

1050-1060 Helen Avenue

Sunnyvale, California

Draft Environmental Noise Assessment

6 November 2014

Prepared for:

FMA Development

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INTRODUCTION

This letter summarizes our environmental noise assessment for the 1050-1060 Helen Avenue residential project in Sunnyvale, California. The project consists of seven single-family houses in four buildings with fenced yards. The site, currently occupied by two residences, is located north of El Camino Real. Surrounding land uses are a combination of residences and commercial businesses. Following is a summary of our findings:

1. Incorporating sound-rated windows and doors into residences along Helen Avenue and facing El Camino Real will reduce interior noise levels to the DNL¹ 45 dB² criterion, due to exterior sources.
2. Estimated environmental noise in the backyards is DNL 63 and below. With the installation of an enhanced fence at Unit 7, the levels will be consistent with the City's goal for backyard spaces.
3. Outdoor condensing units and other mechanical equipment must be designed measures to meet the City's Municipal Code limit at the adjacent property lines.

ACOUSTICAL CRITERIA

Sunnyvale General Plan

The Noise sub-element of the Sunnyvale General Plan includes indoor and outdoor noise goals for various land uses in the community. Noise levels are characterized in terms of Day/Night Average Sound Levels (DNL). The guidelines for residential projects are summarized in Table 1 below.

Table 1: Summary of Noise and Land Use Compatibility Guidelines for Residential Land Use (Figure 6-5)

Community Noise Exposure (DNL)	Residential Compatibility
Less than 60 dB	<i>Normally Acceptable:</i> Specified land use is satisfactory, based on the assumption that any buildings involved are of normal conventional construction, without any special insulation requirements.
60 to 75 dB	<i>Conditionally Acceptable:</i> Specified land use may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features are included in the design.
Greater than 75 dB	<i>Unacceptable:</i> New construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies.

In addition, the General Plan includes policies to address noise as follow:

- Policy SN-8.1 identifies the interior noise goal in residences, due to exterior sources, as DNL 45 dB.
- Policy SN-8.3 states "Attempt to achieve a maximum instantaneous noise level of 50 dB in bedrooms and 55 dB in other areas of residential units exposed to train or aircraft noise, where the exterior DNL exceeds 55 dB." The site does not appear to be in close proximity to airports or rail. Therefore, this assessment does not address instantaneous noise levels indoors.
- Policy SN-8.7 states "Supplement Figure 6-5 ... for residential uses by attempting to achieve an outdoor DNL of no greater than 60 dB for common recreation areas, backyards, patios and medium and large-size balconies."

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 A-Weighted Sound Level (dB) — A term for the A-Weighted sound pressure level. The sound level is obtained by use of a standard sound level meter and is expressed in decibels.

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Sunnyvale Municipal Code

Section 19.42.030 of the Sunnyvale Municipal Code contains performance standards for the generation of noise at residential properties which are summarized as follows:

- 75 dB at any point on the source property line
- 60 dB during the day at adjacent residences
- 55 dB during the night (45 dB if tonal) at adjacent residences

EXISTING NOISE ENVIRONMENT

The noise environment is influenced by local vehicle traffic and both rooftop mechanical equipment and general intermittent noise from adjacent commercial sites. To quantify the existing noise environment, two long-term monitors continuously measured noise levels at the site between 27 and 29 of October 2014. In addition, short-term "spot" measurements were conducted and compared with corresponding time periods of the long-term monitors to determine how noise levels vary at different locations and 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	DNL
L1	Helen Avenue Monitor Approximately 40' east of Helen Avenue centerline, 12' above grade	27-29 October 2014	62 dB
L2	1050 Helen Ave Driveway Monitor Approximately 120' east of Helen Avenue centerline, 12' above grade		58 dB
S1/S2	1050 Helen Ave Future Facade Spot Approximately 45' east of Helen Avenue centerline, 5'/16' above grade	5:15-5:30 PM 29 October 2014	57/59 dB
S3	1050 Helen Ave Backyard Spot Approximately 130' east of Helen Avenue centerline, 5' above grade	5:00-5:30 PM 29 October 2014	55 dB

In a report dated 6 August 2014, DKS Associates estimates that average daily traffic along El Camino Real west of Bowers Avenue will increase by 28-percent between 2013 and 2040³. This corresponds with a traffic noise increase of approximately 1 dB (DNL) over a ten year period, which is the basis of the analysis and recommendations below.

ANALYSIS AND RECOMMENDATIONS

Land Use Compatibility

Estimated future noise at the setback of planned residences ranges from below DNL 60 dB in the interior shielded portions of the site to DNL 63 dB along Helen Avenue. This falls into the City's *normally* and *conditionally acceptable* categories for residential projects.

Interior Noise

The project should incorporate sound rated windows and doors to reduce vehicle traffic noise to DNL 45 dB or less indoors. Preliminary estimates suggest that incorporating windows and doors with sound insulation ratings of STC⁴ 28 or higher at residential Units 1, 5, 6 and 7 will reduce transportation noise to

³ El Camino Real Bus Rapid Transit (BRT) Traffic Operations Analysis Report, Revised Draft, August 2014, Table 14.

⁴ Sound Transmission Class (STC) – A single-number rating standardized by ASTM and used to rate the sound insulation properties of partitions. The STC rating is derived from laboratory measurements of a building element and as such is representative of the maximum sound insulation. Increasing STC ratings correspond to improved noise isolation.

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this criterion.⁵ These estimates assume a typical room size of 12 by 14 feet with one-third of exterior facades consisting of glazing, and exterior walls equivalent to 3-coat stucco over wood sheathing, 2x4 or 2x6 wood studs with batt insulation in stud cavities, and at least one layer of gypsum board on the interior. The final design and sound insulation ratings should be reviewed by an acoustical consultant prior to construction.

Where windows need to be closed to meet the interior noise goal, consider incorporating a ventilation or air-conditioning system for the comfort of future residents. This applies to residential Units 1, 5, 6 and 7, and should be discussed with the project mechanical engineer during design. The architectural site plan is attached for Unit number reference.

Exterior Noise

Outdoor use space will be provided via fenced yards. Estimated future transportation noise ranges from DNL 56 dB at the yards inset to the site to DNL 63 dB in the backyard of Unit 7. Incorporating a noise barrier at the Unit 7 yard will reduce transportation noise to the DNL 60 dB goal in all yards. The noise barrier should be solid from bottom to a six-foot height with no cracks or gaps, and should have a minimum surface density of approximately three pounds per square foot. Effective barriers can be constructed out of CMU block or framed plaster walls. Enhanced wood fences may also be used, however special care must be taken to ensure that gaps do not form as wood expands and shrinks over time. Details should be determined during the design phase and revised by an acoustical consultant.

Mechanical Equipment Noise (Associated with the Project)

Outdoor mechanical equipment must meet the Municipal Code noise limits summarized above. It is assumed that residences may include outdoor air-condensing units. An acoustical consultant should review manufacturer's noise level data for the proposed units during the design phase to determine if noise reduction measures are needed. If needed, noise reduction may include a combination of selecting quiet units, maintaining minimum distances to property lines, physical barriers and/or enclosures.

⁵ STC ratings are for full window assemblies (glass and frame) rather than just the glass itself. Laboratory-tested sound-rated assemblies from an NVLAP accredited lab should be used. For reference, standard dual-pane construction grade windows and sliding glass doors have sound insulation ratings in the range of STC 26 to 28.



FIGURE 1
1050-1060 HELEN AVE
MEASUREMENT LOCATIONS AND
FUTURE NOISE LEVELS

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