ENVIRONMENTAL NOISE ASSESSMENT
FOLEY FAMILY COMMUNITY PAVILION
(APN 002-0170-02, 03 and 21)
3 North Street, Healdsburg, California

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Prepared for:

TLCD Architecture
520 Third Street #250
Santa Rosa, CA 95401

Prepared by:

Fred M. Svinth, INCE, Assoc. AIA
ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
429 East Cotati Avenue
Cotati, CA 94931
(707) 794-0400

Project: 22-090

INTRODUCTION

This report summarizes the results of the noise assessment prepared for the Foley Family Community Pavilion proposed at 3 North St. in Healdsburg CA. The proposed project would repurpose a former, 1920's era, warehouse space on the property into a community events pavilion which is intended to become home to the Healdsburg Certified Farmers' Market, and host community events such as musical performances, fundraisers for local non-profit organizations, antique and art fairs, bike and foot races, classes and programs, and other similar events. The project site and its surroundings are shown in Figure 1.

Figure 1: Project Site, Surroundings and Noise Measurement Location

This report presents background information on environmental noise and definitions of the technical terms used in the assessment, the applicable regulatory criteria used in the assessment, a summary of existing noise levels, and our evaluation of the compatibility of the proposed project with regard to the noise environment at the project site. Preliminary noise reduction measures are presented to provide an acceptable noise environment per City of Healdsburg and State of California guidelines.

SETTING

FUNDAMENTALS OF ENVIRONMENTAL NOISE

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in particular locations. A *decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA).* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This *energy-equivalent sound/noise descriptor* is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Day/Night Average Sound Level* (L_{dn}) is a measure of the cumulative noise exposure in a community, with a 10 dB penalty added to nocturnal (10:00 pm - 7:00 am) noise levels.

Effects of Noise

Sleep and Speech Interference: The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noises of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential standards for multi-family dwellings are set by the State of California at 45 dBA L_{dn}. Typically, the highest steady traffic noise level during the daytime is about equal to the L_{dn} and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the

TABLE 1 Definition of Acoustical Terms Used in this Report

Term	Definition
Decibel, dB	A unit 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. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e. g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	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 frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

same criterion for all residential uses. Typical structural attenuation is 12-17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57-62 dBA L_{dn} with open windows and 65-70 dBA L_{dn} if the windows are closed. Levels of 55-60 dBA are common along collector streets and secondary arterials, while 65-70 dBA is a typical value for a primary/major arterial. Levels of 75-80 dBA are normal noise levels at the first row of development outside a freeway right-of-way. In order to achieve an acceptable interior noise environment, bedrooms facing secondary roadways

need to be able to have their windows closed; those facing major roadways and freeways typically need special glass windows.

TABLE 2 Typical Noise Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

Source: Technical Noise Supplement (TeNS), California Department of Transportation, September 2013.

Annoyance: Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 50 dBA L_{dn}. At a L_{dn} of about 60 dBA, approximately 12 percent of the population is highly annoyed.

When the L_{dn} increases to 70 dBA, the percentage of the population highly annoyed increases to about 25-30 percent of the population. There is, therefore, an increase of about 2 percent per dBA between a L_{dn} of 60-70 dBA. Therefore, between an L_{dn} of 70 to 80 dBA, each decibel increase results in an increase of about 3 percent of the population being highly annoyed. People appear to respond more adversely to aircraft noise. When the L_{dn} is 60 dBA, approximately 30-35 percent of the population is believed to be highly annoyed. Each decibel increase to 70 dBA adds about 3 percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increase results in about a 4 percent increase in the percentage of the population highly annoyed.

REGULATORY CRITERIA

The State of California and the City of Healdsburg have established regulatory criteria that are applicable in this assessment. The State of California Environmental Quality Act (CEQA) Guidelines, Appendix G, are used to assess the potential significance of impacts pursuant to local General Plan policies, Zoning Code standards, or the applicable standards of other agencies. A summary of the applicable regulatory criteria is provided below.

State CEQA Guidelines.

CEQA contains guidelines to evaluate the significance of effects of environmental noise attributable to a proposed project. Under CEQA, noise impacts would be considered significant if the project would result in:

(a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies,
(b) Generation of excessive groundborne vibration or groundborne noise levels,
(c) For a project located within the vicinity of a private airstrip or an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport, if the project would expose people residing or working in the project area to excessive noise levels.

CEQA does not define what noise level increase would be considered substantial. Typically, an increase in the L_{dn} noise level resulting from the project at noise sensitive land uses of 3 dBA or greater would be considered a significant impact when projected noise levels would exceed those considered acceptable for the affected land use. An increase of 5 dBA L_{dn} or greater would be considered a significant impact when projected noise levels would remain within those considered acceptable for the affected land use.

City of Healdsburg 2030 General Plan

The Safety Element of the City of Healdsburg 2030 General Plan provides the following Noise goal, policies, and implementation measures that apply to the proposed project:

GOAL S-G: Protection of residents and other sensitive noise receptors from the harmful effects of excessive noise.

POLICY S-G-1: New development shall not be approved unless it is generally consistent with the Land Use Compatibility for Community Noise Environments guidelines contained in General Plan Figure 10 (reproduced below as Figure 2), and it is demonstrated that the new development will not violate the City's ordinance regulating excessive noise.

Land Use Category	Community Noise Exposure (dBA L_{dn})			
	Normally Acceptable[1]	Conditionally Acceptable[2]	Normally Unacceptable[3]	Clearly Unacceptable[4]
Residential – Single-family, duplex, mobile home	≤60[5]	55–70	70–75	75+
Residential – Multi-family	≤65[6]	60–70	70–75	75+
Residential - Interior	≤45			
Transient lodging - Motel, hotel	<65	60–70	70–80	80+
School, library, church, hospital, nursing home	<70	60–70	70–80	80+
Auditorium		<70	65+	
Sports arena, outdoor spectator sports		<75	70+	
Playground, neighborhood park	<70		67.5–75	72.5+
Golf course, cemetery	<75		70–80	80+
Commercial – retail, office, service	<70	67.5–77.5	75+	
Industrial, utility, agriculture	<75	70–80	75+	

Notes: dBA = A-weighted decibels; L_{dn} = day-night average noise level

[1] Specified land use is satisfactory based on the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

[2] New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and after needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh-air supply systems or air conditioning, will normally suffice.

[3] 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. Outdoor areas must be shielded.

[4] New construction or development should generally not be undertaken.

[5] Outdoor private use areas

[6] Outdoor active use areas, excluding balconies

Figure 2: Land Use Compatibility for Community Noise Environments (GP Fig. 10)

POLICY S-G-2: The City will require the inclusion of design techniques in new construction that minimize noise impacts, including building location and orientation, building design features, and placement of noise-tolerant components (i.e., parking, utility areas, and maintenance facilities) between noise sources and the sensitive receptor areas where necessary to meet the Land Use Compatibility for Community Noise Environments guidelines contained in General Plan Fig. 10.

IMPLEMENTATION MEASURE S-16: Require a noise study, including field noise measurements, for any proposed project that would place a potentially intrusive noise source near an existing noise-sensitive use or place a noise-sensitive land use near an existing or potentially-intrusive noise source such as a freeway, arterial street or railroad.

City of Healdsburg Municipal Code

9.32.020 Goals.

In accordance with the adopted goals and policies of the Healdsburg general plan section VIII, health and safety goal H, which states that the purpose and goal of this section is "to protect Healdsburg residents and other sensitive noise receptors from the harmful effects of exposure to excessive noise and to ensure noise exposure compatibility between neighboring land uses," this chapter is adopted in the furtherance of that general plan goal.

9.32.050 Prohibition against excessive noise.

Notwithstanding any other provision of this chapter and in addition thereto, it is unlawful for any person to willfully make, create, maintain or continue, or cause to be made or continued directly or indirectly any loud, excessive, unnecessary or unusual noise which disturbs the peace and quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area or is in any manner prohibited by or does not comply with the provisions of this chapter, and shall be punishable as specified hereafter.

9.32.060 Exemptions.

The following activities shall be exempted from the provision of this chapter:

A. Occasional outdoor gatherings, public dances, shows, 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.
B. Any mechanical device, apparatus or equipment used, related to, or connected with any emergency, public land or utility maintenance, or agricultural machinery, vehicle, or seasonal work, such as activities related to grape crush.
C. A warning alarm or bell provided the sounding of any bell or alarm on any building or motor vehicle shall terminate its operation within 15 minutes of its being activated. This exemption shall not apply to ongoing land use activities where backup alarm noise is emitted from mobile equipment.
D. Noise emanating from manned aircraft.
E. Noise emanating from railroad vehicles.
F. Noise emanating from delivery vehicles regulated by the PUC and associated loading and unloading of merchandise from these vehicles.

9.32.080 Standards for maximum sound levels and determining violations.

A. Sound Level Standards. It is the objective of the City to require intruding noise levels not to exceed those listed below to determine if a violation exists:

Receptor Land Use	**Daytime Exterior Sound Level (dBA L_{10})**	**Nighttime Exterior Sound Level (dBA L_{10})**
Residential-zoned properties not located adjacent to industrial-zoned properties and office-zoned properties:	60	55
Residential-zoned properties located adjacent to industrial-zoned properties:	65	55
Commercial-zoned properties:	65	60
Industrial-zoned properties:	75	70

B. Daytime shall be considered 7:00 a.m. to 8:00 p.m., and nighttime shall be considered to be 8:00 p.m. to 7:00 a.m.

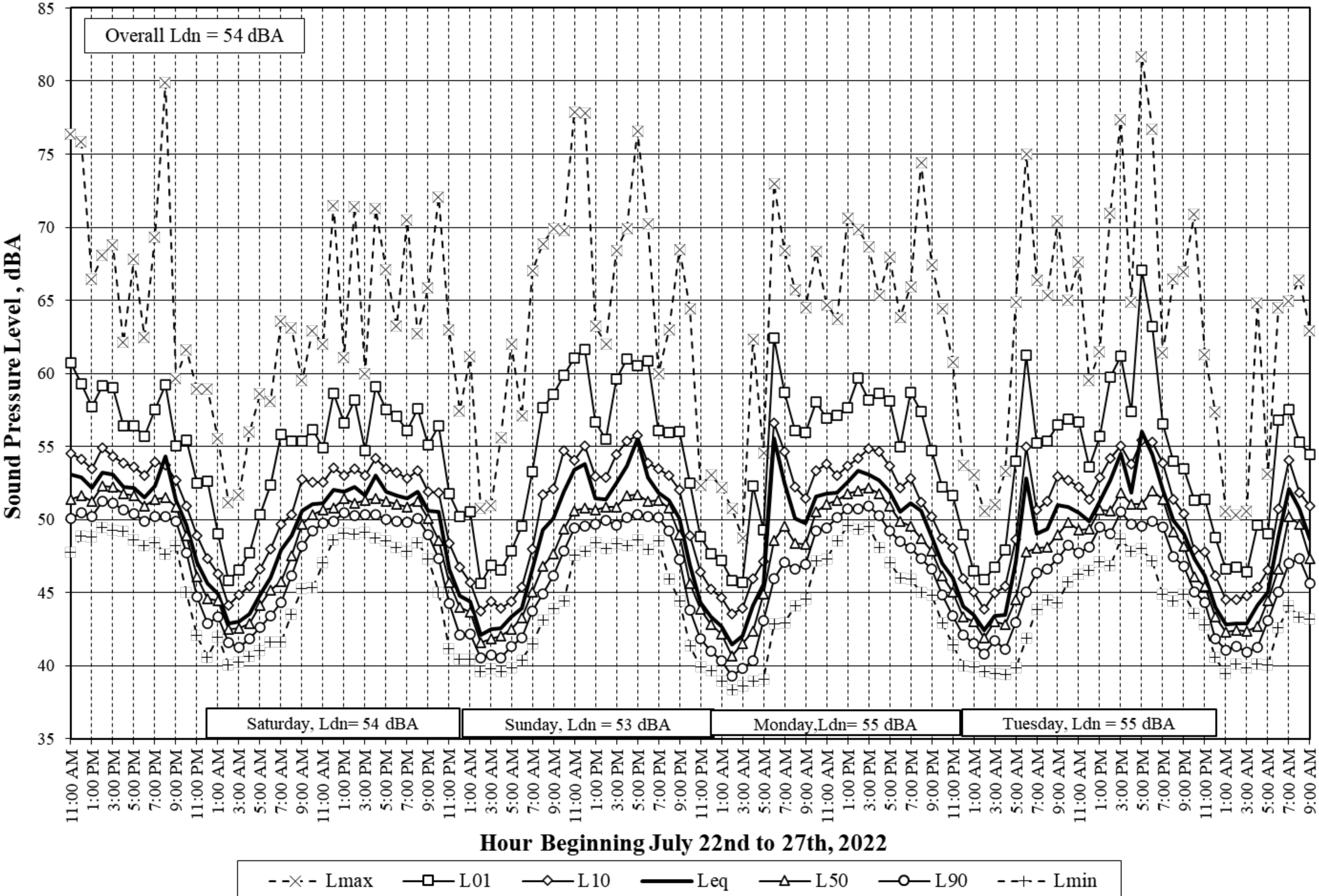
C. Where a land use activity is carried out over two of the above receptor land uses, the least restrictive sound level standard shall apply.
D. Properties that are zoned residential master plan (RMP) or planned development (PD) shall be subject to the sound level standards under this section based upon the corresponding general plan land use designation of residential, office, commercial, or industrial.
E. Mobile equipment used for ongoing land use activities shall be equipped with radar-activated backup alarms to the extent allowed under applicable state and federal regulations.
F. The following criteria, at a minimum, shall be applied in addition to the quantitative sound level measurements and standards during an enforcement procedure as set forth in HMC 9.32.100, to assist in a determination of the nature and severity of a potential violation:
    1. The intensity of the noise;
    2. Whether the origin of the noise is natural or unnatural;
    3. The level and intensity of the background noise;
    4. The proximity of the noise source to receptors;
    5. The time of the day or night the noise occurs;
    6. The duration of the noise;
    7. Whether the noise is recurrent, intermittent, or constant;
    8. Whether the noise is produced by a commercial or noncommercial activity; and
    9. Whether the noise is produced by equipment normally required for maintenance of residential properties or for authorized construction projects.

EXISTING NOISE ENVIRONMENT

A noise monitoring survey was conducted to quantify the existing noise environment at the site between 11 am on July 22nd and 10 am on July 27th, 2022. The noise monitoring survey included one long-term noise measurement east of the site along the Foss Creek Greenway (LT-1), two short-term noise measurements on the site at its W. North and Grove Street frontages (ST-1 and ST-2), and another off-site short-term measurement south of the W. North Street in the Greenspace opposite the existing location of the Healdsburg Farmers' market (ST-3). Figure 1 shows these noise monitoring locations. All noise measurements were conducted with Larson Davis Laboratories (LDL) Type I Model LXT Sound Level Meters fitted with ½-inch pre-polarized condenser microphones and windscreens. The meters were calibrated with a Larson Davis Model CA250 precision acoustic calibrator prior to and following the measurement survey. The internal clocks of the sound level meters were set to less than one second of each other to ensure both identical sound level response and simultaneous operation.

The noise monitor at location LT-1 was positioned at a height of 12 feet above the existing grade on the trunk of a redwood tree on the project site's eastern property line shared with the Foss Creek greenway, approximately 50 feet south of the property line shared with the Du Champ Hotel, 180 feet north of the centerline of W. North Street, and 280 feet east of the centerline of Grove Street. Vehicular traffic on area roadways, visitors on the Foss Creek walking way, area commercial and hotel use and sound from birds and other green space fauna were the predominant noise source affecting the site. The measured noise levels at this location, including the energy equivalent noise level (L_{eq}), maximum (L_{max}), minimum (L_{min}), and the noise levels exceeded 1, 10, 50 and 90 percent of the time (indicated as L_1, L_{10}, L_{50} and L_{90}) are shown in Chart 1, following.

Chart 1: LT-1 Hourly Noise Measurement Data



A review of the Chart 1 data indicates that the noise levels at site LT-1 followed a diurnal pattern characteristic of traffic noise, with increases in average noise levels during the early morning and evening period, judged to be associated with increased visitor use and bird song. The respective average daytime and nighttime noise levels during the measurement period ranged from 47 to 56 dBA L_{eq} and 41 to 56 dBA L_{eq}, and the respective L_{10}[1] daytime and nighttime noise levels during the measurement period ranged from 48 to 56 dBA and 44 to 57 dBA.

The calculated Day/Night Noise Level (L_{dn}) over the entire 115-hour measurement survey was 54 dBA, with the L_{dn} during full weekend days ranging from 53 to 54 dBA and the L_{dn} on full weekdays constant at 55 dBA.

The first two short-term noise measurements (ST-1 and ST-2) were made concurrently with the long-term measurement at LT-1 on Friday, July 22nd on-site between 11:00 and 11:30 on the W. North and Grove Street project frontages to document existing, ambient noise levels at the southern and western site perimeters. The average day-night noise level (L_{dn}) at the site perimeter short-term locations was estimated by correlating the short-term measurement data to the data gathered during the corresponding period at position LT-1. These measurement results and estimated L_{dn} levels are shown in Table 3.

The third short-term noise measurement (ST-3) was also made concurrent with the long-term measurement at LT-1 at a location 75 feet from the perimeter of the Saturday Healdsburg Farmers' Market held in the West Plaza Parking Lot while it was occurring on Saturday July 23rd between 9:40 and 10:00am to document noise levels Farmers' Market activity. The results of these measurements, the simultaneous sound levels measured at the long-term position (LT-1) and the difference in the levels at the long-term position which were not affected by sound from the Farmers' Market activities to those at site ST-3, which was affected by Farmers' Market activities are also shown in Table 3. Where the difference between Farmers' Market affected and non-affected levels are 5 dBA or more, the level are judged to result primarily from Market activities, there for we have established an L_{10} of 59 dBA, an L_{eq} of 56 to 57 dBA for Farmers' Market activities. It should also be noted that during the measurement two musicians with amplified instruments were playing at the market perimeter, and thus we would establish the L_{10} sound level due to amplified music at the Farmers' Market at 59 dBA at 75 feet.

TABLE 3 Summary of Short-Term Noise Measurement Data

Noise Measurement Location (date, time)	**L_{dn}[1]**	**L_{max}**	**$L_{(1)}$**	**$L_{(10)}$**	**L_{eq}**	**$L_{(50)}$**	**$L_{(90)}$**
ST-1: North Street project frontage (7/22/22, 11:00-11:10am)	57	66	60	56	53	52	50
ST-2: Grove Street project frontage (7/22/22, 11:20-11:30am)	55	70	64	60	56	55	49
ST-3: 75 ft to Farmers' Market Perimeter (7/23/22, 9:40-9:50am)		62	60	59	56	56	51
LT-1: (7/23/22, 9:40-9:50am)		59	55	52	51	50	49
ST-3 increase above LT-1		3	5	7	5	6	2
ST-3: 75 ft to Farmers' Market Perimeter (7/23/22, 9:50-10:00am)		63	61	59	57	57	52
LT-1: (7/23/22, 9:50-10:00am)		59	56	52	50	49	48
ST-4 increase above LT-1		4	5	7	7	8	4

Note: L_{dn} is approximated by correlation to the corresponding measurement period at the long-term site.

[1] The City Municipal code limits are given in terms of the L_{10} level, which is the noise metric often used to give an indication of the upper limit of fluctuating noise

FUTURE NOISE ENVIRONMENT

TRAFFIC AND OTHER AMBIENT NOISE

Future noise levels on the project site and in its vicinity due to area traffic would correlate to increases in traffic volumes on area roadways. Assuming an annual growth rate of between 2% per year for local traffic, noise levels in the area would be expected to increase by about 1 dBA in the next 10 years. Thus, ambient noise levels on the project site and in the project area due to traffic noise are expected to be at or below 60 dBA L_{dn}.

PROJECT GENERATED NOISE

The Foley Family Community Pavilion is intended to serve as a community and special events facility. Events are anticipated to occur within, (a) the covered pavilion area, (b) in the pavilion area & the parking area of the project site, and (c) at times in the pavilion area, the parking area and on North Street. The primary anticipated uses of the project, their operational characteristics and the potential noise resulting from them are presented below:

Healdsburg Farmers' Market

The project site is intended to become the home of the Tuesday and Saturday morning Healdsburg Farmers' Market. Currently, the Tuesday Market occurs in the Healdsburg Plaza and has indicated that it will remain in this location, however if with were to move it would the project site it would use the Pavilion area and the parking area on the project site and would be expected to have the same seasonal and hourly operations as at the Plaza location. These are:

- Mid-May through late October, 9:00 a.m. – 12:30 p.m. Setup typically starts at approximately 8:00 a.m. and takedown is typically completed by approximately 1:30 p.m.
- Approximately 20 vendors
- Attendance estimated at 500 people per week

Currently, the Market operates on Saturday mornings in the area commonly referred to as "West Plaza Parking Lot" located across North Street from the project site. Relocating the Market to the project site would require use of the Pavilion area, the project site parking area, and the closure of North Street to accommodate the current number of vendors and allow some capacity to grow the market. With relocation to the project site the expected seasonal and hourly operations of the Saturday Market would be:

- Mid-April through mid-December, 8:30 a.m. -12:00 p.m. with setup starting at approximately 7:00 a.m. and takedown completed by approximately 1:30 p.m.
- Approximately 46 vendors
- Attendance estimated at 1,000 people per week
- The North Street closure would occur each Saturday morning at approximately 7:00 a.m. and reopen at approximately 1:30 p.m.
- Market season and hours of operation are anticipated to remain the same, but a smaller market could continue during the rainy winter months under the pavilion area.

As discussed above we expect that the Farmers' Market activities on the project site would produce L_{01} levels of between 61 to 62 dBA, L_{10} levels of 59 dBA, and L_{eq} levels of between 56 to 57 dBA at 75 feet from the perimeter of the Market. At 50 feet form the Market perimeter these levels would be an L_{10} of 62 dBA and an L_{eq} of 60 dBA

Community Events and Private Rentals

The project site is anticipated to serve as location for community events that would complement other event venues in Healdsburg. While some events may relocate from existing facilities, other events may be developed specific for the project site. In general, community events would be sponsored by the City or co-sponsored by the City and local nonprofit or civic organizations.

Private rentals of the facility would be secondary to community events and likely be limited in quantity so as not to deter from the community-focused aspect of the project. Examples of the expected types of community events and private rentals from the project description are shown in Table 4.

TABLE 4 Examples of Possible Community Events & Private Rentals at the Project Site

Event Examples	Time of Year	Duration	Use Areas
Music Series	Year-Round	1 to 2 hours: periodic days during the week & weekends	Pavilion
Concerts	Year-Round	1 to 2 hours: usually weekends	Pavilion, Parking Area
Local Theatrical Performances	Spring-Fall	Weekend evenings: usually three weeks	Pavilion
Holiday Market	December	Weekends	Pavilion, Parking Area
Ice Skating Rink	December	Daily	Pavilion, Parking Area
Art After Dark Events	June to August	1 day, typically the last Friday of the month	Pavilion, Parking Area
Non-Profit Fundraiser Events (Dinners, Auctions, etc.)	Spring-Fall	4 to 6 hours	Pavilion
Car Shows	Year-Round	4 to 6 hours	Pavilion, Parking Area
Weddings	Year-Round	6 to 8 hours	Pavilion
Dia de Muertos Festival	October	1 day, typically the last Sunday in October	Pavilion, Parking Area, North Street

PROJECT GENERATED NOISE AT ADJACENT USES

Sound source types for the above event categories are expected to include Amplified Music and Speech, Non-amplified (acoustic) Music, and various numbers of event participants in raised conversation. Table 5 lists typical noise levels at distances of 50 feet from the source which may be generated at the event types listed in Table 4, and as discussed above at the Farmers' Market

Table 5: Typical Noise Source Levels for Events (A-Weighted L_{eq} & L_{10} Levels)

Event or Activity	Typical Noise Levels @ 50 ft.	
	(L_{eq}, dBA)	(L_{10}, dBA)
Large Concert type Amplified Music Performances[1]	103	106
Small Concert type Amplified Music Performances[2]	85	89
Non-Concert type Amplified Music Performances[3]	72	74
Amplified Speech	70	72
Acoustic (Non-amplified) Music Performances[3]	67	70
50 Guests in Raised Conversation with Background Music	58	60
100 Guests in Raised Conversation with Background Music	61	63
200 Guests in Raised Conversation with Background Music	66	68
Farmers' Market Activities[4]	60	62

[1] This is typical of large (touring type) amplified music performances with an large (hundreds to 1000+ person) audience an elevated stage structure and high-powered sound system with arrayed speakers,

[2] This would typically involve the performance of a smaller (likely local) amplified band without an extensive sound system or speaker arrays and a smaller (up to a few hundred person) audience.

[3] This type of amplified or non-amplified music involves a band which is not the focal point of the event and is performing in the background of the primary event at a lower level to encourage conversation.

[4] Farmers' Market activities are assumed to have small groups of musicians playing with amplified instruments at low to moderate sound levels.

To estimate the project generated noise levels at adjacent uses, the propagation of sound to potential noise sensitive receptors needs to be assessed. To do this, it is necessary to assume some rate of sound attenuation between the operations and receiver locations. The most dominant physical effect is due to the spreading out of sound waves with distance. Depending on ground absorption conditions noise fixed project source can be considered to attenuate at a rate of 6 to 7.5 dB per doubling of distance from the source. Considering the largely paved and urban nature of the site and surroundings, a distance attenuation rate of 6 dB per distance doubling for project noise sources are used in this analysis. Other effects can modify these fall-off rates such as partial shielding from buildings or topography, atmospheric attenuation of sound, and meteorological effects. These effects almost always reduce the noise in addition to that due to sound divergence. As most of these effects will vary with time due to changing environmental conditions, it is most conservative to assume only attenuation due to divergence for outdoor activities, realizing that the actual noise level will be at or, most likely, below those predicted using these assumptions at any one time.

Considering these attenuation factors, a review of the above use descriptions and the project plans, along with distances for the center of identified project use areas to adjacent (non-project) use areas and assumed worst case noise sources, we have calculated the expected sound levels for each of the event types in Table 5 on the project perimeters. The results of these calculations are shown in Table 6, following.

SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines states that a project would normally be considered to result in significant noise impacts if noise levels conflict with adopted environmental standards or plans or if noise generated by the project would substantially increase existing noise levels at sensitive receivers over a permanent or temporary basis. A significant impact would be identified for a proposed land use if it would be exposed to noise levels exceeding established guidelines or standards for noise and land use compatibility. Considering the existing and projected future noise in the site vicinity, a substantial permanent noise increase would occur if noise resulting from the project would result in an increase in the L_{dn} level at noise sensitive land uses in the site vicinity of by 5 dBA or greater. A substantial noise increase would also be considered to occur where non-exempt events on the site exceed the City's municipal code noise standards. Additionally, a substantial temporary noise level increase would occur where noise from construction activities exceeds 60 dBA L_{eq} and the ambient noise environment by at least 5 dBA L_{eq} at adjacent land uses in the project vicinity for a period of one year or more. Vibration levels generated during demolition or construction activities would be significant if they cause cosmetic or structural damage to adjacent buildings.

TABLE 6 Project Event Levels at Surrounding Uses (L_{eq} : L_{10}) , dBA

Event type	Identified Use Areas	Possible Noise Sources	North: Du Champ Hotel	East: Residential & Restaurant	West: City Admin. Center	Southwest: Park & Businesses
Music Series	Pavilion	Small Amplified Concert	**77 : 81**	**69 : 73**	**71 : 75**	**68 : 72**
		Non-Amplified Acoustic Performances	**59 : 63**	51: 55	53 : **57**	50 : 54
Concerts	Pavilion	Large Amplified Concert	**95 : 98**	**81 : 84**	**83 : 86**	**80 : 83**
		Small Amplified Concert	**77: 81**	**69 : 73**	**71 : 75**	**68 : 72**
	Parking Area	Large Amplified Concert	**105 : 108**	**87 : 90**	**79 : 82**	**77 : 80**
		Small Amplified Concert	**87 : 91**	**75 : 79**	**67 : 71**	**65** : **69**
Local Theatrical Performances	Pavilion	Non-Amplified Acoustic Performances	**59 : 63**	51: **55**	53 : **57**	50 : 54
		Amplified Speech	**62 : 64**	54 : **56**	**56 : 58**	53 : **55**
Holiday Market	Pavilion	200 Guests w/ Bkg. Music	**59 : 61**	51 : 53	53 : **55**	50 : 52
	Parking Area	200 Guests w/ Bkg. Music	**69 : 71**	**57 : 59**	49 : 51	47 : 49
Ice Skating Rink	Pavilion	100 Guests w/ Bkg. Music	53 : **55**	45 : 47	47 : 49	44 : 46
	Parking Area	100 Guests w/ Bkg. Music	**63 : 65**	51 : 53	43 : 45	41 : 43
Art After Dark Events	Pavilion	100 Guests w/ Bkg. Music	53 : **55**	45 : 47	47 : 49	44 : 46
	Parking Area	100 Guests w/ Bkg. Music	**63 : 65**	51 : 53	43 : 45	41 : 43
Non-Profit Fundraiser Events	Pavilion	Amplified Speech	**62 : 64**	54 :**56**	**56 : 58**	53 : **55**
		200 Guests w/ Bkg. Music	**59 : 61**	51 : 53	53 : 55	50 : 52
Car Shows	Pavilion	200 Guests w/ Bkg. Music	**59 : 61**	51 : 53	53 : 55	50 : 52
		Amplified Speech	**62 : 64**	54 :56	**56 : 58**	53 : 55
	Parking Area	200 Guests w/ Bkg. Music	**69 : 71**	**57 : 59**	49 : 51	47 : 49
		Amplified Speech	**72 : 74**	**60 : 62**	52 : 54	50 : 52
Weddings	Pavilion	Non-concert Amplified Music	**64 : 66**	**56 : 58**	**58 : 60**	55 : **57**
		Amplified Speech	**62 : 64**	54 :**56**	**56 : 58**	53 : 55
		200 Guests w/ Bkg. Music	**59 : 61**	51 : 53	53 : 55	50 : 52
Dia de Muertos Festival	Pavilion	Non-concert Amplified Music	**64** : **66**	**56 : 58**	**58 : 60**	55 : **57**
		Amplified Speech	**62 : 64**	54 :56	**56 : 58**	53 : 55
		100 Guests w/ Bkg. Music	53 : 55	45 : 47	47 : 49	44 : 46
	Parking Area	Amplified Speech	**72 : 74**	**60 : 62**	52 : 54	50 : 52
		100 Guests w/ Bkg. Music	**63 : 65**	51 : 53	43 : 45	41 : 43
	North Street	100 Guests w/ Bkg. Music	44 : 46	47 : 49	43 : 54	42 : 44
Farmers' Market	Pavilion	Farmers' Market Activities	52 : 54	44 : 46	46 : 48	43 : 45
	Parking Area	Farmers' Market Activities	**62 : 64**	50 : 52	42 : 44	40 : 42
	North Street	Farmers' Market Activities	43 : 45	46 : 48	42 : 44	41 : 43

NOISE IMPACTS AND MITIGATION MEASURES

Impact 1: **Noise and Land Use Compatibility.** The proposed community and private events on the project site and pavilion would be exposed to exterior noise levels considered normally acceptable for this use by the City of Healdsburg General Plan without the use of noise mitigation. **This is a less than significant impact.**

Based on the results of our noise measurement survey the project site is exposed environmental noise levels of less than 60 dBA L_{dn}. The Healdsburg General Plan Current considers all land uses exposed to levels of less than 60 dBA L_{dn} to be normally acceptable of any type of development, therefore the proposed development is also considered normally acceptable for development.

Mitigation Measure 1: None Required

Impact 2: **Project Operational Noise Generation** Noise produced by the events proposed on the project site may exceed the Sound Level Standards contained in Section 9.32.080 of the City of Healdsburg Municipal code and may significantly increase or alter the existing noise environment at adjacent noise sensitive uses. **This is a potentially significant impact.**

Non-exempt events[2] which exceed an L_{10} level of 65 dBA during the daytime hours or 55 dBA during the nighttime hours at either the northern property line shared with the Hotel Du Champ or western property line shared with the residence at 4101 Foss Street and events which exceed 65 dBA during the daytime hours (7:00 am to 8:00 pm) or 55 dBA during the nighttime hours (8:00 pm to 7:00 am) at the property lines of the commercial uses to the south or west of the site would exceed the City of Healdsburg Municipal code limits.

Generally, events with amplified music will, or have the potential, to produce sound levels which exceed the daytime L_{10} limit of 65 dBA at the properties adjacent to the project site. The noise levels and their locations for various events where this may occur are entered in **bold red** in Table 6. Many other event activities have the potential to exceed the nighttime L_{10} limit of 55 dBA at the properties adjacent to the project site. The noise levels and their locations for various events where this may occur are entered in **bold black** in Table 6.

Mitigation Measure 2: Permit Requirement for Amplified Sound and Large Events.

All events which occur during the nighttime hours (between 8:00 pm and 7:00 am), and any of the following daytime events should be required to obtain a permit from the City:

1. Any daytime concert with amplified music (large or small),
2. Any daytime event with non-concert type live amplified music performance[3],
3. Any daytime event in the parking area with more than 100 persons in concurrent attendance,
4. Any daytime event held in the parking lot with amplified speech.

[2] Non-exempt events are those conducted without a permit or license issued by the City relative to the staging of the event.

[3] This does not include amplified music where this music is performed by a few musicians (not a full band), is background in nature, and is not a featured part of the event, such as the amplified music performed by musicians at the Farmers' Market. As discussed above, this type of music is amplified to lower sound levels and is generally self-regulating.

The City's Municipal Code does not outline what is required to obtain an event permit, however, to reduce project generated noise levels to the greatest extent feasible and reasonable, the following measures are recommended to obtain an event permit:

1. Events with amplified music performances should be held in the event pavilion or 75 feet or more from the northern property line in the parking area. Additionally temporary sound absorptive noise barrier walls with a minimum height of 10 feet above the performance stage level should be installed on the western and eastern side of the stage when held in the Pavilion and or on the northern, western, and eastern side of the stage when held in the Parking area. Example barrier placements are shown in Figure 3. These temporary barriers should be installed without gaps in the face and have a minimum surface weight of 2.0 lb. per sq. ft. Acceptable temporary barriers include Environmental Noise Control[4] STC-27 Acoustical Barrier/Absorber Blankets, or acoustical equivalent. This type of barrier may be set up on a supporting structure, such as an existing fence or on guywires strung between temporary supports but the full 10-foot height should be maintained. Temporary acoustical barriers are typically available for rental (monthly or seasonally) or for purchase. With the use of a guy-wire type structure the wall area may also be demounted for deliveries and access, however, to be effective it should be fully installed during amplified music events.
2. All speakers used for amplified music or speech should be directed away from the northern property line and be positioned so as not to directly face the western and eastern property lines to reduce the degree of sound escaping the audience area.
3. All events planned with more than 100 persons in concurrent attendance should be limited to the pavilion and the southern half of the parking area to avoid noise impacts to the uses to the north and northeast of the project site.

[4] Environmental Noise Control Phone - (707) 252-9019; Web: www.environmental-noise-control.com

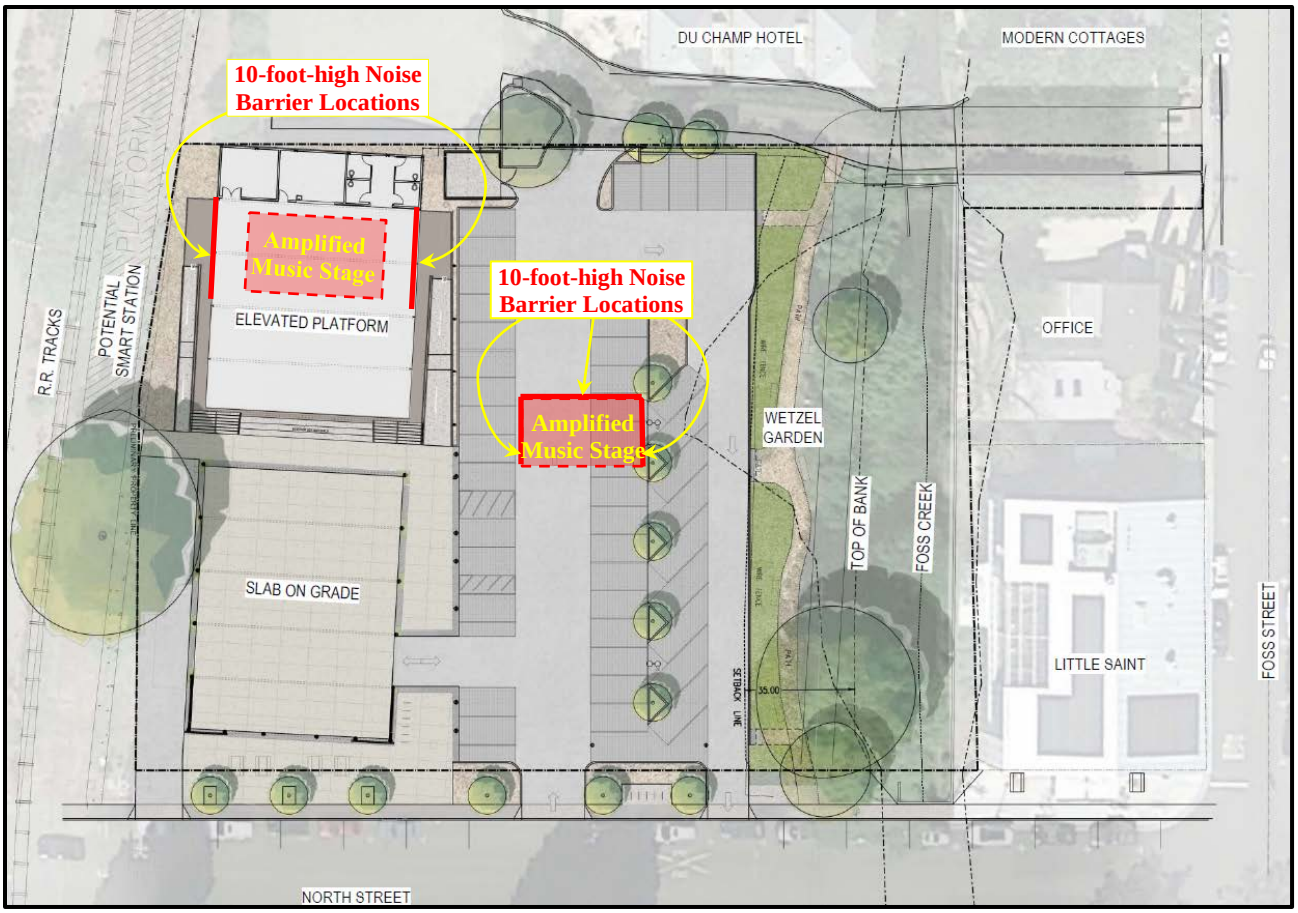


Figure 3: Example placement of noise barrier walls for Amplified Music Performances

Impact 3: **Exposure to Construction Generated Groundborne Vibration.** Residences and businesses in the vicinity of the project site are not expected to be exposed to perceptible vibration levels from construction activities. **This is a less-than-significant impact.**

Construction activities are expected to include site preparation work such as demolition, grading and the installation of utilities, foundation work, and new building framing. Construction techniques that generate the highest vibration levels, such as impact or vibratory pile driving, are not expected at this project. Construction activities would generally occur at distances of 70 feet or more from the nearest existing structures.

For structural damage, the California Department of Transportation uses a vibration limit of 0.5 in/sec, PPV for buildings structurally sound and designed to modern engineering standards and 0.2 in/sec, PPV for buildings that are found to be structurally sound but where structural damage is a major concern.

Project construction activities such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may generate substantial vibration in the immediate vicinity. Building framing, exterior and interior finishing, and landscaping activities are not anticipated to be sources of substantial vibration. Construction activities are expected to conclude within one construction season, with substantial construction vibration only occurring during limited periods. Table 7 presents vibration source levels for typical construction equipment at a distance of 25 feet. Jackhammers typically generate vibration levels of 0.035 in/sec PPV, drilling typically generates vibration levels of 0.09 in/sec PPV, and

vibratory rollers generate vibration levels of 0.21 in/sec PPV at a distance of 25 feet. Vibration levels would vary depending on soil conditions, construction methods, and equipment used. At distances of 70 feet or greater, construction activities would be well below the 0.50 in/sec PPV damage criteria.

In areas where vibration would not be expected to cause structural damage, vibration levels may still be perceptible. However, as with any type of construction, this would be anticipated, and it would not be considered significant given the intermittent and short duration of the phases that have the highest potential of producing vibration (jackhammers and vibratory rollers). By use of administrative controls such as notifying adjacent land uses of scheduled construction activities and scheduling construction activities with the highest potential to produce perceptible vibration to hours with least potential to affect nearby uses, perceptible vibration can be kept to a minimum and as such would not result in a significant impact with respect to perception.

TABLE 7 Vibration Source Levels for Construction Equipment[5]

Equipment	PPV at 25 ft. (in/sec)
Clam shovel drop	0.202
Vibratory Roller	0.210
Hoe Ram	0.089
Large bulldozer	0.089
Caisson drilling	0.089
Loaded trucks	0.076
Jackhammer	0.035
Small bulldozer	0.003

Mitigation 3: None Required

Impact 4: **Construction Noise.** Noise levels generated by project construction activities would temporarily elevate ambient noise levels at sensitive land uses in the vicinity. Major noise generating construction activities would be limited to less than one construction season or less. **This is a less-than-significant impact.**

The construction of the project would generate noise and would temporarily increase noise levels at adjacent residential receivers. Noise impacts resulting from construction depend on the noise generated by various pieces of construction equipment operating on site, the timing and duration of noise generating activities, and the distance between construction noise sources and noise sensitive receptors. Construction of the project would involve site improvements, such as the establishment of utilities, excavation of foundations, building erection, paving, and landscaping. The hauling of excavated material and construction materials would also generate truck trips on local roadways. Construction activities are typically carried out in stages. During each stage of construction, there would be a different mix of equipment operating. Construction noise levels would vary by stage and vary within stages based on the amount of equipment in operation and location where the equipment is operating. Typical construction noise levels at a distance of 50 feet are shown in Table 6, which gives the average noise level ranges by construction phase. Most demolition and construction noise is in the range of 80 to 90 dBA at a distance of 50 feet from the source.

The nearest noise sensitive uses will be 70 feet from the closest significant project construction activities. Average noise levels at this distance of typical construction activity at this site could reach 85 dBA during busy construction periods. These noise levels drop off at a rate of about 6 dBA per doubling of distance between the noise source and receptor. The adjacent uses would therefore be intermittently exposed to high levels of noise during periods of nearby construction. Typically,

[5] Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, May 2006.

significant noise impacts do not result when standard construction noise control measures are enforced at the project site and when the duration of the noise generating construction period is limited to one construction season (typically one year) or less. Noise generated by major construction activities is not expected to result in noise levels exceeding 60 dBA L_{eq} and the ambient noise environment by 5 dBA L_{eq} for a period of greater than one year.

TABLE 6: Typical Ranges of L_{eq} Construction Noise Levels at 50 Feet, dBA

Construction Stage	Domestic Housing		Office Building, Hotel, Hospital, School, Public Works		Public Works Roads & Highways, Sewers, and Trenches	
	I	II	I	II	I	II
Ground Clearing	83	83	84	84	84	84
Excavation	88	75	89	79	88	78
Foundations	81	81	78	78	88	88
Erection	81	65	87	75	79	78
Finishing	88	72	89	75	84	84
I - All pertinent equipment present at site, **II** - Minimum required equipment present at site.						

Source: U.S.E.P.A., Legal Compilation on Noise, Vol. 1, p. 2-104, 1973.

The following standard controls are assumed to be included in the project:

- Equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Locate stationary noise generating equipment (e.g., compressors) as far as possible from adjacent residential receivers.
- Acoustically shield stationary equipment located near residential receivers with temporary noise barriers.
- Utilize "quiet" air compressors and other stationary noise sources where technology exists.
- Designate a "disturbance coordinator" responsible for responding to any complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., bad muffler, etc.) and will require that reasonable measures be implemented to correct the problem.

With the implementation of these controls, and the limited duration of the noise generating construction period, the substantial temporary increase in ambient noise levels associated with construction activities would be less-than-significant.

Mitigation Measure 4: No additional measures required.