operation

NOISE ENVIRONMENT

Environmental noise at the site is dominated by vehicle traffic on Silver Creek Valley Road. To quantify existing noise levels, long-term (LT) monitors measured noise levels for multi-day periods in April 2013 and 2014. In addition, three short-term (ST) measurements were conducted and compared with corresponding time periods of the long-term monitors to determine how noise levels compare near residences and Silver Creek. Table 1 summarizes existing noise levels at the site. Figure 1, attached, shows the approximate measurement locations.

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

[5] $L_{eq}(h)$ – 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.

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Table 1: Existing Noise Environment

Site	Location	Date/Time	DNL
LT-1	Silver Creek Valley Road Monitor Approx. 90' SW roadway centerline	26 to 30 April 2013	62 dB
LT-2	Silver Creek Monitor Approx. 190' SW of Silver Creek Valley Road centerline	14 to 16 April 2014	57 dB
ST-1	Residential property line south of Silver Creek Valley Road Spot Approx. 560' SW of roadway centerline	9:10 - 9:25 26 April 2013	53 dB
ST-2	Residential property line north of Silver Creek Valley Road Spot Approx. 320' NE of roadway centerline	10:15 - 10:30 30 April 2013	56 dB
ST-3	Silver Creek Spot Approx. 310' SW of Silver Creek Valley Road centerline	15:50 - 16:05 14 April 2014	55 dB

For reference, measured hourly average sound levels, Leq(h), at the LT-1 monitor were lower than DNL values.

ANALYSIS AND FINDINGS

Land-Use Compatibility (Policy EC-1.1 of the GP and California Building Code)

As indicated in Table 1 above, the measured noise environment at the site ranged from DNL 55 to 62 dB. The corresponding DNL at the setback of the planned building is 61 dB, which falls into the City's *normally acceptable* category for business commercial projects. Typical hourly average sound levels, Leq(h), at the setback of the planned building were 60 dB and below, which is below the threshold where the CALGreen code would require special noise reduction measures.

Project-Generated Noise (Policy EC-1.2, 1.3 and 1.6 of the GP, and Riparian Corridor Policy Study)

The Initial Study prepared for the project estimates the building will generate approximately 93 average daily trips (ADT) on Silver Creek Valley Road, with approximately of the 13 trips occurring during both the AM and PM peak traffic hours. Existing average daily traffic volumes along Silver Creek Valley Road in the project vicinity are between 10,000 and 20,000 vehicles.[6] Typically, a doubling of vehicle traffic would result in a 3 dB increase in traffic noise. Since traffic volumes in the project vicinity will not double as a result of the proposed project, the noise level increase due to project generated traffic would be less than 3 dB, which is considered less than significant.

The planned building will include rooftop mechanical equipment for heating and cooling (HVAC equipment). At the time of this study, the specific HVAC equipment is not yet known. Equipment should be selected and located to meet the allowable noise level limits. Following is an initial discussion identifying allowable noise levels:

- Residences – The GP and Municipal Code include criteria for allowable instantaneous noise levels, and day/night average sound levels (DNL), at receiving residential property lines. These limits are 55 dB (instantaneous) and DNL 55 dB.
  - The DNL will vary, depending on the duration and time of day that equipment is in operation.

[6] Envision San Jose 2040 General Plan: Transportation Impact Analysis for the Draft Environmental Impact Report, Fehr & Peers Transportation Consultants, October 2010, Figure 2.

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If equipment operates continuously during operational hours (between 6:00 AM and 12:00 AM), then the allowable instantaneous noise level would be 52 dB (3 dB more stringent that the Municipal Code limit).

- Table 2, below, shows the existing noise levels at the nearest residences, the maximum allowable HVAC noise at the residential property line under the GP and Municipal Code (DNL 55 dB), and the estimated future noise levels at the residential property lines with HVAC in operation.[7] As shown in the table, the noise level increase at the nearest residences resulting from HVAC operation would be less than 5 dB (DNL). Since the cumulative noise level will remain below the GP's normally acceptable level at residences, this is considered less than significant.

Table 2: Future Noise Levels at Riparian Corridor

Receiver	Existing DNL	HVAC DNL	Estimated Future DNL	Increase due to HVAC	Significant Increase?
Northern Residences	56 dB	55 dB	59 dB	3 dB	No
Southern Residences	53 dB		57 dB	4 dB	No

- Riparian Corridor – The Riparian Corridor Policy Study states that noise from mechanical equipment should not exceed the GP levels for Open Space areas or ambient/background noise levels.
  - The existing DNL measured near the riparian corridor is 55 to 57 dB adjacent to the Silver Creek Trail.
  - It is assumed that HVAC equipment will be located in rooftop equipment wells, shielded from the adjacent trail and creek by the roof/parapet.
  - Table 3, below, shows the existing noise levels along the Silver Creek riparian corridor/Silver Creek Trail, the allowable HVAC noise outlined in the Riparian Corridor Policy Study (DNL 55 dB), and the estimated future noise levels at the riparian corridor with HVAC in operation.[8] As shown in the table, the noise level increase at the riparian corridor resulting from HVAC operation would be less than 5 dB (DNL). Since the cumulative existing and HVAC noise level will remain below the GP's normally acceptable level at parks and recreation areas, this is considered less than significant.

Table 3: Future Noise Levels at Nearest Residences

Receiver	Existing DNL	HVAC DNL	Estimated Future DNL	Increase due to HVAC	Significant Increase
Silver Creek Valley Trail	55 – 57 dB	55 dB	58 – 59 dB	2– 3 dB	No

Please call with any questions.

* * *

[7] Preliminary estimates suggest that a cumulative sound power level of 99 dB for rooftop HVAC equipment will result in a sound pressure level of 52 dB at the nearest residential property lines.

[8] Preliminary estimates suggest that a cumulative sound power level of approximately 94 dB for rooftop HVAC equipment will result in a sound pressure level of DNL 55 dB at the trail and creek if equipment operates constantly during operational hours. Equipment schedules and manufacturer's sound data will need to be reviewed prior to construction.

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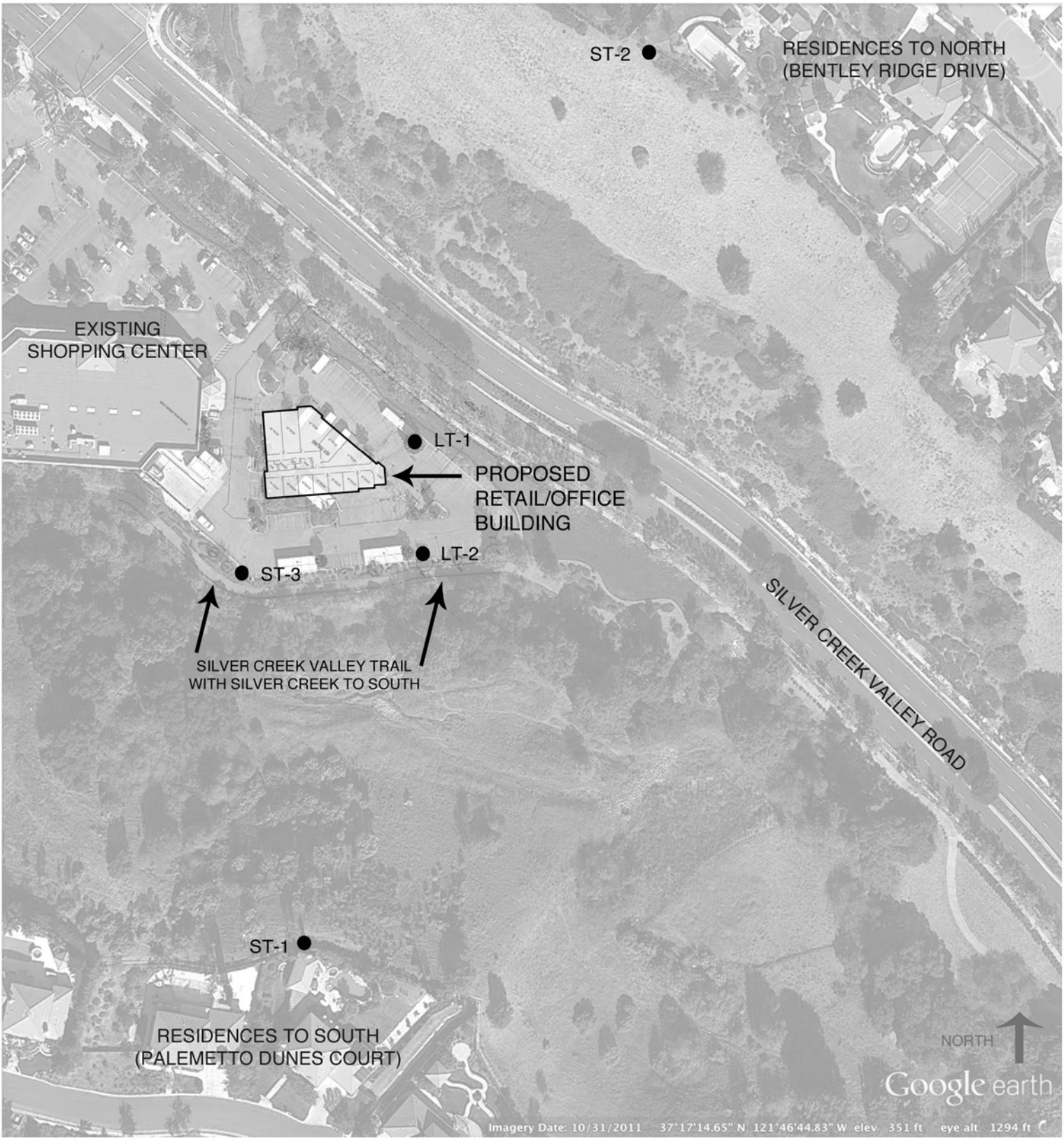

● INDICATES APPROXIMATE NOISE MEASUREMENT LOCATION

NOTE: DRAWING PROVIDED BY OTHERS; NO SCALE

CANYON CREEK PLAZA
AERIAL PHOTO INDICATING APPROXIMATE NOISE MEASUREMENT LOCATIONS AND LEVELS

FIGURE 1

CSA PROJECT NO. 15-0548
12 OCTOBER 2015
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