CERTIFIED FINAL
ENVIRONMENTAL IMPACT REPORT

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SANTA BARBARA COTTAGE HOSPITAL
SEISMIC COMPLIANCE AND MODERNIZATION PLAN

Volume III

City of Santa Barbara
Community Development Department

March 24, 2005

CERTIFIED FINAL
ENVIRONMENTAL IMPACT REPORT

VOLUME III—APPENDICES

SANTA BARBARA COTTAGE HOSPITAL

SEISMIC COMPLIANCE AND MODERNIZATION PLAN

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SANTA BARBARA COTTAGE HOSPITAL SEISMIC COMPLIANCE AND MODERNIZATION PLAN

LSA

March 2005

NOISE AND VIBRATION ANALYSIS

SANTA BARBARA COTTAGE HOSPITAL SEISMIC COMPLIANCE AND MODERNIZATION PLAN

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INTRODUCTION

This section addresses potential impacts related to noise and vibration as a result of the proposed project. Documents reviewed and incorporated as part of this analysis include *The Santa Barbara Cottage Hospital Seismic and Modernization Plan Acoustical Analysis Report* (Acoustical Analysis Associates Inc. [AAAI] 2003; *Proposed Helicopter Operations* (AAAI 1999); *Proposed Helicopter Operations Addendum Report* (AAAI 2003); *Santa Barbara Cottage Hospital EIR, Mechanical Equipment Noise* (Martin Newson & Associates, LLC [MNA] 2002); *Response to Development Application Review Team (DART) Comments, Vibration Effects During Construction* [Fugro West, Inc. 2003]); *and Noise and Vibration Analysis* (LSA Associates, Inc. [LSA] 2004). The LSA Noise and Vibration Analysis is contained in Appendix H. The LSA report also provides the fundamentals of noise and groundborne vibration and the effects of noise and vibration exposure.

PROJECT DESCRIPTION

The Project Applicant, the Santa Barbara Cottage Hospital (SBCH), has submitted an application requesting City approval of the proposed SBCH Modernization and Seismic Compliance Plan (or proposed project). In 1994, the State passed Senate Bill (SB) 1953, intended to ensure that all licensed acute care hospitals are compliant with the Alfred E. Alquist Hospital Facilities Seismic Safety Act (HSSA) by January 1, 2030, in order to be reasonably capable of providing services to the public after a major seismic event. By January 1, 2008, SBCH is required to use all buildings that pose potential risk of collapse for non-acute care only. This deadline can be extended to 2013 if a hospital chooses to comply with the new standards by rebuilding its facility, as is being requested by SBCH. By January 1, 2030, SBCH is required to have all hospital buildings not in substantial compliance with the standards demolished, replaced, or changed to non-hospital use. The proposed project includes the following components: demolition of approximately 270,000 square feet of existing hospital structures; construction of approximately 438,500 square feet of new hospital structure housing acute care ambulatory and ancillary support services; construction of a helipad, two parking structures, and a three-structure day-care complex; and the closure of Castillo Street between Pueblo and Junipero Streets.

Figure 1 illustrates the regional location of the proposed reconstruction of Santa Barbara Cottage Hospital. The project site is located on Pueblo Street east of U.S. 101 in the City of Santa Barbara.

Figure 2 illustrates the project site plan. The proposed reconstruction of Santa Barbara Cottage Hospital includes reconstruction of the hospital facility for seismic compliance and modernization purposes, a new central plant building, two parking structures, a child care center, and a helipad.

METHODOLOGY RELATED TO NOISE AND VIBRATION IMPACT ASSESSMENT

To identify impacts from each noise and vibration source, the various sources were discussed separately. The following methodologies was used to evaluate noise and vibration impacts.

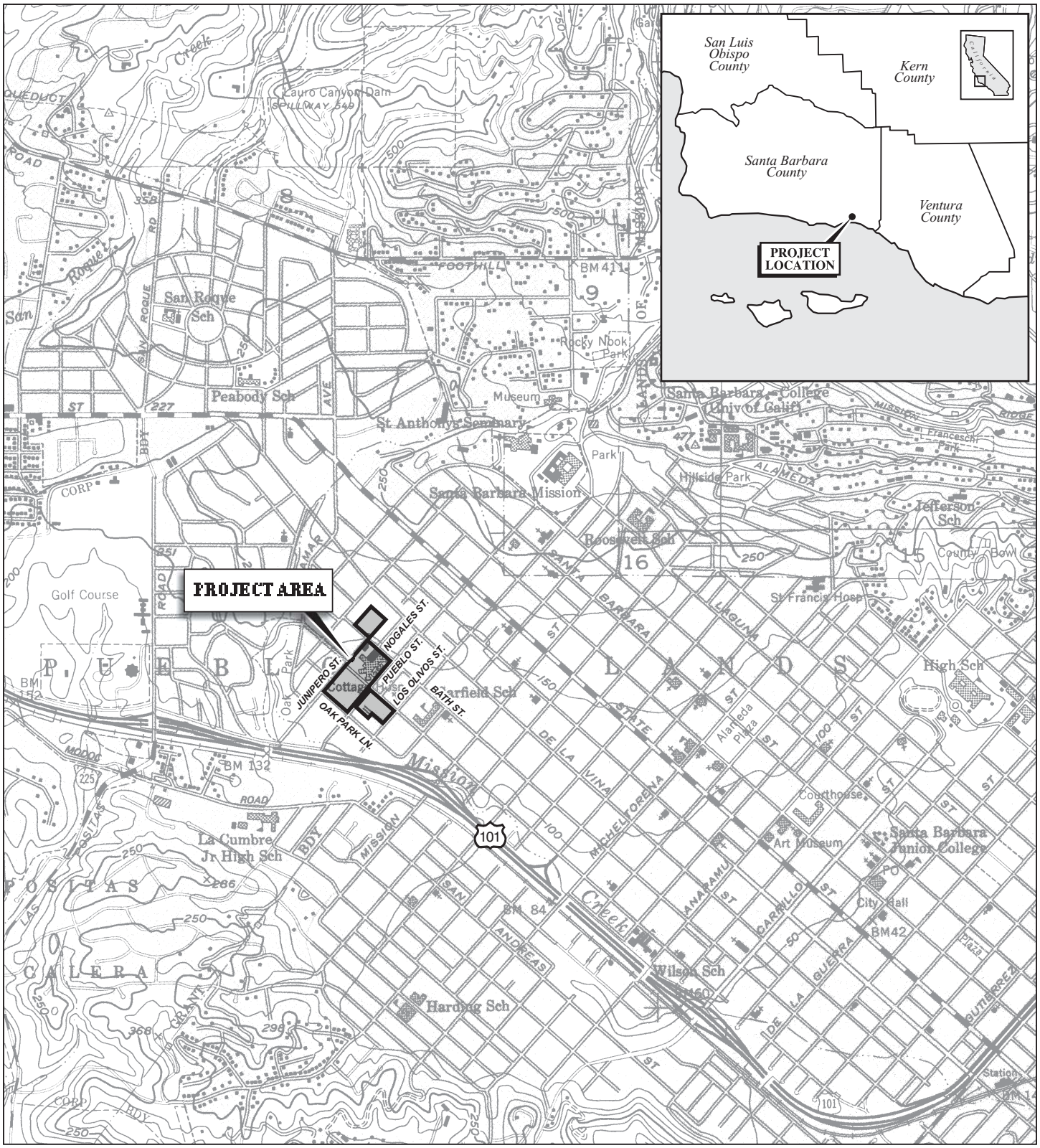

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FIGURE 1

Santa Barbara Cottage Hospital
Seismic Compliance and Modernization Plan
Project Location

SOURCE: USGS 7.5' Quad - Santa Barbara, Ca

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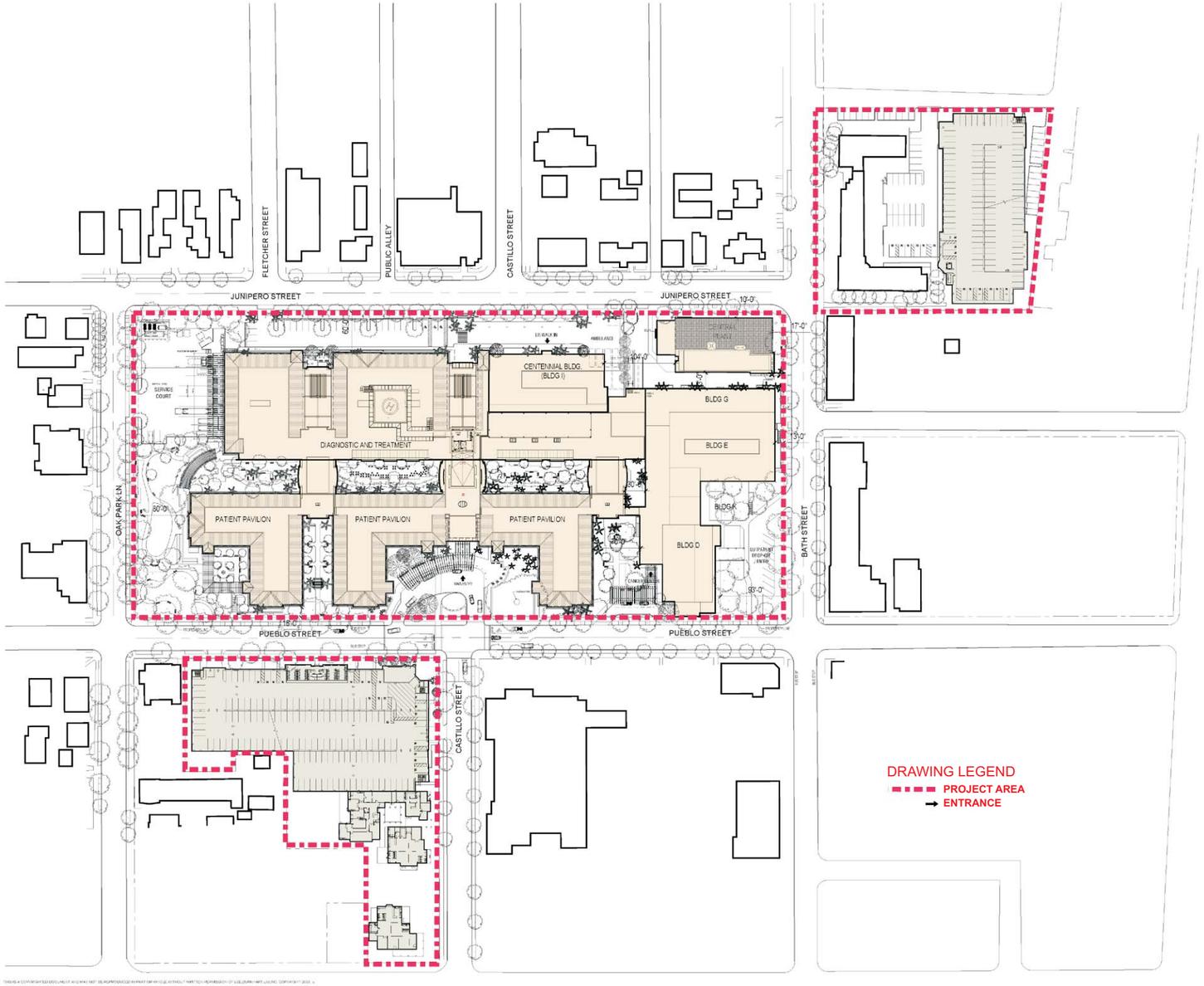

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FIGURE 2

N

0 100 200

SOURCE: Lee, Burkhart, Liu, April 2004

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Santa Barbara Cottage Hospital
Seismic Compliance and Modernization Plan
Proposed Site Plan

Ambient Noise Measurement Methodology

Ambient noise levels were measured to document the existing noise environment in the project area using the Larson Davis Model 824 Type 1 noise meter (Serial No. 1612). The following measurement procedures were utilized:

1. Calibrate sound level meter
2. Set up sound level meter at a height of 1.5 m (5 ft)
3. Commence noise monitoring
4. Collect site-specific data such as date, time, direction of traffic, and distance from sound level meter to the right-of-way
5. Stop measurement after 10 minutes
6. Calibrate sound level meter
7. Proceed to next monitoring site and repeat

Traffic Noise Modeling Methodology

Traffic-related noise for the existing and future conditions was modeled using the Federal Highway Administration (FHWA) highway traffic noise prediction model (FHWA RD-77-108). The noise model requires various parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry, to compute typical equivalent noise levels during daytime, evening, and nighttime hours. Traffic volumes used in the analysis were based on the traffic study prepared by LSA (June 2004). The resultant noise levels are weighted and summed over 24-hour periods to determine the L_{dn} values.

Helicopter Noise Methodology

Helicopter noise related to the proposed hospital rooftop helipad was evaluated using helicopter noise levels provided by Acoustical Analysis Associates, Inc. (AAAI). These noise levels were calculated at sensitive land use locations and were compared to the City's noise standards and maximum allowable noise levels established by the State's modeled community noise control ordinance. To evaluate helicopter noise levels against the City's noise standard, 24-hour day-night noise levels were calculated for more than one event during the nighttime hours. Maximum noise levels obtained from noise level measurements conducted by AAAI were used to evaluate helicopter noise levels against the maximum allowable noise levels.

Construction Noise Evaluation Methodology

Construction-related noise was evaluated using typical maximum noise generated by construction equipment provided by the Noise Control for Building and Manufacturing Plants (Bolt, Beranek and Newman, 1987). These noise levels were calculated at sensitive land use locations and were compared to the maximum allowable noise levels established by the State's Model Community Noise Ordinance because the City of Santa Barbara does not have any regulations related to construction

noise. Maximum allowable noise levels were used in predicting community annoyance. Typical construction equipment for grading and construction includes dozers, front-end loaders, graders, pile drivers, pneumatic tools, haul trucks, etc. Assuming that each piece of construction equipment operates at some distance from the other equipment, the worst-case combined noise level at each individual residence would be 91 dBA L_{max} at a distance of 50 feet.[1] Noise levels were then calculated at the nearest sensitive land use locations as worst-case conditions.

Construction Vibration Evaluation Methodology

Construction-related vibration impacts were evaluated using typical levels of groundborne vibration. Based on the data in the FTA's Transit Noise and Vibration Impact Assessment, typical heavy-tracked construction equipment generates a worst-case vibration level lower than 95 VdB at a distance of 50 feet. The vibration levels were calculated at sensitive land use locations and were compared to the groundborne noise and vibration criteria established by the Federal Transit Administration (FTA) because the City of Santa Barbara does not have any regulations related to construction vibration. Vibration levels were also compared to vibration thresholds that would damage structures. The groundborne vibration and noise criteria were obtained from the FTA's *Transit Noise and Vibration Impact Assessment* (FTA, April 1995). Although the FTA's groundborne noise and vibration criteria are prepared for railroads, vibration thresholds were used to predict community annoyance from other sources. Vibration levels generated by construction equipment were also compared with the FTA's *Human Response to Different Levels of Groundborne Noise and Vibration* to predict community annoyance.

Stationary Noise Sources Evaluation Methodology

Stationary noise source impacts were evaluated using estimated noise levels generated by stationary noise sources. Noise levels were calculated at sensitive land uses and were compared to the City's noise standards and maximum allowable noise levels established by the State's modeled community noise ordinance. Stationary noise sources within the project area include activities inside parking facilities, the existing and proposed Central Plant building, Heating Ventilation Air Conditioning (HVAC) equipment, and truck loading and unloading activities.

Stationary Noise Sources from Parking Facilities. Noise generated at parking facilities was evaluated using data obtained from LSA's past experience with noise generated at parking facilities. These noise levels were projected to the nearby sensitive land use locations and compared to maximum allowable noise levels established by the state's modeled community noise ordinance. Activities inside a parking structure include tire squeals, door slams, car alarms and horns, and engine start-ups. The maximum instantaneous noise generated within parking lot facilities can reach 75 dBA L_{max} at a distance of 50 feet.

Stationary Noise Sources from the Central Plant Building. Noise generated by the hospital's Central Plant building was evaluated using typical mechanical equipment noise levels obtained from

[1] Noise levels are usually measured at 50 feet as a reference level.

the *Noise Control for Building and Manufacturing Plants* (Bolt, Beranek and Newman, 1987). These noise levels were calculated at sensitive land use locations and compared to the City's noise standards for mechanical equipment and maximum allowable noise levels established by the State's modeled community noise ordinance. The hospital's Central Plant Building includes cooling towers, boilers, and emergency generators. The combined sound pressure level (SPL) from the Central Plant Building is estimated to generate a noise level of 104 dBA L_{max} at a distance of one foot. As the equipment is housed inside a building, the building would provide a sound-level reduction of at least 24 dBA with no open windows (Protective Noise Levels, EPA 550/9-79-100, November 1978). The maximum noise levels were calculated to the nearest sensitive land use location to determine worst-case conditions. The maximum worst-case noise levels were also converted to the 24-hour CNEL level to compare with the noise standards for mechanical noise.

Heating Ventilation Air Conditioning (HVAC) Equipment. Noise generated by HVAC equipment was evaluated using typical maximum HVAC equipment noise levels. These noise levels were calculated at sensitive land use locations and compared to the City's noise standards for mechanical equipment and maximum allowable noise established by the State's modeled community noise ordinance. It is expected that HVAC equipment would be located on building rooftops. Rooftop building edges that act as noise barriers provide at least an 8 dBA noise reduction. Maximum noise levels were projected to the nearest sensitive land use location to determine worst-case conditions. The maximum worst-case noise levels were also converted to the 24-hour Community Noise Equivalent Level (CNEL) to compare with the City's noise standards for mechanical noise.

Truck Loading and Unloading Activities. Noise generated by truck loading and unloading activities was evaluated using typical noise generated by these activities based on data obtained from LSA's past experience with truck loading and unloading activities. These noise levels were projected to sensitive land use locations and compared to the maximum allowable noise levels established in the State's modeled community noise ordinance. Truck loading and unloading activities can generate up to 80 dBA L_{max} at a distance of 50 feet. Noise levels were calculated to the nearest sensitive land use to determine the worst-case conditions.

CHARACTERISTICS OF SOUND

Sound is increasing in the environment and can affect quality of life. Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect the ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a wave resulting in the tone's range from high to low. Loudness is the strength of a sound and describes a noisy or quiet environment; it is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves, combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be precisely measured with instruments. The analysis of a project defines the noise environment of the project area in terms of sound intensity and its effect on adjacent sensitive land uses.

MEASUREMENT OF SOUND

Sound intensity is measured through the A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Unlike linear units, such as inches or pounds, decibels are measured on a logarithmic scale representing points on a sharply rising curve.

For example, 10 decibels (dB) are 10 times more intense than one decibel, 20 decibels are 100 times more intense, and 30 decibels are 1,000 times more intense. Thirty decibels represent 1,000 times as much acoustic energy as one decibel. The decibel scale increases as the square of the change, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than zero decibels. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10-decibel increase in sound level is perceived by the human ear as only a doubling of the loudness of the sound. Ambient sounds generally range from 30 dBA (very quiet) to 100 dBA (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. For a single point source, sound levels decrease approximately six decibels for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source, such as highway traffic or railroad operations, the sound decreases three decibels for each doubling of distance in a hard site environment. Line source, noise in a relatively flat environment with absorptive vegetation, decreases four and one-half decibels for each doubling of distance.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq} and community noise equivalent level (CNEL) or the day-night average level (L_{dn}) based on A-weighted decibels (dBA). CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within one dBA of each other and are normally exchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours. The City of Santa Barbara uses the L_{dn} noise scale for long-term noise impact assessments.

Other noise rating scales of importance when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis are specified in terms of maximum levels denoted by L_{max} for short-term noise impacts. L_{max} reflects peak operating conditions and addresses the annoying aspects of intermittent noise.

Another noise scale often used together with the L_{max} in noise ordinances for enforcement purposes is noise standards in terms of percentile noise levels. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half the time the noise level exceeds this level, and half the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first is audible impacts, which refers to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3.0 dB or greater, since this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1.0 and 3.0 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category is changes in noise level of less than 1.0 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

PSYCHOLOGICAL AND PHYSIOLOGICAL EFFECTS OF NOISE

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions and thereby affecting blood pressure and functions of the heart and the nervous system. In comparison, extended periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. A sound level of 190 dBA will rupture the eardrum and permanently damage the inner ear.

The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying, less-developed areas.

Table A lists “Definitions of Acoustical Terms,” and Table B shows “Common Sound Levels and Their Sources.”

FUNDAMENTALS OF GROUNDBORNE VIBRATION

Vibration refers to groundborne noise and perceptible motion. Groundborne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors, where the motion may be discernable, but without the effects associated with the shaking of a building there is less adverse reaction. Vibration energy propagates from a source through intervening soil and rock layers to the foundations of nearby buildings. The vibration then propagates from the foundation throughout the remainder of the structure. Building vibration may be perceived by the occupants as motion of building surfaces, rattling of items on shelves or hanging on walls, or as a low-frequency rumbling noise. The rumbling noise is caused by the vibrating walls, floors, and ceilings radiating sound waves. Building damage is not a factor for normal projects, with the occasional exception of

Table A: Definitions of Acoustical Terms

Term	Definition
Decibel, dB	A unit of level that denotes the ratio between two quantities proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. 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. All sound levels in this report are A-weighted, unless reported otherwise.
L_{02}, L_{08}, L_{50}, L_{90}	The fast A-weighted noise levels equaled or exceeded by a fluctuating sound level at 2 percent, 8 percent, 50 percent, and 90 percent of a stated time period.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 decibels to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 decibels to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 decibels to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant.
Intrusive	The noise that 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 Measurement and Noise Control, 1991.

Table B: Common Sound Levels and Their Noise Sources

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle at a Few Feet Away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	
Near Freeway Auto Traffic	70	Moderately Loud	Reference Level
Average Office	60	Quiet	½ as loud
Suburban Street	55	Quiet	
Light Traffic; Soft Radio Music in Apartment	50	Quiet	¼ as loud
Large Transformer	45	Quiet	
Average Residence without Stereo Playing	40	Faint	⅛ as loud
Soft Whisper	30	Faint	
Rustling Leaves	20	Very Faint	
Human Breathing	10	Very Faint	Threshold of Hearing
	0	Very Faint	

Source: Compiled by LSA Associates, Inc., 2004.

blasting and pile driving during construction. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by up to 10 decibels. This is an order of magnitude below the damage threshold for normal buildings.

Typical sources of groundborne vibration are construction activities (e.g., blasting, pile driving, and operating heavy-duty earthmoving equipment), steel-wheeled trains, and occasional traffic on rough roads. Problems with groundborne vibration and noise from these sources are usually localized to within about 100 feet of the vibration source, although there are examples of groundborne vibration causing interference out to distances greater than 200 feet, as described in the Federal Transit Administration Transit Noise and Vibration Impact Assessment (FTA April 1995). When roadways are smooth, vibration from traffic, even heavy trucks, is rarely perceptible. It is assumed for this project that the roadway surface will be smooth enough that groundborne vibration from street traffic will not exceed the impact criteria; however, construction of the proposed project could result in groundborne vibration that could be perceptible and annoying. Groundborne noise is not likely to be a problem because noise arriving via the normal airborne path usually will be greater than groundborne noise.

Groundborne vibration has the potential to disturb people as well as to damage buildings. Although it is rare for traffic-induced groundborne vibration to cause even cosmetic building damage, it is not uncommon for construction processes such as blasting and pile driving to cause vibration of sufficient amplitude to damage nearby buildings (FTA 1995). Groundborne vibration is usually measured in terms of vibration velocity, either the root-mean-square (rms) velocity or peak particle velocity (PPV). The rms velocity is best for characterizing human response to building vibration, and PPV is used to characterize potential for damage. Decibel notation acts to compress the range of numbers required to describe vibration. Vibration velocity level in decibels is defined as:

$$L_v = 20 \log_{10} [V/V_{ref}]$$

where "L_v" is the velocity in decibels (VdB), "V" is the rms velocity amplitude, and "V_{ref}" is the reference velocity amplitude, or $1x10^{-6}$ inches/second used in the United States.

Factors that influence groundborne vibration and noise include the following:

- Vibration Source: Vehicle suspension, wheel types and condition, track/roadway surface, track support system, speed, transit structure, and depth of vibration source;
- Vibration Path: Soil type, rock layers, soil layering, depth to water table, and frost depth; and
- Vibration Receiver: Foundation type, building construction, and acoustical absorption.

Among the factors listed above, there are significant differences in the vibration characteristics when the source is underground compared to at the ground surface. In addition, soil conditions are known to have a strong influence on the levels of groundborne vibration. Among the most important factors are the stiffness and internal damping of the soil and the depth to bedrock. Vibration propagation is more efficient in stiff clay soils than in loose sandy soils, and shallow rock seems to concentrate the vibration energy close to the surface and can result in groundborne vibration problems at large distance from the track. Factors such as layering of the soil and depth to water table can have significant effects on the propagation of groundborne vibration. Soft, loose, sandy soils tend to

attenuate more vibration energy than hard, rocky materials. Vibration propagation through groundwater is more efficient than through sandy soils.

SETTING

Project Site Conditions

Existing Parking Structure Noise. The existing parking structure is located on the northeast corner of Pueblo Street and Oak Park Lane. Typical noise generated from the parking structure includes tire squeals, door slams, car alarms and horns, and engine startups. Maximum instantaneous noise generated by a parking structure can range from 65 dBA L_{max} to 75 dBA L_{max} at 50 feet. Noise from typical parking structure activities such as car alarms can reach up to 66 dBA L_{max} at 50 feet; door slams up to 72 dBA L_{max} at 50 feet; vehicle tire squeals up to 72 dBA L_{max} at 50 feet; vehicle start-ups up to 73 dBA L_{max} at 50 feet; and vehicle pass-bys up to 75 dBA L_{max}. These noise levels generated by parking structure activities do not exceed the daytime maximum of 75 dBA L_{max}; however parking structure activity noise currently exceeds the nighttime allowable maximum noise of 70 dBA L_{max} at sensitive land uses along Oak Park Lane and Junipero Street without any shielding or obstructions.

The hourly L_{eq} of typical parking structure noise during daytime hours is measured to be 45 dBA L_{eq} at 50 feet. This noise level, when converted to the 24-hour weighted average of L_{dn}, is 52 dBA L_{dn} at 50 feet, without factoring other noise sources in the neighborhood that may generate noise levels near or higher than noise level. This average noise level from the parking structure activities is below the City's noise standard of 60 dBA L_{dn} at sensitive land use locations nearest to the parking structure.

Existing On-Site Sensitive Land Uses. The existing hospital, infant care facility, day care facility, and the hospital outdoor active use areas are the existing on-site sensitive land uses. The infant care facility is located on the southeast corner of Oak Park Lane and Junipero Street. The daycare facility and park are located on the northwest corner of Castillo Street and Pueblo Street. Noise measurements were conducted at two locations by LSA to document the ambient noise levels at these on-site sensitive land uses on March 8, 2004. The noise measurements were performed using a Larson Davis Model 824 Type 1 sound level meter. Table C contains the results of these measurements. Table D describes the physical location of the noise monitoring sites. In Tables C and D, on-site areas are represented by monitoring locations M-5 and M-6. Monitoring location M-5 (53.4 dBA L_{eq}) represents the existing infant care facility and monitoring location M-6 (59.1 dBA L_{eq}) represents the existing daycare and the park. Figure 3 depicts these monitoring locations.

Surrounding Conditions

Existing Off-Site Sensitive Land Uses. The existing off-site sensitive land uses include residences, medical office buildings, and Oak Park. The construction and operation of the proposed project would potentially impact these sensitive uses as discussed in this chapter.

Existing Ambient Noise Level. To document existing noise environment, LSA took ambient (10-minute) noise measurements on March 8, 2004, at seven locations in the project vicinity. Noise level measurements were performed using a Larson Davis Model 824 Type 1 sound level meter. Table C

Table C: Short-Term Ambient Noise Monitoring Results

Monitor #	Date	Start Time	Duration	dBA L_{eq}
M-1	3/8/2004	2:30 PM	10 minutes	57.3
M-2	3/8/2004	2:53 PM	10 minutes	57.0
M-3	3/8/2004	3:13 PM	10 minutes	60.9
M-4	3/8/2004	3:27 PM	10 minutes	58.9
M-5	3/8/2004	3:45 PM	10 minutes	53.4
M-6	3/8/2004	3:59 PM	10 minutes	59.1
M-7	3/8/2004	4:16 PM	10 minutes	50.6
M-8	3/8/2004	4:33 PM	10 minutes	60.2
M-9	3/8/2004	5:49 PM	10 minutes	49.3

Source: LSA Associates, Inc., March 2004.

Table D: Physical Location of Noise Level Measurements

Monitor #	Location Description	Noise Sources	Speed Limit	Traffic Count (10-minute)
M-1	Near multifamily residences located on the north side of the public alley and north of the Knapp Building and parking lot	Traffic traveling through the alley, vehicles starting, and some traffic on Bath Street	25 mph	Public Alley Autos = 6 Medium Trucks = 1 Heavy Trucks = 0
M-2	2410 Castillo Street. The single-family residence is located along Castillo Street north of Junipero Street.	Traffic on Castillo Street and Junipero Street. Traffic entering/ exiting the Outpatient Surgery Center	25 mph	Castillo Street Autos = 27 Medium Trucks = 1 Heavy Trucks = 0
M-3	508 A Junipero Street. The multifamily residence is located at the northwest corner of Fletcher Street and Junipero Street.	Traffic on Junipero Street and some aircraft noise	25 mph	Castillo Street Autos = 42 Medium Trucks = 2 Heavy Trucks = 0
M-4	524 Junipero Street. The multifamily residence is located along Junipero Street west of Oak Park Lane.	Traffic on Junipero Street	25 mph	Castillo Street Autos = 43 Medium Trucks = 0 Heavy Trucks = 0
M-5	2322 Oak Park Lane. The infant care facility is located on the east side of Oak Park Lane and south of Junipero Street.	Traffic on Oak Park Lane and some aircraft noise	25 mph	Oak Park Lane Autos = 7 Medium Trucks = 0 Heavy Trucks = 0
M-6	422 Pueblo Street and Public Park. The day care and public park are located on the north side of Pueblo Street east of Oak Park Lane.	Traffic on Pueblo Street and vehicles starting	25 mph	Pueblo Street Autos = 81 Medium Trucks = 1 Heavy Trucks = 0
M-7	2231 Oak Park Lane. The single-family residence is located on the west side of Oak Park Lane and south of Pueblo Street.	Traffic on Oak Park Lane and faint traffic on U.S. 101	25 mph	Oak Park Lane Autos = 20 Medium Trucks = 0 Heavy Trucks = 0
M-8	2211 Castillo Street. The single-family residence is located on the east side of Castillo Street between Pueblo Street and Los Olivos Street.	Traffic on Castillo Street	25 mph	Castillo Street Autos = 65 Medium Trucks = 2 Heavy Trucks = 0
M-9	Cul-de-sac of Parkway Drive. The single-family residence is located north of Los Olivos Street between Oak Park Lane and Castillo Street.	Some traffic on Los Olivos Street	25 mph	None

Source: LSA Associates, Inc., March 2004.

LSA

FIGURE 3

M-9 NOISE MONITOR LOCATION

N

0 150 300

SOURCE: Lee, Burkhart, Liu, April 2004

Santa Barbara Cottage Hospital
Seismic Compliance and Modernization Plan

Noise Monitoring Locations

1xCSB4300404noise_locs_8x11.cdr (10/18/04)

shows the results of these measurements. Table D describes the physical location of the noise monitoring sites. In Tables C and D, off-site areas are represented by monitoring locations M-1 through M-4 and M-7 through M-9. Figure 3 depicts these monitoring locations.

Existing Traffic Noise. Existing traffic noise levels are generated by vehicles that use the system of roadways in the vicinity of the project site. Noise generated by vehicular traffic on neighborhood streets contributes to the ambient noise levels in the project study area. The FHWA highway traffic noise prediction model (FHWA RD-77-108) was used to evaluate existing traffic-related noise conditions along Junipero Street, Nogales Street, Pueblo Street, Bath Street, Castillo Street, Oak Park Lane, and Mission Street. This model requires various parameters to compute typical equivalent noise levels during daytime, evening, and nighttime hours, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry. Traffic volumes provided in the traffic study for this project (LSA, June 2004) are used in calculating the traffic noise levels. The resultant noise levels are weighted and summed over 24-hour periods to determine the L_{dn} values.

Existing traffic noise levels in the study area along Junipero Street, Nogales Street, Pueblo Street, Bath Street, Castillo Street, Oak Park Lane, and Mission Street are listed in Table E. As shown in Table E, traffic noise along roadway segments in the project vicinity is generally low. The 70 dBA L_{dn} traffic noise contour is confined within the roadway right-of-way along all of the modeled roadway segments in the project area. The 65 dBA L_{dn} traffic noise contour is confined within the right-of-way for Junipero Street, Nogales Street, Pueblo Street, Bath Street, Castillo Street, Oak Park Lane, and Mission Street. The existing traffic model printouts are provided in Appendix H of this EIR.

Table E: Existing Baseline Traffic Noise Levels, dBA

Roadway Segment	ADT	Center-line to 70 L_{dn} (feet)	Center-line to 65 L_{dn} (feet)	Center-line to 60 L_{dn} (feet)	L_{dn} (dBA) 50 Feet from Centerline of Outermost Lane
Junipero Street					
Between Bath Street and Castillo Street	2,805	< 50[1]	< 50	< 50	55.2
Between Castillo Street and Oak Park Lane	3,660	< 50	< 50	< 50	56.4
West of Oak Park Lane	4,000	< 50	< 50	< 50	56.7
Nogales Avenue					
West of De La Vina Street	990	< 50	< 50	< 50	50.7
Pueblo Street					
East of De La Vina Street	2,200	< 50	< 50	< 50	54.1

[1] Traffic noise within 50 feet of a roadway centerline is not provided by the noise model. Site-specific features such as topography or barriers need to be included in the detailed analysis for location-specific impact analysis.

Roadway Segment	ADT	Center-line to 70 L_{dn} (feet)	Center-line to 65 L_{dn} (feet)	Center-line to 60 L_{dn} (feet)	L_{dn} (dBA) 50 Feet from Centerline of Outermost Lane
Between De La Vina Street and Bath Street	3,150	< 50	< 50	< 50	55.7
Between Bath Street and Castillo Street	4,030	< 50	< 50	< 50	56.8
Between Castillo Street and Oak Park Lane	4,355	< 50	< 50	< 50	57.1
West of Oak Park Lane	4,710	< 50	< 50	< 50	57.5
Mission Street					
East of De La Vina Street	16,760	< 50	72	150	65.4
Between De La Vina Street and Bath Street	20,835	< 50	82	174	66.3
Between Bath Street and Castillo Street	25,225	< 50	93	197	67.1
West of Oak Park Lane	30,540	< 50	105	223	68.0
De La Vina Street					
North of Nogales Avenue	8,130	< 50	< 50	55	59.8
Between Nogales Avenue and Pueblo Street	8,545	< 50	< 50	56	60.0
South of Pueblo Street	8,370	< 50	< 50	56	60.0
North of Mission Street	10,470	< 50	< 50	64	60.9
South of Mission Street	11,750	< 50	< 50	70	61.4
Bath Street					
North of Junipero Street	2,900	< 50	< 50	< 50	55.3
Between Junipero Street and Pueblo Street	3,665	< 50	< 50	< 50	56.4
South of Pueblo Street	3,150	< 50	< 50	< 50	55.7
North of Mission Street	5,610	< 50	< 50	< 50	58.2
South of Mission Street	4,470	< 50	< 50	< 50	57.2
Castillo Street					
North of Junipero Street	1,760	< 50	< 50	< 50	53.2
Between Junipero Street and Pueblo Street	2,815	< 50	< 50	< 50	55.2
South of Pueblo Street	3,730	< 50	< 50	< 50	56.4
North of Mission Street	5,420	< 50	< 50	< 50	58.1
South of Mission Street	25,225	< 50	54	115	64.7
Oak Park Street					
Between Junipero Street and Pueblo Street	745	< 50	< 50	< 50	49.4
South of Pueblo Street	970	< 50	< 50	< 50	50.6

Source: LSA Associates, Inc., June 2004.

Existing Groundborne Vibrations. Groundborne vibrations are mostly associated with passenger vehicles and delivery trucks traveling on poor roadway conditions, such as a pothole, bump, expansion joint, or other discontinuity in the road surface. Passenger vehicles and delivery trucks would cause effects such as rattling of windows, and the source is almost always airborne noise. During the site survey of the project site, the existing roadways in the project area were observed to be in good condition. No significant potholes, bumps, expansion joints, or other discontinuities in the road surface were observed that would result in significant groundborne vibration effects.

Thresholds of Significance

The noise and vibration impact significance guidelines are based on the City's Noise Element of the General Plan and its Municipal Code, State of California's model community noise control ordinance, and the groundborne vibration and noise criteria established by the Federal Transit Administration (FTA, April 1995). The noise levels in the Noise Element of the General Plan are expressed in L_{dn}, and the noise levels in the City's noise ordinance are expressed in Community Noise Equivalent Level (CNEL). For the EIR analysis, significant noise and vibration impacts may potentially result from:

- Exposure of residential uses that would exceed a normally acceptable exterior noise level of 60 dBA L_{dn} and an interior noise level of 45 dBA L_{dn}.
- Exposure of hospital uses that would exceed a normally acceptable exterior noise level of 65 dBA L_{dn} and an interior noise level of 45 dBA L_{dn}.
- Exposure of parks that would exceed a normally acceptable exterior noise level of 65 dBA L_{dn}.
- Exposure of commercial uses that would exceed a normally acceptable exterior noise level of 75 dBA L_{dn} and an interior noise level of 50 dBA L_{dn}.
- Exposure of residential land uses to noise located adjacent to the project site related to mechanical equipment that would exceed an exterior noise level of 60 dBA CNEL.
- Exposure of sensitive land uses adjacent to the project site to on-site stationary noise sources that would exceed the maximum daytime noise level of 75 dBA L_{max} and nighttime noise level of 70 dBA L_{max} identified in the State of California's model community noise control ordinance.
- Exposure of sensitive land uses to a groundborne vibration exceeding 72 VdB that would result in community annoyance established by the FTA's groundborne vibration and noise criteria.
- Exposure of off-site sensitive land uses to a long-term averaged noise level increase of 3 dBA or more over corresponding existing noise levels when the existing noise levels already exceed the City's noise standards.
- Exposure of noise sensitive receptors in close proximity to a substantial noise level increase of 10 dBA or more from grading and construction activity for cumulative periods exceeding three months.

FEDERAL AND STATE REGULATIONS, STANDARDS, AND POLICIES

Vibration Impact Criteria

The FTA has compiled groundborne vibration and noise criteria that are based on the maximum levels for a single event. The FTA's groundborne vibration and noise impact criteria were written to predict community annoyance with transit operations from available national and international standards. Although the FTA's groundborne vibration and noise criteria were written for railroad operations, these criteria were used to predict community annoyance from construction-related vibration. Table F shows the FTA's groundborne vibration and noise impact criteria. The table shows groundborne vibration and noise level thresholds that would result in community annoyance for each land use category. There are different vibration and noise level thresholds between frequent and infrequent events. A frequent event is defined as more than 70 events per day, and an infrequent event is defined as less than 70 events per day. The frequent and infrequent event criteria are based on a community response equivalent. Typically a frequent event at lower levels would evoke the same response as an infrequent event at higher levels. For example, as shown in Table F, frequent vibration events at 72 VdB would generate the same community response as infrequent vibration events at 80 VdB for residential land uses.

Table F: Groundborne Vibration and Noise Impact Criteria

Land Use Category	Groundborne Vibration Impact Levels (VdB re 1 micro inch/sec)		Groundborne Noise Impact Levels (dB re 20 micro Pascals)	
	Frequent[1] Events	**Infrequent[2] Events**	**Frequent[1] Events**	**Infrequent[2] Events**
Category 1: Buildings where low ambient vibration is essential for interior operations	65 VdB[3]	65 VdB[3]	–[4]	–[4]
Category 2: Residences and buildings where people normally sleep	72 VdB	80 VdB	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use	75 VdB	83 VdB	40 dBA	48 dBA

Source: Federal Transit Administration, 1995.

1 "Frequent Events" is defined as more than 70 events per day.
2 "Infrequent Events" is defined as fewer than 70 events per day.
3 This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

State of California's Modeled Community Noise Control Ordinance (Maximum Noise Levels)

The State of California modeled community noise control ordinance has established guidelines for maximum allowable noise levels, which were used to evaluate noise levels from stationary sources as these standards were not provided in either the City's General Plan or Municipal Code. Typically, the noise metric used for stationary sources, is defined as noise levels that cannot be exceeded for a certain percentage of time during a specified time period. For example, for residential uses, the maximum allowable exterior noise level is 55 dBA for a cumulative period of more than 30 minutes in any hour during daytime hours between 7:00 a.m. and 10:00 p.m. For nighttime hours between 10:00 p.m. and 7:00 a.m., the maximum allowable exterior noise level is 50 dBA for a cumulative period of more than 30 minutes in any hour. For events having a shorter duration, the maximum allowable noise level would increase. Therefore, the maximum allowable exterior noise level for any period of time for residential uses would be 75 dBA L_{max} during the day and 70 dBA L_{max} during the night.

City of Santa Barbara Noise Standards

Noise Element of the General Plan. The Noise Element of the General Plan specifies exterior and interior noise levels for noise-sensitive land uses, such as residential uses, places of worship, educational facilities, hospitals, hotels/motels, and commercial and other land uses. Table G summarizes the noise level compatibility for each land use category expressed in dBA L_{dn}. In Table G, the left half of the table identifies the maximum interior levels in terms of L_{dn} for each land use category and the right half of the table identifies clearly acceptable, normally acceptable, normally unacceptable, and clearly unacceptable exterior noise levels in terms of L_{dn} for each land use category.

Table G: City of Santa Barbara Land Use Compatibility Guidelines

Land Use Category	Maximum Interior Exposure, L_{dn}	Land Use Interpretation for L_{dn} Value					
		55	60	65	70	75	80
Residential – Single-Family, Duplex, Mobile Homes	45						
Residential – Multifamily, Dormitories, etc.	45						
Transient Lodging	45						
School Classrooms, Libraries, Churches	45						
Hospitals, Nursing Homes	45						
Auditoriums, Concert Halls, Music Shells	35						
Sports Arenas, Outdoor Spectator Sports	N/A						

Land Use Category	Maximum Interior Exposure, L_{dn}	Land Use Interpretation for L_{dn} Value					
		55	60	65	70	75	80
Playgrounds, Neighborhood Parks	N/A						
Golf Courses, Riding Stables, Water Recreation, Cemeteries	N/A						
Office Buildings, Personal Business and Professional	50						
Commercial – Retail, Movie Theaters, Restaurants	50						
Commercial – Wholesale, Some Retail, Industrial, Manufacturing, Utilities	N/A						
Manufacturing, Communication (Noise Sensitive)	N/A						
Livestock Farming, Animal Breeding	N/A						
Agricultural (except Livestock), Mining, Fishing	N/A						
Public Right-of-Way	N/A						
Extensive Natural Recreation Arena	N/A						

CLEARLY ACCEPTABLE
The noise exposure is such that the activities associated with the land use may be carried out with essentially no interference. (Residential areas: both indoor and outdoor noise environments are pleasant.)

NORMALLY ACCEPTABLE
The noise exposure is great enough to be of some concern, but common constructions will make the indoor environment acceptable, even for sleeping quarters. (Residential areas: the outdoor environment will be reasonably pleasant for recreation and play at the quiet end and will be tolerable at the noisy end.)

NORMALLY UNACCEPTABLE
The noise exposure is significantly more severe so that unusual and costly building construction are necessary to ensure adequate performance of activities. (Residential areas: barriers must be erected between the site and prominent noise sources to make the outdoor environment tolerable.)

CLEARLY UNACCEPTABLE
The noise exposure at the site is so severe that construction costs to make the indoor environment acceptable for performance of activities would be prohibitive. (Residential areas: the outdoor environment would be intolerable for normal residential use.)

Source: City of Santa Barbara Noise Element of the General Plan.

City of Santa Barbara Municipal Code

Section 9.16.015 of the City's Municipal Code limits construction hours to between the hours of 7:00 a.m. and 8:00 p.m. Monday through Sunday. Construction activities include construction, demolition, excavation, and altering or repairing of buildings or structures.

Section 9.16.025 of the City's Municipal Code regulates noise affecting parcels zoned or used for residential purposes. Following are the regulations in the Municipal Code affecting noise on residential land uses.

A. Hours of Operation. Hours of operation for planting, grading, vegetation removal, harvesting, sorting, cleaning, packing, shipping, and pesticide application shall be limited to 7:00 a.m. to 7:00 p.m. Monday through Saturday. Hours of operation for the above-stated activities shall be limited to 8:00 a.m. to 7:00 p.m. on Sundays and holidays.

B. Mechanical Equipment. Mechanical equipment other than vehicles and equipment that is operated by electricity obtained from an electricity utility company shall not be used outside before 8:00 a.m. or after 7:00 p.m. on Saturdays, Sundays, or holidays, or before 7:00 a.m. or after 7:00 p.m. Monday through Friday.

C. Noise Limitations. All mechanical equipment other than vehicles shall be insulated, and sound at the property line of any adjacent parcel used or zoned for residential, institutional, or park purposes shall not exceed 60 dBA CNEL.

It should be noted that this noise criterion applies only to noise associated with mechanical equipment other than vehicles. Other noise sources are evaluated using criteria identified in the Methodology Related to Noise and Vibration Impact Assessment section of this analysis.

PROJECT FEATURES

The following project features would reduce noise levels at sensitive land uses:

In Chapter 13, the Transportation and Circulation section of this EIR, the project feature PF 13-3 indicates that during the initial construction phase, a shuttle service for construction workers would be implemented. All construction workers except for construction project manager staff and subcontractor staff would park off site and be shuttled to the project site from the off-site parking location.

PF-1 Acoustic Silencers for Mechanical Equipment. Acoustic louvers are design features that reduce noise levels from mechanical equipment. Acoustic louvers will be installed around the two two-cell cooling towers. Acoustical silencers will be fitted to high-level ventilation louvers in the boiler room. Acoustical silencers will be installed for all generator room ventilation paths. A wall will be constructed around the first-floor louvers on the west facade of the Central Plant building to reduce noise levels.

PROJECT IMPACTS

Construction Impacts

The proposed project includes structural demolition of 270,705 square feet, which includes 233,170 square feet of the existing main hospital building and Eye Center and 37,535 square feet of structures located on the adjacent block bounded by Oak Park Lane, Junipero Street, Castillo Street, and Pueblo Street. Due to the comprehensive nature of the project, demolition, reconstruction, and remodeling would be implemented in phases over an approximate nine-year period, during which the hospital would remain fully operational.

Construction-Related Commute Noise

Construction-related commutes are generated by crew commutes and the transport of construction equipment and materials to the project site. Construction workers would be required to park at an off-site location and would be transported from the off-site parking area to the construction site (N-8). The off-site location has not been determined at this time. The off-site locations under consideration include the Earl Warren Fairgrounds (located just north of US-101 and west of Las Positas Road), the St. Francis Hospital site (located at 601 Micheltorena Street), and the proposed Pueblo and Knapp parking structures (when constructed). Employees who are parked off site would be shuttled to the construction site by bus. On-site parking would be limited to the spaces available for the construction project manager and subcontractor only. Construction-related commutes for the proposed project would incrementally increase traffic noise levels on access roads leading to the site. A relatively high single-event noise exposure would occur with trucks passing at 50 feet generating a level of 87 dBA L_{max}. Streets leading to the project site are located within residential and recreational land uses. Construction-related commuting impacts for each of the four construction phases are discussed later in this section.

Construction Noise

Construction-related noise is generated during excavation, grading, and construction on site. Construction is performed in discrete steps, each of which has its own mix of equipment and consequently its own noise characteristics. These various sequential phases would change the character of the noise generated on the site. Therefore, noise levels vary as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase.

Table H lists maximum noise levels for typical construction equipment based on a distance of 50 feet between the equipment and a noise receptor. Typical maximum noise levels range up to 91 dBA L_{max} at 50 feet during the noisiest construction phases. The demolition of structures and site preparation phases (excavation and grading) tend to generate the highest noise levels because of the construction equipment used during these activities. The noisiest construction equipment is earthmoving equipment, which includes excavating machinery such as backfillers, bulldozers, draglines, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for this construction equipment may involve one or two minutes of full power operation followed by three or four minutes at lower power settings.

Demolition and construction of the proposed project is expected to require the use of earthmovers, bulldozers, water trucks, and pickup trucks. This equipment would be used on site. Based on Table H, the maximum noise level generated by each earthmover on the proposed project site is assumed to be 88 dBA L_{max} at 50 feet from the earthmover. Each bulldozer would also generate 85 dBA L_{max} at 50 feet. The maximum noise level generated by water trucks and pickup trucks is approximately 86 dBA L_{max} at 50 feet from these vehicles. Each doubling of a sound source with equal strength increases the noise level by 3 dBA. Assuming that each piece of construction equipment operates at some distance from the other equipment, the worst-case combined noise level at each individual residence during

Table H: Typical Maximum Construction Equipment Noise Levels (L_{max})

Type of Equipment	Range of Maximum Sound Levels Measured (dBA at 50 feet)	Suggested Maximum Sound Levels for Analysis (dBA at 50 feet)
Pile Drivers, 12,000–18,000 ft-lb/blow	81–96	93
Rock Drills	83–99	96
Jack hammers	75–85	82
Pneumatic Tools	78–88	85
Pumps	74–84	80
Dozers	77–90	85
Scrapers	83–91	87
Haul Trucks	83–94	88
Cranes	79–86	82
Portable Generators	71–87	80
Rollers	75–82	80
Tractors	77–82	80
Front-End Loaders	77–90	86
Hydraulic Backhoe	81–90	86
Hydraulic Excavators	81–90	86
Graders	79–89	86
Air Compressors	76–89	86
Trucks	81–87	86

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

this phase of construction would be 91 dBA L_{max} at a distance of 50 feet from the active construction area. Construction-related activity impacts for each of the four construction phases are discussed later in this section.

Construction Vibration

Construction-related vibration is generated by construction equipment. Based on the Response to City staff on the Development Application Review Team (DART) Comments (Fugro West, Inc., September 2003, main construction activities such as blasting explosives, demolition, pile driving, and earthwork compaction using vibratory equipment would result in potential building damages for nearby buildings. According to Fugro West, Inc., a typical 12-ton vibratory roller that would cause the most severe vibration environment would generate 3,000 to 4,000 vibrations per minute and would deliver 25,000 to 40,000 pounds of impact pressure. Structures within 10 feet of the vibratory equipment can be potentially damaged. Operation of the vibratory equipment would be perceptible at 100 feet and would not likely be noticeable at 200 feet from the equipment.

Based on information provided in *The Santa Barbara Cottage Hospital Seismic and Modernization Plan Acoustical Analysis Report Revision 1* (AAAI, October 2003) as referenced by LSA Associates, Inc., the use of heavy diesel equipment would result in groundborne vibration. Heavy diesel equipment includes pile drivers, bulldozers, and other heavy-tracked equipment. Table I lists the typical maximum vibration velocity levels at 50 feet from the source. The locations of sensitive land uses would vary from within fifty feet to several hundred feet from the area where heavy construction equipment is used, depending on the phase of construction. The vibration velocity level normally decreases at a rate of 6 VdB per doubling of distance from the source, as suggested in the FTA's Transit Noise and Vibration Impact Assessment (April 1995). As shown in Table I, a vibration velocity level of 65 VdB or above would be perceptible, while a level of 72–80 VdB may cause residential annoyance. A vibration velocity of 95–100 VdB would result in potential building damage. Table J shows a vibration velocity of 75 VdB, with noise levels of a low frequency of 35 dBA and a midfrequency of 50 dBA, is the threshold of annoyance for humans.

Groundborne vibration and noise impact criteria based on the FTA's *Transit Noise and Vibration Impact Assessment* (FTA, 1995) was used to analyze potential construction vibration impacts. Although the groundborne vibration and noise impact criteria in this document are prepared for railroads, the vibration levels were used to evaluate construction vibration levels. The locations of sensitive land uses would vary from within 50 feet to several hundred feet from the area where heavy construction equipment is used, depending on the phase of construction. Construction-related vibration impacts for each of the four construction phases are discussed below.

The construction of the proposed project is proposed to be implemented over a total of eight phases. However, the eight construction phases were consolidated into four phases to facilitate the analysis of construction impacts in the EIR.

The following provides a description of the proposed construction work that would occur during the four consolidated construction phases and the temporary impacts that may occur during the phases.

Table I: Typical Levels of Groundborne Vibration

Response/Criteria	Velocity Level[1]	Typical Vibration Sources (50 ft from source)
Damage Threshold	100	Blasting from construction projects
Damage threshold, historic or fragile buildings	95	
		Bulldozers and other heavy tracked construction equipment
Difficulty with task such as reading a VDT screen	90	
	85	Commuter rail, upper range
	82	
Residential annoyance, infrequent events (e.g. freight trains)	80	Rapid transit, upper range
	75	Commuter rail, typical
Residential annoyance, frequent events (e.g. transit trains)	72	Bus or truck over bump
	70	Rapid transit, typical
Limit for vibration sensitive equipment. Approx. threshold for human perception of vibration	65	
	62	Bus or truck, typical
	60	
	52	Typical background vibration
	50	

Source: Federal Transit Administration, U.S. Department of Transportation, 1995.

[1] RMS Vibration Velocity Level in dB relative to 10^6 inches/second or VdB.

Table J: Human Response to Different Levels of Groundborne Noise and Vibration

Vibration Velocity Level	Noise Level		Human Response
	Low Frequency[1]	Mid Frequency[2]	
65 VdB	25 dBA	40 dBA	Approximate threshold of perception for many humans. Low-frequency sound usually inaudible; midfrequency sound excessive for quiet sleeping areas.
75 VdB	35 dBA	50 dBA	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find transit vibration at this level unacceptable. Low-frequency noise acceptable for sleeping areas; midfrequency noise annoying in most quiet occupied areas.
85 VdB	45 dBA	60 dBA	Vibration acceptable only for an infrequent number of events per day. Low-frequency noise unacceptable for sleeping areas; midfrequency noise unacceptable even for infrequent events with institutional land uses such as schools and churches.

Source: Federal Transit Administration, 1995.

[1] Approximate noise level when vibration spectrum peak is near 30 Hz.
[2] Approximate noise level when vibration spectrum peak is near 60 Hz.

Construction Phase I

Construction Phase I consists of demolition of the Eye Center; clearing of the Pueblo parking structure site; and construction of the Pueblo parking structure, Child Care facility, Knapp parking structure, and Central Plant Building. During this phase of construction, noise sensitive land uses immediately adjacent to Junipero Street, Bath Street, Pueblo Street, and Castillo Street would be potentially affected by short-term, intermittently high noise levels due to construction activities occurring near the project boundary. Sensitive land uses surrounding this construction phase are shown in Figure 4.9.3 in the Land Use section of the EIR. This construction phase is estimated to take approximately two and one-half years within which the applicant proposes four different subphases of work.

Construction Commute and Transport of Construction Equipment Impact (Phase I). During this phase, vehicular traffic would include the commute of construction workers and the transport of construction equipment to the project site. Construction workers would be shuttled into the project area from an off-site parking area (N-8). The construction trips for Phase I would generate approximately 133 ADT. Table K lists the expected addition of construction trips on the neighborhood streets for Phase I and the increase in noise generated by these additional construction trips for Phase I. As shown in Table K, the traffic noise would increase up to 0.2 dBA and would not exceed 60 dBA L_{dn} for all street segments in the project area. Although there would be short-term intermittently high single-event pass-by noise caused by equipment transport, it would not add significantly to the longer-term noise levels such as L_{eq} and L_{dn}. **Therefore, the incremental increase in traffic noise due to the additional construction trips in the project area for Phase I would not result in a significant traffic noise impacts to nearby residences, hospital patients and employees, medical office occupants, and park users.**

Construction Noise Impact (Phase 1). Phase I of construction would take place in three portions of the project site. During this phase, construction activity would require the use of heavy-tracked construction equipment.

Noise Impacts from Demolition of the Eye Center and the Construction of the Central Plant Building (Phase I). The demolition of the Eye Center and the construction of the Central Plant building would occur on the southwest corner of Bath Street and Junipero Street. Construction activities would generate a maximum exterior noise level of 91 dBA L_{max} at 50 feet. The following describes the potential noise impact for each land use adjacent to this construction activity.

Office Buildings. The shortest distance from office buildings along Junipero Street and Bath Street to the construction activity is approximately 70 feet. The office buildings would experience a noise level up to 88 dBA L_{max} from Phase I construction activities. Employees associated with the office building would be exposed to occasional high noise levels generated by this construction phase. Because construction activity is intermittent in nature, construction noise from the project site would not result in exceedance of the 75 dBA L_{dn} exterior noise standard and the 50 dBA L_{dn} interior noise standard for commercial uses at these office buildings. Office workers in these office buildings would experience maximum noise levels of 64 dBA (with

Table K: Phase I Street Noise Analysis

Roadway Segment	Existing ADT	Phase I ADT	Percent Increase	L_{dn} (dBA) 50 Feet from Centerline of Outermost Lane	Increase in Noise Level (dBA)
Junipero Street					
Between Bath Street and Castillo Street	2,805	133	5%	55.2	0.2
Between Castillo Street and Oak Park Lane	3,660	133	4%	56.4	0.2
West of Oak Park Lane	4,000	133	3%	56.7	0.1
Pueblo Street					
Between Bath Street and Castillo Street	4,030	133	3%	56.8	0.1
Between Castillo Street and Oak Park Lane	4,355	133	3%	57.1	0.1
West of Oak Park Lane	4,710	133	3%	57.5	0.1
Bath Street					
North of Junipero Street	2,900	133	5%	55.3	0.2
Between Junipero Street and Pueblo Street	3,665	133	5%	56.4	0.2
South of Pueblo Street	3,150	133	4%	55.7	0.2
Castillo Street					
Between Junipero Street and Pueblo Street	2,815	133	5%	55.2	0.2
South of Pueblo Street	3,730	133	4%	56.4	0.2

Source: LSA Associates, Inc., August 2004.

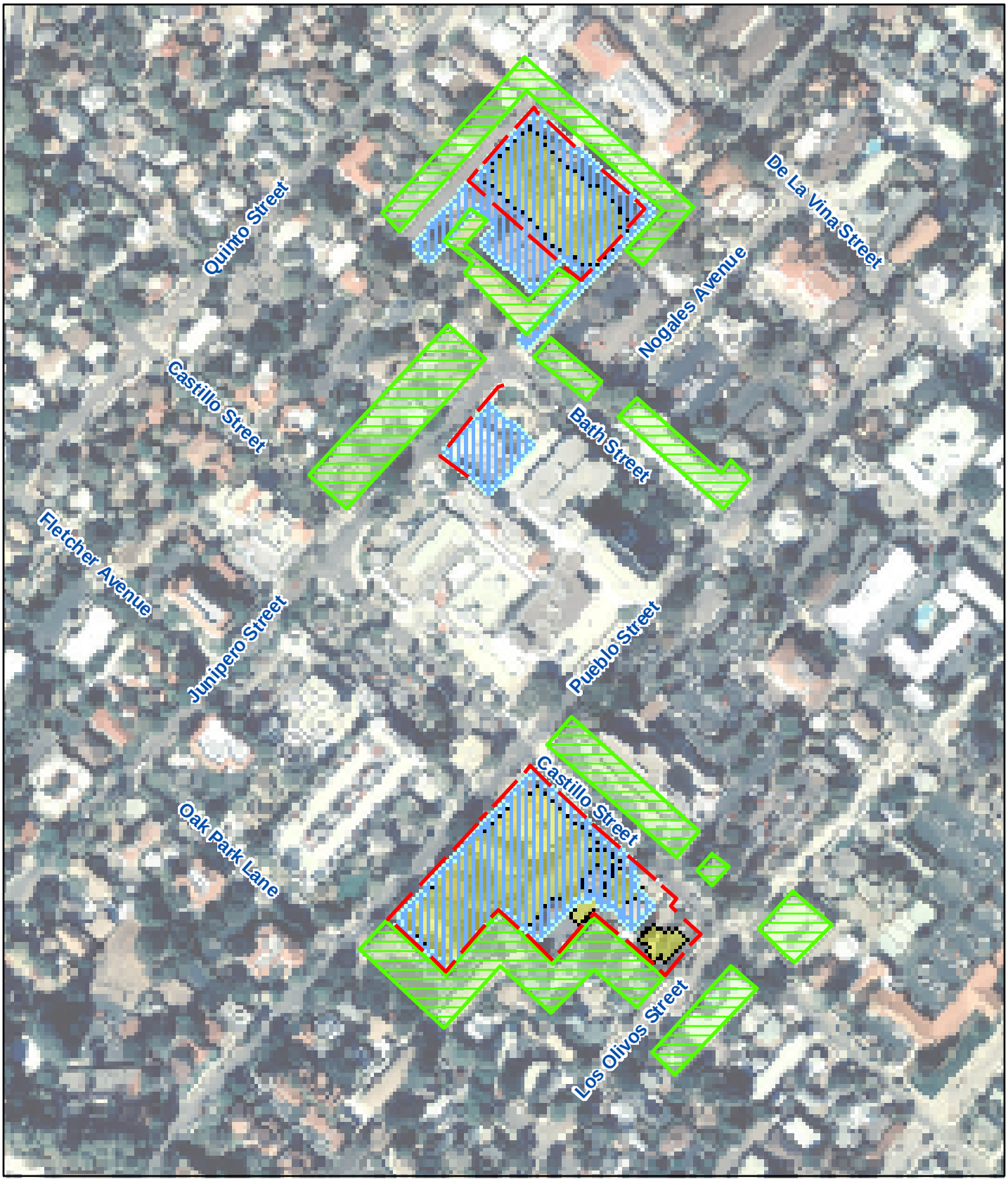
windows closed) to 76 dBA (with windows open) L_{max}. This range of interior noise levels would potentially distract workers inside the office buildings. Although not required based on the L_{dn} noise standard, temporary noise walls up to 8 feet high are recommended to reduce the maximum construction noise inside these office buildings.

With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction), Mitigation Measure N-4 (requiring the best available noise control technology for all construction equipment), and the recommended 8-foot temporary construction wall, the potential construction noise impacts on the office buildings would be reduced to less than significant. It should be noted that although the implementation of Mitigation Measure N-3 would reduce daily construction hours as proposed by the SBCH, and would reduce the number of hours construction noise affects sensitive receptors around the project site on a daily basis, it would extend project construction by 1,211 days (3.5 years) and therefore, the number of days these sensitive receptors would be exposed to construction noise. In addition, during the additional construction days, other construction-related impacts, such as traffic, air quality, and aesthetics, would also be extended.

Residential. The shortest distance from residences on Bath Street north of Junipero Street to Phase I construction activity is 175 feet. The nearest residences could experience a noise level up to 80 dBA L_{max}. The maximum daytime noise threshold of 75 dBA L_{max} would be exceeded and community annoyance would occur.

To reduce noise levels at the residences located along Bath Street north of Junipero Street, temporary noise barriers up to 8-foot-high would be placed between the construction area and these residences as prescribed in Mitigation Measure N-5. Figure 4 shows the temporary noise barrier locations for Phase I construction activities. With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction), Mitigation Measure N-4 (requiring the best available noise control technology for all construction equipment), and Mitigation Measure N-5 (requiring temporary construction barriers along the construction areas in the vicinity of outdoor active use areas), potential construction noise impacts on these residences would be reduced to the extent feasible. **However, unavoidable adverse noise impacts on the residences from the Phase I construction activities would remain.**

Hospital. The shortest distance from the hospital building located immediately adjacent to the Eye Center to the Phase I construction activity is approximately 50 feet. The hospital would experience an exterior noise level up to 91 dBA L_{max}. Because construction activity is intermittent in nature, construction noise from the project site would not result in the exceedance of the 60 dBA L_{dn} exterior noise standard and the 45 dBA L_{dn} interior noise standard for hospital uses. Hospital patients and workers would experience maximum noise levels of 67 dBA (with windows closed) to 79 dBA (with windows closed) L_{max}. This range of interior noise levels would potentially annoy the patients and distract workers inside the hospital. Although not required based on the L_{dn} noise standard, temporary noise walls up to 8 feet high are recommended to reduce the maximum construction noise inside the hospital building.



LSA

FIGURE 4

LEGEND

- Temporary Noise Barrier
- Crack and Video Survey Areas
- Buildings Being Demolished
- New Building

0 250 500

Feet

Santa Barbara Cottage Hospital
Seismic Compliance and Modernization Plan

Temporary Noise Barrier Locations and Crack Survey and Video Reconnaissance Area for Phase 1

Source: Lee, Burkhart, Liu (April 2004), City of Santa Barbara

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With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction), Mitigation Measure N-4 (requiring the best available noise control technology for all construction equipment), and the temporary construction barriers recommended, potential construction noise impacts on the hospital buildings would be reduced to less than significant.

Oak Park. Oak Park is located approximately 940 feet northwest of the Phase I construction activity. The park would experience a noise level up to 66 dBA L_{max}. This noise level would not exceed the daytime maximum noise threshold of 75 dBA L_{max}. **No significant Phase I construction noise impact would occur at the park.**

Noise Impact from Clearing of the Pueblo Parking Structure Site and Construction of the Pueblo Parking Structure and the Child Care Facility. The clearing of the existing Pueblo parking structure site and the construction of the Pueblo parking structure and child care facility would occur on the southwest corner of Castillo Street and Pueblo Street. Construction activities would generate maximum exterior noise levels of 91 dBA L_{max} at 50 feet. The following describes the potential noise impact for each of the land uses adjacent to this construction activity.

Office Buildings. The shortest distance from office buildings along Castillo Street south of Pueblo Street to the Phase I construction of the Pueblo parking structure is approximately 50 feet. The office buildings would experience an exterior noise level up to 91 dBA L_{max}. Employees associated with the office buildings would be exposed to occasional high noise levels generated by this construction phase. Because construction activity is intermittent in nature, construction noise from the project site would not result in the exceedance of the 75 dBA L_{dn} exterior noise standard and the 50 dBA L_{dn} interior noise standard for commercial uses at these office buildings. Standard office buildings provide a minimum of 12 dBA exterior-to-interior noise attenuation with windows open and 24 dBA noise reduction with windows closed. Office workers would experience maximum noise levels of 67 dBA (with windows closed) to 79 dBA (with windows open) L_{max}. This range of interior noise levels would potentially distract workers inside the office buildings. Although not required based on the L_{dn} noise standard, temporary noise walls up to 8 feet high are recommended to reduce maximum construction noise inside these office buildings.

With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction), Mitigation Measure N-4 (requiring the best available noise control technology for all construction equipment), and the recommended temporary construction barriers, the potential construction noise impacts on the office buildings would be reduced to less than significant

Residential. Residences along Oak Park Lane, Los Olivos Street, and Parkway Drive would experience potentially significant noise levels from Phase I construction activities. The shortest distance from these residences along Oak Park Lane, Los Olivos Street, and Parkway Drive to the Phase I construction of the Pueblo parking structure is approximately within 50 feet. These residences would experience a noise level up to 91 dBA L_{max}. The maximum daytime noise threshold of 75 dBA L_{max} would be exceeded, and community annoyance would occur.

To reduce noise levels at the residences along Oak Park Lane, Los Olivos Street, and Parkway Drive, temporary noise barriers would be placed between the construction area and these residences as prescribed in Mitigation Measure N-5. Figure 4 shows the temporary noise barrier locations for Phase I construction activities. With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction), Mitigation Measure N-4 (requiring the best available noise control technology for all construction equipment), and Mitigation Measure N-5 (requiring temporary construction barriers along the construction areas in the vicinity of outdoor active use areas), potential construction noise impacts on the residences would be reduced to the extent feasible. **However, unavoidable adverse noise impacts on the residences from the Phase I construction activities would remain.**

Hospital. The shortest distance from the hospital building located on the northeast corner of Castillo Street and Pueblo Street to the Phase I construction of the Pueblo parking structure is approximately 140 feet. The hospital would experience a noise level up to 82 dBA L_{max}. Because construction activity is intermittent in nature, construction noise from the project site would not result in the exceedance of the 75 dBA L_{dn} exterior noise standard and the 50 dBA L_{dn} interior noise standard for commercial uses at these office buildings. Office workers would experience maximum noise levels of 58 dBA (with windows closed) to 70 dBA (with windows open) L_{max}. This range of interior noise levels would potentially distract workers inside the office buildings. Although not required based on the L_{dn} noise standard, temporary noise walls up to 8 feet high are recommended to reduce maximum construction noise inside these office buildings.

With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction), Mitigation Measure N-4 (requiring the best available noise control technology for all construction equipment), and the recommended temporary construction barriers, potential construction noise impacts on the hospital buildings would be reduced to less than significant.

Oak Park. Oak Park is located approximately 750 feet northwest of the construction of the Pueblo parking structure. The park could experience a noise level up to 68 dBA L_{max} from Phase I construction activities. This noise level would not exceed the daytime maximum noise threshold of 75 dBA L_{max}. **No significant Phase I construction noise impacts would occur at the park.**

Noise Impacts from Construction of the Knapp Parking Structure. The construction of the Knapp parking structure is along Bath Street north of Nogales Avenue. Construction activities would generate maximum exterior noise levels of 91 dBA L_{max} at 50 feet. The following describes the potential noise impact for each of the land uses adjacent to this construction activity.

Office Buildings. The shortest distance from office buildings immediately west of the proposed Knapp parking structure to the Phase I construction of the Knapp parking structure is approximately 50 feet. The office buildings would experience a noise level up to 91 dBA L_{max}. Employees associated with the office buildings would be exposed to occasional high noise levels generated by this construction phase. Because construction activity is intermittent in nature, construction noise from the project site would not result in the exceedance of the 75 dBA L_{dn}

exterior noise standard and the 50 dBA L_{dn} interior noise standard for commercial uses at these office buildings. Standard office buildings provide a minimum of 12 dBA exterior-to-interior noise attenuation with windows open and 24 dBA noise reduction with windows closed. Office workers would experience maximum noise levels of 67 dBA (with windows closed) to 79 dBA (with windows open) L_{max}. This range of interior noise levels would potentially distract workers inside the office buildings. Although not required based on the L_{dn} noise standard, temporary noise walls up to 8 feet high are recommended to reduce maximum construction noise inside these office buildings.

With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction), Mitigation Measure N-4 (requiring the best available noise control technology for all construction equipment), and the recommended construction barriers, potential construction noise impacts on the office buildings would be reduced to less than significant.

Residential. The shortest distance from residences along the east side of Bath Street north of the Knapp parking structure to the Phase I construction of the Knapp parking structure is approximately 50 feet. These residences would experience a noise level up to 91 dBA L_{max}. The maximum daytime noise threshold of 75 dBA L_{max} would be exceeded and community annoyance would occur.

To reduce noise levels at these residences, temporary noise barriers would be placed between the construction area and these residences as prescribed in Mitigation Measure N-5. Figure 4 shows the temporary noise barrier locations for Phase I construction activities.

With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction), Mitigation Measure N-4 (requiring the best available noise control technology for all construction equipment), and Mitigation Measure N-5 (requiring temporary construction barriers along the construction areas in the vicinity of outdoor active use areas), potential construction noise impacts on the residences would be reduced to the extent feasible. **However, unavoidable adverse noise impacts from the construction activities on the residences in the vicinity of Phase I would remain.**

Hospital. The shortest distance from the hospital building located on the southwest corner of Bath Street and Junipero Street to the Phase I construction site is approximately 180 feet. The hospital building would experience a noise level up to 80 dBA L_{max}. Because construction activity is intermittent in nature, construction noise from the project site would not result in the exceedance of the 75 dBA L_{dn} exterior noise standard and the 50 dBA L_{dn} interior noise standard for commercial uses at these office buildings. Office workers would experience maximum noise levels of 56 dBA (with windows closed) to 68 dBA (with windows open) L_{max}. This range of interior noise levels would potentially distract workers inside the office buildings. Although not required based on the L_{dn} noise standard, temporary noise walls up to 8 feet high are recommended to reduce maximum construction noise inside these office buildings.

With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction), Mitigation Measure N-4 (requiring the best available noise control technology for

all construction equipment), and the recommended construction barriers, potential construction noise impacts on the hospital buildings would be reduced to less than significant. **However, unavoidable adverse noise impacts on the hospital buildings from the Phase I construction activities would remain.**

Oak Park. Oak Park is located approximately 840 feet northwest of the construction of the Knapp parking structure. The park could experience a noise level up to 67 dBA L_{max} from Phase I construction activities. This noise level would not exceed the daytime maximum noise threshold of 75 dBA L_{max}. **No significant Phase I construction noise impact would occur at the park.**

Construction Vibration Impact (Phase I). Phase I construction of the proposed project would take place in three locations of the project site. During this phase, construction activity would require the use of heavy-tracked construction equipment, which may cause vibration impacts.

Vibration Impacts from Demolition of the Eye Center and the Construction of the Central Plant building. Demolition of the Eye Center and construction of the Central Plant Building would occur on the southwest corner of Bath Street and Junipero Street. Construction activities would generate vibration levels up to 95 VdB at 50 feet. The following describes the potential vibration impact for each of the land uses adjacent to this construction activity.

Office Buildings. The shortest distance from office buildings along Junipero Street and Bath Street to the Phase I construction activity is approximately 70 feet. The office buildings would experience a vibration level up to 92 VdB. This vibration level would not result in structural damage. To ensure that adjacent structures are not damaged as of result of on-site construction activities, Mitigation Measure N-2 (a crack survey and video reconnaissance) shall be implemented. See Figure 4 for crack survey and video reconnaissance locations for Phase I construction. There are no feasible mitigation measures to reduce the vibration impact during construction. **Therefore, unavoidable adverse Phase I construction vibration impacts upon adjacent medical office uses would remain.**

Residential. The shortest distance from these residences along Castillo Street north of Junipero Street to the Phase I construction activity is approximately 175 feet. These residences would experience a vibration level of to 84 VdB. This vibration level would result in potential community annoyance. However, it would not result in structural damage. To ensure that adjacent structures are not damaged as a result of construction activities, Mitigation Measure N-2 (a crack survey and video reconnaissance) shall be implemented. See Figure 4 for crack survey and video reconnaissance locations for Phase I construction. **Therefore, unavoidable adverse Phase I construction vibration impacts upon adjacent residential uses would remain.**

Hospital. The shortest distance from the hospital building located immediately adjacent to the Eye Center to the Phase I construction activities is approximately 50 feet. The hospital would

experience a vibration level lower than 95 VdB. This vibration level would not result in structural damage. Mitigation Measure N-1 (coordination with SBCH on location of construction equipment) would ensure that the construction vibration does not affect vibration-sensitive equipment within any of the hospital buildings. **Therefore, unavoidable adverse Phase I construction vibration impacts upon adjacent hospital uses would remain.**

Oak Park. Oak Park is located approximately 940 feet northwest of the construction activity. The park would experience a potential maximum Phase I construction vibration level up to 70 VdB. **This level of vibration would not affect the park users.**

Construction Vibration Impact (Phase 1). Vibration Impact from Clearing of the Pueblo Parking Structure Site and the Construction of the Pueblo Parking Structure and the Child Care Facility. The clearing of the Pueblo parking structure site and the construction of the Pueblo parking structure and child care facility would occur on the southwest corner of Castillo Street and Pueblo Street. Construction activities would generate vibration levels up to 95 VdB at 50 feet. The following describes the potential vibration impact for each land use adjacent to this construction activity.

Office Buildings. The shortest distance from office buildings along Castillo Street south of Pueblo Street to the Phase I construction activities is approximately 50 feet. The office buildings would experience a vibration level lower than 95 VdB. This vibration level would not result in structural damage. To ensure that adjacent structures are not damaged as of result of on-site construction activities, Mitigation Measure N-2 (a crack survey and video reconnaissance) shall be implemented. See Figure 4 for crack survey and video reconnaissance locations for Phase I construction. **Therefore, unavoidable adverse Phase I construction vibration impacts upon adjacent medical office uses would remain.**

Residential. The shortest distance from residences along Oak Park Lane, Los Olivos Street, and Parkway Drive to the Phase I construction activities is approximately 50 feet. These residences would experience a vibration level lower than 95 VdB. This vibration level would result in community annoyance. However, it would not result in structural damage. To ensure that adjacent structures are not damaged as of result of construction activities, Mitigation Measure N-2 (a crack survey and video reconnaissance) shall be implemented. See Figure 4 for crack survey and video reconnaissance locations for Phase I construction. **Therefore, unavoidable adverse Phase I construction vibration impacts upon adjacent residential uses would remain.**

Hospital. The shortest distance from the hospital building located on the north east corner of Castillo Street and Pueblo Street to the Phase I construction activities is approximately 140 feet. The hospital building would experience a vibration level of up to 86 VdB. This vibration level would not result in structural damage. Mitigation Measure N-1 (coordination with SBCH on location of construction equipment) would ensure that the construction vibration does not affect

vibration sensitive equipment within any of the hospital buildings. **Therefore, unavoidable adverse Phase I construction vibration impacts upon adjacent hospital uses would remain.**

Oak Park. Oak Park is located approximately 750 feet northwest of the Phase I construction activity. The park would experience a vibration level of up to 72 VdB. **This level of outdoor vibration would not affect the park users.**

Vibration Impacts from Construction of the Knapp Parking Structure. The construction of the Knapp parking structure would occur along Bath Street north of Nogales Avenue. Construction activities would generate vibration levels of 95 VdB at 50 feet. The following describes the potential vibration impacts for each land use adjacent to this construction activity.

Office Buildings. The shortest distance from office buildings located immediately west of the construction site to the Phase I construction activities is approximately 50 feet. At this distance, the office buildings would experience a potential vibration level lower than 95 VdB. This vibration level would not result in structural damage. To ensure that adjacent structures are not damaged as of result of construction activities, Mitigation Measure N-2 (a crack survey and video reconnaissance) shall be implemented. See Figure 4 for crack survey and video reconnaissance locations for Phase I construction. **Therefore, unavoidable adverse Phase I construction vibration impacts upon adjacent medical office uses would remain.**

Residential. The shortest distance from residences along Bath Street north of the Knapp parking structure to the Phase I construction activities is approximately 50 feet. These residences would experience a vibration level lower than 95 VdB. This vibration level would result in community annoyance. However, it would not result in structural damage. To ensure that adjacent structures are not damaged as of result of construction activities, Mitigation Measure N-2 (a crack survey and video reconnaissance) shall be implemented. See Figure 4 for crack survey and video reconnaissance locations for Phase I construction. **Therefore, unavoidable adverse Phase I construction vibration impacts upon adjacent residential uses would remain.**

Hospital. The shortest distance from the hospital building located on the southwest corner of Bath Street and Junipero Street to the Phase I construction activities is approximately 180 feet. The hospital building would experience a maximum vibration level of up to 84 VdB. This vibration level would not result in structural damage. Mitigation Measure N-1 (coordination with SBCH on location of construction equipment) would ensure that the construction vibration does not affect vibration sensitive equipment within any of the hospital buildings. **Therefore, unavoidable adverse Phase I construction vibration impacts upon adjacent hospital uses would remain.**

Oak Park. Oak Park is located approximately 840 feet northwest of the Phase I construction activity. The park would experience a maximum vibration level of up to 71 VdB. **This level of outdoor vibration would not significantly affect park users.**

Construction Phase II

Construction Phase II consists of demolition of the existing Central Plant building and existing parking structure; construction of the Diagnostic and Treatment Building and Patient Pavilions; and the partial remodel of the Centennial Building and Building E. Noise-sensitive land uses immediately adjacent to Junipero Street, Oak Park Lane, Pueblo Street, and Bath Street would potentially be affected by short-term, intermittently high noise levels due to construction activities occurring near the project boundary. Sensitive land uses surrounding this construction phase are shown in Figure 4.9.3. This construction phase is estimated to take approximately four years, with two subphases during Construction Phase II.

Construction Commute and Transport of Construction Equipment Impact (Phase II). During this phase, vehicular traffic would include the commute of construction workers and the transport of construction equipment to the project site. The applicant, SBCH, proposes to shuttle construction workers into the project area from an off-site parking area (N-8). The construction trips for Phase II would generate approximately 112–224 ADT. Table L lists the expected addition of construction trips on the neighborhood streets and the increase in noise generated by the additional construction trips for Phase II. As shown in Table L, the increase in traffic noise would be as much as 0.6 dBA and would not exceed 60 dBA L_{dn} along all street segments in the project area. Similarly, short-term pass-by noise would not result in any significant traffic noise impacts during construction. Therefore, the incremental increase in noise due to the additional construction trips in the project area for Phase II would not result in significant traffic noise impacts to nearby residences and park users.

Construction Noise Impact (Phase II). Phase II of construction would take place in one location of the project site. As in Phase I, construction activity would require the use of heavy-tracked construction equipment.

Noise Impacts from Demolition of the Existing Central Plant, Demolition of the Existing Parking Structure, Construction of the Diagnostic and Treatment Building, Construction of the Patient Pavilions, and the Partial Remodel of the Centennial Building and Building E. Construction activities would generate a maximum noise level of 91 dBA L_{max} at 50 feet The following describes the potential noise impacts for each land use adjacent to this construction activity.

Office Buildings. The shortest distance from these office buildings located across the street along Junipero Street and Oak Park Lane to the Phase II construction activities is approximately 75 feet. The office buildings would experience a maximum noise level of up to 88 dBA L_{max}. Employees associated with the office buildings would be exposed to occasional high noise levels generated by this construction phase. Because construction activity is intermittent in nature, construction noise from the project site would not result in the exceedance of the 75 dBA L_{dn} exterior noise

Table L: Phase II Street Noise Analysis

Roadway Segment	Existing ADT	Phase II Construction ADT	Percent Increase	Existing L_{dn} (dBA) 50 feet from Centerline of Outermost Lane	Increase in Noise Level (dBA)
Junipero Street					
Between Bath Street and Castillo Street	2,805	224	8%	55.2	0.3
Between Castillo Street and Oak Park Lane	3,660	224	6%	56.4	0.3
West of Oak Park Lane	4,000	224	6%	56.7	0.3
Pueblo Street					
Between Bath Street and Castillo Street	4,030	224	6%	56.8	0.3
Between Castillo Street and Oak Park Lane	4,355	224	5%	57.1	0.3
West of Oak Park Lane	4,710	224	5%	57.5	0.3
Bath Street					
Between Junipero Street and Pueblo Street	3,665	112	3%	56.4	0.2
South of Pueblo Street	3,150	224	7%	55.7	0.3
Oak Park Lane					
Between Junipero Street and Pueblo Street	745	112	15%	49.4	0.6

Source: LSA Associates, Inc., August 2004.

standard and the 50 dBA L_{dn} interior noise standard for commercial uses at these office buildings. Office workers would experience maximum noise levels of 64 dBA (with windows closed) to 76 dBA (with windows open) L_{max}. This range of interior noise levels would potentially distract workers inside the office buildings. Although not required based on the L_{dn} noise standard, temporary noise walls up to 8 feet high are recommended to reduce maximum construction noise inside these office buildings.

With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction), and Mitigation Measure N-4 (requiring the best available noise control technology for all construction equipment), and the recommended construction barriers, potential construction noise impacts on the office buildings would be reduced to less than significant.

Residential. The shortest distance from residences along the north side of Junipero Street and the west side of Oak Park Lane to the Phase II construction activities is approximately 75 feet. These residences would experience a potential maximum noise level of up to 88 dBA L_{max}. The maximum daytime noise threshold of 75 dBA L_{max} would be exceeded and community annoyance would occur.

To reduce noise levels at these residences, temporary noise barriers would be placed between the construction area and these residences as prescribed in Mitigation Measure N-5. Figure 5 shows the temporary noise barrier locations for Phase II construction activities. With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction), Mitigation Measure N-4 (requiring the best available noise control technology for all construction equipment), and Mitigation Measure N-5 (requiring temporary construction barriers along the construction areas in the vicinity of outdoor active use areas), potential construction noise impacts on the residences would be reduced to the extent feasible. **However, unavoidable adverse noise impacts on the residences from the Phase II construction activities would remain.**

Hospital. The shortest distance from the hospital building located on the east side immediately adjacent to the Phase II construction to the construction activities is approximately 50 feet. The hospital would experience a potential maximum noise level of up to 91 dBA L_{max}. Because construction activity is intermittent in nature, construction noise from the project site would not result in the exceedance of the 60 dBA L_{dn} exterior noise standard and the 45 dBA L_{dn} interior noise standard for hospital uses. Hospital patients and workers would experience maximum noise levels of 67 dBA (with windows closed) to 79 dBA (with windows open) L_{max}. This range of interior noise levels would potentially annoy the patients and distract workers inside the hospital. Although not required based on the L_{dn} noise standard, temporary noise walls up to 8 feet high are recommended to reduce maximum construction noise inside the hospital building.

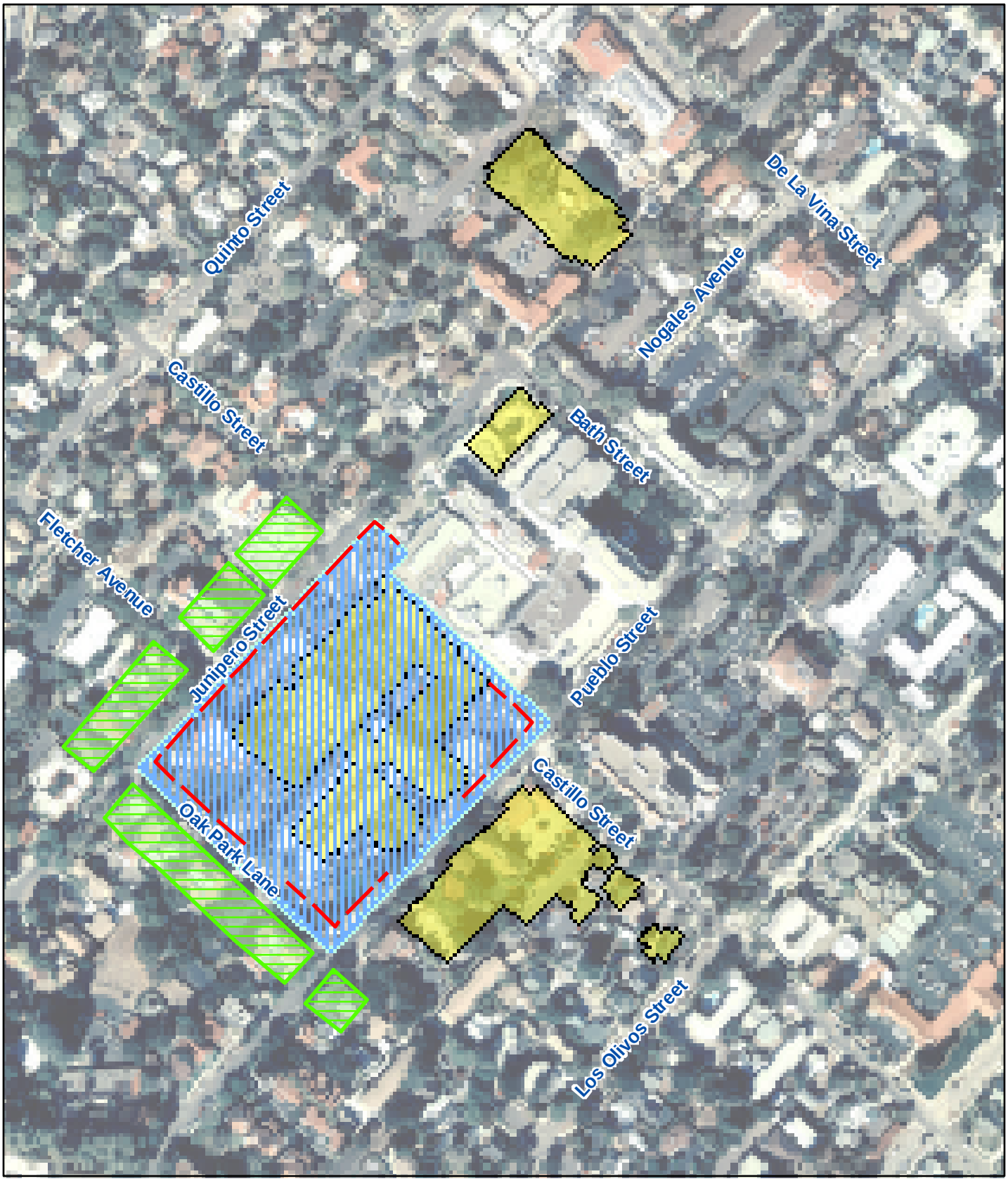

FIGURE 5

L S A

LEGEND

- Temporary Noise Barrier
- Crack and Video Survey Areas
- Buildings Being Demolished
- New Building

N

0 250 500

Feet

Santa Barbara Cottage Hospital
Seismic Compliance and Modernization Plan

Temporary Noise Barrier Locations and Crack Survey and Video Reconnaissance Area for Phase II

Source: Lee, Burkhart, Liu (April 2004), City of Santa Barbara

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With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction), Mitigation Measure N-4 (requiring the best available noise control technology for all construction equipment), and the recommended construction barriers, potential construction noise impacts on the hospital buildings would be reduced to less than significant.

Oak Park. Oak Park is located approximately 500 feet northwest of the Phase II construction activity. The park would experience maximum noise levels up to 71 dBA L_{max}. This noise level would not exceed the daytime maximum noise threshold of 75 dBA L_{max}. **No significant Phase II construction noise impact would occur at the park.**

Construction Vibration Impact (Phase II). Phase II of the proposed project construction would take place in one area of the project site. During this phase, construction activity would require the use of heavy-tracked construction equipment, which may cause vibration impacts.

Vibration Impacts from Demolition of the Existing Central Plant, Demolition of the Existing Parking Structure, Construction of the Diagnostic and Treatment Building, Construction of the Patient Pavilions, and the Partial Remodel of the Centennial Building and Building E. Construction activities would generate a maximum vibration level of 95 VdB at 50 feet. The following describes the potential vibration impact for each land use adjacent to this construction activity.

Office Buildings. The shortest distance from these office buildings located across the street along Junipero Street and Oak Park Lane to the Phase II construction activity is approximately 75 feet. The office buildings would experience a vibration level of up to 92 VdB. This vibration level would not result in structural damage. To ensure that adjacent structures are not damaged as of result of construction activities, Mitigation Measure N-2 (a crack survey and video reconnaissance) shall be implemented. See Figure 5 for crack survey and video reconnaissance locations for Phase II construction. **Therefore, unavoidable adverse Phase II construction vibration impacts upon adjacent medical office uses would remain.**

Residential. The shortest distance from residences located along the north side of Junipero Street and the west side of Oak Park Lane to the Phase II construction activity is approximately 75 feet. These residences would experience a potential vibration level up to 92 VdB. This vibration level would result in community annoyance. However, it would not result in structural damage. To ensure that adjacent structures are not damaged as of result of construction activities, Mitigation Measure N-2 (a crack survey and video reconnaissance) shall be implemented . See Figure 5 for crack survey and video reconnaissance locations for Phase II. **Therefore, unavoidable adverse Phase II construction vibration impacts upon adjacent residential uses would remain.**

Hospital. The hospital building would experience significant vibration impacts from construction activities. The shortest distance from the hospital building located on the east side immediately

adjacent to the construction site to the Phase II construction activity is approximately 50 feet. The hospital would experience a vibration level lower than 95 VdB.. This vibration level would result in annoyance to hospital patients, employees, and visitors. However, it would not result in structural damage. Mitigation Measure N-1 (coordination with SBCH on location of construction equipment) would ensure that the construction vibration does not affect vibration-sensitive equipment within any of the hospital buildings. **Therefore, significant unavoidable adverse Phase II construction vibration impacts upon adjacent hospital uses would remain.**

Oak Park. Oak Park is located approximately 500 feet northwest of the Phase II construction activity. The park would experience a vibration level up to 75 VdB. **This level of outdoor vibration would not affect the park users.**

Construction Phase III

Construction Phase III consists of the partial remodeling of the South, East, and Centennial Buildings; the demolition of the North Wing, West Wing, Reeves and Central Wing; and construction of the Diagnostic and Treatment Extension and Nursing Pavilion. Noise-sensitive land uses immediately adjacent to Junipero Street and Pueblo Street would potentially be affected by short-term, intermittently high noise levels due to construction activities occurring near the project boundary. Sensitive land uses surrounding this construction phase are shown in Figure 4.9.3 in the Land Use section of the EIR. This construction phase is estimated to take approximately two and one-half years within which the applicant proposes four different subphases of work.

Construction Commute and Transport of Construction Equipment Impact (Phase III). During this phase, vehicular traffic would include the commute of construction workers and the transport of construction equipment to the project site. Construction workers would be shuttled into the project area from an off-site parking site. Construction equipment would also be transported to and from the project site (N-8). The construction trips for Phase III would generate approximately 116 ADT. Table M lists the expected construction trips on the neighborhood streets for Phase III and the increase in noise. As shown in Table M, the traffic noise would increase up to 0.3 dBA and would not exceed 60 dBA L_{dn} along all street segments in the project area. Similarly, short-term pass-by noise would not result in any significant traffic noise impacts during construction. **Therefore, the incremental increase in noise due to the additional construction trips for Phase III would not result in a significant traffic noise impact to residences and park users.**

Construction Noise Impact (Phase III). Phase III of construction would take place at one concentrated location of the project area.

Noise Impact from Partial Remodeling of the South, East, and Centennial Buildings; the Demolition of the North Wing, West Wing, Reeves and Central Wing; and Construction of the Diagnostic and Treatment Extension and Nursing Pavilion. Construction activities would generate a maximum noise level of 91 dBA L_{max} at 50 feet. The following describes the potential noise impacts for each land use adjacent to this construction activity.

Table M: Phase III Street Noise Analysis

Roadway Segment	Existing ADT	Phase III Construction ADT	Percent Increase	Existing L_{dn} (dBA) 50 Feet from Centerline of Outermost Lane	Increase in Noise Level (dBA)
Junipero Street					
Between Bath Street and Castillo Street	2,805	161	6%	55.2	0.3
Between Castillo Street and Oak Park Lane	3,660	161	4%	56.4	0.2
West of Oak Park Lane	4,000	161	4%	56.7	0.2
Pueblo Street					
Between Bath Street and Castillo Street	4,030	161	4%	56.8	0.2
Between Castillo Street and Oak Park Lane	4,355	161	4%	57.1	0.2
West of Oak Park Lane	4,710	161	3%	57.5	0.1
Bath Street					
Between Junipero Street and Pueblo Street	3,665	161	4%	56.4	0.2
South of Pueblo Street	3,150	161	5%	55.7	0.2

Source: LSA Associates, Inc., August 2004.

Office Buildings. Office buildings would potentially experience significant noise levels from construction activities. The shortest distance from the office buildings located across the street along Junipero Street and Pueblo Street to the Phase III construction activity is approximately 115 feet. The office buildings would experience a maximum noise level of up to 84 dBA L_{max}. The maximum daytime noise threshold of 75 dBA L_{max} would be exceeded. Employees associated with the office buildings would be exposed to occasional high noise levels generated by this construction phase. Because construction activity is intermittent in nature, construction noise from the project site would not result in the exceedance of the 75 dBA L_{dn} exterior noise standard and the 50 dBA L_{dn} interior noise standard for commercial uses at these office buildings. Office workers would experience maximum noise levels of 60 dBA (with windows closed) to 72 dBA (with windows open) L_{max}. This range of interior noise levels would potentially distract workers inside the office buildings. Although not required based on the L_{dn} noise standard, temporary noise walls up to 8 feet high are recommended to reduce maximum construction noise inside these office buildings.

With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction), Mitigation Measure N-4 (requiring the best available noise control technology for all construction equipment), and the recommended construction barriers, potential construction noise impacts on the office buildings would be reduced to less than significant.

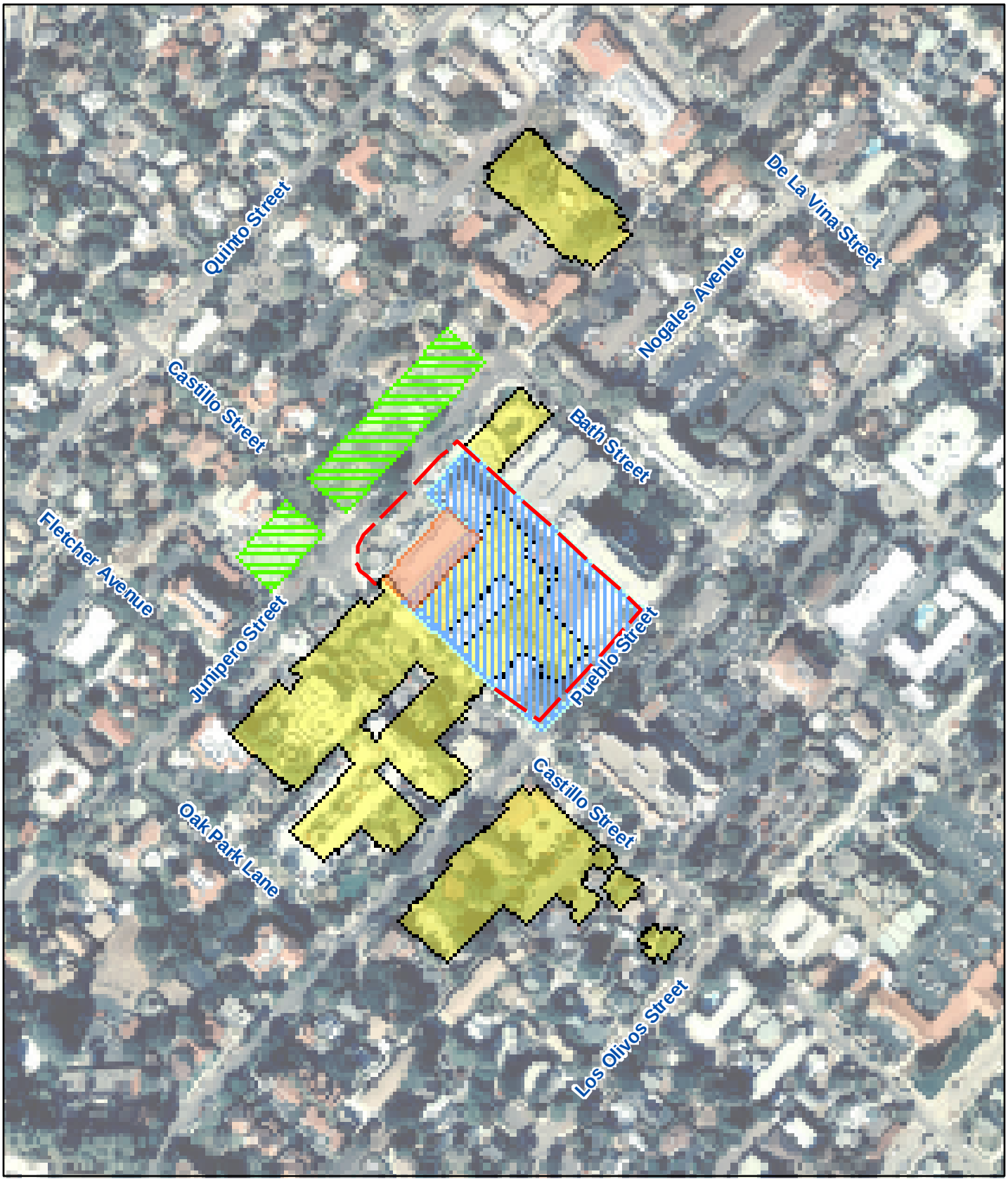
Residential. The shortest distance from the residences located along Castillo Street north of Junipero Street to the Phase III construction activity is approximately 210 feet. These residences would experience a maximum noise level up to 79 dBA L_{max}. The maximum daytime noise threshold of 75 dBA L_{max} would be exceeded, and community annoyance would occur.

To reduce noise levels at these residences, temporary noise barriers would be placed between the construction area and these residences as prescribed in Mitigation Measure N-5. Figure 6 shows the temporary noise barrier locations for Phase III construction. With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction), Mitigation Measure N-4 (requiring the best available noise control technology for all construction equipment), and Mitigation Measure N-5 (requiring temporary construction barriers along the construction areas in the vicinity of outdoor active use areas), potential construction noise impacts on the residences would be reduced to the extent feasible. **However, unavoidable adverse noise impacts on the residences from the Phase III construction activities would remain.**

Hospital. The shortest distance from the hospital building located both on the east and west sides immediately adjacent to the construction site to the Phase III construction activity is approximately 50 feet. Because construction activity is intermittent in nature, construction noise from the project site would not result in the exceedance of the 60 dBA L_{dn} exterior noise standard and the 45 dBA L_{dn} interior noise standard for hospital uses. Hospital patients and workers would experience maximum noise levels of 67 dBA (with windows closed) to 79 dBA (with windows open) L_{max}. This range of interior noise levels would potentially annoy the patients and distract workers inside the hospital. Although not required based on the L_{dn} noise standard, temporary noise walls up to 8 feet high are recommended to reduce maximum construction noise inside the hospital building.

With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction), Mitigation Measure N-4 (requiring the best available noise control technology for all construction equipment), and the recommended construction barriers, potential construction noise impacts on the hospital buildings would be reduced to less than significant.

Oak Park. Oak Park is located approximately 850 feet northwest of the Phase III construction activity. The park would experience a maximum noise level up to 66 dBA L_{max}. This noise level would not exceed the daytime maximum noise threshold of 75 dBA L_{max}. **Therefore, Phase III construction activities would not have a significant noise impact on park uses.**



L S A

LEGEND

- Temporary Noise Barrier
- Crack and Video Survey Areas
- Buildings Being Demolished
- Buildings Being Remodeled
- New Building

N

0 250 500

Feet

FIGURE 6

Santa Barbara Cottage Hospital
Seismic Compliance and Modernization Plan

Temporary Noise Barrier Locations and Crack Survey and Video Reconnaissance Area for Phase III

Source: Lee, Burkhart, Liu (April 2004), City of Santa Barbara

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Construction Vibration Impact (Phase III). Phase III of the proposed project construction would take place in one area of the project site.

Vibration Impact from Partial Remodeling of the South, East, and Centennial Buildings; the Demolition of the North Wing, West Wing, Reeves and Central Wing; and Construction of the Diagnostic and Treatment Extension and Nursing Pavilion. Construction activities would generate maximum vibration levels up to 95 VdB at 50 feet. The following describes the potential vibration impacts for each land use adjacent to this construction activity.

Office Buildings. The shortest distance from office buildings located across the street along Junipero Street and Pueblo Street to the Phase III construction activity is approximately 115 feet. The office buildings would experience a vibration level up to 88 VdB. This vibration level would not result in structural damage. To ensure that adjacent structures are not damaged as of result of construction activities, Mitigation Measure N-2 (a crack survey and video reconnaissance) shall be implemented. See Figure 6 for crack survey and video reconnaissance locations for Phase III construction. **Therefore, unavoidable adverse Phase III construction vibration impacts upon adjacent medical office uses would remain.**

Residential. The shortest distance from these residences located along Castillo Street north of Junipero Street to the Phase III construction activity is approximately 210 feet. These residences would experience a vibration level of up to 83 VdB. Construction activities would result in community annoyance at these residences. However, they would not result in structural damage. To ensure that adjacent structures are not damaged as a result of construction activities, Mitigation Measure N-2 (a crack survey and video reconnaissance) shall be implemented. See Figure 6 for crack survey and video reconnaissance locations for Phase III construction. **Therefore, unavoidable adverse Phase III construction vibration impacts upon adjacent residential uses would remain.**

Hospital. The shortest distance from the hospital building located on both the east and west sides immediately adjacent to the Phase III construction site to the construction activity is approximately 50 feet. The hospital building would experience a vibration level lower than 95 VdB. This vibration level would not result in structural damage. Mitigation Measure N-1 (coordination with SBCH on location of construction equipment) would ensure that the construction vibration does not affect vibration sensitive equipment within any of the hospital buildings. **Therefore, unavoidable adverse Phase III vibration impacts upon adjacent hospital uses would remain.**

Oak Park. Oak Park is located approximately 850 feet northwest of the Phase III construction activity. The park would experience a vibration level up to 70 VdB. **This level of outdoor vibration would not affect the park users.**

Construction Phase IV

Construction Phase IV consists of the remodeling of the South and East wings. Noise-sensitive land uses immediately adjacent to Junipero Street, Bath Street, and Pueblo Street would potentially be affected by short-term, intermittently high noise levels. Sensitive land uses surrounding this construction phase are shown in Figure 4.9.3 in Chapter 4.0. This construction phase is estimated to take approximately one year.

Construction Commute and Transport of Construction Equipment Impact (Phase IV). During this phase, vehicular traffic would include the commute of construction employees and the transport of construction equipment. The applicant proposes to shuttle construction workers into the project area from an off-site parking area (N-8). The construction trips during Phase IV would generate approximately 70 ADT. Table N lists the forecast addition of construction trips on the neighborhood streets for Phase IV and the increase in traffic noise. As shown in Table N, the increase in noise would be as much as 0.1 dBA and would not exceed 60 dBA L_{dn} along all street segments in the project area. Similarly, short-term pass-by noise would not result in any significant traffic noise impacts. **Therefore, the incremental increase in noise due to the additional construction trips in the project area for Phase IV would not result in significant traffic noise impacts to residences and park users.**

Construction Noise Impact (Phase IV). During this phase, construction activity would not require the use of heavy-tracked construction equipment as the phase involves interior remodeling. No land uses surrounding the remodeling activity would be exposed to any high exterior noise levels that would result in community annoyance. **Therefore, construction in Phase IV would not a have a significant noise impact on adjacent sensitive land uses. Therefore, construction in Phase IV would not a have a significant noise impact on adjacent sensitive land uses.**

Construction Vibration Impact (Phase IV). The construction of Phase IV would not require the use of heavy construction equipment. No land uses surrounding the remodeling activity would be exposed to high vibration levels that would result in community annoyance. **Therefore, construction in Phase IV would not a have a significant vibration impact on adjacent sensitive land uses.**

Table N: Phase IV Street Noise Analysis

Roadway Segment	Existing ADT	Phase IV Construction ADT	Percent Increase	Existing L_{dn} (dBA) 50 feet from Centerline of Outermost Lane	Increase in Noise Level (dBA)
Junipero Street					
Between Bath Street and Castillo Street	2,805	70	2%	55.2	0.1
Between Castillo Street and Oak Park Lane	3,660	70	2%	56.4	0.1
West of Oak Park Lane	4,000	70	2%	56.7	0.1
Pueblo Street					
Between Bath Street and Castillo Street	4,030	70	2%	56.8	0.1
Bath Street					
Between Junipero Street and Pueblo Street	3,665	70	2%	56.4	0.1
South of Pueblo Street	3,150	70	2%	55.7	0.1

Source: LSA Associates, Inc., August 2004.

Construction Noise and Vibration Impact—Conclusion

Construction operations are considered short term and not sustained at any single location. Implementation of Mitigation Measures N-1 through N-12 (specified hours of construction, placement of temporary noise barriers, preparation of a crack survey and video reconnaissance, shuttling construction employees to and from an off-site parking site, and other construction-related mitigation measures) described below would reduce construction noise impacts. **There are no established quantitative thresholds to evaluate construction noise and vibration impacts on sensitive land uses. However, because construction of the proposed project would result in high noise levels at some sensitive receptor locations over a construction period of nine years, construction activities of the proposed project are considered to cause significant noise and vibration impacts at the surrounding land uses.**

Specific Plan Construction Noise Impacts

For the purposes of this EIR analysis, build out of the Specific Plan (SP-8) would consist of demolishing those portions of the hospital that are planned to be remodeled and reconstruction of that portion of the hospital pursuant to Alquist Act standards or subsequent State standards that would be in effect for acute care facilities. Potential future development that could take place under SP-8 would be in roughly the same physical area as the proposed remodeling of buildings in Construction Phase IV. The impacts from demolition, reconstruction, and remodeling for any potential future development as part of SP-8 would be similar to the project-specific impacts of any additional development beyond what is specified in the proposed project. The primary difference is that there is

a possibility of more demolition after completion of the proposed project's final construction phase. The hospital would remain operational during the entire construction duration of the potential future development in order to maintain existing hospital services and minimize disruption to patient care.

Specific Plan Construction Noise Impacts. Future developments allowed under the proposed Specific Plan would require the transport of construction employees, transport of construction equipment, and the use of heavy-tracked construction equipment. Construction activities would generate a maximum noise level of 91 dBA L_{max} at 50 feet. Sensitive land uses surrounding this construction phase are shown in Figure 4.9.3 in Chapter 4.0. The following describes the potential noise impact for each land use adjacent to this construction activity.

Office Buildings. Office buildings would experience potentially significant noise levels from construction activities. The shortest distance from these office buildings located across the street along Junipero Street, Bath Street, and Pueblo Street to the Specific Plan construction activity is approximately 75 feet. The office buildings would experience maximum noise levels of up to 88 dBA L_{max}. Employees associated with the office buildings would be exposed to occasional high noise levels generated by construction activities. With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction) and Mitigation Measure N-4 (requiring the best available noise control technology for all construction equipment), potential construction noise impacts on the office buildings would be reduced to the extent feasible. **However, unavoidable adverse noise impacts on the office buildings from the Specific Plan construction activities would remain.**

Residential. The shortest distance from residences located along Castillo Street north of Junipero Street to the Specific Plan construction activity is approximately 320 feet. These residences would experience a maximum noise level up to 75 dBA L_{max}. Because construction activities would not exceed the City's daytime exterior noise threshold of 75 dBA L_{max}, no exterior mitigation measures are required.

With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction), Mitigation Measure N-4 (requiring the best available noise control technology for all construction equipment), and Mitigation Measure N-5 (requiring temporary construction barriers along the construction areas in the vicinity of outdoor active use areas), potential construction noise impacts on the residences would be reduced to the extent feasible. **However, unavoidable adverse noise impacts on the residences from the Specific Plan construction activities would remain.**

Hospital. The shortest distance from the hospital building located on the west side immediately adjacent to the construction site to the Specific Plan construction activity is approximately 50 feet. The hospital would experience a potential maximum noise level of up to 91 dBA L_{max}. Patients, employees, and visitors associated with the hospital would be exposed to occasional high noise levels generated by construction activity. With the implementation of Mitigation Measure N-3 (limiting the permitted hours of construction) and Mitigation Measure N-4

(requiring the best available noise control technology for all construction equipment), potential construction noise impacts on the hospital buildings would be reduced to the extent feasible. **However, unavoidable adverse noise impacts on the hospital buildings from the Specific Plan construction activities would remain.**

Oak Park. Oak Park is located approximately 1,000 feet northwest of the Specific Plan construction site. The park would experience a maximum noise level up to 65 dBA L_{max}. **Noise levels would not exceed the daytime maximum noise threshold of 75 dBA L_{max} and therefore would not be significant.**

Similar to the proposed project construction, noise generated from the Specific Plan construction activities would be short-term and not sustained at any single location. Implementation of Mitigation Measures N-1 through N-12 (specified hours of construction, placement of temporary noise barriers, preparation of a crack survey and video reconnaissance, shuttling construction employees to and from an off-site parking site, and other construction-related mitigation measures) described below would reduce construction noise impacts. **There are no established thresholds to evaluate construction noise and vibration impacts on sensitive land uses. However, because construction of the Specific Plan would result in high noise levels over an extended period of time in addition to the initial construction period of nine years; the proposed Specific Plan construction activities would cause significant noise and vibration impact at the surrounding land uses.**

Specific Plan Construction Vibration Impacts. Future development allowed under the Specific Plan would require heavy-tracked construction equipment, which would generate a vibration level of 95 VdB at 50 feet. The following describes the potential vibration impact for each land use adjacent to this construction activity.

Office Buildings. Office buildings would experience potential vibration impacts from construction activities. The shortest distance from the office buildings located across the street along Junipero Street, Bath Street, and Pueblo Street to the Specific Plan construction activity is approximately 75 feet. The office buildings would experience vibration levels of up to 92 VdB. These vibration levels would not result in structural damage.

To ensure that adjacent structures are not damaged as of result of construction activities, Mitigation Measure N-2 (a crack survey and video reconnaissance) shall be implemented. See Figure 6 for crack survey and video reconnaissance locations for Specific Plan construction. **Therefore, unavoidable adverse Specific Plan construction vibration impacts upon adjacent medical office uses would remain.**

Residential. Residences would experience potential vibration impacts from construction activities. The shortest distance from residences located along Castillo Street north of Junipero Street to the Specific Plan construction activity is approximately 320 feet. These residences would experience a vibration level of up to 79 VdB. This vibration level would not result in structural damage.

To ensure that adjacent structures are not damaged as of result of construction activities, Mitigation Measure N-2 (a crack survey and video reconnaissance) shall be implemented. See Figure 6 for crack survey and video reconnaissance locations for Specific Plan construction. **Therefore, unavoidable adverse Specific Plan construction vibration impacts upon adjacent residential uses would remain.**

Hospital Building. The hospital building would experience potential vibration impacts from construction activities. The shortest distance from the hospital building located on the west side immediately adjacent to the construction site to the Specific Plan construction activity is approximately 50 feet. The hospital would experience a vibration level lower than 95 VdB. This vibration level would not result in structural damage. Mitigation Measure N-1 (coordination with SBCH on location of construction equipment) would ensure that the construction vibration does not affect vibration sensitive equipment within any of the hospital buildings. **Therefore, unavoidable adverse Specific Plan construction vibration impacts upon adjacent hospital uses would remain.**

Oak Park. Oak Park is located approximately 1,000 feet northwest of the Specific Plan construction site. The park would experience a vibration level of up to 69 VdB. **This level of outdoor vibration would not affect the park users.**

Traffic Noise Impact

Vehicular traffic noise associated with the proposed hospital modernization project would potentially impact on-site and off-site sensitive land uses. Table O shows the future without the proposed project traffic noise levels. Table P shows the future with the proposed project traffic noise levels. These noise levels represent the worst-case scenario, which assumes that no shielding is provided between the traffic and the location where the noise contours are drawn. The specific assumptions used in developing these noise levels and the model printouts are provided in Appendix H of this EIR.

Table P shows that the 70, 65, and 60 dBA L_{dn} traffic noise contours with the project-generated traffic would be confined within the right-of-way along Junipero Street, Pueblo Street, Bath Street, and Oak Park Lane. These streets are immediately adjacent to the project site. No on-site noise-sensitive land uses would experience traffic noise levels exceeding 60 dBA L_{dn}. Therefore, traffic noise levels along streets immediately adjacent to the project site would not result in any significant on-site noise impact.

As shown in Table P, traffic noise remains low to moderate under the future with project conditions. The project-related traffic would result in a noise level increase of 1.5 dBA for Junipero Street, 1.2 dBA for Pueblo Street, 1.8 dBA for Bath Street, 2.6 dBA for Castillo Street, and 4.7 dBA for Oak Park Lane. The potential increase in traffic noise along Oak Park Lane would be caused by a significant increase in traffic volume due to the proposed closure of Castillo Street between Junipero Street and Pueblo Street. Pursuant to the impact guidelines in Threshold of Significance section, a significant traffic noise impact on sensitive land uses would result when both of the following criteria are met: (1) the noise levels exceed City noise standards, and (2) there is an increase in noise levels of

Table O: Future Noise Levels without Project Traffic

Roadway Segment	ADT	Centerline to 70 L_{dn} (feet)	Centerline to 65 L_{dn} (feet)	Centerline to 60 L_{dn} (feet)	L_{dn} (dBA) 50 feet from Centerline of Outermost Lane
Junipero Street					
Between Bath Street and Castillo Street	3,085	< 50[1]	< 50	< 50	55.6
Between Castillo Street and Oak Park Lane	3,955	< 50	< 50	< 50	56.7
West of Oak Park Lane	4,360	< 50	< 50	< 50	57.1
Nogales Avenue					
West of De La Vina Street	1,050	< 50	< 50	< 50	50.9
Pueblo Street					
East of De La Vina Street	2,420	< 50	< 50	< 50	54.6
Between De La Vina Street and Bath Street	3,430	< 50	< 50	< 50	56.1
Between Bath Street and Castillo Street	4,355	< 50	< 50	< 50	57.1
Between Castillo Street and Oak Park Lane	4,720	< 50	< 50	< 50	57.5
West of Oak Park Lane	5,130	< 50	< 50	< 50	57.8
Mission Street					
East of De La Vina Street	18,560	< 50	76	161	65.8
Between De La Vina Street and Bath Street	23,020	< 50	87	185	66.7
Between Bath Street and Castillo Street	27,815	< 50	99	210	67.6
West of Oak Park Lane	33,630	54	112	238	68.4
De La Vina Street					
North of Nogales Avenue	8,990	< 50	< 50	58	60.3
Between Nogales Avenue and Pueblo Street	9,445	< 50	< 50	60	60.5
South of Pueblo Street	9,220	< 50	< 50	59	60.4
North of Mission Street	11,510	< 50	< 50	69	61.3
South of Mission Street	12,920	< 50	< 50	74	61.8
Bath Street					
North of Junipero Street	3,170	< 50	< 50	< 50	55.7
Between Junipero Street and Pueblo Street	3,995	< 50	< 50	< 50	56.7
South of Pueblo Street	4,570	< 50	< 50	< 50	57.3
North of Mission Street	6,120	< 50	< 50	< 50	58.6
South of Mission Street	4,890	< 50	< 50	< 50	57.6
Castillo Street					
North of Junipero Street	1,830	< 50	< 50	< 50	53.3
Between Junipero Street and Pueblo Street	2,665	< 50	< 50	< 50	55.0
South of Pueblo Street	3,980	< 50	< 50	< 50	56.7
North of Mission Street	5,910	< 50	< 50	< 50	58.4
South of Mission Street	4,270	< 50	< 50	< 50	57.0
Oak Park Street					
Between Junipero Street and Pueblo Street	810	< 50	< 50	< 50	49.8
South of Pueblo Street	1,060	< 50	< 50	< 50	51.0

Source: LSA Associates, Inc., June 2004.

[1] Traffic noise within 50 feet of a roadway centerline is not provided by the noise model. Site-specific features such as topography or barriers need to be included in the detailed analysis for location-specific impact analysis.

Table P: Future Noise Levels with Project Traffic

Roadway Segment	ADT	Centerline to 70 L_{dn} (feet)	Centerline to 65 L_{dn} (feet)	Centerline to 60 L_{dn} (feet)	L_{dn} (dBA) 50 feet from Centerline of Outermost Lane	Change from No Project level (dBA)
Junipero Street						
Between Bath Street and Castillo Street	4,305	< 50[1]	< 50	< 50	57.1	1.5
Between Castillo Street and Oak Park Lane	4,730	< 50	< 50	< 50	57.5	0.8
West of Oak Park Lane	5,950	< 50	< 50	< 50	57.7	0.6
Nogales Avenue						
South of De La Vina Street	1,050	< 50	< 50	< 50	50.9	0.0
Pueblo Street						
East of De La Vina Street	2,470	< 50	< 50	< 50	54.7	0.1
Between De La Vina Street and Bath Street	3,580	< 50	< 50	< 50	56.3	0.2
Between Bath Street and Castillo Street	5,630	< 50	< 50	< 50	58.2	1.1
Between Castillo Street and Oak Park Lane	6,265	< 50	< 50	< 50	58.7	1.2
West of Oak Park Lane	5,540	< 50	< 50	< 50	58.2	0.4
Mission Street						
East of De La Vina Street	18,560	< 50	76	161	65.8	0.0
Between De La Vina Street and Bath Street	23,020	< 50	87	185	66.7	0.0
Between Bath Street and Castillo Street	28,080	< 50	99	211	67.6	0.0
West of Oak Park Lane	34,130	55	113	240	68.5	0.1
De La Vina Street						
North of Nogales Avenue	9,000	< 50	< 50	58	60.3	0.0
Between Nogales Avenue and Pueblo Street	9,455	< 50	< 50	60	60.5	0.0
South of Pueblo Street	9,220	< 50	< 50	59	60.4	0.0
North of Mission Street	11,510	< 50	< 50	69	61.3	0.0
South of Mission Street	12,920	< 50	< 50	74	61.8	0.0
Bath Street						
North of Junipero Street	4,080	< 50	< 50	< 50	56.8	1.1
Between Junipero Street and Pueblo Street	5,990	< 50	< 50	< 50	58.5	1.8
South of Pueblo Street	4,850	< 50	< 50	< 50	57.6	0.3
North of Mission Street	6,400	< 50	< 50	< 50	58.8	0.2
South of Mission Street	4,910	< 50	< 50	< 50	57.6	0.0
Castillo Street						
North of Junipero Street	3,310	< 50	< 50	< 50	55.9	2.6
South of Pueblo Street	4,530	< 50	< 50	< 50	57.3	0.6
North of Mission Street	6,260	< 50	< 50	< 50	58.7	0.3
South of Mission Street	4,370	< 50	< 50	< 50	57.1	0.1
Oak Park Lane						
Between Junipero Street and Pueblo Street	2,380	< 50	< 50	< 50	54.5	4.7
South of Pueblo Street	1,060	< 50	< 50	< 50	51.0	0.0

Source: LSA Associates, Inc., June 2004.

[1] Traffic noise within 50 feet of a roadway centerline is not provided by the noise model. Site-specific features such as topography or barriers need to be included in the detailed analysis for location-specific impact analysis.

3 dBA or more. Oak Park Lane is the only street that would experience a traffic noise increase of 3 dBA or more. However, the 60 dBA L_{dn} contour would remain confined within the roadway right-of-way. Sensitive land uses along Oak Park Lane would not experience traffic noise levels exceeding the City's noise standard of 60 dBA L_{dn}. Therefore, the proposed project would not result in any significant off-site traffic noise impact.

Helicopter Noise Impacts

Noise associated with the proposed helicopter operations would potentially impact on-site and off-site sensitive land uses. The City of Santa Barbara previously approved a helipad location on the northwest corner of Pueblo Street and Castillo Street for the existing hospital; however, that helipad was never built. The proposed project proposes to provide a helipad on top of a reconstructed three-story SBCH building approximately 240 feet south of Castillo Street.

Table Q indicates maximum noise levels generated from helicopter noise for single-event noise measurements at six monitoring locations as identified in the AAAI Report. Figure 7 shows helicopter noise monitoring locations. Residences and office buildings located near Monitoring Location 4 would experience maximum noise levels up to 93.3 dBA L_{max}. The hospital rooftop exterior at Monitoring Location 5A would be exposed to maximum noise levels of 97.5 dBA $L_{max.}$ The hospital sixth floor interior at Monitoring Location 5B would potentially be exposed to 56.8 dBA L_{max}. At all five exterior monitoring sites, the maximum helicopter noise levels would exceed the daytime noise threshold of 75 dBA L_{max} and nighttime noise threshold of 70 dBA L_{max}. Therefore, land uses surrounding the proposed helicopter flight paths would be subject to high noise levels and result in community annoyance. To minimize the high noise levels generated by helicopter operations, nighttime helicopter operations should be limited with the exception of emergencies as prescribed in Mitigation Measure N-13.

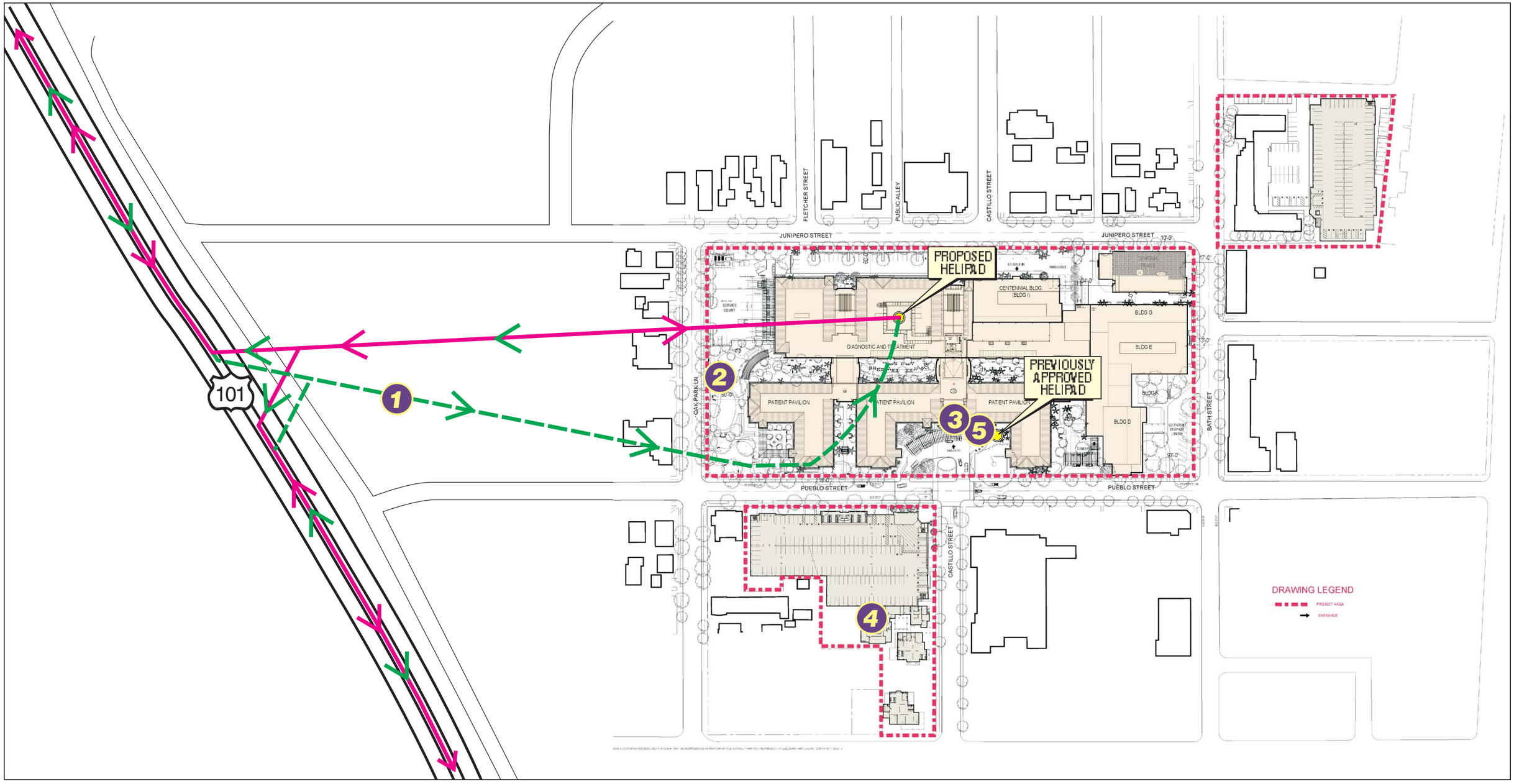
As estimated by SBCH, helicopter approach and departure operations would occur up to twice per week and would have a duration of approximately two minutes. Therefore, a maximum of one helicopter event per day would occur. Events that occur during nighttime hours (10:00 p.m. to 7:00 a.m.) have a larger noise impact on surrounding sensitive uses than events during daytime hours. Therefore, a maximum of one helicopter event per day would occur as a worst-case scenario. Events that occur during nighttime hours (10:00 p.m. to 7:00 a.m.) have a larger noise impact on surrounding sensitive uses than events during daytime hours. Therefore, the analysis evaluates the worst-case scenario of helicopter operations occurring during nighttime hours. Noise levels generated by helicopter operations during the daytime hours between the hours of 7:00 a.m. and 10:00 p.m. is found to be less than significant, as described below. Although a maximum of only one event per day is anticipated by SBCH, there is a possibility of additional flights due to the increase in demand for emergency services or in the event of a major emergency. Therefore, the following analysis evaluated noise impacts from one nighttime event to two nighttime events per day:

Day-Night Noise Levels for One Landing and One Takeoff During Nighttime Hours. Table R shows the day-night average sound levels of a single helicopter event in a 24-hour period. This helicopter event (consisting of one landing and one takeoff) is assumed to occur during nighttime hours as a worst-case scenario for time of day. Table R shows that Monitoring Locations 3 (Hospital/Office; see Table R and 5A (Hospital Exterior, see Table R) would be exposed to noise

Table Q: Summary of Measured Helicopter Single Events around Santa Barbara Cottage Hospital (January 5, 1999) (See Figure 7)

Operational Condition	Type of Operation	Event Time	SEL (dB)	L_{max}	Duration (min:sec)
Site 1 Northwest Corner of Pueblo Street and U.S. 101 (Office/Residential)					
Normal	Arrival	11:09:50 a.m.	91.0	80.0	00:36.78
Normal	Departure	11:11:28 a.m.	86.5	74.9	00:28.84
Normal	Arrival	11:13:07 a.m.	91.2	80.5	00:34.84
Normal	Departure	11:14:46 a.m.	85.2	75.2	00:20.84
Normal	Arrival	11:17:02 a.m.	91.4	78.9	00:42.84
Normal	Departure	11:18:48 a.m.	85.9	74.4	00:26.50
Windy	Arrival	11:20:52 a.m.	90.7	79.9	00:42.28
Windy	Departure	11:22:43 a.m.	85.4	73.8	00:31.53
Windy	Arrival	11:24:47 a.m.	90.5	79.7	00:48.65
Windy	Departure	11:26:58 a.m.	85.0	73.0	00:26.31
Windy	Arrival	11:29:24 a.m.	88.4	74.8	00:39.31
Windy	Departure	11:31:17 a.m.	84.8	73.2	00:24.00
Site 2 Children's Daycare on Oak Park Lane (Office/Residential)					
Normal	Arrival and Departure	11:09:13 a.m.	92.0	75.9	02:24.31
Normal	Arrival and Departure	11:12:21 a.m.	92.9	76.9	02:25.31
Normal	Arrival and Departure	11:16:37 a.m.	93.6	78.1	02:07.93
Windy	Arrival and Departure	11:20:07 a.m.	90.9	75.9	02:47.00
Windy	Arrival and Departure	11:24:08 a.m.	91.1	76.5	02:59.90
Windy	Arrival and Departure	11:28:32 a.m.	90.7	77.2	02:53.50
Site 3 South Castillo Street Entrance to Hospital (Hospital/Office)					
Normal	Arrival and Departure	11:09:34 a.m.	100.6	89.3	02:35.25
Normal	Arrival and Departure	11:12:54 a.m.	100.6	88.4	02:32.56
Normal	Arrival and Departure	11:16:30 a.m.	101.4	89.1	02:50.21
Windy	Arrival and Departure	11:20:31 a.m.	93.3	77.2	02:59.78
Windy	Arrival and Departure	11:24:22 a.m.	95.0	83.1	02:37.53
Windy	Arrival and Departure	11:28:55 a.m.	94.1	80.1	02:06.34
Site 4 Hospital Employee Parking on Castillo Street (Office/Residential)					
Normal	Arrival and Departure	11:09:38 a.m.	94.8	80.9	02:28.93
Normal	Arrival and Departure	11:12:46 a.m.	95.6	93.3	02:33.37
Normal	Arrival and Departure	11:16:44 a.m.	95.2	81.9	02:34.68
Windy	Arrival and Departure	11:20:32 a.m.	94.5	82.0	02:53.21
Windy	Arrival and Departure	11:24:36 a.m.	94.3	78.5	03:03.15
Windy	Arrival and Departure	11:29:01 a.m.	93.8	77.1	02:55.81
Site 5A Hospital Rooftop near Helipad—Exterior (Hospital Exterior)					
Normal	Arrival and Departure	11:09:34 a.m.	107.0	94.9	02:03.50
Normal	Arrival and Departure	11:12:54 a.m.	105.6	94.1	01:40.50
Normal	Arrival and Departure	11:16:30 a.m.	102.5	92.0	01:30.50
Windy	Arrival and Departure	11:20:31 a.m.	103.7	96.4	01:49.50
Windy	Arrival and Departure	11:24:22 a.m.	106.4	97.0	01:59.50
Windy	Arrival and Departure	11:28:55 a.m.	107.6	97.5	01:49.50
Site 5B Hospital 6th Floor Room—Interior (Hospital Interior)					
Normal	Arrival and Departure	11:09:38 a.m.	67.3	55.2	02:00.00
Normal	Arrival and Departure	11:12:46 a.m.	67.7	56.8	01:30.50
Normal	Arrival and Departure	11:16:44 a.m.	65.9	55.0	01:49.50
Windy	Arrival and Departure	11:20:32 a.m.	62.9	46.0	01:44.50
Windy	Arrival and Departure	11:24:36 a.m.	63.9	46.6	01:59.50
Windy	Arrival and Departure	11:29:01 a.m.	62.6	47.1	01:19.50

Source: Acoustical Analysis Associates, Inc., 2003.



LSA

LEGEND

3 NOISE MEASUREMENT LOCATIONS

NORMAL HELICOPTER FLIGHT PATH & DIRECTION

WINDY DAY HELICOPTER FLIGHT PATH & DIRECTION

0 100 200

SCALE IN FEET

SOURCE: Acoustical Analysis Associates, Incorporated

I:\CSB430\GIS\Helicopter Noise.cdr (9/23/04)

FIGURE 7

Santa Barbara Cottage Hospital

Seismic Compliance and Modernization Plan

Helicopter Noise Monitoring Locations

Table R: Day-Night Average Sound Level (L_{dn}) From the Proposed Helicopter Operations, Santa Barbara Cottage Hospital (See Figure 7)

Site	Representative Land Use	Existing Ambient L_{dn}, dBA	One Nighttime[1] Helicopter Operation			Two Nighttime Helicopter Operations		
			Helicopter Noise L_{dn}, dBA	Future plus Project Total L_{dn}, dBA[2]	Project Increase L_{dn}, dBA	Helicopter Noise L_{dn}, dBA	Future plus Project Total L_{dn}, dBA[1]	Project Increase L_{dn}, dBA
1	Office/Residential	65[3]	57	66	1	60	66	1
2	Office/Residential	53	59	60	7	62	63	10
3	Hospital/Office	66	68	70	4	71	72	6
4	Office/Residential	53	57	58	5	60	61	8
5A	Hospital Exterior	66[4]	69	71	5	72	73	7
5B	Hospital Interior	44	30	44	0	33	44	0

Source: Acoustical Analysis Associates, Inc., 2003.

1 Nighttime operations were assumed for a worst-case scenario.
2 Existing ambient noise level plus projected helicopter noise level. Sound levels are combined using energy addition. For example 65 dBA + 57 dBA = 66 dBA.
3 Extracted from the City of Santa Barbara Noise Element of the General Plan.
4 Estimated from similar measurement site.

levels exceeding the City's noise standard and a 3 dBA or more increase in noise over existing levels. For Monitoring Locations 3 and 5A, there are no outdoor active use areas associated with the Hospital and office buildings. In addition, Monitoring Location 5B shows that interior noise levels during helicopter operations (44 dBA L_{dn}; see Table R) would be reduced to below 45 dBA L_{dn} by noise attenuation provided by the hospital building. The maximum interior noise level attributable to helicopter operations at the hospital interior (Site 5B in Table R) ranged from 46.0 to 56.8 dBA L_{max} (versus 92.0 to 97.5 dBA outside the hospital). This range of interior noise levels is similar to or lower than noise generated by typical hospital activities. Under the worst-case condition of a single helicopter operation event in a 24-hour period during the nighttime hours, no significant helicopter noise impacts on sensitive land uses in the project area would occur. **Therefore, the increase in the noise levels from one helicopter event (one nighttime landing and one nighttime takeoff) in a 24-hour period would be less than significant.**

Day-Night Noise Levels for Two Landings and Two Takeoffs During Nighttime Hours. Table R also shows the day-night sound levels for two helicopter events in a 24-hour period. Both events are assumed to occur during nighttime hours as a worst-case scenario. Under this scenario, Monitoring Locations 2, 3, 4, 5A would be exposed to noise levels exceeding the City's noise standard and an increase of 3 dBA or more over the existing level. If helicopter operations increase to more than one event (nighttime landing and one nighttime takeoff) within a 24-hour period, significant noise impacts would result for Monitoring Locations 2 and 4. As helicopter noise would potentially impact sensitive land uses, nighttime helicopter operations should be limited to emergencies only. An annual helicopter evaluation with filing of a detailed record of helicopter operations should be conducted to ensure minimal impacts to surrounding sensitive land uses. **Therefore, an increase in helicopter operations to more than one nighttime flight within a 24-hour period would result in a significant helicopter noise impact. Implementation of Mitigation Measure N-13, to limit the operating hours of non-emergency helicopter operations to daytime hours only, would reduce the long-term helicopter noise impacts. However, significant unavoidable adverse noise impacts from the helicopter operations would remain.**

Parking Structure. Noise generated from the two proposed new parking structures would potentially impact off-site sensitive land uses. The proposed project includes the construction of two parking structures located on Pueblo Street and Bath Street. Maximum instantaneous noise generated by activities within a parking structure ranges from 65 dBA L_{max} to 75 dBA L_{max} at 50 feet. Individual events inside the parking structure, such as car door slams, up to 72 dBA L_{max} at 50 feet, vehicle start-ups at 73 dBA L_{max} at 50 feet, car alarms at 66 dBA L_{max} at 50 feet, and tire squeals at 72 dBA L_{max} at 50 feet, would be below the daytime maximum allowable noise level of 75 dBA L_{max}, however, they would potentially exceed the maximum allowable nighttime noise level of 70 dBA L_{max} at the closest receptor locations as describe below.

The typical hourly L_{eq} of the parking structure noise during daytime hours is 45 dBA L_{eq} at 50 feet. This noise level, when converted to the 24-hour weighted average of L_{dn}, is 52 dBA L_{dn} at 50 feet without factoring in other noise sources in the vicinity of the parking structures.

The following describes the potential noise impact for each land use adjacent to the proposed Pueblo parking structure:

Office Buildings. The shortest distance from the office buildings along Castillo Street south of Pueblo Street to the Pueblo parking structure is approximately 80 feet. At this distance, the office buildings would experience a potential noise level of 48 dBA L_{dn} and a maximum noise level of up to 71 dBA L_{max}. The 48 dBA L_{dn} would be below the City noise standard of 75 dBA L_{dn} for office land uses, and the maximum daytime noise threshold of 75 dBA L_{max} would not be exceeded. **Therefore, activities inside the new Pueblo parking structure would not have a significant noise impact on adjacent office buildings.**

Residential. The shortest distance from residences along Oak Park Lane, Los Olivos Street, and Parkway Drive to the Pueblo parking structure is approximately 50 feet. At this distance, the nearest residences would experience a potential noise level of 52 dBA L_{dn} and a maximum noise level of up to 75 dBA L_{max} from the Pueblo parking structure. The 52 dBA L_{dn} would not exceed the City's exterior noise threshold of 60 dBA L_{dn} for residential land uses.

Residences would potentially experience a noise level exceeding the nighttime threshold of 70 dBA L_{max}. Activities inside the parking structure would result in community annoyance. A residential structure provides an exterior to interior noise reduction of 12 dBA with windows open and 24 dBA with windows closed (Protective Noise Levels, EPA 550/9-79-100, November 1978). Interior noise levels at these residences would be 51 dBA L_{max} with windows closed. This noise level is similar to or lower than noise associated with normal household activities. **Although community annoyance would result from short-term maximum noise levels generated by activities inside the parking structure, there would not be a significant noise impact on residential land uses.**

Hospital. The shortest distance from the hospital building to the Pueblo parking structure is approximately 80 feet. At this distance, the hospital rooms on the north side of the parking structure would experience a noise level of 48 dBA L_{dn} and a maximum exterior noise level of up to 71 dBA L_{max}. The 48 dBA L_{dn} would not exceed the City noise standard of 65 dBA L_{dn} for hospital uses. However, the maximum exterior nighttime noise threshold of 70 dBA L_{max} would be potentially exceeded. As shown in Table R, the hospital building would have an exterior to interior noise level reduction of 35 dBA or more from windows and wall structures, as evidenced by the concurrent helicopter noise levels measured inside and outside the existing hospital building by AAAI. Therefore, maximum interior noise level from the parking structure activities would be reduced to 36 dBA L_{max}. This maximum interior noise level, when converted to the 24-hour weighted average L_{dn}, would be below the hospital interior noise standard of 45 dBA L_{dn}. **Therefore, noise generated by activities inside the Pueblo parking structure would not have a significant noise impact on the hospital.**

Oak Park. Oak Park is located approximately 750 feet northwest of the proposed Pueblo parking structure. At this distance, the park would experience a potential noise level of 29 dBA L_{dn} and a

maximum noise level of up to 52 dBA L_{max} from activities at the Pueblo parking structure. The 29 dBA L_{dn} would not exceed the City noise standard of 65 dBA L_{dn} for park uses. The maximum daytime noise threshold of 75 dBA L_{max} and the maximum nighttime noise threshold of 70 dBA L_{max} would not be exceeded. **Therefore, activities inside the Pueblo parking structure would not have a significant noise impact on Oak Park.**

Knapp Parking Structure. The following describes the potential noise impact for each land use adjacent to the proposed Knapp parking structure.

Office Buildings. The shortest distance from these office buildings along Bath Street north of Junipero Street to the proposed Knapp parking structure is approximately 50 feet. At this distance, the office buildings would experience a potential noise level of 52 dBA L_{dn} and a maximum noise level of up to 75 dBA L_{max}. The 52 dBA L_{dn} would be below the City's noise standard of 75 dBA L_{dn} for office land uses, and the maximum daytime noise threshold of 75 dBA L_{max} would not be exceeded. **Therefore, activities inside the new Knapp parking structure would not have a significant noise impact on office buildings adjacent to the parking structure.**

Residential. The shortest distance from these residences on the east side of Bath Street north of the proposed Knapp building to the Knapp parking structure is approximately 50 feet. At this distance, the nearest residences would experience a potential noise level of 52 dBA L_{dn} and a maximum noise level of up to 75 dBA L_{max}. The 52 dBA L_{dn} would not exceed the City exterior noise standard of 60 dBA L_{dn} for residential land uses. Residences would experience a noise level of 75 dBA L_{max} that exceed the nighttime maximum noise threshold of 70 dBA L_{max}. The potential noise level exposure from parking structure activities would result in community annoyance.

With the exterior to interior noise level reduction for residential structures (with windows closed) recommended by the EPA, residences would experience an interior noise level of 51 dBA L_{max} with windows closed. This noise level is similar to or lower than noise associated with normal household activities. **Although community annoyance would result from short-term maximum noise levels generated by parking structure activities during the nighttime hours, parking structure activities would not have a significant noise impact on residential land uses.**

Hospital. The shortest distance from the hospital building to the proposed Knapp parking structure is approximately 280 feet. At this distance, the hospital rooms would experience a noise level of 37 dBA L_{dn} and a maximum noise level up to 60 dBA L_{max}. The 37 dBA L_{dn} would not exceed the City noise standard of 65 dBA L_{dn} for hospital uses. The maximum daytime noise threshold of 75 dBA L_{max} and nighttime noise threshold of 70 dBA L_{max} would not be exceeded. **Therefore, activities inside the proposed Knapp parking structure would not result in a significant noise impact on the hospital.**

Oak Park. Oak Park is located approximately 840 feet northwest of the proposed Knapp parking structure. At this distance, the park would experience a potential noise level of 28 dBA L_{dn} and a maximum noise level of up to 51 dBA L_{max} from activities at the Knapp parking structure. The 28 dBA L_{dn} would not exceed the City noise standard of 65 dBA L_{dn} for park uses. The maximum daytime noise threshold of 75 dBA L_{max} and a maximum nighttime noise threshold of 70 dBA L_{max} would not be exceeded. **Therefore, activities inside the proposed Knapp parking structure would not have a significant noise impact on Oak Park.**

In summary, land uses immediately adjacent to the proposed Pueblo and Knapp parking structures would be exposed to occasional high noise levels due to parking structure activities. Parking structure noise would remain 52 dBA L_{dn} or lower at the nearest sensitive receptor location. This noise level would be below the City noise standard for each of the sensitive land uses surrounding the two parking structures. **Therefore, activities inside the two proposed parking structures would not have a significant noise impact on adjacent sensitive land uses.**

Central Plant Building. The new is proposed to be located on the southwest corner of Bath Street and Junipero Street. The Central Plant building would include two two-cell cooling towers, three boilers, and four emergency generators. Other types of mechanical equipment are also proposed; however, they would be quieter than the cooling tower, boilers, and generators and thus would not add measurably to the existing noise levels. Mechanical equipment is anticipated to operate continuously during the day, night, and weekends. Generators are expected to operate only during emergencies or periodic testings.

As shown in Table S, the worst-case noise level of 60 dBA CNEL at the nearest residence located on the east side of Bath Street north of Junipero Street would be generated by normal mechanical equipment operation plus generator testing at the new Central Plant building. It assumed that generator testing would be conducted during daytime hours between 7:00 a.m. and 7:00 p.m. This noise level would not exceed the City's noise ordinance requirement of 60 dBA CNEL at the residential property line. **However, if generator testing occurs during the evening or nighttime time hours, mechanical equipment noise would potentially violate the City's noise ordinance for residential land uses. Mitigation Measure N-16, limiting generator testing to between the hours of 7:00 a.m. and 7:00 p.m. from Monday through Sunday, would reduce this impact to less than significant.**

Table S: Predicted Mechanical Equipment Noise Levels at the Nearest Sensitive Receptor Location

Mechanical Equipment Activity	Predicted CNEL (dBA)
Normal operation	58
Generator testing plus normal operation of other equipment	60
Steam vent testing plus normal operation of other equipment	59

Source: Martin Newson & Associate, LLC., 2002.

In addition to the analysis based on the City's 24-hour weighted CNEL standard, maximum noise levels associated with mechanical equipment were also evaluated to enhance potential noise impacts at the sensitive receptor locations, as discussed below.

Typical maximum noise levels generated by mechanical equipment were obtained from the *Noise Control for Building and Manufacturing Plants* (Bolt, Beranek and Newman Inc., January 1987), which lists sound power level (PWL) generated by cooling towers, boilers, and generators. Two two-cell cooling towers would generate a sound power level of 104 dBA, three boilers at 104 dBA, and four emergency generators at 110 dBA. These noise levels are used and converted into sound pressure level (SPL) perceived by the human ear. Mechanical equipment would generate a noise level of 104 dBA at a distance of one foot. Mechanical equipment would also be housed in the Central Plant building; the building would provide at least a 24 dBA noise reduction. The following describes the potential maximum noise impact for each type of sensitive land use adjacent to the proposed Central Plant Building.

Office Buildings. The shortest distance from the office buildings along Bath Street and Junipero Street to the Central Plant building is approximately 70 feet. At this distance, the office buildings would experience a noise level of 62 dBA CNEL and up to 67 dBA L_{max}. The maximum daytime noise threshold of 75 dBA L_{max} would not be exceeded. **As the office buildings are not considered sensitive to mechanical noise, mechanical equipment operation in the proposed Central Plant Building would not have a significant noise impact on office buildings.**

Residential. The shortest distance from residences along Castillo Street north of Junipero Street to the Central Plant building is approximately 175 feet. Based on the noise measurements conducted by Martin Newson Associates (2002), the closest residences would experience a noise level of 58 dBA CNEL and up to 59 dBA L_{max}. The 58 dBA CNEL would not exceed the City's noise ordinance requirement of 60 dBA CNEL for residential land uses. The maximum daytime noise threshold of 75 dBA L_{max} and the maximum nighttime noise threshold of 70 dBA L_{max} would not be exceeded. **Therefore, mechanical equipment operation in the proposed Central Plant building would not have a significant noise impact on adjacent residential land uses.**

Hospital. The shortest distance from the hospital building on the southwest corner of Bath Street and Junipero Street to the proposed Central Plant building is approximately 50 feet. At this distance, the hospital would experience a noise level of 70 dBA CNEL and up to 75 dBA L_{max}. Hospital patients, employees, and visitors at the hospital would experience a noise level exceeding the nighttime exterior noise threshold of 70 dBA L_{max}. The noise level of 70 dBA CNEL would exceed the noise standard of 60 dBA CNEL from mechanical noise; however, the hospital building at this location does not have outdoor active use areas. As shown in Table R (helicopter noise measurements conducted by AAAI), the existing hospital building provides a 35 dBA or more in exterior to interior noise reduction. The potential maximum interior noise level would be reduced to 40 dBA L_{max}. This maximum interior noise level would not result in a noise level exceeding the hospital's interior noise standard of 45 dBA L_{dn}. **Therefore, mechanical equipment operation in the proposed Central Plant building would not have a significant noise impact on the hospital.**

Oak Park. Oak Park is located approximately 940 feet northwest of the proposed Central Plant building. At this distance, the park would experience a noise level of 39 dBA CNEL and up to 45 dBA L_{max}. The maximum daytime noise threshold of 75 dBA L_{max} and maximum nighttime noise threshold of 70 dBA L_{max} would not be exceeded. The noise level of 39 dBA CNEL would not exceed the City's noise standard of 60 dBA CNEL for mechanical noise. **Therefore, mechanical equipment operation in the proposed Central Plant building would not have a significant noise impact on Oak Park.**

Several Project Features would further reduce potential noise levels from mechanical equipment at the Central Plant building. To reduce mechanical equipment noise at the residential property line: (1) acoustic louvers would be installed around the two two-cell cooling towers, (2) high level ventilation louvers to the boiler room would be fitted with acoustical silencers, (3) acoustic silencers would be installed for all generator room ventilation paths, and (4) a continuous concrete wall would be constructed around the first-floor louver on the west facade of the proposed Central Plant building (see PF 11-1). **Therefore, noise impacts from mechanical equipment operation at the Central Plant building would not have any significant impact on adjacent sensitive land uses.**

Truck Loading/Unloading Activities. Loading and unloading docks for the proposed project would be located on the northeast corner of Junipero Street and Oak Park Lane. Loading and unloading dock access is proposed to be located along Oak Park Lane. A total of five loading and unloading spaces are proposed. The truck deck, located between the hospital building and Oak Park Lane, would be used by trucks for maneuvering to/from the docks while unloading and loading products and as a staging area while waiting for the appropriate dock to become available. During loading and unloading activities, noise would be generated by the trucks' diesel engines, exhaust systems, and brakes during low-speed gear shifting; braking activities; backing up toward the docks; dropping down the dock ramps; and while maneuvering away from the docks. These peak event noise sources are measured as a single event from a point source.

Based on similar projects LSA's experience with analysis of on truck with periodic loading and unloading activities, peak noise levels from the proposed on-site truck loading and unloading activities would range up to 80 dBA L_{max} when measured at 50 feet from the point source. Noise attenuation from a point source would drop off at 6 dBA per doubling of the distance.

The following describes the potential noise impact for each sensitive land use adjacent to the proposed loading and unloading activity area.

Office Buildings. The shortest distance from the office buildings along Oak Park Lane and Junipero Street to the proposed loading dock building is approximately 150 feet. At this distance, the office buildings would experience a periodic noise level up to 70 dBA L_{max}. The maximum daytime noise threshold of 75 dBA L_{max} would not be exceeded. **Therefore, truck activities at the proposed loading and unloading area would not have a significant noise impact on the surrounding office uses.**

Residential. The shortest distance from these residences along Oak Park Lane and Junipero Street to the loading dock is approximately 150 feet. At this distance, residences would experience periodic noise level of up to 70 dBA L_{max}. This periodic noise level would not exceed the maximum daytime noise level of 75 dBA L_{max} under the California Model Ordinance and it would be up to but not exceeding the maximum nighttime noise level of 70 dBA L_{max} , indicating community annoyance, an adverse but not significant noise impact. **Recommended Mitigation Measure N-17 would limit loading and unloading activities to the daytime hours of 7:00 a.m.–10:00 p.m. to minimize associated noise impacts to these sensitive receptors adjacent to the project site.**

Hospital. The shortest distance from the hospital building and the hospital outdoor active use area located on the southeast corner of Oak Park Lane and Junipero Street to the proposed loading dock is approximately 50 feet. At this distance, the hospital would experience a periodic noise level up to 80 dBA L_{max}. Hospital patients, employees, and visitors would periodically experience noise levels exceeding the California Model Ordinance maximum daytime noise level of 75 dBA L_{max} and the maximum nighttime noise level of 70 dBA L_{max}. These periodic noise levels indicate community annoyance and would result in an adverse but less than significant noise impact. As shown in Table R, the hospital building provides a 35 dBA or more exterior to interior noise reduction from windows and wall structures. This interior noise level would not result in a noise level that exceeds the hospital interior noise standard of 45 dBA L_{dn}.

In order to reduce noise levels at the hospital's active use area, a sound wall is recommended. Mitigation Measure N-18 (loading dock noise barrier) would reduce maximum noise exposure from loading and unloading activities to on-site outdoor active use areas by implementing an eight-foot wall between the loading dock and the hospital's outdoor active use areas. A higher wall would be in conflict with proposed zoning ordinance SP-8. An 8-foot wall would only partially block the line of sight to trucks; noise levels would be partially reduced. The sound wall would reduce the noise levels experienced by the hospital's active use area by 5 dBA or more.

Although the hospital's outdoor active use area would be likely to be used less during the hours of 10:00 p.m.–7:00 a.m., the use cannot be precluded. In order to reduce the noise level from truck loading and unloading activities to 70 dBA L_{max} during the nighttime hours, recommended Mitigation Measure N-17, Loading Dock Hour Limits, would restrict loading/unloading to the hours of 7 a.m. to 10 p.m. each day/evening. **With implementation of recommended Mitigation Measures N-17 (Hour Limits) and N-18 (Barrier Wall), adverse but less than significant noise levels at the proposed hospital's outdoor active use area would be further reduced.**

Oak Park. Oak Park is located approximately 500 feet northwest of the proposed loading dock. At this distance, the park would experience a noise level up to 60 dBA L_{max}. The maximum daytime noise threshold of 75 dBA L_{max} and the maximum nighttime noise threshold of 70 dBA L_{max} would not be exceeded. **Therefore, truck loading and unloading activities would not have a significant noise impact on Oak Park.**

Also, trucks may stage within the truck deck while waiting for the appropriate dock to become available. Trucks may be equipped with refrigeration units to keep products cold. Typically, these trucks keep the refrigerating engine running during the entire loading and unloading process, as well as while staging. The appropriate measurement for such consistent noise generation is the L_{eq}. A truck staging on site with its refrigeration unit running continuously would generate noise levels of 65 dBA L_{eq} at a distance of 50 feet. This continuous noise level and associated impact is lower than the peak noise impact identified for on-site truck loading/unloading activities. Measures N-5 and N-6 identified for on-site loading/unloading activities would help reduce this truck noise as well.

Heat, Ventilation, Air Conditioning (HVAC). HVAC equipment is typically located on the building rooftop. HVAC equipment generates an SPL of up to 95 dBA at one foot. The roof edge creates a natural noise barrier that reduces noise levels from these rooftop HVAC units by an 8 dBA or more. It is assumed that HVAC equipment would operate continuously through the day, evening, and night. The following describes the potential noise impact from HVAC equipment for each land use adjacent to the hospital building rooftops.

Office Buildings. The shortest distance from the office buildings along Pueblo Street, Oak Park Lane, Bath Street, and Junipero Street to the hospital's proposed rooftop HVAC equipment is approximately 100 feet. At this distance, the office buildings would experience a noise level of 54 dBA CNEL and up to 47 dBA L_{max}. The maximum daytime noise threshold of 75 dBA L_{max} and nighttime noise threshold of 70 dBA L_{max} would not be exceeded. **Therefore, the operation of the hospital's proposed rooftop HVAC equipment would not have a significant noise impact on office buildings adjacent to the project site.**

Residential. The shortest distance from these residences along the north side of Junipero Street to the hospital's proposed HVAC equipment is approximately 150 feet. At this distance, residences would experience a noise level of 51 dBA CNEL and up to 44 dBA L_{max}. The maximum daytime noise threshold of 75 dBA L_{max} and nighttime noise threshold of 70 dBA L_{max} would not be exceeded. This noise level of 51 dBA CNEL would not exceed the 60 dBA CNEL noise standard for mechanical noise. **Therefore, operation of the hospital's proposed rooftop HVAC equipment would not have a significant noise impact on residential uses adjacent to the project site.**

Hospital. At the shortest distance of approximately 50 feet from the hospital's proposed outdoor active use area, the hospital exterior would experience a noise level of 60 dBA CNEL and up to 53 dBA L_{max} from the rooftop HVAC. The daytime maximum noise threshold of 75 dBA L_{max} and a maximum nighttime noise threshold of 70 dBA L_{max} would not be exceeded. Also, the rooftop HVAC equipment would not result in noise levels that exceed the City's noise standards for mechanical equipment at sensitive receptors. **Therefore, the operation of the hospital's proposed rooftop HVAC equipment would not have a significant noise impact on hospital outdoor active uses.**

Oak Park. Oak Park, located approximately 500 feet northwest of the hospital, would experience potential noise increases resulting from the operation of the proposed HVAC equipment. At this distance, the park would experience a potential noise level of 40 dBA CNEL and a maximum noise level of 33 dBA L_{max}. The maximum daytime noise threshold of 75 dBA L_{max} and a maximum nighttime noise threshold of 70 dBA L_{max} would not be exceeded. The noise level of 40 dBA CNEL would not exceed the 60 dBA CNEL noise standard for mechanical noise. **Therefore, operation of the hospital's proposed roof top HVAC equipment would not have a significant noise impact on activities at Oak Park.**

In summary, noise attenuation provided by the distance and natural barrier from the rooftop would reduce noise levels generated by HVAC equipment at residential land uses in the project vicinity and the resulting noise levels would not exceed the 60 dBA CNEL noise standards for mechanical equipment specified in the City's noise ordinance. In addition, the operation of the hospital's proposed HVAC equipment would not exceed maximum allowable daytime noise threshold of 75 dBA L_{max} and nighttime noise threshold of 70 dBA L_{max} at adjacent sensitive uses. **Therefore, the hospital's rooftop HVAC equipment would not have a significant noise impact on off-site and on-site sensitive land uses.**

Specific Plan Long-Term Impacts

In addition to the proposed hospital modernization project, SBCH is seeking approval of a Specific Plan, which would allow the future demolition and reconstruction of a portion of the existing hospital. For purposes of this EIR analysis, the Specific Plan would allow for an additional acute care nursing pavilion with up to 100 beds. Implementation of the Specific Plan could incrementally increase the noise generated by vehicles.

Implementation of the additional Specific Plan development would increase the activity within the parking structures and loading docks. However, since the maximum noise levels associated with these activities were already used in the analysis of project-related impacts, the future Specific Plan development would not increase the maximum noise levels generated within these uses. Therefore, the Specific Plan would not increase the noise impact at the sensitive receptor locations in the vicinity of these uses.

Operation of the Central Plant would not intensify with the implementation of an additional nursing pavilion as part of the future Specific Plan development. Therefore, the Specific Plan would not result in any additional noise impacts in the vicinity of the Central Plant.

Specific Plan Long-Term Traffic Noise Impacts. Potential future construction of an additional nursing pavilion or similar use as allowed under could result in additional traffic, and have a potentially significant noise impact on off-site and on-site sensitive land uses. The implementation of future development allowed under SP-8 would generate an additional average daily traffic (ADT) of 769 ADT, which would incrementally increase traffic noise in the project area. Table T shows the incremental noise increases along affected streets segment as a result of the additional 769 ADT. As shown in Table T, incremental increases in noise would be as much as 0.4 dBA, and the overall noise levels would not exceed 60 dBA L_{dn} along all affected street segments in the project area. **Therefore,**

Table T: Increase in Noise Due to Additional Traffic under the SP-8 Development

Roadway Segment	Future Plus Project ADT	Specific Plan ADT	Percent Increase	Future Plus Project and Specific Plan Noise Level at 50 Feet from Centerline of Outermost Lane L_{dn} (dBA)	Specific Plan Related Increase in Noise Level (dBA)
Junipero Street					
Between Bath Street and Castillo Street	4,305	302	7%	57.1	0.3
Between Castillo Street and Oak Park Lane	4,730	151	3%	57.5	0.2
West of Oak Park Lane	5,950	64	1%	57.7	0.0
Pueblo Street					
Between Bath Street and Castillo Street	5,630	294	5%	58.2	0.2
Between Castillo Street and Oak Park Lane	6,265	223	4%	58.7	
West of Oak Park Lane	5,540	167	3%	58.2	0.2
Bath Street					
North of Junipero Street	4,080	397	10%	56.8	0.4
Between Junipero Street and Pueblo Street	5,990	278	5%	58.5	0.2
South of Pueblo Street	4,850	302	6%	57.6	0.3
Castillo Street					
North of Junipero Street	3,310	199	6%	55.9	0.3
South of Pueblo Street	4,530	310	7%	57.3	0.3
Oak Park Lane					
Between Junipero Street and Pueblo Street	2,380	119	5%	54.5	0.2
South of Pueblo Street	1,060	56	5%	51.0	0.2

Source: LSA Associates, Inc., August 2004.

the additional average daily traffic allowed under the SP-8 development would not have a significant noise impact to off-site and on-site sensitive land uses.

Specific Plan Helicopter Operation Noise Impacts. The additional 100 beds allowed for the proposed acute care nursing pavilion could result in an increase in the number of helicopter operations. **Therefore, implementation of the proposed Specific Plan development would result in additional significant noise impacts related to the helicopter operations.**

Specific Plan Long-Term Noise Mitigation Measures

Mitigation Measures 11-13, 11-14, and 11-15 would be continued to be applied to SP-8 development.

MITIGATION MEASURES

Construction Impacts

The following measures would reduce potential construction noise and vibration impacts on nearby sensitive receptors:

N-1. Review Types of Construction Equipment. Prior to issuance of grading permits for each phase of construction, SBCH shall review the types of construction equipment that may be in proximity to the hospital's equipment that is sensitive to noise and vibration impacts. The construction contractor and SBCH shall coordinate to ensure that construction equipment that generates noise and vibration would not be operated within the vicinity of sensitive hospital equipment. Sensitive equipment shall be moved away from areas of potential vibration impact and protected with vibration isolation or other techniques. This mitigation measure shall be included in the project construction plan specifications.

N-2. Prepare a Crack Survey and Video Reconnaissance. Prior to issuance of demolition permits, SBCH or its designee shall prepare a crack survey and video reconnaissance documenting the existing condition of the hospital structure that would remain and neighboring structures that are within 150 feet of the project site and are over 20 years old prior to project construction. After each major phase of construction, a follow-up crack survey and video reconnaissance of neighboring structures shall be conducted to determine whether any new cracks or other damage have occurred. The City and SBCH shall review the results of both pre- and postconstruction surveys to determine whether any new damage resulted from project construction activities. SBCH would be responsible for the cost of damage to structures resulting from project construction. Figures 4–6 show the potential areas that would require a crack survey and video reconnaissance documentation.

N-3. Construction Hour Limits. Construction hours shall be limited to the hours between 8:00 a.m. and 5:00 p.m., Monday through Friday. Construction activities would be prohibited on Saturdays,

Sundays, and legal holidays.[1] This mitigation measure to reduce the number of working hours per day from the proposed construction hour limits would extend construction of the proposed project by 1,211 days.

N-4. Noise Control for Construction. The construction contractors shall use equipment with best available noise control technology in regard to mufflers, acoustically treated components, etc. When feasible, noisy operations and equipment shall be located away from noise-sensitive land uses. This mitigation measure shall be included in the construction plan specifications.

N-5. Temporary Noise Barriers. During Construction Phases I, II, and III, temporary noise barriers, with an effective height of eight feet, shall be installed around construction sites by the construction contractor. Figures 4–6 show the approximate location of the barriers for each construction phase. This mitigation measure shall be included in the construction plan specifications.

N-6. Construction Notifications to Neighbors. Prior to construction (demolition, grading, and construction), SBCH shall develop and execute a community information program, notifying neighbors of planned construction schedules and periods of maximum activity. The notice shall provide a construction schedule, required noise conditions applied to the project, and the name and telephone number of the Construction Project Manager who can address questions and problems that may arise during construction. The City Planning Department shall approve this mitigation measure prior to the issuance of demolition permits.

N-7. Truck Routing. Prior to construction (issuance of demolition and grading permits), a Haul Route Plan shall be prepared by the contractor and approved by the City. The haul route plan shall limit construction equipment haul and delivery routes to Junipero Street and Pueblo Street and would utilize the shortest routes to U.S. 101.

N-8. No Worker Access to the Neighborhood. Prior to initial construction work (issuance of demolition permits), the City of Santa Barbara shall require construction contractors to designate off-site parking areas for construction workers to be shuttled to and from the project site. Workers shall also remain in designated on-site areas during all breaks, and workers shall not be permitted to gather off-site during the course of the construction activities. The City Planning Department shall approve this mitigation measure prior to the issuance of demolition permits.

N-9. Radios and Alarms. Construction contractors shall prohibit radio, music playback equipment, musical instruments, or automobile or truck alarms on the construction site. This mitigation measure shall be included in the construction plan specifications.

[1] When a holiday falls on a Saturday or Sunday, the preceding Friday or following Monday, respectively, shall be observed as a legal holiday.

N-10. Construction-Related Vehicle Noise. Except as otherwise required by law, construction employees shall ensure that all construction-related vehicle horns shall remain silent except in case of emergency. This mitigation measure shall be included in the construction plan specifications.

N-11. Loitering in the Project Area. Construction employees shall not loiter at any gate, on the job site, or on any street, whether before, during, or after work hours, on weekdays, or on weekends. This mitigation measure shall be included in the construction plan specifications and will be monitored by SBCH construction security personnel..

N-12. Limited Site Access. Access to the site shall be limited to areas approved by the City and shall be included in the construction plan specifications. The gate shall incorporate the same method of noise shielding as the construction fence and shall be kept closed except for vehicle passage.

Additional Construction Measures Recommended

Although not required based on the L_{dn} noise standard, temporary noise walls up to 8 feet high are recommended to reduce maximum construction noise inside the hospital and office buildings adjacent to the project site.

The following mitigation measures shall be implemented to reduce potential long-term noise impacts:

N-13. Helicopter Operations Plan. Prior to issuance of building permits by OSHPD in the helipad as part of the Diagnostic and Treatment Building (Phase II), SBCH shall submit a Helicopter Operations Plan that shall specify hours of operation as daytime hours between 7:00 a.m. and 7:00 p.m. The plan shall specify that nighttime helicopter operations shall be prohibited, with the exception of emergencies.

N-14. Annual Helicopter Operation Evaluations. Annual evaluations of helicopter flight activity shall be provided by SBCH to the Community Development Department. This provision shall be incorporated into the Helicopter Operations Plan.

N-15. Helicopter Activity Records. Detailed helicopter operation records regarding the type of trip and the time of arrival and departure shall be provided by SBCH to the Community Development Department annually. This provision shall be incorporated into the Helicopter Operations Plan. If the proposed annual helicopter operations other than emergencies increase by 50 trips, the City shall reevaluate the hospital's helicopter operations and allow the Planning Commission to consider other alternatives.

N-16. Mechanical Equipment Testing. Mechanical equipment testing conducted by SBCH shall be limited to between the hours of 7:00 a.m. and 7:00 p.m., Monday through Sunday. SBCH shall provide notification to the City Community Development Department prior to planned testing events.

Recommended Mitigation Measures for Loading Dock Noise

N-17. Truck Deliveries and Loading Dock Hour Limits. SBCH shall limit truck deliveries and loading and unloading activities to the daytime hours of 7:00 a.m. to 10:00 p.m. This measure shall be included in the Hospital Operations Plan or similar plan.

N-18. Loading Dock Noise Barrier. Prior to issuance of building permits for Phase III, construction of a minimum 8-foot sound wall between the proposed loading dock and the hospital outdoor active use areas shall be incorporated into the Landscaping Plan for this phase. This plan shall be reviewed and approved by the Community Development Department.

Design of the noise barrier shall be conducted by an acoustical engineer, acceptable by the City. The engineer shall determine the appropriate location and size (maximum height anticipated to be eight feet) of the barrier such that a 5 dBA reduction would be achieved at the nearby hospital outdoor active use area. The design will consider any siting constraints (e.g., flood-prone areas in the proposed loading dock location). The noise barrier design and siting pans shall be reviewed and approved by the Public Works Department prior to issuance of building permits for Phase III.

Specific Plan Construction Noise and Vibration Mitigation Measures

Mitigation measures for the impact of future development of an additional nursing pavilion under the Specific Plan would be similar to the mitigation measures for construction noise and vibration impacts for the proposed project. These measures would be evaluated at the time of development application review by the City to determine applicability and any necessary refinements.

Cumulative Impacts

Under the build out conditions, the proposed project would have the following cumulative impacts:

Traffic Noise. The cumulative study area for traffic noise impacts includes roadway segments listed in Tables O and P. A significant noise increase would occur when both: (1) noise levels increase by 3 dBA or more over the corresponding baseline noise levels, and (2) noise levels already exceed City noise standards under the baseline condition. Traffic noise associated with project site operation would incrementally contribute to cumulative noise levels of on-site and off-site sensitive land uses. Future traffic noise levels with and without project (see Tables O and P) would continue to be moderately low throughout the project cumulative area. Traffic noise levels would not exceed 60 dBA L_{dn} at locations 50 feet from the centerline of the outermost travel lane along all street segments affected in the project study area. Residences along Oak Park Lane would experience a traffic noise increase of 4.7 dBA L_{dn}. However, traffic noise levels along Oak Park Lane would remain below 60

dBA L_{dn} under the future condition. The proposed project's contribution to the future traffic noise levels would be less than significant.. Therefore, no cumulative traffic noise impact would occur.

Helicopter Noise. Helicopter noise associated with project site operation would potentially have a cumulative effect on on-site and off-site sensitive land uses. The project vicinity as shown in Figure 7 defines the cumulative area for helicopter noise. There are no airports or other helipad locations in the vicinity of the project area. The proposed helicopter operations would not add to other aircraft noise in the area. **Therefore, no cumulative noise impacts would occur as a result of helicopter operations.**

Parking Structure Noise. Noise generated by parking structure activities is considered a local noise source. The proposed new parking structures would be located on Pueblo Street and Bath Street. The nearest residential land uses located along the west side of Oak Park Lane and along the east side of Bath Street north of Junipero Street would not experience noise levels from the proposed parking structures that exceed the City's noise standard. Noise from the proposed Pueblo and Knapp parking structures would not contribute significantly to the ambient noise. **Therefore, no cumulative noise impacts would occur as a result of parking structure activities.**

Central Plant Building. The proposed Central Plant building would be located on the southwest corner of Bath Street and Junipero Street. Noise generated by the operation of mechanical equipment in the Central Plant building is considered a local point source. The mechanical equipment would operate continuously during the day, night, and weekends. Generators are expected to only operate during emergencies or during periodic testings. The testing of generators should be limited to between the hours of 7:00 a.m. and 7:00 p.m., Monday through Sunday (Mitigation Measure N-16). The nearest sensitive land uses located on the southwest corner of Bath Street and Junipero Street would not experience a potential noise level that exceeds the City's noise ordinance requirement of 60 dBA CNEL for sensitive land uses. Noise from the proposed Central Plant building would not contribute significantly to ambient noise. **Therefore, no cumulative noise impacts would occur as a result of the Central Plant building.**

Truck Loading/Unloading Activities. The hospital's proposed truck loading dock would be located on the southeast corner of Oak Park Lane and Junipero Street. Noise generated by truck loading and unloading activities is considered a local point source. Peak noise levels from these on-site truck loading and unloading activities range up to 80 dBA L_{max} measured at 50 feet. The nearest residences located near the intersection of Oak Park Lane and Junipero Street is approximately 150 feet from these activities and would experience a potential maximum noise level up to 70 dBA L_{max}. The maximum allowable daytime noise level of 75 dBA L_{max} would not be exceeded; however, the nearest sensitive land uses would experience a noise level reaching the maximum nighttime noise level threshold of 70 dBA L_{max}. Noise from the hospital's loading dock would not contribute significantly to ambient noise. **Therefore, the proposed loading and unloading activities would not have a significant contribution to the cumulative noise environment.**

Heat Ventilation Air Conditioning (HVAC). The hospital's HVAC equipment would be located on the hospital building rooftop. Noise generated by HVAC equipment is considered a local point source. HVAC equipment generates sound power levels (PWL) of up to 95 dBA at one foot. Noise generated by rooftop HVAC equipment would also be reduced by 8 dBA from the rooftop. The closest on-site sensitive use area located on the east side of Oak Park Lane between Junipero Street and Pueblo Street is approximately 25 feet and would experience a noise level up to 45 dBA L_{max}. Off-site residences are located farther away and would experience low noise levels from the HVAC equipment. Noise generated by HVAC equipment at the nearest sensitive land use would not exceed the City's noise ordinance requirement. The hospital's HVAC equipment would not add measurably to ambient noise in the project area. **Therefore, no cumulative noise impacts would occur as a result of the HVAC equipment.**

LEVEL OF SIGNIFICANCE AFTER MITIGATION

With implementation of the identified mitigation measures, potential short-term construction noise and vibration impacts would be reduce; however, because construction of the proposed project would result in high noise levels over a long construction period of nine years, the proposed project construction activities would cause significant noise and vibration impacts at the surrounding land uses. The implementation of the identified mitigation measures for long-term noise impacts would be reduced to below the level of significance.

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COTTAGE HOSPITAL

FHWA TRAFFIC NOISE MODEL PRINTOUTS

CUMULATIVE YEAR (2013) BASELINE CONDITIONS

TABLE Interim NP-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Junipero Street between Bath Street and Castillo Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3085 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 55.62

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	61.5

TABLE Interim NP-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Junipero Street between Castillo Street and Oak Park Lane
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3955 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.70

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	72.5

TABLE Interim NP-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Junipero Street South of Oak Park Lane
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4360 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 57.12

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	77.3

TABLE Interim NP-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Nogales Avenue South of De La Vina Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1050 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 50.94

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Interim NP-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Pueblo Street North of De La Vina Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2420 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.56

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	52.4

TABLE Interim NP-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Pueblo Street between De La Vina Street and Bath Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3430 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.08

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	66.0

TABLE Interim NP-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Pueblo Street between Bath Street and Castillo Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4355 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 57.12

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	77.2

TABLE Interim NP-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Pueblo Street between Castillo Street and Oak Park Lane
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4720 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 57.46

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	81.5

TABLE Interim NP-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Pueblo Street South of Oak Park Lane
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 5130 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 57.83

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	86.1

TABLE Interim NP-10
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Mission Street North of De La Vina Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 18560 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.80

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	76.3	160.8	344.6

TABLE Interim NP-11
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Mission Street between De La Vina Street and Bath Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 23020 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.74

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	87.5	185.3	397.7

TABLE Interim NP-12
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Mission Street between Bath Street and Castillo Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 27815 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.56

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	98.8	210.0	451.1

TABLE Interim NP-13
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Mission Street South of Oak Park Lane
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 33630 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.39

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
54.2	111.7	238.1	511.7

TABLE Interim NP-14
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: De La Vina Street West of Nogales Avenue
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8990 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 60.26

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	58.3	125.0

TABLE Interim NP-15
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: De La Vina Street between Nogales Avenue and Pueblo Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9445 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 60.48

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	60.2	129.2

TABLE Interim NP-16
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: De La Vina Street East of Pueblo Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9220 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 60.37

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	59.2	127.1

TABLE Interim NP-17
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: De La Vina Street West of Mission Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11510 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 61.34

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	68.6	147.3

TABLE Interim NP-18
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: De La Vina Street East of Mission Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12920 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 61.84

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	74.0	159.1

TABLE Interim NP-19
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Bath Street West of Bath Junipero Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3170 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 55.74

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	62.6

TABLE Interim NP-20
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Bath Street between Junipero Street and Pueblo Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3995 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.74

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	73.0

TABLE Interim NP-21
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Bath Street East of Pueblo Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4570 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 57.32

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	79.8

TABLE Interim NP-22
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Bath Street West of Mission Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 6120 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 58.59

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	96.8

TABLE Interim NP-23
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Bath Street East of Mission Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4890 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 57.62

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	83.4

TABLE Interim NP-24
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Castillo Street West of Junipero Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1830 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 53.35

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Interim NP-25
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Castillo Street between Junipero Street and Pueblo Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2665 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.98

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	55.8

TABLE Interim NP-26
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Castillo Street East of Pueblo Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3980 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.72

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	72.8

TABLE Interim NP-27
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Castillo Street West of Mission Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 5910 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 58.44

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	94.6

TABLE Interim NP-28
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Castillo Street East of Mission Street
NOTES: Cottage Hospital - Interim NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4270 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 57.03

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	76.2

TABLE Interim NP-29
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Oak Park Lane between Junipero Street and Pueblo Street
NOTES: Cottage Hospital - Interim NP

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 810 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 49.81

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Interim NP-30
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Oak Park Lane East of Pueblo Street
NOTES: Cottage Hospital - Interim NP

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1060 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 50.98

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

COTTAGE HOSPITAL

FHWA TRAFFIC NOISE MODEL PRINTOUTS

CUMULATIVE YEAR (2013) PLUS PROJECT CONDITIONS

TABLE Interim P-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Junipero Street between Bath Street and Castillo Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4305 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 57.07

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	76.7

TABLE Interim P-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Junipero Street between Castillo Street and Oak Park Lane
NOTES: Cottage Hospital - Interim P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4730 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 57.47

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	81.6

TABLE Interim P-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Junipero Street South of Oak Park Lane
NOTES: Cottage Hospital - Interim P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4950 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 57.67

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	84.1

TABLE Interim P-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Nogales Avenue South of De La Vina Street
NOTES: Cottage Hospital - Interim P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1050 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 50.94

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Interim P-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Pueblo Street North of De La Vina Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2470 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.65

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	53.1

TABLE Interim P-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Pueblo Street between De La Vina Street and Bath Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3580 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.26

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	67.8

TABLE Interim P-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Pueblo Street between Bath Street and Castillo Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 5630 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 58.23

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	91.6

TABLE Interim P-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Pueblo Street between Castillo Street and Oak Park Lane
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 6265 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 58.69

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	98.3

TABLE Interim P-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Pueblo Street South of Oak Park Lane
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 5540 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 58.16

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	90.6

TABLE Interim P-10
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Mission Street North of De La Vina Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 18560 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.80

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	76.3	160.8	344.6

TABLE Interim P-11
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Mission Street between De La Vina Street and Bath Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 23020 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.74

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	87.5	185.3	397.7

TABLE Interim P-12
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Mission Street between Bath Street and Castillo Street
NOTES: Cottage Hospital - Interim P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 28080 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.60

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	99.4	211.3	453.9

TABLE Interim P-13
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Mission Street South of Oak Park Lane
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 34130 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.45

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
54.7	112.8	240.4	516.8

TABLE Interim P-14
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: De La Vina Street West of Nogales Avenue
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9000 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 60.27

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	58.3	125.1

TABLE Interim P-15
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: De La Vina Street between Nogales Avenue and Pueblo Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9455 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 60.48

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	60.2	129.2

TABLE Interim P-16
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: De La Vina Street East of Pueblo Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9220 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 60.37

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	59.2	127.1

TABLE Interim P-17
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: De La Vina Street West of Mission Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11510 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 61.34

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	68.6	147.3

TABLE Interim P-18
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: De La Vina Street East of Mission Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12920 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 61.84

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	74.0	159.1

TABLE Interim P-19
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Bath Street West of Bath Junipero Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4080 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.83

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	74.0

TABLE Interim P-20
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Bath Street between Junipero Street and Pueblo Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 5990 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 58.50

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	95.4

TABLE Interim P-21
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Bath Street East of Pueblo Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4850 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 57.58

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	83.0

TABLE Interim P-22
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Bath Street West of Mission Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 6400 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 58.79

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	99.7

TABLE Interim P-23
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Bath Street East of Mission Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4910 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 57.64

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	83.6

TABLE Interim P-24
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Castillo Street West of Junipero Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3310 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 55.92

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	64.4

TABLE Interim P-25
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Castillo Street between Junipero Street and Pueblo Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 123 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 41.62

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Interim P-26
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Castillo Street East of Pueblo Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4530 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 57.29

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	79.3

TABLE Interim P-27
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Castillo Street West of Mission Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 6260 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 58.69

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	98.3

TABLE Interim P-28
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Castillo Street East of Mission Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4370 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 57.13

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	77.4

TABLE Interim P-29
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Oak Park Lane between Junipero Street and Pueblo Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2380 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.49

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	51.8

TABLE Interim P-30
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 07/22/2004
ROADWAY SEGMENT: Oak Park Lane East of Pueblo Street
NOTES: Cottage Hospital - Interim P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1060 SPEED (MPH): 25 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 50.98

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

LSA

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ROCKLIN

MEMORANDUM

DATE: April 1, 2004

TO: Jill O'Connor

FROM: Keith Lay

SUBJECT: Cottage Hospital EIR - Review of Previous Noise and Vibration Analyses

As requested a review of the Noise and Vibration reports prepared for the previous Cottage Hospital EIR was conducted. The following documents were reviewed:

- Santa Barbara Cottage Hospital Seismic and Modernization Plan Acoustical Analysis Report (Acoustical Analysis Associates, Incorporated, October 2003).
- Acoustical Analysis, Proposed Helicopter Operations Santa Barbara Cottage Hospital (Acoustical Analysis Associates, Incorporated, September 1999).
- Acoustical Analysis, Proposed Helicopter Operations Santa Barbara Cottage Hospital (Acoustical Analysis Associates, Incorporated, October 2003).

Acoustic Analysis Report, October 2003

The acoustical analysis evaluated the following impacts:

- Construction Noise
- Vibration Impacts
- Parking Structure Noise

The acoustical analysis concluded that the impacts from vibration and parking structure noise, although noticeable, would be less than significant. The information from these sections will be incorporated into the EIR noise analysis. The construction noise impact analysis included a detailed evaluation of the equipment to be used on-site and the construction phasing. However, the analysis evaluated the construction impacts by converting the maximum noise levels to a day-night average noise level (L_{dn}). This may underestimate the project's impact on single event noise exposure level or short-term maximum noise level as construction activities are limited to the hours of 7:00 a.m. to 8:00 p.m. by the City of Santa Barbara's Municipal Code. Therefore, the construction activities will not occur during the nighttime hours (10:00 p.m. to 7:00 a.m.) that are penalized by the addition of 10 dBA when using L_{dn}. For the EIR noise analysis, LSA will calculate the maximum noise level (L_{max}) generated during construction at the nearest sensitive receptors to evaluate the worst case construction noise levels.

The analysis prepared by Acoustical Analysis Associates, Incorporated (AAAI) adequately evaluated the three noise impacts listed above. However, the analysis did not evaluate the following noise impacts:

- Traffic noise on-site and adjacent off-site sensitive uses.
- On-site stationary noise on adjacent off-site sensitive uses.

The potential traffic noise impacts, on the surrounding sensitive land uses, from the vehicle trips generated by the proposed project will be calculated. In addition, the future traffic noise levels will be calculated adjacent to the on-site sensitive land uses. Mitigation measures will be recommended to reduce the traffic noise impacts to below a level of significance, if necessary.

The noise levels from on-site stationary noise sources, such as ventilation systems, loading docks, or parking lots, will be calculated. If on-site or off-site impacts are identified during noise evaluation, mitigation measures will be recommended to reduce the noise impacts to below a level of significance.

Proposed Helicopter Operations, September 1999/October 2003

The acoustical analyses evaluated the following impacts:

- On-site and off-site exterior helicopter noise levels
- On-site interior helicopter noise levels

The acoustical analyses included a detailed evaluation of the existing ambient noise levels and the potential on-site and off-site helicopter noise levels. However, analysis evaluated the helicopter impacts by converting the noise levels to L_{dn}. This may underestimate the project's impact on single-event noise exposure level or short-term maximum noise level as the helicopters are only projected to fly twice a week. Therefore, in addition to the L_{dn} evaluation the helicopter noise levels will be calculated by LSA using the Federal Aviation Administration's (FAA) system for measuring and evaluating noise impacts. That system, as incorporated in FAR Part 150 and Order 1050.1D, is the family of units based on the "A" weighted sound level. For helistop (or heliports/helipads), the FAA chose the SEL, which is a single-event measure combining both the events maximum intensity and its duration and the EQL, which is a 24-hour measure based on the SEL levels.

Two different helipad locations and flight paths were evaluated in the two acoustical analyses. The potential helicopter noise impacts will be evaluated using the noise levels in the two previous analyses and the final helipad location.

While the analysis prepared by AAAI thoroughly evaluated the on-site and off-site exterior noise impacts of the helicopter noise, the following additional noise impact will be evaluated by LSA for the proposed project:

- Off-site interior helicopter noise levels

Off-site interior noise level impacts from the helicopter operations will be evaluated using the City's interior noise threshold of 45 dBA L_{dn} and the FAA's EQL. Mitigation measures will be recommended to reduce the noise impacts to below a level of significance, if necessary.