# *4TH AND ST. JOHN MIXED-USE STUDENT HOUSING PROJECT NOISE AND VIBRATION ASSESSMENT*

## *San José, California*

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**Prepared for:**

**Tyler Rogers**
**Assistant Project Manager**
**David J. Powers & Associates, Inc.**
**1736 Franklin Street, 3rd Floor**
**Oakland, CA 94612**

**Prepared by:**

**Casey Divine and**
**Michael S. Thill**

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
429 E. Cotati Avenue
Cotati, CA 94931
(707) 794-0400

**I&R Job No.: 17-051**

## INTRODUCTION

The proposed 4th and St. John Mixed-Use Student Housing project is located on the northeast corner of N. 4th Street and E. St. John Street in San José, California. The property is currently occupied by vacant lots used for parking and two vacant residences. The proposed project is seeking a Rezoning and Site Development Permit to allow for the relocation of the existing single-family homes off-site and the construction of a 23-story, mixed-use building with up to 298 student housing units and approximately 8,978 square feet of ground floor retail space. The project site would be rezoned to DC – Downtown Commercial. Three levels of parking would be provided above the ground floor retail, with the remaining floors consisting of student housing units. Two courtyards on the 5th floor of the building would provide open space for the student housing. The proposed project falls within the boundary limits of the Downtown San José Strategy Plan 2040 (DTS 2040). Applicable mitigation measures from the DTS 2040 will be applied to this project.

This report evaluates the project's potential to result in significant noise and vibration impacts with respect to applicable California Environmental Quality Act (CEQA) guidelines. The report is divided into three sections: 1) the Setting Section provides a brief description of the fundamentals of environmental noise and groundborne vibration, summarizes applicable regulatory criteria, and discusses the results of the ambient noise monitoring survey completed to document existing noise conditions; 2) the General Plan Consistency Section discusses noise and land use compatibility utilizing policies in the City's General Plan; and, 3) the Impacts and Mitigation Measures Section describes the significance criteria used to evaluate project impacts, provides a discussion of each project impact, and presents measures, where necessary, to mitigate the impacts of the project on sensitive receptors in the vicinity.

## SETTING

### Fundamentals of Environmental Noise

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

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

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

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

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level* (*CNEL*) is a measure of the cumulative noise exposure in a community, with a 5-dB penalty added to evening (7:00 pm - 10:00 pm) and a 10-dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level* ($L_{dn}$ or *DNL*) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

**Effects of Noise**

*Sleep and Speech Interference*

The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noises of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential standards for multi-family dwellings are set by the State of California at 45 dBA DNL. Typically, the highest steady traffic noise level during the daytime is about equal to the DNL and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses. Typical structural attenuation is 12-17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57-62 dBA DNL with open windows and 65-70 dBA DNL if the windows are closed. Levels of 55-60 dBA are common along collector streets and secondary arterials, while 65-70 dBA is a typical value for a primary/major arterial. Levels of 75-80 dBA are normal noise levels at the first row of development outside a freeway right-of-way. In order to achieve an acceptable interior noise environment, bedrooms facing secondary roadways need to be able to have their windows closed; those facing major roadways and freeways typically need special glass windows.

*Annoyance*

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The DNL as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 50 dBA DNL. At a DNL of about 60 dBA, approximately 12 percent of the population is highly annoyed. When the DNL increases to 70 dBA, the percentage of the population highly annoyed increases to about 25-30 percent of the population. There is, therefore, an increase of about 2 percent per dBA between a DNL of 60-70 dBA. Between a DNL of 70-80 dBA, each decibel increase increases by about 3 percent the percentage of the population highly annoyed. People appear to respond more adversely to aircraft noise. When the DNL is 60 dBA, approximately 30-35 percent of the population is believed to be highly annoyed. Each decibel increase to 70 dBA adds about 3 percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increase results in about a 4 percent increase in the percentage of the population highly annoyed.

**Fundamentals of Groundborne Vibration**

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the Peak Particle Velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table 3 displays the reactions of people and the effects on buildings that continuous or frequent intermittent vibration levels produce. The guidelines in Table 3 represent syntheses of vibration criteria for human response and potential damage to buildings resulting from construction vibration.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to cause damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as paint flaking or minimal extension of cracks in building surfaces; minor, including limited surface cracking; or major, that may threaten the structural integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher. The damage criteria presented in Table 3 include several categories for ancient, fragile, and historic structures, the types of structures most at risk to damage. Most buildings are included within the categories ranging from "Historic and some old buildings" to "Modern industrial/commercial buildings". Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

The annoyance levels shown in Table 3 should be interpreted with care since vibration may be found to be annoying at lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

**TABLE 1 Definition of Acoustical Terms Used in this Report**

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

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

**TABLE 2 Typical Noise Levels in the Environment**

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

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

**TABLE 3 Reaction of People and Damage to Buildings from Continuous or Frequent Intermittent Vibration Levels**

| Velocity Level, PPV (in/sec) | Human Reaction | Effect on Buildings |
|---|---|---|
| 0.01 | Barely perceptible | No effect |
| 0.04 | Distinctly perceptible | Vibration unlikely to cause damage of any type to any structure |
| 0.08 | Distinctly perceptible to strongly perceptible | Recommended upper level of the vibration to which ruins and ancient monuments should be subjected |
| 0.1 | Strongly perceptible | Threshold at which there is a risk of damage to fragile buildings with no risk of damage to most buildings |
| 0.25 | Strongly perceptible to severe | Threshold at which there is a risk of damage to historic and some old buildings. |
| 0.3 | Strongly perceptible to severe | Threshold at which there is a risk of damage to older residential structures |
| 0.5 | Severe - Vibrations considered unpleasant | Threshold at which there is a risk of damage to new residential and modern commercial/industrial structures |

Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, September 2013.

**Regulatory Background - Noise**

The State of California, Santa Clara County, and the City of San José have established regulatory criteria that are applicable in this assessment. The State CEQA Guidelines, Appendix G, California Building Code, Santa Clara County Airport Land Use Commission Comprehensive Land Use Plan, and the City of San José General Plan are used to assess the potential significance of impacts. A summary of the applicable regulatory criteria is provided below.

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

(a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies;

(b) Generation of excessive groundborne vibration or groundborne noise levels; or

(c) For a project located within the vicinity of a private airstrip or an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport, if the project would expose people residing or working in the project area to excessive noise levels.

Pursuant to recent court decisions, the impacts of site constraints, such as exposure of the proposed project to excessive levels of noise and vibration, are not included in the Impacts and Mitigation Section of this report. These items are discussed in a separate section addressing the project's consistency with the policies set forth in the City's General Plan.

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

***2016 California Building Code, Title 24, Part 2.*** The current version of the California Building Code (CBC) requires interior noise levels in multi-family residential units attributable to exterior environmental noise sources to be limited to a level not exceeding 45 dBA DNL/CNEL in any habitable room.

***2016 California Building Cal Green Code.*** The State of California established exterior sound transmission control standards for new non-residential buildings, as set forth in the 2010 California Green Building Standards Code (Section 5.507.4.1 and 5.507.4.2). These standards were not altered in the 2016 revisions. Section 5.507 states that either the prescriptive (Section 5.507.4.1) or the performance method (Section 5.507.4.2) shall be used to determine environmental control at indoor areas. The prescriptive method is very conservative and not practical in most cases; however, the performance method can be quantitatively verified using exterior-to-interior calculations. For the purposes of this report, the performance method is utilized to determine consistency with the Cal Green Code. Both of the sections that pertain to this project are as follows:

> **5.507.4.1 Exterior noise transmission, prescriptive method.** Wall and roof-ceiling assemblies exposed to the noise source making up the building envelope shall meet a composite STC rating of at least 50 or a composite OITC rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 when the building falls within the 65 dBA DNL noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway noise source, as determined by the local general plan noise element.
>
> **5.507.4.2 Performance method.** For buildings located, as defined by Section 5.507.4.1, wall and roof-ceiling assemblies exposed to the noise source making up the building envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level ($L_{eq\,(1\text{-}hr)}$) of 50 dBA in occupied areas during any hour of operation.

***Santa Clara County Airport Land Use Commission Comprehensive Land Use Plan.*** The Comprehensive Land Use Plan adopted by the Santa Clara County Airport Land Use Commission contains standards for projects within the vicinity of San José International Airport, which are relevant to this project:

4.3.2.1 Noise Compatibility Policies

**Policy N-3** Noise impacts shall be evaluated according to the Aircraft Noise Contours presented on Figure 5 (2022 Aircraft Noise Contours).

**Policy N-4** No residential or transient lodging construction shall be permitted within the 65 dB CNEL contour boundary unless it can be demonstrated that the resulting interior

sound levels will be less than 45 dB CNEL and there are no outdoor patios or outdoor activity areas associated with the residential portion of a mixed-use residential project or a multi-unit residential project. (Sound wall noise mitigation measures are not effective in reducing noise generated by aircraft flying overhead.)

***City of San José General Plan.*** The Environmental Leadership Chapter in the Envision San José 2040 General Plan sets forth policies with the goal of minimizing the impact of noise on people through noise reduction and suppression techniques, and through appropriate land use policies in the City of San José. The following policies are applicable to the proposed project:

**EC-1.1** Locate new development in areas where noise levels are appropriate for the proposed uses. Consider federal, state, and City noise standards and guidelines as a part of new development review. Applicable standards and guidelines for land uses in San José include:

Interior Noise Levels

- The City's standard for interior noise levels in residences, hotels, motels, residential care facilities, and hospitals is 45 dBA DNL. Include appropriate site and building design, building construction and noise attenuation techniques in new development to meet this standard. For sites with exterior noise levels of 60 dBA DNL or more, an acoustical analysis following protocols in the City-adopted California Building Code is required to demonstrate that development projects can meet this standard. The acoustical analysis shall base required noise attenuation techniques on expected Envision General Plan traffic volumes to ensure land use compatibility and General Plan consistency over the life of this plan.

Exterior Noise Levels

- The City's acceptable exterior noise level objective is 60 dBA DNL or less for residential and most institutional land uses (Table EC-1). The acceptable exterior noise level objective is established for the City, except in the environs of the San José International Airport and the Downtown, as described below:

    - For new multi-family residential projects and for the residential component of mixed-use development, use a standard of 60 dBA DNL in usable outdoor activity areas, excluding balconies and residential stoops and porches facing existing roadways. Some common use areas that meet the 60 dBA DNL exterior standard will be available to all residents. Use noise attenuation techniques such as shielding by buildings and structures for outdoor common use areas. On sites subject to aircraft overflights or adjacent to elevated roadways, use noise attenuation techniques to achieve the 60 dBA DNL standard for noise from sources other than aircraft and elevated roadway segments.

Table EC-1: Land Use Compatibility Guidelines for Community Noise in San José

| LAND USE CATEGORY | EXTERIOR NOISE EXPOSURE (DNL IN DECIBELS (DBA)) 55 60 65 70 75 80 |
|---|---|
| 1. Residential, Hotels and Motels, Hospitals and Residential Care[1] | |
| 2. Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds | |
| 3. Schools, Libraries, Museums, Meeting Halls, Churches | |
| 4. Office Buildings, Business Commercial, and Professional Offices | |
| 5. Sports Arena, Outdoor Spectator Sports | |
| 6. Public and Quasi-Public Auditoriums, Concert Halls, Amphitheaters | |

[1]Noise mitigation to reduce interior noise levels pursuant to Policy EC-1.1 is required.

**Normally Acceptable:**

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

**Conditionally Acceptable:**

- Specified land use may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features included in the design.

**Unacceptable:**

- New construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies.

**EC-1.2** Minimize the noise impacts of new development on land uses sensitive to increased noise levels (Categories 1, 2, 3 and 6) by limiting noise generation and by requiring use of noise attenuation measures such as acoustical enclosures and sound barriers, where feasible. The City considers significant noise impacts to occur if a project would:

- Cause the DNL at noise sensitive receptors to increase by five dBA DNL or more where the noise levels would remain "Normally Acceptable;" or

- Cause the DNL at noise sensitive receptors to increase by three dBA DNL or more where noise levels would equal or exceed the "Normally Acceptable" level.

**EC-1.3** Mitigate noise generation of new nonresidential land uses to 55 dBA DNL at the property line when located adjacent to existing or planned noise-sensitive residential and public/quasi-public land uses.

**EC-1.6** Regulate the effects of operational noise from existing and new industrial and commercial development on adjacent uses through noise standards in the City's Municipal Code.

**EC-1.7** Require construction operations within San José to use best available noise suppression devices and techniques and limit construction hours near residential uses per the City's Municipal Code. The City considers significant construction noise impacts to occur if a project located within 500 feet of residential uses or 200 feet of commercial or office uses would:

- Involve substantial noise generating activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing) continuing for more than 12 months.

For such large or complex projects, a construction noise logistics plan that specifies hours of construction, noise and vibration minimization measures, posting or notification of construction schedules, and designation of a noise disturbance coordinator who would respond to neighborhood complaints will be required to be in place prior to the start of construction and implemented during construction to reduce noise impacts on neighboring residents and other uses.

**EC-1.11** Require safe and compatible land uses within the Mineta San José International Airport noise zone (defined by the 65 CNEL contour as set forth in State law) and encourage aircraft operating procedures that minimize noise.

**Regulatory Background – Vibration**

***City of San José General Plan.*** The Environmental Leadership Chapter in the Envision San José 2040 General Plan sets forth policies to achieve the goal of minimizing vibration impacts on people, residences, and business operations in the City of San José. The following policies are applicable to the proposed project:

**EC-2.3** Require new development to minimize continuous vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, including ruins and ancient monuments or building that are documented to be structurally weakened, a continuous vibration limit of 0.08 in/sec PPV (peak particle velocity) will be used to minimize the potential for cosmetic damage to a building. A continuous vibration limit of 0.20 in/sec PPV will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction. Equipment or activities typical of generating continuous vibration include but are not limited to: excavation equipment; static compaction equipment; vibratory pile drivers; pile-extraction equipment; and vibratory compaction equipment. Avoid use of impact pile drivers within 125 feet of any buildings, and within 300 feet of historical buildings, or buildings in poor condition. On a project-specific basis, this distance of 300 feet may be reduced where warranted by a technical study by a qualified professional that verifies that there will be virtually no risk of cosmetic damage to

sensitive buildings from the new development during demolition and construction. Transient vibration impacts may exceed a vibration limit of 0.08 in/sec PPV only when and where warranted by a technical study by a qualified professional that verifies that there will be virtually no risk of cosmetic damage to sensitive buildings from the new development during demolition and construction.

**Existing Noise Environment**

The project site is located on the northeast corner of N. 4th Street and E. St. John Street in San José. Figure 1 show the project site plan overlaid on an aerial image of the site vicinity. As shown on Figure 1, the project site is surrounded by residential and commercial land uses. Single- and multi-family residential buildings are located adjacent to the project site to the north and east, as well as opposite E. St. John Street to the south. Commercial buildings are located opposite N. 4th Street to the west.

A noise monitoring survey was performed to quantify and characterize ambient noise levels at the site and in the project vicinity between Tuesday, April 25, 2017 and Thursday, April 27, 2017. The monitoring survey included two long-term noise measurements (LT-1 and LT-2) and three short-term measurements (ST-1 through ST-3), as shown in Figure 1. The noise environment at the site and at the nearby land uses in the project vicinity results primarily from vehicular traffic along N. 4th Street and E. St. John Street. Aircraft associated with Mineta San José International Airport also contribute to the noise environment in the area.

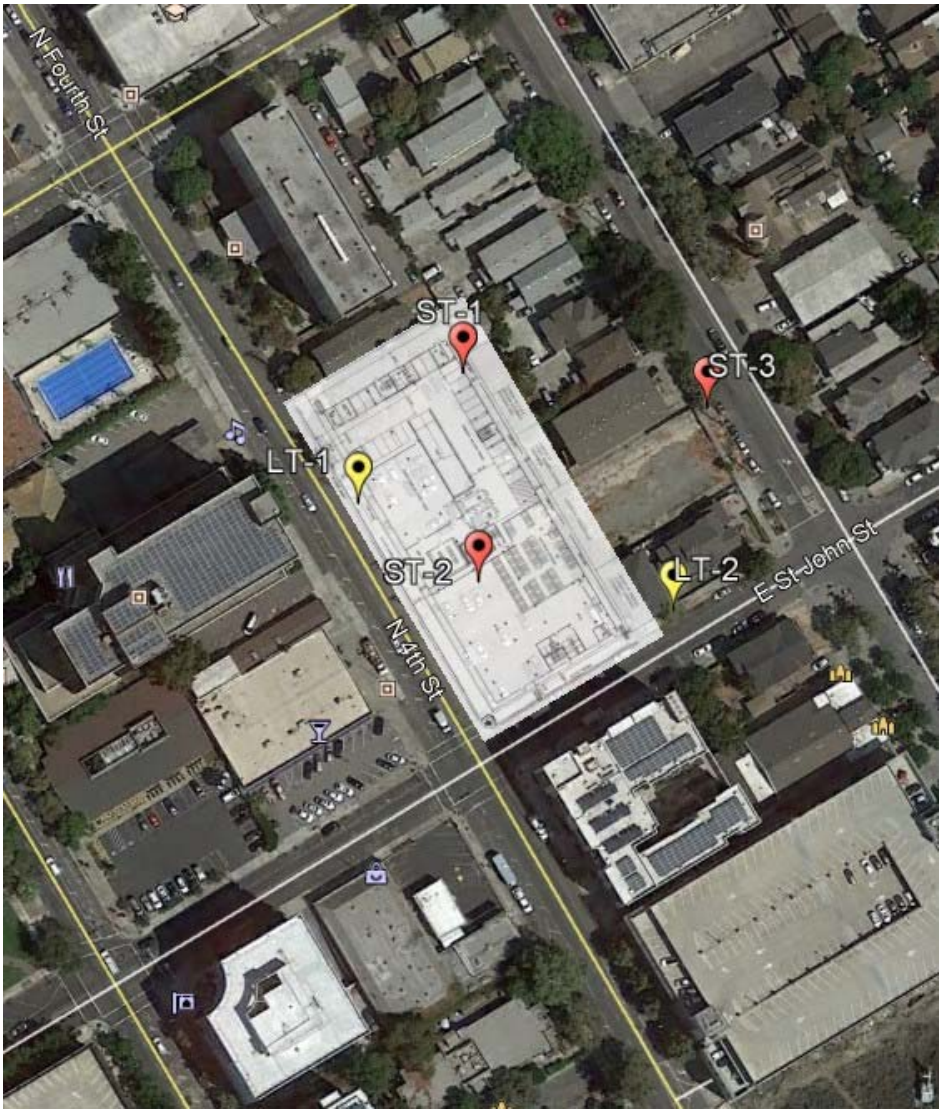
Long-term noise measurement LT-1 was made in front of the project site at 120 N. 4th Street, approximately 25 feet east of the N. 4th Street centerline. Hourly average noise levels at this location ranged from 61 to 70 dBA $L_{eq}$ during the day, and from 50 to 66 dBA $L_{eq}$ at night. The day-night average noise level on Wednesday, April 26, 2017 was 68 dBA DNL. The daily trend in noise levels at LT-1 is shown in Figure 2.

Long-term noise measurement LT-2 was made in front of 167 E. St. John Street, approximately 25 feet north of the E. St. John Street centerline. Hourly average noise levels at this location ranged from 56 to 68 dBA $L_{eq}$ during the day, and from 48 to 61 dBA $L_{eq}$ at night. The day-night average noise level on Wednesday, April 26, 2017 was 63 dBA DNL. The daily trend in noise levels at LT-2 is shown in Figure 3.

Short-term noise measurement ST-1 was made in the northeast corner of the project site, approximately 160 feet east of the N. 4th Street centerline and approximately 290 feet north of the E. St. John Street centerline. The 10-minute average noise level measured at this location between 12:20 p.m. and 12:30 p.m. on Thursday, April 27, 2017 was 52 dBA $L_{eq}$. During the measurement at ST-1, airplanes passing overhead produced maximum noise levels of 63 to 64 dBA $L_{max}$. Short-term noise measurement ST-2 was made close to the center of the project site, approximately 80 feet east of the N. 4th Street centerline and approximately 130 feet north of the E. St. John Street centerline. The 10-minute average noise level measured at this location between 12:40 p.m. and 12:50 p.m. on Thursday, April 27, 2017 was 55 dBA $L_{eq}$. Short-term noise measurement ST-3 was made in front of 129 N. 5th Street, approximately 40 feet west of the N. 5th Street centerline and approximately 160 feet north of the E. St. John Street centerline. The 10-minute average noise

level measured at this location between 1:00 p.m. and 1:10 p.m. on Thursday, April 27, 2017 was 56 dBA $L_{eq}$. Table 4 summarizes the results of the short-term measurements.

**FIGURE 1 Noise Measurement Locations**




Source: Google Earth 2019.

**FIGURE 2 Daily Trend in Noise Levels at LT-1**

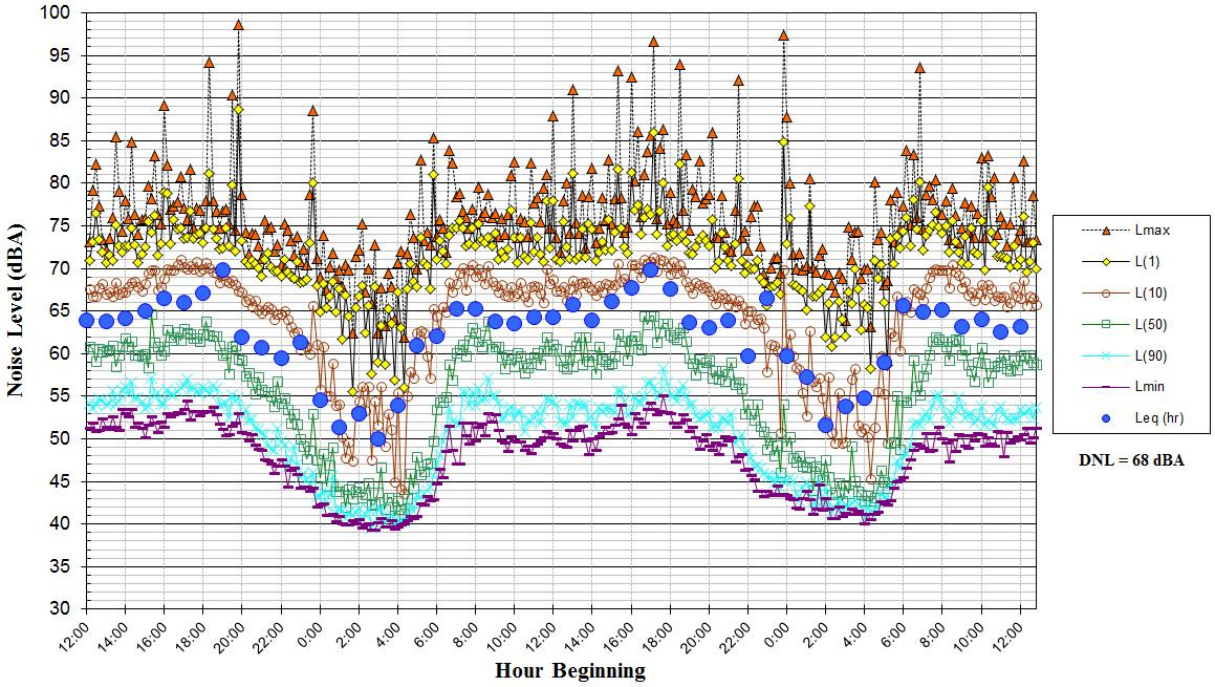



**FIGURE 3 Daily Trend in Noise Levels at LT-2**

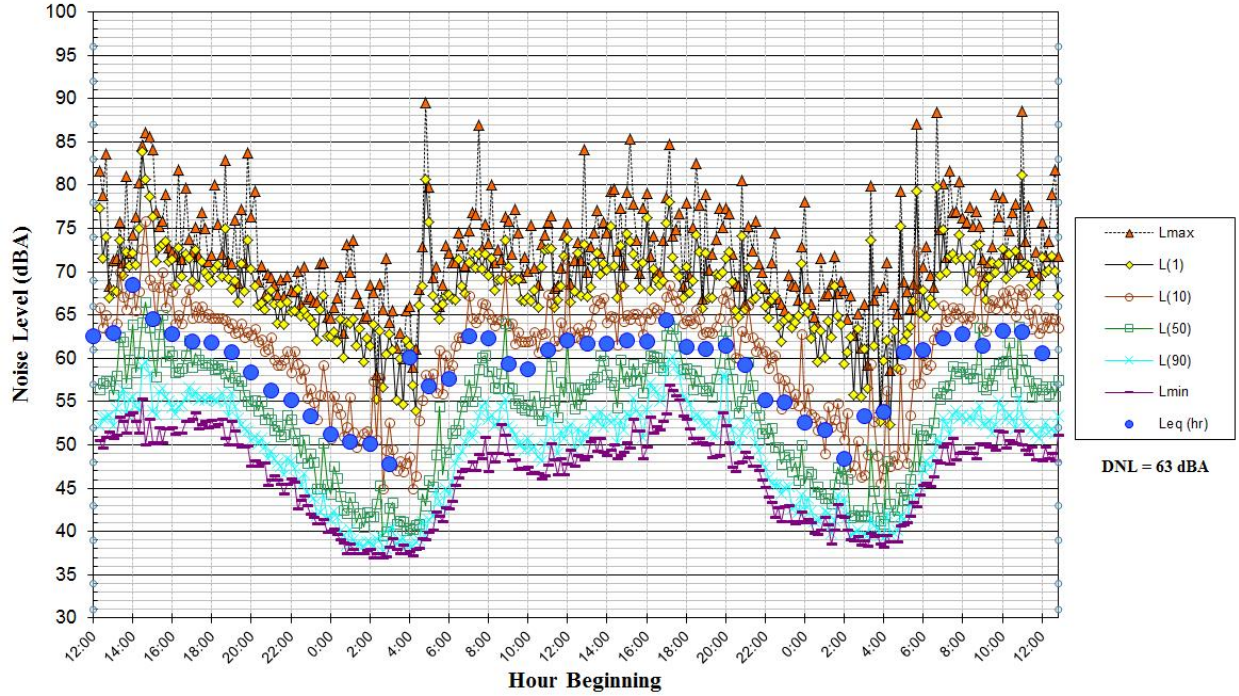


**TABLE 4 Summary of Short-Term Noise Measurement Data (dBA)**

| Noise Measurement Location | $L_{max}$ | $L_{(1)}$ | $L_{(10)}$ | $L_{(50)}$ | $L_{(90)}$ | $L_{eq}$ |
|---|---|---|---|---|---|---|
| ST-1: Northeast corner of project site. (4/27/2017, 12:20 p.m. - 12:30 p.m.) | 64 | 60 | 55 | 50 | 47 | 52 |
| ST-2: Center of project site. (4/27/2017, 12:40 p.m. - 12:50 p.m.) | 61 | 60 | 58 | 54 | 50 | 55 |
| ST-3: In front of 129 N. 5th Street. (4/27/2017, 1:00 p.m. - 1:10 p.m.) | 67 | 64 | 59 | 52 | 50 | 56 |

## PLAN CONSISTENCY ANALYSIS

### Noise and Land Use Compatibility

The ambient noise levels measured along the roadways bordering the project site ranges from 63 to 68 dBA DNL. The future noise environment at the project site would continue to result primarily from vehicular traffic along N. 4th Street and E. St. John Street, as well as other nearby roadways and the occasional aircraft overflights. A traffic study was conducted for the proposed project in June 2019 by *Hexagon Transportation Consultants, Inc.*[1] However, this traffic study did not include existing or future project traffic volumes since the project is covered under DTS 2040. In addition, the June 2018 DTS 2040 traffic study[2] did not include traffic volume counts at any intersections or streets near the project site. Therefore, the July 2017 traffic study[3] for this project was used. According to the July 2017 traffic study, the future background plus project conditions are expected to increase traffic noise levels along N. 4th Street by up to 2 dBA DNL and along E. St. John Street by up to 1 dBA DNL. To estimate the future noise environment at the project site, this increase is applied to the results of the existing measurements described above, and noise level differences due to distance between the measurement locations and building facades are calculated. Therefore, at a distance of 40 feet from the centerline of N. 4th Street, the future unmitigated noise level at the western façade of the proposed building would be 68 dBA DNL. At a distance of 40 feet from the centerline of E. St. John Street, the future unmitigated noise level at the southern façade of the proposed building would be 62 dBA DNL.

*Future Exterior Noise Environment*

Residential Land Uses

The exterior noise threshold established in the City's General Plan for new residential projects and for the residential component of this mixed-use development is 60 dBA DNL at usable outdoor activity areas, excluding balconies and porches.

Common outdoor use areas for the proposed project would include two podium level courtyards on the 5th floor, opening to the northeast. Typically, the exterior noise standards established by the

[1] Hexagon Transportation Consultants, Inc., "Fourth Street & St. John Street Housing Local Transportation Analysis," June 2019.
[2] Hexagon Transportation Consultants, Inc., "Downtown Strategy 2040 EIR Transportation Analysis," June 2018.
[3] Hexagon Transportation Consultants, Inc., "4th Street & St. John Street Housing Traffic Impact Analysis," July 2017.

City are evaluated at the center of each space. The building would completely shield the courtyards from N. 4th Street traffic noise leaving distant traffic noise from E. St. John Street and other local roadways as the dominant noise sources.

The center of the 5th floor podium courtyard nearer to E. St. John Street would be approximately 125 feet from the centerline of E. St. John Street. Accounting for the effects of distance, the 5th floor elevation, and shielding provided by the building itself, the future exterior noise level at this courtyard would be up to 54 dBA DNL. The noise exposure of the other courtyard would be similar. Exterior noise levels at the acoustically shielded residential outdoor use areas would not exceed the City's 60 dBA DNL exterior noise standard and would be considered compatible with the proposed land use.

Commercial Land Use

The exterior noise threshold established in the City's General Plan for new commercial projects and for the retail component of this mixed-use development is 70 dBA DNL at usable outdoor activity areas. There are no commercial outdoor use areas proposed for this project.

*Future Interior Noise Environment*

Residential Land Uses

The State of California and the City of San José requires that interior noise levels be maintained at 45 dBA DNL or less for residential land uses Residential units would be located on the 5th floor through the 23rd floor. At a distance of 40 feet away from the roadway centerlines, the exterior traffic noise exposure at the western facade of the proposed building would be up to 68 dBA DNL and at the southern facade would be up to 62 dBA DNL. Mechanical equipment is located on the rooftops of the buildings to the west and south of the project. The residential units along these building façades located above the elevation of the roofs of the adjacent buildings would also be exposed to noise from the mechanical equipment that could elevate the overall noise level and be potentially disturbing due to tonal characteristics.

Interior noise levels would vary depending upon the design of the buildings (relative window area to wall area) and the selected construction materials and methods. Standard residential construction provides approximately 15 dBA of exterior-to-interior noise reduction, assuming the windows are partially open for ventilation. Standard construction with the windows closed provides approximately 20 to 25 dBA of noise reduction in interior spaces. Where exterior noise levels range from 60 to 65 dBA DNL, the inclusion of adequate forced-air mechanical ventilation is often the method selected to reduce interior noise levels to acceptable levels by closing the windows, at the discretion of the residents, to control noise. Where noise levels exceed 65 dBA DNL, forced-air mechanical ventilation systems and sound-rated construction methods are normally required. Such methods or materials may include a combination of smaller window and door sizes as a percentage of the total building façade facing the noise source, sound-rated windows and doors, sound-rated exterior wall assemblies, and mechanical ventilation so windows may be kept closed at the occupant's discretion.

Assuming windows to be partially open for ventilation, the interior noise levels for the proposed project would be up to 53 dBA DNL at the units along the western façade of proposed building. This would exceed the 45 dBA DNL threshold for interior noise.

Commercial Retail Uses

The performance method enforced in the Cal Green Code requires that interior noise levels be maintained at 50 dBA $L_{eq(1\text{-}hr)}$ or less during hours of operation at the proposed commercial retail on the ground floor. The proposed retail uses would be located on the ground floor of the proposed building, along the western and southern façades, and would be exposed to future exterior noise levels ranging from 57 to 72 dBA $L_{eq(1\text{-}hr)}$ during daytime hours. Standard commercial construction provides at least 30 dBA of outdoor to indoor noise reduction assuming that the building includes adequate forced-air mechanical ventilation systems so that the windows and doors may remain closed to control noise. Assuming standard commercial construction methods with the windows and doors closed, interior noise levels are calculated to range from 27 to 42 dBA $L_{eq(1\text{-}hr)}$ during daytime hours, which would be below the Cal Green Code standard of 50 dBA $L_{eq(1\text{-}hr)}$.

*Noise Insulation Features to Reduce Future Interior Noise Levels*

The following noise insulation features shall be incorporated into the proposed project to reduce interior noise levels at residential uses to 45 dBA DNL or less:

- Preliminary calculations indicate that the residential units along the southern and eastern façades of proposed building would require windows and doors with a minimum rating of 28 STC to meet the interior noise threshold of 45 dBA DNL.

- Provide a suitable form of forced-air mechanical ventilation, as determined by the local building official, for all residential units on the project site, so that windows can be kept closed at the occupant's discretion to control interior noise and achieve the interior noise standards.

- A qualified acoustical specialist shall prepare a detailed analysis of interior residential noise levels resulting from all exterior sources during the design phase pursuant to requirements set forth in the State Building Code. The study will also establish appropriate criteria for noise levels inside the commercial spaces affected by environmental noise. The study will review the final site plan, building elevations, and floor plans prior to construction and recommend building treatments to reduce residential interior noise levels to 45 dBA DNL or lower. Treatments would include, but are not limited to, sound-rated windows and doors, sound-rated wall and window constructions, acoustical caulking, protected ventilation openings, etc. The specific determination of what noise insulation treatments are necessary shall be conducted on a unit-by-unit basis during final design of the project. Results of the analysis, including the description of the necessary noise control treatments, shall be submitted to the City, along with the building plans and approved design, prior to issuance of a building permit.

The implementation of these noise insulation features would reduce interior noise levels to 45 dBA DNL or less.

## NOISE IMPACTS AND MITIGATION MEASURES

### Significance Criteria

The following criteria were used to evaluate the significance of environmental noise resulting from the project:

- A significant noise impact would be identified if the project would generate a substantial temporary or permanent noise level increase over ambient noise levels at existing noise-sensitive receptors surrounding the project site and that would exceed applicable noise standards presented in the General Plan or Municipal Code at existing noise-sensitive receptors surrounding the project site.

    - A significant noise impact would be identified if construction-related noise would temporarily increase ambient noise levels at sensitive receptors. The City of San José considers large or complex projects involving substantial noise-generating activities and lasting more than 12 months significant when within 500 feet of residential land uses or within 200 feet of commercial land uses or offices.

    - A significant permanent noise level increase would occur if project-generated traffic would result in: a) a noise level increase of 5 dBA DNL or greater, with a future noise level of less than 60 dBA DNL, or b) a noise level increase of 3 dBA DNL or greater, with a future noise level of 60 dBA DNL or greater.

    - A significant noise impact would be identified if the project would expose persons to or generate noise levels that would exceed applicable noise standards presented in the General Plan.

- A significant impact would be identified if the construction of the project would generate excessive vibration levels surrounding receptors. Groundborne vibration levels exceeding 0.2 in/sec PPV would have the potential to result in cosmetic damage to normal buildings and groundborne vibration levels exceeding 0.08 in/sec PPV would have the potential to result in cosmetic damage to fragile historic buildings.

- A significant noise impact would be identified if the project would expose people residing or working in the project area to excessive aircraft noise levels.

**Impact 1a:** **Temporary Construction Noise.** Existing noise-sensitive land uses would be exposed to a temporary increase in ambient noise levels due to project construction activities. The incorporation of construction best management practices as project conditions of approval would result in a **less-than-significant** temporary noise impact.

Noise impacts resulting from construction depend upon the noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive areas. Construction noise impacts

primarily result when construction activities occur during noise-sensitive times of the day (e.g., early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise-sensitive land uses, or when construction lasts over extended periods of time.

Policy EC-1.7 of the City's General Plan requires that all construction operations within the City to use best available noise suppression devices and techniques and to limit construction hours near residential uses per the Municipal Code allowable hours, which are between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday when construction occurs within 500 feet of a residential land use. Further, the City considers significant construction noise impacts to occur if a project located within 500 feet of residential uses or 200 feet of commercial or office uses would involve substantial noise-generating activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing) continuing for more than 12 months.

Existing single- and multi-family residences are located adjacent to the project site to the north and east, as well as opposite E. St. John Street to the south. Commercial buildings are located opposite N. 4$^{th}$ Street to the west. The residences and commercial buildings located along N. 4$^{th}$ Street have ambient noise environments represented by LT-1 and ST-2, which range from 61 to 70 dBA $L_{eq}$ during daytime hours. The residences located along E. St. John Street have ambient noise environments represented by LT-2 and ST-1 and ST-3, which range from 56 to 68 dBA $L_{eq}$ during daytime hours.

Construction activities generate considerable amounts of noise, especially during earth-moving activities when heavy equipment is used. The highest maximum noise levels generated by project construction would typically range from about 80 to 90 dBA $L_{max}$ at a distance of 50 feet from the noise source. Typical hourly average construction-generated noise levels for residential buildings are about 81 to 88 dBA $L_{eq}$ measured at a distance of 50 feet from the center of the site during busy construction periods (e.g., earth moving equipment, impact tools, etc.), as shown in Table 5. A list of typical maximum instantaneous noise levels measured at 50 feet are provided in Table 6. Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of the distance between the source and receptor. Shielding by buildings or terrain can provide an additional 5 to 10 dBA noise reduction at distant receptors.

Project construction is expected to start in early May 2020 and be completed by July 2022. A detailed list of equipment expected to be used during each phase of construction was provided and is summarized in Table 7. Federal Highway Administration's (FHWA's) Roadway Construction Noise Model (RCNM) was used to calculate the hourly average noise levels for each phase of construction, assuming every piece of equipment would operate simultaneously, which would represent the worst-case scenario. This construction noise model includes representative sound levels for the most common types of construction equipment and the approximate usage factors of such equipment that were developed based on an extensive database of information gathered during the construction of the Central Artery/Tunnel Project in Boston, Massachusetts (CA/T Project or "Big Dig"). The usage factors represent the percentage of time that the equipment would be operating at full power.

For each phase, the worst-case hourly average noise level, as estimated at the property line of each surrounding land use, is also shown in Table 7. Construction would occur throughout the site, and

therefore, hourly average noise levels at each of the receiving land uses would vary depending on the location of the active construction site. For the purposes of estimating the worst-case scenario, noise levels in Table 7 were calculated from the center of the project construction site.

As shown in Table 7, ambient levels at the surrounding uses would potentially be exceeded by 5 dBA $L_{eq}$ or more at various times throughout construction. Since project construction would last for a period of more than one year and considering that the project site is within 500 feet of existing residences and within 200 feet of existing commercial uses, the proposed project would be considered a significant temporary impact.

The proposed project falls within the *Downtown San José Strategy Plan 2040 EIR* plan area, which included the mitigation measures to reduce temporary construction noise levels at noise-sensitive receptors. The *Downtown San José Strategy Plan 2040 EIR* would enforce Policy EC-1.7 of the City's General Plan, which states the following:

> Construction operations within the City will be required to use available noise suppression devices and techniques and continue to limit construction hours near residential uses per the City's Municipal Code. The City considers significant construction noise impacts to occur if a project located within 500 feet of residential uses or 200 feet of commercial or office uses would:
>
> - Involve substantial noise generating activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing) continuing for more than 12 months.
>
> For such large or complex projects, a construction noise logistics plan that specifies hours of construction, noise and vibration minimization measures, posting or notification of construction schedules, and designation of a noise disturbance coordinator who would respond to neighborhood complaints will be required to be in place prior to the start of construction and implemented during construction to reduce noise impacts on neighboring residents and other uses.

Additionally, the City requires that reasonable noise reduction measures be incorporated into the construction plan and implemented during all phases of construction activity. Accordingly, the *Downtown San José Strategy Plan 2040 EIR* requires that all projects shall implement the following standard noise control measures:

- Construction will be limited to the hours of 7:00 a.m. to 7:00 p.m. Monday through Friday for any on-site or off-site work within 500 feet of any residential unit. Construction outside of these hours may be approved through a development permit based on a site-specific "construction noise mitigation plan" and a finding by the Director of Planning, Building and Code Enforcement that the construction noise mitigation plan is adequate to prevent noise disturbance of affected residential uses.

- The contractor shall use "new technology" power construction equipment with state-of-the-art noise shielding and muffling devices. All internal combustion engines used on the project site shall be equipped with adequate mufflers and shall be in good

mechanical condition to minimize noise created by faulty or poorly maintained engines or other components.

- The unnecessary idling of internal combustion engines shall be prohibited. Staging areas and stationary noise-generating equipment shall be located as far as possible from noise-sensitive receptors such as residential uses (a minimum of 200 feet, where feasible).

- The surrounding neighborhood within 500 feet shall be notified early and frequently of the construction activities.

- A "noise disturbance coordinator" shall be designated to respond to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints (e.g., beginning work too early, bad muffler, etc.) and institute reasonable measures warranted to correct the problem. A telephone number for the disturbance coordinator would be conspicuously posted at the construction site.

Adherence to the Municipal Code requirements would minimize impacts to neighboring properties from temporary increases in ambient noise levels resulting from future construction activities. Larger projects within the *Downtown San José Strategy Plan 2040 EIR* plan area that are expected to last over one year in duration, such as the proposed project, may result in a substantial temporary noise increase at adjacent land uses and would require a "construction noise logistics plan," in accordance with GP Policy EC-1.7. As stated in the *Downtown San José Strategy Plan 2040 EIR*, typical construction noise logistics plan would include, but not be limited to, the following measures to reduce construction noise levels as low as practical:

- Utilize 'quiet' models of air compressors and other stationary noise sources where technology exists;

- Equip all internal combustion engine-driven equipment with mufflers, which are in good condition and appropriate for the equipment;

- Locate all stationary noise-generating equipment, such as air compressors and portable power generators, as far away as possible from adjacent land uses;

- Locate staging areas and construction material areas as far away as possible from adjacent land uses;

- Prohibit all unnecessary idling of internal combustion engines;

- If impact driving is proposed, multiple-pile drivers shall be considered to expedite construction. Although noise levels generated by multiple pile drivers would be higher than the noise generated by a single pile driver, the total duration of pile driving activities would be reduced;

- If impact pile driving is proposed, temporary noise control blanket barriers shall shroud pile drivers or be erected in a manner to shield the adjacent land uses. Such noise control blanket barriers can be rented and quickly erected;

- If impact pile driving is proposed, foundation pile holes shall be pre-drilled to minimize the number of impacts required to seat the pile Pre-drilling foundation pile holes is a standard construction noise control technique. Pre-drilling reduces the number of blows required to seat the pile. Notify all adjacent land uses of the construction schedule in writing;

- Designate a "disturbance coordinator" who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem be implemented. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include it in the notice sent to neighbors regarding the construction schedule.

With the implementation of GP Policy EC-1.7, Municipal Code requirements, and the above measures included in the *Downtown San José Strategy Plan 2040 EIR*, the temporary construction noise impact would be reduced to a less-than-significant level.

**Mitigation Measure 1a: No further mitigation required.**

**TABLE 5 Typical Ranges of Construction Noise Levels at 50 Feet, $L_{eq}$ (dBA)**

| | Domestic Housing | | Office Building, Hotel, Hospital, School, Public Works | | Industrial Parking Garage, Religious Amusement & Recreations, Store, Service Station | | Public Works Roads & Highways, Sewers, and Trenches | |
|---|---|---|---|---|---|---|---|---|
| | I | II | I | II | I | II | I | II |
| Ground Clearing | 83 | 83 | 84 | 84 | 84 | 83 | 84 | 84 |
| Excavation | 88 | 75 | 89 | 79 | 89 | 71 | 88 | 78 |
| Foundations | 81 | 81 | 78 | 78 | 77 | 77 | 88 | 88 |
| Erection | 81 | 65 | 87 | 75 | 84 | 72 | 79 | 78 |
| Finishing | 88 | 72 | 89 | 75 | 89 | 74 | 84 | 84 |

**I** - All pertinent equipment present at site.
**II** - Minimum required equipment present at site.

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

**TABLE 6 Construction Equipment 50-Foot Noise Emission Limits**

| Equipment Category | $L_{max}$ Level (dBA)[1,2] | Impact/Continuous |
|---|---|---|
| Arc Welder | 73 | Continuous |
| Auger Drill Rig | 85 | Continuous |
| Backhoe | 80 | Continuous |
| Bar Bender | 80 | Continuous |
| Boring Jack Power Unit | 80 | Continuous |
| Chain Saw | 85 | Continuous |
| Compressor[3] | 70 | Continuous |
| Compressor (other) | 80 | Continuous |
| Concrete Mixer | 85 | Continuous |
| Concrete Pump | 82 | Continuous |
| Concrete Saw | 90 | Continuous |
| Concrete Vibrator | 80 | Continuous |
| Crane | 85 | Continuous |
| Dozer | 85 | Continuous |
| Excavator | 85 | Continuous |
| Front End Loader | 80 | Continuous |
| Generator | 82 | Continuous |
| Generator (25 KVA or less) | 70 | Continuous |
| Gradall | 85 | Continuous |
| Grader | 85 | Continuous |
| Grinder Saw | 85 | Continuous |
| Horizontal Boring Hydro Jack | 80 | Continuous |
| Hydra Break Ram | 90 | Impact |
| Impact Pile Driver | 105 | Impact |
| Insitu Soil Sampling Rig | 84 | Continuous |
| Jackhammer | 85 | Impact |
| Mounted Impact Hammer (hoe ram) | 90 | Impact |
| Paver | 85 | Continuous |
| Pneumatic Tools | 85 | Continuous |
| Pumps | 77 | Continuous |
| Rock Drill | 85 | Continuous |
| Scraper | 85 | Continuous |
| Slurry Trenching Machine | 82 | Continuous |
| Soil Mix Drill Rig | 80 | Continuous |
| Street Sweeper | 80 | Continuous |
| Tractor | 84 | Continuous |
| Truck (dump, delivery) | 84 | Continuous |
| Vacuum Excavator Truck (vac-truck) | 85 | Continuous |
| Vibratory Compactor | 80 | Continuous |
| Vibratory Pile Driver | 95 | Continuous |
| All other equipment with engines larger than 5 HP | 85 | Continuous |

Notes:

[1] Measured at 50 feet from the construction equipment, with a "slow" (1 sec.) time constant.

[2] Noise limits apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.

[3] Portable Air Compressor rated at 75 cfm or greater and that operates at greater than 50 psi.

**TABLE 7 Estimated Construction Noise Levels at Nearby Land Uses**

| Phase of Construction | Time Duration | Construction Equipment (Quantity) | Calculated Hourly Average Noise Levels, $L_{eq}$ (dBA) | | |
|---|---|---|---|---|---|
| | | | North Res. & West Com. (150ft) | East Res. (70ft) | South Res. (215ft) |
| Demolition | 5/4/2020-6/5/2020 | Excavator (1)<br>Rubber-Tired Dozer (1)<br>Tractor/Loader/Backhoe (1) | 73 dBA | 80 dBA | 70 dBA |
| Site Preparation | 6/8/2020-6/12/2020 | Grader (1)<br>Rubber-Tired Dozer (1)<br>Tractor/Loader/Backhoe (1) | 75 dBA | 82 dBA | 72 dBA |
| Grading/Excavation | 6/15/2020-6/28/2020 | Excavator (1)<br>Tractor/Loader/Backhoe (1) | 72 dBA | 79 dBA | 69 dBA |
| Trenching | 6/28/2020-9/15/2020 | Tractor/Loader/Backhoe (1)<br>Crane for Caisons (1) | 71 dBA | 78 dBA | 68 dBA |
| Building Exterior | 9/15/2020-2/9/2022 | Crane (1)<br>Forklift (1)<br>Generator Set (1)<br>Welder (1) | 70-73 dBA[a] | 77-80 dBA[a] | 67-70 dBA[a] |
| Building Interior/Architectural Coating | 6/15/2021-7/20/2022 | Air Compressor (3)<br>Aerial Lift (2)<br>Man Lift (1) | 69-71 dBA[b] | 76-78 dBA[b] | 66-68 dBA[b] |
| Paving | 4/20/2022-5/4/2022 | Paving Equipment (1)<br>Roller (1) | 67-71 dBA[c] | 74-78 dBA[c] | 64-68 dBA[c] |

[a] Range in hourly average noise levels reflects the building exterior phase only and during the overlap period with the building interior phase.
[b] Range in hourly average noise levels reflects the building interior phase only and during the overlap period with the paving phase.
[f] Range in hourly average noise levels reflects the paving phase only and during the overlap period with the building interior phase.

**Impact 1b:** **Permanent Noise Level Increase.** The proposed project is not expected to cause a substantial permanent noise level increase at the existing residential land uses in the project vicinity. **This is a less-than-significant impact.**

According to Policy EC-1.2 of the City's General Plan, a significant permanent noise increase would occur if the project would increase noise levels at noise-sensitive receptors by 3 dBA DNL or more where ambient noise levels exceed the "normally acceptable" noise level standard. Where ambient noise levels are at or below the "normally acceptable" noise level standard, noise level increases of 5 dBA DNL or more would be considered significant. The City's General Plan defines the "normally acceptable" outdoor noise level standard for the residential land uses to be 60 dBA DNL. Existing ambient levels, based on the measurements made in the project vicinity, exceed 60 dBA DNL. Therefore, a significant impact would occur if traffic due to the proposed project would permanently increase ambient levels by 3 dBA DNL. For reference, a 3 dBA DNL noise increase would be expected if the project would double existing traffic volumes along a roadway.

The July 2017 traffic study included peak hour turning movements for the existing traffic volumes at eight intersections in the vicinity of the project site. The traffic study also included peak hour project trips, which when added to the existing volumes provided existing plus project peak hour turning movements. By comparing the existing plus project traffic scenario to the existing scenario, the project's contribution to the overall noise level increase was determined to be 1 dBA DNL or less along each roadway segment in the project vicinity. Therefore, the project would not result in a permanent noise increase of 3 dBA DNL or more at noise-sensitive receptors in the project vicinity. This is a less-than-significant impact.

**Mitigation Measure 1b:** **None required.**

**Impact 1c:** **Noise Levels in Excess of Standards.** The proposed project could generate noise in excess of standards established in the City's General Plan at the nearby sensitive receptors. The incorporation of mitigation measures to reduce operational noise levels as project conditions of approval would result in a **less-than-significant** noise impact.

*Mechanical Equipment Noise*

Under the City's Noise Element, noise levels from building equipment shall not exceed a noise level of 55 dBA DNL at receiving noise-sensitive land uses. Noise-sensitive receptors surrounding the site would include existing residences adjoining the site to the north and east; existing residences to the south of the site opposite E. St. John Street; and existing commercial uses to the west of the site opposite N. 4$^{th}$ Street.

Mixed-use, multi-family residential buildings typically require various mechanical equipment, such as air conditioners, exhaust fans, and air handling equipment for ventilation of the buildings. The site plan indicates mechanical, utility, and electrical rooms located on the first through fourth parking levels on the interior, as well as mechanical units in a rooftop enclosure. Due to the number of variables inherent in the mechanical equipment needs of the project (number and types of units, size, housing, specs, etc.), the impacts of mechanical equipment noise on nearby noise-sensitive

uses should be assessed during the final project design stage. Design planning should take into account the noise criteria associated with such equipment and utilize site planning to locate equipment in less noise-sensitive areas. Other controls could include, but shall not be limited to, fan silencers, enclosures, and screen walls.

Given the close proximity of noise-sensitive uses to the project site and lack of sufficient details about the mechanical equipment, mechanical rooms, and rooftop enclosure, there is the potential for noise from mechanical equipment to exceed 55 dBA DNL at noise-sensitive land uses in the immediate project vicinity. The final design plans should be reviewed by a qualified acoustical consultant to address any potential conflicts. This is a potentially significant impact.

For noise-generating land uses, the *Downtown San José Strategy Plan 2040 EIR* states the following:

> The implementation of General Plan Policies EC-1.2, EC-1.3, and EC-1.9 would reduce potential impacts associated with new noise-producing land uses facilitated by the plan to a less-than-significant level. Policy EC-1.2 limits noise generation by requiring use of noise attenuation measures, such as acoustical enclosures and sound barriers, where feasible, to avoid substantial increases to ambient noise. General Plan Policy EC-1.3 would be implemented and would require new projects to mitigate noise generation to 55 dBA DNL at the property line. Lastly, General Plan Policy EC-1.9 would be implemented and would require that studies be conducted to mitigate loud intermittent noise sources associated with new projects.

For the proposed project, mechanical equipment shall be selected and designed to reduce impacts on surrounding uses to meet the City's 55 dBA DNL requirement prior to the issuance of building permits. A qualified acoustical consultant shall be retained by the project applicant to review mechanical noise as the equipment systems are selected in order to determine specific noise reduction measures necessary to reduce noise to comply with the City's noise limit at the shared property lines. Noise reduction measures could include, but are not limited to, selection of equipment that emits low noise levels and/or installation of noise barriers, such as mechanical equipment screens or enclosures. This would satisfy the *Downtown San José Strategy Plan 2040 EIR* requirements, and with the implementation of this mitigation measures as a project condition of approval, this is a less-than-significant impact.

*Truck Loading and Unloading*

Truck deliveries for the ground-level retail uses on the project site would have the potential to generate noise. The site plan indicates a new on-street loading zone along the west project frontage on N. 4$^{th}$ Street, just south of the project parking garage driveway. Additionally, the retail and residential trash areas were also indicated on the ground level within the parking garage. While delivery and trash pickup times and frequency of these events were not provided at the time of this study, it is assumed that these activities would occur during daytime hours, at most 2 to 3 times a week. Typical noise levels generated by loading and unloading of truck deliveries would be similar to noise levels generated by truck movements on existing local roadways and by similar activities at surrounding uses. Peak noise levels from truck activities would therefore not increase the day-night

average noise level. These infrequent deliveries are not anticipated to substantially increase ambient noise levels at the nearby noise-sensitive land uses.

Truck deliveries occurring at the proposed project site are not expected to generate levels exceeding 55 dBA DNL or existing ambient conditions at the nearby residences. This would be a less-than-significant impact.

*Parking Structure Noise*

Intermittent noise from the parking levels must meet the project generated noise threshold established in the City's Municipal Code. According to the project data, parking would be available on the 1st through 4th floors.

The surrounding land uses are currently exposed to the parking lot noise and will continue to be exposed to the parking structure noise within the proposed mixed-use building. The existing parking lot is at the ground level, could be used at all times, and the current day-night average noise level along the roadway is 68 dBA DNL, which exceeds 55 dBA DNL threshold. The new ground level parking area would be shielded by solid walls, and the upper parking levels on floors two through four would be at higher elevations than the existing parking lot. This would mean that the distance from the parking structure noise sources would be at a greater distance from the sensitive-noise receptors and there would be partial shielding from the parking structure wall barriers. Therefore; parking structure noise levels would be less than the existing parking lot noise levels, which is already above the 55 dBA DNL threshold. This is a less-than-significant impact.

**Mitigation Measure 1c: No further mitigation required.**

**Impact 2: Exposure to Excessive Groundborne Vibration due to Construction.** Construction-related vibration levels would exceed 0.2 in/sec PPV at nearby conventional, non-historical residential and commercial buildings and would exceed 0.08 in/sec PPV at nearby historical residential and commercial buildings. The incorporation of mitigation measures to reduce operational noise levels as project conditions of approval would result in a **less-than-significant** noise impact.

The construction of the project may generate perceptible vibration when heavy equipment or impact tools (e.g. jackhammers, hoe rams) are used. Construction activities would include site preparation work, foundation work, and new building framing and finishing. According to construction information provided by the applicant, pile driving would be used, which can cause excessive vibration.

According to Policy EC-2.3 of the City of San José General Plan, a vibration limit of 0.08 in/sec PPV shall be used to minimize the potential for cosmetic damage to sensitive historical structures, and a vibration limit of 0.20 in/sec PPV shall be used to minimize damage at buildings of normal conventional construction. Impact pile driving would have the potential to produce vibration levels of 0.08 in/sec PPV or more at historical buildings within 170 feet of the project site and 0.2 in/sec PPV or more at conventional, non-historical buildings located within 70 feet of the project site.

Table 8 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. Project construction activities, such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.), may generate substantial vibration in the immediate vicinity. Jackhammers typically generate vibration levels of 0.035 in/sec PPV, and drilling typically generates vibration levels of 0.09 in/sec PPV at a distance of 25 feet. Vibration levels would vary depending on soil conditions, construction methods, and equipment used. Use of pile drivers and to a lesser extent other construction equipment would require attention to ensure that structures in the vicinity of the project, especially the buildings within 200 feet from such activities are sufficiently protected. Impact pile driving has the potential to generate the highest ground vibration levels and would be the primary concern to cosmetic structural damage, particularly when it occurs within 100 to 200 feet of structures, given that impact pile driving could be anticipated to generate vibration levels of 0.644 in/sec PPV but could reach levels up to 1.158 in/sec PPV at 25 feet. Vibratory pile driving would produce less vibration than impact pile driving, but could still generate vibration levels of 0.17 in/sec PPV and could reach levels up to 0.734 in/sec PPV at 25 feet. Table 8 also summarizes the distances to the 0.08 in/sec PPV threshold for historical buildings and to the 0.2 in/sec PPV threshold for all other buildings.

**TABLE 8 Vibration Source Levels for Construction Equipment**

| Equipment | | PPV at 25 ft. (in/sec) | Minimum Distance to Meet 0.08 in/sec PPV (feet) | Minimum Distance to Meet 0.2 in/sec PPV (feet) |
|---|---|---|---|---|
| Pile Driver (Impact) | upper range | 1.158 | 283 | 121 |
| | typical | 0.644 | 166 | 71 |
| Pile Driver (Sonic) | upper range | 0.734 | 187 | 80 |
| | typical | 0.170 | 50 | 22 |
| Clam shovel drop | | 0.202 | 58 | 26 |
| Hydromill (slurry wall) | in soil | 0.008 | 3 | 1 |
| | in rock | 0.017 | 6 | 2 |
| Vibratory Roller | | 0.210 | 60 | 27 |
| Hoe Ram | | 0.089 | 28 | 12 |
| Large bulldozer | | 0.089 | 28 | 12 |
| Caisson drilling | | 0.089 | 28 | 12 |
| Loaded trucks | | 0.076 | 24 | 10 |
| Jackhammer | | 0.035 | 12 | 5 |
| Small bulldozer | | 0.003 | 1 | <1 |

Source: Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, May 2006, as modified by Illingworth & Rodkin, Inc., July 2019.

Based on the inventory of historically documented buildings in the City of San José,[4] four buildings are located 170 feet or less from the boundaries of the project site. These four buildings would potentially be impacted by the construction of the project. Figure 4 shows these buildings in relation to the project site.

[4] http://www.sanjoseca.gov/DocumentCenter/View/35475

The nearest sensitive receptors would be the adjacent residences located approximately 5 feet to the north and east of the project property line, with one of the adjacent buildings to the east being a historical building. At this distance, vibration levels due to construction activities (excluding pile driving) would be up to 1.2 in/sec PPV, which would exceed the 0.2 in/sec PPV threshold for conventional buildings and the 0.08 in/sec PPV threshold for historical buildings. Pile driving could occur as close as 15 feet from these structures. Vibration levels from impact pile driving would typically be 1.1 in/sec PPV but could reach levels up to 2.0 in/sec PPV. Vibration levels from vibratory pile driving would typically be 0.3 in/sec PPV but could reach levels up to 1.3 in/sec PPV. Vibration from both impact and vibratory pile driving would be above the 0.2 in/sec PPV threshold for conventional buildings and the 0.08 in/sec PPV threshold for historical buildings. Other historical sensitive receptors are located 60 feet south of the project property, and at this distance, vibration levels due to construction activities would be up to 0.08 in/sec PPV. Pile driving could occur as close as 70 feet from these receptors. Vibration levels from impact pile driving would typically be 0.21 in/sec PPV but could reach levels up to 0.37 in/sec PPV. Vibration levels from vibratory pile driving would typically be 0.06 in/sec PPV but could reach levels up to 0.24 in/sec PPV. Vibration from impact pile driving and the upper range of vibratory pile driving would be above the 0.08 in/sec PPV threshold for historical buildings, but typical levels of vibratory pile driving would be below the threshold.

The nearest commercial land uses would be located opposite N. 4$^{th}$ Street approximately 80 feet to the west of the project property line, with one of the commercial buildings to the west being a historical building. At this distance, vibration levels due to construction activities excluding pile driving would be up to 0.05 in/sec PPV, which would be below the 0.2 in/sec PPV threshold for conventional buildings and the 0.08 in/sec PPV threshold for historical buildings. Pile driving could occur as close as 90 feet from these commercial buildings. Vibration levels from impact pile driving would typically be 0.16 in/sec PPV but could reach levels up to 0.28 in/sec PPV. Vibration levels from vibratory pile driving would typically be 0.04 in/sec PPV but could reach levels up to 0.18 in/sec PPV. Pile driving vibration levels would be below the 0.2 in/sec PPV threshold for conventional buildings for all pile driving levels except for the upper range for impact pile driving, but would be above the 0.08 in/sec PPV threshold for historical buildings for all pile driving levels except for the typical range for vibratory pile driving.

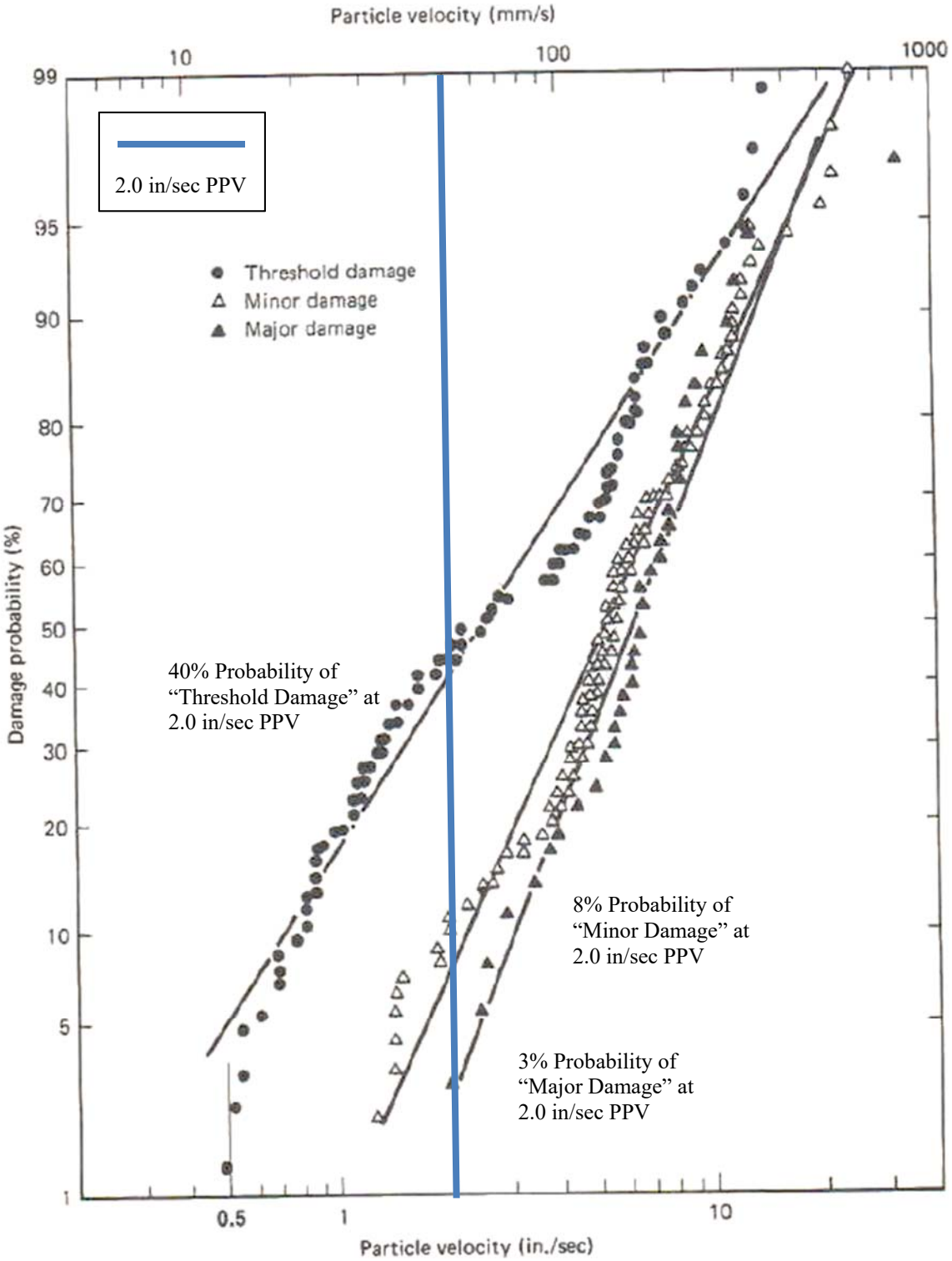
The last historical structure is a commercial building located 170 feet southwest of the project site. At this distance, vibration levels due to construction activities excluding pile driving would be up to 0.03 in/sec PPV, which would be below the 0.08 in/sec PPV threshold for historical buildings. Pile driving could occur as close as 180 feet from the building. Vibration levels from impact pile driving would typically be 0.07 in/sec PPV but could reach levels up to 0.13 in/sec PPV. Vibration levels from vibratory pile driving would typically be 0.02 in/sec PPV but could reach levels up to 0.08 in/sec PPV. Pile driving vibration levels would be below the 0.08 in/sec PPV threshold for historical buildings for the typical ranges of both pile driving types, but above the threshold for upper levels of both pile driving types.

A study completed by the US Bureau of Mines analyzed the effects of blast-induced vibration on buildings in USBM RI 8507.[5] The findings of this study have been applied to buildings effected by construction-generated vibrations.[6] As reported in USBM RI 8507[5] and reproduced by Dowding,[6] Figure 5 presents the damage probability, in terms of "threshold damage," "minor damage," and "major damage," at varying vibration levels. Threshold damage, which is described as cosmetic damage in this report, would entail hairline cracking in plaster, the opening of old cracks, the loosening of paint or the dislodging of loose objects. Minor damage would include hairline cracking in masonry or the loosening of plaster, and major structural damage would include wide cracking or shifting of foundation or bearing walls. As shown in Figure 5, maximum vibration levels of 2.0 in/sec PPV (due to pile driving) would result in approximately 40% of threshold damage or cosmetic damage, 8% of minor damage, and 3% of major damage.

**FIGURE 4 Nearby Historical Buildings Surrounding the Project Site**


[5] Siskind, D.E., M.S. Stagg, J.W. Kopp, and C.H. Dowding, Structure Response and Damage Produced by Ground Vibration form Surface Mine Blasting, RI 8507, Bureau of Mines Report of Investigations, U.S. Department of the Interior Bureau of Mines, Washington, D.C., 1980.
[6] Dowding, C.H., Construction Vibrations, Prentice Hall, Upper Saddle River, 1996.

**FIGURE 5 Probability of Cracking and Fatigue from Repetitive Loading**




Source: Dowding, C.H., Construction Vibrations, Prentice Hall, Upper Saddle River, 1996 as modified by Illingworth & Rodkin, Inc., May 2018.

Typical construction equipment and pile drivers, shown in Table 8, would have the potential to produce vibration levels of 0.08 in/sec PPV or more at the historic buildings identified in Figure 4. Due to the sensitive nature of these buildings, cosmetic or minor damage would potentially occur. Heavy vibration-generating construction equipment, such as pile drivers, clam shovel drops or vibratory rollers, would have the potential to produce vibration levels of 0.2 in/sec PPV or more at buildings of normal conventional construction located within 70 feet of the project site (i.e., adjacent buildings to the north and east). Project-generated vibration levels, excluding pile driving, would fall below the General Plan threshold of 0.2 in/sec PPV at other surrounding conventional buildings located 30 feet or more from the project site. Neither cosmetic, minor, or major damage would occur at conventional buildings located 70 feet or more from the project site.

At these locations, and in other surrounding areas where vibration would not be expected to cause cosmetic damage, vibration levels may still be perceptible. However, as with any type of construction, this would be anticipated and would not be considered significant, given the intermittent and short duration of the phases that have the highest potential of producing vibration (use of jackhammers and other high-power tools). By use of administrative controls, such as notifying neighbors of scheduled construction activities and scheduling construction activities with the highest potential to produce perceptible vibration during hours with the least potential to affect nearby businesses, perceptible vibration can be kept to a minimum.

In summary, the construction of the project would generate vibration levels exceeding the General Plan threshold of 0.08 in/sec PPV or more at historic buildings within 170 feet of the project site and of 0.2 in/sec PPV or more at buildings of normal conventional construction located within 70 feet of the project site. Such vibration levels would be capable of cosmetically damaging the adjacent buildings. This is a significant impact.

The proposed project falls within the *Downtown San José Strategy Plan 2040 EIR* plan area, which included the mitigation measures to reduce temporary construction vibration levels at surrounding receptors. The *Downtown San José Strategy Plan 2040 EIR* would enforce Policy EC-2.3 of the City's General Plan, which states the following:

> Require new development to minimize continuous vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, including ruins and ancient monuments or building that are documented to be structurally weakened, a continuous vibration limit of 0.08 in/sec PPV (peak particle velocity) will be used to minimize the potential for cosmetic damage to a building. A continuous vibration limit of 0.20 in/sec PPV will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction. Equipment or activities typical of generating continuous vibration include but are not limited to: excavation equipment; static compaction equipment; vibratory pile drivers; pile-extraction equipment; and vibratory compaction equipment. Avoid use of impact pile drivers within 125 feet of any buildings, and within 300 feet of historical buildings, or buildings in poor condition. On a project-specific basis, this distance of 300 feet may be reduced where warranted by a technical study by a qualified professional that verifies that there will be virtually no risk of cosmetic damage to sensitive buildings from the new development during demolition and construction. Transient vibration impacts may exceed a vibration limit of 0.08 in/sec PPV

only when and where warranted by a technical study by a qualified professional that verifies that there will be virtually no risk of cosmetic damage to sensitive buildings from the new development during demolition and construction.

Additionally, the *Downtown San José Strategy Plan 2040 EIR* requires that all projects shall implement the following standard vibration control measures:

For projects impacting receptors who would have construction vibration levels greater than 0.3 in/sec PPV that do not involve impact or vibratory pile driving, the following best available controls shall be implemented:

- A list of all heavy construction equipment to be used for this project known to produce high vibration levels (tracked vehicles, vibratory compaction, jackhammers, hoe rams, etc.) shall be submitted to the City by the contractor. This list shall be used to identify equipment and activities that would potentially generate substantial vibration and to define the level of effort for reducing vibration levels below the thresholds.

- Place operating equipment on the construction site as far as possible from vibration-sensitive receptors.

- Use smaller equipment to minimize vibration levels below the limits.

- Avoid using vibratory rollers and tampers near sensitive areas.

- Select demolition methods not involving impact tools.

- Modify/design or identify alternative construction methods to reduce vibration levels below the limits.

- Avoid dropping heavy objects or materials.

For projects impacting receptors who would have construction vibration levels greater than 0.3 in/sec PPV where pile driving will occur, in addition to the controls above, implement the following best available controls:

- Notify neighbors within 500 feet of the construction site of the construction schedule and that there could be noticeable vibration levels resulting from pile driving.

- Foundation pile holes shall be pre-drilled to minimize the number of impacts required to seat the pile.

- Jet or partially jet piles into place to minimize the number of impacts required to seat the pile.

- A construction vibration monitoring plan shall be implemented to document conditions prior to, during, and after pile driving. All plan tasks shall be undertaken under the direction

of a licensed Professional Structural Engineer in the State of California and be in accordance with industry-accepted standard methods. The construction vibration monitoring plan should be implemented to include the following tasks:

- Identification of sensitivity to ground-borne vibration of nearby structures. A vibration survey (generally described below) would need to be performed.

- Performance of a photo survey, elevation survey, and crack monitoring survey for each of these structures. Surveys shall be performed prior to any pile driving activity, in regular interval during pile driving, and after completion and shall include internal and external crack monitoring in structures, settlement, and distress and shall document the condition of foundations, walls and other structural elements in the interior and exterior of said structures.

- Development of a vibration monitoring and construction contingency plan to identify structures where monitoring would be conducted, set up a vibration monitoring schedule, define structure-specific vibration limits, and address the need to conduct photo, elevation, and crack surveys to document before and after pile driving. Alternative construction methods would be identified for when vibration levels approach the limits that are stated in the General Plan such as Policy EC-2.3.

- If vibration levels approach limits, suspend construction and implement alternative construction methods to either lower vibration levels or secure the affected structures.

- Conduct post-survey on structures where either monitoring has indicated high levels or complaints of damage has been made. Make appropriate repairs or compensation where damage has occurred as a result of construction activities.

- The results of all vibration monitoring shall be summarized and submitted in a report shortly after substantial completion of each phase identified in the project schedule. The report will include a description of measurement methods, equipment used, calibration certificates, and graphics as required to clearly identify vibration-monitoring locations. An explanation of all events that exceeded vibration limits will be included together with proper documentation supporting any such claims.

- Designate a person responsible for registering and investigating claims of excessive vibration. The contact information of such person shall be clearly posted on the construction site.

With the implementation of GP Policy EC-2.3 and the above measures included in the *Downtown San José Strategy Plan 2040 EIR*, the temporary construction vibration impact would be reduced to a less-than-significant level.

**Impact 3:** **Excessive Aircraft Noise.** The project site is located more than 1.5 miles from a public airport or public use airport and would not expose people residing or working in the project area to excessive aircraft noise levels with the implementation of forced-air mechanical ventilation. **This is a less-than-significant impact.**

Norman Y. Mineta San José International Airport is a public-use airport located approximately 1.6 miles northwest of the project site. The project site lies outside the 60 dBA CNEL 2027 noise contour for the airport, according to the Norman Y. Mineta San José International Airport Master Plan Update Project[7] report published in February 2010 as an addendum to the Environmental Impact Report (see Figure 6). This means that future exterior noise levels due to aircraft from Norman Y. Mineta San José International Airport would be less than 60 dBA CNEL/DNL at the project site. According to Policy EC-1.11 of the City's General Plan, the required safe and compatible threshold for exterior noise levels would be at or below 65 dBA CNEL/DNL for aircrafts. Therefore, the proposed project would be compatible with the City's exterior noise standards for aircraft noise.

Assuming standard construction materials for aircraft noise less than 60 dBA DNL, the future interior noise levels resulting from aircraft would be less than 45 dBA DNL. The proposed project would be compatible with the City's interior noise standards of 45 dBA DNL threshold for aircraft noise. This would be a less-than-significant impact.

**Mitigation Measure 3:** **None required.**

[7] City of San José, "Norman Y. Mineta San José International Airport Master Plan Update Project: Eighth Addendum to the Environmental Impact Report," City of San José Public Project File No. PP 10-024, February 10, 2010.

**FIGURE 6 2027 CNEL Noise Contours for SJIA Relative to Project Site**