Appendix G – Noise Assessment

Pacific Mall

Milpitas, California

Environmental Noise Assessment

29 January 2013

Prepared for:

Steinberg Architects
Dennis Cook
60 Pierce Avenue
San Jose, CA 95110
Phone: 408.295.5446
Email: dcook@steinberg.us.com

Prepared by:

Charles M. Salter Associates, Inc.
Philip N. Sanders, LEED AP
Erika A. Frederick
100 West San Fernando, Suite 430
San Jose, CA 95113
Phone: 408.295.4944
Email: philip.sanders@cmsalter.com

CSA No. 12-0292

Charles M. Salter
ASSOCIATES INC

INTRODUCTION

This report summarizes an environmental noise assessment for the mixed-use Pacific Mall project in Milpitas, California. The purpose of this study is to quantify the noise environment at the project site, compare it with applicable City and State standards, and propose conceptual noise mitigation measures as needed. Following is a summary of our findings:

1. Incorporating sound-rated windows into the exterior building facades of the hotel will reduce estimated future noise levels to the State's criterion of DNL 45 dBA [1] indoors. Figure 2, attached shows preliminary sound insulation ratings for exterior windows.
2. Since windows will need to be closed to meet the interior noise criterion, guest rooms must incorporate ventilation or air-conditioning systems to provide a habitable interior environment.
3. Estimated future environmental noise levels at the outdoor hotel restaurant veranda are consistent with the City's goal for business/commercial projects, but exceed the goal for hotel projects. Incorporating solid noise barriers along the edges of the hotel restaurant dining veranda will reduce estimated future traffic noise to the City's hotel goal of DNL 65 dBA or lower.
4. Estimated hourly average sound levels at the site will be Leq-1hr 65 dBA or higher. Therefore, prescriptive or performance-based measures noise reduction measures will need to be implemented to meet the interior California Green Building Standards Code (CALGreen) requirement for retail spaces.
5. The Milpitas Municipal Code does not identify specific noise level thresholds for mechanical equipment. Noise levels should be considered when selecting and locating outdoor mechanical equipment.

DESCRIPTION

The project consists of a two-story retail mall (approx. 285,000 sq. ft.) with underground parking for approximately 835 cars, and a twelve-story hotel. The hotel will include 250 guest rooms and will be located above first-floor retail space at the south end of the development. Outdoor use space will consist of an elevated veranda for restaurant dining, associated with the hotel. The site is located between North McCarthy Boulevard and Ranch Drive, approximately 1,150 feet west of Interstate 880 (I-880) and 1,050 feet north of State Route 237 (SR237). The site is generally flat and is currently occupied by commercial and retail buildings (some spaces are presently vacant), as well as an at-grade parking lot that will remain.

APPLICABLE CRITERIA

City of Milpitas General Plan

The Noise Element 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 [2] (DNL). Table 1, below, summarizes these guidelines for hotel and retail (business/ commercial) land uses.

---

1 dBA – 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.

2 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 Land Use Compatibility for Community Noise Environment

DNL Value in Decibels		Land Use Compatibility
Hotel	Business/ Commercial	
65 dBA[3] or less	70 dBA 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.
60 to 70 dBA	67 to 77 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. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
70 to 80 dBA	75 or higher	*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.

This assessment assumes that the *normally acceptable* exterior noise levels for hotels and for business/commercial developments, DNL 65 dBA and DNL 70 dBA, respectively, are the goals for environmental noise in outdoor use areas, such as verandas.

Policy 6-1-5 of the Noise Element defines DNL 45 dBA as the interior noise level goal for all lodging facilities, 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". This is consistent with the California Building Code requirement as described below.

City of Milpitas Municipal Code

Chapter 213 (Noise Abatement) of the Milpitas Municipal Code describes excessive sound as being a hazard to public health, welfare, safety, and the quality of life in residential areas, and imposes qualitative regulations intended to protect residents. However, it does not specify quantitative thresholds that apply to the hotel and business commercial components of this project.

California Building Code (CBC)

Title 24, Part 2, Chapter 1207 of the California Code limits indoor noise from outdoor sources to DNL 45 dBA in guest rooms of hotels.[4] Projects exposed to an outdoor DNL greater than 60 dBA require an acoustical analysis during the design phase showing that the proposed design will limit outdoor noise to the prescribed allowable interior level. Additionally, if windows must be closed to meet the interior standard, "the design for the structure must also specify a ventilation or air-conditioning system to provide a habitable interior environment."

Title 24, Part 11 of the California Code of Regulations is the California Green Building Standards Code (CALGreen). Section 5.507.4 includes prescriptive and performance-based sound insulation requirements for non-residential projects exposed to an exterior noise level of Leq-1hr 65 dBA or higher.[5] In summary, wall and roof-ceiling assemblies making up the building envelope must either have a composite sound

---

[3] 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.

[4] 2010 California Building Code, California Code of Regulations, Title 24, Part 2, Chapter 12, Section 1207: Sound Transmission.

[5] 1 July 2012 Supplement, 2010 California Building Code, California Code of Regulations, Title 24, Part 11 "Green Building Standards Code", Chapter 5: Nonresidential Mandatory Measures, Section 5.507.4.

insulation rating of STC 50 or higher, with exterior windows of a minimum STC of 40, or the assemblies must reduce interior levels to Leq-1hr 50 dBA or lower indoors.

NOISE ENVIRONMENT

Existing Noise Environment

Vehicle traffic on Ranch Drive, North McCarthy Boulevard, I-880, and SR237 is the dominant source of environmental noise at the site. To quantify the existing noise environment, two long-term monitors continuously measured noise levels at the site between 3 and 6 July 2012.[6] 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. Figure 1, attached, shows approximate measurement locations.

Table 2 – Existing Noise Environment

Site	Location	Date / Time	DNL
LT-1	North Site Monitor Approximately 490' northwest of Ranch Drive centerline	3 to 6 July 2012	64 dBA [7]
LT-2	South Site Monitor Approximately 130' north of Ranch Drive centerline	3 to 6 July 2012	65 dBA
ST-1	Ranch Drive Spot Measurement Approximately 110' north of Ranch Drive centerline	16:40 – 16:55 3 July 2012	65 dBA
ST-2	North McCarthy Boulevard Spot Measurement Approximately 90' east of N. McCarthy Blvd centerline	17:15 – 17:30 3 July 2012	68 dBA

Typical maximum noise levels from vehicles were 81 dBA at LT-1 and 84 dBA at LT-2.[8] For reference, the loudest noise levels at the site were measured at LT-2, and were identified as landscaping equipment (91 dBA) and a vehicle (90 dBA).

Future Noise Environment

The Draft Transportation Impact Analysis for the project provides existing peak hour volumes for vehicles along Ranch Drive and North McCarthy Boulevard. In addition, it provides projected future volumes, which are summarized below:

- North McCarthy Boulevard – Based on year 2035 projections, peak hour traffic volumes along North McCarthy Boulevard are expected to increase by 178 percent by the year 2035. This corresponds with an increase in traffic noise of 4 to 5 decibels by 2035.
- Ranch Drive – The report does not contain year 2035 projections for Ranch Drive. However, by comparing the difference between cumulative "with project" projections and year 2035 projections for North McCarthy Boulevard, extrapolated year 2035 volumes for Ranch Drive indicate an increase in peak hour traffic volume by approximately 94 percent. This corresponds with an increase in traffic noise of 3 dB by the year 2035.

---

[6] The noise measurement period included the July 4th holiday. However, to ensure that our measurement data included at least 48 hours of non-holiday traffic conditions, we extended our measurement period by an additional day (three days total) to compensate for the holiday.

[7] Noise generated by an unidentified mechanical source occurred during the 10:00PM hour on July 3 and during the 12:00AM hour on July 4, and contributed to a DNL of 70 dBA measured at the LT-1 monitor location. However, this noise did not occur at any other time during our measurement, and is therefore not assumed to be part of the typical noise environment at the site. DNL 64 dBA represents the adjusted existing day/night average sound level at the LT-1 monitor location.

[8] Greene, Rob, "Max Level Intrusion Noise Limit", 1982 National Conference on Environmental and Occupational Noise. Typical maximum is the Lmax30, obtained by logarithmically averaging events that exceeded 75 dBA.

The traffic report does not contain data for I-880 and SR237. In a report dated November 2007, the Metropolitan Transportation Commission estimates that vehicle trips in the San Francisco Bay Area will increase by 38 percent between the years 2006 and 2035.[9] This corresponds with an approximate 1- to 2-decibel increase in DNL across the site from each of the two local highways, I-880 and SR237, by the year 2035.

Estimated overall future noise levels, based on measured levels at the site and expected future increases in traffic volumes along local roadways and highways, are shown in Figure 1, attached.

ANALYSIS AND RECOMMENDATIONS

Environmental Noise

Land Use Compatibility

As shown in Figure 1, estimated future environmental noise levels range from DNL 63 dBA at the northern façade of the hotel building to DNL 70 dBA along facades facing North McCarthy Boulevard. This falls within the City's *normally acceptable* and *conditionally acceptable* ranges for business/commercial and hotel land uses, respectively.

Exterior-to-Interior Noise Reduction

Hotel:

The project must incorporate sound-rated windows to reduce indoor noise to the DNL 45 dBA criterion or lower in hotel rooms.

1. Figure 2, attached, shows preliminary exterior window sound insulation ratings for guest rooms that are intended to meet the interior noise criterion, which are based on schematic design floor plans and elevations dated 27 August 2012. Preliminary sound insulation ratings will be reviewed as the design progresses, and as floor plans, exterior walls, and window sizes are finalized. Standard dual-pane construction grade windows have sound insulation ratings in the range of STC 26 to 28. Where not indicated in the figure, these ratings are assumed.
2. Submit acoustical test reports for proposed window assemblies for review. Sound transmission loss curves should be free of large dips, which may be audible as tones in the guest rooms. In general, panes of glass in dual pane assemblies should be of different thicknesses, or one of the two panes should be laminated glass.
3. Preliminary sound insulation rating estimates assume that, where curtain walls are not used, exterior walls will provide sound insulation equivalent to STC 45.
4. Since hotel windows must be closed to meet the interior noise criterion, the design must include "... a ventilation or air conditioning system to provide a habitable interior environment." This should be discussed with the project mechanical engineer. The ventilation system must not compromise sound insulation of exterior window/wall assemblies. This applies to all guest rooms.
5. For reference, reducing interior noise levels to a market rate goal of DNL 40 dBA would require selecting windows and exterior doors with sound insulation ratings approximately 5 STC points higher than those indicated in Figure 2.

---

[9] Transportation 2035 Change in Motion, Travel Forecasts for the San Francisco Bay Area 2009 Regional Transportation Plan Vision 2035 Analysis, November 2007, Tables E.17.2 and E.18.2.

Retail:

Measured hourly average sound levels at the site, between the hours of 8:00AM and 10:00PM (when the mall is expected to be open), were in the range of Leq-1hr 49 to 70 dBA. CALGreen limits interior noise levels to Leq-1hr 50 dBA in non-residential spaces. Common shell assemblies used in business/ commercial buildings typically reduce noise levels by 20 dBA or more. Therefore, interior noise levels in retail areas are expected to meet CALGreen performance-based criteria with standard construction.

Outdoor Noise

Outdoor noise levels vary, depending on the location and orientation on site. The conceptual floor plan for the second level of the hotel (Sheet A2.3) indicates that there will be an exterior restaurant dining veranda associated with the hotel located at the southeast corner of the building. There do not appear to be any individual or shared guest room decks or any other common use terraces.

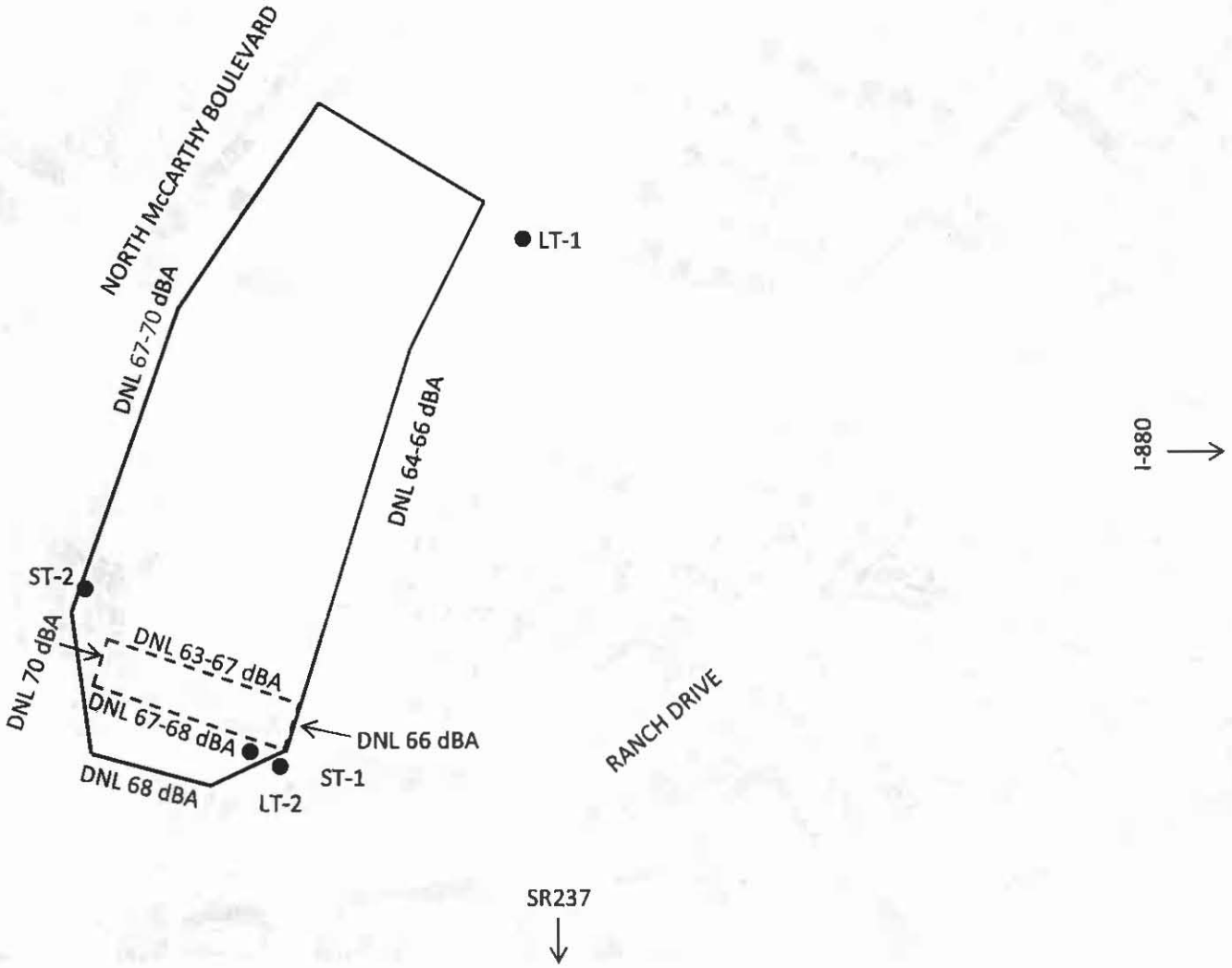
Drawings show that the building will provide partial shielding for the elevated veranda from North McCarthy Boulevard. Estimated future outdoor noise levels at this space are in the range of DNL 65 to 68 dBA. While this meets the DNL 70 dBA goal for business/commercial uses, it exceeds the *normally acceptable* goal of DNL 65 dBA for hotel uses. Incorporating partial height solid noise barriers (minimum 42 inches tall) will reduce estimated traffic noise to approximately DNL 65 dBA or lower for patrons seated on the veranda.

Effective barriers should be solid from the bottom to top with no cracks or gaps, and should have a minimum surface density of approximately three pounds per square foot. Details should be determined during the design phase.

Mechanical Equipment Associated with the Project

Mechanical equipment associated with the project is expected to consist of a variety of units, including exhaust fans, make-up air units, condensing units, air conditioning units, etc. While the Milpitas Municipal Code does not identify specific noise level limits, the project should consider noise levels at neighboring properties, as well as on-site uses, when selecting and locating equipment. Details should be determined as the design progresses.

* * *



Indicates Proposed Pacific Mall Project Boundary

Indicates Proposed Hotel Boundary

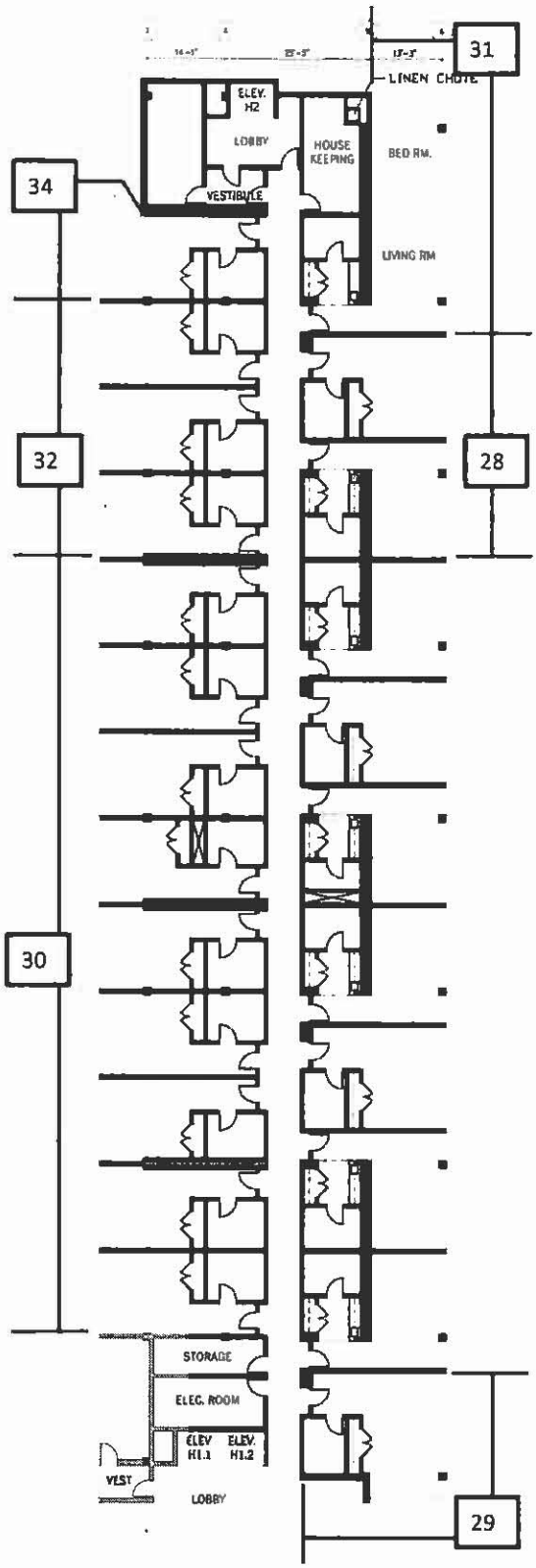
© 2012
CHARLES M. SALTER ASSOCIATES, INC.
FOR ACOUSTIC DESIGN INFORMATION ONLY

PACIFIC MALL – MILPITAS, CA

SITE PLAN INDICATING ESTIMATED FUTURE NOISE ENVIRONMENT

FIGURE 1

CSA Project No. 12-0292
29 January 2013



© 2012
CHARLES M. SALTER ASSOCIATES, INC.
FOR ACOUSTIC DESIGN INFORMATION ONLY

PACIFIC MALL – MILPITAS, CA
PRELIMINARY MINIMUM WINDOW STC RATINGS INTENDED TO MEET DNL 45 dBA OR LOWER INDOORS
(Applies to 3rd through 12th Floors of Hotel; NOT FOR CONSTRUCTION)

FIGURE 2
CSA Project No. 12-0292
29 January 2013