11.0 NOISE AND VIBRATION

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.

11.1 NOISE AND VIBRATION - IMPACT SIGNIFICANCE GUIDELINES

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). The L_{dn} is the day-night noise level for a 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 hours between 10:00 p.m. and 7:00 p.m. The Community Noise Equivalent Level (CNEL) is the 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of five decibels to sound levels occurring in the evening from 7:00 a.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. CNEL and L_{dn} are within 1 dBA of each other and are usually interchangeable.

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, hospital, and park 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 the 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.

11.2 NOISE AND VIBRATION IMPACTS - METHODOLOGY

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.

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 percentile noise levels. For example, the L_{10} level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} 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} 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 steady noise source, the L_{eq} and L_{50} are approximately the same.

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

➢ Maximum Noise Level Methodology

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.

➢ Ambient Noise Measurement Methodology

LSA conducted noise measurements on March 8, 2004, to document the existing noise environment in the project area using the Larson Davis Model 824 Type 1 noise meter (Serial No. 1612.). Measurements were taken at nine locations around the project site as described further in Section 11.4. The following measurement procedures were utilized at each location:

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 Control 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).

Table 11.A shows the FTA's groundborne vibration and noise impact criteria, predicting vibration levels that would result in community annoyance for each land use category. As shown in Table 11.A, community annoyance thresholds are based on different vibration levels and the frequency of events. A frequent event is defined as more than 70 events per day, and an infrequent event is defined as fewer than 70 events per day. Also shown in Table 11.A, a frequent event at lower levels would evoke the same response as an infrequent event at higher levels. For example, in Table 11.A, frequent vibration event at 72 VdB would generate the same community response as infrequent vibration events at 80 VdB for residential land uses.

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

TABLE 11.A: 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]	—	—
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.

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.

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.

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 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.

➢ Combined Noise Analysis Methodology

In order to assess the effects of combined noise levels from various sources, a qualitative analysis was conducted.

The characteristics of the noise from these sources varies greatly, including short-term, intermittent noise sources such as activities associated with parking lot, loading/unloading, HVAC equipment, and helicopter operations, and long-term, steady noise sources such as vehicular traffic on the roadways. As the distances of these major noise sources vary for each sensitive receptor location, noise levels also vary. For example, sensitive land uses closer to a roadway would experience higher noise levels from vehicular traffic than locations that are farther removed from the roadway.

Each identified receptor experiences composite noise from multiple sources; however, the characteristics and duration of noise vary with the source, making it difficult to accurately characterize the composite noise as a single measurement. Potential environmental or

community noise impacts from various sources on individual receptors are evaluated in terms of different noise scales, including community noise equivalent level (CNEL), day-night average noise level (L_{dn}), and maximum noise level (L_{max}), as described in more detail below.

Noise from transportation sources such as vehicular traffic, railroad operations, and airport activities is usually evaluated with the 24-hour weighted average CNEL or L_{dn}.

Noise generated by temporary or stationary noise sources, such as activities associated with construction, parking lot, or loading/unloading operations, is usually evaluated with noise criteria specified in the noise ordinance. These criteria are listed in terms of the maximum noise level (L_{max}) or other percentile exceedance noise levels (L_n).

Due to the differences in composition of these noise scales/standards, noise from temporary, short-term sources such as construction or loading/unloading activities is not combined with noise from steady, long-term sources such as vehicular traffic on adjacent streets. For example, an area adjacent to a loading area and a street with steady traffic would be affected by both noise sources. However, noise generated by temporary, short-term loading/unloading activities would not have measurable changes to and should not be included in the calculation of the 24-hour weighted CNEL that is established for transportation noise sources for planning purposes. Similarly, noise generated by loading/unloading activities should be evaluated separately, using the maximum and/or percentile exceedance noise levels in the noise ordinance for enforcement purposes. Therefore, noise associated with different sources is evaluated separately against the noise standards established for the respective activities.

Any attempt to combine the noise from short-term intermittent sources with long-term steady sources requires many assumptions. For example, assumptions for parking lot activities include the frequency of vehicles entering or leaving the site, the distance from a specific vehicle to the receptor location of concern, and the time of day these activities occur, as well as noise reduction provided by intervening structures between the receptor and the noise source. Similarly, noise from sirens, car alarms, loading/unloading activities, and other short-term noise events that occur intermittently with no specific timing would require many assumptions to estimate a noise level in terms of the 24-hour weighted CNEL/L_{dn}.

Combining noise metrics from all short-term and long-term noise sources for a single receptor location requires the use of a large number of assumptions and "guesswork" and therefore does not yield useful information for quantitative evaluation of the potential project impacts. However, a qualitative description of noise sources and characteristics can provide a useful characterization of the combined, or composite, noise experienced at representative neighborhood locations under existing and future conditions.

11.3 NOISE AND VIBRATION IMPACTS - REGULATORY FRAMEWORK

A project would normally have a significant noise-related effect on the environment if it would substantially increase the ambient noise levels for adjoining areas or conflict with the adopted environmental plans and goals of the community in which it is located. The applicable noise standards governing the project site are the criteria in the City's Noise Element of the General Plan and its Municipal Code, as described below.

➢ City of Santa Barbara 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 11.B summarizes the noise level compatibility for each land use category expressed in dBA L_{dn}. In Table 11.B, 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.

➢ 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.

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.

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.

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 Section 11.1 and Section 11.2 in this analysis.

11.4 NOISE AND VIBRATION IMPACTS - EXISTING SETTING

11.4.1 PROJECT SITE NOISE 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 within a parking structure can range from 65 dBA L_{max} to 75 dBA L_{max} at 50 feet. Noise from typical

TABLE 11.B: 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						
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						

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

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.)

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 51 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 to document the ambient noise levels at these on-site sensitive land uses on March 8, 2004, as discussed in Section 11.2. Table 11.C contains the results of these measurements. Table 11.D describes the physical location of the noise monitoring sites. In Tables 11.C and 11.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 11.1 depicts these monitoring locations.

TABLE 11.C: AMBIENT NOISE MEASUREMENT 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 11.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.

11.4.2 SURROUNDING NOISE 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. Table 11.C shows the results of these measurements. Table 11.D describes the physical location of the noise monitoring sites. In Tables 11.C and 11.D, off-site areas are represented by monitoring locations M-1 through M-4 and M-7 through M-9. Figure 11.1 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. 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 11.E. As shown in Table 11.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.

➢ 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.

11.5 NOISE AND VIBRATION IMPACTS - 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.

TABLE 11.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
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

[1] Traffic noise within 50 feet of 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
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.

PF 11-1 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.

11.6 NOISE AND VIBRATION IMPACTS - LONG-TERM IMPACTS

11.6.1 PROJECT SPECIFIC IMPACTS (LONG TERM)

➢ Vehicular Traffic Impacts (Long-Term)

Vehicular traffic noise associated with the proposed hospital modernization project would potentially impact on-site and off-site sensitive land uses. Table 11.F shows the future without the proposed project traffic noise levels. Table 11.G 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.

Table 11.G 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 11.G, 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 Section 11.1, 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 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.***

TABLE 11.F: 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 11.G: 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						
West 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.

➢ Helicopter Operations Impacts (Long-Term)

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 11.H indicates maximum noise levels generated from helicopter noise for single-event noise measurements at six monitoring locations as identified in the AAAI Report. Figure 11.2 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-1.

As estimated by SBCH, helicopter approach and departure operations for medical emergencies 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 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 11.I 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 11.I shows that Monitoring Locations 3 (Hospital/Office; see Table 11.I) and 5A (Hospital Exterior; see Table 11.I.) would be exposed to noise 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 11.I) 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 11.I) 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

TABLE 11.H: SUMMARY OF MEASURED HELICOPTER SINGLE EVENTS AROUND SANTA BARBARA COTTAGE HOSPITAL (JANUARY 5, 1999) (SEE FIGURE 11.2)

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.

TABLE 11.I: DAY-NIGHT AVERAGE SOUND LEVEL (L_{DN}) FROM THE PROPOSED HELICOPTER OPERATIONS, SANTA BARBARA COTTAGE HOSPITAL (SEE FIGURE 11.2)

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.

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 11.I 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 (one 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-1, 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.***

Regardless of the number of helicopter operations, Mitigation Measures N-2 and N-3 would apply. Mitigation Measures N-2 and N-3 require annual evaluations of helicopter flight activity and annual detailed operations records, respectively, to be included in the Helicopter Operations Plan.

➢ Parking Structure Noise Impacts (Long-Term)

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.

Pueblo Parking Structure. 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 11.I, 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 on the southwest corner of Bath Street and Junipero Street 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 Noise Impacts (Long-Term)

The new Central Plant 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 11.J, 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 is 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 hours, mechanical equipment noise would potentially violate the City's noise ordinance for residential land uses. ***Mitigation Measure N-4, 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 11.J: PREDICTED MECHANICAL EQUIPMENT NOISE LEVELS AT THE NEAREST RESIDENCE LOCATED ALONG CASTILLO STREET NORTH OF JUNIPERO STREET

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 HVAC equipment were also evaluated to enhance potential noise impacts at the sensitive receptor locations, as discussed below.

Typical maximum noise generated by mechanical equipment was obtained from the *Noise Control for Building and Manufacturing Plants* (Bolt, Beranek and Newman Inc., January 1987), which lists sound power level 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 the 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 11.I (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 and Unloading Activity Noise Impacts (Long-Term)

Loading and unloading docks for the proposed project are 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 LSA's experience with analysis of truck 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 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 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 levels 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 Model Community Noise Control 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-5 would limit loading and unloading activities to the daytime hours of 7:00 a.m. to 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 noise level up to 80 dBA L_{max} from loading dock activities. ***Hospital patients, employees, and visitors that would use the outdoor use area would periodically experience noise levels exceeding the Model Community Noise Control Ordinance maximum daytime noise level of 75 dBA L_{max}, and the maximum nighttime noise level of 70 dBA L_{max} at night (after 10:00 p.m.), which indicates community annoyance and an adverse but less than significant noise impact.***

As shown in Table 11.I, 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-6 (loading dock noise barrier) would reduce maximum noise exposure from loading and unloading activities to on-site outdoor active use areas by implementing an

8-foot wall between the loading dock and the hospital's outdoor active use areas. The noise wall would reduce the noise levels experienced by the hospital's active use area by 5 dBA to 75 dBA $L_{max,}$ or the guideline for maximum daytime noise level identified in the Model Community Noise Control Ordinance.

Although the hospital's outdoor active use area would be likely to be used less during the hours of 10:00 p.m. to 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-5, Loading Dock Hour Limits, would restrict loading/ unloading to the hours of 7:00 a.m. to 10:00 p.m. each day/evening. With implementation of recommended Mitigation Measures N-5 (Hour Limits) and N-6 (Barrier Wall), adverse but less than significant noise levels at the proposed hospital's outdoor active use area would be further reduced.

Recommended Mitigation Measure N-6, the loading dock noise barrier, could have impact related to being located in a flood-prone area of the project site. Mitigation Measure N-6 prescribes that an engineering assessment to site the wall, its ultimate height, and any constraints such as drainage or flood hazards, shall be conducted prior to issuance of building permits for the affected portion of the reconstructed hospital.

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 continuous 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.

➢ HVAC Noise Impacts (Long-Term)

HVAC equipment is typically located on building rooftop. HVAC equipment generates 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.***

➢ Combined Noise Levels (Long-Term)

The following addresses the combined noise effects of the various sources at sensitive receptor locations around the project site. As discussed in Section 11.2, this qualitative analysis characterizes the potential noise impact at these sensitive receptor locations. Ten sensitive receptors have been identified by LSA as representative sensitive noise receptors for the SBCH project. These receptors are labeled R-1 through R-10, as identified on Figure 11.3, and are included in Table 11.K below.

TABLE 11.K: SENSITIVE RECEPTOR LOCATIONS

Sensitive Receptor	Land Use	Location
R-1	Residence	West side of De La Vina Street north of Nogales Avenue.
R-2	Residence	East side of Bath Street north of Junipero Street.
R-3	Residence	West side of Bath Street north of Los Olivos Street.
R-4	Residence	North side of Junipero Street between Castillo Street and Bath Street.
R-5	Residence	North side of Junipero Street near the intersection of Oak Park Lane.
R-6	Residence	Northeast corner of Los Olivos Street and Oak Park Lane near existing Parking Lot 3.
R-7	Residence	South side of Los Olivos Street and west of Castillo Street.
R-8	Existing Hospital Park	North side of Pueblo Street between Castillo Street and Oak Park Lane, (would be replaced with the proposed new hospital use).
R-9	Proposed Hospital Park	East side of Oak Park between Junipero Street and Pueblo Street.
R-10	Park	North of Junipero Street west of Walamar Avenue.

Source: LSA Associates, Inc., 2004.

The following describes the effects of combined noise at these sensitive receptors.

Sensitive Receptor R-1. Major noise sources that contribute to existing ambient noise at receptor location R-1 include existing vehicular traffic on De La Vina Street, existing parking lot activities, rooftop HVAC equipment, and the existing Central Plant. The primary noise sources that contribute to future/with project ambient noise at this receptor location include future vehicular traffic on De La Vina Street, existing and proposed parking lot/structure activities, rooftop HVAC equipment, the proposed helipad, the proposed loading dock, and the proposed Central Plant.

Intervening structures would reduce future noise generated by roadway traffic at the proposed Pueblo parking structure, at the proposed helipad, at the hospital's proposed loading dock, and at the planned Central Plant structure. The edge of the hospital rooftop provides some noise reduction for the rooftop HVAC equipment. Noise from the proposed Central Plant structure is further attenuated by the structure itself, providing an interior to exterior noise reduction. There are no intervening structures between receptor location R-1 and the Knapp parking structure.

Generally, most of the noise sources affecting receptor location R-1 would not significantly change between existing and future conditions. Increased vehicular traffic will result in a minor increase in vehicular traffic noise, both with and without implementation of the proposed project. Noise from most of the other existing noise sources is reduced, and noise from most of the future noise sources will be reduced by the presence of intervening structures. Noise from the proposed helipad and loading dock represent new noise sources; however, they are sporadic in nature. Due to the heavier weighting of nighttime noise, however, a single helicopter flight per night would have some effect on the 24-hour average weighted noise level experienced at the receptor site. The number, timing, and frequency of noise from emergency vehicle sirens cannot be predicted, but is not anticipated to be substantially different from existing conditions at any of the receptor locations, since a hospital use already exists at the site. ***Therefore, sensitive receptor R-1 is not expected to experience a notable change in the composite noise***

environment. Receptor R-1 would experience new single-event noise episodes as a result of helicopter flights and the use of the proposed loading dock.

Sensitive Receptor R-2. Major noise sources contributing to existing ambient noise at receptor location R-2 include vehicular traffic on Bath Street, parking lot activities, rooftop HVAC equipment, and the existing Central Plant building. The primary noise sources that contribute to future/with project ambient noise at this receptor location include future vehicular traffic on Bath Street, helicopter noise associated with the proposed helipad, activities at the proposed Pueblo and Knapp parking structures, the new Central Plant building, proposed new HVAC equipment, and loading and unloading activities at the proposed loading dock.

The proposed project would result in future changes to traffic levels, with a corresponding increase in anticipated street noise compared with existing conditions. The proposed Knapp parking structure would be located approximately 50 feet from Receptor R-2. The only barrier between noise generated by the proposed Knapp parking structure and the receptor is the structure's guard rail; therefore, it is anticipated that Receptor R-2 would experience an increase in noise as a result of the new parking structure. The proposed Pueblo parking structure and the proposed hospital loading dock are each over 1,000 feet from Receptor R-2, and there are multiple intervening structures between the noise sources and Receptor R-2. Therefore, activities at the Pueblo parking structure and the hospital loading dock are not expected to have an appreciable impact on Receptor R-2.

Other noise sources that would affect the future composite noise environment for Receptor R-2 include the proposed helipad, the hospital rooftop HVAC equipment, and the new Central Plant building. Noise from the helipad would be sporadic, and attenuated somewhat by intervening structures that block the line of sight between R-2 and the helipad. The edge of the hospital rooftop could provide some noise reduction for the HVAC equipment, and noise from the new Central Plant building would be reduced through interior-to-exterior noise reduction and the presence of intervening structures.

As a result of the increased noise from helipad operations and the proposed Knapp and Pueblo parking structures, and the new proposed HVAC equipment, Receptor R-2 is expected to experience a notable increase in composite noise levels compared with existing conditions. In addition, Receptor R-2 is expected to experience new single-event noise episodes as a result of helicopter flights.

Sensitive Receptor R-3. Major existing noise sources that contribute to ambient noise at receptor location R-3 include vehicular traffic on Bath Street, parking lot activities, rooftop HVAC equipment, and the existing Central Plant building. The primary future noise sources that contribute to future/with project ambient noise at receptor location R-3 include future vehicular traffic on Bath Street, helicopter noise, activities at the proposed Pueblo and Knapp parking structures, the new Central Plant building, proposed new HVAC equipment, and truck loading and unloading activities.

Receptor R-3 is located approximately 465 feet from the Pueblo parking lot, 980 feet from the Knapp parking lot, 770 feet from an existing parking structure, and 880 feet from the existing Central Plant. The distance between Receptor R-3 and the existing parking areas and existing Central Plant, combined with multiple intervening structures, results in existing noise levels from these sources that are estimated to be low.

No appreciable increase in traffic noise or HVAC noise is anticipated as a result of project implementation. Traffic levels on Bath Street are not expected to increase significantly. The proposed Knapp parking structure and the proposed hospital loading dock are each over 1,000 feet from Receptor R-3, and there are multiple intervening structures between the noise sources and this receptor. Therefore, activities at the Knapp parking structure and the hospital loading zone are not expected to have an appreciable effect on this receptor. Similarly, the proposed new Central Plant structure is not expected to result in significant noise levels due to the distance from the receptor and the interior-to-exterior noise reduction. The proposed Pueblo parking structure would be closer, approximately 500 feet; however, noise would be attenuated by intervening structures. The proposed helipad is approximately 900 feet from Receptor R-3. Noise from the helipad would be sporadic and attenuated somewhat by intervening structures that block the line of sight between R-3 and the helipad.

Therefore, Receptor R-3 is not expected to experience a notable change in the composite noise environment. Receptor R-3 would experience new single-event noise episodes as a result of helicopter flights and the use of the proposed loading docks.

Sensitive Receptor R-4. Major sources of existing ambient noise at receptor location R-4 include vehicular traffic (Bath Street, Castillo Street, and Junipero Street), parking lot activities, rooftop HVAC equipment, and the existing Central Plant building. Existing noise levels are estimated to be low because of low levels of traffic on adjacent streets and the combination of distance and noise attenuation from existing intervening structures.

The primary noise sources that contribute to future/with project ambient noise at receptor location R-4 include vehicular traffic (Bath Street, Castillo Street, and Junipero Street), helicopter noise, activities at the Pueblo and Knapp parking structures, proposed new HVAC equipment, the Central Plant building, and truck loading and unloading activities. A small increase in traffic noise is anticipated commensurate with the small increase in project traffic levels. In addition, many of the other noise sources will generate incrementally higher noise levels at this location because Receptor R-4 is closer to the proposed hospital improvements, such as the proposed Central Plant building, than to the existing hospital, and because the Knapp parking structure will result in increased noise levels compared with the existing parking lot at that location. The loading zone and helipad are new noise sources that would sporadically affect the noise level at this receptor.

Therefore, sensitive receptor R-4 is expected to experience a notable change in the composite noise environment as a result of multiple noise sources. Receptor R-4 may experience new single-event noise episodes as a result of helicopter flights and the use of the proposed loading docks.

Sensitive Receptor R-5. Major sources of existing ambient noise at receptor location R-5 include vehicular traffic (Junipero Street and Oak Park Lane), parking lot activities, rooftop HVAC equipment, and the existing Central Plant building.

Major sources of future noise at receptor location R-5 include future vehicular traffic (Junipero Street and Oak Park Lane), proposed parking structures, proposed new rooftop HVAC equipment, the proposed Central Plant building, the operation of the helipad, and the proposed loading zone. ***It is anticipated that noise from most sources will increase only slightly compared with existing conditions. The helipad and loading dock operations are new noise***

sources, but as these sources are sporadic in nature, the overall increase in composite noise may be somewhat noticeable but not considerably different from existing conditions.

Sensitive Receptor R-6. Major sources of existing ambient noise at receptor location R-6 include vehicular traffic on Oak Park Lane, and parking lot activities.

The primary sources of future/with project ambient noise at receptor location R-6 include future vehicular traffic noise, helicopter noise, activities at the Pueblo parking structures, new proposed HVAC equipment, and truck loading and unloading activities. Future traffic levels on Oak Park Lane will remain low with implementation of the proposed project, and the resulting noise level is expected to be low. The Knapp parking structure is located over 1,200 feet from this receptor, and the proposed Central Plant building is located approximately 870 feet from Receptor R-6. Distance combined with noise attenuation provided by intervening structures indicate that these uses will have little effect on Receptor R-6. However, notable noise increases are expected to occur as a result of the operation of the Pueblo parking structure, particularly since there is little to no sound attenuation provided by intervening structures. In addition, the proposed helipad and loading zone are new noise sources. ***The Pueblo parking structure, helipad operations, and loading zone are all intermittent noise sources; however, in combination, these sources are expected to result in an appreciable increase in composite noise experienced at this receptor location compared with existing conditions.***

Sensitive Receptor R-7. Major sources of existing ambient noise at receptor location R-7 include vehicular traffic on Castillo Street, parking lot activities, and rooftop HVAC equipment.

The primary sources of future/with project ambient noise at receptor location R-7 include future vehicular traffic on Castillo Street, activities at proposed parking structures, proposed new rooftop HVAC equipment, the proposed Central Plant Building, the helipad operations, and the proposed loading dock activities. ***Overall, future noise sources are expected to be different from current conditions, but comparable to the existing composite noise levels.*** For example, the increase in noise from the helipad operations and, to a lesser extent, the loading dock operations would be somewhat offset by a decrease in noise experienced by HVAC operations after the new hospital improvements have been constructed.

Sensitive Receptor R-8. As noted in Table 11.K, Receptor R-8 is the existing hospital park, or outdoor use area. This park would be replaced with the proposed reconstructed hospital facilities, and therefore would not remain in the long-term operational condition.

Sensitive Receptor R-9. Sensitive receptor R-9 is a proposed hospital park, or outdoor use area. The existing park is located on the north side of Pueblo Street. The primary sources of future/with project ambient noise levels at the proposed hospital park are traffic on Oak Park Lane and Junipero Street, the proposed Knapp and Pueblo parking structures, the new Central Plant building and proposed new rooftop HVAC equipment, and activities at the proposed helipad and loading dock. The most significant noise sources at this location would be vehicular traffic, the helipad operations, and the loading dock operations. As a result of the proximity to the proposed loading dock and the absence of intervening structures, the resulting loading zone noise levels would be highest at this location compared with the other identified sensitive receptors. ***Due to the intermittent nature of noise at the loading dock, however, the overall effect on the composite noise environment is not expected to be appreciable.***

Sensitive Receptor R-10. Sensitive Receptor R-10 is the existing Oak Park, west of Alamar Avenue. Major noise sources contributing to existing ambient noise at receptor location R-10 include vehicular traffic on Junipero Street, existing parking lots and parking structures, the existing Central Plant building and the existing hospital HVAC equipment.

The primary sources of future ambient noise at this receptor location include future vehicular traffic on Junipero Street, existing and proposed parking structures, the proposed Central Plant building, the proposed hospital HVAC equipment, the helipad operations, and the proposed loading dock activities. Increased noise levels are expected from minor increases in street traffic and from activities in the parking structures. Minor decreases in noise are expected from the Central Plant building and HVAC equipment compared with noise from the existing sources. ***Overall, future composite noise levels at the park are expected to be slightly higher than existing levels; however, future noise levels are expected to be well within the thresholds for outdoor recreation uses.***

➢ Summary of Long-Term Combined Noise Impacts at Sensitive Receptors

Among the 10 sensitive noise receptors evaluated for the potential effects of combined or composite noise, discernable increases in noise levels from various sources are anticipated at R-2, R-4, and R-6 compared with existing noise conditions. Although the combined noise effects would be discernable, they are not anticipated to be significant given that the increases in noise from the individual noise sources averaged over the day/night would be incremental and within threshold levels. The various sensitive receptors may be affected by one or more of the noise sources at their respective locations adjacent to the hospital campus, but the noise would be periodic and short-term in nature, generated at different times and locations. As an example, single event noise from use of the proposed hospital loading dock or from one helicopter landing and takeoff during nighttime hours may be experienced; however, these noise events would be episodic and not continuous throughout the day/night and would not represent a significant noise impact. As discussed previously in this chapter, day/night averaged noise levels for more than one helicopter landing and takeoff during nighttime hours would constitute a significant unavoidable adverse impact. Receptors R-1, R-3, R-5, R-7, R-9, and R-10 would experience combined noise levels that would not be discernable; or would not be considerably different than existing levels.

11.6.2 PROJECT LONG-TERM NOISE MITIGATION MEASURES

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

N-1 Helicopter Operations Plan. Prior to issuance of building permits by OSHPD for the Diagnostic and Treatment Building (Phase II) that includes the helipad, 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-2 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-3 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-4 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-5 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-6 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.

11.6.3 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.

➢ Traffic Noise Impacts (Specific Plan Long-Term)

Potential future construction of an additional nursing pavilion or similar use as allowed under SP-8 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 11.L shows the incremental noise increases along affected street segments as a result of the additional 769 ADT. As shown in Table 11.L, 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, 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.***

➢ Helicopter Operation Noise Impacts (Specific Plan Long-Term)

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.***

11.6.4 SPECIFIC PLAN LONG-TERM NOISE MITIGATION MEASURES

Mitigation Measures N-1, N-2, and N-3 would be applied to SP-8 development.

11.6.5 CUMULATIVE LONG-TERM IMPACTS

➢ Traffic Noise Impacts (Cumulative Long-Term)

The cumulative study area for traffic noise impacts includes roadway segments listed in Tables 11.F and 11.G. 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 conditions. Traffic noise associated with project site operation would incrementally contribute to cumulative noise levels of on-site and off-site sensitive land uses. Cumulative traffic noise levels with and without project (see Tables 11.F and 11.G) 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 cumulative 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 (Cumulative Long-Term)

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 11.2 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

TABLE 11.L: 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.

aircraft noise in the area. ***Therefore, no cumulative noise impacts would occur as a result of helicopter operations.***

➢ Parking Structure Noise (Cumulative Long-Term)

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 Impact (Cumulative Long-Term)

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 testing. 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-4). 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 and Unloading Activities (Cumulative Long-Term)

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.***

➢ HVAC Equipment (Cumulative Long-Term)

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 an SPL 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.***

11.6.6 CUMULATIVE LONG-TERM NOISE MITIGATION MEASURES

There are no cumulative long-term noise impacts; therefore, no mitigation measures are required.

11.7 NOISE AND VIBRATION IMPACTS - TEMPORARY 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.

➢ Commute Noise (Construction-Related)

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-14). 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.

➢ On-Site Noise (Construction-Related)

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 11.M 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.

TABLE 11.M: 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.

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 11.M, 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 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.

- **Vibration (Construction-Related)**

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 11.N 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 11.N, 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 11.O 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.

11.7.1 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

TABLE 11.N: 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 11.O: 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.

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. 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-14). The construction trips for Phase I would generate approximately 133 ADT. Table 11.P 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 11.P, 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 impact to nearby residences, hospital patients and employees, medical office occupants, and park users.***

➢ Construction Site Noise Impacts (Phase I)

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 windows closed) to 76 dBA (with windows closed) 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.

TABLE 11.P: 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.

With the implementation of Mitigation Measure N-9 (limiting the permitted hours of construction), Mitigation Measure N-10 (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-9 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 would increase. Also, 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-11. Figure 11.4 shows the temporary noise barrier locations for Phase I construction activities. With the implementation of Mitigation Measure N-9 (limiting the permitted hours of construction), Mitigation Measure N-10 (requiring the best available noise control technology for all construction equipment), and Mitigation Measure N-11 (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.

With the implementation of Mitigation Measure N-9 (limiting the permitted hours of construction), Mitigation Measure N-10 (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 closed) 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 8feet high are recommended to reduce maximum construction noise inside these office buildings.

With the implementation of Mitigation Measure N-9 (limiting the permitted hours of construction), Mitigation Measure N-10 (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. The shortest distance from residences along Oak Park Lane, Los Olivos Street, and Parkway Drive to the Phase I construction of the Pueblo 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 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-11. Figure 11.4 shows the temporary noise barrier locations for Phase I construction activities. With the implementation of Mitigation Measure N-9 (limiting the permitted hours of construction), Mitigation Measure N-10 (requiring the best available noise control technology for all construction equipment), and Mitigation Measure N-11 (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 closed) 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-9 (limiting the permitted hours of construction), Mitigation Measure N-10 (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 closed) 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-9 (limiting the permitted hours of construction), Mitigation Measure N-10 (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-11. Figure 11.4 shows the temporary noise barrier locations for Phase I construction activities. With the implementation of Mitigation Measure N-9 (limiting the permitted hours of construction), Mitigation Measure N-10 (requiring the best available noise control technology for all construction equipment), and Mitigation Measure N-11 (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 closed) 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-9 (limiting the permitted hours of construction), Mitigation Measure N-10 (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 (Phase I)

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 could experience a vibration level up to 92 VdB, which exceeds the groundborne vibration impact criteria (see Table 11.A). This vibration level is not anticipated to result in structural damage; however, it would cause community disturbance. Mitigation Measure N-8 (a crack survey and video reconnaissance) shall be implemented to document preconstruction conditions. See Figure 11.4 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 could experience a vibration level of to 84 VdB. This vibration level would result in potential community annoyance (see impact criteria in Table 11.A); however, it would not result in structural damage. Mitigation Measure N-8 (a crack survey and video reconnaissance) shall be implemented to document preconstruction conditions. See Figure 11.4 for crack survey and video reconnaissance locations for Phase I construction. However, there are no feasible mitigation measures to reduce the disturbance to the adjacent community. ***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-7 (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. However, there are no feasible mitigation measures to reduce vibration disturbance to less than criteria levels. ***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.***

➢ Vibration Impact from Clearing of the Pueblo Parking Structure Site and the Construction of the Pueblo Parking Structure and the Child Care Facility (Phase I)

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; however, it would cause community disturbance. Mitigation Measure N-8 (a crack survey and video reconnaissance) shall be implemented. See Figure 11.4 for crack survey and video reconnaissance locations for Phase I construction. However, there are no feasible mitigation measures to reduce the disturbance caused by the vibration. ***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. Mitigation Measure N-8 (a crack survey and video reconnaissance) shall be implemented. See Figure 11.4 for crack survey and video reconnaissance locations for Phase I construction. However, there are no feasible mitigation measures to reduce the disturbance caused by the vibration. ***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 is not anticipated to result in structural damage. Mitigation Measure N-7 (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. However, there are no feasible mitigation measures to reduce or prevent this potential vibration level. ***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 (Phase I)

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; however, it would cause community

disturbance. Mitigation Measure N-8 (a crack survey and video reconnaissance) shall be implemented. See Figure 11.4 for crack survey and video reconnaissance locations for Phase I construction. However, as indicated previously, there are no feasible mitigation measures to reduce vibration levels. ***Therefore, unavoidable adverse construction vibration impacts upon adjacent medical office uses from construction of the Knapp parking structure 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. Mitigation Measure N-8 (a crack survey and video reconnaissance) shall be implemented. See Figure 11.4 for crack survey and video reconnaissance locations for Phase I construction. ***However, without feasible mitigation measures to reduce vibration levels, 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 is not likely to result in structural damage to the hospital. Mitigation Measure N-7 (coordination with SBCH on location of construction equipment) would reduce the potential for damage to vibration sensitive equipment within any of the hospital buildings; however, there are no feasible measures to reduce vibration levels. ***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.***

11.7.2 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 sub-phases during Construction Phase II.

➢ Noise Impact from 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 to the project site from an off-site parking area (N-14). The construction trips for Phase II would generate approximately 112–224 ADT. Table 11.Q lists the expected addition of construction trips on the neighborhood streets and the increase in noise generated by these additional construction trips for Phase II. As shown in Table 11.Q, 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.***

TABLE 11.Q: PHASE II STREET NOISE ANALYSIS

Roadway Segment	Existing ADT	Phase II Construction ADT	Percent Increase	Existing L_{dn} (dBA) 050 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.

➢ 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 (Phase II). 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 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 closed) 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-9 (limiting the permitted hours of construction), and Mitigation Measure N-10 (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-11. Figure 11.5 shows the temporary noise barrier locations for Phase II construction activities. With the implementation of Mitigation Measure N-9 (limiting the permitted hours of construction), Mitigation Measure N-10 (requiring the best available noise control technology for all construction equipment), and Mitigation Measure N-11 (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 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 maximum construction noise inside the hospital building.

With the implementation of Mitigation Measure N-9 (limiting the permitted hours of construction), Mitigation Measure N-10 (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 (Phase II). 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; however, it would cause disturbance to nearby office workers. Mitigation Measure N-8 (a crack survey and video reconnaissance) shall be implemented to document preconstruction conditions. See Figure 11.5 for crack survey and video reconnaissance locations for Phase II construction. However, there are no feasible mitigation measures to reduce actual vibration levels. ***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. Mitigation Measure N-8 (a crack survey and video reconnaissance) shall be implemented. However, there are no feasible mitigation measures to reduce actual vibration levels. See Figure 11.5 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 is not likely to result in structural damage to the hospital. Mitigation Measure N-7

(coordination with SBCH on location of construction equipment) would reduce the potential for damage to vibration-sensitive equipment within any of the hospital buildings. However, there are no feasible mitigation measures to reduce actual vibration levels. ***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.***

11.7.3 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. This construction phase is estimated to take approximately two and one-half years within which the applicant proposes four different sub-phases of work.

➢ Noise Impacts from 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 to the project site from an off-site parking area. Construction equipment would also be transported to and from the project site (N-14). The construction trips for Phase III would generate approximately 116 ADT. Table 11.R lists the expected construction trips on the neighborhood streets for Phase III and the increase in noise. As shown in Table 11.R, 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 (Phase III). 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. 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

TABLE 11.R: 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.

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 closed) 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-9 (limiting the permitted hours of construction), Mitigation Measure N-10 (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-11. Figure 11.6 shows the temporary noise barrier locations for Phase III construction. With the implementation of Mitigation Measure N-9 (limiting the permitted hours of construction), Mitigation Measure N-10 (requiring the best available noise control technology for all construction equipment), and Mitigation Measure N-11 (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. The hospital would experience a potential maximum noise level up to 91 dBA L_{max}. Patients, employees, and visitors would be exposed to occasional high noise levels. 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 maximum construction noise inside the hospital building.

With the implementation of Mitigation Measure N-9 (limiting the permitted hours of construction), Mitigation Measure N-10 (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.***

➢ 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 (Phase III). 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 is not likely to result in structural damage; however, it would cause disturbance to nearby office workers. Mitigation Measure N-8 (a crack survey and video reconnaissance) shall be implemented to document preconstruction conditions. See Figure 11.6 for crack survey and video reconnaissance locations for Phase III construction. However, there are no feasible mitigation measures to reduce actual vibration levels. ***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. Mitigation Measure N-8 (a crack survey and video reconnaissance) shall be implemented. See Figure 11.6 for crack survey and video reconnaissance locations for Phase III construction. However, there are no feasible mitigation measures to reduce actual vibration levels. ***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 is not anticipated to result in structural damage. Mitigation Measure N-7 (coordination with SBCH on location of construction equipment) would reduce the potential for damage to vibration sensitive equipment within any of the hospital buildings. However, there are no feasible mitigation measures to reduce actual vibration levels. ***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.***

11.7.4 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.

➢ Noise Impact from 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 to the project site from an off-site parking area (N-14). The construction trips during Phase IV would be approximately 70 ADT. Table 11.S lists the forecast addition of construction trips on the neighborhood streets for Phase IV and the increase in traffic noise. As shown in Table 11.S, 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 for Phase IV would not result in significant traffic noise impacts to residences and park users.***

TABLE 11.S: 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 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 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.***

11.7.5 CONSTRUCTION NOISE AND VIBRATION IMPACT - CONCLUSION

Construction operations are considered temporary and not sustained at any single location. Implementation of Mitigation Measures N-7 through N-17 (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.***

11.7.6 PROJECT CONSTRUCTION NOISE AND VIBRATION MITIGATION MEASURES

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

N-7 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-8 Prepare a Crack Survey and Video Reconnaissance. Prior to issuance of demolition permits, SBCH or its designee shall prepare 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, as identified in the EIR, pages 3-20 through 3-24 and Figure 3.10, 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 due to project construction. Figures 11.4–11.6 show the potential areas that would require a crack survey and video reconnaissance documentation.

N-9 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 shall be included in the construction plan specifications. 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-10 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-11 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 11.4–11.6 show the approximate location of the barriers for each construction phase. This mitigation measure shall be included in the construction plan specifications.

N-12 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-13 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-14 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.

[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-15 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.

N-16 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-17 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-18 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.

11.7.7 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.

➢ Construction Noise Impacts (Specific Plan)

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-9 (limiting the permitted hours of construction) and Mitigation Measure N-10 (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-9 (limiting the permitted hours of construction), Mitigation Measure N-10 (requiring the best available noise control technology for all construction equipment), and Mitigation Measure N-11 (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-9 (limiting the permitted hours of construction) and Mitigation Measure N-10 (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-7 through N-17 (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. ***However, there are no established thresholds to evaluate construction noise and vibration impacts on sensitive land uses. 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.***

➢ Construction Vibration Impacts (Specific Plan)

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-8 (a crack survey and video reconnaissance) shall be implemented. See Figure 11.6 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-8 (a crack survey and video reconnaissance) shall be implemented. See Figure 11.6 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. 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-7 (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.***

11.7.8 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.

➢ Construction Noise and Vibration Impacts (Cumulative)

The proposed project would generate relatively high noise levels during construction in the project area. However, construction noise is localized in nature and would not affect land uses that are not directly adjacent to the project site. There are no other large-scale construction projects known to occur in the Oak Park neighborhood during the proposed project's construction phases; larger cumulative development projects currently known are not in the adjacent area. Compliance with the specified construction hours in combination with other construction-related mitigation described subsequently in this report would reduce construction noise impacts from the proposed project. ***Therefore, the proposed project would not cause significant cumulative noise impacts.***

11.7.9 CUMULATIVE CONSTRUCTION NOISE MITIGATION MEASURES

There are no mitigation measures for cumulative construction noise.

11.8 SUMMARY OF NOISE AND VIBRATION IMPACTS

The proposed project and the Specific Plan would have the potential to result in the following long-term impacts:

Long-Term Helicopter Noise Impact. Under the worst-case scenario of more than one helicopter event during nighttime hours, the proposed project would expose residences to a significant noise increase of 3 dBA over the corresponding existing level and noise levels that exceed the City's noise standard of 60 dBA L_{dn}. With the implementation of the mitigation measures prescribed in this Chapter, noise impacts resulting from helicopter operations would be reduced. However, ***helicopter noise would remain significant and unavoidable.***

Long-Term Truck Loading and Unloading Activities. Periodic loading and unloading activities associated with the hospital's truck loading dock would generate noise levels exceeding the Model Community Noise Control Ordinance Guidelines of daytime maximum noise level of 75 dBA L_{max} and nighttime maximum noise level of 70 dBA L_{max} at the on-site hospital outdoor active use areas, an adverse but less than significant impact. Impacts to residences along Oak Park Lane and Junipero Street would experience maximum noise levels at the threshold for maximum nighttime noise level which would be an adverse but less than significant impact. With implementation of the recommended Mitigation Measures N-5 (Hour Limits) and N-6 (Barrier Wall), adverse ***noise impacts resulting from truck loading and unloading activities would be reduced.***

Long-Term Central Plant Noise Impact. Mechanical equipment proposed for the Central Plant building would expose residences to noise levels exceeding the City's Municipal Code requirements of 60 dBA CNEL. With the implementation of the mitigation measures prescribed in this Chapter, ***mechanical noise would be reduced to a less than significant level.***

Long-Term Traffic Noise Impact. The project-related traffic noise would not expose office buildings, residences, the hospital, or parks to noise levels exceeding the City's noise standard. ***Therefore, long-term traffic noise would not be significant.***

Long-Term Parking Structure Noise Impact. The two proposed parking structures would not expose office buildings, residences, the hospital, or parks to noise levels exceeding the City's noise standard. Therefore, ***noise generated inside the parking structure would not be significant.***

Long-Term HVAC Equipment Noise Impact. The hospital's rooftop HVAC equipment would not expose residences, the hospital park, and Oak Park to noise levels exceeding the City's Municipal Code requirement of 60 dBA CNEL. The office use areas would not be exposed to noise levels exceeding the daytime maximum allowable noise level of 75 dBA L_{max} or the nighttime maximum allowable noise level of 70 dBA L_{max}. Therefore, ***noise generated by the hospital's rooftop HVAC equipment would not be significant.***

Long-Term Cumulative Noise Impacts. The proposed project and Specific Plan potential future development would have a less than significant contribution to cumulative noise.

Temporary Construction Impacts. The proposed project would have significant unavoidable adverse noise and vibration impacts from construction activities during Phases I, II, and III. Construction noise impacts during Phase IV would be less than significant.

Potential future development (reconstruction) of hospital buildings as allowed under the Specific Plan would have significant unavoidable adverse noise and vibration impacts during construction.

LSA

FIGURE 11.1

M-9 NOISE MONITOR LOCATION

N

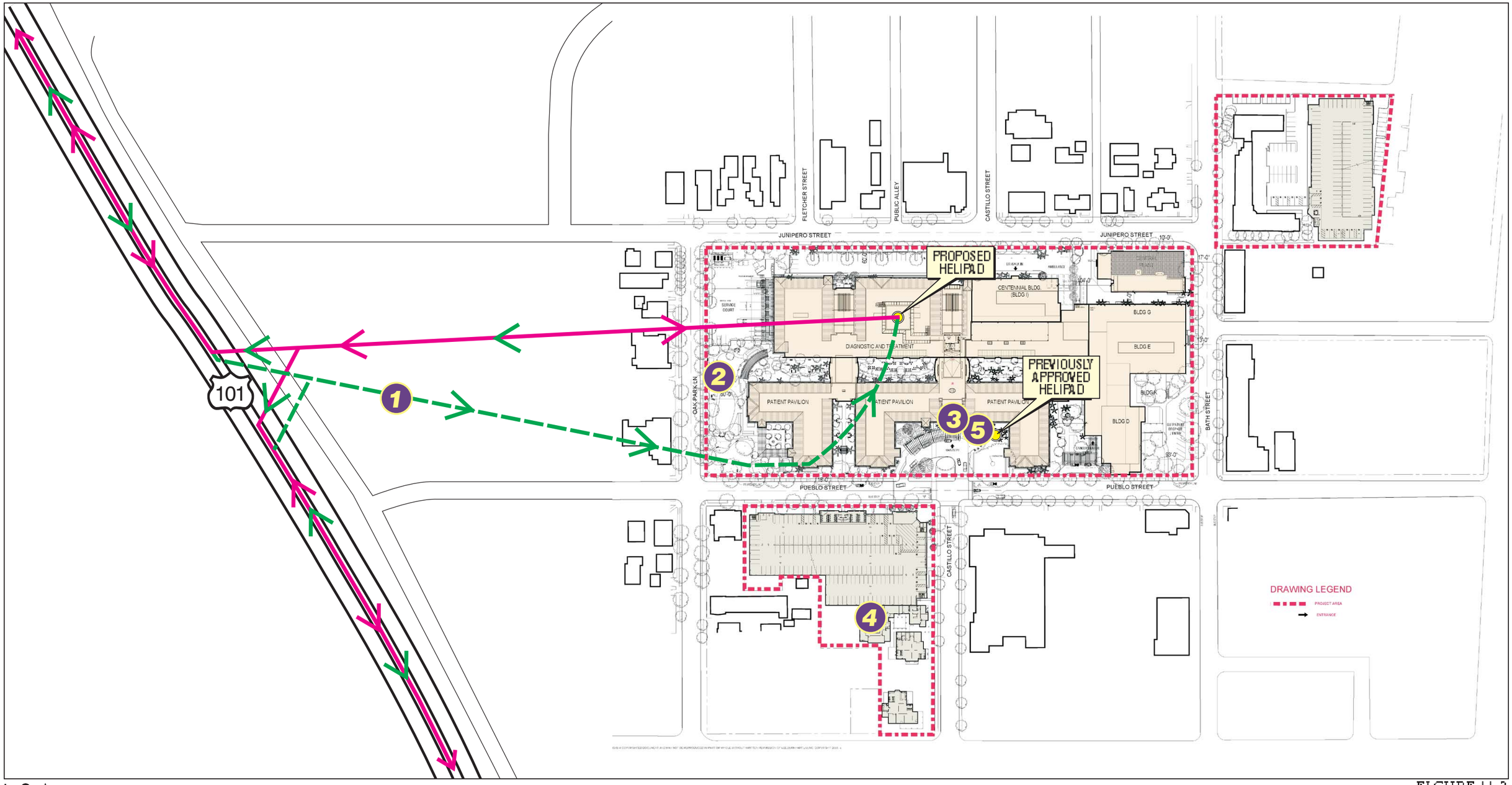
0 150 300

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)



LSA

LEGEND

3 NOISE MEASUREMENT LOCATIONS

NORMAL HELICOPTER FLIGHT PATH & DIRECTION

WINDY DAY HELICOPTER FLIGHT PATH & DIRECTION

0 200 400
FEET

SOURCE: Acoustical Analysis Associates, Incorporated

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

FIGURE 11.2

Santa Barbara Cottage Hospital
Seismic Compliance and Modernization Plan
Helicopter Noise Monitoring Locations