
APPENDIX C

ACOUSTICAL ANALYSIS

STAFF PRELIMINARY WORKING DRAFT-FOR INTERNAL USE ONLY-CA GOVT CODE SECTION 6254(A)

ACOUSTICAL ANALYSIS
HILLVIEW COMMUNITY CENTER
LOS ALTOS, CALIFORNIA

WJVA Report No. 18-001

PREPARED FOR

EMC PLANNING
301 LIGHTHOUSE AVENUE, SUITE C
MONTEREY, CA 93940

PREPARED BY

WJV ACOUSTICS, INC.
VISALIA, CALIFORNIA



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MAY 14, 2018

1. INTRODUCTION

Project Description:

The City of Los Altos proposes to demolish the existing 30,362 square-foot community center consisting of four buildings and connecting breezeways. While the site would be cleared of all improvements, some of the existing trees would be retained. The site would be re-designed, with the new 24,500 square foot single community center building occupying a location at the north end of the present community center site. Pedestrian pathways would be provided throughout the site to connect the proposed parking lots and existing sidewalks to the new buildings, recreational facilities, and existing buildings surrounding the site to provide improved pedestrian circulation.

Environmental Noise Assessment:

This environmental noise assessment has been prepared to determine if significant noise impacts will be produced by the project and to describe mitigation measures for noise if significant impacts are determined. The environmental noise assessment, prepared by WJV Acoustics, Inc. (WJVA), is based upon the project site plan dated March 1, 2018, traffic data provided by Hexagon Transportation Consultants, project information provided by the project architect, Noll and Tam, and the findings of on-site noise measurements. Revisions to the site plan, traffic impact analysis or other project-related information available to WJVA at the time the analysis was prepared may require a reevaluation of the findings and/or recommendations of the report.

Appendix A provides definitions of the acoustical terminology used in this report. Unless otherwise stated, all sound levels reported in this analysis are A-weighted sound pressure levels in decibels (dB). A-weighting de-emphasizes the very low and very high frequencies of sound in a manner similar to the human ear. Most community noise standards utilize A-weighted sound levels, as they correlate well with public reaction to noise. Appendix B provides examples of sound levels for reference.

2. THRESHOLDS OF SIGNIFICANCE

The CEQA Guidelines indicate that significant noise impacts occur when the project exposes people to noise levels in excess of standards established in local noise ordinances or general plan noise elements or causes a substantial permanent or temporary increase in noise levels above levels existing without the project.

a. **Noise Level Standards**

LOS ALTOS

The Natural Environment & Hazards Element of the Los Altos General Plan (hereafter referred to as General Plan, adopted November 2002) establishes land use compatibility criteria in terms of the Day-Night Average Level (L_{dn}) or Community Noise Equivalent Level (CNEL) to describe noise exposure for noise compatibility planning purposes. Both the L_{dn} and CNEL represent the time-weighted energy average noise level for a 24-hour day, with a 10 dB penalty added to noise levels occurring during the nighttime hours (10:00 p.m.-7:00 a.m.). The CNEL includes an additional penalty of 5 dB (technically 4.77 dB) that is added to noise levels occurring during the evening hours between 7:00 p.m. and 10:00 p.m. The CNEL is utilized to describe aircraft noise exposure as required by the State of California. Both the L_{dn} and CNEL represent cumulative exposure to noise over an extended period of time and are therefore calculated based upon *annual average* conditions. The L_{dn} and CNEL are considered to be equivalent descriptors of the community noise environment for the purposes of this study and this report will generally use the L_{dn} descriptor hereafter.

The General Plan establishes an outdoor level of 60 dB L_{dn} as “normally acceptable” and an exterior noise level of up to 70 dB L_{dn} as “conditionally acceptable”. These standards typically apply to construction and development of new noise-sensitive land uses for residential uses, schools, libraries, churches and hospitals. While the General Plan does not specifically describe a standard that would apply to a community center, it does set an exterior standard of 60 dB L_{dn} for schools, libraries, churches, hospitals and nursing homes.

The Noise Element also requires that interior noise levels attributable to exterior sources not exceed 45 dB L_{dn} . This standard is consistent with interior noise level criteria applied by the State of California and the U.S. Department of Housing and Urban Development (HUD). The intent of the interior noise level standard is to provide an acceptable noise environment for indoor communication and sleep.

Additionally, section 6.16.050 (Exterior Noise Limits) of the City of Los Altos Municipal Code provides exterior noise limits for specific land zoning designations within the City. The subject property is zoned PCF (Public and Community Facilities) and the surrounding properties are zoned R1 (Single-Family Residential). Table I provides the baseline noise level standards that apply to these two zoning designations.

TABLE I LOS ALTOS EXTERIOR NOISE LEVEL LIMITS (dBA) NON-TRANSPORTATION NOISE SOURCES		
Receiving Land Use Category	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
R1 (Single-Family Residential)	55	45
PCF (Public & Community Facilities)	55	50

Source: City of Los Altos Municipal Code

In regards to the baseline noise level standards provided in Table I, the municipal states the following,

No person shall operate, or cause to be operated, any source of sound at any location within the city, or allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level, when measured on any other property, either incorporated or unincorporated, to exceed:

- a. *The noise standard for that land use as specified in Table I for a cumulative period of more than thirty (30) minutes in any hour; or*
- b. *The noise standard plus five (5) dB for a cumulative period of more than fifteen (15) minutes in any hour; or*
- c. *The noise standard plus ten (10) dB for a cumulative period of more than five (5) minutes in any hour; or*
- d. *The noise standard plus fifteen (15) dB for a cumulative period of more than one (1) minute in any hour; or*
- e. *The noise standard plus twenty (20) dB or the maximum measured ambient for any period of time.*

The municipal also states:

- *If the measured ambient noise level exceeds that permissible within any of the first four noise limit categories above, the allowable noise exposure standard shall be increased in five dB increments in each category as appropriate to encompass or reflect such ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.*
- *If the noise measurement occurs on a property adjacent to a zone or boundary, the noise level limit applicable to the lower noise zone, plus five (5) dB.*

Therefore, the applicable baseline (L_{50}) noise level standard (noise level not to exceed for a period of more than 30 minutes in any hour) is 55 dB during daytime hours (7:00 a.m. to 10:00 p.m.) and 50 dB during nighttime hours (10:00 p.m. to 7:00 a.m.). These noise levels become incrementally five (5) dB less restrictive, for shorter periods of time, as described above.

It is important to note that Section 6.16.090 of the Municipal Code also provides some special exemptions, of which the following would apply to the project:

- *Outdoor activities. The provisions of this chapter shall not apply to occasional public outdoor gatherings, public dances, shows, and sporting and entertainment events provided such events are conducted pursuant to a permit or license issued by the city relative to the staging of such events.*

State of California

There are no state noise standards that are applicable to the project.

Federal Noise Standards

There are no federal noise standards that are applicable to the project.

b. Construction Noise

Section 6.16.070 (Prohibited Acts) of the City of Los Altos Municipal Code provides guidelines in respect to construction noise limitations. The municipal code provides time restrictions as well as maximum allowable noise levels for construction activities, based upon land zoning designations.

In regards to time limitations for construction activities, the municipal code states the following is restricted:

- *Single-family zoning districts. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work on weekdays before 7:00 a.m. and after 5:30 p.m. and on Saturdays before 9:00 a.m. or after 3:00 p.m. or any time on Sundays or the city observed holidays of New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day and Christmas Day, such that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public utilities or by special exception. This section shall apply to operations on residentially zoned property only".*
- *All other zoning districts. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work on weekdays before 7:00 a.m. and after 7:00 p.m. and Saturdays before 9:00 a.m. or after 6:00 p.m. or any time on Sundays or the city observed holidays of New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day and Christmas Day, such that the sound*

therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by special exception. This section shall apply to operations on properties other than residentially zoned property.

In regards to maximum allowable noise levels resulting from construction activities, the Municipal Code states the following:

- *Where technically and economically feasible, construction activities shall be conducted in such a manner that the maximum noise levels at affected properties will not exceed those listed in the following schedules:*

TABLE II LOS ALTOS EXTERIOR NOISE LEVEL LIMITS (dBA) CONSTRUCTION ACTIVITIES		
Receiving Land Use Category	All R1 Zoning Districts	All PCF and R3 Zoning Districts
Daily, except Sundays and legal holidays 7:00 a.m. — 7:00 p.m.	75 dB L _{max}	80 dB L _{max}
Daily, 7:00 p.m. — 7:00 a.m. and all day Sundays and legal holidays	50 dB L _{max}	55 dB L _{max}

Source: City of Los Altos Municipal Code

c. Vibration

There are no state or federal standards that specifically address construction vibration. Additionally, the City of Los Altos General Plan does not specifically provide vibration guidelines or standards. Some guidance is provided by the Caltrans Transportation and Construction Vibration Guidance Manual. The Manual provides guidance for determining annoyance potential criteria and damage potential threshold criteria. These criteria are provided below in Table II and Table III and are presented in terms of peak particle velocity (PPV) in inches per second (in/sec).

TABLE III GUIDELINE VIBRATION ANNOYANCE POTENTIAL CRITERIA		
Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely Perceptible	0.04	0.01
Distinctly Perceptible	0.25	0.04
Strongly Perceptible	0.9	0.1
Severe	2.0	0.4

Source: Caltrans

TABLE IV
GUIDELINE VIBRATION DAMAGE POTENTIAL THRESHOLD CRITERIA

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile, historic buildings, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: Caltrans

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3. SETTING

The proposed project site is an existing community center located along the north side of Hillview Avenue and east of San Antonio Road, within the City of Los Altos. The project site is surrounded by single-family residential land uses to the north, east and the south, commercial land uses to the west (adjacent to San Antonio Road) with municipally owned properties to the northwest. The project site plan is provided as Figure 1. The project site and vicinity are provided as Figure 2.

a. Background Noise Level Measurements

Existing noise levels in the project vicinity are dominated by traffic noise associated with vehicles on Hillview Avenue and San Antonio Road. Other sources of noise observed during a site visit included aircraft overflights, birds, human voices (mostly children), noise associated with nearby construction activities and noise associated with both on-site and off-site HVAC units.

Measurements of existing ambient noise levels in the project vicinity were conducted on February 6 & 7, 2018. Long-term (24-hour) ambient noise level measurements were conducted at two (2) locations (sites LT1 and LT2). Site LT1 was located in the front yard of 90 Hillview Avenue, a residence located immediately south of the project site, and was exposed to noise associated with vehicle traffic along Hillview Avenue and San Antonio Road. Site LT2 was located on the east side of the project site, along the fence line between the project site and a backyard of a residence located along Eleanor Avenue, and was exposed to noise associated with current activities at the existing community center, noise associated with nearby construction activities and other residential noise sources.

Additionally, short-term (15-minute) ambient noise level measurements were conducted at eight (8) locations (Sites ST1 through ST8). The locations of the noise monitoring sites are shown on Figure 2. Two (2) individual noise measurements were taken at each of the eight short-term sites to quantify ambient noise levels in the morning and afternoon hours. The locations of the long-term and short-term sites are shown in Figure 2.

Noise monitoring equipment consisted of Larson-Davis Laboratories Model LDL-820 sound level analyzers equipped with B&K Type 4176 1/2" microphones. The equipment complies with the specifications of the American National Standards Institute (ANSI) for Type I (Precision) sound level meters. The meters were calibrated with a B&K Type 4230 acoustic calibrator to ensure the accuracy of the measurements.

Table V provides the hourly average noise levels (L_{eq}), the hourly maximum (L_{max}) and the L_{90} statistical noise levels at the two 24-hour measurement sites (LT1 and LT2). Measured hourly energy average noise levels (L_{eq}) at site LT1 ranged from a low of 39.2 dB between 3:00 a.m. and 4:00 a.m. to a high of 63.1 dBA between 7:00 a.m. and 8:00 a.m. Hourly maximum (L_{max}) noise levels at site LT1 ranged from 53.8 to 88.0 dBA. Residual noise levels at the monitoring site, as defined by the L_{90} , ranged from 37.1-46.1 dBA. The L_{90} is a statistical descriptor that defines the noise level exceeded 90% of the time during each hour of the sample period. The L_{90} is generally considered to represent the residual (or background) noise level in the absence of identifiable single noise events from traffic, aircraft and other local noise sources. The measured L_{dn} value at

site LT1 during the two individual days of noise monitoring was 56.1 dB L_{dn} . Figure 3 graphically depicts hourly variations in ambient noise levels at site LT1.

TABLE V						
SUMMARY OF 24-HOUR NOISE LEVEL MEASUREMENTS HILLVIEW COMMUNITY CENTER FEBRUARY 6, 2018						
Time	A-Weighted Decibels, dB, L_{eq} (one-hour average)					
	LT1			LT2		
	L_{eq}	L_{max}	L_{90}	L_{eq}	L_{max}	L_{90}
12:00 a.m.	45.1	63.1	31.7	43.3	63.1	37.3
1:00 a.m.	46.5	48.2	31.4	34.3	65	38.1
2:00 a.m.	39.6	48.3	31.4	34.5	53.8	37.5
3:00 a.m.	39.2	48.2	31.2	34.7	56.9	37.1
4:00 a.m.	47.7	45.3	30.5	34.2	54.9	37.3
5:00 a.m.	46.0	60.1	35.2	41.2	67.6	39.3
6:00 a.m.	53.1	64.9	42.4	46.8	76.7	44.7
7:00 a.m.	63.1	61.3	44.3	47.9	88.0	46.1
8:00 a.m.	55.7	65.7	55.1	57.1	72.2	46.0
9:00 a.m.	54.0	68.9	40.3	54.5	70.9	41.2
10:00 a.m.	53.7	70.4	40.3	56.7	72.9	40.5
11:00 a.m.	51.9	67.0	39.4	53.3	70.8	39.7
12:00 p.m.	52.7	62.4	33.9	42.1	70.5	38.8
1:00 p.m.	54.6	59.2	34.6	42.1	80.8	39.8
2:00 p.m.	53.0	64.8	38.2	46.7	77.5	41.6
3:00 p.m.	53.2	64.7	39.3	46.6	72.6	40.9
4:00 p.m.	52.1	70.8	39.6	46.1	68.6	40.9
5:00 p.m.	53.4	73.8	38.7	51.1	68.6	42.2
6:00 p.m.	51.7	57.2	39.4	42.8	67.9	43.9
7:00 p.m.	51.0	58.1	40.1	43.4	70.8	44.1
8:00 p.m.	48.5	55.9	39.5	42.9	67.4	43.2
9:00 p.m.	48.5	54.9	37.3	41.6	69.1	41.7
10:00 p.m.	49.2	55.4	36.1	40.8	78.0	40.9
11:00 p.m.	43.5	54.5	33.4	37.4	65.8	39.1
24-Hour L_{dn} , dB	56.1			51.0		

Source: WJV Acoustics, Inc.

Measured hourly L_{eq} noise levels at site LT2 ranged from a low of 34.2 dB between 4:00 a.m. and 5:00 a.m. to a high of 57.1 dBA between 8:00 a.m. and 9:00 a.m. Hourly L_{max} noise levels at site LT2 ranged from 45.3 to 73.8 dBA. Residual noise levels at the monitoring site, as defined by the L_{90} , ranged from 30.5 to 55.1 dBA. The measured L_{dn} value at site LT2 was 51.0 dB L_{dn} . Figure 4 graphically depicts hourly variations in ambient noise levels at site LT2. The measured 24-hour noise levels at both sites, as defined by the L_{dn} , was within acceptable noise level limits provided in the General Plan.

Table VI summarizes short-term noise measurement results. The noise measurement data included energy average (L_{eq}) maximum (L_{max}) as well as five individual statistical parameters. Observations

were made of the dominant noise sources affecting the measurements. The statistical parameters describe the percent of time a noise level was exceeded during the measurement period. As stated above, the L₉₀ describes the noise level exceeded 90 percent of the time during the measurement period and is generally considered to represent the residual (or background) noise level in the absence of identifiable single noise events from traffic, aircraft and other local noise sources.

TABLE VI
SUMMARY OF SHORT-TERM NOISE MEASUREMENT DATA
HILLVIEW COMMUNITY CENTER, LOS ALTOS
FEBRUARY 6 & 7, 2018

Site	Time	A-Weighted Decibels, dBA							Sources
		L _{eq}	L _{max}	L ₂	L ₅	L ₂₅	L ₅₀	L ₉₀	
ST1	8:07 a.m.	46.2	52.6	50.9	49.5	47.5	45.4	40.7	BD, V, AC
ST1	2:47 p.m.	45.5	51.8	48.9	47.8	45.7	43.2	38.3	BD, V, D
ST2	8:20 a.m.	52.6	65.7	62.6	55.8	50.6	48.1	45.7	C, BD, V
ST2	3:05 p.m.	53.8	62.8	64.1	56.2	51.0	49.6	46.6	C, BD, V
ST3	8:40 a.m.	44.7	60.6	51.6	48.1	44.5	42.0	38.6	TR, V, D
ST3	3:26 p.m.	47.7	62.5	52.4	49.7	46.3	43.8	40.1	TR, V, AC
ST4	9:04 a.m.	47.4	56.0	54.1	51.6	48.4	45.0	40.0	TR, V
ST4	3:45 p.m.	48.0	57.9	55.5	52.2	50.0	47.1	42.4	TR, V
ST5	9:23 a.m.	55.0	67.9	64.5	60.8	54.0	47.0	38.6	TR, V, D, LB
ST5	4:06 p.m.	53.1	62.5	60.4	58.6	53.3	45.1	39.0	TR, AC
ST6	9:52 a.m.	55.8	71.2	65.9	59.1	53.4	51.0	46.9	TR, AC
ST6	4:29 p.m.	57.2	73.9	66.6	61.2	54.5	52.1	48.9	TR, V
ST7	10:10 a.m.	65.4	71.7	70.6	69.1	67.3	63.6	56.9	TR, V, AC
ST7	4:49 p.m.	63.1	65.4	68.2	67.4	65.2	61.4	57.6	TR
ST8	10:31 a.m.	66.1	76.5	74.2	71.0	65.6	62.5	58.5	TR
ST8	5:10 p.m.	68.2	77.9	76.1	73.3	66.8	63.0	58.2	TR, V

TR: Traffic AC: Aircraft V: Voices D: Dogs Barking BD: Birds Leaf Blower: LB C: Construction Activities
Source: WJV Acoustics, Inc.

Short-term noise measurements were conducted for 15-minute periods. Sites ST1-ST4 were located within or near the existing community center. Observed sources of noise were distant traffic, human voices associated both with community center activities and nearby residential land uses, construction activities, birds, barking dogs and aircraft overflights. Site ST5-ST8 were located near or adjacent to roadways, and, generally speaking, traffic noise was the dominant noise source at these noise measurement sites.

4. PROJECT IMPACT ASSESSMENT

a. Project Traffic Noise Impacts on Existing Noise-Sensitive Land Uses Outside Project Site (No Impact)

A Traffic Analysis for the project was prepared by Hexagon Transportation Consultants, Inc. (March 22, 2018). The analysis indicated that because the project would not increase the size of the existing community center and would not add services, it is not expected to generate any net new trips. Therefore, it can be reasonably assumed that the project would not result in any quantifiable increase in traffic noise exposure at nearby noise-sensitive receivers.

The Traffic Analysis determined that the existing community center generates 1,444 daily vehicle trips on average. The driveway counts indicated that the highest hourly volume occurred during the typical AM commute hour (8:15 to 9:15 AM, with 174 vehicles entering/exiting the site (104 inbound trips and 70 outbound trips).

While the new community center would not be expected to result in any net new trips, WJVA modeled the noise levels from community center traffic trips along Hillview Avenue to estimate project-related traffic noise in respect to overall existing noise in the project vicinity.

WJVA utilized the FHWA Traffic Noise Model to quantify project-related traffic noise exposure along Hillview Avenue. The FHWA Model is a standard analytical method used by state and local agencies for roadway traffic noise prediction. The model is based upon reference energy emission levels for automobiles, medium trucks (2 axles) and heavy trucks (3 or more axles), with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA Model was developed to predict hourly L_{eq} values for free-flowing traffic conditions and is generally considered to be accurate within ± 1.5 dB. To predict L_{dn} values, it is necessary to determine the hourly distribution of traffic for a typical day and adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Using the above-described FHWA Traffic Noise Model and the total number of project-related daily trips (1,444), WJVA calculated traffic noise exposure from vehicle traffic associated with the community center. In order to estimate the portion of the existing ambient noise level in the project vicinity, WJVA compared modeled traffic noise with noise level measurements obtained from long-term noise monitoring site LT1 (front yard of 90 Hillview Avenue).

The noise meter at site LT1 was located approximately 50 feet from the centerline of Hillview Avenue. Applying the setback distance of 50 feet as the modeled distance, the traffic noise exposure resulting from vehicles associated with the community center was calculated to be 47.2 dB L_{dn} . As described above, the measured 24-hour noise level at site LT1 was measured to be 56.1 dB L_{dn} . By logarithmically subtracting the calculated project-related traffic noise exposure level of 47.2 dB L_{dn} from the overall ambient noise level of 56.1 dB L_{dn} , the remaining (non-project traffic noise) was 55.5 dB L_{dn} . This indicates that noise levels resulting from traffic associated with the community center contributes a very small portion to the overall existing ambient noise levels along Hillview Avenue.

**b. Project Noise Impacts from Operational On-Site Sources
(No Impact)**

Sources of operational noise from the proposed community center would typically be limited to parking lot vehicle movements, human activity and Mechanical/HVAC systems. Mechanical/HVAC equipment for the proposed community center includes heat pumps, heat recovery units and exhaust and ventilation fans.

Mechanical:

Mechanical equipment would be located at various locations throughout the community center. Roof-mounted HVAC equipment would be screened by a solid parapet wall, which would provide acoustical shielding of associated noise levels. WJVA analyzed manufacturer-supplied noise level data for the proposed mechanical equipment. Noise data supplied as sound power levels was first converted to A-weighted decibels for the purpose of this analysis. Table VII provides the noise levels (dBA) for each piece of proposed mechanical equipment, normalized to a reference distance of ten (10) feet from the source.

TABLE VII MECHANICAL EQUIPMENT NOISE LEVELS, dBA AT 10' HILLVIEW COMMUNITY CENTER, LOS ALTOS	
EQUIPMENT TYPE	dBA @ 10'
Greenheck Inline Fan, Model SQ-130HP-VG	47.0
Greenheck Inline Fan, Model SQ-140HP-VG	44.0
Greenheck Roof Exhaust Fan, Model CUE-161-VG	64.0
LG ARUB288DTE4 Heat Recovery Unit	62.5
Daikin Rebel 002 Heat Pump Model DPS006A	74.3
Whisper Green Select Panasonic Ventilation Fan Model FV-05-11VKS1	28.0

Source: WJVA

Based upon noise levels provided in Table VI and relative distances from each equipment type to nearby noise-sensitive land uses, WJVA calculated noise levels associated with proposed mechanical equipment at nearby off-site noise-sensitive receivers. WJVA calculated expected noise levels associated with the proposed mechanical equipment based upon the standard rate of attenuation with increased distance from a point noise source (6 dB/doubling of distance). For the purpose of the calculations, it was assumed that all mechanical equipment was operating simultaneously, and noise levels reported should therefore be considered a worst-case assessment of mechanical equipment noise levels. The locations of the analyzed mechanical equipment are provided as Figure 5.

Noise levels associated with proposed mechanical equipment were calculated to be in the range of approximately 39-46 dB at nearby residential land uses. Figure 6 provides the calculated

mechanical equipment noise levels at the adjacent residential property lines. Such levels are below applicable noise level standards and below existing ambient noise levels in the project vicinity. Further mitigation is not required.

Vehicle Movements:

Noise due to traffic in parking lots is typically limited by low speeds and is not usually considered to be significant. Human activity in parking lots that can produce noise includes voices, stereo systems and the opening and closing of car doors and trunk lids. Such activities can occur at any time during regular hours of operation. The noise levels associated with these activities cannot be precisely defined due to variables such as the number of parking movements, time of day and other factors. It is typical for a passing car in a parking lot to produce a maximum noise level of 60 to 65 dBA at a distance of 50 feet, which is comparable to the level of a raised voice. For this project, the closest proposed parking would be located approximately 100 feet from the closest existing residential uses. At such a distance, noise levels associated with parking lots and vehicle movements would be approximately 54-59 dB.

Noise levels associated with vehicle movements would not exceed the applicable maximum noise level standards at nearby noise-sensitive land uses. Additionally, noise levels associated with vehicle movements would be within the range of existing ambient noise levels in the project vicinity. Further mitigation is not required.

Teen Patio Area:

The project includes an outdoor teen patio area, to be located along the northern exterior portion of the North Bar. The teen patio area would be available to teenagers typically during after school hours and during school breaks. The City estimates a maximum number of 10-15 individuals would use the teen patio area when in use.

The project does not plan to incorporate any amplified speech or music within the teen patio area. Sources of noise within the teen patio area would be limited to human speech. The typical maximum noise level of human voice in typical conversation is approximately 55-60 dB at a distance of ten feet. Such levels would result in noise levels of approximately 37-42 dB at the closest off-site noise-sensitive receiver locations. Noise levels associated with human activity at the teen patio area would not exceed any City of Los Altos noise level standards and would not exceed existing ambient noise levels. Further mitigation is not required.

Courtyard Area:

The project would include a centrally located courtyard area. The courtyard area would be used periodically for small musical performances and other gatherings. According to the City staff, amplified speech and music would not be incorporated into regularly scheduled activities that may utilize the Courtyard Area. Noise levels associated with human voice activity within the courtyard area would not exceed any applicable City of Los Altos noise level standards at off-site noise-sensitive land uses. Further mitigation is not required.

Any activities that may occur within the Courtyard Area that would incorporate amplified speech or music would be subject to standard permitting processes as may be required by the City of Los Altos.

Indoor Classes, Events and Activities:

The project includes several rooms that would be used for various regularly scheduled classes, events and activities. Such rooms include the Movement Room, Community Room, Senior Rooms, Multipurpose Room, Crafts Room, Teen Room and Kinderprep Room. Activities that may occur indoors within these rooms could periodically involve the use of amplified music or speech (including the use of televisions or movie screens).

Typical noise levels associated with these activities would be attenuated by the building assemblies. A typical exterior façade assembly built to existing building code standards will attenuate noise levels by a minimum of 25 dB, assuming doors and windows are closed. Noise levels associated with regularly scheduled classes, events and activities would not exceed applicable noise level standards at nearby noise-sensitive land uses nor would they result in noise levels exceeding existing ambient noise levels. Further mitigation is not required.

**c. Noise From Construction
(No Impact)**

Construction noise could occur at various locations within the project site through the demolition and build-out period. Table VIII provides typical construction-related noise levels at reference distances of 25 feet, 50 feet, and 100 feet.

Construction noise is not usually considered to be a significant impact if construction is limited to the daytime hours and construction equipment is adequately maintained and muffled. Extraordinary noise-producing activities (e.g., pile driving) are not anticipated. Additionally, construction activities should be restricted as described in Section 6.16.070 of the City of Los Altos Municipal Code (and provided in Section 2.b of this report). Further mitigation is not required.

TABLE VIII
TYPICAL CONSTRUCTION EQUIPMENT
MAXIMUM NOISE LEVELS, dBA

Type of Equipment	25 Ft.	50 Ft.	100 Ft.
Backhoe	84	78	72
Concrete Saw	96	90	84
Crane	87	81	75
Excavator	87	81	75
Front End Loader	85	79	73
Jackhammer	95	89	83
Paver	83	77	71
Pneumatic Tools	91	85	79
Dozer	88	82	76
Rollers	86	80	74
Trucks	92	86	80
Pumps	86	80	74
Scrapers	93	87	81
Portable Generators	86	80	74
Front Loader	92	86	80
Backhoe	92	86	80
Excavator	92	86	80
Grader	92	86	80

Source: FHWA

Noise Control for Buildings and Manufacturing Plants, Bolt, Beranek & Newman, 1987

d. Vibration Impacts (Less Than Significant)

The dominant sources of man-made vibration are sonic booms, blasting, pile driving, pavement breaking, demolition, diesel locomotives, and rail-car coupling. Vibration from construction activities could be detected at the closest sensitive land uses, especially during movements by heavy equipment or loaded trucks and during some paving activities. Typical vibration levels at distance of 25 and 100 feet are summarized by Table IX.

TABLE IX
TYPICAL VIBRATION LEVELS DURING CONSTRUCTION

Equipment	PPV (in/sec)	
	@ 25'	@ 100'
Bulldozer (Large)	0.09	0.011
Bulldozer (Small)	0.003	0.0004
Loaded Truck	0.08	0.01
Jackhammer	0.04	0.005
Vibratory Roller	0.2	.03
Loaded Trucks	0.08	.01

Source: Caltrans

Table IX indicates that the equipment with the highest potential vibration levels would be a vibratory roller. While in use, a roller could produce vibration levels of approximately 0.03 PPV (in/sec) at a distance of 100 feet. As described in Table III and Table IV, such levels would not be expected to cause damage to any of the described building types and would be “barely noticeable” at the closest residence if the equipment was used continuously or frequently. Such levels are not considered to be a significant impact.

After full project build out, it is not expected that ongoing operational activities will result in any vibration impacts at nearby sensitive uses. Activities involved in trash bin collection could result in minor on-site vibrations as the bin is placed back onto the ground. Such vibrations would not be expected to be felt at the closest off-site sensitive uses.

STAFF PRELIMINARY WORKING DRAFT-FOR INTERNAL USE ONLY-CA GOVT CODE SECTION 6254(A)

5. **IMPACT SUMMARY**

Project-related noise levels resulting from the proposed Hillview Community Center, to be located in the City of Los Altos, are not expected to exceed any applicable City of Los Altos noise level standards or result in any significant long-term increases in ambient noise levels in the project vicinity or throughout the City. Project site demolition and project construction could result in short-term increases in localized ambient noise levels. However, construction-related noise levels are not considered to be a significant impact if local construction noise time limits are observed and equipment is properly maintained and muffled. Additional mitigation is not required.

STAFF PRELIMINARY WORKING DRAFT-FOR INTERNAL USE ONLY-CA GOVT CODE SECTION 6254(A)

FIGURE 1: PROJECT SITE PLAN



NOLL & TAM
ARCHITECTS

720 Henri Avenue
Berkeley, CA 94710
tel 915 542 2000
fax 915 542 2001

ARCHITECTS SEAL

**DRAFT
NOT FOR
CONSTRUCTION**

PROJECT TITLE

**Los Altos Hillview
Community Center**

97 Hillview Ave
Los Altos, CA 94022

ISSUE TITLE

SCHEMATIC DESIGN

ISSUE DATE

09/20/18

NOLL & TAM JOB NUMBER

2170

DESCRIPTION

NO.	DATE	DESCRIPTION
1		

SHEET TITLE

FLOOR PLAN

SHEET NUMBER

A2.31

FIGURE 2: PROJECT VICINITY AND AMBIENT NOISE MONITORING SITES

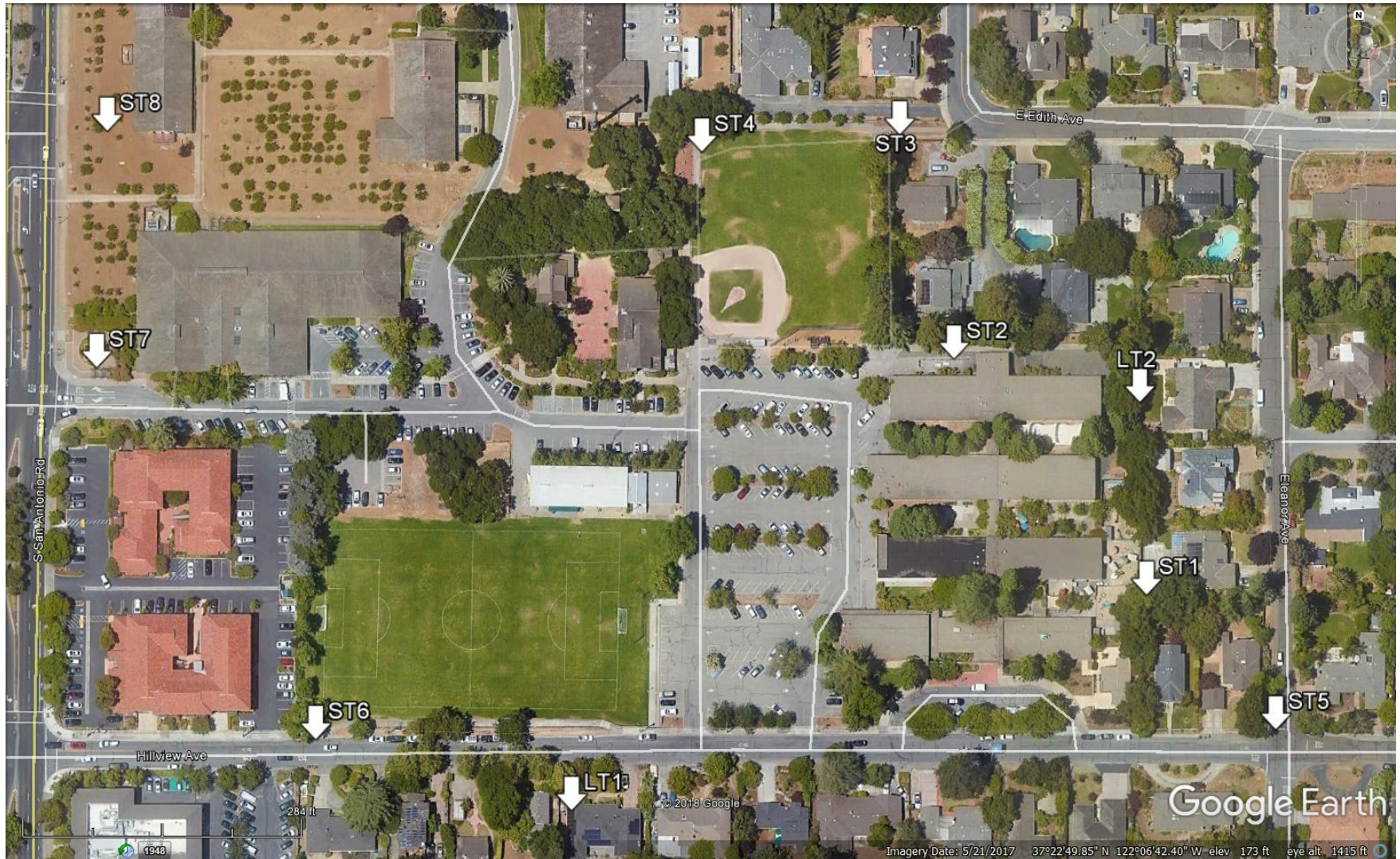


FIGURE 3: HOURLY NOISE LEVELS AT SITE LT1

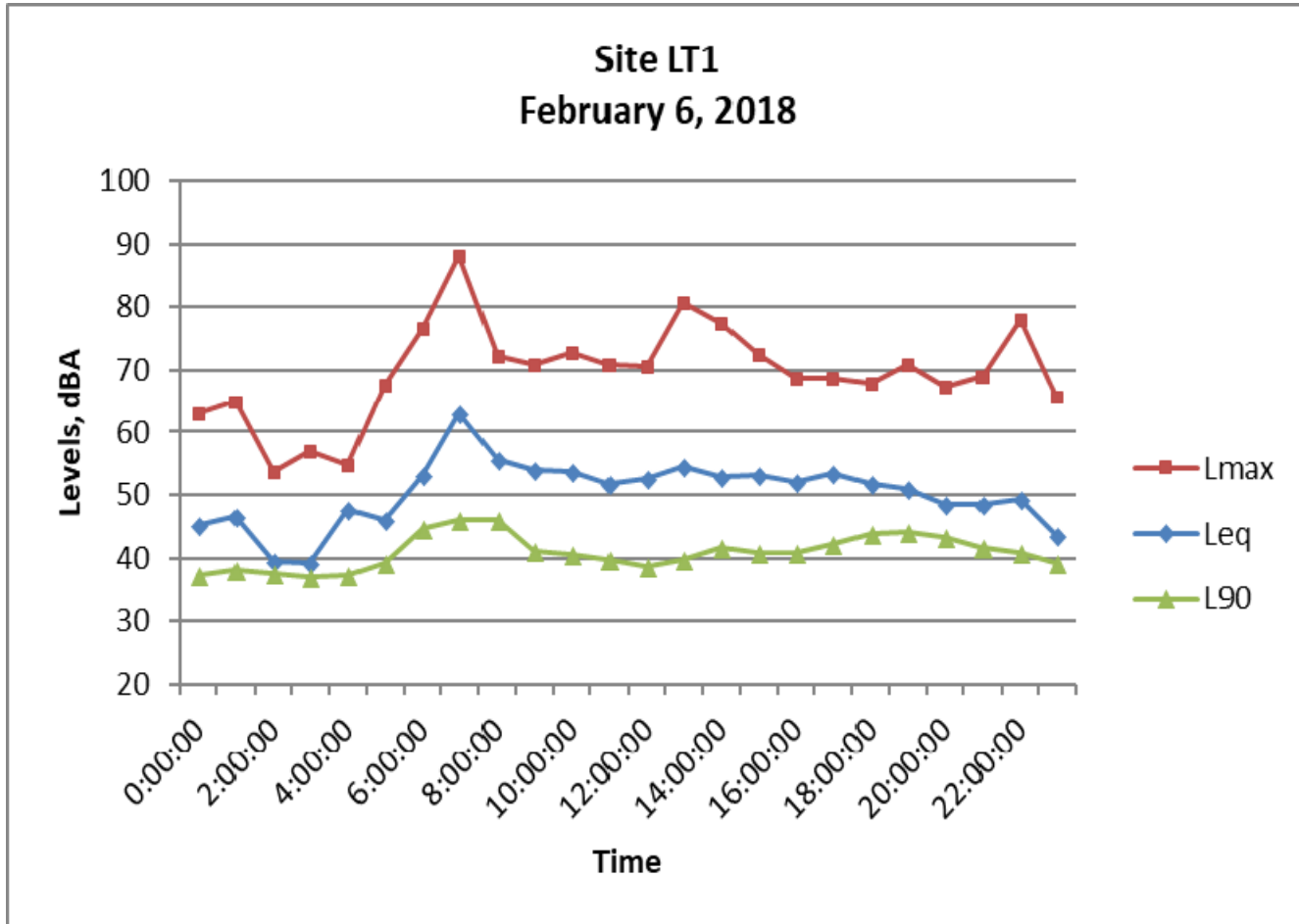


FIGURE 4: HOURLY NOISE LEVELS AT SITE LT2

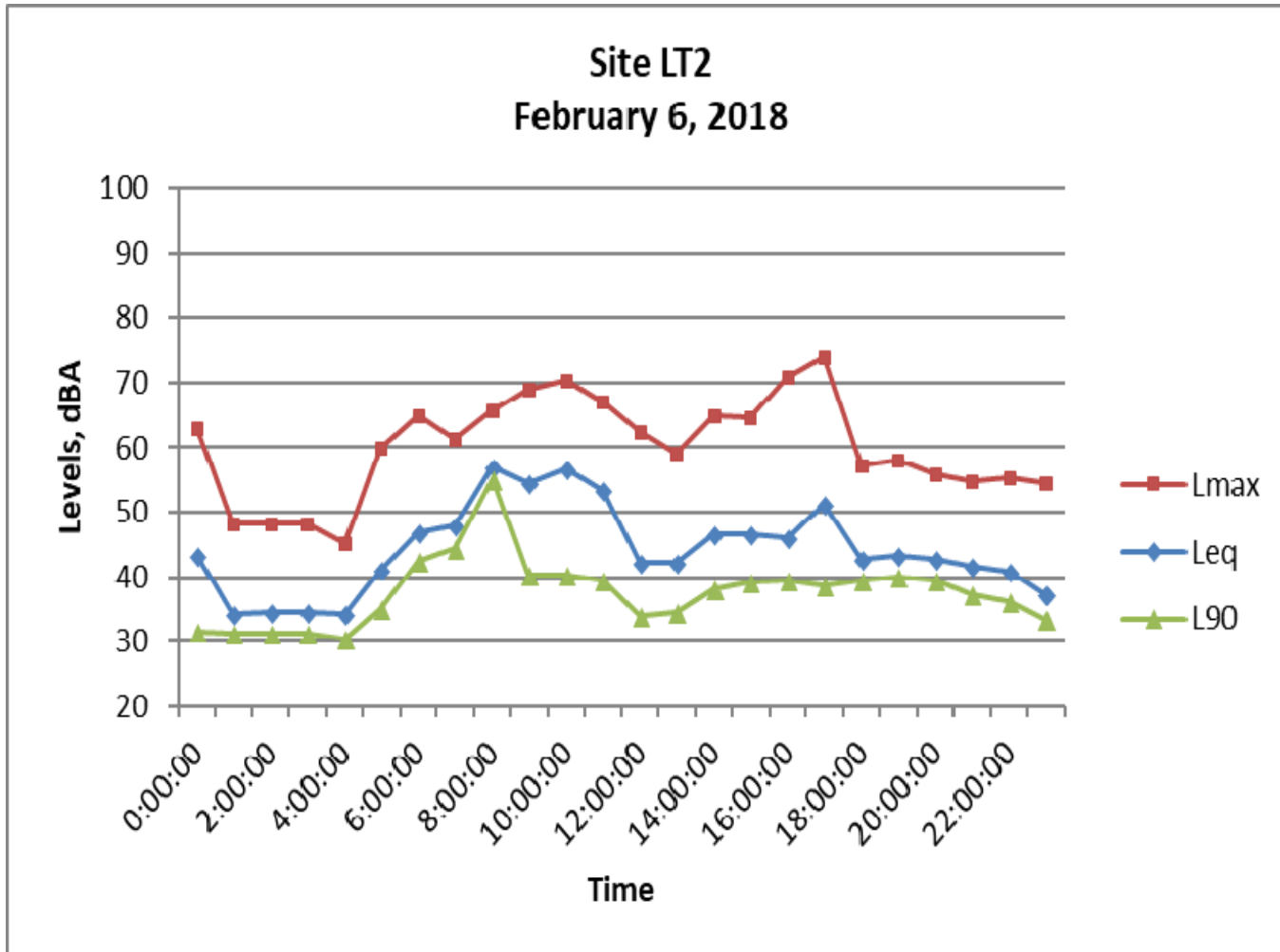


FIGURE 5: LOCATIONS OF ANALYZED MECHANICAL EQUIPMENT

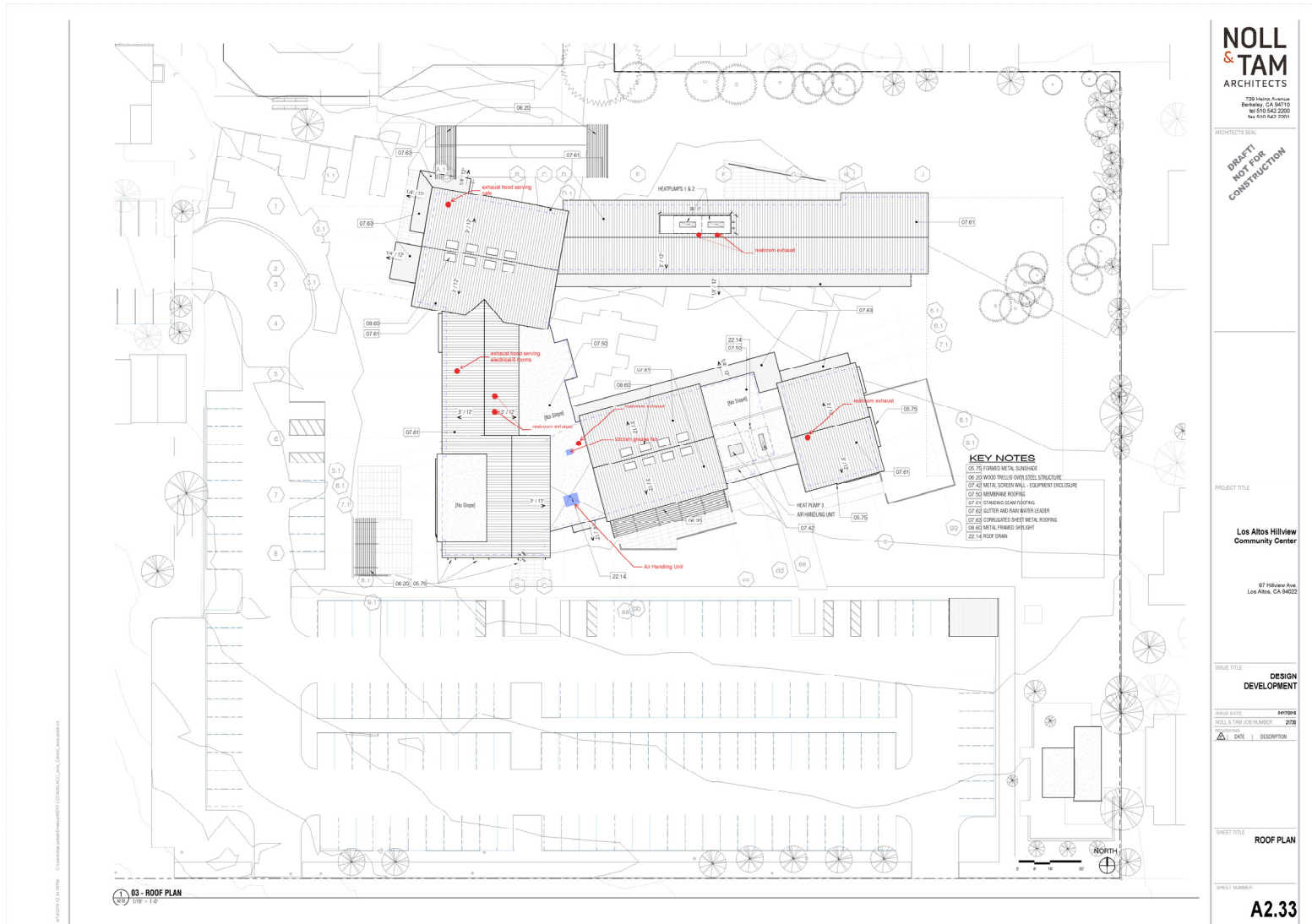


FIGURE 6: NOISE LEVELS ASSOCIATED WITH MECHANICAL EQUIPMENT



APPENDIX A-1

ACOUSTICAL TERMINOLOGY

AMBIENT NOISE LEVEL: The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

CNEL: Community Noise Equivalent Level. The average equivalent sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night before 7:00 a.m. and after 10:00 p.m.

DECIBEL, dB: A unit for describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).

DNL/L_{dn}: Day/Night Average Sound Level. The average equivalent sound level during a 24-hour day, obtained after addition of ten decibels to sound levels in the night after 10:00 p.m. and before 7:00 a.m.

L_{eq}: Equivalent Sound Level. The sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is typically computed over 1, 8 and 24-hour sample periods.

NOTE: The CNEL and DNL represent daily levels of noise exposure averaged on an annual basis, while L_{eq} represents the average noise exposure for a shorter time period, typically one hour.

L_{max}: The maximum noise level recorded during a noise event.

L_n: The sound level exceeded "n" percent of the time during a sample interval (L₉₀, L₅₀, L₁₀, etc.). For example, L₁₀ equals the level exceeded 10 percent of the time.

ACOUSTICAL TERMINOLOGY

NOISE EXPOSURE CONTOURS:

Lines drawn about a noise source indicating constant levels of noise exposure. CNEL and DNL contours are frequently utilized to describe community exposure to noise.

NOISE LEVEL REDUCTION (NLR):

The noise reduction between indoor and outdoor environments or between two rooms that is the numerical difference, in decibels, of the average sound pressure levels in those areas or rooms. A measurement of "noise level reduction" combines the effect of the transmission loss performance of the structure plus the effect of acoustic absorption present in the receiving room.

SEL or SENEL:

Sound Exposure Level or Single Event Noise Exposure Level. The level of noise accumulated during a single noise event, such as an aircraft overflight, with reference to a duration of one second. More specifically, it is the time-integrated A-weighted squared sound pressure for a stated time interval or event, based on a reference pressure of 20 micropascals and a reference duration of one second.

SOUND LEVEL:

The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear and gives good correlation with subjective reactions to noise.

SOUND TRANSMISSION CLASS (STC):

The single-number rating of sound transmission loss for a construction element (window, door, etc.) over a frequency range where speech intelligibility largely occurs.

APPENDIX B
EXAMPLES OF SOUND LEVELS

NOISE SOURCE	SOUND LEVEL	SUBJECTIVE DESCRIPTION
AMPLIFIED ROCK 'N ROLL ▶	120 dB	DEAFENING
JET TAKEOFF @ 200 FT ▶		
	100 dB	VERY LOUD
BUSY URBAN STREET ▶		
	80 dB	LOUD
FREEWAY TRAFFIC @ 50 FT ▶		
	60 dB	MODERATE
CONVERSATION @ 6 FT ▶		
TYPICAL OFFICE INTERIOR ▶		FAINT
SOFT RADIO MUSIC ▶	40 dB	
RESIDENTIAL INTERIOR ▶		VERY FAINT
WHISPER @ 6 FT ▶	20 dB	
HUMAN BREATHING ▶	0 dB	