APPENDIX F

NOISE ASSESSMENT

ENVIRONMENTAL NOISE ASSESSMENT

BAYWOOD CONDOMINIUM DEVELOPMENT
SAN JOSE, CALIFORNIA

WJVA Report No. 19-047

PREPARED FOR

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

PREPARED BY

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1. INTRODUCTION

Project Description

The proposed project would consist of the replacement of existing single-family residences currently on-site with 79 residential condominium units and 11,146 square feet of commercial space and offices. A total of 105 parking spaces will be provided on site. Entry to the residential lobby would be located on Hemlock Avenue. Commercial access would be located on three sides, on Hemlock, Baywood and Redwood Avenue. The project site plan is provided as Figure 1.

Environmental Noise Assessment

This environmental noise assessment has been prepared to determine if significant noise impacts would be produced by the project and to describe mitigation measures for noise if significant impacts are determined. The environmental noise assessment, prepared by WJV Acoustics, Inc. (WJVA), is based upon the project site plan design and construction package prepared by Carpira Design Group Company, project-related traffic data provided by Hexagon Transportation Consultants, Inc. and a project site visit on January 30 and 31, 2020. Revisions to the site plan, project-related traffic data or other project-related information available to WJVA at the time the analysis was prepared may require a reevaluation of the findings and/or recommendations of the report.

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

In terms of human perception, a 5 dB increase or decrease is considered to be a noticeable change in noise levels. Additionally, a 10 dB increase or decrease is perceived by the human ear as half as loud or twice as loud. In terms of perception, generally speaking the human ear cannot perceive an increase (or decrease) in noise levels less than 3 dB.

2. THRESHOLDS OF SIGNIFICANCE

The CEQA Guidelines apply the following questions for the assessment of significant noise impacts for a project:

a. Would the project result in 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. Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

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

a. Noise Level Standards

City of San Jose

General Plan

The Environmental Leadership Chapter of the Envision San Jose 2040 General Plan[1] (adopted November 1, 2011) establishes land use compatibility criteria in terms of the Day-Night Average Level (L_{dn}/DNL). The L_{dn} represents the time-weighted energy average noise level for a 24-hour day, with a 10 dB penalty added to noise levels occurring during the nighttime hours (10:00 p.m.-7:00 a.m.). The L_{dn} represents cumulative exposure to noise over an extended period of time and are therefore calculated based upon *annual average* conditions. The General Plan establishes noise exposure criteria for specific land use types. The Noise level criteria established in the General Plan are provided below.

Goal EC-1 – Community Noise Levels and Land Use Compatibility

Minimize the impact of noise on people through noise reduction and suppression techniques, and through appropriate land use policies.

Policies – Community Noise Levels and Land Use Compatibility

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.

- For single family residential uses, use a standard of 60 dBA DNL for exterior noise in private usable outdoor activity areas, such as backyards.

Although not explicitly stated in the General Plan, exterior noise level standards are typically applied to "outdoor activity areas". Outdoor activity areas are generally considered to be backyards of single-family residential land uses, common use outdoor areas and individual patios and balconies of multi-family residential land uses, and common use outdoor areas for transient lodging land uses.

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"
- Cause the DNL at noise sensitive receptors to increase by three dBA DNL or more where the 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.

Municipal Code

Section 20.40.600 (Performance Standards) of the City of San Jose Municipal Code provides additional noise standards for stationary noise sources applicable to the project. The Municipal Code states that noise levels associated with commercially zoned properties cannot exceed 55 dB L_{max} (maximum) at adjacent residential property lines.

b. Construction Noise and Vibration

The General Plan provides establishes the following guidelines related to construction activities:

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.

Additionally, section 20.100.450 of the City of San Jose Municipal code provides the following:

- Unless otherwise expressly allowed in a development permit or other planning approval, no applicant or agent of an applicant shall suffer or allow any construction activity on a site located within 500 feet of a residential unit before 7:00 a.m. or after 7:00 p.m., Monday through Friday, or at any time on weekends.

The General Plan also provides some guidance and guidelines associated with vibration.

Goal EC-2 - Vibration
Minimize vibration impacts on people, residences, and business operations.

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.

Additional guidance is provided by the Caltrans Transportation and Construction Vibration Guidance Manual[3]. The Manual provides guidance for determining annoyance potential criteria and damage potential threshold criteria. These criteria are provided below in Table I and Table II, and are presented in terms of peak particle velocity (PPV) in inches per second (in/sec).

TABLE I

GUIDELINE VIBRATION ANNOYANCE POTENTIAL CRITERIA

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely Perceptible	0.04	0.01
Distinctly Perceptible	0.25	0.04
Strongly Perceptible	0.9	0.1
Severe	2.0	0.4

Source: Caltrans

TABLE II

GUIDELINE VIBRATION DAMAGE POTENTIAL THRESHOLD CRITERIA

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

Source: Caltrans

3. SETTING

The project site is located adjacent to S. Baywood Avenue to the east, Hemlock Avenue to the south and S. Redwood Avenue to the west. Existing single-family residences border the project site to the north, although some of the residences are currently being utilized as office uses. There are additional single-family residential land uses to the west of the project site and multi-family residential land uses to the south of the project site.

a. Background Noise Level Measurements

Existing ambient noise levels in the project vicinity are dominated by traffic noise along local roadways adjacent to and the in vicinity of the project site. Additional sources of noise observed during site inspection included aircraft overflights, birds, barking dogs, construction activities and landscaping activities.

Measurements of existing ambient noise levels in the project vicinity were conducted on January 30 and January 31, 2020. Long-term (24-hour) ambient noise level measurements were conducted at one (1) location (sites LT-1). Site LT-1 was located at the front of the current residence located at 375 S. Baywood Avenue, at a distance of approximately fifty (50) feet from the roadway. Site LT-1 was exposed to traffic noise associated with vehicles on nearby local roadways, as well as parking lot activities associated with nearby multi-family residential land uses, aircraft overflights and noise associated with residential activities, including construction and landscaping activities.

Additionally, short-term (15-minute) ambient noise level measurements were conducted at five (5) locations (Sites ST-1 through ST-5). Two (2) individual measurements were taken at each of the five short-term sites to quantify ambient noise levels in the morning and afternoon hours. The project vicinity and locations of the noise monitoring sites are shown on Figure 2.

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

Measured hourly energy average noise levels (L_{eq}) at site LT-1 ranged from a low of 43.0 dB between 1:00 a.m. and 2:00 a.m. to a high of 58.0 dB between 7:00 a.m. and 8:00 a.m. Hourly maximum (L_{max}) noise levels at site LT-1 ranged from 60.5 to 90.9 dB. Residual noise levels at the monitoring site, as defined by the L_{90} statistical descriptor ranged from 38.9 to 51.0 dB. The L_{90} is a statistical descriptor that defines the noise level exceeded 90% of the time during each hour of the sample period. The L_{90} is generally considered to represent the residual (or background) noise level in the absence of identifiable single noise events from traffic, aircraft and other local noise sources. The measured L_{dn} value at site LT-1 during the 24-hour noise measurement period was 57.5 dB L_{dn}. Figure 3 graphically depicts hourly variations in ambient noise levels at the LT-1 long-term monitoring site as well as a site photograph.

The short-term site noise measurement data included energy average (L_{eq}) maximum (L_{max}) as well as five (5) individual statistical parameters. Observations were made of the dominant noise sources affecting the measurements. The statistical parameters describe the percent of time a noise level was exceeded during the measurement period. Table III summarizes short-term noise measurement results.

TABLE III

SUMMARY OF SHORT-TERM NOISE MEASUREMENT DATA
BAYWOOD CONDOMINIUM MIXED-USE DEVELOPMENT
SAN JOSE, CALIFORNIA
JANUARY 30 & 31, 2020

Site	Time	A-Weighted Decibels, dBA							Sources
		L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}	L_{90}	
ST-1	8:55 a.m.	58.5	76.3	68.4	58.8	52.6	50.8	48.8	TR, B, C
ST-1	3:50 p.m.	55.7	69.2	66.4	56.0	50.1	47.8	45.3	TR, AC, C
ST-2	9:15 a.m.	52.7	63.3	60.7	57.7	52.1	49.1	47.2	TR, B, C
ST-2	4:15 p.m.	53.4	65.2	61.0	56.6	54.7	50.6	48.0	TR, AC
ST-3	9:35 a.m.	58.2	72.8	66.2	61.3	56.8	55.3	53.3	TR, C
ST-3	4:35 p.m.	59.9	81.0	68.1	62.4	58.6	56.0	54.1	TR, AC
ST-4	10:00 a.m.	54.1	62.2	58.7	56.5	54.0	53.3	52.4	TR, C, AC
ST-4	5:00 p.m.	55.5	63.7	59.2	57.4	55.0	52.1	51.8	TR, V
ST-5	10:20 a.m.	54.2	68.9	59.6	55.5	53.8	53.0	51.8	TR, B, C, L, V
ST-5	5:20 p.m.	56.1	71.5	61.0	57.2	55.4	53.4	52.7	TR, V

TR: Traffic AC: Aircraft V: Voices B: Birds R: L: Landscaping Activities C: Construction
Source: WJV Acoustics, Inc.

Short-term noise measurements were conducted for 15-minute periods. Sites ST-1 and ST-3 were located in the vicinity of existing commercial and office uses, while sites ST-2, ST-4 and ST-5 were located in the vicinity of predominantly residential uses. All of the five short-term monitoring sites were exposed to noise from traffic sources, construction noise sources, aircraft overflights and other sources typical of an urban residential environment (barking dogs, birds, landscaping activities, etc.).

4. PROJECT IMPACTS AND MITIGATION MEASURES

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

WJVA utilized the FHWA Traffic Noise Model[4] to quantify expected project-related increases in traffic noise exposure at representative noise-sensitive receptor locations in the project vicinity. Traffic noise exposure levels for Existing, Existing Plus Project, Cumulative No Project and Cumulative Plus Project traffic conditions were calculated based upon the FHWA Model and traffic volumes provided by Hexagon Transportation Consultants. Cumulative traffic volumes reflect projected traffic volumes on the planned roadway network with completion of the pending developments in the area as well as the proposed project and approved developments. The day/night distribution of traffic and the percentages of trucks on the roadways used for modeling were obtained from previous studies WJVA has conducted along similar roadways. The Noise modeling assumptions used to calculate project traffic noise are provided as Appendix C.

Project-related significant impacts would occur if an increase in traffic noise associated with the project would result in noise levels exceeding the City's applicable noise level standards at the location(s) of sensitive receptors. For the purpose of this analysis a significant impact is also assumed to occur if traffic noise levels were to increase by 3 dB at sensitive receptor locations where noise levels already exceed the City's applicable noise level standards (without the project), as 3 dB generally represents the threshold of perception in change for the human ear.

This analysis of project traffic noise focuses on residential land uses, as they represent the most restrictive noise level criteria by land use type provided in the General Plan. The City's exterior noise level standard for residential land uses is 60 dB L_{dn}. Traffic noise was modeled at six (6) receptor locations (R-1 through R-6). The six modeled receptors are located at roadway setback distances representative of the sensitive receptors (residences) along each analyzed roadway segment. The receptor locations are described below and provided graphically on Figure 4.

- R-1: Approximately 75 feet from the centerline of Winchester Blvd, north of Stevens Creek Blvd.
- R-2: Approximately 200 feet from the centerline of Stevens Creek Blvd, west of Winchester Blvd.
- R-3: Approximately 225 feet from the centerline of Winchester Blvd, south of Stevens Creek Blvd.
- R-4: Approximately 65 feet from the centerline of Santana Row, south of Stevens Creek Blvd.
- R-5: Approximately 135 feet from the centerline of Monroe St, south of Stevens Creek Blvd.
- R-6: Approximately 100 feet from the centerline of Redwood Ave, south of Stevens Creek Blvd.

Table IV provides a comparison of traffic noise levels at the six modeled receptor locations for Existing, Existing Plus Project, Cumulative and Cumulative Plus Project traffic conditions. Noise levels described in Table IV do not take into account any localized acoustic shielding that may result from intervening topography, existing buildings or existing sound walls, and should be considered a worst-case assessment of traffic noise exposure levels. As described in Table IV, project-related traffic is not expected to result in noise levels at any sensitive receptors to exceed the City's noise level standard, nor result in an increase of 3 dB in any sensitive receptor locations where noise levels already exceed the County's noise level standard without the implementation of the project. Project-related traffic is not expected to increase traffic noise levels at any roadway. Therefore, project-related increases in traffic noise exposure are considered to be no impact.

TABLE IV

PROJECT-RELATED INCREASES IN TRAFFIC NOISE, dB, L_{dn}
BAYWOOD CONDOMINIUM MIXED-USE DEVELOPMENT

Modeled Receptor	Existing	Existing Plus Project	Cumulative	Cumulative Plus Project	Change (Maximum)	Significant Impact?
R-1	67	67	68	68	0	No
R-2	60	60	61	61	0	No
R-3	61	61	63	63	0	No
R-4	55	55	56	56	0	No
R-5	57	57	60	60	0	No
R-6	45	45	45	45	0	No

Source: WJV Acoustics, Inc.
Hexagon Transportation Consultants

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

Sources of operational noise from the proposed mixed-use development would typically be limited to parking lot vehicle movements, outdoor human activity and Mechanical/HVAC systems. The project design does not include any loading docks or trash compactors, and truck deliveries would not be expected to occur at the site.

The project would incorporate approximately 105 parking spaces, located at two underground levels and one aboveground level. Access to the upper level is from Hemlock Avenue and the underground levels from Baywood Avenue.

Noise due to traffic in parking lots is typically limited by low speeds and is not usually considered to be significant. Human activity in parking lots that can produce noise includes voices, stereo systems and the opening and closing of car doors and trunk lids. The noise levels associated with these activities cannot be precisely defined due to variables such as the number of parking movements, time of day and other factors. It is typical for a passing car in a parking lot to produce a maximum

noise level of 60 to 65 dBA at a distance of 50 feet, which is comparable to the level of a raised voice. However, all project parking spaces will be located within the structure of the building, and noise associated with vehicle movements would not be audible at any nearby sensitive receptor locations.

Although a location was not specifically shown in the project plans provided to WJVA, it is assumed that the project could include roof-mounted Mechanical/HVAC units on the building. Based upon data collected by WJVA for previous acoustical studies, it is estimated that noise levels from roof-mounted HVAC units at the closest off-site sensitive receptor locations to the project site (nearby residential land uses) would be in the range of 45-50 dBA. These levels would generally not be audible above existing ambient noise levels at adjacent land-uses and would not exceed any City of San Jose noise level standards.

c. Noise From Construction (Less Than Significant With Mitigation)

Policy EC-1.7 of the General Plan requires construction operations within the City 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 twelve 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.

Section 20.100.450 of the City of San Jose Municipal code requires any construction activity on a site located within 500 feet of a residential unit must occur between the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and no construction activities are allowed on weekends.

Construction noise would occur at various locations within and near the project site through the build-out period. The distance from the closest residences to the project site is approximately 100 feet. Table V provides typical construction-related noise levels at distances of 100 feet, 200 feet, and 300 feet.

TABLE V

TYPICAL CONSTRUCTION EQUIPMENT
MAXIMUM NOISE LEVELS, dBA

Type of Equipment	100 Ft.	200 Ft.	300 Ft.
Concrete Saw	84	78	74
Crane	75	69	65
Excavator	75	69	65
Front End Loader	73	67	63
Jackhammer	83	77	73
Paver	71	65	61
Pneumatic Tools	79	73	69
Dozer	76	70	66
Rollers	74	68	64
Trucks	80	72	70
Pumps	74	68	64
Scrapers	81	75	71
Portable Generators	74	68	64
Backhoe	80	74	70
Grader	80	74	70

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

Noise impacts associated with construction activities typically depend on the noise levels generated by the type of equipment in use, the duration of usage of the equipment and the distance at which the equipment is used in respect to nearby sensitive receptors. Noise impacts typically occur when construction activities occur beyond the limited hours of construction and/or within close proximity to sensitive receptors (residential land uses).

Construction activities will occur within 500 feet of residential land uses and within 200 feet of office uses. However, the anticipated duration of project construction (including demolition) is anticipated to be approximately nine (9) months.

Construction noise is typically not considered to be a significant impact if construction is limited to the daytime hours and construction equipment is adequately maintained and muffled. Extraordinary noise-producing activities (e.g., pile driving) are not anticipated. In this case, all project construction activity must be confined to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday. Construction noise impacts could result in annoyance or sleep disruption for nearby residents if nighttime operations were to occur or if equipment is not properly muffled or maintained. If construction activities that involved substantial noise generating activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing) for a duration greater than twelve months, a substantial impact would occur.

Potential Impact: If the overall duration of construction activities were to occur over a period greater than twelve months, a noise impact would occur, as determined by the City of San Jose Municipal Code.

Mitigation Measure: The anticipated duration of project construction (including demolition) is approximately nine months. However, If project construction were to occur for a duration greater than twelve months, the project team must provide 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.

Vibration Impacts (Less Than Significant)

The dominant sources of man-made vibration are sonic booms, blasting, pile driving, pavement breaking, demolition, diesel locomotives, and rail-car coupling. The highest levels of construction-related vibration are typically associated with pile driving and the use of vibratory rollers. While the project would include pavement breaking and demolition activities, project demolition and construction would not require pile driving or the use of a vibratory roller. Vibration from demolition and construction activities could be detected at the closest sensitive land uses, especially during demolition (pavement/concrete breaking), movements by heavy equipment or loaded trucks and during some paving activities (if they were to occur). Typical vibration levels at distances of 25 feet, 100 feet and 300 feet are summarized by Table VI. These levels would not be expected to exceed any significant threshold levels for annoyance or damage, as provided above in Table I and Table II.

TABLE VI

TYPICAL VIBRATION LEVELS DURING CONSTRUCTION

	PPV (in/sec)		
Equipment	**@ 25´**	**@ 100´**	**@ 300´**
Bulldozer (Large)	0.089	0.019	0.006
Bulldozer (Small)	0.003	0.0006	0.0002
Loaded Truck	0.076	0.017	0.005
Jackhammer	0.035	0.008	0.002
Vibratory Roller	0.210	0.046	0.013
Caisson Drilling	0.089	0.019	0.006

Source: *Caltrans*

Project demolition and construction activities would not be expected to produce continuous vibration levels exceeding the City's criterion of 0.20 in/sec PPV at nearby sensitive receptor locations. After full project build out, it is not expected that ongoing operational activities will result in any vibration impacts at nearby sensitive uses. Activities involved in trash bin collection could result in minor on-site vibrations as the bin is placed back onto the ground. Such vibrations

would not be expected to be felt at the closest off-site sensitive uses. Additional mitigation is not required.

e. Noise Impacts from Nearby Airports or Airstrips (No Impact)

The Project site is not located within two miles of a public airport or private airstrip. The San Jose International Airport is located approximately 2.5 miles northeast of the project site.

f. Noise Impacts to On-Site Proposed Noise-Sensitive Uses (Less Than Significant)

The General Plan establishes an exterior noise level standard of 60 dB L_{dn} for residential land uses. The exterior noise level standard applies to usable outdoor activity areas, excluding balconies and residential stoops and porches facing existing roadways. The General Plan also establishes an interior noise level standard of 45 dB L_{dn} (attributable to exterior noise sources) within residential land uses.

Exterior Noise

The project would include two (2) rooftop common use seating areas (Roof Garden Common Area). The rooftop area would be acoustically shielded from most exterior traffic noise, and there would be no line-of-sight between the rooftop seating areas and nearby roadway traffic. Based upon the noise levels measured at noise monitoring site LT-1 (approximately 58 dB L_{dn}) and acoustical shielding provided by the building, exterior noise levels at the common use rooftop seating areas would be expected to be approximately 50-55 dB L_{dn}.

Interior Noise

The City's interior noise level standard is 45 dB L_{dn}. The measured 24-hour noise exposure level at noise monitoring site LT-1 was approximately 58 dB L_{dn}. Noise levels within the project's urban environment would be expected to increase over time. A worst-case assumption of future noise levels could apply a doubling of overall noise levels, which would result in a noise exposure level exterior to the proposed building façades of approximately 61 dB L_{dn} (decibels are logarithmic in nature and are not added arithmetically).

Assuming the above-described future doubling in the overall exterior noise, the worst-case noise exposure at the closest exterior facades would be approximately 61 dB L_{dn}. This means that the proposed residential construction must be capable of providing a minimum outdoor-to-indoor noise level reduction (NLR) of approximately 16 dB (61-45=16).

A specific analysis of interior noise levels was not performed. However, it may be assumed that residential construction methods complying with current building code requirements will reduce exterior noise levels by approximately 25 dB or more if windows and doors are closed. This will be sufficient for compliance with the City's 45 dB L_{dn} interior standard at all proposed residential units. Requiring that it be possible for windows and doors to remain closed for sound insulation means that air conditioning or mechanical ventilation will be required.

5. IMPACT SUMMARY

Operational exterior noise levels associated with the proposed project would be limited to human voices within individual balconies and the roof garden common area as well as noise associated with mechanical/HVAC systems. It is assumed that any mechanical/HVAC system equipment would be roof mounted or contained within the building itself. HVAC noise levels would be expected to be below 50 dB at the adjacent residential land uses. Vehicle movements would be limited to the enclosed and below ground parking area, and vehicle noise would not be expected to exceed any City of Sana Jose noise level standards. Operational noise associated with the project itself would not be expected to exceed 60 dB L_{dn} (General Plan) or 55 dB L_{max} (Municipal Code) at any adjacent or nearby residential land uses.

This impact summary addresses only the noise impacts determined to be "potentially significant" and summarizes the mitigation measures that would be required to reduce noise levels to a "less than significant" level. Project-related noise levels resulting from the proposed Baywood Condominium Mixed-Use Development project are not expected to exceed any applicable City of San Jose noise level standards if proper mitigation measures are incorporated into project construction operations. Potential impacts and correlating mitigation measures are described in detail above, and summarized below.

Potential Impact: If the overall duration of construction activities were to occur over a period greater than twelve months, a noise impact would occur, as determined by the City of San Jose Municipal Code.

Mitigation Measure: The anticipated duration of project construction (including demolition) is approximately nine months. However, if project construction were to occur for a duration greater than twelve months, the project team must provide 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.

6. SOURCES CONSULTED

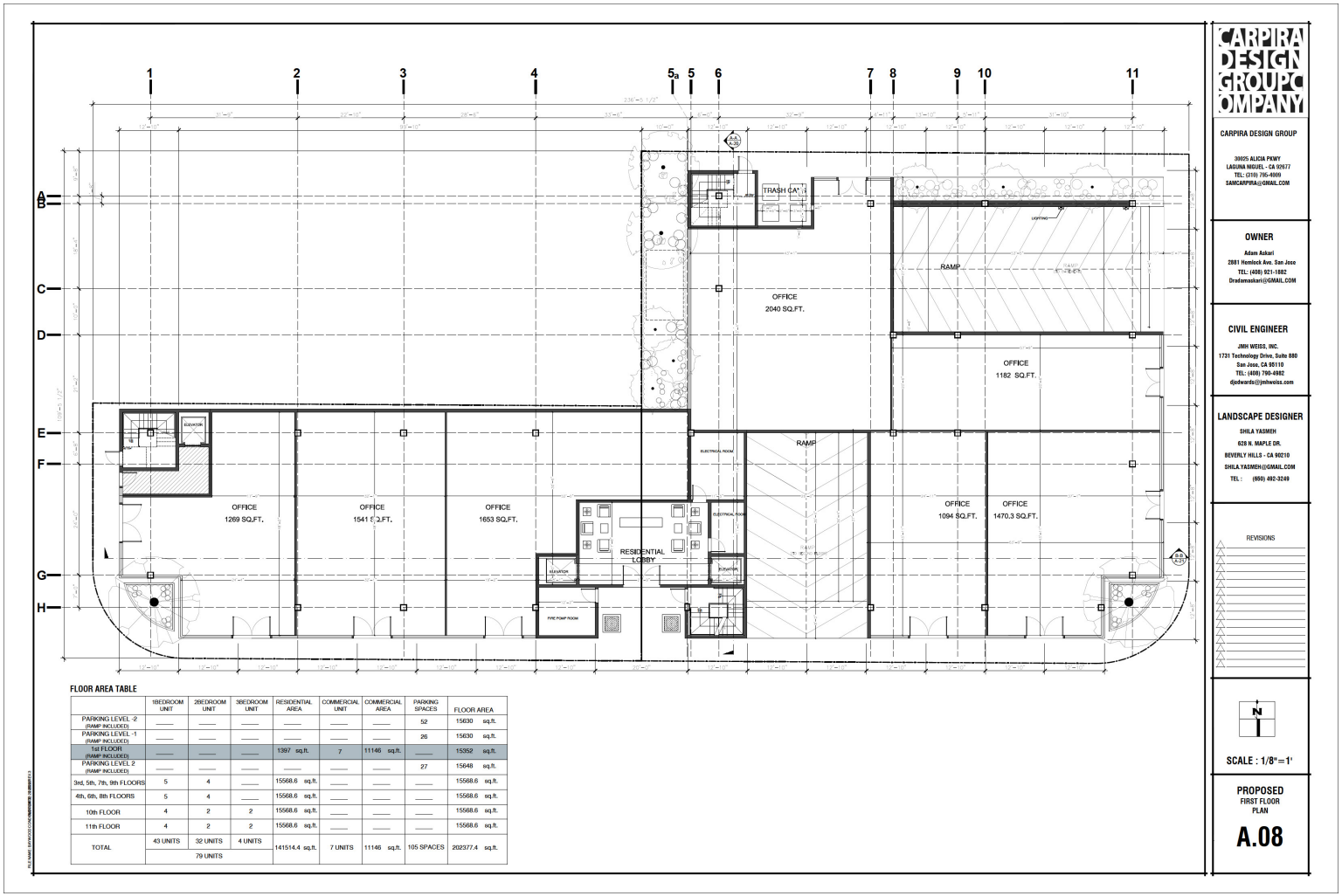
1. Envision San Jose 2040 General Plan, November 2011.

2. San Jose Municipal Code, 2000.

3. California Department of Transportation, *Transportation and Construction Vibration Guidance Manual,* September 2013.

4. Federal Highway Administration, *Traffic Noise Model, Version 2.5,* April 14, 2004

FIGURE 1: PROJECT FLOOR PLAN



FLOOR AREA TABLE

	1BEDROOM UNIT	2BEDROOM UNIT	3BEDROOM UNIT	RESIDENTIAL AREA	COMMERCIAL UNIT	COMMERCIAL AREA	PARKING SPACES	FLOOR AREA
PARKING LEVEL -2 (RAMP INCLUDED)	____	____	____	____	____	____	52	15630 sq.ft.
PARKING LEVEL -1 (RAMP INCLUDED)	____	____	____	____	____	____	26	15630 sq.ft.
1st FLOOR (RAMP INCLUDED)	____	____	____	1397 sq.ft.	7	11146 sq.ft.	____	15352 sq.ft.
PARKING LEVEL 2 (RAMP INCLUDED)	____	____	____	____	____	____	27	15648 sq.ft.
3rd, 5th, 7th, 9th FLOORS	5	4	____	15568.6 sq.ft.	____	____	____	15568.6 sq.ft.
4th, 6th, 8th FLOORS	5	4	____	15568.6 sq.ft.	____	____	____	15568.6 sq.ft.
10th FLOOR	4	2	2	15568.6 sq.ft.	____	____	____	15568.6 sq.ft.
11th FLOOR	4	2	2	15568.6 sq.ft.	____	____	____	15568.6 sq.ft.
TOTAL	43 UNITS	32 UNITS	4 UNITS	141514.4 sq.ft.	7 UNITS	11146 sq.ft.	105 SPACES	202377.4 sq.ft.
	79 UNITS							

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REVISIONS

SCALE : 1/8"=1'

PROPOSED
FIRST FLOOR PLAN

A.08

FIGURE 2: PROJECT VICINITY AND AMBIENT NOISE MONITORING SITES

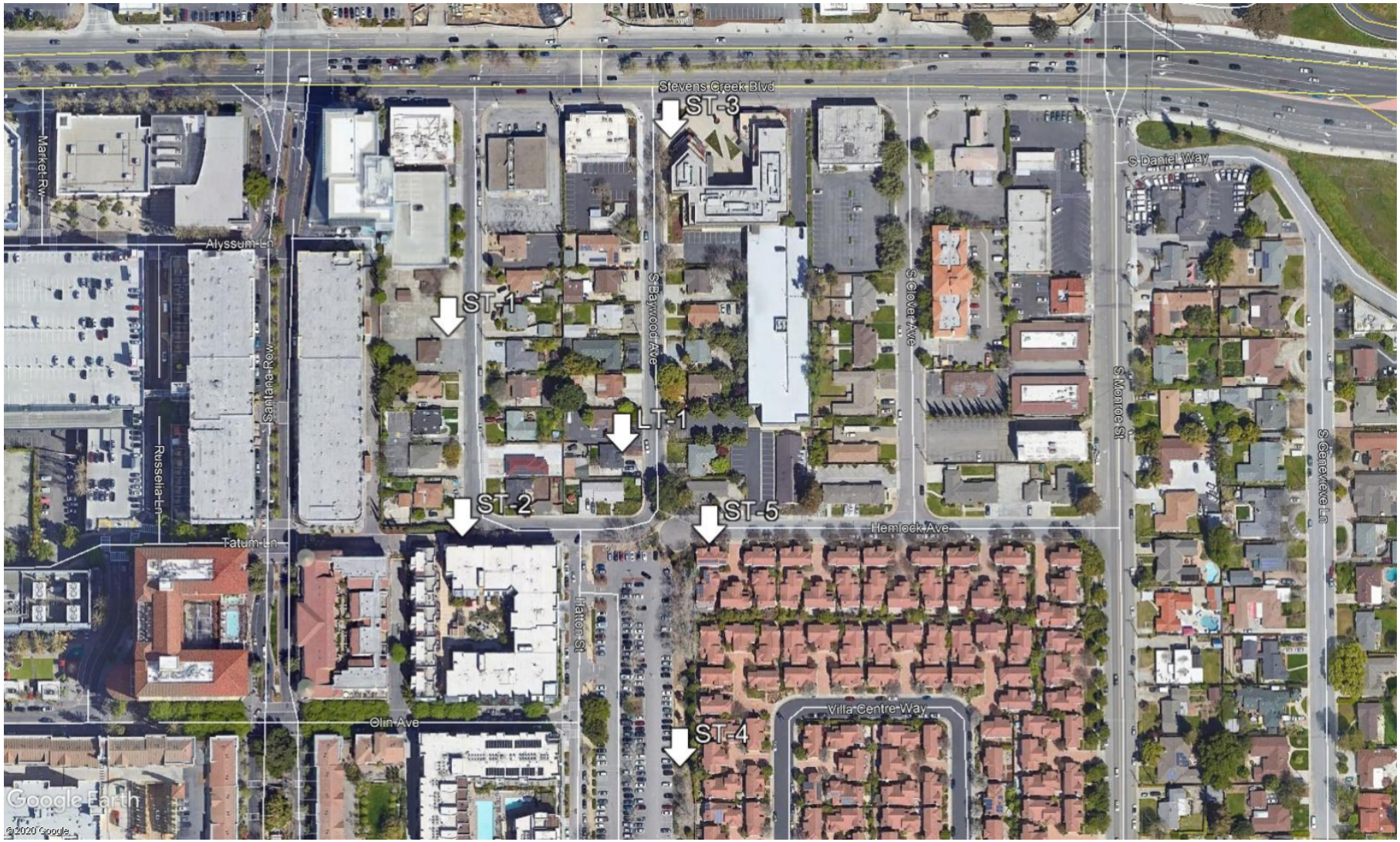


FIGURE 3: HOURLY NOISE LEVELS AT LONG-TERM MONITORING SITE LT-1

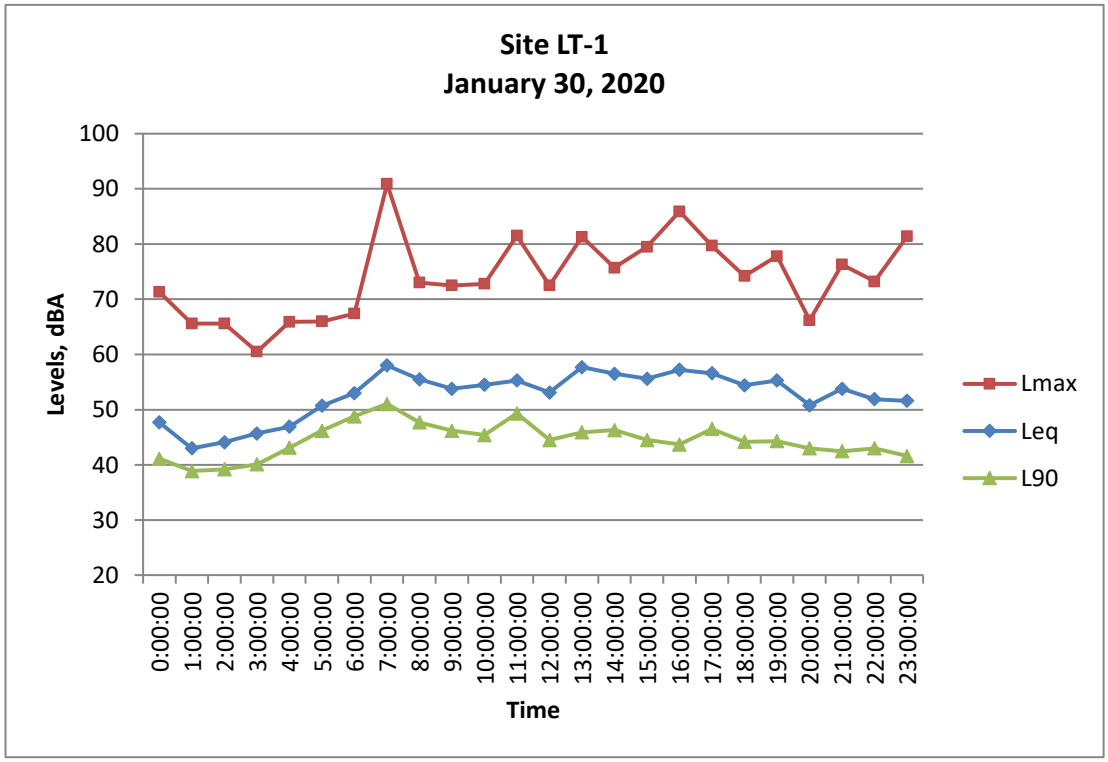
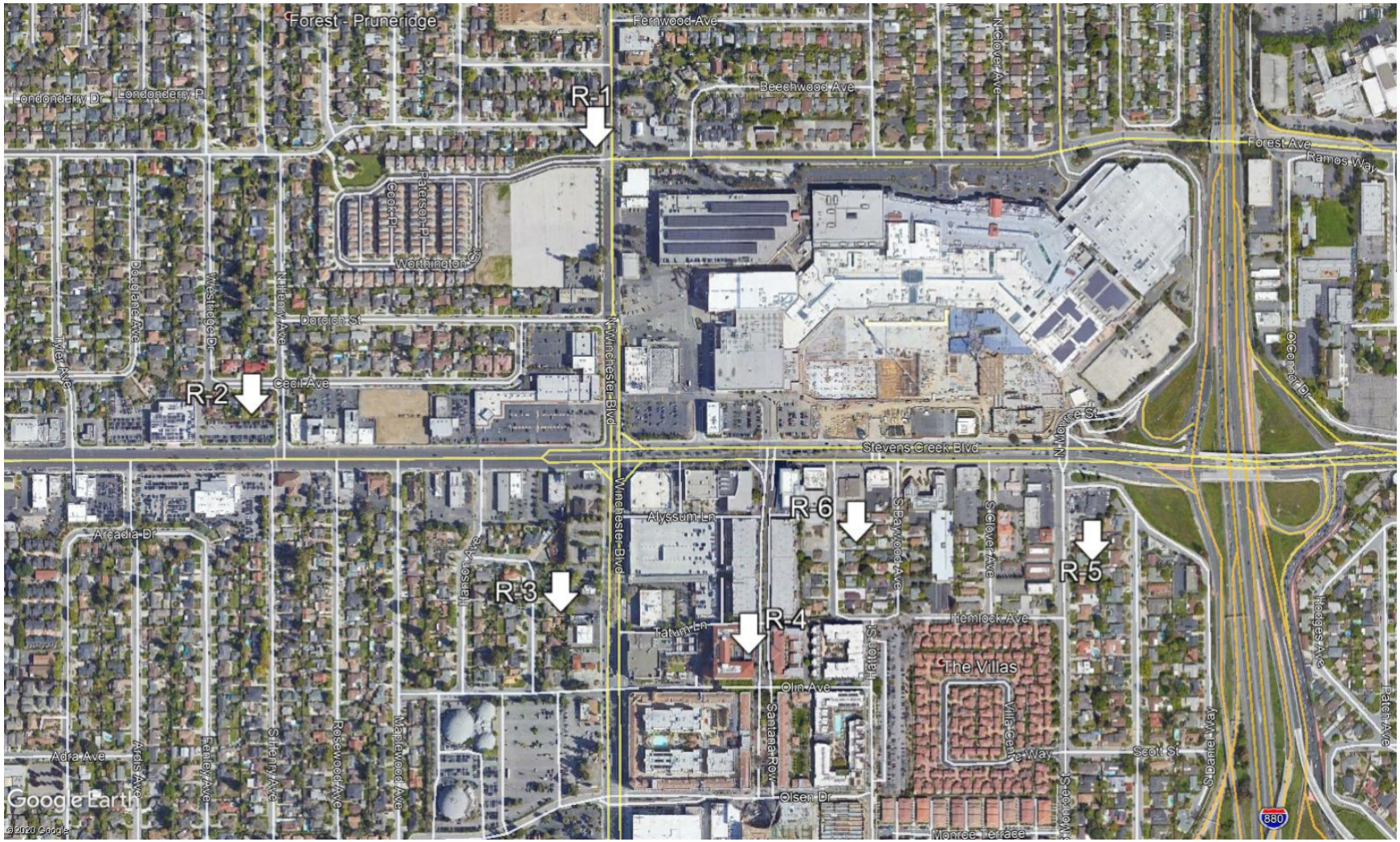


FIGURE 4: LOCATIONS OF MODELED TRAFFIC NOISE RECEPTORS



APPENDIX A-1

ACOUSTICAL TERMINOLOGY

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

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

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

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

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

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

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

L_n: The sound level exceeded "n" percent of the time during a sample interval (L_{90}, L_{50}, L_{10}, etc.). For example, L_{10} equals the level exceeded 10 percent of the time.

A-2

ACOUSTICAL TERMINOLOGY

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

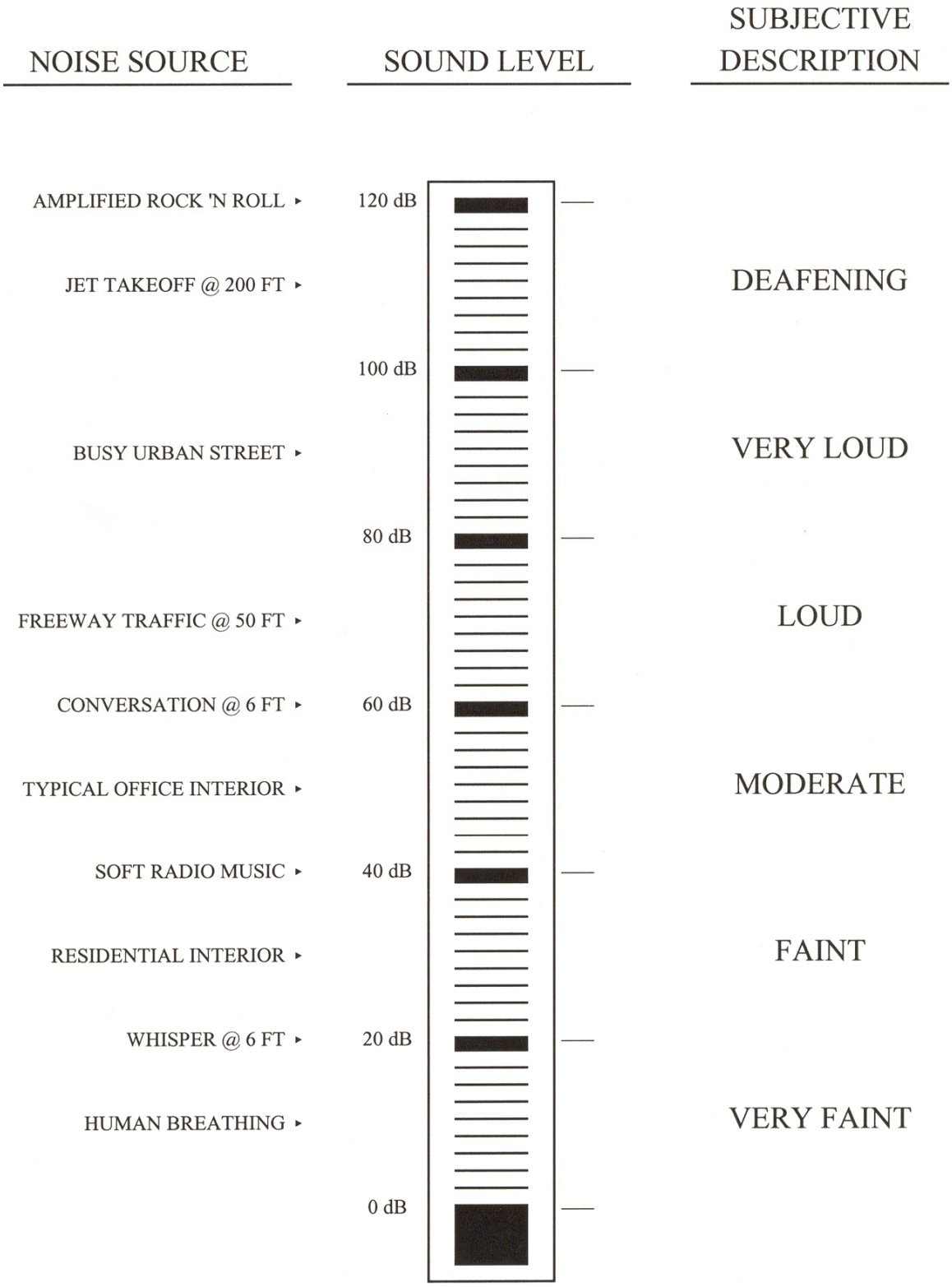
NOISE LEVEL REDUCTION (NLR): The noise reduction between indoor and outdoor environments or between two rooms that is the numerical difference, in decibels, of the average sound pressure levels in those areas or rooms. A measurement of Anoise level reduction" combines the effect of the transmission loss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

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

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

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

APPENDIX B
EXAMPLES OF SOUND LEVELS



APPENDIX C

TRAFFIC NOISE MODELING CALCULATIONS

WJV Acoustics, Inc
FHWA-RD-77-108
Calculation Sheets
August 5, 2020

Project #:	19-047
Description:	Existing
Ldn/Cnel:	Ldn
Site Type:	Soft

Contour Levels (dB)	60	65	70	75					

Segment	Roadway Name	Segment Description	ADT	%Day	%Evening	%Night	%Med	%Heavy	Speed	Distance	Offset
1	Winchester Blvd	n/o Stevens Creek R-1	24590	90		10	2	2	40	75	
2	Stevens Creek Blvd	w/o Winchester R-2	27060	90		10	2	2	35	200	
3	Winchester Blvd	s/o Stevens Creek R-3	30140	90		10	2	2	40	225	
4	Santana Row	s/o Stevens Creek R-4	5070	90		10	2	2	20	65	
5	Monroe St.	s/o Stevens Creek R-5	6360	90		10	2	2	40	135	
6	Redwood Ave	s/o Stevens Creek R-6	590	90		10	2	2	25	100	

WJV Acoustics, Inc
FHWA-RD-77-108
Calculation Sheets
August 5, 2020

Project #:	19-047
Description:	Existing + project
Ldn/Cnel:	Ldn
Site Type:	Soft

Contour Levels (dB) 60 65 70 75

Segment	Roadway Name	Segment Description	ADT	%Day	%Evening	%Night	%Med	%Heavy	Speed	Distance	Offset
1	Winchester Blvd	n/o Stevens Creek R-1	24610	90		10	2	2	40	75	
2	Stevens Creek Blvd	w/o Winchester R-2	27100	90		10	2	2	35	200	
3	Winchester Blvd	s/o Stevens Creek R-3	30200	90		10	2	2	40	225	
4	Santana Row	s/o Stevens Creek R-4	5070	90		10	2	2	20	65	
5	Monroe St.	s/o Stevens Creek R-5	6360	90		10	2	2	40	135	
6	Redwood Ave	s/o Stevens Creek R-6	620	90		10	2	2	25	100	

WJV Acoustics, Inc
FHWA-RD-77-108
Calculation Sheets
August 5, 2020

Project #:	19-047
Description:	Cumulative No Project
Ldn/Cnel:	Ldn
Site Type:	Soft

Contour Levels (dB) 60 65 70 75

Segment	Roadway Name	Segment Description	ADT	%Day	%Evening	%Night	%Med	%Heavy	Speed	Distance	Offset
1	Winchester Blvd	n/o Stevens Creek R-1	33280	90		10	2	2	40	75	
2	Stevens Creek Blvd	w/o Winchester R-2	32880	90		10	2	2	35	200	
3	Winchester Blvd	s/o Stevens Creek R-3	51830	90		10	2	2	40	225	
4	Santana Row	s/o Stevens Creek R-4	5090	90		10	2	2	20	65	
5	Monroe St.	s/o Stevens Creek R-5	12960	90		10	2	2	40	135	
6	Redwood Ave	s/o Stevens Creek R-6	590	90		10	2	2	25	100	

WJV Acoustics, Inc
FHWA-RD-77-108
Calculation Sheets
August 5, 2020

Project #:	19-047
Description:	Cumulative + project
Ldn/Cnel:	Ldn
Site Type:	Soft

Contour Levels (dB) 60 65 70 75

Segment	Roadway Name	Segment Description	ADT	%Day	%Evening	%Night	%Med	%Heavy	Speed	Distance	Offset
1	Winchester Blvd	n/o Stevens Creek R-1	33300	90		10	2	2	40	75	
2	Stevens Creek Blvd	w/o Winchester R-2	33920	90		10	2	2	35	200	
3	Winchester Blvd	s/o Stevens Creek R-3	51870	90		10	2	2	40	225	
4	Santana Row	s/o Stevens Creek R-4	5090	90		10	2	2	20	65	
5	Monroe St.	s/o Stevens Creek R-5	12960	90		10	2	2	40	135	
6	Redwood Ave	s/o Stevens Creek R-6	620	90		10	2	2	25	100	