WaterStone

Milpitas, California

Environmental Noise Assessment

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INTRODUCTION

This report summarizes our environmental noise assessment for the WaterStone residential project located at 1494 and 1600 California Circle in Milpitas, California. The project is the first phase of a larger planned residential area which includes the adjacent site to the south. The purpose of this study is to quantify the noise environment at the site, compare it with City goals for indoor and outdoor noise, and propose noise mitigation measures as needed.

Following is a summary of our findings:

1. Incorporating sound-rated windows and doors into the exterior building facades of selected units will reduce interior noise levels to City and State standards. Preliminary estimates suggest that sound insulation ratings up to approximately STC 38 may be needed in homes along California Circle.
2. Since windows will need to be closed to achieve the DNL 45 dBA criterion indoors, houses should include mechanical ventilation systems.
3. Estimated future traffic noise is in the range of DNL 60 to 65 dBA in the three common open spaces in the east and southern portions of the site. Preliminary estimates suggest that incorporating noise barriers at side yards of homes nearest to and with a line-of-sight to California Circle would reduce traffic noise to these levels for seated residents across the site. This falls into the City's *conditionally acceptable* land use category for exterior noise in residential projects.
4. The Milpitas Municipal Code does not identify specific noise levels that are acceptable for mechanical equipment. If air conditioning systems or other outdoor mechanical equipment is used, noise levels should be considered when selecting and locating equipment.

DESCRIPTION

The project consists of 84, three-story detached single-family homes (see Figure 1, attached). Outdoor use space will consist of three shared open space areas, private decks, and fenced yards. The 7.4-acre site is located east of Interstate 880 (I-880) and various commercial businesses across California Circle. It is south and west of existing residences across Penitencia Creek, and north of existing office buildings. Dixon Landing Road is approximately 475 feet to the north. The site is generally flat. The nearest at-grade railway appears to be approximately 1,400 feet to the east.

APPLICABLE CRITERIA

City of Milpitas General Plan

The Noise section of the Milpitas General Plan contains land use compatibility guidelines for environmental noise in the community. Noise levels are characterized in terms of Day/Night Average Sound Levels (DNL[1]). Table 1, below, summarizes these guidelines for single-family residential land uses. The bulleted items summarize additional policies outlined in the General Plan.

[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.

Table 1: Summary of Table 6-1 – Land Use Compatibility for Community Noise Environments

Exterior DNL	Single-Family Detached Residential Compatibility Level
60 dBA[2] or less	*Normally Acceptable*: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
55 to 70 dBA	*Conditionally Acceptable*: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.
70 to 75 dBA	*Normally Unacceptable*: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

- Policy 6-1-4 prompts the use of mitigation measures to reduce sound levels in rear yards and common open space to "acceptable" levels when environmental noise levels exceed the *normally acceptable* level.

- Policy 6-1-5 defines DNL 45 dBA as the interior noise level goal for all residences, and requires the incorporation of mechanical ventilation where the "use of windows for ventilation will result in higher than DNL 45 dBA interior noise levels".

City of Milpitas Municipal Code

Chapter 213 of the Milpitas Municipal Code prohibits the generation of *disturbing noise* on residentially zoned properties during nighttime hours between 10:00pm and 7:00am. Disturbing noise is defined as "…any sound or vibration caused by sound which occurs with such intensity, frequency or in such a manner as to disturb the peace and quiet of any person."

ENVIRONMENTAL NOISE

Noise from vehicle traffic on I-880 and California Circle dominate environmental noise at the site. To quantify the existing noise environment, three long-term monitors continuously measured noise levels between 14 and 17 February 2012. 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 across the site and at different elevations. Table 2 summarizes existing noise levels at the site. Figure 1, attached, shows the approximate measurement locations.

[2] A-Weighted Sound Level (dBA) — 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.

Table 2: Existing Noise Environment

Site	Location	Date / Time	DNL
LT-1	Northwest Site Monitor Approx. 60' northeast of California Cir. centerline	14 to 17 February 2012	72 dBA [3]
LT-2	Southwest Site Monitor Approx. 55' northeast of California Cir. centerline		70 dBA [3]
LT-3	East Site Monitor Approx. 295' northeast of California Cir. centerline		64 dBA [3]
ST-1	Northwest Site Spot Approx. 70' northeast of California Cir. centerline	17:05 to 17:25 17 February 2012	72 dBA
ST-2	Southwest Site Spot Approx. 60' northeast of California Cir. centerline	14:55 to 15:10 17 February 2012	67 dBA
ST-3	East Site Spot *(Shielded from roadways by existing buildings)* Approx. 295' northeast of California Cir. centerline	16:00 to 16:15 17 February 2012	59 dBA

The Transportation Impact Analysis for the project, prepared by Hexagon Transportation Consultants and dated 22 February 2012, provides existing peak hour volumes for vehicles along California Circle. In addition, it provides both existing and projected future volumes for Dixon Landing Road.[4] Along Dixon Landing Road, peak hour traffic volumes are projected to increase by 26 to 44 percent by 2030. This corresponds with approximately a 1-decibel increase in traffic noise over the next ten years. In the absence of projected future traffic volumes for California Circle and I-880, this assessment assumes a similar increase in environmental noise across the site. Estimated future noise levels are summarized on Figure 1, attached.

ANALYSIS AND RECOMMENDATIONS

Environmental Noise

As shown in Figure 1 attached, estimated future noise levels range from DNL 61 dBA along the eastern edge of the site to DNL 73 dBA at the northernmost residences along California Circle. These levels fall into the *conditionally acceptable* and *normally unacceptable* categories for land use compatibility. The project should incorporate mitigation measures to reduce indoor noise to DNL 45 dBA, and reduce outdoor environmental noise in residential yards to acceptable levels. Consider the following:

1. Based on floor plans dated 21 March 2012, preliminary estimates suggest that window and door sound insulation ratings up to approximately STC 36 may be needed for rooms along California Circle, and STC 33 at rooms perpendicular to and set back from California Circle. Needed sound insulation ratings will decrease in units further east, until standard construction-grade dual pane windows will suffice.[5] These estimates assume an exterior wall assembly similar to 3-coat stucco over wood

[3] Existing DNL listed has been adjusted to exclude the influence of specific high noise level events identified as landscaping activities.
[4] The Transportation Impact Analysis indicates that projected 2030 traffic volumes for Dixon Landing Road are based on a cumulative study area including planned transportation improvements to I-880, Calaveras Boulevard, Montague Expressway, and McCarthy Boulevard.
[5] Standard dual-pane construction-grade windows and sliding glass doors have sound insulation ratings in the range of STC 26 to 28.

sheeting with insulation in stud cavities and at least one layer of gypsum board on the interior. Specific details and sound insulation ratings must be determined during the design phase as floor plans and exterior elevations are finalized.

2. Since windows of residences will need to be closed to meet the interior DNL 45 dBA criterion, houses should include mechanical ventilation systems. This should be discussed with the project mechanical engineer and must not compromise sound insulation of the exterior assemblies.

3. Noise levels in outdoor spaces will vary, depending on the location and orientation on site. The conceptual site plan includes three common lawn areas in the east and southern portions of the site, and private fenced side yards alongside homes.

   a. Common Lawn Areas – Estimated future noise levels in the three common lawn areas will be between DNL 60 and 65 dBA with shielding from the proposed houses on-site. This falls into the City's *conditionally acceptable* category for residences.

   b. Private Yards – Environmental noise levels will vary across the site, depending on the location and orientation to I-880 and California Circle. Preliminary estimates suggest that incorporating 6- to 8-foot tall noise barriers at yards nearest to and with a direct line-of-sight to California Circle will reduce traffic noise to between approximately DNL 60 and 65 dBA for residents.[6] The proposed houses will reduce estimated traffic noise to these levels, or lower, in side yards of other homes in the eastern portion of the site. This falls into the *conditionally acceptable* land use range for community noise.

      Effective noise barriers should be solid from bottom to top with no cracks or gaps, and should have a minimum surface density of three pounds per square foot. Details should be determined as site and landscaping plans are further developed.

Mechanical Equipment (associated with the project)

Mechanical equipment associated with the project is expected to consist of residential air-conditioning units. While the Milpitas Municipal Code does not identify specific noise level limits, the project should consider noise levels at neighboring units when selecting and locating units. This should be considered during the design phase.

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[6] Barrier height with respect to roadway elevation or yard elevation, whichever is higher.

● INDICATES APPROXIMATE NOISE MEASUREMENT LOCATION

NOTE: DRAWING PROVIDED BY OTHERS; NO SCALE

WATERSTONE
SITE PLAN INDICATING ESTIMATED FUTURE NOISE ENVIRONMENT

FIGURE 1

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