APPENDIX A

AIR QUALITY ASSESSMENT

70 NORTH 27TH STREET RESIDENTIAL DEVELOPMENT AIR QUALITY ASSESSMENT

San José, California

September 27, 2022

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Introduction

The purpose of this report is to address air quality and community health risk impacts associated with the proposed residential development project located at 70 North 27th Street in San José, California. The air quality impacts from this project would be associated with the demolition of the existing land uses and construction of the new building and infrastructure. Air pollutants associated with construction of the project were predicted using appropriate computer models. In addition, the potential project health risk impacts (construction) and the impacts of existing toxic air contaminant (TAC) sources affecting the nearby sensitive receptors were evaluated. The analysis was conducted following guidance provided by the Bay Area Air Quality Management District (BAAQMD).[1]

Project Description

The 1.2-acre project site is currently occupied by an approximately 21,400-square foot (sf) commercial building with an associated parking surrounding the building. The project proposes to demolish the existing use to construct a 106,350-sf, 198-dwelling unit, 6-story residential building which would include one level of parking on the first floor. The residential dwelling units would be located on floors two through six. The grade level parking would provide 213 parking spaces. The first floor would also include approximately 7,100-sf of retail space. Construction is expected to begin in January 2024 and be completed by May 2026.

Setting

The project is located in Santa Clara County, which is in the San Francisco Bay Area Air Basin. Ambient air quality standards have been established at both the State and federal level. The Bay Area meets all ambient air quality standards with the exception of ground-level ozone, respirable particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$).

Air Pollutants of Concern

High ozone levels are caused by the cumulative emissions of reactive organic gases (ROG) and nitrogen oxides (NO_X). These precursor pollutants react under certain meteorological conditions to form high ozone levels. Controlling the emissions of these precursor pollutants is the focus of the Bay Area's attempts to reduce ozone levels. The highest ozone levels in the Bay Area occur in the eastern and southern inland valleys that are downwind of air pollutant sources. High ozone levels aggravate respiratory and cardiovascular diseases, reduced lung function, and increase coughing and chest discomfort.

Particulate matter is another problematic air pollutant of the Bay Area. Particulate matter is assessed and measured in terms of respirable particulate matter or particles that have a diameter of 10 micrometers or less (PM_{10}) and fine particulate matter where particles have a diameter of 2.5 micrometers or less ($PM_{2.5}$). Elevated concentrations of PM_{10} and $PM_{2.5}$ are the result of both region-wide (or cumulative) emissions and localized emissions. High particulate matter levels

[1] Bay Area Air Quality Management District, *CEQA Air Quality Guidelines*, May 2017.

aggravate respiratory and cardiovascular diseases, reduce lung function, increase mortality (e.g., lung cancer), and result in reduced lung function growth in children.

Toxic Air Contaminants

Toxic air contaminants (TAC) are a broad class of compounds known to cause morbidity or mortality, often because they cause cancer. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter [DPM] near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, State, and federal level.

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about three-quarters of the cancer risk from TACs (based on the Bay Area average). According to the California Air Resources Board (CARB), diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the State's Proposition 65 or under the Federal Hazardous Air Pollutants programs. Health risks from TACs are estimated using the Office of Environmental Health Hazard Assessment (OEHHA) risk assessment guidelines, which were published in February of 2015.[2] See *Attachment 1* for a detailed description of the community risk modeling methodology used in this assessment.

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 16, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. For cancer risk assessments, children are the most sensitive receptors, since they are more susceptible to cancer causing TACs. Residential locations are assumed to include infants and small children. The closest sensitive receptors to the project site are the single-family residences to the west and northwest of the project site. There are more sensitive receptors at farther distances, including students at the Cristo Rey San Jose Jesuit High School. The project would introduce new sensitive receptors (i.e., residents) to the area.

[2] OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.

Regulatory Setting

Federal Regulations

The United States Environmental Protection Agency (EPA) sets nationwide emission standards for mobile sources, which include on-road (highway) motor vehicles such trucks, buses, and automobiles, and non-road (off-road) vehicles and equipment used in construction, agricultural, industrial, and mining activities (such as bulldozers and loaders). The EPA also sets nationwide fuel standards. California also has the ability to set motor vehicle emission standards and standards for fuel used in California, as long as they are the same or more stringent than the federal standards.

In the past decade the EPA has established a number of emission standards for on- and non-road heavy-duty diesel engines used in trucks and other equipment. This was done in part because diesel engines are a significant source of NO_X and particulate matter (PM_{10} and $PM_{2.5}$) and because the EPA has identified DPM as a probable carcinogen. Implementation of the heavy-duty diesel on-road vehicle standards and the non-road diesel engine standards are estimated to reduce particulate matter and NO_X emissions from diesel engines up to 95 percent in 2030 when the heavy-duty vehicle fleet is completely replaced with newer heavy-duty vehicles that comply with these emission standards.[3]

In concert with the diesel engine emission standards, the EPA has also substantially reduced the amount of sulfur allowed in diesel fuels. The sulfur contained in diesel fuel is a significant contributor to the formation of particulate matter in diesel-fueled engine exhaust. The new standards reduced the amount of sulfur allowed by 97 percent for highway diesel fuel (from 500 parts per million by weight [ppmw] to 15 ppmw), and by 99 percent for off-highway diesel fuel (from about 3,000 ppmw to 15 ppmw). The low sulfur highway fuel (15 ppmw sulfur), also called ultra-low sulfur diesel (ULSD), is currently required for use by all vehicles in the U.S.

All of the above federal diesel engine and diesel fuel requirements have been adopted by California, in some cases with modifications making the requirements more stringent or the implementation dates sooner.

State Regulations

To address the issue of diesel emissions in the state, CARB developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*.[4] In addition to requiring more stringent emission standards for new on-road and off-road mobile sources and stationary diesel-fueled engines to reduce particulate matter emissions by 90 percent, a significant component of the plan involves application of emission control strategies to existing diesel vehicles and equipment. Many Plan measures have been approved and adopted, including

[3] USEPA, 2000. *Regulatory Announcement, Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements*. EPA420-F-00-057. December.
[4] California Air Resources Board, 2000. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles. October.

the federal on-road and non-road diesel engine emission standards for new engines, and adoption of regulations for low sulfur fuel in California.

CARB has adopted and implemented a number of additional regulations for stationary and mobile sources to reduce emissions of DPM. Several of these regulatory programs affect medium and heavy-duty diesel trucks that represent the bulk of DPM emissions from California highways. CARB regulations require on-road diesel trucks to be retrofitted with particulate matter controls or replaced to meet 2010 or later engine standards that have much lower DPM and $PM_{2.5}$ emissions. This regulation will substantially reduce these emissions between 2013 and 2023. While new trucks and buses will meet strict federal standards, CARB's program is intended to accelerate the rate at which the fleet either turns over so there are more cleaner vehicles on the road or is retrofitted to meet similar standards. With this regulation, older, more polluting trucks would be removed from the roads sooner.

CARB has also adopted and implemented regulations to reduce DPM and NO_X emissions from in-use (existing) and new off-road heavy-duty diesel vehicles (e.g., loaders, tractors, bulldozers, backhoes, off-highway trucks, etc.). The regulations apply to diesel-powered off-road vehicles with engines 25 horsepower (hp) or greater. The regulations are intended to reduce particulate matter and NO_X exhaust emissions by requiring owners to turn over their fleet (replace older equipment with newer equipment) or retrofit existing equipment in order to achieve specified fleet-averaged emission rates. Implementation of this regulation, in conjunction with stringent federal off-road equipment engine emission limits for new vehicles, will significantly reduce emissions of DPM and NO_X.

Bay Area Air Quality Management District (BAAQMD)

BAAQMD has jurisdiction over an approximately 5,600-square mile area, commonly referred to as the San Francisco Bay Area (Bay Area). The District's boundary encompasses the nine San Francisco Bay Area counties, including Alameda County, Contra Costa County, Marin County, San Francisco County, San Mateo County, Santa Clara County, Napa County, southwestern Solano County, and southern Sonoma County.

BAAQMD is the lead agency in developing plans to address attainment and maintenance of the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). The District also has permit authority over most types of stationary equipment utilized for the proposed project. The BAAQMD is responsible for permitting and inspection of stationary sources; enforcement of regulations, including setting fees, levying fines, and enforcement actions; and ensuring that public nuisances are minimized.

BAAQMD's Community Air Risk Evaluation (CARE) program was initiated in 2004 to evaluate and reduce health risks associated with exposures to outdoor TACs in the Bay Area.[5] The program examines TAC emissions from point sources, area sources, and on-road and off-road mobile sources with an emphasis on diesel exhaust, which is a major contributor to airborne health risk in California. The CARE program is an on-going program that encourages

[5] See BAAQMD: https://www.baaqmd.gov/community-health/community-health-protection-program/community-air-risk-evaluation-care-program , accessed 2/18/2021.

community involvement and input. The technical analysis portion of the CARE program is being implemented in three phases that includes an assessment of the sources of TAC emissions, modeling and measurement programs to estimate concentrations of TAC, and an assessment of exposures and health risks. Throughout the program, information derived from the technical analyses will be used to focus emission reduction measures in areas with high TAC exposures and high density of sensitive populations. Risk reduction activities associated with the CARE program are focused on the most at-risk communities in the Bay Area. The BAAQMD defines overburdened communities as areas located (i) within a census tract identified by the California Communities Environmental Health Screening Tool (CalEnviroScreen), Version 4.0 implemented by OEHHA, as having an overall CalEnviroScreen score at or above the 70th percentile, or (ii) within 1,000 feet of any such census tract.[6] The BAAQMD has identified six communities as impacted: Concord, Richmond/San Pablo, Western Alameda County, San José, Redwood City/East Palo Alto, and Eastern San Francisco. The project site is located in the San José CARE area but not within a BAAQMD overburdened area as identified by CalEnviroScreen since the Project site is scored at the 57th percentile.

The BAAQMD California Environmental Quality Act (*CEQA) Air Quality Guidelines*[7] were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process consistent with California Environmental Quality Act (CEQA) requirements including thresholds of significance, mitigation measures, and background air quality information. They also include assessment methodologies for TACs, odors, and greenhouse gas (GHG) emissions. *Attachment 1* includes detailed community risk modeling methodology.

San José Envision 2040 General Plan

The San José Envision 2040 General Plan includes goals, policies, and actions to reduce exposure of the City's sensitive population to exposure of air pollution and toxic air contaminants or TACs. The following goals, policies, and actions are applicable to the proposed project and this assessment:

Applicable Goals – Air Pollutant Emission Reduction

Goal MS-10 Minimize emissions from new development.

Applicable Policies – Air Pollutant Emission Reduction

MS-10.1 Assess projected air emissions from new development in conformance with the Bay Area Air Quality Management District (BAAQMD) CEQA Guidelines and relative to state and federal standards. Identify and implement feasible air emission reduction measures.

[6] See BAAQMD: https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-2-permits/2021-amendments/documents/20210722_01_appendixd_mapsofoverburdenedcommunities-pdf.pdf?la=en , accessed 10/1/2021.

[7] Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May.

MS-10.2 Consider the cumulative air quality impacts from proposed developments for proposed land use designation changes and new development, consistent with the region's Clean Air Plan and State law.

MS-10.3 Promote the expansion and improvement of public transportation services and facilities, where appropriate, to both encourage energy conservation and reduce air pollution.

MS-10.5 In order to reduce vehicle miles traveled and traffic congestion, require new development within 2,000 feet of an existing or planned transit station to encourage the use of public transit and minimize the dependence on the automobile through the application of site design guidelines and transit incentives.

MS-10.7 Encourage regional and statewide air pollutant emission reduction through energy conservation to improve air quality.

MS-10.11 Enforce the City's wood-burning appliance ordinance to limit air pollutant emissions from residential and commercial buildings.

MS-10.13 As a part of City of San José Sustainable City efforts, educate the public about air polluting household consumer products and activities that generate air pollution. Increase public awareness about the alternative products and activities that reduce air pollutant emissions.

Applicable Goals – Toxic Air Contaminants

Goal MS-11 Minimize exposure of people to air pollution and toxic air contaminants such as ozone, carbon monoxide, lead, and particulate matter.

Applicable Policies – Toxic Air Contaminants

MS-11.2 For projects that emit toxic air contaminants, require project proponents to prepare health risk assessments in accordance with BAAQMD-recommended procedures as part of environmental review and employ effective mitigation to reduce possible health risks to a less than significant level. Alternatively, require new projects (such as, but not limited to, industrial, manufacturing, and processing facilities) that are sources of TACs to be located an adequate distance from residential areas and other sensitive receptors.

MS-11.4 Encourage the installation of appropriate air filtration at existing schools, residences, and other sensitive receptor uses adversely affected by pollution sources.

MS-11.5 Encourage the use of pollution absorbing trees and vegetation in buffer areas between substantial sources of TACs and sensitive land uses.

Actions – Toxic Air Contaminants

MS-11.6 Develop and adopt a comprehensive Community Risk Reduction Plan that includes: baseline inventory of toxic air contaminants (TACs) and particulate matter smaller than 2.5 microns ($PM_{2.5}$), emissions from all sources, emissions reduction targets, and enforceable emission reduction strategies and performance measures. The Community Risk Reduction Plan will include enforcement and monitoring tools to ensure regular review of progress toward the emission reduction targets, progress reporting to the public and responsible agencies, and periodic updates of the plan, as appropriate.

MS-11.7 Consult with BAAQMD to identify stationary and mobile TAC sources and determine the need for and requirements of a health risk assessment for proposed developments.

MS-11.8 For new projects that generate truck traffic, require signage which reminds drivers that the State truck idling law limits truck idling to five minutes.

Applicable Goals – Construction Air Emissions

Goal MS-13 Minimize air pollutant emissions during demolition and construction activities

Applicable Policies – Construction Air Emissions

MS-13.1 Include dust, particulate matter, and construction equipment exhaust control measures as conditions of approval for subdivision maps, site development and planned development permits, grading permits, and demolition permits. At minimum, conditions shall conform to construction mitigation measures recommended in the current BAAQMD CEQA Guidelines for the relevant project size and type.

Applicable Actions – Construction Air Emissions

MS-13.4 Adopt and periodically update dust, particulate, and exhaust control standard measures for demolition and grading activities to include on project plans as conditions of approval based upon construction mitigation measures in the BAAQMD CEQA Guidelines.

Significance Thresholds

In June 2010, BAAQMD adopted thresholds of significance to assist in the review of projects under CEQA and these significance thresholds were contained in the District's 2011 CEQA Air Quality Guidelines. These thresholds were designed to establish the level at which BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA. The thresholds were challenged through a series of court challenges and were mostly upheld. BAAQMD updated the CEQA Air Quality Guidelines in 2017 to include the latest significance thresholds, which were used in this analysis and are summarized in Table 1. Impacts above the threshold are considered potentially significant.

Table 1. BAAQMD CEQA Significance Thresholds

Criteria Air Pollutant	Construction Thresholds	
	Average Daily Emissions (lbs./day)	
ROG	54	
NO_x	54	
PM_{10}	82 (Exhaust)	
$PM_{2.5}$	54 (Exhaust)	
CO	Not Applicable	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	
Health Risks and Hazards	**Single Sources Within 1,000-foot Zone of Influence**	**Combined Sources (Cumulative from all sources within 1000-foot zone of influence)**
Excess Cancer Risk	10 per one million	100 per one million
Hazard Index	1.0	10.0
Incremental annual $PM_{2.5}$	0.3 $\mu g/m^3$	0.8 $\mu g/m^3$
Note: ROG = reactive organic gases, NOx = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less.		

Source: Bay Area Air Quality Management District, 2017

AIR QUALITY IMPACTS AND MITIGATION MEASURES

Impact AIR-1: Conflict with or obstruct implementation of the applicable air quality plan?

BAAQMD is the regional agency responsible for overseeing compliance with State and Federal laws, regulations, and programs within the San Francisco Bay Area Air Basin (SFBAAB). BAAQMD, with assistance from the Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC), prepares and implements specific plans to meet the applicable laws, regulations, and programs. The most recent and comprehensive of which is the *Bay Area 2017 Clean Air Plan*.[8] The primary goals of the Clean Air Plan are to attain air quality standards, reduce population exposure and protect public health, and reduce GHG emissions and protect the climate. The BAAQMD has also developed CEQA guidelines to assist lead agencies in evaluating the significance of air quality and GHG impacts. In formulating compliance strategies, BAAQMD relies on planned land uses established by local general plans. Land use planning affects vehicle travel, which, in turn, affects region-wide emissions of air pollutants and GHGs.

The 2017 Clean Air Plan, adopted by BAAQMD in April 2017, includes control measures that are intended to reduce air pollutant emissions in the Bay Area either directly or indirectly. Plans must show consistency with the control measures listed within the Clean Air Plan. At the project-level, there are no consistency measures or thresholds. The Project is part of the Five Wounds Urban Village which is included in the San Jose Envision 2040 General Plan's Urban Village strategy. Therefore, the project would not conflict with the latest Clean Air planning efforts. Additionally, 1) the Project would have construction emissions below the BAAQMD thresholds (see Impact 2 below), 2) the project would be considered urban infill, and 3) the project would be located near transit with regional connections.

Impact AIR-2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

The Bay Area is considered a non-attainment area for ground-level ozone and $PM_{2.5}$ under both the Federal Clean Air Act and the California Clean Air Act. The area is also considered non-attainment for PM_{10} under the California Clean Air Act, but not the federal act. The area has attained both State and federal ambient air quality standards for carbon monoxide. As part of an effort to attain and maintain ambient air quality standards for ozone and PM_{10}, the BAAQMD has established thresholds of significance for these air pollutants and their precursors. These thresholds are for ozone precursor pollutants (ROG and NO_X), PM_{10}, and $PM_{2.5}$ and apply to both construction period and operational period impacts.

Construction Period Emissions

The California Emissions Estimator Model (CalEEMod) Version 2020.4.0 was used to estimate emissions from on-site construction activity, construction vehicle trips, and evaporative

[8] Bay Area Air Quality Management District (BAAQMD), 2017. *Final 2017 Clean Air Plan.*

emissions. The project land use types and size, and anticipated construction schedule were input to CalEEMod. The CARB EMission FACtors 2021 (EMFAC2021) model was used to predict emissions from construction traffic, which includes worker travel, vendor trucks, and haul trucks.[9] The CalEEMod model output along with construction inputs are included in *Attachment 2* and EMFAC2021 vehicle emissions modeling outputs are included in *Attachment 3*.

CalEEMod Inputs

Land Use Inputs

The proposed project land uses were entered into CalEEMod as described in Table 2.

Table 2. Summary of Project Land Use Inputs

Project Land Uses	Size	Units	Square Feet	Acreage
Apartments Mid Rise	198	Dwelling Unit	166,350	1.2
Regional Shopping Center	7.12	1,000-sf	7,118	
Enclosed Parking with Elevator	213	Parking Space	32,650	

Construction Inputs

CalEEMod computes annual emissions for construction activities that are based on the project type, size, and acreage. The model provides emission estimates for both on-site and off-site construction activities. On-site activities are primarily made up of construction equipment emissions, while off-site activity includes worker, hauling, and vendor traffic. The construction build-out scenario including equipment list and schedule, were based on information that was provided by the project applicant.

The project construction equipment worksheets included the schedule for each phase (included in *Attachment 2*). Within each phase, the quantity of equipment to be used along with the average hours per day and total number of workdays were provided by the applicant. The construction schedule assumed that the earliest possible start date would be January 2024 and would be built out over a period of approximately 29 months, or 624 construction workdays. The earliest year of full operation was assumed to be 2027.

Construction Traffic Emissions

Construction would produce traffic in the form of worker trips and truck traffic. The traffic-related emissions are based on worker and vendor trip estimates produced by CalEEMod and haul trips that were computed based on the estimate of demolition material to be exported, soil material imported and/or exported to the site, and the estimate of concrete and asphalt truck trips. CalEEMod provides daily estimates of worker and vendor trips for each applicable phase. The total trips for those were computed by multiplying the daily trip rate by the number of days in that phase. Haul trips were estimated from the provided demolition and grading volumes by assuming each truck could carry 10 tons per load. The number of concrete and asphalt total

[9] See CARB's EMFAC2021 Emissions Inventory at https://arb.ca.gov/emfac/emissions-inventory

round haul trips were provided for the project and converted to total one-way trips, assuming two trips per delivery.

The latest version of the CalEEMod model is based on the older version of the CARB EMFAC2017 motor vehicle emission factor model. This model has been superseded by the EMFAC2021 model; however, CalEEMod has not been updated to include EMFAC2021. Therefore, The construction traffic information was combined with EMFAC2021 motor vehicle emissions factors. EMFAC2021 provides aggregate emission rates in grams per mile for each vehicle type. The vehicle mix for this study was based on CalEEMod defaults, where worker trips are assumed to be comprised of light-duty autos (EMFAC category LDA) and light duty trucks (EMFAC category LDT1 and LDT2). Vendor trips are comprised of delivery and large trucks (EMFAC category MHDT and HHDT) and haul trips, including concrete trucks, are comprised of large trucks (EMFAC category HHDT). Travel distances are based on CalEEMod default lengths, which are 10.8 miles for worker travel, 7.3 miles for vendor trips and 20 miles for hauling (demolition material export and soil import/export). Since CalEEMod does not address concrete or asphalt trucks, these were treated as vendor travel distances. Each trip was assumed to include an idle time of 5 minutes. Emissions associated with vehicle starts were also included. On-road emission rates from the years 2024 - 2026 for Santa Clara County were used. Table 3 provides the traffic inputs combined with the EMFAC2021 emission database to compute vehicle emissions.

Table 3. Construction Traffic Data Used for EMFAC2021 Model Runs

CalEEMod Run/Land Uses and Construction Phase	Trips by Trip Type			Notes
	Total Worker[1]	Total Vendor[1]	Total Haul[2]	
Vehicle mix[1]	50% LDA 25% LDT1 25% LDT2	50% MHDT 50% HHDT	100% HHDT	
Trip Length (miles)	10.8	7.3	20.0 (Demo/Soil) 7.3 (Concrete/Asphalt)	CalEEMod default distance with 5-min truck idle time.
Demolition	223	-	125	21,454-sf building and 12,000-sf pavement demolition. CalEEMod default worker trips.
Site Preparation	200	-	-	CalEEMod default worker trips.
Grading	270	-	-	CalEEMod default worker trips.
Trenching	240	-	-	CalEEMod default worker trips.
Building Construction	41,499	7,308	380	Est. 190 concrete round trips. CalEEMod default worker and vendor trips.
Architectural Coating	8,352	-	-	CalEEMod default worker trips.
Paving	450	-	9	4,000-sf pavement. CalEEMod default worker trips.

Notes: [1] Based on 2024-2026 EMFAC2021 light-duty vehicle fleet mix for Santa Clara County.
[2] Includes demolition and grading trips estimated by CalEEMod based on amount of material to be removed. Concrete and trips estimated based on data provided by the applicant.

Summary of Computed Construction Period Emissions

Average daily emissions were annualized for each year of construction by dividing the annual construction emissions by the number of active workdays during that year. Table 4 shows the annualized average daily construction emissions of ROG, NO_X, PM_{10} exhaust, and $PM_{2.5}$ exhaust during construction of the project. As indicated in Table 4, predicted annualized project construction emissions would not exceed the BAAQMD significance thresholds during any year of construction.

Table 4. Construction Period Emissions

Year	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Construction Emissions Per Year (Tons)				
2024	0.23	1.87	0.08	0.08
2025	0.99	0.89	0.04	0.03
2026	0.40	0.26	0.01	0.01
Average Daily Construction Emissions Per Year (pounds/day)				
2024 (261 construction workdays)	1.77	14.32	0.65	0.58
2025 (261 construction workdays)	7.56	6.85	0.31	0.27
2026 (102 construction workdays)	7.82	5.17	0.25	0.21
BAAQMD Thresholds (pounds per day)	*54* lbs./day	*54* lbs./day	*82* lbs./day	*54* lbs./day
Exceed Threshold?	No	No	No	No

Construction activities, particularly during site preparation and grading, would temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. The BAAQMD CEQA Air Quality Guidelines consider these impacts to be less-than-significant if best management practices are implemented to reduce these emissions. *Mitigation Measure AQ-1 would implement BAAQMD-recommended best management practices.*

Mitigation Measure AQ-1: **Include measures to control dust and exhaust during construction.**

During any construction period ground disturbance, the applicant shall ensure that the project contractor implement measures to control dust and exhaust. Implementation of the measures recommended by BAAQMD and listed below would reduce the air quality impacts associated with grading and new construction to a less-than-significant level. Additional measures are identified to reduce construction equipment exhaust emissions. The contractor shall implement the following best management practices that are required of all projects:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

4. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).

5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

8. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Effectiveness of Mitigation Measure AQ-1

The measures above are consistent with BAAQMD-recommended basic control measures for reducing fugitive particulate matter that are contained in the BAAQMD CEQA Air Quality Guidelines.

Impact AIR-3: Expose sensitive receptors to substantial pollutant concentrations?

Project impacts related to increased community risk can occur either by introducing a new source of TACs with the potential to adversely affect existing sensitive receptors in the project vicinity or by significantly exacerbating existing cumulative TAC impacts. This project would introduce new sources of TACs during construction (i.e., on-site construction and truck hauling emissions).

Project construction activity would generate dust and equipment exhaust that would affect nearby sensitive receptors. The project would not include the installation of a stand-by generator powered by a diesel engine. The project is not expected to generate a large number of trips and any traffic generated by the project would consist of mostly light-duty vehicles.

Project impacts to existing sensitive receptors were addressed for temporary construction activities. There are also several sources of existing TACs and localized air pollutants in the vicinity of the project. The impact of the existing sources of TAC was also assessed in terms of the cumulative risk which includes the project contribution.

Community Health Risk from Project Construction

Construction Emissions

The CalEEMod and EMFAC2021 models provided total annual PM_{10} exhaust emissions (assumed to be DPM) for the off-road construction equipment and for exhaust emissions from on-road vehicles, with total emissions from all construction stages of 0.12 tons (250 pounds). The on-road emissions are a result of haul truck travel during demolition and grading activities, worker travel, and vendor deliveries during construction. A trip length of one mile was used to represent vehicle travel while at or near the construction site. Fugitive $PM_{2.5}$ dust emissions were calculated by CalEEMod as 0.07 tons (142 pounds) for the overall construction period.

Dispersion Modeling

The U.S. EPA AERMOD dispersion model was used to predict DPM and $PM_{2.5}$ concentrations at sensitive receptors (residences) in the vicinity of the project construction area. The AERMOD dispersion model is a BAAQMD-recommended model for use in modeling analysis of these types of emission activities for CEQA projects.[10,11] Emission sources for the construction site were grouped into two categories: exhaust emissions of DPM and fugitive $PM_{2.5}$ dust emissions.

Construction Sources

To represent the construction equipment exhaust emissions, an area source emission release height of 20 feet (6 meters) was used for the area sources.[12] The release height incorporates both the physical release height from the construction equipment (i.e., the height of the exhaust pipe) and plume rise after it leaves the exhaust pipe. Plume rise is due to both the high temperature of the exhaust and the high velocity of the exhaust gas. It should be noted that when modeling an area source, plume rise is not calculated by the AERMOD dispersion model as it would do for a point source (exhaust stack). Therefore, the release height from an area source used to represent emissions from sources with plume rise, such as construction equipment, should be based on the height the exhaust plume is expected to achieve, not just the height of the top of the exhaust pipe.

For modeling fugitive $PM_{2.5}$ emissions, an area source with a near-ground level release height of 7 feet (2 meters) was used. Fugitive dust emissions at construction sites come from a variety of sources, including truck and equipment travel, grading activities, truck loading (with loaders)

[10] BAAQMD, 2012, *Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0.* May. Web: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/risk-modeling-approach-may-2012.pdf?la=en
[11] BAAQMD, 2020, *BAAQMD Health Risk Assessment Modeling Protocol.* December. Web: https://www.baaqmd.gov/~/media/files/ab617-community-health/facility-risk-reduction/documents/baaqmd_hra_modeling_protocol-pdf.pdf?la=en
[12] California Air Resource Board, 2007. *Proposed Regulation for In-Use Off-Road Diesel Vehicles, Appendix D: Health Risk Methodology*. April. Web: https://ww3.arb.ca.gov/regact/2007/ordiesl07/ordiesl07.htm

and unloading (rear or bottom dumping), loaders and excavators moving and transferring soil and other materials, etc. All of these activities result in fugitive dust emissions at various heights at the point(s) of generation. Once generated, the dust plume will tend to rise as it moves downwind across the site and exit the site at a higher elevation than when it was generated. For all these reasons, a 7-foot release height was used as the average release height across the construction site. Emissions from the construction equipment and on-road vehicle travel were distributed throughout the modeled area sources. Figure 1 shows the project construction site and receptors.

AERMOD Inputs and Meteorological Data

The modeling used a five-year meteorological data set (2013-2017) from the San José Airport prepared for use with the AERMOD model by the BAAQMD. Construction emissions were modeled as occurring daily between 7:00 a.m. to 7:00 p.m. per the project applicant's construction schedule. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the 2024-2026 period were calculated using the model. DPM and $PM_{2.5}$ concentrations were calculated at nearby sensitive receptor locations. Receptor heights of 5 feet (1.5 meters) and 15 feet (4.5 meters) were used to represent the breathing heights on the first and second floors of sensitive receptors in the residences near the site. [13] A receptor height of 5 feet (1.5 meters) was used to represent the breathing height of older children at the Cristo Rey San Jose Jesuit High School.

Summary of Construction Community Risk Impacts

The maximum increased cancer risks were calculated using the modeled TAC concentrations combined with the Office of Environmental Health Hazard Assessment (OEHHA) guidance for age sensitivity factors and exposure parameters as recommended by BAAQMD (see *Attachment 1)*. Non-cancer health hazards and maximum $PM_{2.5}$ concentrations were also calculated and identified. Age-sensitivity factors reflect the greater sensitivity of infants and children to cancer causing TACs. Third-trimester, infant, child, and adult exposures were assumed to occur at all residences during the entire construction period, while child exposures were assumed to occur at the high school.

The maximum modeled annual $PM_{2.5}$ concentration was calculated based on combined exhaust and fugitive concentrations. The maximum computed HI value was based on the ratio of the maximum DPM concentration modeled and the chronic inhalation reference exposure level of 5 $\mu g/m^3$.

The maximum-modeled annual DPM and $PM_{2.5}$ concentrations were identified at nearby sensitive receptors (as shown in Figure 1) to find the maximally exposed individuals (MEI). Results of this assessment indicated that the construction MEI was located at the first floor (1.5 meters) of a multi-family residence southeast of the project site. Table 5 summarizes the maximum cancer risks, $PM_{2.5}$ concentrations, and health hazard indexes for project related construction activities affecting the construction MEI. *Attachment 4* to this report includes the

[13] Bay Area Air Quality Management District, 2012, Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0. May. Web: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/risk-modeling-approach-may-2012.pdf?la=en

emission calculations used for the construction area source modeling and the cancer risk calculations.

Additionally, modeling was conducted to predict the cancer risks, non-cancer health hazards, and maximum $PM_{2.5}$ concentrations associated with construction activities at the nearby Cristo Rey San Jose Jesuit High School. The maximum increased cancer risks were adjusted using child exposure parameters. The uncontrolled cancer risk, $PM_{2.5}$ concentration, and HI at the nearby high school would not exceed their respective BAAQMD single-source significance thresholds, as shown in Table 5.

Table 5. Construction Risk Impacts at the Off-Site MEI

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Impact				
Project Construction	Unmitigated	**35.89 (infant)**	0.29	0.03
	Mitigated*	7.67 (infant)	0.09	0.01
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	***Yes***	*No*	*No*
	Mitigated*	*No*	*No*	*No*
Cristo Rey San Jose Jesuit High School Impacts				
Project Construction	Unmitigated	3.70 (child)	0.07	0.01
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*

* Construction equipment with Tier 4 engines and BMPs as Mitigation.

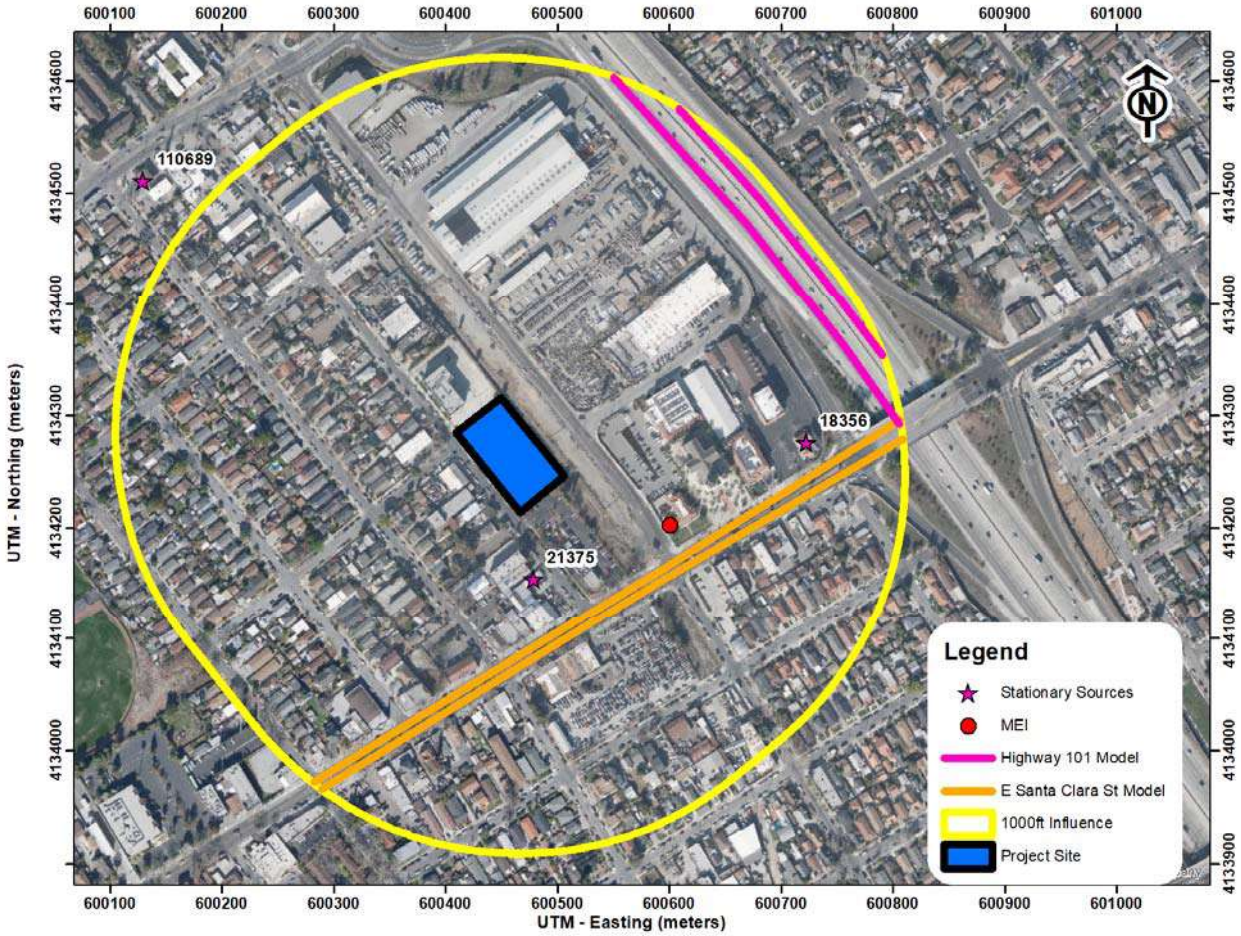
Figure 1. Locations of Project Construction Site, Off-Site Sensitive Receptors, and Maximum TAC Location (MEI)

Cumulative Community Risks of all TAC Sources at the Off-Site Project MEI

Community health risk assessments typically look at all substantial sources of TACs that can affect sensitive receptors that are located within 1,000 feet of a project site (i.e., influence area). These sources include rail lines, freeways or highways, busy surface streets, and stationary sources identified by BAAQMD.

A review of the project area based on provided traffic information indicated that traffic on U.S. Highway 101 and East Santa Clara Street would exceed 10,000 vehicles per day. Other nearby streets would have less than 10,000 vehicles per day. A review of BAAQMD's stationary source map website identified three stationary sources with the potential to affect the project MEI. Figure 2 shows the location of the sources affecting the MEI. Community risk impacts from these sources upon the MEI are reported in Table 6. Details of the modeling and community risk calculations are included in *Attachment 5.*

Figure 2. Project Site and Nearby TAC and $PM_{2.5}$ Sources



Highways – U.S. Highway 101

The project MEI is located near Highway 101. A refined analysis of the impacts of TACs and $PM_{2.5}$ to the MEI receptor is necessary to evaluate potential cancer risks and $PM_{2.5}$ concentrations from Highway 101. A review of the traffic information reported by Caltrans indicates that Highway 101 traffic includes 156,000 vehicles per day (based on an annual average)[14] that are about 6.6 percent trucks, of which 3.4 percent are considered diesel heavy duty trucks and 3.3 percent are medium duty trucks.[15]

Local Roadways – East Santa Clara Street

A refined analysis of potential health impacts from vehicle traffic on East Santa Clara Street was conducted since the roadway was estimated to have average daily traffic (ADT) exceeding 10,000 vehicles. The refined analysis involved predicting emissions for the traffic volume and mix of vehicle types on the roadway near the project site and using an atmospheric dispersion model to predict exposure to TACs. The associated cancer risks are then computed based on the modeled exposures. *Attachment 1* includes a description of how community risk impacts, including cancer risk are computed.

Traffic Emissions Modeling

This analysis involved the development of DPM, organic TACs, and $PM_{2.5}$ emissions for traffic on Highway 101 and East Santa Clara Street using the Caltrans version of the CARB EMFAC2017 emissions model, known as CT-EMFAC2017. CT-EMFAC2017 provides emission factors for mobile source criteria pollutants and TACs, including DPM. [16] Emission processes modeled include running exhaust for DPM, $PM_{2.5}$ and total organic compounds (TOG), running evaporative losses for TOG, and tire and brake wear and fugitive road dust for $PM_{2.5}$. All $PM_{2.5}$ emissions from all vehicles were used, rather than just the $PM_{2.5}$ fraction from diesel powered vehicles, because all vehicle types (i.e., gasoline and diesel powered) produce $PM_{2.5}$. Additionally, $PM_{2.5}$ emissions from vehicle tire and brake wear from re-entrained roadway dust were included in these emissions. DPM emissions are projected to decrease in the future and are reflected in the CT-EMFAC2017 emissions data. Inputs to the model include region (Santa Clara County), type of road (freeway and major/collector), traffic mix assigned by CT-EMFAC2017 for the county, adjusted for the local truck mix on Highway 101 and truck percentage for non-state highways in Santa Clara County (3.51 percent)[17] for East Santa Clara Street, year of analysis (2024 – construction start year), and season (annual).

To estimate TAC and $PM_{2.5}$ emissions over the 30-year exposure period used for calculating the increased cancer risks for sensitive receptors at the MEI, the CT-EMFAC2017 model was used to develop vehicle emission factors for the year 2024 (construction start year). Emissions

[14] Caltrans. 2022. *2020 Traffic Volumes California State Highways.*
[15] Caltrans. 2022. *2020 Annual Average Daily Truck Traffic on the California State Highway System.*
[16] The CT-EMFAC2017 version was used in the analysis because Caltrans has not yet release a CT-EMFAC version with the updated EMFAC2021 emissions that would provide TAC emission rates.
[17] Bay Area Air Quality Management District, 2012, *Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0.* May. Web: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/risk-modeling-approach-may-2012.pdf?la=en

associated with vehicle travel depend on the year of analysis because emission control technology requirements are phased-in over time. Therefore, the earlier the year analyzed in the model, the higher the emission rates utilized by CT-EMFAC2017. Year 2024 emissions were conservatively assumed as being representative of future conditions over the time period that cancer risks are evaluated since, as discussed above, overall vehicle emissions, and in particular diesel truck emissions, will decrease in the future.

The ADT volumes and truck percentages were based on Caltrans data for Highway 101. Traffic volumes were assumed to increase 1 percent per year for a total of 160,680 vehicles. Hourly traffic distributions specific to these segments of Highway 101 were obtained from Caltrans Performance Measurement System (PeMS). PeMS data is collected in real-time from nearly 40,000 individual detectors spanning the freeway system across all major metropolitan areas of California.[18] The fraction of traffic volume each hour was calculated and applied to the 2024 average daily traffic volumes estimate to estimate hourly traffic emission rates for Highway 101.

Based on traffic data from the Caltrans PeMS, traffic speeds during the daytime and nighttime periods were identified. For northbound traffic, the following was assumed for all vehicles:

- 65 mph – All hours of the day except 7:00 a.m. until 10:00 a.m.
- 55 mph – From 7:00 a.m. until 10:00 a.m.

For southbound traffic, all traffic was assumed to travel at 65 mph for all hours of the day.

The ADT for East Santa Clara Street was calculated based on traffic data provided by the project's traffic consultant.[19] Assuming a 1 percent per year increase, the predicted ADT on East Santa Clara Street was 20,671 vehicles. Average hourly traffic distributions for Santa Clara County roadways were developed using the EMFAC model,[20] which were then applied to the ADT volumes to obtain estimated hourly traffic volumes and emissions for the roadway. An average travel speed of 25 mph on East Santa Clara Street was used for all hours of the day based on posted speed limit signs on the roadway.

This analysis involved the development of DPM, organic TACs, and $PM_{2.5}$ emissions for future traffic on Highway 101 and East Santa Clara Street and using these emissions with an air quality dispersion model to calculate TAC and $PM_{2.5}$ concentrations at the project MEI receptor locations. Maximum increased lifetime cancer risks and annual $PM_{2.5}$ concentrations for the receptors were then computed using modeled TAC and $PM_{2.5}$ concentrations and BAAQMD methods and exposure parameters described in *Attachment 1*.

Dispersion Modeling

Dispersion modeling of TAC and $PM_{2.5}$ emissions was conducted using the U.S. EPA AERMOD dispersion model, which is recommended by the BAAQMD for this type of analysis.[21] TAC and

[18] https://dot.ca.gov/programs/traffic-operations/mpr/pems-source
[19] Email Correspondence from Jodi Starbird and Hexagon Transportation Consultants, Inc., August 16, 2022. File: *Figure 13 Cumulative Traffic Volumes.pdf*.
[20] The Burden output from EMFAC2007, a previous version of CARB's EMFAC model, was used for this since the current web-based version of EMFAC2021 does not include Burden type output with hour by hour traffic volume information.
[21] BAAQMD. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May 2012

$PM_{2.5}$ emissions from traffic on the roadways within about 1,000 feet of the project site were evaluated with the model. Emissions from vehicle traffic were modeled in AERMOD using a series of volume sources along a line (line volume sources), with line segments used to represent the travel lanes on the roadways. The same meteorological data and off-site sensitive receptors used in the previous construction dispersion modeling were used in the highway and roadway modeling. Other inputs to the model included road geometry, hourly traffic emissions, and receptor locations and heights. Annual TAC and $PM_{2.5}$ concentrations for 2024 from traffic on the roadways were calculated using the model. Concentrations were calculated at the project MEIs with receptor heights of 5 feet (1.5 meters) to represent the breathing heights on the first floor of the nearby residence.

Figure 2 shows the roadway segments modeled and residential MEI receptor location used in the modeling. Table 6 lists the risks and hazards from the roadway. The emission rates and roadway calculations used in the analysis are shown in *Attachment 5*.

Stationary Sources

Permitted stationary sources of air pollution near the project site were identified using BAAQMD's *Permitted Stationary Sources 2020* GIS website,[22] which identifies the location of nearby stationary sources and their estimated risk and hazard impacts, including emissions and adjustments to account for new OEHHA guidance. Three sources were identified using this tool: a diesel generator, an auto body coating operation, and a gas dispensing facility. A Stationary Source Information Form (SSIF) containing the identified sources was prepared and submitted to BAAQMD. BAAQMD provided updated emissions data and risk values.[23]

The screening level risks and hazards provided by BAAQMD for the stationary sources were adjusted for distance using BAAQMD's *Distance Adjustment Multiplier Tool for Diesel Internal Combustion Engines, Gasoline Dispensing Facility, and Generic Equipment*. Community risk impacts from the stationary sources upon the MEI are reported in Table 6.

Summary of Cumulative Risks at the Project MEI

Table 6 reports both the project and cumulative community risk impacts at the project MEI. The project would have an exceedance with respect to community risk caused by project construction since the unmitigated maximum cancer risk exceeds the BAAQMD single-source threshold. With the implementation of *Mitigation Measure AQ-1 and AQ-2*, the project's cancer risk would be lowered to a level below the single-source thresholds. The unmitigated and mitigated cancer risk, annual $PM_{2.5}$ concentration, and HI would not exceed the cumulative-source threshold.

[22] BAAQMD, *Stationary Source Screening Map*, 2022. Web: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=845658c19eae4594b9f4b805fb9d89a3
[23] Correspondence with Matthew Hanson, Environmental Planner II, BAAQMD, April 19, 2022.

Table 7. Cumulative Community Risk Impacts at the Location of the Project MEI

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Impacts				
Total/Maximum Project Impacts	Unmitigated	**35.89 (infant)**	0.29	0.03
	Mitigated	7.67 (infant)	0.09	0.01
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	***Yes***	*No*	*No*
	Mitigated	*No*	*No*	*No*
Cumulative Operational Sources				
East Santa Clara Street, ADT 20,671		2.30	0.17	<0.01
Highway 101, ADT 160,680		1.64	0.07	<0.01
Verizon Wireless (Highway101/Julian) (Facility ID #18356, Generators), MEI at 460 feet		0.16	<0.01	<0.01
Tough Auto Body (Facility ID #21375, Auto Body Coating Operation), MEI at 420 feet		-	-	<0.01
Mobil SS#63175 (Facility ID #110689, Gas Dispensing Facility), MEI at 1000+ feet		0.39	-	<0.01
Combined Sources	Unmitigated	40.38	<0.54	<0.08
	Mitigated	12.16	<0.34	<0.06
BAAQMD Cumulative Source Threshold		***100***	***0.8***	***10.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*
	Mitigated	*No*	*No*	*No*

Mitigation Measure AQ-2: Use construction equipment that has low diesel particulate matter exhaust emissions.

Implement a feasible plan to reduce DPM emissions by 75 percent such that increased cancer risk and annual $PM_{2.5}$ concentrations from construction would be reduced below TAC significance levels as follows:

1. All construction equipment larger than 25 horsepower used at the site for more than two continuous days or 20 hours total shall meet U.S. EPA Tier 4 emission standards for PM (PM_{10} and $PM_{2.5}$), if feasible, otherwise,

    a. If use of Tier 4 equipment is not available, alternatively use equipment that meets U.S. EPA emission standards for Tier 3 engines and include particulate matter emissions control equivalent to CARB Level 3 verifiable diesel emission control devices that altogether achieve an 75 percent reduction in particulate matter exhaust in comparison to uncontrolled equipment; alternatively (or in combination).

    b. Use of electrical or non-diesel fueled equipment.

2. Alternatively, the applicant may develop another construction operations plan demonstrating that the construction equipment used on-site would achieve a reduction in construction diesel particulate matter emissions by 75 percent or greater. Elements of the plan could include a combination of some of the following measures:

- Implementation of No. 1 above to use Tier 4 or alternatively fueled equipment,
- Installation of electric power lines during early construction phases to avoid use of diesel generators and compressors,
- Use of electrically-powered equipment,
- Forklifts and aerial lifts used for exterior and interior building construction shall be electric or propane/natural gas powered,
- Change in construction build-out plans to lengthen phases, and
- Implementation of different building techniques that result in less diesel equipment usage.

Such a construction operations plan would be subject to review by an air quality expert and approved by the City prior to construction.

Effectiveness of Mitigation Measure AQ-1 and AQ-2

CalEEMod was used to compute emissions associated with this mitigation measure assuming that all equipment met U.S. EPA Tier 4 Interim engine standards and BAAQMD best management practices for construction were included. With these implemented, the project's construction cancer risk levels (assuming infant exposure) would be reduced by 79 percent to 7.67 chances per million. Assuming a level of mitigation that achieves an 75-percent reduction in the project's DPM emissions, increased cancer risks would be reduced to below 10 chances per million. As a result, the project's construction risks would be reduced below the BAAQMD single-source thresholds.

Non-CEQA: On-site Community Risk Assessment for TAC Sources - New Project Residences

The City's General Plan Policy MS-11.1 requires new residential development projects and projects categorized as sensitive receptors to incorporate effective mitigation into project designs to avoid significant risks to health and safety required when new residential are proposed near existing sources of TACs. BAAQMD's recommended thresholds for health risks and hazards, shown in Table 1, are used to evaluate on-site exposure.

In addition to evaluating health impact from project construction, a health risk assessment was completed to determine the impact that existing TAC sources would have on the new proposed sensitive receptors (residents) that the project would introduce. The same TAC sources identified above were used in this health risk assessment.[24] Figure 3 shows the on-site sensitive receptors in relation to the nearby TAC sources. All on-site community task results are listed in Table 7. *Attachment 5* includes the dispersion modeling and risk calculations for TAC source impacts upon the proposed on-site sensitive receptors.

Nearby Highways and Roadways – Highway 101 and East Santa Clara Street

The highway and roadway analysis for the new project residents was conducted in the same manner as described above for the off-site MEI. However, year 2027 (operational year) emission factors were conservatively assumed as being representative of future conditions, instead of 2024 (construction year). An analysis based on 2027 resulted in an increased ADT on Highway 101 of 163,360 vehicles and 21,279 vehicles on East Santa Clara Street. The project set of receptors were placed throughout the project area and were spaced every 23 feet (7 meters). Highway and roadway impacts were modeled at receptor heights of 21 feet (6.4 meters) and 31 feet (9.4 meters) representing sensitive receptors on the second and third floors (first and second residential floors) of the building. The portions of Highway 101 and East Santa Clara Street included in the modeling are shown in Figure 3 along with the project site and receptor locations where impacts were modeled.

Maximum increased cancer risks were calculated for the residents at the project site using the maximum modeled TAC concentrations. A 30-year exposure period was used in calculating cancer risks assuming the residents would include third trimester pregnancy and infants/children and were assumed to be in the new housing area for 24 hours per day for 350 days per year. The maximum impacts from Highway 101 occurred at a second-floor receptor in the northeast corner of the building. The maximum impacts from East Santa Clara Street occurred at a second-floor receptor in the southwest corner of the building. Cancer risks associated with each roadway are greatest closest to each respective roadway and decrease with distance from the road. The highway and roadway community risk impacts at the project site are shown in Table 7. Risk values were computed using modeled DPM and $PM_{2.5}$ concentrations and BAAQMD recommended methods and exposure parameters described in *Attachment 1*. Details of the

[24] We note that to the extent this analysis considers *existing* air quality issues in relation to the impact on *future residents* of the Project, it does so for informational purposes only pursuant to the judicial decisions in *CBIA v. BAAQMD* (2015) 62 Cal.4th 369, 386 and *Ballona Wetlands Land Trust v. City of Los Angeles* (2011) 201 Cal.App.4th 455, 473, which confirm that the impacts of the environment on a project are excluded from CEQA unless the project itself "exacerbates" such impacts.

emission calculations, dispersion modeling, and cancer risk calculations are contained in *Attachment 5.*

Stationary Sources

The stationary source screening analysis for the new project sensitive receptors was conducted in the same manner as described above for the construction MEI. Three sources were located within the project's 1000-foot influence area. Table 7 shows the health risk assessment results from the stationary sources upon the project residents.

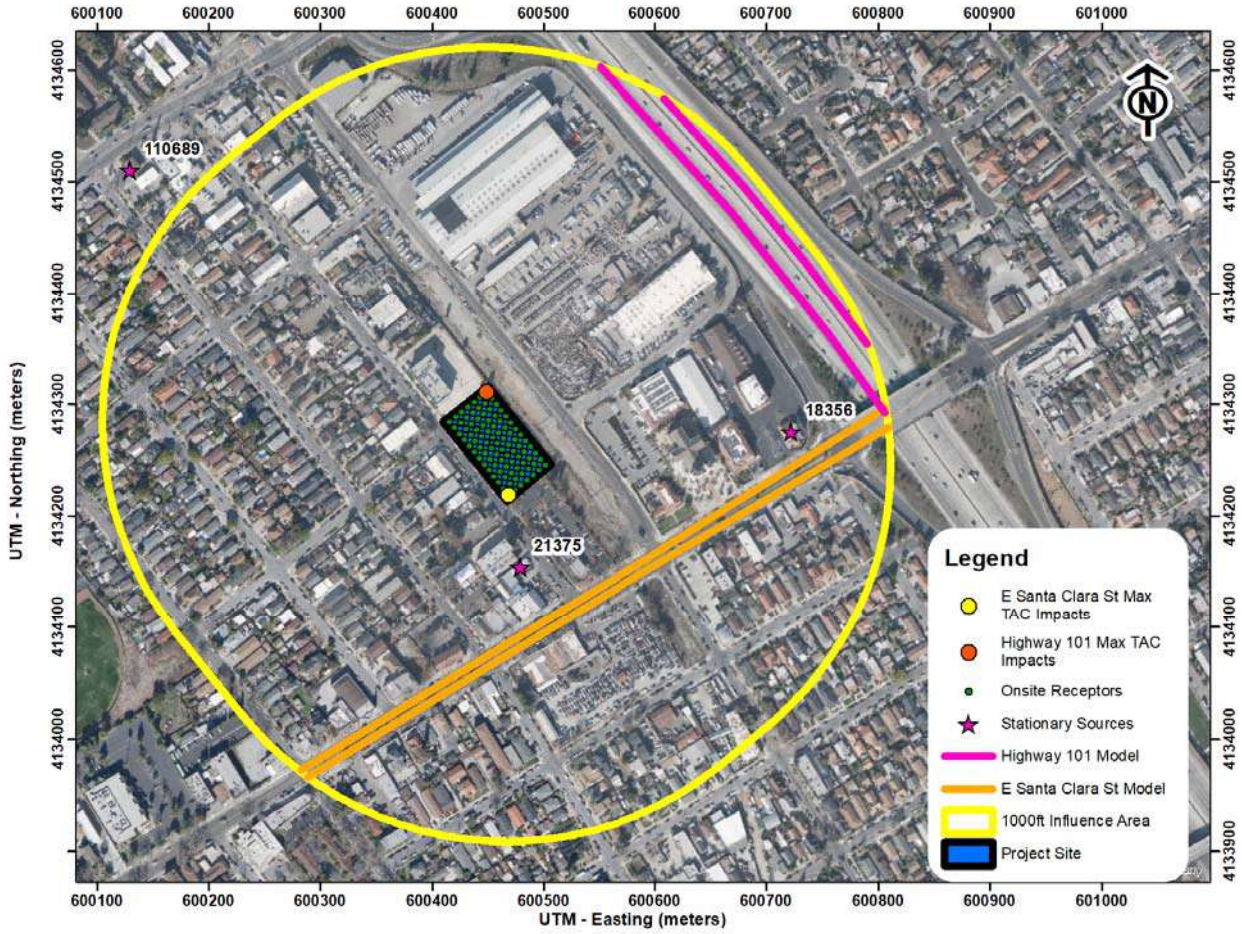
Summary of Cumulative Community Risks at the Project Site

Community risk impacts from the existing and TAC sources upon the project site are reported in Table 7. The risks from the singular TAC sources are compared against the BAAQMD single-source threshold. The risks from all the sources are then combined and compared against the BAAQMD cumulative-source threshold. As shown, none of the sources exceed the single-source or cumulative-source thresholds.

Table 7. Impacts from Combined Sources to Project Site Receptors

Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
East Santa Clara Street, ADT 21,279	0.63	0.05	<0.01
Highway 101, ADT 163,360	1.11	0.05	<0.01
Verizon Wireless (Highway101/Julian) (Facility ID #18356, Generators), MEI at 460 feet	0.09	<0.01	<0.01
Tough Auto Body (Facility ID #21375, Auto Body Coating Operation), MEI at 420 feet	-	-	<0.01
Mobil SS#63175 (Facility ID #110689, Gas Dispensing Facility), MEI at 1000+ feet	0.39	-	<0.01
BAAQMD Single-Source Threshold	***10***	***0.3***	***1.0***
Exceed Threshold?	*No*	*No*	*No*
Cumulative Total	2.22	<0.11	<0.05
BAAQMD Cumulative Source Threshold	***100***	***0.8***	***10.0***
Exceed Threshold?	*No*	*No*	*No*

Figure 3. Locations of Project Site, On-Site Residential Receptors, Roadway Models, Stationary Sources, and Maximum TAC Impacts



Supporting Documentation

Attachment 1 is the methodology used to compute community risk impacts, including the methods to compute increased cancer risk from exposure to project emissions.

Attachment 2 includes the CalEEMod output for project construction emissions. Also included are any modeling assumptions.

Attachment 3 includes the EMFAC2021 emissions modeling. The input files for these calculations are voluminous and are available upon request in digital format.

Attachment 4 is the health risk assessment. This includes the summary of the dispersion modeling and the cancer risk calculations for construction and operation. The AERMOD dispersion modeling files for this assessment, which are quite voluminous, are available upon request and would be provided in digital format.

Attachment 5 includes the cumulative community risk calculations, modeling results, and health risk calculations from sources affecting the construction MEI and project site receptors.

Attachment 1: Health Risk Calculation Methodology

Health Risk Calculation Methodology

A health risk assessment (HRA) for exposure to Toxic Air Contaminates (TACs) requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and California Air Resources Board (CARB) develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.[25] These guidelines incorporate substantial changes designed to provide for enhanced protection of children, as required by State law, compared to previous published risk assessment guidelines. CARB has provided additional guidance on implementing OEHHA's recommended methods.[26] This HRA used the 2015 OEHHA risk assessment guidelines and CARB guidance. The BAAQMD has adopted recommended procedures for applying the newest OEHHA guidelines as part of Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants.[27] Exposure parameters from the OEHHA guidelines and the recent BAAQMD HRA Guidelines were used in this evaluation.

Cancer Risk

Potential increased cancer risk from inhalation of TACs is calculated based on the TAC concentration over the period of exposure, inhalation dose, the TAC cancer potency factor, and an age sensitivity factor to reflect the greater sensitivity of infants and children to cancer causing TACs. The inhalation dose depends on a person's breathing rate, exposure time and frequency and duration of exposure. These parameters vary depending on the age, or age range, of the persons being exposed and whether the exposure is considered to occur at a residential location or other sensitive receptor location.

The current OEHHA guidance recommends that cancer risk be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, they recommend evaluating risks for the third trimester of pregnancy to age zero, ages zero to less than two (infant exposure), ages two to less than 16 (child exposure), and ages 16 to 70 (adult exposure). Age sensitivity factors (ASFs) associated with the different types of exposure are an ASF of 10 for the third trimester and infant exposures, an ASF of 3 for a child exposure, and an ASF of 1 for an adult exposure. Also associated with each exposure type are different breathing rates, expressed as liters per kilogram of body weight per day (L/kg-day) or liters per kilogram of body weight per 8-hour period for the case of worker or school child exposures. As recommended by the BAAQMD for residential exposures, 95th percentile breathing rates are used for the third trimester and infant exposures, and 80th percentile breathing rates for child and adult exposures. For children at schools and daycare facilities, BAAQMD recommends using the 95th percentile

[25] OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.
[26] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.
[27] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. December 2016.

8-hour breathing rates. Additionally, CARB and the BAAQMD recommend the use of a residential exposure duration of 30 years for sources with long-term emissions (e.g., roadways). For workers, assumed to be adults, a 25-year exposure period is recommended by the BAAQMD. For school children a 9-year exposure period is recommended by the BAAQMD.

Under previous OEHHA and BAAQMD HRA guidance, residential receptors are assumed to be at their home 24 hours a day, or 100 percent of the time. In the 2015 Risk Assessment Guidance, OEHHA includes adjustments to exposure duration to account for the fraction of time at home (FAH), which can be less than 100 percent of the time, based on updated population and activity statistics. The FAH factors are age-specific and are: 0.85 for third trimester of pregnancy to less than 2 years old, 0.72 for ages 2 to less than 16 years, and 0.73 for ages 16 to 70 years. Use of the FAH factors is allowed by the BAAQMD if there are no schools in the project vicinity have a cancer risk of one in a million or greater assuming 100 percent exposure (FAH = 1.0).

Functionally, cancer risk is calculated using the following parameters and formulas:

Cancer Risk (per million) = $CPF \times Inhalation\ Dose \times ASF \times ED/AT \times FAH \times 10^6$

Where:

CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = $C_{air} \times DBR^* \times A \times (EF/365) \times 10^{-6}$

Where:

C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
8HrBR = 8-hour breathing rate (L/kg body weight-8 hours)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

* An 8-hour breathing rate (8HrBR) is used for worker and school child exposures.

The health risk parameters used in this evaluation are summarized as follows:

Parameter	*Exposure Type* →	Infant		Child	Adult
	Age Range →	3rd Trimester	0<2	2 < 16	16 - 30
DPM Cancer Potency Factor (mg/kg-day)$^{-1}$		1.10E+00	1.10E+00	1.10E+00	1.10E+00
Daily Breathing Rate (L/kg-day) 80th Percentile Rate		273	758	572	261
Daily Breathing Rate (L/kg-day) 95th Percentile Rate		361	1,090	745	335
8-hour Breathing Rate (L/kg-8 hours) 95th Percentile Rate		-	1,200	520	240
Inhalation Absorption Factor		1	1	1	1
Averaging Time (years)		70	70	70	70
Exposure Duration (years)		0.25	2	14	14*
Exposure Frequency (days/year)		350	350	350	350*
Age Sensitivity Factor		10	10	3	1
Fraction of Time at Home (FAH)		0.85-1.0	0.85-1.0	0.72-1.0	0.73*

* For worker exposures (adult) the exposure duration and frequency are 25 years 250 days/year and FAH is not applicable.

Non-Cancer Hazards

Non-cancer health risk is usually determined by comparing the predicted level of exposure to a chemical to the level of exposure that is not expected to cause any adverse effects (reference exposure level), even to the most susceptible people. Potential non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). OEHHA has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. The total HI is calculated as the sum of the HIs for each TAC evaluated and the total HI is compared to the BAAQMD significance thresholds to determine whether a significant non-cancer health impact from a project would occur.

Typically, for residential projects located near roadways with substantial TAC emissions, the primary TAC of concern with non-cancer health effects is diesel particulate matter (DPM). For DPM, the chronic inhalation REL is 5 micrograms per cubic meter ($\mu g/m^3$).

Annual $PM_{2.5}$ Concentrations

While not a TAC, fine particulate matter ($PM_{2.5}$) has been identified by the BAAQMD as a pollutant with potential non-cancer health effects that should be included when evaluating potential community health impacts under the California Environmental Quality Act (CEQA). The thresholds of significance for $PM_{2.5}$ (project level and cumulative) are in terms of an increase in the annual average concentration. When considering $PM_{2.5}$ impacts, the contribution from all sources of $PM_{2.5}$ emissions should be included. For projects with potential impacts from nearby local roadways, the $PM_{2.5}$ impacts should include those from vehicle exhaust emissions, $PM_{2.5}$ generated from vehicle tire and brake wear, and fugitive emissions from re-suspended dust on the roads.

Attachment 2: CalEEMod Input Assumptions and Outputs

Project Name:	70-80 N. 27th Street, San Jose, CA							
	See Equipment Type TAB for type, horsepower and load factor							
	Project Size	198	Dwelling Units	1.16	total project acres disturbed			
		166,350	s.f. residential					Pile Driving? Y/N? NO
		7,118	s.f. retail					
		0	s.f. office/commercial					
		5,389	s.f. other, specify: no-built area (BART easement)					
		32,650	s.f. parking garage	213	spaces			
		0	s.f. parking lot	0	spaces			
	Construction Hours	7	am to	7	pm			

Qty	Description	0	Load Factor	Hours/day	Total Work Days	Avg. Hours per day	Annual Hours	Comments
	Demolition	**Start Date:**	**1/2/2024**	**Total phase:**	**15**			**Overall Import/Export Volumes**
		End Date:	**1/19/2024**					
2	Concrete/Industrial Saws	81	0.73	8	15	8		**Demolition Volume**
2	Excavators	162	0.38	8	15	8		Square footage of buildings to be demolished
1	Rubber-Tired Dozers	255	0.4	8	15	8		(*or* total tons to be hauled)
1	Tractors/Loaders/Backhoes	97	0.37	8	15	8		**21,454** square feet
	Site Preperation	**Start Date:**	**1/22/2024**	**Total phase:**	**20**			Any pavement demolished and hauled? **12,000 sf**
		End Date:	**2/16/2024**					
2	Graders	174	0.41	8	20	8		
1	Rubber Tired Dozers	255	0.4	8	20	8		
1	Tractors/Loaders/Backhoes	97	0.37	8	20	8		
	Grading / Excavation	**Start Date:**	**2/19/2024**	**Total phase:**	**18**			
		End Date:	**3/13/2024**					**Soil Hauling Volume**
	Scrapers	**361**	**0.48**					
2	Excavators	162	0.38	8	18	8		Export volume = **0** cubic yards
2	Graders	174	0.41	8	18	8		Import volume = **0** cubic yards
1	Rubber Tired Dozers	255	0.4	8	18	8		
1	Tractors/Loaders/Backhoes	97	0.37	8	18	8		
	Other Equipment?							
	Trenching/Foundation	**Start Date:**	**3/14/2024**	**Total phase:**	**24**			
		End Date:	**4/16/2024**					
2	Tractor/Loader/Backhoe	97	0.37	8	24	8		
2	Excavators	162	0.38	8	24	8		
	Other Equipment?							
	Building - Exterior	**Start Date:**	**4/17/2024**	**Total phase:**	**250**			**Cement Trucks? _?_ Total Round-Trips**
		End Date:	**4/17/2025**					
1	Cranes	226	0.29	8	250	8	2000	Electric? (Y/N) ___ Otherwise assumed diesel
2	Forklifts	89	0.2	8	250	8	4000	Liquid Propane (LPG)? (Y/N) ___ Otherwise Assumed diesel
1	Generator Sets	84	0.74	8	250	8	2000	Or temporary line power? (Y/N) ___
2	Tractors/Loaders/Backhoes	97	0.37	8	250	8	4000	
2	Welders	46	0.45	8	250	8	4000	
	Other Equipment?					0		
	Building - Interior/Architectural Coating	**Start Date:**	**4/18/2025**	**Total phase:**	**250**			
		End Date:	**4/17/2026**					
2	Air Compressors	78	0.48	8	250	8	4000	
1	Aerial Lift	62	0.31	8	250	8	2000	
	Other Equipment?							
	Paving	**Start Date:**	**4/20/2026**	**Total phase:**	**25**			
		Start Date:	**5/22/2026**					
2	Cement and Mortar Mixers	9	0.56	8	25	8	400	
1	Pavers	125	0.42	8	25	8	200	**Asphalt? 4000 sf**
1	Paving Equipment	130	0.36	8	25	8	200	
1	Rollers	80	0.38	8	25	8	200	
2	Tractors/Loaders/Backhoes	97	0.37	8	25	8	400	
	Other Equipment?							

Equipment types listed in "Equipment Types" worksheet tab.
Equipment listed in this sheet is to provide an example of inputs
It is assumed that water trucks would be used during grading
Add or subtract phases and equipment, as appropriate
Modify horepower or load factor, as appropriate

Construction Criteria Air Pollutants						
Unmitigated	ROG	NOX	PM10 Exhaust	PM2.5 Exhaust	**CO2e**	
Year	Tons				MT	
Construction Equipment						
2024	0.20	1.78	0.08	0.07	301.11	
2025	0.96	0.81	0.03	0.03	164.01	
2026	0.39	0.23	0.01	0.01	52.61	
EMFAC						
2024	0.03	0.09	0.01	0.00	111.80	
2025	0.03	0.08	0.01	0.00	108.71	
2026	0.01	0.03	0.00	0.00	41.38	
Total Construction Emissions by Year						
2024	0.23	1.87	0.08	0.08	412.91	
2025	0.99	0.89	0.04	0.03	272.71	
2026	0.40	0.26	0.01	0.01	93.99	
	Total Construction Emissions					
Tons	1.62	3.03	0.14	0.12	779.61	
Pounds/Workdays	*Average Daily Emissions*				Workdays	
2024	1.77	14.32	0.65	0.58		**261**
2025	7.56	6.85	0.31	0.27		**261**
2026	7.82	5.17	0.25	0.21		**102**
Threshold - lbs/day	**54.0**	**54.0**	**82.0**	**54.0**		
	Total Construction Emissions					
Pounds	17.15	26.34	1.21	1.06	0.00	
Average	5.18	9.70	0.44	0.39	0.00	624.00
Threshold - lbs/day	**54.0**	**54.0**	**82.0**	**54.0**		

22-048 70 N 27th St, San Jose - Santa Clara County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

22-048 70 N 27th St, San Jose

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	198.00	Dwelling Unit	1.16	166,350.00	566
Regional Shopping Center	7.12	1000sqft	0.00	7,118.00	0
Enclosed Parking with Elevator	213.00	Space	0.00	32,650.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2027
Utility Company	San Jose Clean Energy				
CO2 Intensity (lb/MWhr)	177.69	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Updated with SJCE 2020 CO2 Intensity

Land Use - Information found in construction sheet

Construction Phase - Construction dates provided by applicant

Off-road Equipment - Construction equipment provided by applicant

Off-road Equipment - Construction equipment provided by applicant

Off-road Equipment - Construction equipment provided by applicant

Off-road Equipment - Construction equipment provided by applicant

Off-road Equipment - Construction equipment provided by applicant

Off-road Equipment - Construction equipment provided by applicant

Off-road Equipment - Construction equipment provided by applicant

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Risk & Hazard Stationary Source Inquiry Form

This form is required when users request stationary source data from BAAQMD

This form is to be used with the BAAQMD's Google Earth stationary source screening tables.

Click here for guidance on coducting risk & hazard screening, including roadways & freeways, refer to the District's Risk & Hazard Analysis flow chart.

Click here for District's Recommended Methods for Screening and Modeling Local Risks and Hazards document.

Table A: Requester Contact Information

Date of Request	**4/5/2022**
Contact Name	Zachary Palm
Affiliation	Illingworth & Rodkin, Inc.
Phone	707-794-0400 x117
Email	zpalm@illingworthrodkin.com
Project Name	70 N 27th St
Address	70 N 27th St
City	San Jose
County	Santa Clara
Type (residential, commercial, mixed use, industrial, etc.)	Residential
Project Size (# of units or building square feet)	198du
Comments:	

For Air District assistance, the following steps must be completed:

1. Complete all the contact and project information requested in Table A ncomplete forms will not be processed. Please include a project site map.

2. Download and install the free program Google Earth, **http://www.google.com/earth/download/ge/,** and then download the county specific Google Earth stationary source application files from the District's website, **http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.** The small points on the map represent stationary sources permitted by the District (Map A on right). These permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc. Click on a point to view the source's Information Table, including the name, location, and preliminary estimated cancer risk, hazard index, and PM2.5 concentration.

3. Find the project site in Google Earth by inputting the site's address in the Google Earth search box.

4. Identify stationary sources within at least a 1000ft radius of project site. Verify that the location of the source on the map matches with the source's address in the Information Table, by using the Google E[illegible] search box to confirm the source's address location. Please report any mapping errors to the District.

5. List the stationary source information in Table B [illegible]ue section only.

6. Note that a small percentage of the stationary sources have Health Risk Screening Assessment (HRSA) data INSTEAD of screening level data. These sources will be noted by an asterisk next to the Plant Name (Map B on right). If HRSA values are presented, these values have already been modeled and cannot be adjusted further.

7. Email this completed form to District staff. District staff will provide the most recent risk, hazard, and PM2.5 data that are available for the source(s). If this information or data are not available, source emissions data will be provided. Staff will respond to inquiries within three weeks.

Note that a public records request received for the same stationary source information will cancel the processing of your SSIF request.

Submit forms, maps, and questions to Areana Flores at 415-749-4616, or aflores@baaqmd.gov

Table B: Google Earth data

Construction MEIs

Distance from Receptor (feet) or MEI[1]	Plant No.	Facility Name	Address	Cancer Risk[2]	Hazard Risk[2]	$PM_{2.5}$[2]	Source No.[3]	Type of Source[4]	Fuel Code[5]	Status/Comments	Distance Adjustment Multiplier	Adjusted Cancer Risk Estimate	Adjusted Hazard Risk	Adjusted PM2.5
460	18356	Verizon Wireless (Hwy 101/Julian)	1401 E Santa Clara St	1.14	0.00	0.00		Generators		2020 Dataset	0.14	0.16	0.000	0.00
420	21375	Tough Auto Body	15 N 27th St		0.00			Auto Body Coating Operation		2020 Dataset	0.42	0.00	0.000	0.00
1000+	110689	Mobil SS#63175	1256 E Julian St	25.73	0.11			Gas Dispensing Facility		2020 Dataset	0.02	0.39	0.002	0.00

Project Site

Distance from Receptor (feet) or MEI[1]	FACID (Plant No.)	Distance Adjustment Multiplier	Adjusted Cancer Risk Estimate	Adjusted Hazard Risk	Adjusted PM2.5
720	18356	0.08	0.09	0.000	0.000
190	21375	0.66	0.00	0.001	0.000
1000+	110689	0.02	0.39	0.002	0.000

Footnotes:

1. Maximally exposed individual
2. These Cancer Risk, Hazard Index, and PM2.5 columns represent the values in the Google Earth Plant Information Table.
3. Each plant may have multiple permits and sources.
4. Permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc.
5. Fuel codes: 98 = diesel, 189 = Natural Gas.
6. If a Health Risk Screening Assessment (HRSA) was completed for the source, the application number will be listed here.
7. The date that the HRSA was completed.
8. Engineer who completed the HRSA. For District purposes only.
9. All HRSA completed before 1/5/2010 need to be multiplied by an age sensitivity factor of 1.7.
10. The HRSA "Chronic Health" number represents the Hazard Index.
11. Further information about common sources:
    a. Sources that only include diesel internal combustion engines can be adjusted using the BAAQMD's Diesel Multiplier worksheet.
    b. The risk from natural gas boilers used for space heating when <25 MM BTU/hr would have an estimated cancer risk of one in a million or less, and a chronic hazard index of
    c. BAAQMD Reg 11 Rule 16 required that all co-residential (sharing a wall, floor, ceiling or is in the same building as a residential unit) dry cleaners cease use of perc on July 1, 2010. Therefore, there is no cancer risk, hazard or PM2.5 concentrations from co-residential dry cleaning businesses in the BAAQMD.
    d. Non co-residential dry cleaners must phase out use of perc by Jan. 1, 2023. Therefore, the risk from these dry cleaners does not need to be factored in over a 70-year period, but instead should
    e. Gas stations can be adjusted using BAAQMD's Gas Station Distance Mulitplier worksheet.
    f. Unless otherwise noted, exempt sources are considered insignificant. See BAAQMD Reg 2 Rule 1 for a list of exempt sources.
    g. This spray booth is considered to be insignificant.

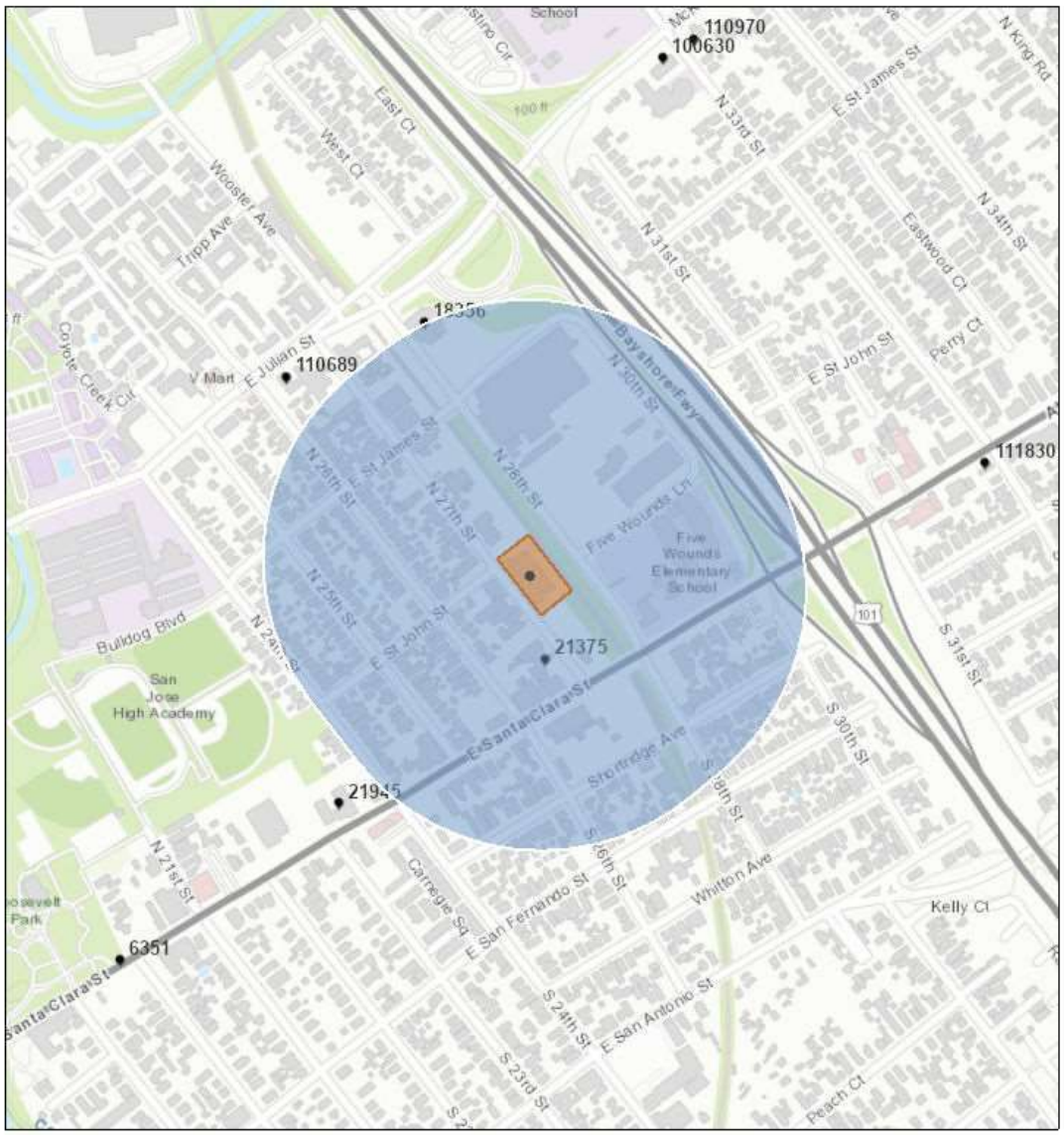
Date last updated:
03/13/2018

Stationary Source Risk & Hazards Screening Report

Area of Interest (AOI) Information

Area : 4,124,088.13 ft²

Mar 31 2022 13:01:23 Pacific Daylight Time



Summary

Name	Count	Area(ft²)	Length(ft)
Permitted Facilities 2018	2	N/A	N/A

Permitted Facilities 2018

#	FACID	Name	Address	City	St
1	18356	Verizon Wireless (Hwy 101/Julian)	1401 E Santa Clara St	San Jose	CA
2	21375	Tough Auto Body	15 N 27th St	San Jose	CA

#	Zip	County	Cancer	Hazard	PM_25	Type	Count
1	95116	Santa Clara	1.140	0.000	0.000	Generators	1
2	95116	Santa Clara	0.000	0.000	0.000	Contact BAAQMD	1

Note: The estimated risk and hazard impacts from these sources would be expected to be substantially lower when site specific Health Risk Screening Assessments are conducted.

The screening level map is not recommended for evaluating sensitive land uses such as schools, senior centers, day cares, and health facilities.

APPENDIX B

ARBORIST REPORT

ARBORIST REPORT-

Tree Survey & Preliminary Construction Impact Assessment

70-80 North 27th Street

APN: 467-09-076

San Jose, CA

7/20/2022

Prepared for:

HC Investments Associates, LP.
C/O Melanie Griswold
1842 University Avenue
San Jose, CA 95126

Prepared by:

Kurt Fouts
Arborist Consultant

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Capitola, CA 95010
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ISA Certified Arborist WE0681A
ISA Tree Risk Assessment Qualification (TRAQ)

Table of Contents

Attachments: Appendix A - I

Appendix A – Tree Assessment Chart

Appendix B – Criteria for Tree Assessment Chart

Appendix C –- Tree Location Map

Appendix D – Tree Survey, Aerial Image

Appendix E – Certificate of Performance

Appendix F – Bibliography

Appendix G - Glossary

Appendix H - Tree Protection Guidelines & Restrictions

- Protecting Trees During Construction
- Project Arborist Duties & Inspection Schedule
- Tree Protection Fencing
- Tree Protection Signs
- Monitoring
- Root Pruning
- Tree Work Standards & Qualifications
- City of San Jose Regulated Tree Definition

Appendix I - Assumptions & Limiting Conditions

SUMMARY

This report provides the following information:

1. A summary of the health and structural condition of 24 trees.
2. A preliminary evaluation of anticipated construction impacts to the trees.
3. Recommendations for retention or removal of assessed trees based on their condition and anticipated construction impacts.

- A six-story mixed use facility is proposed.
- Twenty -four trees within or near the project limits were surveyed.
- All the onsite trees will be highly impacted, and their removal will be necessary to accommodate the project.
- Most of the street trees fronting the property, will be moderately impacted, and can be incorporated into the project.
- The street trees moderately impacted will need mitigation methods to reduce construction impacts.
- Replacement trees will be required for trees recommended for removal.
- The *Tree Assessment Chart*, Appendix A is the condensed reference guide to inform all tree management decisions for the trees evaluated.

Background

Plans will be submitted to the City of San Jose Planning Department, for construction of six story mixed use, facility. Ms. Melanie Griswold, of Hestia Real Estate Inc., requested my services, to assess the condition of twenty-three trees within or near the project limits, the construction impacts that may affect them, and provide tree protection specifications for retained trees. Further, to provide a report with my findings and recommendations to meet City of San Jose planning requirements.

Assignment

Provide an arborist report that includes an assessment of the trees within the project area. The assessment is to include the species, size (trunk diameter, height and canopy diameter spread), condition (health and structure), and suitability for preservation ratings.

To complete this assignment, the following services were performed:

- **Tree Resource Evaluation:** Survey, evaluate and assign suitability for preservation ratings for subject trees.
- **Plan Review: Reviewed provided plans including**: Site Development Plan set for 70-80 North 27th Street, San Jose., by Ruggeri-Jensen-Azar, dated 2/15/2022.
- **Construction Impact Assessment:** Combine tree resource data with anticipated construction impacts, to provide recommendations for removal or retention of trees.
- **Mapping:** Tree canopies were plotted onto: *Preliminary Grading Plan,* Sheet C3 by*,* Ruggeri-Jensen-Azar, dated 2/15/2022, and a Tree Location Map, Appendix C, was created.

Limits of the Assignment

The information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection on 7/12/2022.
The inspection is limited to visual examination of accessible items without climbing, dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the trees in questions may not arise in the future.

Purpose and use of the report

The report is intended to identify all the trees within the plan area that could be affected by a project. The report is to be used by the developer, their agents, and the City of San Jose as a reference for existing tree conditions and to help satisfy the City of San Jose planning requirements.

Resources

All information within this report is based on site plans as of the date of this report.
Resources are as follows:

- Site Development Plan Set for 70-80 North 27th Street, San Jose., by Ruggeri-Jensen-Azar, dated 2/15/2022.
- Site Visit, Tree Survey & Condition Evaluation on 7/12/2022 at 70-80 North 27th Street.
- City of San Jose Municipal Code – Chapter 13.28 *Street Trees, Hedges and Shrubs,*(Applicable sections), & Chapter 13.32 – *Tree Removal Controls,* (Applicable sections).

OBSERVATIONS

The one-acre parcel is on a flat grade and contains a multi-tenant commercial building, parking lot, and trees planted around the lot perimeter, (Image #1). Commercial buildings are adjacent to the north and south. A railroad right-of way is located to the east, with North 27th Street to the west.

I surveyed a total of 24 trees. All the trees surveyed are regulated by the City of San Jose, with permitting requirements dependent on their sub-category within the ordinance. Tree populations surveyed include fifteen trees on the subject parcel, six street trees fronting North 27th Street, and three trees to the south in the McDonalds parking lot, with canopies overhanging the subject parcel. A hedgerow of xylosma shrubs is planted along the perimeter, in the rear of the property adjacent to the railroad right-of-way.

Three palm trees on the subject parcel are ordinance size trees, with the remainder of on-site trees below ordinance size. An ordinance size tree is any tree 12 inches or greater in diameter measured at 4.5 feet above grade. The three trees on the adjacent parcel (MacDonalds), are all ordinance size.

Six trees surveyed are street trees. Street trees Per the Municipal Code Section 13.28.010 *"A "street tree" is any tree planted along a public street."*

Image #1- Parcel boundary in red with existing building, adjacent to North 27th Street. On-site trees are planted around the property perimeter. Street trees are between North 27th street and the property boundary.

Four crape myrtle grow in a planter along the north fence line, (Image #2). A fan palm grows in the northeast property corner, (Image #2),

Image #2- Trees T1 – T4, crape myrtle and T5, fan palm.

The young myrtles, T1-T4, have well developed structure and are in good condition.

The trunk and lower fronds of fan palm, T5, are blackened. Apparently a fire burned adjacent to the palm but does not appear to have significantly affected the tree. The palm is in fair condition.

A hedgerow of xylosma has been planted along the east property line as a screening shrub from the railroad right-of-way, (Image #3).

Three purple-leaf cherry plums are planted at evenly spaced intervals between the xylosma hedge, (Image #3).

Image #3- Trees T6 and T7 purple-leaf plum, growing between hedgerow of xylosma shrubs. Tree T8, purple-leaf plum not visible, grows near top of image.

The purple-leaf plums are in good condition.

Four crape myrtle, trees T9, T11, T14,T15, a glossy privet, T10 and two fan palms, T12 and T13, grow in a planter along the south fence line, (Image #4).

Image #4 – Trees T11, crape myrtle and T12 and T13, fan palm, grow in landscape planter along south fence line. Also note overhanging canopy of trees T2-A & T3A, (red outline), ornamental pear, which grow on the MacDonalds property.

The four crape myrtle growing along the south fence line are in fair or good condition. The glossy privet is in fair condition, and the two fan palms are in good condition.

Six ornamental pear street trees grow in sidewalk cutouts along North 27th Street, (Image #5).

Image #5 – Street trees T16-T21, ornamental pear.

Most of the street trees are in fair condition. Some show signs of water deficit as evidenced by tip dieback. All have minor to moderate fire blight infection as evidenced by groups of dead leaves at branch tips. Fire blight is a common bacterial infection on ornamental pear.

One street tree, T18, has significant dieback throughout the canopy and is in fair to poor condition. The trees health should be monitored. It may be desireble to remove and replace this tree with a healthy specimen, if it continues to decline.

Three street trees T16,T17 & T18 are lifting the sidewalk. Trip hazards are occuring in multiple locations at tree T16, (Image #6).

Image #6 – Tree T16, ornamental pear. The lifted sidewalk is creating significant trip hazards in three locations.

The trees rooting area is restricted, shallow rooting has developed, and the sidewalk is lifted by root diameter expansion.

Shallow roots and a restricted rooting area also causing significant sidewalk lifting adjacent to tree T17, (Image #7).

Image #7 – Tree T17, ornamental pear. Note sidewalk lifting.

The sidewalk lifting above the curb from tree T17, is a significant trip hazard for people getting in and out of their vehicles.

There are three “ordinance size” trees on the adjacent MacDonalds property to the south, with canopies that overhang the subject property. Tree T1-A grows near the entrance driveway to 70-80 North 27th Street, (Image #8).

Image #8 – Tree T1-A, ornamental pear. Note overhanging canopy, (in red).

The ornamental pear is in fair condition. Its canopy overhangs the subject property by about 10-feet.

Trees T2-A and T3-A grow near the southeast corner of the subject property. Their canopies overhang the subject property, (Image #9).

Image #9 – Trees T2-A and T3-A, ornamental pear. Grow on adjacent property and have overhanging canopies, (in red).

The two ornamental pears are in fair condition.

DISCUSSION

Species List - Regulated Trees

ON SITE TREES: 15 Trees

8	crape myrtle	(*Lagerstroemia indica*)
3	fan palm	(*Washingtonia spp.)*
3	purple-leaf plum	(*Prunus cerasifera*)
1	glossy privet	(*Ligustrum lucidum*)

STREET TREES: 6 Trees

6	ornamental pear	(*Pyrus calleryana*)

TREES ON ADJACENT PROPERTY: 3 Trees

3	ornamental pear	(*Pyrus calleryana*)

A complete list of trees is in Appendix A – Tree Assessment Chart.

Tree Evaluation and Recording Methods

Site evaluations were made on 7/12/2022. *The inventory included all trees near or within the project limits.* The health and structural **condition** of each tree was assessed and recorded. Based on the trees health and structural condition, each trees **suitability for preservation** was rated and recorded. The recorded data is included in the *Tree Assessment Chart, Appendix A,* of this report. Detailed criteria for each assessment rating category are included in Appendix B – *Criteria for Tree Assessment Chart.*

Condition Rating - Regulated Trees

A trees condition is determined by an assessing both the **health** and **structure**, then combining the two factors to reach a *condition rating*. Tree condition is rated as poor, fair or good. The quantity of trees assigned for each category (good, fair or poor), is indicated below:

Tree Condition Rating

- Good - 10
- Fair - 13
- Poor - 1

Suitability for Preservation - Regulated Trees

A trees suitability for preservation is determined based on its health, structure, age, species characteristics and longevity using a scale of good, fair or poor. The quantity of trees assigned to each category (good, fair or poor), is listed below.

Suitability Rating

- Good - 11
- Fair – 12
- Poor - 1

Tree Protection Zone

The tree protection zone (TPZ), is a defined area (radius from trunk), within which certain activities are prohibited or restricted to minimize potential injury to designated trees during construction.

The size of the optimal TPZ can be determined by a formula based on 1) trunk diameter 2) species tolerance to construction impacts, and 3) tree age (Matheny, N. and Clark, J 1998). In some instances, tree drip line is used as the TPZ. Development constraints can also influence the final size of the tree protection zone.

Fencing is installed to delineate the (TPZ), and to protect tree roots, trunk, and scaffold branches from construction equipment. *The fenced protection area may be smaller than the optimal or designated TPZ area in some circumstances.* Tree protection may also involve the armoring of the tree trunk and/or scaffold limbs with barriers to prevent mechanical damage from construction equipment. *See Tree Protection Guidelines & Restrictions* – Appendix E.

Once the TPZ is delineated and fenced (prior to any site work, equipment and materials move in), construction activities are only to be permitted within the TPZ if allowed for and specified by the project arborist.

Where tree protection fencing cannot be used, or as an additional protection from heavy equipment, tree wrap may be used. Wooden slats at least one inch thick are to be bound securely, edge to edge, around the trunk. A single layer or more of orange plastic construction fencing is to be wrapped and secured around the outside of the wooden slats. Major scaffold limbs may require protection as determined by the City arborist or Project arborist. Straw wattle may also be used as a trunk wrap and secured with orange plastic fencing.

Data has been entered in the *Tree Assessment Chart – Appendix A,* which indicates the optimal Tree Protection Zone for each tree.

Additional general tree protection guidelines are included in *Tree Protection Guidelines & Restrictions* – Appendix G.

Critical Root Zone

The CRZ is the biological limit of a tree's capacity to recover from root loss. It is "the area of soil around a tree where the minimum number of roots that are biologically essential to the structural stability and health of the tree are located. There are no universally accepted methods to calculate the CRZ." (Clark, Metheny, Smiley, et al, *The Tree Protection Zone & the Critical Root Zone*, 12/2021). The methods utilized to determine the Critical Root Zone are varied and can be based on professional guidelines and/or industry standards. Criteria such as trunk diameter, tree age and vigor, species tolerance, tree architecture and existing site constraints are commonly used criteria.

Critical Root Zone, Continued:

Using this information, the arborist can find the distance from the trunk that should be protected per unit of trunk diameter. The CRZ does not always represent a radius around the tree. When necessary, the area can be offset or shaped in a manner that accepts tree canopy constraints or existing conditions.

For purposes of this report the CRZ is the minimum tolerable distance between the trunk, and excavation that requires root cutting. I have estimated it to be five times the trunk Diameter at Breast Height, (DBH is 4.5' above grade). For example, if a tree has a one-foot trunk diameter, the CRZ extends to five feet from the trunk.

If encroachment into the CRZ or TPZ is required to retain the tree during development, the arborist must provide alternative construction methods or preconstruction treatments to reduce impacts.

Root Disturbance Distance

No one can estimate and predict with absolute certainty what distance from a tree, a soil disturbance such as excavation for construction should be, to ensure it will not significantly affect tree stability or health. Or to what degree, (low, moderate or high), a tree might be impacted. There are simply too many variables involved that we cannot see or anticipate. However, three times the D.B.H. (diameter at breast height), is a widely accepted minimum used in the industry for root disturbance, *on one side of the trunk*, and is supported by several research studies including (Smiley, Fraedich & Hendrickson 2002, Bartlett Tree Research Laboratories). This distance is often used during the design and planning phases of a project in order to estimate root loss due to construction activities. This distance is a guideline only and should be increased for trees with significant leans, decay or other structural problems.

The ISA, International Society of Arboriculture- Root Management (2017) publication recommends, "cutting roots at a distance greater than six times the trunk diameter (DBH) minimizes the likelihood of affecting both health and stability. This recommendation is given further direction by the companion publication, A.N.S.I. (*American National Standard*) A300 (Part 8)- 2013 Root Management, when roots are cut in a *non-selective* manner, i.e. in a straight line on one side of a tree. It says, if the cutting is "within six times the trunk diameter (DBH), mitigation shall be recommended". Further, A.N.S.I. recommends the "minimum distance from the trunk for root cutting should be adjusted according to trunk diameter, species tolerance to root loss, tree age, health and site condition".

In general, root cutting that occurs at a distance less than ten times the diameter of a tree should be undertaken by hand digging and hand (or Sawzall), root pruning. These methods help mitigate root loss impacts.

Construction Impacts to Regulated Trees

Based on the preliminary site plan, impacts to all trees on the parcel will be high and their removal will be necessary. The existing building will be demolished, and grading will encompass the entire lot. There will be partial subterranean parking, with excavation and grading that will occur at significant depths to near the lot perimeter.

Impacts to the six ornamental pear street trees will be moderate to high.

Street Tree T16, ornamental pear, will be less than one foot from the proposed driveway, will suffer extensive root loss beyond what it can tolerate, and its removal will be necessary, (Image #10).

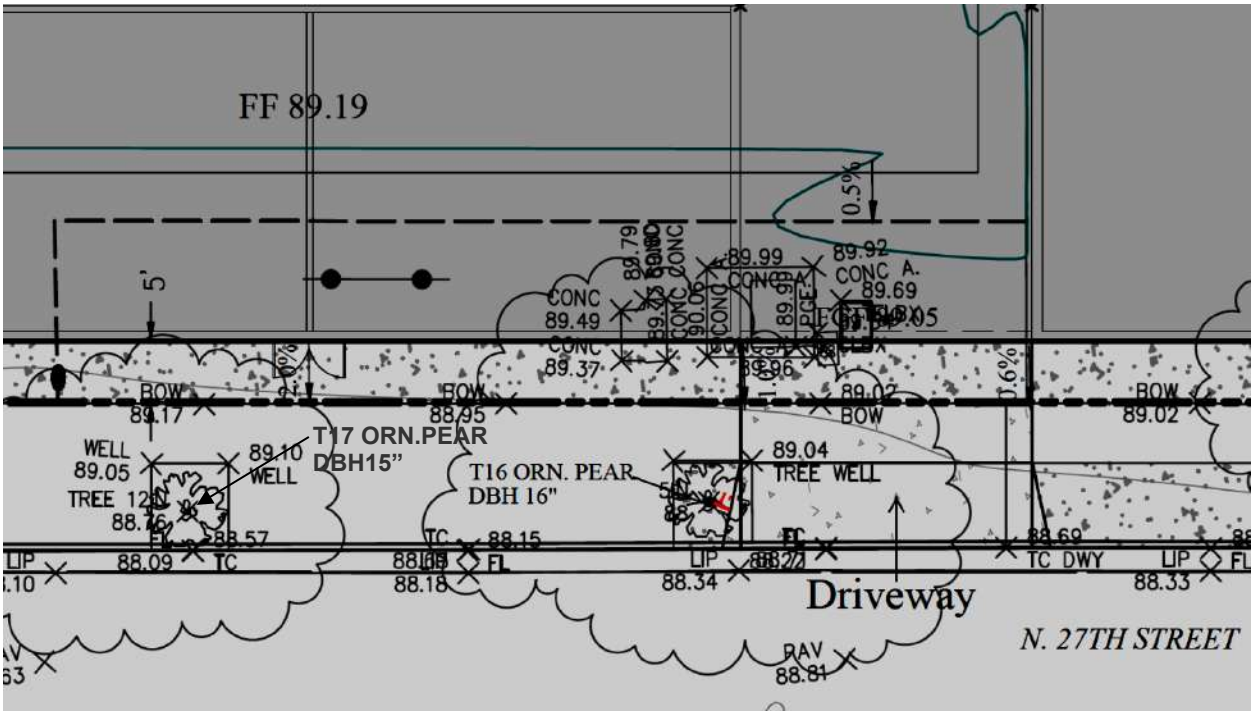

Image #10 – Screen shot from Preliminary grading and drainage, Sheet C3. Tree T16, ornamental pear. Tree is located at edge of proposed driveway. The trunk will be within the footprint of over- excavation and forming. The canopy of tree T17, ornamental pear will need minor clearance pruning to allow construction of new building.

Construction Impacts to Regulated Trees, Continued:

Impacts to the remaining street trees will be moderate. Elements impacting the trees include:

Demolition of existing concrete driveway, sidewalk, curb, and gutter.
Excavation for new driveway, sidewalk, curb, and gutter.
Construction of building.
Excavation for utilities (fire service line, sanitary sewer lateral, storm drain line), (Image #11).

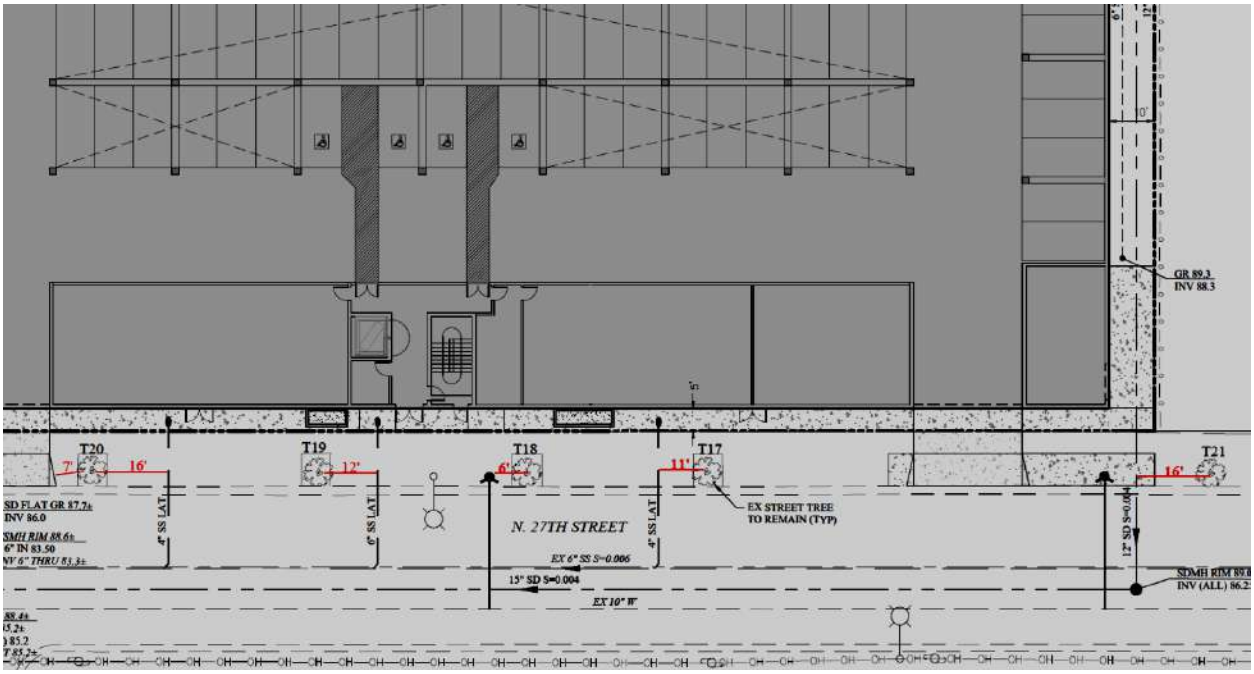

Image #11 – Screenshot from Preliminary Utility Plan, Sheet C4. Trees T17 -T21 ornamental pear, and distance to utility laterals.

Some root loss will occur from the construction elements, the ornamental pears can tolerate the loss, and will need tree protection measures, to reduce root loss impacts.

Street tree T17, ornamental pear, will need minor clearance pruning to allow construction of the new building, (Image #10).

Impacts to the ornamental pears on the adjacent property will be moderate. Some root loss may occur from the excavation and grading for the new building. Some canopy loss will occur as the trees have overhanging branches that will need pruning to allow construction of the new building.

Impact Level – Regulated Trees

Impact level rates the degree a tree may be impacted by construction activity and is primarily determined by how close the construction procedures occur to the tree. Construction impacts are rated as low, moderate, high. The quantity of trees assigned for each category (low, moderate, high), is indicated below:

Impact Rating

- Low - 0
- Moderate – 8
- High - 16

Regulated Trees Recommended for Removal Due to Construction Impacts

Sixteen Trees –

Tree Number	Species	Ordinance Size?
T1-T4, T9, T11, T14 & T15,	crape myrtle	No
T5, T12 & T13	fan palm	Yes
T6-T8	purple-leaf cherry	No
T10	glossy privet	No
T16	ornamental Pear	Street Tree

Mitigation Measures for Retained Trees

If encroachment into the CRZ or TPZ is required to retain the tree during development, the arborist must provide alternative construction methods or preconstruction treatments to reduce impacts.

The trees retained on this project will require some or all the following methods to protect them from the impacts described above and to minimize root loss during the construction phases.

- Tree Protection Fencing
- Hand trenching
- Supervised root pruning

Tree Replacement Requirements

The City of San Jose requires replacement trees for trees removed.

For trees on commercial or industrial properties, a Tree Removal permit is required for *ordinance size trees,* or a ***permit adjustment*** is required if the tree is smaller than ordinance sized. A Tree Removal permit is required for any size Street Tree.

The proposed development site at 70-80 North 27th Street has three ordinance size trees, and twelve trees smaller than ordinance size, proposed for removal.

Development as proposed would also require the removal of one *Street Tree*.

13.32.110 - Action on a Permit.
C. The Director or the Planning Commission on appeal, if applicable, shall impose as a condition on the issuance of any permit for the removal of any tree the requirement that a suitable replacement tree or trees as determined by the Director or the Planning Commission on appeal be or cause to be provided, installed and maintained, at no cost to the City: on-site by the permittee; or if on-site replacement is not feasible, at another site within the City of San José in the manner determined by the Director or the Planning Commission on appeal.

D. **The replacement tree requirement set forth in this Section shall be roughly proportionate** to the tree replacement needed to alleviate and address the burdens and other impacts created by allowing the removal of the tree or trees under the permit.

E. On-site tree replacement shall include a requirement that any on-site replacement tree that fails within three years after planting shall be promptly replaced. Off-site replacement shall include similar assurance of longevity of the replacement tree(s).

Note: Trees 12-inches in diameter or greater, shall not be removed unless a Tree Removal Permit, or equivalent, has been approved for the removal of such trees.

CONCLUSION

- A six-story mixed use facility is proposed.
- Twenty -four trees within or near the project limits were surveyed.
- All the onsite trees will be highly impacted, and their removal will be necessary to accommodate the project.
- Most of the street trees fronting the property, will be moderately impacted, and can be incorporated into the project. This includes street trees T17-T21, ornamental pear.
- One street tree T16, ornamental pear, will be highly impacted by the project and its removal will be necessary.
- The street trees moderately impacted will need mitigation methods to reduce construction impacts.
- Three trees on the adjacent property, T1-A, T2-A & T3-A, ornamental pear, will be moderately impacted, and can be incorporated into the project.
- Replacement trees will be required for trees recommended for removal.
- The *Tree Assessment Chart*, Appendix A is the condensed reference guide to inform all tree management decisions for the trees evaluated.

RECOMMENDATIONS

1. Obtain all necessary permits prior to removing or significantly altering any trees on site.
2. Remove highly impacted trees recommended for removal.
3. Plant replacement trees as required according to City of San Jose Mitigation Requirements, section,13.32.110 - *Action on a Permit.*
4. For fire blight control on ornamental pear street trees: Prune out infected branches in summer or winter. Apply a chemical control once blooming begins in the spring, and at successive seven-day intervals until the end of blooming period.

Respectfully submitted,

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70-80 North 27th Street, San Jose

Tree Assessment Chart - Appendix A

Suitability for Preservation Ratings:

Good: Trees in good health and structural condition with potential for longevity on the site

Fair: Trees in fair health and/or with structural defects that may be reduced with treatment procedures

Poor: Trees in poor health and/or with poor structure that cannot be effectively abated with treatment

Retention or Removal Code:

RT: Retain Tree
RI: Remove Due to Construction Impacts

I.M. Impacts Can Be Mitigated With Pre-Construction Treatments
R.C. Remove Due to Condition

Regulated Tree City of San Jose, Chapter 13:32 - Ordinance Size Tree - Any tree 12 inches or greater in diameter measured at 4.5 feet above grade. Multi-trunk is combined measurement of all trunks. Any tree regardless of size located on multifamily, commercial or industrial property.

Tree #	Species	Trunk Diameter @ 54 inches a.g.	Ordinance Size Tree	Crown Height & Spread (Diameter)	Health Rating	Structural Rating	Suitability for Preservation (Based Upon Condition)	Tree Protection Zone (in feet from trunk)	Construction Impacts (Rating & Description)	Retention or Removal Code	Comments
Trees on 70-80 North 27th Avenue											
T1	crape myrtle (*Lagerstroemia indica*)	5"	No	20'X10'	Good	Good	Good	10'	High (Within grading limits)	R.I.	Young tree.
T2	crape myrtle	6"	No	20'X10'	Good	Good	Good	10'	High (Within grading limits)	R.I.	Young tree.

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Tree Assessment Chart - Appendix A

Tree #	Species	Trunk Diameter @ 54 inches a.g.	Ordinance Size Tree	Crown Height & Spread (Diameter)	Health Rating	Structural Rating	Suitability for Preservation (Based Upon Condition)	Tree Protection Zone (in feet from trunk)	Construction Impacts (Rating & Description)	Retention or Removal Code	Comments
Trees on 70-80 North 27th Avenue											
T3	crape myrtle	6"	No	20'X10'	Good	Good	Good	10'	High (Within grading limits)	R.I.	Young tree.
T4	crape myrtle	6"	No	20'X10'	Good	Good	Good	10'	High (Within grading limits)	R.I.	Young tree.
T5	fan palm (*Washingtonia spp* .)	37"	Yes	40'X10'	Fair	Fair	Fair	10'	High (Within grading limits)	R.I.	Fire damage on trunk and lower fronds.
T6	purple-leaf cherry plum (*Prunus cerasifera 'Atropurpurea* ')	7"	No	15'X10'	Good	Fair	Good	10'	High (Within grading limits)	R.I.	Young tree.
T7	purple-leaf cherry plum	6"	No	20'X10'	Good	Fair	Good	10'	High (Within grading limits)	R.I.	Young tree.
T8	purple-leaf cherry plum	9"	No	20'X10'	Fair	Fair	Good	10'	High (Within grading limits)	R.I.	Young tree.

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Tree Assessment Chart - Appendix A

Tree #	Species	Trunk Diameter @ 4.5'	Ordinance Size Tree	Crown Height & Spread (Diameter)	Health Rating	Structural Rating	Suitability for Preservation (Based Upon Condition)	Tree Protection Zone (in feet)	Construction Impacts (Rating & Description)	Retention or Removal Code	Comments
Trees on 70-80 North 27th Avenue											
T9	crape myrtle	6"	No	10'x10'	Fair	Fair	Fair	10'	High (Within grading limits)	R.I.	Young tree
T10	glossy privet (*Ligustrum lucidum*)	5"	No	15'X15'	Fair	Fair	Fair	10'	High (Within grading limits)	R.I.	
T11	crape myrtle	5"	No	10'X10'	Fair	Fair	Fair	10'	High (Within grading limits)	R.I.	Young tree.
T12	fan palm	24"	Yes	60'X10'	Good	Good	Good	10'	High (Within grading limits)	R.I.	Remove dead lower fronds.
T13	fan palm	25"	Yes	60'X10'	Good	Good	Good	10'	High (Within grading limits)	R.I.	
T14	crape myrtle	6"	No	15'X10'	Good	Good	Good	10'	High (Within grading limits)	R.I.	
T15	crape myrtle	6"	No	15'X10'	Good	Good	Good	10'	High (Within grading limits)	R.I.	

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Tree Assessment Chart - Appendix A

Tree #	Species	Trunk Diameter @ 4.5'	Ordinance Size Tree	Crown Height & Spread (Diameter)	Health Rating	Structural Rating	Suitability for Preservation (Based Upon Condition)	Tree Protection Zone (in feet)	Construction Impacts (Rating & Description)	Retention or Removal Code	Comments
Street Trees											
T16	ornamental pear (*Pyrus calleryana*)	16"	Yes	40'X30'	Good	Fair	Fair	20'	High (**Root loss**, excavation)	R.I.	< 1' from new driveway. Tip dieback. Minor fire blight infection. Mistletoe. Restricted rooting area, lifting sidewalk.
T17	ornamental pear	15"	Yes	45'X30'	Fair	Fair	Fair	20'	Moderate (**Root loss**-excavation, canopy loss, clearance pruning)	R.T.	Tip dieback. Moderate fire blight infection. Restricted rooting area, lifting sidewalk.
T18	ornamental pear	10"	No	35'X20'	Fair-Poor	Fair	Fair	15'	Moderate (**Root loss**-excavation)	R.T.	Significant canopy dieback. Moderate fire blight infection. Restricted rooting area, lifting sidewalk.
T19	ornamental pear	9"	No	30'X20'	Fair	Fair	Fair	15'	Moderate (**Root loss**-excavation)	R.T.	Moderate fire blight infection.
T20	ornamental pear	9"	No	40'x15'	Fair-Poor	Fair	Fair	15'	Moderate (**Root loss**-excavation)	R.T.	Significant fire blight infection. Dieback throughout canopy.
T21	ornamental pear	10"	Yes	35'X25'	Fair	Fair	Fair	20'	Moderate (**Root loss**-excavation)	R.T.	Minor fire blight infection.

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Tree Assessment Chart - Appendix A

Tree #	Species	Trunk Diameter @ 4.5'	Ordinance Size Tree	Crown Height & Spread (Diameter)	Health Rating	Structural Rating	Suitability for Preservation (Based Upon Condition)	Tree Protection Zone (in feet)	Construction Impacts (Rating & Description)	Retention or Removal Code	Comments
Trees on Adjacent Property											
T1-A	ornamental pear	20"	Yes	40'X25'	Fair	Fair	Fair	20'	Moderate (**Root loss**, excavation, Canopy loss, clearance pruning)	R.T.	Moderate fire blight infection. 2-3" diameter limbs overhang subject property.
T2-A	ornamental pear	12"	Yes	40'X35'	Fair	Fair	Fair	20'	Moderate (**Root loss**, excavation, Canopy loss, clearance pruning)	R.T.	Minor fire blight infection. Multiple 3-5" diameter limbs overhang subject property.
T3-A	ornamental pear	19"	Yes	50'X35'	Fair	Fair	Fair	20'	Moderate (**Root loss**, excavation, Canopy loss, clearance pruning)	R.T.	Moderate fire blight infection. 2-3" diameter limbs overhang subject property.

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APPENDIX B – CRITERIA FOR TREE ASSESSMENT CHART

Following is an explanation of the data used in the tree evaluations. The data is incorporated in the *Tree Assessment Chart, Appendix A.*

Trunk Diameter and Number of Trunks:

Trunk diameter as measured at 4.5 feet above grade. The number of trunks refers to a single or multiple trunked tree. Multiple trunks are measured at 4.5 feet above grade.

Health Ratings:

Good: A healthy, vigorous tree, reasonably free of signs and symptoms of disease

Fair: Moderate vigor, moderate twig and small branch dieback, crown may be thinning and leaf color may be poor

Poor: Tree in severe decline, dieback of scaffold branches and/or trunk, most of foliage from epicormics

Structure Ratings:

Good: No significant structural defects. Growth habit and form typical of the species

Fair: Moderate structural defects that might be mitigated with regular care

Poor: Extensive structural defects that cannot be abated.

Relative Age:

I estimated tree age as young, semi-mature, mature, or over-mature.

Suitability for Preservation Ratings:

Rating factors:

Tree Health: Healthy vigorous trees are more tolerant of construction impacts such as root loss, grading, and soil compaction, then are less vigorous specimens.

Structural integrity: Preserved trees should be structurally sound and absent of defects or have defects that can be effectively reduced, especially near structures or high use areas.

Tree Age: Over mature trees have a reduced ability to tolerate construction impacts, generate new tissue and adjust to an altered environment. Young to maturing specimens are better able to respond to change.

Species response: There is a wide variation in the tolerance of individual tree species to construction impacts.

Rating Scale:

Good: Trees in good health and structural condition with potential for longevity on the site

Fair: Trees in fair health and/or with structural defects that may be reduced with treatment procedures.

Poor: Trees in poor health and/or with poor structure that cannot be effectively abated with treatment. Trees can be expected to decline or fail regardless of construction impacts or management . The species or individual may possess characteristics that are incompatible or undesirable in landscape settings or unsuited for the intended use of the site.

Construction Impacts:

Rating Scale:

High: Development elements proposed that are located within the Tree Protection Zone that would severely impact the health and /or stability of the tree. The tree impacts cannot be mitigated without design changes. The tree may be located within the building footprint.

Moderate: Development elements proposed that are located within the Tree Protection Zone that will impact the health and/or stability of the tree and can be mitigated with tree protection treatments.

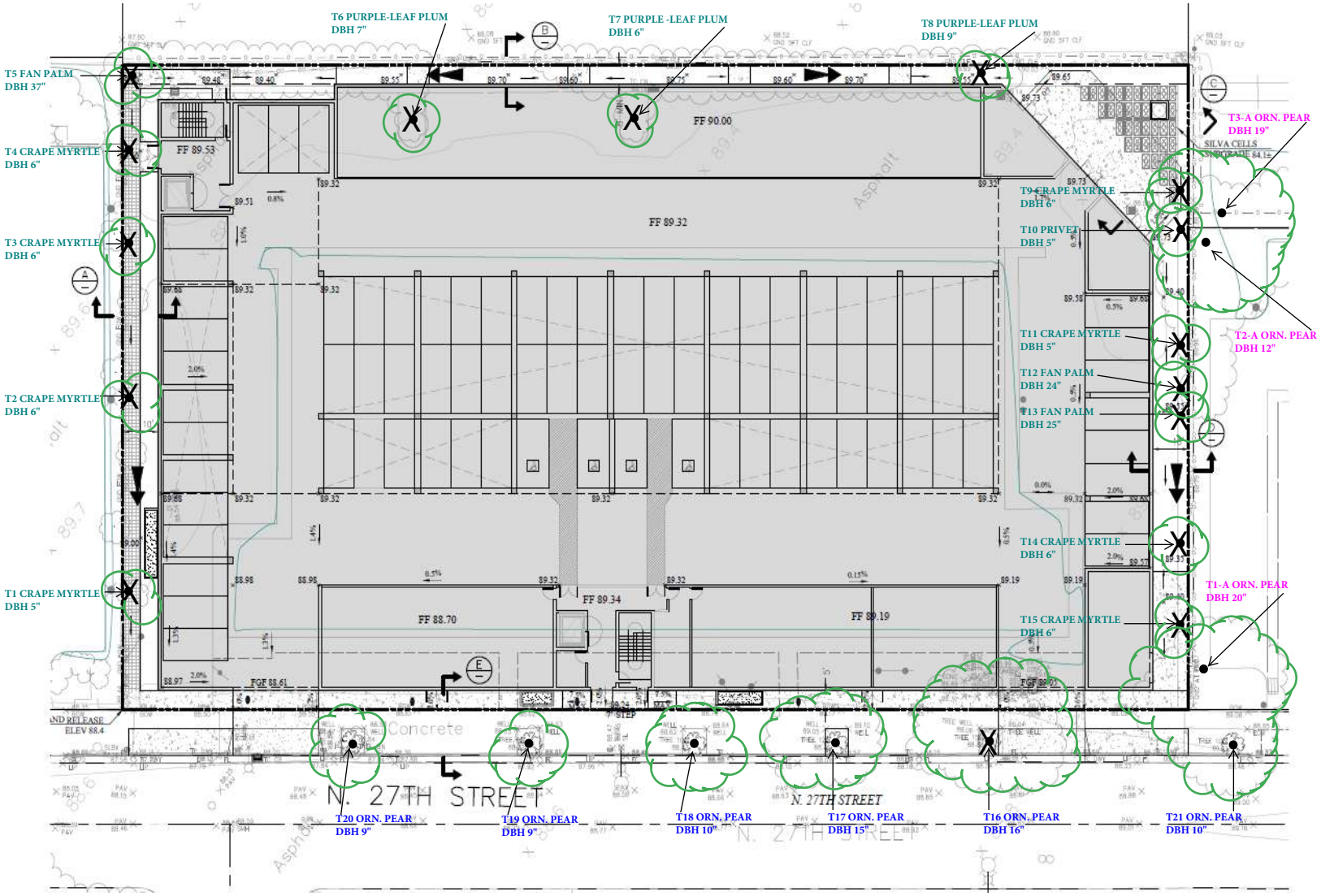
Low: Development elements proposed that are located within or near the Tree Protection Zone that will have a minor impact on the health of the tree and can be mitigated with tree protection treatments.

None: Development elements will have no impact on the health and stability of the Tree.

Tree Protection Zone (TPZ):

Defined area within which certain activities are prohibited or restricted to prevent or minimize potential injury to designated trees, particularly during construction or development.

Appendix C



Tree LocationMap

Screen shot from **Preliminary Grading Plan**, Sheet C3 by Ruggeri,Jensen & Azar, dated 2/15/2022. For illustration purposes only.

Legend

#= onsite tree

#= street tree

#= neigboring tree

= canopy extents

X = remove tree

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Appendix - D

Tree Survey - 70-80 North 27th Street

San Jose, CA

7/20/2022

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Certificate of Performance

I, Kurt Fouts, certify:

That I have personally inspected the tree(s) and/or the property referred to in this report and have stated my findings accurately to the best of my professional judgement.

- That I have no current interest in the vegetation or the property that is the subject of this report, and I have no personal interest or bias with respect to the parties involved;
- That the analysis, opinions and conclusions stated herein are my own, and were developed and prepared according to commonly accepted arboricultural practices.
- That my compensation is not contingent upon the reporting of a predetermined conclusion that favors the cause of the client or any other party, nor upon the results of the assessment, the attainment of stipulated results, or the occurrence of any subsequent events;
- That my analysis, opinions, and conclusions were developed and this report has been prepared according to commonly accepted arboricultural practices;
- That no one provided significant professional assistance to the consultant, except as indicated within the report.

I further certify that I am an International Society of Arboriculture Certified Arborist and carry an International Society of Arboriculture Tree Risk Assessment Qualification. I have been involved in the practice of arboriculture and the care and study of trees for more than 20 years.

Signed: Kurt Fouts Date: 7/20/2022

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Glossary of Terms

Basal rot: decay of the lower trunk, trunk flare, or buttress roots.

Canker: Localized diseased area on stems, roots and branches. Often sunken and discolored.

Critical Root Zone (CRZ): Area of soil around a tree where a minimum number of roots considered critical to the structural stability or health of the tree are located. CRZ determination is sometimes based on the drip line or a multiple of the DBH, but because root growth can be asymmetric due to site conditions, on-site investigation may be required.

Codominant branches/stems: Forked branches (or trunks), nearly the same size in diameter, arising from a common junction and lacking a normal branch union, may have included bark.

Crown: Upper part of a tree, measured from the lowest branch, including all branches and foliage.

Defect: An imperfection, weakness, or lack of something necessary. In trees defects are injuries, growth patterns, decay, or other conditions that reduce the tree's structural strength.

Diameter at breast height (DBH): Measurement of trunk diameter at 4.5 feet above grade.

Frass: Fecal material and/or wood shavings produced by insects.

Included Bark Attachments (crotches): Branch/limb or limb /trunk, or codominant trunks originating at acute angles from each other. Bark remains between such crotches, preventing the development of axillary wood. The inherent weakness of such attachments increases with time, through the pressure of opposing growth and increasing weight of wood and foliage, often resulting in failure.

Live Crown Ratio (LCR): Ratio of the the crown length (live foliage), to total tree height.

Scaffold branches: Permanent or structural branches that form the scaffold architecture or structure of a tree.

Suppressed: Trees that have been overtopped and occupy an understory position within a group or grove of trees. Suppressed trees often have poor structure.

Tree Protection Zones (TPZ): Defined area within which certain activities are prohibited of restricted to prevent or minimize potential injury to designated trees, especially during construction or development.

Trunk flare: Transition zone from trunk to roots where the trunk expands into the buttress or structural roots.

This Glossary of Terms was adapted from the *Glossary of Arboricultural Terms* (ISA, 2015)

Appendix H - TREE PROTECTION GUIDELINES AND RESTRICTIONS

Protecting Trees During Construction:

1) Before the start of site work, equipment or materials move in, clearing, excavation, construction, or other work on the site, every tree to be retained shall be securely fenced- off as delineated in approved plans. Such fences shall remain continuously in place for the duration of the work undertaken in connection with the development.

2) If the proposed development, including any site work, will encroach upon the tree protection zone, special measures shall be utilized, as approved by the project arborist, to allow the roots to obtain necessary oxygen, water, and nutrients.

3) Underground trenching shall avoid the major support and absorbing tree roots of protected trees. If avoidance is impractical, hand excavation undertaken under the supervision of the project arborist may be required. Trenches shall be consolidated to service as many units as possible. Boring/tunneling under roots should be considered as an alternative to trenching.

4) Concrete or asphalt paving shall not be placed over the root zones of protected trees, unless otherwise permitted by the project arborist.

5) Artificial irrigation shall not occur within the root zone of native oaks, unless deemed appropriate on a temporary basis by the project arborist to improve tree vigor or mitigate root loss.

6) Compaction of the soil within the tree protection zone shall be avoided.

7) Any excavation, cutting, or filling of the existing ground surface within the tree protection zone shall be minimized and subject to such conditions as the project arborist may impose. Retaining walls shall likewise be designed, sited, and constructed to minimize their impact on protected trees.

8) Burning or use of equipment with an open flame near or within the tree protection zone shall be avoided. All brush, earth, and other debris shall be removed in a manner that prevents injury to the tree.

9) Oil, gas, chemicals, paints, cement, stucco or other substances that may be harmful to trees shall not be stored or dumped within the tree protection zone of any protected tree, or at any other location on the site from which such substances might enter the tree protection zone of a protected tree.

10) Construction materials shall not be stored within the tree protection zone of a protected tree.

Project Arborist Duties and Inspection Schedule:

The project arborist is the person(s) responsible for carrying out technical tree inspections, assessment of tree health, structure and risk, arborist report preparation, consultation with designers and municipal planners, specifying tree protection measures, monitoring, progress reports and final inspection.
A qualified project arborist (or firm) should be designated and assigned to facilitate and insure tree preservation practices. He/she/they should perform the following inspections:

Inspection of site: Prior to equipment and materials move in, site work, demolition, landscape construction and tree removal: The project arborist will meet with the general contractor, architect / engineer, and owner or their representative to review tree preservation measures, designate tree removals, delineate the location of tree protection fencing, specify equipment access routes and materials storage areas, review the existing condition of trees and provide any necessary recommendations.

Inspection of site: During excavation or any activities that could affect trees: Inspect site during any activity within the Tree Protection Zones of preserved trees and any recommendations implemented. Assess any changes in the health of trees since last inspection.

Final Inspection of Site: Inspection of site following completion of construction. Inspect for tree health and make any necessary recommendations.

Kurt Fouts shall be the Project Arborist for this project. All scheduled inspections shall include a brief Tree Monitoring report, documenting activities and provided to the City Arborist.

Tree Protection Fencing

Tree Protection fencing shall be installed prior to the arrival of construction equipment or materials. Fence shall be comprised of six -foot chain link fence mounted on eight - foot tall, 1 and 7/8-inch diameter galvanized posts, driven 24 inches into the ground and spaced on a minimum of 10-foot centers. Once established, the fence must remain undisturbed and be maintained throughout the construction process until final inspection.

A final inspection by the City Arborist at the end of the project will be required prior to removing any tree protection fencing.

Tree Protection Signs

All sections of fencing should be clearly marked with signs stating that all areas within the fencing are Tree Protection Zones and that disturbance is prohibited.

Monitoring

Any trenching, construction or demolition that is expected to damage or encounter tree roots should be monitored by the project arborist or a qualified ISA Certified Arborist and should be documented.

The site should be evaluated by the project arborist or a qualified ISA Certified Arborist after construction is complete, and any necessary remedial work that needs to be performed should be noted.

Root Pruning

Root pruning shall be supervised by the project arborist. When roots over two inches in diameter are encountered they should be pruned by hand with loppers, handsaw, reciprocating saw, or chain saw rather than left crushed or torn. Roots should be cut beyond sinker roots or outside root branch junctions and be supervised by the project arborist. When completed, exposed roots should be kept moist with burlap or backfilled within one hour.

Tree Work Standards and Qualifications

All tree work, removal, pruning, planting, shall be performed using industry standards of workmanship as established in the Best Management Practices of the International Society of Arboriculture (ISA) and the American National Standards Institute series, *Safety Requirements in Arboriculture Operations* ANSI Z133-2017,

Contractor licensing and insurance coverage shall be verified.

During tree removal and clearance, sections of the Tree Protection Fencing may need to be temporarily dismantled to complete removal and pruning specifications. After each section is completed, the fencing is to be re-installed.

Trees to be removed shall be cut into smaller manageable pieces consistent with safe arboricultural practices, and carefully removed so as not to damage any surrounding trees or structures. The trees shall be cut down as close to grade as possible. Tree removal is to be performed by a qualified contractor with valid City Business/ State Licenses and General Liability and Workman's Compensation insurance.

Development Site Tree Health Care Measures

RECOMMENDED TO PROVIDE OPTIMUM GROWING CONDITIONS, PHYSIOLOGICAL INVIGORATION AND STAMINA, FOR PROTECTION AND RECOVERY FROM CONSTRUCTION IMPACT.

Establish and maintain TPZ fencing, trunk and scaffold limb barriers for protection from mechanical damage, and other tree protection requirements as specified in the arborist report.

Project arborist to specify site-specific soil surface coverings (wood chip mulch or other) for prevention of soil compaction and loss of root aeration capacity.

Soil, water and drainage management is to follow the ISA BMP for "Managing Trees During Construction" and the ANSI Standard A300(Part 2)- 2011 Soil Management (a. Modification, b. 'Fertilization, c. Drainage.)

Fertilizer / soil amendment product(s) amounts and method of application to be specified by certified arborist.

City of San Jose – Protected Tree

Ordinance-Size Trees

An ordinance-size tree on private property is either:

Single Trunk – 38 inches or more in circumference at 4.5 feet above ground, or

Multi-Trunk – The combined measurements of each trunk circumference, at 4.5 feet above ground, add up to 38 inches or more in circumference.

ASSUMPTIONS AND LIMITING CONDITIONS

1. Any legal description provided by the appraiser/consultant is assumed to be correct. No responsibility is assumed for matters legal in character nor is any opinion rendered as the quality of any title.
2. The appraiser/consultant can neither guarantee nor be responsible for accuracy of information provided by others.
3. The appraiser/consultant shall not be required to give testimony or to attend court by reason of this appraisal unless subsequent written arrangements are made, including payment of an additional fee for services.
4. Loss or removal of any part of this report invalidates the entire appraisal/evaluation.
5. Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person(s) to whom it is addressed without written consent of this appraiser/consultant.
6. This report and the values expressed herein represent the opinion of the appraiser/consultant, and the appraiser/consultant's fee is in no way contingent upon the reporting of a specified value nor upon any finding to be reported.
7. Sketches. Diagrams. Graphs. Photos. Etc., in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering reports or surveys.
8. This report has been made in conformity with acceptable appraisal/evaluation/diagnostic reporting techniques and procedures, as recommended by the International Society of Arboriculture.
9. When applying any pesticide, fungicide, or herbicide, always follow label instructions.
10. No tree described in this report was climbed, unless otherwise stated. We cannot take responsibility for any defects which could only have been discovered by climbing. A full root collar inspection, consisting of excavating around the tree to uncover the root collar and major buttress roots, was not performed, unless otherwise stated. We cannot take responsibility for any root defects which could only have been discovered by such an inspection.

CONSULTING ARBORIST DISCLOSURE STATEMENT

Arborists are tree specialists who use their education. Knowledge, training, and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce risk of living near trees, Clients may choose to accept or disregard the recommendations of the arborist, or to seek additional advice.

Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like medicine, cannot be guaranteed.

Trees can be managed, but they cannot be controlled. To live near trees is to accept some degree of risk. The only way to eliminate all risk associated with trees is to eliminate all trees.

Kurt Fouts
Arborist Consultant
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Capitola, CA 95010
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MEMBER
INTERNATIONAL SOCIETY OF ARBORICULTURE
ISA
™

APPENDIX C

ARCHAEOLOGICAL SENSITIVITY ASSESSMENT (On-file at the City's Department of Planning, Building & Code Enforcement)

APPENDIX D

GEOTECHNICAL INVESTIGATION

CORNERSTONE EARTH GROUP

TYPE OF SERVICES	Geotechnical Investigation
PROJECT NAME	North 27th Street Mixed-Use Development
LOCATION	70-80 North 27th Street San Jose, California
CLIENT	HC Investment Associates, LP
PROJECT NUMBER	1285-1-2
DATE	December 1, 2021

CORNERSTONE EARTH GROUP

Type of Services	**Geotechnical Investigation**
Project Name	**North 27th Street Mixed-Use Development**
Location	**70-80 North 27th Street** **San Jose, California**
Client	**HC Investment Associates, LP**
Client Address	**1700 Embarcadero Road** **Palo Alto, California**
Project Number	**1285-1-2**
Date	**December 1, 2021**

Prepared by **Bryan Cervantes Guzman, E.I.T.**
Senior Staff Engineer

Nicholas S. Devlin, P.E.
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Geotechnical Project Manager

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CORNERSTONE EARTH GROUP

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CORNERSTONE EARTH GROUP

Type of Services	**Geotechnical Investigation**
Project Name	**North 27th Street Mixed-Use Development**
Location	**70-80 North 27th Street** **San Jose, California**

SECTION 1: INTRODUCTION

This geotechnical report was prepared for the sole use of HC Investment Associates, LP for the North 27th Street Mixed-Use Development in San Jose, California. The location of the site is shown on the Vicinity Map, Figure 1. For our use, we were provided with the following documents:

- Preliminary sketches depicting the layout and elevation profile of the proposed structure prepared by Ruggeri Jensen Azar (RJA), undated.

1.1 PROJECT DESCRIPTION

We understand the project will consist of redeveloping the approximately 1.2-acre rectangular site with an at-grade, mixed-use building consisting of 5-stories of residential above a concrete podium commercial and parking floor. A portion of the podium parking level will be below-grade to accommodate a 3-level puzzle lift parking system in the central portion of the proposed building. The podium floor will also include 7,000 square feet for commercial use. The second floor will consist of residential units surrounding an outdoor podium courtyard. The third through sixth floors will consist of residential units. A total of 198 residential units consisting of studio to 1-bedroom apartments are currently planned. Appurtenant parking, utilities, landscaping and other improvements necessary for site development are also planned. We anticipate the podium level of commercial area and parking to be of concrete construction and the residential units above to be of wood construction.

Structural loads are not currently known for the proposed structure; however, structural loads are expected to be typical of similar type structures. Minor cuts and fills on the order of 1 to 3 feet are expected for site development. However, excavations of up to 8 feet are anticipated for the below-grade portions of the 3-level puzzle mechanical lifts.

1.2 SCOPE OF SERVICES

Our scope of services was presented in our proposal dated September 23, 2021 and consisted of field and laboratory programs to evaluate physical and engineering properties of the subsurface soils, engineering analysis to prepare recommendations for site work and grading, building foundations, flatwork, retaining walls, and pavements, and preparation of this report. Brief descriptions of our exploration and laboratory programs are presented below.

1.3 EXPLORATION PROGRAM

Field exploration consisted of two borings drilled on October 19, 2021 with truck-mounted, hollow-stem auger drilling equipment and four Cone Penetration Tests (CPTs) advanced on October 14, 2021 and October 18, 2021. The borings were drilled to depths of 30 to 50 feet; the CPTs were advanced to depths of 50 to 90 feet in which CPT-1 encountered refusal at a depth of 90 feet. Seismic shear wave velocity measurements were performed at CPT-1. Two of the borings (Borings EB-1 and EB-2) were advanced adjacent to CPT-1 and CPT-4, respectively, for direct evaluation of physical samples to correlated soil behavior. We also performed two percolation tests using hand auger equipment to excavate the test holes to depths of 4 to 5 feet on October 20, 2021.

The borings and CPTs were backfilled with cement grout in accordance with local requirements; exploration permits were obtained as required by local jurisdictions.

The approximate locations of our exploratory borings are shown on the Site Plan, Figure 2. Details regarding our field program are included in Appendix A.

1.4 LABORATORY TESTING PROGRAM

In addition to visual classification of samples, the laboratory program focused on obtaining data for foundation design and seismic ground deformation estimates. Testing included moisture contents, dry densities, washed sieve analyses, Plasticity Index tests, a triaxial compression test, and a consolidation test. Details regarding our laboratory program are included in Appendix B.

1.5 ENVIRONMENTAL SERVICES

Cornerstone Earth Group also provided environmental services for this project which included a Phase 1 Site Assessment; environmental findings and conclusions are provided under separate covers.

SECTION 2: REGIONAL SETTING

2.1 GEOLOGICAL SETTING

The site is located within the Santa Clara Valley, which is a broad alluvial plane between the Santa Cruz Mountains to the southwest and west, and the Diablo Range to the northeast. The

San Andreas Fault system, including the Monte Vista-Shannon Fault, exists within the Santa Cruz Mountains and the Hayward and Calaveras Fault systems exist within the Diablo Range. Alluvial soil thicknesses in the area are expected to be on the order of 500 feet or greater (Rogers & Williams, 1974).

2.2 REGIONAL SEISMICITY

While seismologists cannot predict earthquake events, geologists from the U.S. Geological Survey have recently updated (in 2015) earlier estimates from their 2014 Uniform California Earthquake Rupture Forecast (Version 3; UCERF3) publication. The estimated probability of one or more magnitude 6.7 earthquakes (the size of the destructive 1994 Northridge earthquake) expected to occur somewhere in the San Francisco Bay Area has been revised (increased) to 72 percent for the period 2014 to 2043 (Aagaard et al., 2016). The faults in the region with the highest estimated probability of generating damaging earthquakes between 2014 and 2043 are the Hayward (33%), Calaveras (26%), and San Andreas Faults (22%). In this 30-year period, the probability of an earthquake of magnitude 6.7 or larger occurring is 22 percent along the San Andreas Fault and 33 percent for the Hayward Fault.

The faults considered capable of generating significant earthquakes are generally associated with the well-defined areas of crustal movement, which trend northwesterly. The table below presents the State-considered active faults within 25 kilometers of the site.

Table 1: Approximate Fault Distances

Fault Name	Distance	
	(miles)	(kilometers)
Hayward (Southeast Extension)	3.9	6.3
Calaveras	6.6	10.7
Hayward (Total Length)	7.6	12.2
Monte Vista-Shannon	9.0	14.5
San Andreas	13.6	21.9
Sargent	15.2	24.5

A regional fault map is presented as Figure 3, illustrating the relative distances of the site to significant fault zones.

SECTION 3: SITE CONDITIONS

3.1 SITE BACKGROUND

We reviewed historical aerial imagery provided online by Historical Aerials (http://www.historicaerials.com). A summary of pertinent surface changes at and in the near vicinity of the site is as follows:

- 1948: The site appears to be part of a larger previous parcel spanning along North 27th Street. The site appears developed with warehouse buildings along the western edge and staging area on the eastern section of the site. The railroad tracks are observed east of the site. The church along Santa Clara Street appears built and in its current location. The adjacent residential neighborhood to the west appears mostly built with a few lots undeveloped.
- 1968: The project site appears to remain the same. The adjacent neighborhood appears to have been further developed and largely resembles current conditions.
- 1982: The warehouse buildings appear to have been demolished on the project site. Remainder of the site appears to remain the same.
- 1998: The project site appears to match the current property boundary. The current existing commercial building appears to be built, but the surrounding parking lot and landscape do not appear to be completed yet.
- 2002: The surrounding parking lot and landscaping appear to have been constructed. The adjacent building to the northwest appears to be built
- 2018: The site appears fully constructed with the building, asphalt parking lot, and landscaping in its current condition. No further changes are observed to the site.

3.2 SURFACE DESCRIPTION

The project site is set in a commercial/industrial zone near the intersection of Santa Clara Street and U.S. Highway 101. The area directly west of the site across North 27th Street consist of a residential neighborhood with a few commercial buildings. Currently, the site is developed and occupied by a two-story commercial building, asphalt parking lot, concrete sidewalks, flatwork, utility boxes/pads, and landscaping areas on the edges of the site. Site elevations range from 89 to 91 feet (Google Earth Pro, WGS84). The site is relatively level but graded to drain to storm drain facilities.

Surface pavements generally consisted of 2 to 4 inches of asphalt concrete over 5½ to 8 inches of aggregate base. Based on our observations, the existing pavements are in fair to poor condition with moderate alligator cracking.

3.3 SUBSURFACE CONDITIONS

Our explorations generally encountered existing undocumented fill underlain by interbedded native alluvial soil to the terminal depths explored during this investigation. A more detailed description of the subsurface conditions is presented in the following sections.

3.3.1 Undocumented Fills

Below the surface pavements, our borings encountered approximately 2¼ to 3 feet of undocumented fill; however, deeper localized fill may be encountered during demolition and/or site grading. The fills were highly variable in content and generally consisted of hard, sandy lean clay and medium dense, silty gravel with sand.

3.3.2 Alluvial Soil

Below the undocumented fills, our borings encountered native alluvial soil consisting of medium stiff to very stiff, lean clay and lean clay with sand to a depth of approximately 50 feet below existing site grades. Thin interbedded layers of loose, silty sand were encountered from approximately 8 to 10 feet within our Exploratory Boring EB-2 and 14 to 14½ feet within Boring EB-1. Below the terminal boring depth of 50 feet, our CPTs generally encountered additional fine-grained material consisting of stiff to very stiff, lean clay with varying amounts of silt and sand to depths of approximately 63½ to 64½ feet. Below the fine-grained materials, dense to very dense, sand with variable amounts of silt and clay fines were encountered to a depth of approximately 90 feet, the depth of refusal.

3.3.1 Plasticity/Expansion Potential

We performed two Plasticity Index (PI) tests on representative samples. Test results were used to evaluate expansion potential of surficial soils. The results of the surficial PI tests indicated PIs ranging from 11 to 16, indicating low to moderate expansion potential to wetting and drying cycles.

3.3.2 In-Situ Moisture Contents

Laboratory testing indicated that the in-situ moisture contents within the upper 10 feet range from 5 to 31 percent moisture. In our opinion, we estimated this corresponds to about 2 percent below the estimate laboratory optimum moisture content of the sandy gravel fill encountered within EB-1. For the underlying clayey soil, we estimate this corresponds to about 3 to 18 percent above the estimated laboratory optimum moisture content.

3.4 GROUNDWATER

Groundwater was encountered in our Boring EB-1 at a depth of 13 feet below current site grades. Groundwater was inferred at our CPTs (CPT-1 to CPT-4) at depths of approximately 10 to 16 feet below current grades. The depths to groundwater inferred from the CPTs are based on pore pressure dissipation tests being performed at each CPT location. All measurements were taken at the time of drilling and may not represent the stabilized levels that can be higher than the initial levels encountered.

Maps published by the California Geological Survey (CGS, 2000) indicate historical high groundwater depth between 5 to 10 feet below the ground surface. We also reviewed groundwater data available online from the website GeoTracker, https://geotracker.waterboards.ca.gov/. Nearby monitoring well data indicates that groundwater has been measured at depths of approximately 9 to 11 feet at wells located approximately 600 feet east of the project site between 2007 to 2014.

Based on the above, we recommend a design groundwater depth of 8 feet. Fluctuations in groundwater levels occur due to many factors including seasonal fluctuation, underground drainage patterns, regional fluctuations, and other factors.

3.5 IN-SITU WATER INFILTRATION

The design of subsurface drainage systems including detention basins and bio-swales typically requires adequate subsurface data and percolation characteristics of the underlying soil. Percolation characteristics of the underlying soil were requested in future potential retention basin or bioswales. To estimate the infiltration rate of the soils at locations and depths typically associated with these subsurface drainage systems, we performed two in-situ field infiltration tests using a Guelph permeameter by SoilMoisture Equipment Corp., Model #2800, in general accordance with ASTM D5126. Generally, the Guelph permeameter is a constant head device, which uses two water-filled chambers to measure infiltration rate in a shallow borehole. A constant head level is established in the borehole and the rate of water outflow into the surrounding soil is noted. The rate of flow when it reaches a steady state, or constant rate, is used to determine an approximate infiltration rate for that location and depth.

The approximate location of the field infiltration tests (P-1 and P-2) are shown on the Site Plan, Figure 2. The infiltration tests were performed at approximate depths of 4 and 5 feet below existing site grades, respectively. The test results are summarized in Table 2.

Table 2: In-Situ Field Guelph Permeameter Test Results

Location	Depth Below Existing Grade (ft)	Infiltration Rate (in/hr)
P-1	4.0	1.2
P-2	5.0	1.2

3.5.1 Reliability of Field Test Data

Test results may not be truly indicative of the long-term, in-situ infiltration. Other factors including stratifications, heterogeneous deposits, overburden stress, disturbance, organic content, depth to groundwater, and other factors can influence test results. In addition, for stratified soils such as those encountered at the site, the average horizontal infiltration is typically greater than the average vertical infiltration.

3.5.2 Findings and Recommendations

Based on our findings, the soil at the locations tested and at depths of about 4 and 5 feet below existing grade have an infiltration rate of about 1.2 inches per hour. Based on our test results, the in-situ field tests generally indicated a moderate infiltration rate at the depths and locations tested.

We recommend the above estimate be confirmed in the field at the time of construction, as required. In addition, the project civil engineer should review the above information and provide additional recommendations as deemed necessary.

3.5.3 General Comments and Design Considerations

As discussed, the tests were performed at discrete locations and depths. In addition, some disturbance in preparing the test also can occur. Therefore, the above results can vary significantly and may not be representative over the entire site. Localized areas/depths with higher or lower permeable materials can increase or decrease the actual infiltration rates. Therefore, we recommend the potential for variations be considered when evaluating the soil infiltration capacity or performance.

SECTION 4: GEOLOGIC HAZARDS

4.1 FAULT SURFACE RUPTURE

As discussed above several significant faults are located within 25 kilometers of the site. The site is not located within a State-designated Alquist Priolo Earthquake Fault Zone, or a Santa Clara County Fault Hazard Zone. As shown in Figure 3, no known surface expression of fault traces is thought to cross the site; therefore, fault surface rupture hazard is not a significant geologic hazard at the site.

4.2 ESTIMATED GROUND SHAKING

Moderate to severe (design-level) earthquakes can cause strong ground shaking, which is the case for most sites within the Bay Area. A peak ground acceleration (PGA_M) was estimated following the ground motion hazard analysis procedure presented in Chapter 16 and 18 and Appendix J of the 2019 California Building Code (CBC) and Chapter 21, Section 21.2 of ASCE 7-16 and Supplement No. 1. For our analysis we used a PGA_M of 0.70g which was determined in accordance with Section 21.5 of ASCE 7-16.

4.3 LIQUEFACTION POTENTIAL

The site is within a State-designated Liquefaction Hazard Zone (CGS, San Jose East Quadrangle, 2001) as well as a Santa Clara County Liquefaction Hazard Zone (Santa Clara County, 2012). Our field and laboratory programs addressed this issue by testing and sampling potentially liquefiable layers to depths of at least 50 feet, performing visual classification on sampled materials, evaluating CPT data, and performing various tests to further classify soil properties.

4.3.1 Background

During strong seismic shaking, cyclically induced stresses can cause increased pore pressures within the soil matrix that can result in liquefaction triggering, soil softening due to shear stress loss, potentially significant ground deformation due to settlement within sandy liquefiable layers as pore pressures dissipate, and/or flow failures in sloping ground or where open faces are present (lateral spreading) (NCEER 1998). Limited field and laboratory data is available regarding ground deformation due to settlement; however, in clean sand layers settlement on the order of 2 to 4 percent of the liquefied layer thickness can occur. Soils most susceptible to

liquefaction are loose, non-cohesive soils that are saturated and are bedded with poor drainage, such as sand and silt layers bedded with a cohesive cap.

4.3.2 Analysis

As discussed in the "Subsurface" section above, several sand layers were encountered below the design groundwater depth of 8 feet. Following the liquefaction analysis framework in the 2008 monograph, *Soil Liquefaction During Earthquakes* (Idriss and Boulanger, 2008), incorporating updates in *CPT and SPT Based Liquefaction Triggering Procedures* (Boulanger and Idriss, 2014), and in accordance with CDMG Special Publication 117A guidelines (CDMG, 2008) for quantitative analysis, these layers were analyzed for liquefaction triggering and potential post-liquefaction settlement. These methods compare the ratio of the estimated cyclic shaking (Cyclic Stress Ratio - CSR) to the soil's estimated resistance to cyclic shaking (Cyclic Resistance Ratio - CRR), providing a factor of safety against liquefaction triggering. Factors of safety less than or equal to 1.3 are considered to be potentially liquefiable and capable of post-liquefaction re-consolidation (i.e. settlement).

The CSR for each layer quantifies the stresses anticipated to be generated due to a design-level seismic event, is based on the peak horizontal acceleration generated at the ground surface discussed in the "Estimated Ground Shaking" section above and is corrected for overburden and stress reduction factors as discussed in the procedure developed by Seed and Idriss (1971) and updated in the 2008 Idriss and Boulanger monograph.

The soil's CRR is estimated from the in-situ measurements from CPTs and laboratory testing on samples retrieved from our borings. SPT "N" values obtained from hollow-stem auger borings were not used in our analyses, as the "N" values obtained are less reliable in sands below groundwater. The tip pressures are corrected for effective overburden stresses, taking into consideration both the groundwater level at the time of exploration and the design groundwater level, and stress reduction versus depth factors. The CPT method utilizes the soil behavior type index (I_C) to estimate the plasticity of the layers. Selected soil samples collected from advancing borings EB-1 and EB-2 adjacent to CPT-1 and CPT-4, respectively, were tested to evaluate grain size, as well as visually observed for confirmation of CPT soil behavior types.

The results of our CPT analyses (CPT-1 to CPT-4) are presented on Figures 4A to 4D of this report. Calculations for these CPTs are included in Appendix C.

4.3.3 Summary

Our analyses indicate that several layers could potentially experience liquefaction triggering that could result in post-liquefaction total settlement at the ground surface ranging from ¼- to ½-inch based on the Yoshimine (2006) method. As discussed in SP 117A, differential movement for level ground sites over deep soil sites will be up to about two-thirds of the total settlement between independent foundation elements. In our opinion, differential settlements are anticipated to be on the order of ¼ inch or less between independent foundation elements or over a horizontal distance of 30 feet.

4.3.4 Ground Deformation and Surficial Cracking Potential

The methods used to estimate liquefaction settlements assume that there is a sufficient cap of non-liquefiable material to prevent ground deformation or sand boils. For ground deformation to occur, the pore water pressure within the liquefiable soil layer will need to be great enough to break through the overlying non-liquefiable layer, which could cause significant ground deformation and settlement. The work of Youd and Garris (1995) indicates that the 8-foot-thick layer of non-liquefiable cap is sufficient to prevent ground deformation and significant surficial cracking; therefore, the above total settlement estimates are reasonable.

4.4 LATERAL SPREADING

Lateral spreading is horizontal/lateral ground movement of relatively flat-lying soil deposits towards a free face such as an excavation, channel, or open body of water; typically, lateral spreading is associated with liquefaction of one or more subsurface layers near the bottom of the exposed slope. As failure tends to propagate as block failures, it is difficult to analyze and estimate where the first tension crack will form.

There are no open faces within a distance considered susceptible to lateral spreading; therefore, in our opinion, the potential for lateral spreading to affect the site is low.

4.5 SEISMIC SETTLEMENT/UNSATURATED SAND SHAKING

Loose unsaturated sandy soils can settle during strong seismic shaking. As the soils encountered at the site were predominantly stiff to very stiff clays and medium dense sands, in our opinion, the potential for significant differential seismic settlement affecting the proposed improvements is low.

4.6 FLOODING

Based on our internet search of the Federal Emergency Management Agency (FEMA) flood map public database, the site is located within Zone AH and AO, special flood hazard zones with a base flood elevation of 89 feet and a depth of flooding of 1 foot. We understand the project civil engineer confirmed this information.

SECTION 5: CONCLUSIONS

5.1 SUMMARY

From a geotechnical viewpoint, the project is feasible provided the concerns listed below are addressed in the project design. Descriptions of each concern with brief outlines of our recommendations follow the listed concerns.

- Potential for Static and Seismic Settlement
- Mitigation of Undocumented Fill and Redevelopment Considerations
- Shallow Groundwater – Puzzle Lifts

5.1.1 Potential for Static and Seismic Settlement

5.1.2.1 Static Settlement

We understand the finished floor of the proposed building will approximately be at the existing site grade and that new fill is not anticipated at this time. As such, static settlement due to fill placement was not considered in our static settlement analysis discussed below. In addition, structural loads were not available; therefore, we estimated foundation loading (dead plus live loads) of 600 to 650 kips for interior columns beneath the residential floors, 250 kips for interior columns beneath the courtyard/deepened podium level and 18 to 22 kips per lineal foot for exterior walls. Our static settlement estimates are based on an at-grade building being supported on conventional shallow spread and strip footings with deepened footings under the mechanical puzzle lifts.

For shallow footings for the building anticipated to be about 2 to 4 feet below existing site grades, we estimate static settlement to be on the order of ¾ to 1 inch with differential settlement on the order of ⅓ to ½ inch. Based on our review of the provided plans, we anticipate deepened footings for the puzzle lift to be on the order of 8 to 10 feet below existing site grades. For deepened footings for the puzzle lifts, we estimate static settlement on the order of 1⅓ to 2 inches with differential settlement on the order of ⅔ to 1 inch. This range of settlement is preliminary and will depend on the final building loads and finished floor elevations for the building. Therefore, we recommend that we be retained to re-evaluate the static settlement estimates after final structural loads are known.

5.1.2.2 Seismic Settlement

As discussed above, our liquefaction analysis indicates that there is a potential for liquefaction of localized sand layers during a significant seismic event. Although the potential for liquefied sand to vent to the ground surface through cracks in the surficial soil is low, our analysis indicates that liquefaction-induced settlement of ¼ to ½ inch could occur, resulting in differential settlement of up to ⅓ inch between adjacent independent foundation elements or over a horizontal distance of 30 feet.

5.1.2.3 Total (Static and Seismic) Settlement

Based on the estimated settlement discussed above, the total (static and seismic) settlement for shallow footings could be on the order of 1 to 1½ inches with differential settlement of about ½ to ¾ inch between independent adjacent foundation elements, or over a horizontal distance of about 30 feet. In addition, the total (static and seismic) settlement for the deeper puzzle lift footings could be on the order of 1½ to 2½ inches with differential settlement of about ¾ inch to 1⅓ inches between independent adjacent foundation elements, or over a horizontal distance of about 30 feet.

5.1.2.4 Foundation Recommendations

Based on our assumed structural loads and results of our settlement analysis, we anticipate the proposed building may be supported on shallow foundations consisting of conventional spread footings provided the estimated total and differential settlement is tolerable. If the settlement estimated above is not tolerable for spread footings, the proposed building may be supported on a rigid mat foundation designed to tolerate the total and differential settlement discussed above. Detailed recommendations are presented in the "Foundations" section.

5.1.2 Mitigation of Undocumented Fill and Redevelopment Considerations

As discussed above, approximately 2¼ to 3 feet of undocumented fill was encountered below current site grades in our borings during our field exploration. Based on our explorations and due to the previous development and site history, we anticipate fills are generally present across the site. Undocumented fills are expected to be variable in thickness, density, and consistency. Additionally, deeper localized fill may be encountered during demolition and/or site grading. We recommend all undocumented fill at the site be completely removed from within the building areas and replaced as engineered fill. Additional recommendations are provided in the "Earthwork" section.

5.1.3 Shallow Groundwater – Puzzle Lifts

Shallow groundwater was encountered within our borings and inferred at our CPTs at depths ranging from approximately 10 to 16 feet below the existing ground surface. As discussed above, we recommend a design groundwater depth of 8 feet. Anticipated grading for the proposed building pad and foundations are expected to be on the order of 2 to 3 feet to mitigate existing undocumented fill and approximately 8 to 10 feet for the puzzle lift parking system. Our experience with similar sites in the vicinity indicates that shallow groundwater could significantly impact grading and underground construction. These impacts typically consist of potentially wet and unstable subgrade, difficulty achieving compaction, and difficult underground utility installation. Dewatering and shoring of excavations and utility trenches may be required in some isolated areas (e.g. puzzle lifts) of the site. Detailed recommendations addressing this concern are presented in the "Earthwork" section of this report.

5.2 PLANS AND SPECIFICATIONS REVIEW

We recommend that we be retained to review the geotechnical aspects of the project structural, civil, and landscape plans and specifications, allowing sufficient time to provide the design team with any comments prior to issuing the plans for construction.

5.3 CONSTRUCTION OBSERVATION AND TESTING

As site conditions may vary significantly between the small-diameter borings performed during this investigation, we also recommend that a Cornerstone representative be present to provide geotechnical observation and testing during earthwork and foundation construction. This will allow us to form an opinion and prepare a letter at the end of construction regarding contractor

compliance with project plans and specifications, and with the recommendations in our report. We will also be allowed to evaluate any conditions differing from those encountered during our investigation and provide supplemental recommendations as necessary. For these reasons, the recommendations in this report are contingent of Cornerstone providing observation and testing during construction. Contractors should provide at least a 48-hour notice when scheduling our field personnel.

SECTION 6: EARTHWORK

6.1 SITE DEMOLITION

All existing improvements not to be reused for the current development, including all foundations, flatwork, pavements, utilities, and other improvements should be demolished and removed from the site. Recommendations in this section apply to the removal of these improvements, which are currently present on the site, prior to the start of mass grading or the construction of new improvements for the project.

Cornerstone should be notified prior to the start of demolition and should be present on at least a part-time basis during all backfill and mass grading as a result of demolition. Occasionally, other types of buried structures (wells, cisterns, debris pits, etc.) can be found on sites with prior development. If encountered, Cornerstone should be contacted to address these types of structures on a case-by-case basis.

6.1.1 Demolition of Existing Slabs, Foundations and Pavements

All slabs, foundations, and pavements should be completely removed from within planned building areas.

Special care should be taken during the demolition and removal of existing floor slabs, foundations, utilities and pavements to minimize disturbance of the subgrade. Excessive disturbance of the subgrade, which includes either native or previously placed engineered fill, resulting from demolition activities can have serious detrimental effects on planned foundation and paving elements.

Existing foundations are typically mat-slabs, shallow footings, or piers/piles. If slab or shallow footings are encountered, they should be completely removed. If drilled piers are encountered, they should be cut off at an elevation at least 60-inches below proposed footings or the final subgrade elevation, whichever is deeper. The remainder of the drilled pier could remain in place. Foundation elements to remain in place should be surveyed and superimposed on the proposed development plans to determine the potential for conflicts or detrimental impacts to the planned construction. Following review, additional mitigation or planned foundation elements may need to be modified.

6.1.2 Abandonment of Existing Utilities

All utilities should be completely removed from within planned building areas. For any utility line to be considered acceptable to remain within building areas, the utility line must be completely backfilled with grout or sand-cement slurry (sand slurry is not acceptable), the ends outside the building area capped with concrete, and the trench fills either removed and replaced as engineered fill with the trench side slopes flattened to at least 1:1, or the trench fills are determined not to be a risk to the structure. The assessment of the level of risk posed by the particular utility line will determine whether the utility may be abandoned in place or needs to be completely removed. The contractor should assume that all utilities will be removed from within building areas unless provided written confirmation from both the owner and the geotechnical engineer.

Utilities extending beyond the building area may be abandoned in place provided the ends are plugged with concrete, they do not conflict with planned improvements, and that the trench fills do not pose significant risk to the planned surface improvements.

The risk for owners associated with abandoning utilities in place include the potential for future differential settlement of existing trench fills, and/or partial collapse and potential ground loss into utility lines that are not completely filled with grout.

6.2 SITE CLEARING AND PREPARATION

6.2.1 Site Stripping

The site should be stripped of all surface vegetation, and surface and subsurface improvements to be removed within the proposed development area. Demolition of existing improvements is discussed in the prior paragraphs. A detailed discussion of removal of existing fills is provided later in this report. Surface vegetation and topsoil should be stripped to a sufficient depth to remove all material greater than 3 percent organic content by weight. Based on our site observations, surficial stripping should extend about 3 to 4 inches below existing grade in vegetated areas.

6.2.2 Tree and Shrub Removal

Trees and shrubs designated for removal should have the root balls and any roots greater than ½-inch diameter removed completely. Mature trees are estimated to have root balls extending to depths of 2 to 4 feet, depending on the tree size. Significant root zones are anticipated to extend to the diameter of the tree canopy. Grade depressions resulting from root ball removal should be cleaned of loose material and backfilled in accordance with the recommendations in the “Compaction” section of this report.

6.3 MITIGATION OF UNDOCUMENTED FILL

As discussed above, approximately 2¼ to 3 feet of undocumented fill was encountered; however, deeper localized fills may be encountered during demolition and/or site grading and

should be anticipated and planned for by the contractor. We anticipate that existing fill will be removed within the areas of the deeper excavations (e.g. puzzle lifts); however, all undocumented fills should be completely removed from within building areas and to a lateral distance of at least 5 feet beyond the building footprint or to a lateral distance equal to fill depth below the perimeter footing, whichever is greater. Provided the fills meet the "Material for Fill" requirements below, the fills may be reused when backfilling the excavations. Based on review of the samples collected from our borings, it appears that the fill may be reused. If materials are encountered that do not meet the requirements, such as debris, wood, trash, those materials should be screened out of the remaining material and be removed from the site. Backfill of excavations should be placed in lifts and compacted in accordance with the "Compaction" section below.

Fills extending into planned pavement and flatwork areas may be left in place provided they are determined to be a low risk for future differential settlement and that the upper 12 to 18 inches of fill below pavement subgrade is re-worked and compacted as discussed in the "Compaction" section below.

6.4 TEMPORARY CUT AND FILL SLOPES

The contractor is responsible for maintaining all temporary slopes and providing temporary shoring where required. Temporary shoring, bracing, and cuts/fills should be performed in accordance with the strictest government safety standards. On a preliminary basis, the upper 10 feet at the site may be classified as OSHA Soil Type C materials.

Excavations performed during site demolition and fill removal should be sloped at 3:1 (horizontal:vertical) within the upper 5 feet below building subgrade. Actual excavation inclinations should be reviewed in the field during construction, as needed. Excavations below building subgrade and excavations in pavement and flatwork areas should be sloped in accordance with OSHA soil classification requirements.

6.5 BELOW-GRADE EXCAVATIONS

The below-grade excavations for the proposed puzzle lifts may be constructed with temporary slopes in accordance with the "Temporary Cut and Fill Slopes" section above if space allows. Alternatively, temporary shoring may support the planned cuts of up to 8 to 10 feet. We have provided geotechnical parameters for shoring design in the section below. The choice of shoring method should be left to the contractor's judgment based on experience, economic considerations and adjacent improvements such as utilities, pavements, and foundation loads. Temporary shoring should support adjacent improvements without distress and should be the contractor's responsibility. A pre-condition survey including photographs and installation of monitoring points for existing site improvements should be included in the contractor's scope. We should be provided the opportunity to review the geotechnical parameters of the shoring design prior to implementation; the project structural engineer should be consulted regarding support of adjacent structures.

6.5.1 Temporary Shoring – Puzzle Lifts

Based on the site conditions encountered during our investigation, the cuts for the puzzle lifts may be supported by slide rails, braced excavations, or potentially other methods. Where shoring will extend more than about 10 feet, restrained shoring will most likely be required to limit detrimental lateral deflections and settlement behind the shoring. In addition to soil earth pressures, the shoring system will need to support adjacent loads such as construction vehicles and incidental loading, existing structure foundation loads, and street loading. We recommend that heavy construction loads (cranes, etc.) and material stockpiles be kept at least 15 feet behind the shoring. Where this loading cannot be set back, the shoring will need to be designed to support the loading. The shoring designer should provide for timely and uniform mobilization of soil pressures that will not result in excessive lateral deflections. Minimum suggested geotechnical parameters for shoring design are provided in the table below.

Table 3: Suggested Temporary Shoring Design Parameters

Design Parameter	Design Value
Minimum Lateral Wall Surcharge (upper 5 feet)	120 psf
Cantilever Wall – Triangular Earth Pressure	40 pcf
Restrained Wall – Trapezoidal Earth Pressure	Increase from 0 to 25H* psf
Passive Pressure – Starting at 2 feet below the bottom of the excavation	400 pcf up to 2,000 psf maximum uniform pressure

* H equals the height of the excavation; passive pressures are assumed to act over twice the soldier pile diameter

The restrained earth pressure may also be distributed as described in Section 5.2.4 Figure 23(b) of the *FHWA Circular No. 4 – Ground Anchors and Anchored Systems* (with the hinge points at ¼H and ¾H) provided the total pressure is established from the uniform pressure above.

If shotcrete lagging is used for the shoring facing, the permanent retaining wall drainage materials, as discussed in the “Wall Drainage” section of this report, will need to be installed during temporary shoring construction. At a minimum, 2-foot-wide vertical panels should be placed between soil nails or tiebacks that are spaced at 6-foot centers. For 8-foot centers, 4-foot-wide vertical panels should be provided. A horizontal strip drain connecting the vertical panels should be provided, or pass-through connections should be included for each vertical panel.

We performed our borings with hollow-stem auger drilling equipment and as such were not able to evaluate the potential for caving soils, which can create difficult conditions during soldier beam, tie-back, or soil nail installation; caving soils can also be problematic during excavation and lagging placement. The contractor is responsible for evaluating excavation difficulties prior to construction. Where relatively clean sands (especially encountered below ground water) or difficult drilling or cobble conditions were encountered during our exploration, pilot holes

performed by the contractor may be desired to further evaluate these conditions prior to the finalization of the shoring budget.

In addition to anticipated deflection of the shoring system, other factors such as voids created by soil sloughing, and erosion of granular layers due to perched water conditions can create adverse ground subsidence and deflections. The contractor should attempt to cut the excavation as close to neat lines as possible. Where voids are created, they should be backfilled as soon as possible with sand, gravel, or grout.

The above recommendations are for the use of the design team; the contractor in conjunction with input from the shoring designer should perform additional subsurface exploration they deem necessary to design the chosen shoring system. A California-licensed civil or structural engineer must design and be in responsible charge of the temporary shoring design. The contractor is responsible for means and methods of construction, as well as site safety.

6.6 SUBGRADE PREPARATION

After site clearing and demolition is complete, and prior to backfilling any excavations resulting from fill removal or demolition, the excavation subgrade and subgrade within areas to receive additional site fills, slabs-on-grade and/or pavements should be scarified to a depth of 6 inches, moisture conditioned, and compacted in accordance with the “Compaction” section below.

6.7 WET SOIL STABILIZATION GUIDELINES

Native soil and fill materials, especially soils with high fines contents such as clays and silty soils, can become unstable due to high moisture content, whether from high in-situ moisture contents or from winter rains. As the moisture content increases over the laboratory optimum, it becomes more likely the materials will be subject to softening and yielding (pumping) from construction loading or become unworkable during placement and compaction.

As discussed in the “Subsurface” section in this report, the in-situ moisture contents are about 3 to 18 percent over the estimated laboratory optimum in the upper 10 feet of the soil profile. The contractor should anticipate drying the soils prior to reusing them as fill. In addition, repetitive rubber-tire loading will likely de-stabilize the soil.

There are several methods to address potential unstable soil conditions and facilitate fill placement and trench backfill. Some of the methods are briefly discussed below. Implementation of the appropriate stabilization measures should be evaluated on a case-by-case basis according to the project construction goals and the site conditions.

6.7.1 Scarification and Drying

The subgrade may be scarified to a depth of 6 to 12 inches and allowed to dry to near optimum conditions, if sufficient dry weather is anticipated to allow sufficient drying. More than one round of scarification may be needed to break up the soil clods.

6.7.2 Removal and Replacement

As an alternative to scarification, the contractor may choose to over-excavate the unstable soils and replace them with dry on-site or import materials. A Cornerstone representative should be present to provide recommendations regarding the appropriate depth of over-excavation, whether a geosynthetic (stabilization fabric or geogrid) is recommended, and what materials are recommended for backfill.

6.7.3 Chemical Treatment

Where the unstable area exceeds about 5,000 to 10,000 square feet and/or site winterization is desired, chemical treatment with quicklime (CaO), kiln-dust, or cement may be more cost-effective than removal and replacement. Recommended chemical treatment depths will typically range from 12 to 18 inches depending on the magnitude of the instability.

6.8 MATERIAL FOR FILL

6.8.1 Re-Use of On-site Soils

On-site soils with an organic content less than 3 percent by weight may be reused as general fill. General fill should not have lumps, clods or cobble pieces larger than 6 inches in diameter; 85 percent of the fill should be smaller than 2½ inches in diameter. Minor amounts of oversize material (smaller than 12 inches in diameter) may be allowed provided the oversized pieces are not allowed to nest together and the compaction method will allow for loosely placed lifts not exceeding 12 inches.

6.8.2 Re-Use of On-Site Site Improvements

If asphalt concrete (AC) grindings are mixed with the underlying AB to meet Class 2 AB specifications, they may be reused within the new pavement and flatwork structural sections. AC/AB grindings may not be reused beneath the building areas. Laboratory testing will be required to confirm the grindings meet project specifications.

If the site area allows for on-site pulverization of PCC and provided the PCC is pulverized to meet the “Material for Fill” requirements of this report, it may be used as select fill within the proposed building areas, excluding the capillary break layer; as typically pulverized PCC comes close to or meets Class 2 AB specifications, the recycled PCC may likely be used within the pavement structural sections. Laboratory testing will be required to confirm the material meets project specifications. PCC grindings also make good winter construction access roads, similar to a cement-treated base (CTB) section.

6.8.3 Potential Import Sources

Non-expansive material should be inorganic with a Plasticity Index (PI) of 15 or less, and not contain recycled asphalt concrete where it will be used within the habitable building areas. Imported soil for use as general fill material should be inorganic with a Plasticity Index (PI) of 15

or less, and not contain recycled asphalt concrete where it will be used within the habitable building areas. To prevent significant caving during trenching or foundation construction, imported material should have sufficient fines. Samples of potential import sources should be delivered to our office at least 10 days prior to the desired import start date. Information regarding the import source should be provided, such as any site geotechnical reports. If the material will be derived from an excavation rather than a stockpile, potholes will likely be required to collect samples from throughout the depth of the planned cut that will be imported. At a minimum, laboratory testing will include PI tests. Material data sheets for select fill materials (Class 2 aggregate base, ¾-inch crushed rock, quarry fines, etc.) listing current laboratory testing data (not older than 6 months from the import date) may be provided for our review without providing a sample. If current data is not available, specification testing will need to be completed prior to approval.

Environmental and soil corrosion characterization should also be considered by the project team prior to acceptance. Suitable environmental laboratory data to the planned import quantity should be provided to the project environmental consultant; additional laboratory testing may be required based on the project environmental consultant's review. The potential import source should also not be more corrosive than the on-site soils, based on pH, saturated resistivity, and soluble sulfate and chloride testing.

6.9 COMPACTION REQUIREMENTS

All fills, and subgrade areas where fill, slabs-on-grade, and pavements are planned, should be placed in loose lifts 8 inches thick or less and compacted in accordance with ASTM D1557 (latest version) requirements as shown in the table below. In general, clayey soils should be compacted with sheepsfoot equipment and sandy/gravelly soils with vibratory equipment; open-graded materials such as crushed rock should be placed in lifts no thicker than 18 inches and consolidated in place with vibratory equipment. Each lift of fill and all subgrade should be firm and unyielding under construction equipment loading in addition to meeting the compaction requirements to be approved. The contractor (with input from a Cornerstone representative) should evaluate the in-situ moisture conditions, as the use of vibratory equipment on soils with high moistures can cause unstable conditions. General recommendations for soil stabilization are provided in the "Wet Soil Stabilization Guidelines" section of this report. Where the soil's PI is 20 or greater, the expansive soil criteria should be used.

Table 4: Compaction Requirements

Description	Material Description	Minimum Relative[1] Compaction (percent)	Moisture[2] Content (percent)
General Fill (within upper 5 feet)	On-Site Soils	90	>1
General Fill (below a depth of 5 feet)	On-Site Soils	95	>1
Basement Wall Backfill	Without Surface Improvements	90	>1
	With Surface Improvements	95[4]	>1
Trench Backfill	On-Site Soils	90	>1
Trench Backfill (upper 6 inches of subgrade)	On-Site Soils	95	>1
Crushed Rock Fill	¾-inch Clean Crushed Rock	Consolidate In-Place	NA
Non-Expansive Fill	Imported Non-Expansive Fill	90	Optimum
Flatwork Subgrade	On-Site Soils	90	>1
Flatwork Aggregate Base	Class 2 Aggregate Base[3]	90	Optimum
Pavement Subgrade	On-Site Soils	95	>1
Pavement Aggregate Base	Class 2 Aggregate Base[3]	95	Optimum
Asphalt Concrete	Asphalt Concrete	95 (Marshall)	NA

1 – Relative compaction based on maximum density determined by ASTM D1557 (latest version)
2 – Moisture content based on optimum moisture content determined by ASTM D1557 (latest version)
3 – Class 2 aggregate base shall conform to Caltrans Standard Specifications, latest edition, except that the relative compaction should be determined by ASTM D1557 (latest version)
4 – Using light-weight compaction or walls should be braced

6.9.1 Construction Moisture Conditioning

Expansive soils can undergo significant volume change when dried then wetted. The contractor should keep all exposed expansive soil subgrade (and also trench excavation side walls) moist until protected by overlying improvements (or trenches are backfilled). If expansive soils are allowed to dry out significantly, re-moisture conditioning may require several days of re-wetting (flooding is not recommended), or deep scarification, moisture conditioning, and re-compaction.

6.10 TRENCH BACKFILL

Utility lines constructed within public right-of-way should be trenched, bedded and shaded, and backfilled in accordance with the local or governing jurisdictional requirements. Utility lines in private improvement areas should be constructed in accordance with the following requirements unless superseded by other governing requirements.

All utility lines should be bedded and shaded to at least 6 inches over the top of the lines with crushed rock (⅜-inch-diameter or greater) or well-graded sand and gravel materials conforming to the pipe manufacturer's requirements. Open-graded shading materials should be

consolidated in place with vibratory equipment and well-graded materials should be compacted to at least 90 percent relative compaction with vibratory equipment prior to placing subsequent backfill materials.

General backfill over shading materials may consist of on-site native materials provided they meet the requirements in the “Material for Fill” section, and are moisture conditioned and compacted in accordance with the requirements in the “Compaction” section.

Where utility lines will cross perpendicular to strip footings, the footing should be deepened to encase the utility line, providing sleeves or flexible cushions to protect the pipes from anticipated foundation settlement, or the utility lines should be backfilled to the bottom of footing with sand-cement slurry or lean concrete. Where utility lines will parallel footings and will extend below the “foundation plane of influence,” an imaginary 1:1 plane projected down from the bottom edge of the footing, either the footing will need to be deepened so that the pipe is above the foundation plane of influence or the utility trench will need to be backfilled with sand-cement slurry or lean concrete within the influence zone. Sand-cement slurry used within foundation influence zones should have a minimum compressive strength of 75 psi.

6.11 SITE DRAINAGE

Ponding should not be allowed adjacent to building foundations, slabs-on-grade, or pavements. Hardscape surfaces should slope at least 2 percent towards suitable discharge facilities; landscape areas should slope at least 3 percent towards suitable discharge facilities. Roof runoff should be directed away from building areas in closed conduits, to approved infiltration facilities, or on to hardscaped surfaces that drain to suitable facilities. Retention, detention or infiltration facilities should be spaced at least 10 feet from buildings, and preferably at least 5 feet from slabs-on-grade or pavements. However, if retention, detention or infiltration facilities are located within these zones, we recommend that these treatment facilities meet the requirements in the Storm Water Treatment Design Considerations section of this report.

6.12 LOW-IMPACT DEVELOPMENT (LID) IMPROVEMENTS

The Municipal Regional Permit (MRP) requires regulated projects to treat 100 percent of the amount of runoff identified in Provision C.3.d from a regulated project’s drainage area with low impact development (LID) treatment measures onsite or at a joint stormwater treatment facility. LID treatment measures are defined as rainwater harvesting and use, infiltration, evapotranspiration, or biotreatment. A biotreatment system may only be used if it is infeasible to implement harvesting and use, infiltration, or evapotranspiration at a project site.

Technical infeasibility of infiltration may result from site conditions that restrict the operability of infiltration measures and devices. Various factors affecting the feasibility of infiltration treatment may create an environmental risk, structural stability risk, or physically restrict infiltration. The presence of any of these limiting factors may render infiltration technically infeasible for a proposed project. To aid in determining if infiltration may be feasible at the site, we provide the following site information regarding factors that may aid in determining the feasibility of infiltration facilities at the site.

- In general, from our percolation testing discussed above, the near surface clayey site soils would likely be categorized as Hydrological Soil Group C for USDA soil classification, which typically has a possible range of infiltration of approximately 0.2 up to 1.2 inches per hour. In our opinion, these clayey soils will limit the infiltration of stormwater.

- Locally, design high groundwater is designated at a depth of 8 feet, and therefore is expected to be within 10 feet of the base of the infiltration measure.

- In our opinion, infiltration locations within 10 feet of the buildings would create a geotechnical hazard.

6.12.1 Storm Water Treatment Design Considerations

If storm water treatment improvements, such as shallow bio-retention swales, basins or pervious pavements, are required as part of the site improvements to satisfy Storm Water Quality (C.3) requirements, we recommend the following items be considered for design and construction.

6.12.1.1 General Bioswale Design Guidelines

- If possible, avoid placing bioswales or basins within 10 feet of the building perimeter or within 5 feet of exterior flatwork or pavements. If bioswales must be constructed within these setbacks, the side(s) and bottom of the trench excavation should be lined with 10-mil visqueen to reduce water infiltration into the surrounding expansive clay.

- Bioswales constructed within 3 feet of proposed buildings may be within the foundation zone of influence for perimeter wall loads. Therefore, where bioswales will parallel foundations and will extend below the "foundation plane of influence," an imaginary 1:1 plane projected down from the bottom edge of the foundation, the foundation will need to be deepened so that the bottom edge of the bioswale filter material is above the foundation plane of influence.

- The bottom of bioswale or detention areas should include a perforated drain placed at a low point, such as a shallow trench or sloped bottom, to reduce water infiltration into the surrounding soils near structural improvements, and to address the low infiltration capacity of the on-site clay soils.

6.12.1.2 Bioswale Infiltration Material

- Gradation specifications for bioswale filter material, if required, should be specified on the grading and improvement plans.

- Compaction requirements for bioswale filter material in non-landscaped areas or in pervious pavement areas, if any, should be indicated on the plans and specifications to satisfy the anticipated use of the infiltration area.

- If bioswales are to be vegetated, the landscape architect should select planting materials that do not reduce or inhibit the water infiltration rate, such as covering the bioswale with grass sod containing a clayey soil base.

- Due to the relatively loose consistency and/or high organic content of many bioswale filter materials, long-term settlement of the bioswale medium should be anticipated. To reduce initial volume loss, bioswale filter material should be wetted in 12-inch lifts during placement to pre-consolidate the material. Mechanical compaction should not be allowed, unless specified on the grading and improvement plans, since this could significantly decrease the infiltration rate of the bioswale materials.

- It should be noted that the volume of bioswale filter material may decrease over time depending on the organic content of the material. Additional filter material may need to be added to bioswales after the initial exposure to winter rains and periodically over the life of the bioswale areas, as needed.

6.12.1.3 Bioswale Construction Adjacent to Pavements

If bio-infiltration swales or basins are considered adjacent to proposed parking lots or exterior flatwork, we recommend that mitigative measures be considered in the design and construction of these facilities to reduce potential impacts to flatwork or pavements. Exterior flatwork, concrete curbs, and pavements located directly adjacent to bio-swales may be susceptible to settlement or lateral movement, depending on the configuration of the bioswale and the setback between the improvements and edge of the swale. To reduce the potential for distress to these improvements due to vertical or lateral movement, the following options should be considered by the project civil engineer:

- Improvements should be setback from the vertical edge of a bioswale such that there is at least 1 foot of horizontal distance between the edge of improvements and the top edge of the bioswale excavation for every 1 foot of vertical bioswale depth, or

- Concrete curbs for pavements, or lateral restraint for exterior flatwork, located directly adjacent to a vertical bioswale cut should be designed to resist lateral earth pressures in accordance with the recommendations in the “Retaining Walls” section of this report, or concrete curbs or edge restraint should be adequately keyed into the native soil or engineered to reduce the potential for rotation or lateral movement of the curbs.

6.13 LANDSCAPE CONSIDERATIONS

Since the near-surface soils are moderately expansive, we recommend greatly reducing the amount of surface water infiltrating these soils near foundations and exterior slabs-on-grade. This can typically be achieved by:

- Using drip irrigation

- Avoiding open planting within 3 feet of the building perimeter or near the top of existing slopes
- Regulating the amount of water distributed to lawns or planter areas by using irrigation timers
- Selecting landscaping that requires little or no watering, especially near foundations.

We recommend that the landscape architect consider these items when developing landscaping plans.

SECTION 7: 2019 CBC SEISMIC DESIGN CRITERIA

7.1 SEISMIC DESIGN CRITERIA

We developed site-specific seismic design parameters in accordance with Chapter 16, Chapter 18 and Appendix J of the 2019 California Building Code (CBC) and Chapters 11, 12, 20, and 21 and Supplement No. 1 of ASCE 7-16.

7.1.1 Site Location and Provided Data For 2019 CBC Seismic Design

The project is located at latitude 37.349730° and longitude -121.865795°, which is based on Google Earth (WGS84) coordinates at the approximate center of site in San Jose, California. We have assumed that a Seismic Importance Factor (I_e) of 1.00 has been assigned to the structure in accordance with Table 1.5-2 of ASCE 7-16 for structures classified as Risk Category II. The building period has not been provided by the project structural engineer.

7.2 2019 CBC SEISMIC DESIGN CRITERIA

As discussed in the “Subsurface” of our report, our CPT and exploratory borings encountered alluvial soils consisting of medium dense to dense sands and medium stiff to very stiff clay deposits to a depth of 90 feet, the maximum depth explored. Shear wave velocity (V_S) measurements were performed while advancing CPT-1, resulting in a time-averaged shear wave velocity for the top 30 meters (V_{S30}) of 246 meters per second (807 feet per second), for the upper 100 feet.

7.2.1 2019 CBC Seismic Design

As our borings encountered deep alluvial soils with shear wave velocity for the upper 30 meters between 600 and 1200 feet per second, per section 20.3.2 of ASCE 7-16, we have classified the site as Soil Classification D, which is described as a “stiff soil” profile. Because we used site specific data from our explorations and laboratory testing, the site class should be considered as “determined” for the purposes of estimating the seismic design parameters from the code. Our site-specific ground motion hazard analysis considered a V_{S30} of 246 m/s (807 ft/s).

In accordance with Section 11.4.8 of ASCE 7-16, we performed a ground motion hazard analysis following Chapter 21, Section 21.2 of ASCE 7-16. We evaluated both Probabilistic MCE_R Ground Motions in accordance with Method 1 and Deterministic MCE_R Ground Motions to generate our recommended design response spectrum for the project, see Figure 6. The recommended design spectral accelerations and associated periods are provided graphically on Figure 5.

SECTION 8: FOUNDATIONS

8.1 SUMMARY OF RECOMMENDATIONS

As discussed in the "Conclusions" section, the building may be supported on shallow foundations consisting of conventional spread footings provided the recommendations in the "Earthwork" section and below are followed. As an alternative, the building may be supported on a rigid mat foundation. Foundation recommendations are presented in the following sections.

8.2 SHALLOW FOUNDATIONS

8.2.1 Conventional Spread Footings

Conventional shallow footings should bear on natural, undisturbed soil or engineered fill, be at least 15 inches wide, and extend at least 24 inches below the lowest adjacent grade. Lowest adjacent grade is defined as the deeper of the following: 1) bottom of the adjacent interior slab-on-grade, or 2) finished exterior grade, excluding landscaping topsoil.

Footings constructed to the above dimensions and in accordance with the "Earthwork" recommendations of this report are capable of supporting maximum allowable bearing pressures of 1,500 psf for dead loads, 2,250 psf for combined dead plus live loads, and 3,000 psf for all loads including wind and seismic. These pressures are based on factors of safety of 3.0, 2.0, and 1.5 applied to the ultimate bearing pressure for dead, dead plus live, and all loads, respectively. These pressures are net values; the weight of the footing may be neglected for the portion of the footing extending below grade (typically, the full footing depth). Top and bottom mats of reinforcing steel should be included in continuous footings to help span irregularities and differential settlement.

8.2.2 Footing Settlement

Structural loads were not known at the time this report was prepared; therefore, we assumed the following typical loading. We estimated foundation loading (dead plus live loads) of 600 to 650 kips for interior columns beneath the residential floors, 250 kips for interior columns beneath the courtyard/deepened podium level and 18 to 22 kips per lineal foot for exterior walls.

8.2.2.1 Shallow Footings

Based on the above loading and the allowable bearing pressures presented above, we estimate the total static footing settlement will be on the order of ¾ to 1 inch, with about ⅓ to ½ inch of post-construction differential settlement between adjacent foundation elements. In addition, we estimate that differential seismic movement will be on the order of ¼ to ⅓ inch resulting in a total estimated differential footing movement of ½ to ¾ inch between foundation elements, assumed to be on the order of 30 feet.

8.2.2.2 Deep Footings – Puzzle Lifts

Based on the above loading and the allowable bearing pressures presented above, we estimate the total static footing settlement will be on the order of 1⅓ to 2 inches, with about ⅔ to 1 inch of post-construction differential settlement between adjacent foundation elements. In addition, we estimate that differential seismic movement will be on the order of ¼ to ⅓ inch resulting in a total estimated differential footing movement of ¾ inch to 1⅓ inches between foundation elements, assumed to be on the order of 30 feet.

As our footing loads were assumed, we recommend we be retained to review the final footing layout and loading and verify the settlement estimates above.

8.2.3 Lateral Loading

Lateral loads may be resisted by friction between the bottom of footing and the supporting subgrade, and also by passive pressures generated against footing sidewalls. An ultimate frictional resistance of 0.40 applied to the footing dead load, and an ultimate passive pressure based on an equivalent fluid pressure of 400 pcf may be used in design. The structural engineer should apply an appropriate factor of safety (such as 1.5) to the ultimate values above. Where footings are adjacent to landscape areas without hardscape, the upper 12 inches of soil should be neglected when determining passive pressure capacity.

8.2.4 Conventional Shallow Footing Construction Considerations

Where utility lines will cross perpendicular to strip footings, the footing should be deepened to encase the utility line, providing sleeves or flexible cushions to protect the pipes from anticipated foundation settlement, or the utility lines should be backfilled to the bottom of footing with sand-cement slurry or lean concrete. Where utility lines will parallel footings and will extend below the "foundation plane of influence," an imaginary 1:1 plane projected down from the bottom edge of the footing, either the footing will need to be deepened so that the pipe is above the foundation plane of influence or the utility trench will need to be backfilled with sand-cement slurry or lean concrete within the influence zone. Sand-cement slurry used within foundation influence zones should have a minimum compressive strength of 75 psi.

Footing excavations should be filled as soon as possible or be kept moist until concrete placement by regular sprinkling to prevent desiccation. A Cornerstone representative should observe all footing excavations prior to placing reinforcing steel and concrete. If there is a

significant schedule delay between our initial observation and concrete placement, we may need to re-observe the excavations.

8.3.1 Reinforced Concrete Mat Foundations

As an alternative to conventional spread footings, the proposed structure may be supported on a mat foundation bearing on natural soil or engineered fill prepared in accordance with the "Earthwork" section of this report and designed in accordance with the recommendations below. Reinforced concrete mat foundations should be designed in accordance with the 2019 California Building Code.

To reduce potential differential movement, the mat should be designed for a maximum *average* allowable bearing pressure of 750 psf for dead plus live loads; at column or wall loading, the maximum localized bearing pressure should be limited to 1,500 psf. When evaluating wind and seismic conditions, allowable bearing pressures may be increased by one-third. These pressures are net values; the weight of the mat may be neglected for the portion of the mat extending below grade. Top and bottom mats of reinforcing steel should be included as required to help span irregularities and differential settlement. If the actual average areal bearing pressure is higher than presented above, or if there are other aspects of design not accounted for in this report, please notify us so that we may revise our recommendations.

8.3.2 Mat Foundation Settlement

Based on the assumed areal pressures above, we estimate a static settlement of ¾ to 1 inch with a differential static settlement of up to ½ inch between the center and edges of the mat. The static settlement estimates presented below are based on assumed loads of 125 psf per floor for the residential levels above the podium level and 150 psf per floor for the podium concrete level. Additionally, as discussed earlier, seismic settlements of up to ½ inch with a differential settlement of ¼ inch or less are anticipated across a horizontal distance of 30 feet. The total (static and seismic) settlement is estimated to be 1¼ to 1½ inches with an anticipated differential settlement of up to ¾ inch. As our structural loads are assumed, we recommend we be retained to review the final foundation plan and loading and to verify the settlement estimates above.

If foundations designed in accordance with the above recommendations are not capable of resisting such differential movement, settlement mitigation or an alternative foundation type may be required. Settlement mitigation could possibly include ground improvement to reduce settlement beneath the structures' footprint or the use of a deep foundation system. As mentioned, we recommend we be retained to review the final loading and further evaluate settlement estimates above.

8.3.3 Lateral Loading

Lateral loads may be resisted by friction between the bottom of mat foundation and the supporting subgrade, and also by passive pressures generated against deepened mat edges. An ultimate frictional resistance of 0.40 applied to the mat dead load, and an ultimate passive

pressure based on an equivalent fluid pressure of 400 pcf may be used in design. The structural engineer should apply an appropriate factor of safety (such as 1.5) to the ultimate values above. The upper 12 inches of soil should be neglected when determining passive pressure capacity.

8.3.4 Mat Modulus of Soil Subgrade Reaction

The modulus of soil subgrade reaction is a model element that represents the response to a specific loading condition, including the magnitude, rate, and shape of loading, given the subsurface conditions at that location. Based on the assumed average areal loading indicated above, we developed preliminary soil subgrade moduli for initial structural design. These values are preliminary and should be confirmed/finalized following initial analysis by the project structural engineer. Once contact pressures are available from the initial analysis (SAFE or equivalent), we should revise our model and provide contours of equal soil subgrade modulus values for design. Please forward contact pressures to scale and in color for our analysis.

For preliminary SAFE runs (or equivalent analysis), we recommend an initial modulus of soil subgrade reaction of 5 pounds per cubic inch (pci) for the below grade mat foundation. As discussed above, the modulus of soil subgrade reaction is intended for use in the first iteration of the structural SAFE analysis for the mat design. Once the initial structural analysis is complete, please forward a color plot of contact pressures for the mat (to scale) so that we can provide a revised plan with updated contours of equal modulus of soil subgrade reaction values.

8.3.5 Mat Foundation Construction Considerations

Due to the presence of moderately expansive soils, mat subgrade areas should be kept moist until concrete placement by regular sprinkling to prevent desiccation. If deep drying is allowed to occur, several days of moisture conditioning (flooding of the pads is not recommended) may be required to allow the moisture to re-penetrate the subgrade. If sever drying occurs, reworking and moisture conditioning of the pad may be required. Prior to placement of any vapor retarder and mat construction, the subgrade should be proof-rolled and visually observed by a Cornerstone representative to confirm stable subgrade conditions. The pad moisture should also be checked at least 24 hours prior to vapor barrier or mat reinforcement placement to confirm that the soil has a moisture content of at least 2 percent over optimum in the upper 12 inches.

8.3.6 Hydrostatic Uplift and Waterproofing – Puzzle Lift

As discussed, we recommend a design high groundwater depth of 8 feet below existing grades at the site. In addition, we anticipate the deepened excavations for the puzzle lifts will be 8 to 10 feet below the existing grades. Therefore, where portions of the structure extend below the design groundwater level, including bottoms of slabs-on-grade and mat foundations, they should be designed to resist potential hydrostatic uplift pressures.

In addition, the portions of the structures extending below design groundwater should be waterproofed to limit moisture infiltration, including mat foundation/thickened slab areas, all

construction joints, and any retaining walls. We recommend that a waterproof specialist design the waterproofing system.

8.4 GROUND IMPROVEMENT AND DEEP FOUNDATIONS

As alternatives to shallow spread footings and mat foundations, the building may also be supported on spread footings over ground improvement or a deep foundation system, such as augercast or driven piles. If these options are desired, we can provide additional recommendations upon request.

SECTION 9: CONCRETE SLABS AND PEDESTRIAN PAVEMENTS

9.1 INTERIOR SLABS-ON-GRADE

Due to the expansion potential of the surficial soils, the proposed slabs-on-grade should be at least 5 inches thick and be supported on at least 6 inches of non-expansive fill (NEF) to reduce the potential for slab damage due to soil heave. The NEF layer should be constructed over subgrade prepared in accordance with the recommendations in the "Earthwork" section of this report. If moisture-sensitive floor coverings are planned, the recommendations in the "Interior Slabs Moisture Protection Considerations" section below may be incorporated in the project design if desired. If significant time elapses between initial subgrade preparation and slab-on-grade NEF construction, the subgrade should be proof-rolled to confirm subgrade stability, and if the soil has been allowed to dry out, the subgrade should be re-moisture conditioned to at least 3 percent over the optimum moisture content.

The structural engineer should determine the appropriate slab reinforcement for the loading requirements and considering the expansion potential of the underlying soils. For unreinforced concrete slabs, ACI 302.1R recommends limiting control joint spacing to 24 to 36 times the slab thickness in each direction, or a maximum of 18 feet.

9.2 INTERIOR SLABS MOISTURE PROTECTION CONSIDERATIONS

The following general guidelines for concrete slab-on-grade construction where floor coverings are planned are presented for the consideration by the developer, design team, and contractor. These guidelines are based on information obtained from a variety of sources, including the American Concrete Institute (ACI) and are intended to reduce the potential for moisture-related problems causing floor covering failures, and may be supplemented as necessary based on project-specific requirements. The application of these guidelines or not will not affect the geotechnical aspects of the slab-on-grade performance.

- Place a minimum 15-mil vapor retarder conforming to ASTM E 1745, Class C requirements or better directly below the concrete slab; the vapor retarder should extend to the slab edges and be sealed at all seams and penetrations in accordance with manufacturer's recommendations and ASTM E 1643 requirements. A 4-inch-thick capillary break, consisting of crushed rock should be placed below the vapor retarder and consolidated in place with vibratory equipment. The mineral aggregate shall be of

such size that the percentage composition by dry weight as determined by laboratory sieves will conform to the following gradation:

Sieve Size	Percentage Passing Sieve
1”	100
¾”	90 – 100
No. 4	0 – 10
No. 200	0 – 5

The capillary break rock may be considered as the upper 4 inches of the non-expansive fill previously recommended.

- The concrete water:cement ratio should be 0.45 or less. Mid-range plasticizers may be used to increase concrete workability and facilitate pumping and placement.
- Water should not be added after initial batching unless the slump is less than specified and/or the resulting water:cement ratio will not exceed 0.45.
- Polishing the concrete surface with metal trowels is not recommended.
- Where floor coverings are planned, all concrete surfaces should be properly cured.
- Water vapor emission levels and concrete pH should be determined in accordance with ASTM F1869-98 and F710-98 requirements and evaluated against the floor covering manufacturer’s requirements prior to installation.

9.3 EXTERIOR FLATWORK

Exterior concrete flatwork subject to pedestrian and/or occasional light pick up loading should be at least 4 inches thick and supported on at least 4 inches of non-expansive fill overlying subgrade prepared in accordance with the “Earthwork” recommendations of this report. Flatwork that will be subject to heavier or frequent vehicular loading should be designed in accordance with the recommendations in the “Vehicular Pavements” section below. To help reduce the potential for uncontrolled shrinkage cracking, adequate expansion and control joints should be included. Consideration should be given to limiting the control joint spacing to a maximum of about 2 feet in each direction for each inch of concrete thickness. Flatwork should be isolated from adjacent foundations or retaining walls except where limited sections of structural slabs are included to help span irregularities in retaining wall backfill at the transitions between at-grade and on-structure flatwork.

SECTION 10: VEHICULAR PAVEMENTS

10.1 ASPHALT CONCRETE

The following asphalt concrete pavement recommendations tabulated below are based on the Procedure 608 of the Caltrans Highway Design Manual, estimated traffic indices for various

pavement-loading conditions, and on a design R-value of 5. The design R-value was chosen based on our engineering judgement considering the soil type and variable surface conditions.

Table 5: Asphalt Concrete Pavement Recommendations, Design R-value = 5

Design Traffic Index (TI)	Asphalt Concrete (inches)	Class 2 Aggregate Base* (inches)	Total Pavement Section Thickness (inches)
4.0	2.5	7.5	10.0
4.5	2.5	9.5	12.0
5.0	3.0	10.0	13.0
5.5	3.0	12.0	15.0
6.0	3.5	13.0	16.5
6.5	4.0	13.5	17.5

*Caltrans Class 2 aggregate base; minimum R-value of 78

Frequently, the full asphalt concrete section is not constructed prior to construction traffic loading. This can result in significant loss of asphalt concrete layer life, rutting, or other pavement failures. To improve the pavement life and reduce the potential for pavement distress through construction, we recommend the full design asphalt concrete section be constructed prior to construction traffic loading. Alternatively, a higher traffic index may be chosen for the areas where construction traffic will use the pavements.

Asphalt concrete pavements constructed on expansive subgrade where the adjacent areas will not be irrigated for several months after the pavements are constructed may experience longitudinal cracking parallel to the pavement edge. These cracks typically form within a few feet of the pavement edge and are due to seasonal wetting and drying of the adjacent soil. The cracking may also occur during construction where the adjacent grade is allowed to significantly dry during the summer, pulling moisture out of the pavement subgrade. Any cracks that form should be sealed with bituminous sealant prior to the start of winter rains. One alternative to reduce the potential for this type of cracking is to install a moisture barrier at least 24 inches deep behind the pavement curb.

10.2 PORTLAND CEMENT CONCRETE

The Portland Cement Concrete (PCC) pavement recommendations outlined below are based on methods presented in American Concrete Pavement Association (ACPA, 2006). We have provided a few pavement alternatives as an anticipated Average Daily Truck Traffic (ADTT) was not provided. Recommendations for garage slabs-on-grade were provided in the “Concrete Slabs and Pedestrian Pavements” section above.

Table 6: PCC Pavement Recommendations, Design R-value = 5

Traffic Category	Minimum PCC Thickness (inches)	Class 2 Aggregate Base* (inches)
Maximum ADTT = 10	6.5	6.0
Maximum ADTT = 20	7.0	6.0

*Caltrans Class 2 aggregate base; minimum R-value of 78

The PCC thicknesses above are based on a concrete compressive strength of at least 3,500 psi. Adequate expansion and control joints should be included. Consideration should be given to limiting the control joint spacing to a maximum of about 2 feet in each direction for each inch of concrete thickness. Due to the expansive surficial soils present, we recommend that the construction and expansion joints be dowelled.

10.2.2 Stress Pads for Trash Enclosures

Pads where trash containers will be stored, and where garbage trucks will park while emptying trash containers, should be constructed on Portland Cement Concrete. We recommend that the trash enclosure pads and stress (landing) pads where garbage trucks will store, pick up, and empty trash be increased to a minimum PCC thickness of 7 inches. The compressive strength, underlayment, and construction details should be consistent with the above recommendations for PCC pavements.

SECTION 11: RETAINING WALLS

11.1 STATIC LATERAL EARTH PRESSURES

The structural design of any site retaining wall should include resistance to lateral earth pressures that develop from the soil behind the wall, any undrained water pressure, and surcharge loads acting behind the wall. Provided a drainage system is constructed behind the wall to prevent the build-up of hydrostatic pressures as discussed in the section below, we recommend that the walls with level backfill be designed for the pressures in the table below. Due to the presence of expansive native soils, cantilever retaining walls backfilled with the native clay soil should be designed as restrained. If granular backfill materials are used, then the unrestrained values in the table can be used.

Table 7: Recommended Lateral Earth Pressures

Wall Condition	Lateral Earth Pressure*	Additional Surcharge Loads
Unrestrained – Cantilever Wall	45 pcf	⅓ of vertical loads at top of wall
Restrained – Braced Wall	45 pcf + 8H** psf	½ of vertical loads at top of wall

* Lateral earth pressures are based on an equivalent fluid pressure for level backfill conditions
** H is the distance in feet between the bottom of footing and top of retained soil

If adequate drainage cannot be provided behind the wall, an additional equivalent fluid pressure of 40 pcf should be added to the values above for both restrained and unrestrained walls for the portion of the wall that will not have drainage. Damp proofing or waterproofing of the walls may be considered where moisture penetration and/or efflorescence are not desired.

11.2 SEISMIC LATERAL EARTH PRESSURES

The 2019 California Building Code (CBC) states that lateral pressures from earthquakes should be considered in the design of basements and retaining walls. As we anticipate the walls for the puzzle lifts will be at least 8 feet tall, we checked seismic earth pressures for the anticipated proposed restrained walls in accordance with CBC 1803.5.12 and ASCE 7-16 Section 11.8.3 using the Design level earthquake. We developed seismic earth pressures for the proposed puzzle lift walls using interim recommendations generally based on refinement of the Mononobe-Okabe method (Lew et al., SEAOC 2010).

We anticipate the puzzle lift basement retaining wall will be approximately 8 feet tall. The peak ground accelerations at the site are greater than 0.40g so we checked the result of the total seismic increment when added to the recommended active earth pressure against the recommended fixed (restrained) wall earth pressures. Because the wall is restrained, or will act as a restrained wall, and will be designed for 45 pcf (equivalent fluid pressure) plus a uniform earth pressure of 8H psf, based on current recommendations for seismic earth pressures, it appears that active earth pressures plus a seismic increment do not exceed the fixed wall earth pressures. Therefore, an additional seismic increment above the design earth pressures is not required as long as the walls are designed for the restrained wall earth pressures recommended above in accordance with the CBC.

11.3 WALL DRAINAGE

Adequate drainage should be provided by a subdrain system behind all walls. This system should consist of a 4-inch minimum diameter perforated pipe placed near the base of the wall (perforations placed downward). The pipe should be bedded and backfilled with Class 2 Permeable Material per Caltrans Standard Specifications, latest edition. The permeable backfill should extend at least 12 inches out from the wall and to within 2 feet of outside finished grade. Alternatively, ½-inch to ¾-inch crushed rock may be used in place of the Class 2 Permeable Material provided the crushed rock and pipe are enclosed in filter fabric, such as Mirafi 140N or approved equivalent. The upper 2 feet of wall backfill should consist of compacted on-site soil. The subdrain outlet should be connected to a free-draining outlet or sump.

Miradrain, Geotech Drainage Panels, or equivalent drainage matting can be used for wall drainage as an alternative to the Class 2 Permeable Material or drain rock backfill. Horizontal strip drains connecting to the vertical drainage matting may be used in lieu of the perforated pipe and crushed rock section. The vertical drainage panel should be connected to the perforated pipe or horizontal drainage strip at the base of the wall, or to some other closed or through-wall system such as the TotalDrain system from AmerDrain. Sections of horizontal drainage strips should be connected with either the manufacturer's connector pieces or by pulling back the filter fabric, overlapping the panel dimples, and replacing the filter fabric over the connection. At corners, a corner guard, corner connection insert, or a section of crushed rock covered with filter fabric must be used to maintain the drainage path.

Drainage panels should terminate 18 to 24 inches from final exterior grade. The Miradrain panel filter fabric should be extended over the top of and behind the panel to protect it from intrusion of the adjacent soil.

11.4 BACKFILL

Where surface improvements will be located over the retaining wall backfill, backfill placed behind the walls with a PI less than 20 should be compacted to at least 95 percent relative compaction using light compaction equipment. If the soil's PI is 20 or greater, expansive soil criteria should be used as discussed in the "Compaction" section of this report. Where no surface improvements are planned, backfill should be compacted to at least 90 percent for soils with a PI less than 20. Expansive soil criteria should be followed for soils with a PI of 20 or greater. If heavy compaction equipment is used, the walls should be temporarily braced.

11.5 FOUNDATIONS

Retaining walls may be supported on a continuous and or spread footing designed in accordance with the recommendations presented in the "Foundations" section of this report.

SECTION 12: LIMITATIONS

This report, an instrument of professional service, has been prepared for the sole use of HC Investment Associates, LP specifically to support the design of the North 27th Street Mixed-Use Development project in San Jose, California. The opinions, conclusions, and recommendations presented in this report have been formulated in accordance with accepted geotechnical engineering practices that exist in Northern California at the time this report was prepared. No warranty, expressed or implied, is made or should be inferred.

Recommendations in this report are based upon the soil and groundwater conditions encountered during our subsurface exploration. If variations or unsuitable conditions are encountered during construction, Cornerstone must be contacted to provide supplemental recommendations, as needed.

HC Investment Associates, LP may have provided Cornerstone with plans, reports and other documents prepared by others. HC Investment Associates, LP understands that Cornerstone reviewed and relied on the information presented in these documents and cannot be responsible for their accuracy.

Cornerstone prepared this report with the understanding that it is the responsibility of the owner or his representatives to see that the recommendations contained in this report are presented to other members of the design team and incorporated into the project plans and specifications, and that appropriate actions are taken to implement the geotechnical recommendations during construction.

Conclusions and recommendations presented in this report are valid as of the present time for the development as currently planned. Changes in the condition of the property or adjacent properties may occur with the passage of time, whether by natural processes or the acts of other persons. In addition, changes in applicable or appropriate standards may occur through legislation or the broadening of knowledge. Therefore, the conclusions and recommendations presented in this report may be invalidated, wholly or in part, by changes beyond Cornerstone's control. This report should be reviewed by Cornerstone after a period of three (3) years has elapsed from the date of this report. In addition, if the current project design is changed, then Cornerstone must review the proposed changes and provide supplemental recommendations, as needed.

An electronic transmission of this report may also have been issued. While Cornerstone has taken precautions to produce a complete and secure electronic transmission, please check the electronic transmission against the hard copy version for conformity.

Recommendations provided in this report are based on the assumption that Cornerstone will be retained to provide observation and testing services during construction to confirm that conditions are similar to that assumed for design, and to form an opinion as to whether the work has been performed in accordance with the project plans and specifications. If we are not retained for these services, Cornerstone cannot assume any responsibility for any potential claims that may arise during or after construction as a result of misuse or misinterpretation of Cornerstone's report by others. Furthermore, Cornerstone will cease to be the Geotechnical-Engineer-of-Record if we are not retained for these services.

SECTION 13: REFERENCES

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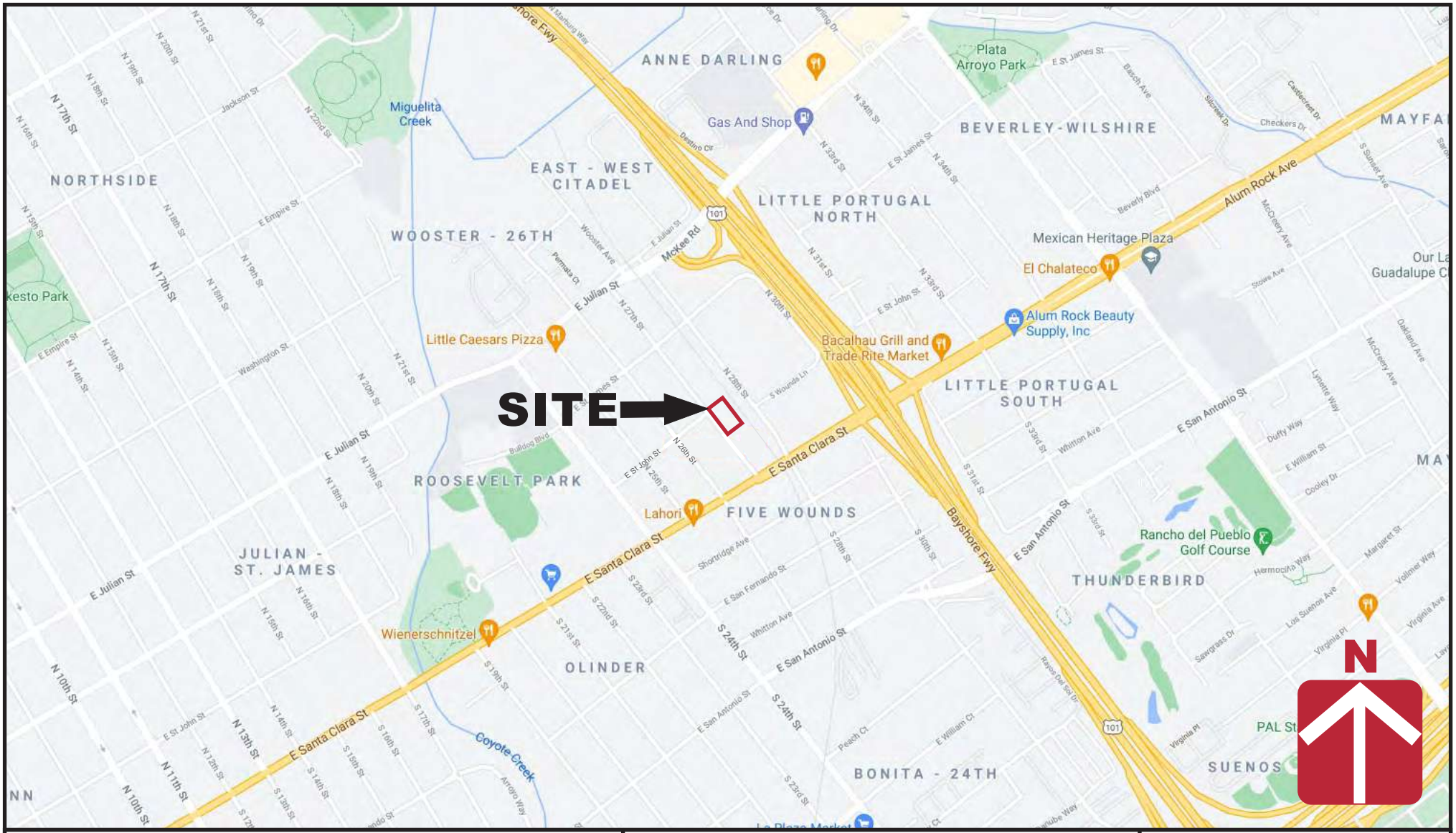


CORNERSTONE EARTH GROUP

Vicinity Map

North 27th Mixed-Use Development
70-80 North 27th Street
San Jose, CA

Project Number	1285-1-2
Figure Number	Figure 1
Date	November 2021
Drawn By	RRN

3-Level Puzzle Mechanical Lifts, Typical

5' Setback

Commercial 3,[illegible] sf

CPT-2

P-1

3/2/2

MPOE

P-2

Access to Public Park & Trail

24' Two-Way Aisle

169'

10' Setback

10/9/9

24' Two-Way Aisle

EB-1

CPT-1

21/20/20

21/20/20

5/4/4

4

10/9/9

Elec

24' Two-Way Aisle

EB-2

CPT-4

10' Setback

24' Two-Way Aisle

4

In-Only

Commercial 1,600 sf

Mail 450 sf

Leasing 550 sf

Commercial 1,800 sf

Out-Only

Trash Room

Transf

Trash Staging

CPT-3

5' Setback

300'

Approximate Site Boundary

North 27th Street

East St. John Street

Legend

Approximate location of exploratory boring (EB)

Approximate location of cone penetration test (CPT)

Approximate location of percolation test (P)

0 30 60

APPROXIMATE SCALE (FEET)

Base by Google Earth, dated 09/04/2020
Overlay: Sketch 09-10-21

Project Number 1285-1-2

Figure Number Figure 2

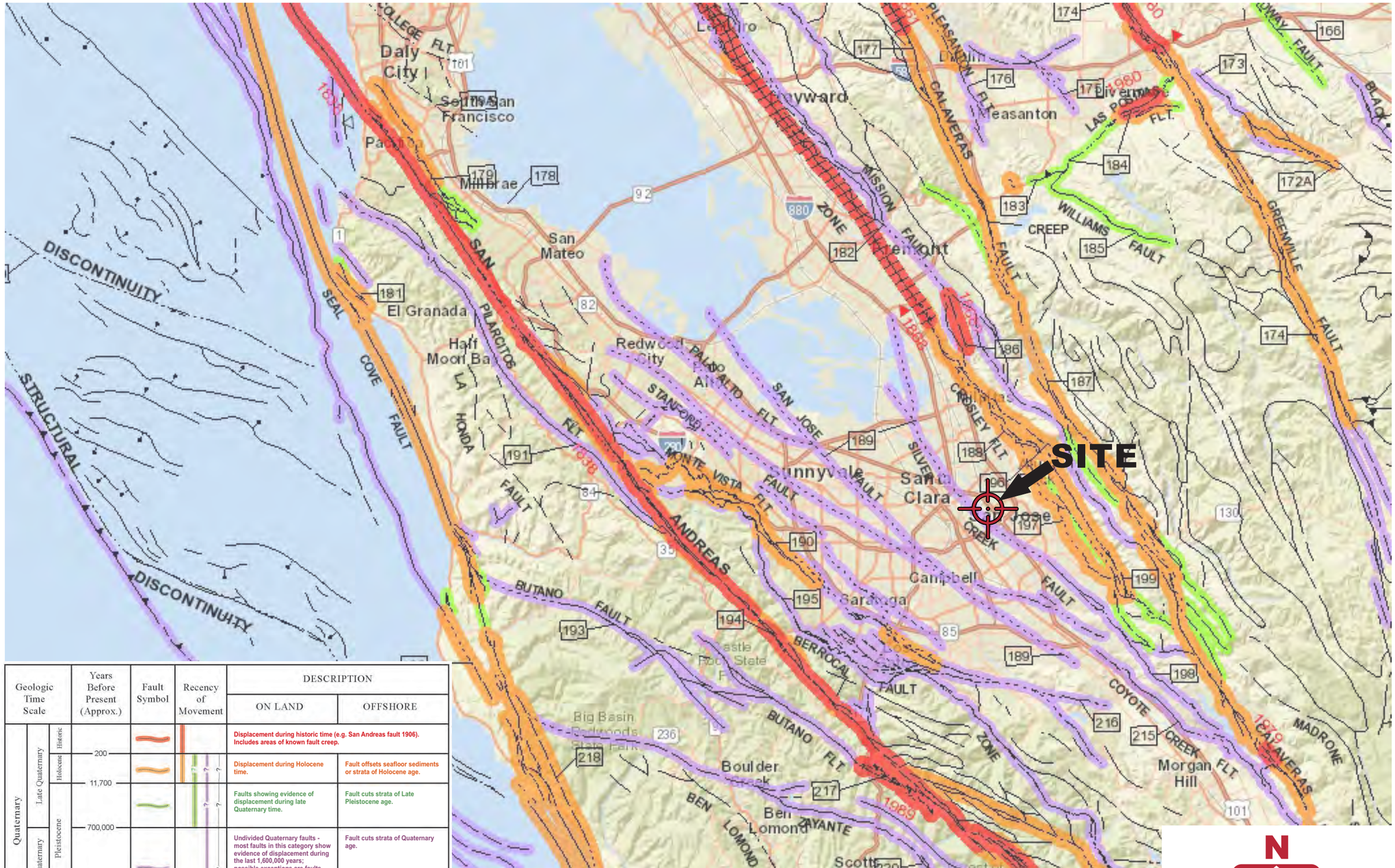
Date November 2021

Drawn By RRN

Site Plan

North 27th Mixed-Use Development
70-80 North 27th Street
San Jose, CA

CORNERSTONE EARTH GROUP



Base by California Geological Survey - 2010 Fault Activity Map of California (Jennings and Bryant, 2010)

Project Number: 1285-1-2

Figure Number: Figure 3

Drawn By: RRN

Date: November 2021

Regional Fault Map

North 27th Mixed-Use Development
70-80 North 27th Street
San Jose, CA

CORNERSTONE EARTH GROUP

CORNERSTONE EARTH GROUP

FIGURE 4B

CPT NO. 2

PROJECT/CPT DATA

Project Title	North 27th Street Mixed-Use
Project No.	1285-1-2
Project Manager	NSD

SEISMIC PARAMETERS

Controlling Fault	Hayward	
Earthquake Magnitude (Mw)	7.08	
PGA (Amax)	0.7	(g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet)	16.3
Design Water Depth (feet)	8
Ave. Unit Weight Above GW (pcf)	120
Ave. Unit Weight Below GW (pcf)	122

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM	8	FEET
	0.01	(Inches)
LIQUEFACTION SETTLEMENT FROM	50	FEET
	0.18	(Inches)
TOTAL SEISMIC SETTLEMENT	**0.2**	**INCHES**

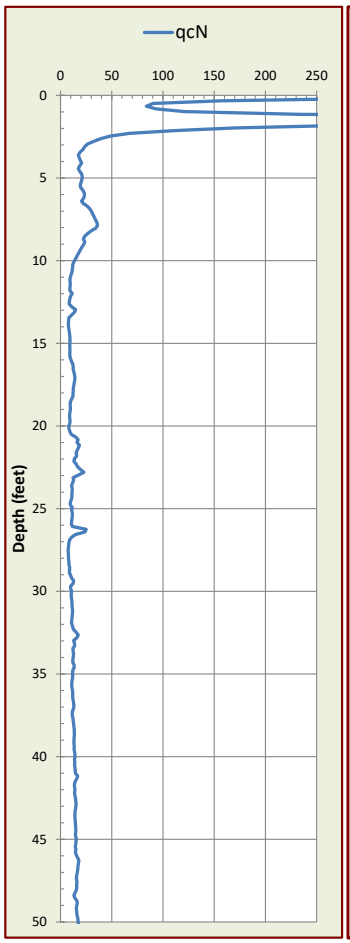
POTENTIAL LATERAL DISPLACEMENT

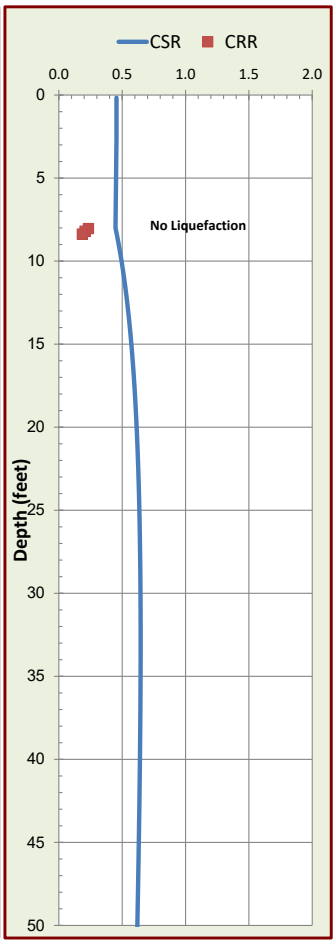
LDI[2]	0.13	L/H	118.4
LDI[1] Corrected for Distance	0.02	(4 < L/H < 40)	

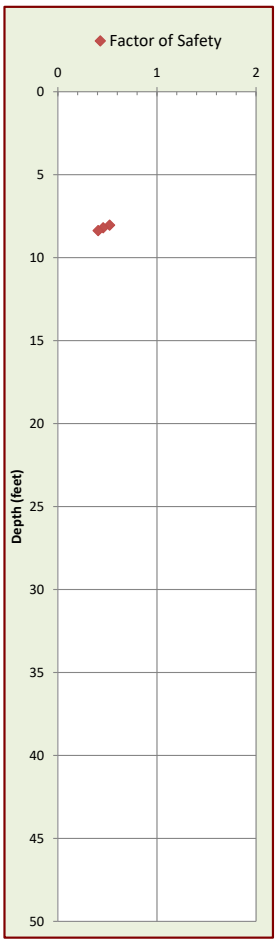
EXPECTED RANGE OF DISPLACEMENT

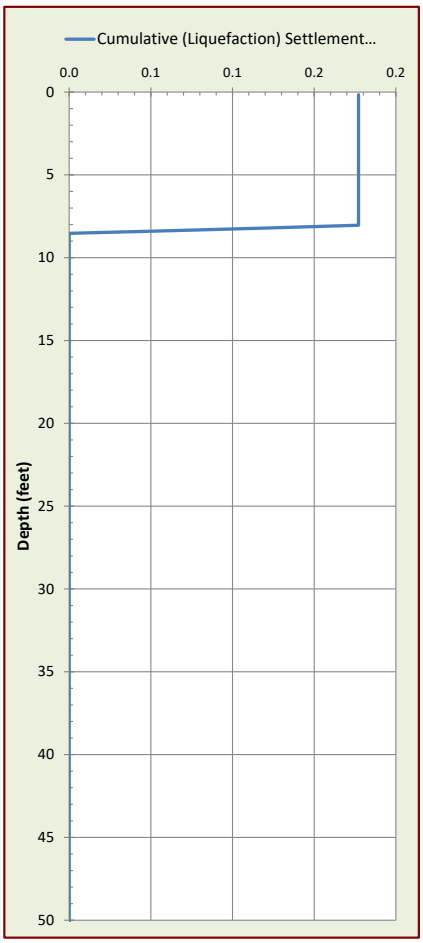
0.0 to 0.0 feet

[1]Not Valid for L/H Values < 4 and > 40.
[2]LDI Values Only Summed to 2H Below Grade.









APPENDIX A: FIELD INVESTIGATION

The field investigation consisted of a surface reconnaissance and a subsurface exploration program using truck-mounted, hollow-stem auger drilling equipment and 25-ton truck-mounted Cone Penetration Test equipment. Two 8-inch-diameter exploratory borings were drilled on October 19, 2021 to depths of approximately 30 to 50 feet. Four CPT soundings were also performed in accordance with ASTM D 5778-95 (revised, 2002) on October 14, 2021 and October 18, 2021, to depths ranging from approximately 50 to 90 feet. The approximate locations of exploratory borings and CPTs are shown on the Site Plan, Figure 2. The soils encountered were continuously logged in the field by our representative and described in accordance with the Unified Soil Classification System (ASTM D2488). Boring logs, as well as a key to the classification of the soil and bedrock, are included as part of this appendix.

Boring and CPT locations were approximated using existing site boundaries and other site features as references. Boring and CPT elevations were based on interpolation of plan contours were not determined. The locations of the borings and CPTs should be considered accurate only to the degree implied by the method used.

Representative soil samples were obtained from the borings at selected depths. All samples were returned to our laboratory for evaluation and appropriate testing. The standard penetration resistance blow counts were obtained by dropping a 140-pound hammer through a 30-inch free fall. The 2-inch O.D. split-spoon sampler was driven 18 inches and the number of blows was recorded for each 6 inches of penetration (ASTM D1586). 2.5-inch I.D. samples were obtained using a Modified California Sampler driven into the soil with the 140-pound hammer previously described. Relatively undisturbed samples were also obtained with 2.875-inch I.D. Shelby Tube sampler which were hydraulically pushed. Unless otherwise indicated, the blows per foot recorded on the boring log represent the accumulated number of blows required to drive the last 12 inches. The various samplers are denoted at the appropriate depth on the boring logs.

The CPT involved advancing an instrumented cone-tipped probe into the ground while simultaneously recording the resistance at the cone tip (q_c) and along the friction sleeve (f_s) at approximately 5-centimeter intervals. Based on the tip resistance and tip to sleeve ratio (R_f), the CPT classified the soil behavior type and estimated engineering properties of the soil, such as equivalent Standard Penetration Test (SPT) blow count, internal friction angle within sand layers, and undrained shear strength in silts and clays. A pressure transducer behind the tip of the CPT cone measured pore water pressure (u_2). Graphical logs of the CPT data is included as part of this appendix.

Field tests included an evaluation of the unconfined compressive strength of the soil samples using a pocket penetrometer device. The results of these tests are presented on the individual boring logs at the appropriate sample depths.

Attached boring and CPT logs and related information depict subsurface conditions at the locations indicated and on the date designated on the logs. Subsurface conditions at other locations may differ from conditions occurring at these boring and CPT locations. The passage of time may result in altered subsurface conditions due to environmental changes. In addition,

any stratification lines on the logs represent the approximate boundary between soil types and the transition may be gradual.

APPENDIX B: LABORATORY TEST PROGRAM

The laboratory testing program was performed to evaluate the physical and mechanical properties of the soils retrieved from the site to aid in verifying soil classification.

Moisture Content: The natural water content was determined (ASTM D2216) on 21 samples of the materials recovered from the borings. These water contents are recorded on the boring logs at the appropriate sample depths.

Dry Densities: In place dry density determinations (ASTM D2937) were performed on 20 samples to measure the unit weight of the subsurface soils. Results of these tests are shown on the boring logs at the appropriate sample depths.

Washed Sieve Analyses: The percent soil fraction passing the No. 200 sieve (ASTM D1140) was determined on one sample of the subsurface soils to aid in the classification of these soils. The result of these test is shown on the boring log at the appropriate sample depth.

Plasticity Index: Two Plasticity Index determinations (ASTM D4318) were performed on samples of the subsurface soils to measure the range of water contents over which this material exhibits plasticity. The Plasticity Index was used to classify the soil in accordance with the Unified Soil Classification System and to evaluate the soil expansion potential. Results of these tests are shown on the boring logs at the appropriate sample depths.

Undrained-Unconsolidated Triaxial Shear Strength: The undrained shear strength was determined on one relatively undisturbed sample by unconsolidated-undrained triaxial shear strength testing (ASTM D2850). The result of this test is included as part of this appendix.

Consolidation: One consolidation test (ASTM D2435) was performed on a relatively undisturbed sample of the subsurface clayey soils to assist in evaluating the compressibility property of this soil. Results of the consolidation test are presented graphically in this appendix.

APPENDIX E

GHG REDUCTION STRATEGY CHECKLIST

DEPARTMENT OF PLANNING, BUILDING AND CODE ENFORCEMENT

Purpose of the Compliance Checklist

In 2020, the City adopted a Greenhouse Gas Reduction Strategy (GHGRS) that outlines the actions the City will undertake to achieve its proportional share of State greenhouse gas (GHG) emission reductions for the interim target year 2030. The purpose of the Greenhouse Gas Reduction Strategy Compliance Checklist (Checklist) is to:

- Implement GHG reduction strategies from the 2030 GHGRS to new development projects.
- Provide a streamlined review process for proposed new development projects that are subject to discretionary review and trigger environmental review pursuant to the California Environmental Quality Act (CEQA).

The 2030 GHGRS presents the City's comprehensive path to reduce GHG emissions to achieve the 2030 reduction target, based on SB 32, BAAQMD, and OPR. Additionally, the 2030 GHGRS leverages other important City plans and policies; including the General Plan, Climate Smart San José, and the City Municipal Code in identifying reductions strategies that achieve the City's target. CEQA Guidelines Section 15183.5 allows for public agencies to analyze and mitigate GHG emissions as part of a larger plan for the reduction of greenhouse gases. Accordingly, the City of San José's 2030 GHGRS represents San José's qualified climate action plan in compliance with CEQA.

As described in the 2030 GHGRS, these GHG reductions will occur through a combination of City initiatives in various plans and policies and will provide reductions from both existing and new developments. This Compliance Checklist specifically applies to proposed discretionary projects that require environmental review pursuant to CEQA. Therefore, the Checklist is a critical implementation tool in the City's overall strategy to reduce GHG emissions. Implementation of applicable reduction actions in new development projects will help the City achieve incremental reductions toward its target. Per the 2030 GHGRS, the City will monitor strategy implementation and make updates, as necessary, to maintain an appropriate trajectory to the 2030 GHG target.

Pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b), a project's incremental contribution to a cumulative GHG emissions effect may be determined not to be cumulatively considerable if it complies with the requirements of the GHGRS.

Instructions for Compliance Checklist

Applicants shall complete the following sections to demonstrate conformance with the City of San José 2030 Greenhouse Gas Reduction Strategy for the proposed project. All projects must complete Section A. General Plan Policy Conformance and Section B. Greenhouse Gas Reduction Strategies. Projects that propose alternative GHG mitigation measures must also complete Section C. Alternative Project Measures and Additional GHG Reductions.

A. General Plan Policy Compliance

Projects need to demonstrate consistency with the Envision San José 2040 General Plan's relevant policies for Land Use & Design, Transportation, Green Building, and Water Conservation, enumerated in Table A. All applicants shall complete the following steps.

1. Complete Table A, Item #1 to demonstrate the project's consistency with the General Plan Land Use and Circulation Diagram.

2. Complete Table A, Items #2 through #4 to demonstrate the project's consistency with General Plan policies[1] related to green building; pedestrian, bicycle & transit site design; and water conservation and urban forestry, as applicable. For each policy listed, mark the relevant yes/no check boxes to indicate project consistency, and provide a qualitative description of how the policy is implemented in the proposed project or why the policy is not applicable to the proposed project. Qualitative descriptions can be included in Table A or provided as separate attachments. This explanation will provide the basis for analysis in the CEQA document.

B. Greenhouse Gas Reduction Strategies

Table B identifies the GHGRS strategies and recommended consistency options. Projects need to demonstrate consistency with the GHGRS reduction strategies listed in Table B or document why the strategies are not applicable or are infeasible. The corresponding GHGRS strategies are indicated in the table to provide additional context, with the full text of the strategies preceding Table B.

Residential projects must complete Table B, Part 1 and 2; Non-residential projects must complete Table B, Part 2 only. All applicants shall complete the following steps for Table B.

1. Review the project consistency options described in the column titled 'GHGRS Strategy and Consistency Options'.

2. Use the check boxes in the column titled "Project Conformance" to indicate if the strategy is 'Proposed', 'Not Applicable', 'Not Feasible', or if there is an 'Alternative Measure Proposed'.

[1] The lists in items # 2-4 do not represent all General Plan policies but allow projects to demonstrate consistency and achievement of policies that are related to quantified reduction estimates in the 2030 GHGRS.

3. Provide a qualitative analysis of the proposed project's compliance with the GHGRS strategies in the column titled "Description of Project Measure". This will be the basis for CEQA analysis to demonstrate compliance with the 2030 GHGRS and by extension, with SB 32. The qualitative analysis should provide:

    a. A description of which consistency options are included as part of the proposed project, or

    b. A description of why the strategy is not applicable to the proposed project, or

    c. A description of why the consistency options are infeasible. If applicants select 'Not Feasible' or 'Alternative Measure Proposed', they must complete Table C to document what alternative project measures will be implemented to achieve a similar level of greenhouse gas reduction and how those reduction estimates were calculated.

C. Alternative Project Measures and Additional GHG Reductions

Projects that propose alternative GHG mitigation measures to those identified in Table B or propose to include additional GHG mitigation measures beyond those described in Tables A and B, shall provide a summary explanation of the proposed measures and demonstrate efficiency or greenhouse gas reductions achievable though the proposed measures. Documentation for these alternative or additional project measures shall be documented in Table C. Any applicants who select 'Not Feasible' or 'Alternative Measure Proposed' in Table B must complete the following steps for Table C.

1. In the column titled "Description of Proposed Measure" provide a qualitative description of what measure will be implemented, why it is proposed, and how it will reduce GHG emissions.

2. In the column titled "Description of GHG Reduction Estimate" demonstrate how the alternative project measure would achieve the same or greater level of greenhouse gas reductions as the GHGRS strategy it replaces. Documentation or calculation files can be attached separately.

3. In the column titled "Proposed Measure Implementation" identify how the measure will be implemented: incorporated as part of the project design or as an additional measure that is not part of the project (e.g., purchase of carbon offsets).

Compliance Checklist

Evaluation of Project Conformance with the 2030 Greenhouse Gas Reduction Strategy

Table A: General Plan Consistency

Development Type: ☐ Commercial X Residential ☐ Office ☐ Other: Specify

1) Consistency with the Land Use/Transportation Diagram (Land Use and Density)	Yes	No
Is the proposed Project consistent with the Land Use/Transportation Diagram?	X	☐
If not, and the proposed project includes a General Plan Amendment, does the proposed amendment decrease GHG emissions (in absolute terms or per capita, per employee, per service population) below the level assumed in the GHGRS based on the existing planned land use? (The project could have a higher density, mix of uses, or other features that would reduce GHG emissions compared to the planned land use).[2]	☐	☐
If not, would the proposed project and the General Plan Amendment increase GHG emissions (in absolute terms or per capita, per employee, per service population)? Project is not consistent with GHGRS and further modeling will be required to determine if additional mitigation measures are necessary.	☐	☐

Response documentation: *[Either here or as an attachment]*

The project is within the approved Five Wounds Urban Village Plan and is therefore consistent with the General Plan. The project conforms to the development standards set forth in the Urban Village plan.

[2] For example, a General Plan Amendment to change use from single-family residential to multi-family residential or a General Plan Amendment to change the use from regional-serving commercial to mixed-use urban in a transit-served area might reduce travel demand, and therefore GHG emissions from mobile sources.

2) Implementation of Green Building Measures	Yes	No
***MS-2.2**: Encourage maximized use of on-site generation of renewable energy for all new and existing buildings.*	X	☐
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] *Project will install solar panels. Solar panels have been identified on roof plan.*		
***MS-2.3**: Encourage consideration of solar orientation, including building placement, landscaping, design and construction techniques for new construction to minimize energy consumption.*	X	☐
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] *Garage uses natural ventilation. Also, roof decks take advantage of unblocked sunlight throughout the entire day.*		
***MS-2.7**: Encourage the installation of solar panels or other clean energy power generation sources over parking areas.*	X	☐
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] *Will install solar panels on the rooftop as shown on the roof plan.*		
***MS-2.11**: Require new development to incorporate green building practices, including those required by the Green Building Ordinance. Specifically, target reduced energy use through construction techniques (e.g., design of building envelopes and systems to maximize energy performance), through architectural design (e.g., design to maximize cross ventilation and interior daylight) and through site design techniques (e.g., orienting buildings on sites to maximize the effectiveness of passive solar design).*	X	☐
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] *Interior daylight is increased by having some corridors to be single-loaded, thus allowing natural light to penetrate deep into the interior of the building.*		
***MS-16.2**: Promote neighborhood-based distributed clean/renewable energy generation to improve local energy security and to reduce the amount of energy wasted in transmitting electricity over long distances.*	X	☐
Not applicable	☐	
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] *Project is an urban infill project and electricity transmission is available within short distances. Energy in the form of electricity and natural gas is provided by PG&E and is currently available to the existing retail commercial uses on the site.*		

3) Pedestrian, Bicycle & Transit Site Design Measures	**Yes**	**No**
***CD-2.1**: Promote the Circulation Goals and Policies in the Envision San José 2040 General Plan. Create streets that promote pedestrian and bicycle transportation by following applicable goals and policies in the Circulation section of the Envision San José 2040 General Plan.*		
a) Design the street network for its safe shared use by pedestrians, bicyclists, and vehicles. Include elements that increase driver awareness.	X	☐
b) Create a comfortable and safe pedestrian environment by implementing wider sidewalks, shade structures, attractive street furniture, street trees, reduced traffic speeds, pedestrian-oriented lighting, mid-block pedestrian crossings, pedestrian-activated crossing lights, bulb-outs and curb extensions at intersections, and on-street parking that buffers pedestrians from vehicles.	X	☐
c) Consider support for reduced parking requirements, alternative parking arrangements, and Transportation Demand Management strategies to reduce area dedicated to parking and increase area dedicated to employment, housing, parks, public art, or other amenities. Encourage de-coupled parking to ensure that the value and cost of parking are considered in real estate and business transactions.	X	☐
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] *Project is located in an area that promotes bicycle ridership.* *The future trail along the eastern edge will attract cyclists.* *Parking area is minimized by using a 3-level "puzzle" mechanical parking-lift system.*		
***CD-2.5**: Integrate Green Building Goals and Policies of the Envision San José 2040 General Plan into site design to create healthful environments. Consider factors such as shaded parking areas, pedestrian connections, minimization of impervious surfaces, incorporation of stormwater treatment measures, appropriate building orientations, etc.*	X	☐
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] *Parking would be shaded and covered.* *Podium courtyards are landscaped to reduce impervious surfaces.* *Stormwater treatment measures are incorporated.*		

	Yes	No
***CD-2.11**: Within the Downtown and Urban Village Overlay areas, consistent with the minimum density requirements of the pertaining Land Use/Transportation Diagram designation, avoid the construction of surface parking lots except as an interim use, so that long-term development of the site will result in a cohesive urban form. In these areas, whenever possible, use structured parking, rather than surface parking, to fulfill parking requirements. Encourage the incorporation of alternative uses, such as parks, above parking structures.*	X	☐
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] *Project has no surface parking at all.* *Mechanical parking-lift system would be used inside the garage.* *The top of the garage is being utilized: Residential Units would sit on top along the perimeter of the garage, while the central area is an open-air courtyard for outdoor recreation.*		
***CD-3.2**: Prioritize pedestrian and bicycle connections to transit, community facilities (including schools), commercial areas, and other areas serving daily needs. Ensure that the design of new facilities can accommodate significant anticipated future increases in bicycle and pedestrian activity.*	X	☐
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] *Plenty of bicycle lockers are placed in a convenient location near the ground floor lobby to encourage the use of bikes.* *Pedestrians and bicycle riders would have access from the site to the future BART station, which would be, once constructed, within walking distance of the site.*		
***CD-3.4**: Encourage pedestrian cross-access connections between adjacent properties and require pedestrian and bicycle connections to streets and other public spaces, with particular attention and priority given to providing convenient access to transit facilities. Provide pedestrian and vehicular connections with cross-access easements within and between new and existing developments to encourage walking and minimize interruptions by parking areas and curb cuts.*	X	☐
Not applicable		☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] *Project has convenient access to BART station* *Project site does not require a cross-access easement.* *Project would include an approximately 14-foot-wide pedestrian pathway on the north side of the building to allow street and project access to the future Five Wounds trail to the east of the site. Project would also include a trail entrance that would be located at the southeast corner of the site.*		

***LU-3.5**: Balance the need for parking to support a thriving Downtown with the need to minimize the impacts of parking upon a vibrant pedestrian and transit oriented urban environment. Provide for the needs of bicyclists and pedestrians, including adequate bicycle parking areas and design measures to promote bicyclist and pedestrian safety.*	X	☐
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] *We have provided adequate bicycle parking areas on each floor of the building. (However, project site is not in Downtown.)*		

	Yes	**No**
***TR-2.8:** Require new development to provide on-site facilities such as bicycle storage and showers, provide connections to existing and planned facilities, dedicate land to expand existing facilities or provide new facilities such as sidewalks and/or bicycle lanes/paths, or share in the cost of improvements.*	X	☐
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] *Bicycle storage is provided on-site. Connections to existing facilities are enhanced, as we have provided direct access from the first floor to bike lanes and trail.*		

***TR-7.1:** Require large employers to develop TDM programs to reduce the vehicle trips and vehicle miles generated by their employees through the use of shuttles, provision for car-sharing, bicycle sharing, carpool, parking strategies, transit incentives and other measures.*	X	☐
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] *The parking provided in the project has been reduced because developer has intended to use TDM programs.*		

***TR-8.5:** Promote participation in car share programs to minimize the need for parking spaces in new and existing development.*	X	☐
Not applicable		☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] *Car-sharing is expected to be one of the measures in the TDM.*		

4) Water Conservation and Urban Forestry Measures	**Yes**	**No**
***MS-3.1**: Require water-efficient landscaping, which conforms to the State's Model Water Efficient Landscape Ordinance, for all new commercial, institutional, industrial and developer-installed residential development unless for recreation needs or other area functions.*	X	☐
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment]		

This project's landscape design conforms to WELO.		
	Yes	**No**
***MS-3.2**: Promote the use of green building technology or techniques that can help reduce the depletion of the City's potable water supply, as building codes permit. For example, promote the use of captured rainwater, graywater, or recycled water as the preferred source for non-potable water needs such as irrigation and building cooling, consistent with Building Codes or other regulations.*		X
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment]		
***MS-19.4**: Require the use of recycled water wherever feasible and cost-effective to serve existing and new development.*		X
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] If construction budget allows, this project will use captured graywater as the preferred source for irrigation.		
***MS-21.3**: Ensure that San José's Community Forest is comprised of species that have low water requirements and are well adapted to its Mediterranean climate. Select and plant diverse species to prevent monocultures that are vulnerable to pest invasions. Furthermore, consider the appropriate placement of tree species and their lifespan to ensure the perpetuation of the Community Forest.*	X	
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] *Landscape design along the eastern and western edges of the site will take this into account.*		
***MS-26.1**: As a condition of new development, require the planting and maintenance of both street trees and trees on private property to achieve a level of tree coverage in compliance with and that implements City laws, policies or guidelines.*	X	☐
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] *Street trees on N. 27th Street and along the proposed 14-foot path on the north side will comply with City's requirement on tree coverage.*		
	Yes	**No**
***ER-8.7**: Encourage stormwater reuse for beneficial uses in existing infrastructure and future development through the installation of rain barrels, cisterns, or other water storage and reuse facilities.*		X
Not applicable	☐	☐
Describe how the project is consistent or why the measure is not applicable. [Either here or as an attachment] Stormwater reuse is being studied.		

GHGRS Strategies

GHGRS #1: The City will implement the San José Clean Energy program to provide residents and businesses access to cleaner energy at competitive rates.

GHGRS #2: The City will implement its building reach code ordinance (adopted September 2019) and its prohibition of natural gas infrastructure ordinance (adopted October 2019) to guide the city's new construction toward zero net carbon (ZNC) buildings.

GHGRS #3: The City will expand development of rooftop solar energy through the provision of technical assistance and supportive financial incentives to make progress toward the Climate Smart San José goal of becoming a one-gigawatt solar city.

GHGRS #4: The City will support a transition to building decarbonization through increased efficiency improvements in the existing building stock and reduced use of natural gas appliances and equipment.

GHGRS #5: As an expansion to Climate Smart San José, the City will update its Zero Waste Strategic Plan and reassess zero waste strategies. Throughout the development of the update, the City will continue to divert 90 percent of waste away from landfills through source reduction, recycling, food recovery and composting, and other strategies.

GHGRS #6: The City will continue to be a partner in the Caltrain Modernization Project to enhance local transit opportunities while simultaneously improving the city's air quality.

GHGRS #7: The City will expand its water conservation efforts to achieve and sustain long-term per capita reductions that ensure a reliable water supply with a changing climate, through regional partnerships, sustainable landscape designs, green infrastructure, and water-efficient technology and systems.

Table B: 2030 Greenhouse Gas Reduction Strategy Compliance

GHGRS Strategy and Consistency Options	Description of Project Measure	Project Conformance
PART 1: RESIDENTIAL PROJECTS ONLY		
Zero Net Carbon Residential Construction 1. Achieve/exceed the City's Reach Code, and 2. Exclude natural gas infrastructure in new construction, or 3. Install on-site renewable energy systems or participate in a community solar program to offset 100% of the project's estimated energy demand, or 4. Participate in San José Clean Energy at the Total Green level (i.e., 100% carbon-free electricity) for electricity accounts associated with the project until which time SJCE achieves 100% carbon-free electricity for all accounts. **Supports Strategies**: GHGRS #1, GHGRS #2, GHGRS #3	*Describe which, if any, project consistency options from the leftmost column you are implementing.* *OR,* *Describe why this strategy is not applicable to your project.* *OR,* *Describe why such measures are infeasible.* *Project will achieve the City's Reach Code and exclude natural gas infrastructure. The Project will enroll in a SJCE program.*	X Proposed ☐ Not Applicable ☐ Not Feasible* ☐ Alternative Measure Proposed ** The 2030 GHGRS assumed this strategy would be feasible for 50% of residential units constructed between 2020 and 2030.*
PART 2: RESIDENTIAL AND NON-RESIDENTIAL PROJECTS		
Renewable Energy Development 1. Install solar panels, solar hot water, or other clean energy power generation sources on development sites, or 2. Participate in community solar programs to support development of renewable energy in the community, or 3. Participate in San José Clean Energy at the Total Green level (i.e., 100% carbon-free electricity) for electricity accounts associated with the project. **Supports Strategies**: GHGRS #1, GHGRS #3	*Describe which, if any, project consistency options from the leftmost column you are implementing.* *OR,* *Describe why this strategy is not applicable to your project.* *OR,* *Describe why such measures are infeasible.* *Project will install solar panels.*	☐ See Part 1 (Residential projects only) X Proposed ☐ Not Applicable ☐ Not Feasible ☐ Alternative Measure Proposed

GHGRS Strategy and Consistency Options	Description of Project Measure	Project Conformance
Building Retrofits – Natural Gas[3] This strategy only applies to projects that include a retrofit of an existing building. If the proposed project does not include a retrofit, select "Not Applicable" in the Project Conformance column. 1. Replace an existing natural gas appliance with an electric alternative (e.g., space heater, water heater, clothes dryer), or 2. Replace an existing natural gas appliance with a high-efficiency model **Supports Strategies:** GHGRS #4	*Describe which, if any, project consistency options from the leftmost column you are implementing.* *OR,* *Describe why this strategy is not applicable to your project.* *OR,* *Describe why such measures are infeasible.* *Project does not include a retrofit.*	☐ Proposed X Not Applicable ☐ Not Feasible ☐ Alternative Measure Proposed
Zero Waste Goal 1. Provide space for organic waste (e.g., food scraps, yard waste) collection containers, and/or 2. Exceed the City's construction & demolition waste diversion requirement. **Supports Strategies:** GHGRS #5	*Describe which, if any, project consistency options from the leftmost column you are implementing.* *OR,* *Describe why this strategy is not applicable to your project.* *OR,* *Describe why such measures are infeasible.* *Project will provide space for organic waste.*	X Proposed ☐ Not Applicable ☐ Not Feasible ☐ Alternative Measure Proposed

[3] GHGRS Strategy #4 applies to existing building retrofits and not to new construction; Strategy #2 applies to new construction to reduce natural gas related GHG emissions

GHGRS Strategy and Consistency Options	Description of Project Measure	Project Conformance
Caltrain Modernization 1. For projects located within ½ mile of a Caltrain station, establish a program through which to provide project tenants and/or residents with free or reduced Caltrain passes or 2. Develop a program that provides project tenants and/or residents with options to reduce their vehicle miles traveled (e.g., a TDM program), which could include transit passes, bike lockers and showers, or other strategies to reduce project related VMT. **Supports Strategies:** GHGRS #6	*Describe which, if any, project consistency options from the leftmost column you are implementing.* *OR,* *Describe why this strategy is not applicable to your project.* *OR,* *Describe why such measures are infeasible.* *Project will provide residents, through a TDM program, transit passes and bike lockers to reduce project-related VMT.*	X Proposed ☐ Not Applicable ☐ Not Feasible ☐ Alternative Measure Proposed
Water Conservation 1. Install high-efficiency appliances/fixtures to reduce water use, and/or include water-sensitive landscape design, and/or 2. Provide access to reclaimed water for outdoor water use on the project site. **Supports Strategies:** GHGRS #7	*Describe which, if any, project consistency options from the leftmost column you are implementing.* *OR,* *Describe why this strategy is not applicable to your project.* *OR,* *Describe why such measures are infeasible.* *Project will include water-sensitive landscape design.*	X Proposed ☐ Not Applicable ☐ Not Feasible ☐ Alternative Measure Proposed

Table C: Applicant Proposed Greenhouse Gas Reduction Measures

Description of Proposed Measure	Description of GHG Reduction Estimate	Proposed Measure Implementation
[Describe the proposed project measure and why it is proposed] **Supports Strategies/Sectors:** GHGRS #	*[Demonstrate the effectiveness of the proposed measure to reduce the project's GHG emissions.* *Include a description of how your measure will reduce emissions and provide supporting quantification documentation/assumptions.]*	☐ Part of Design ☐ Additional Measure
[Describe the proposed project measure and why it is proposed] **Supports Strategies/Sectors:** GHGRS #	*[Demonstrate the effectiveness of the proposed measure to reduce the project's GHG emissions.* *Include a description of how your measure will reduce emissions and provide supporting quantification documentation/assumptions.]*	☐ Part of Design ☐ Additional Measure
[Describe the proposed project measure and why it is proposed] **Supports Strategies/Sectors:** GHGRS #	*[Demonstrate the effectiveness of the proposed measure to reduce the project's GHG emissions.* *Include a description of how your measure will reduce emissions and provide supporting quantification documentation/assumptions.]*	☐ Part of Design ☐ Additional Measure
[Describe the proposed project measure and why it is proposed] **Supports Strategies/Sectors:** GHGRS #	*[Demonstrate the effectiveness of the proposed measure to reduce the project's GHG emissions.* *Include a description of how your measure will reduce emissions and provide supporting quantification documentation/assumptions.]*	☐ Part of Design ☐ Additional Measure

APPENDIX F

PHASE I ENVIRONMENTAL SITE ASSESSMENT

CORNERSTONE EARTH GROUP

TYPE OF SERVICES	Phase I Environmental Site Assessment
LOCATION	70-80 North 27th Street San Jose, California
CLIENT	HC Investment Associates, LP
PROJECT NUMBER	1285-1-1
DATE	May 11, 2021

CORNERSTONE EARTH GROUP

Type of Services	**Phase I Environmental Site Assessment**
Location	**70-80 North 27th Street** **San Jose, California**
Client	**HC Investment Associates, LP**
Client Address	**1700 Embarcadero Road** **Palo Alto, California 24303**
Project Number	**1285-1-1**
Date	**May 11, 2021**

Prepared by

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CORNERSTONE EARTH GROUP

Type of Services	**Phase I Environmental Site Assessment**
Location	**70-80 North 27th Street** **San Jose, California**

SECTION 1: INTRODUCTION

This report presents the results of the Phase I Environmental Site Assessment (ESA) performed at 70-80 North 27th Street in San Jose, California (Site) as shown on Figures 1 and 2. This work was performed for HC Investment Associates, LP in accordance with our April 6, 2021 Agreement (Agreement).

1.1 PURPOSE

The scope of work presented in the Agreement was prepared in general accordance with ASTM E 1527-13 titled, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process" (ASTM Standard). The ASTM Standard is in general compliance with the Environmental Protection Agency (EPA) rule titled, "Standards and Practices for All Appropriate Inquiries; Final Rule" (AAI Rule). The purpose of this Phase I ESA is to strive to identify, to the extent feasible pursuant to the scope of work presented in the Agreement, Recognized Environmental Conditions at the property.

As defined by ASTM E 1527-13, the term Recognized Environmental Condition means the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not Recognized Environmental Conditions.

Cornerstone Earth Group, Inc. (Cornerstone) understands that HC Investment Associates, LP intends to redevelop the Site with a mixed-use podium structure consisting of ground floor commercial and parking space, second floor parking, and three levels of residential units. We performed this Phase I ESA to support HC Investment Associates, LP in evaluation of Recognized Environmental Conditions at the Site. This Phase I ESA is intended to reduce, but not eliminate, uncertainty regarding the potential for Recognized Environmental Conditions at the Site.

1.2 SCOPE OF WORK

As presented in our Agreement, the scope of work performed for this Phase I ESA included the following:

- A reconnaissance of the Site to note readily observable indications of significant hazardous materials releases to structures, soil or groundwater.

- Drive-by observation of adjoining properties to note readily apparent hazardous materials activities that have or could significantly impact the Site.
- Acquisition and review of a regulatory agency database report of public records for the general area of the Site to evaluate potential impacts to the Site from reported contamination incidents at nearby facilities.
- Review of readily available information on file at selected governmental agencies to help evaluate past and current Site use and hazardous materials management practices.
- Review of readily available maps and aerial photographs to help evaluate past and current Site uses.
- Interviews with persons reportedly knowledgeable of existing and prior Site uses.
- Preparation of a written report summarizing our findings and recommendations.

The limitations for the Phase I ESA are presented in Section 10; the terms and conditions of our Agreement are presented in Appendix A.

1.3 ASSUMPTIONS

In preparing this Phase I ESA, Cornerstone assumed that all information received from interviewed parties is true and accurate. In addition, we assumed that all records obtained by other parties, such as regulatory agency databases, maps, related documents and environmental reports prepared by others are accurate and complete. We also assumed that the boundaries of the Site, based on information provided by HC Investment Associates, LP, are as shown on Figure 2. We have not independently verified the accuracy or completeness of any data received.

1.4 ENVIRONMENTAL PROFESSIONAL

This Phase I ESA was performed by Stason I. Foster, P.E. and Christopher J. Heiny, P.G., Environmental Professionals who meet the qualification requirements described in ASTM E 1527-13 and 40 CFR 312 § 312.10 based on professional licensing, education, training and experience to assess a property of the nature, history and setting of the Site.

SECTION 2: SITE DESCRIPTION

This section describes the Site as of the date of this Phase I ESA. The location of the Site is shown on Figures 1 and 2. Tables 1 through 3 summarize general characteristics of the Site and adjoining properties. The Site is described in more detail in Section 7, based on our on-Site observations.

2.1 LOCATION AND OWNERSHIP

Table 1 describes the physical location, and ownership of the property, based on information provided by HC Investment Associates, LP.

Table 1. Location and Ownership

Assessor's Parcel No. (APN)	467-09-076
Reported Address/Location	70-80 North 27th Street, San Jose, California
Owner	HC Investment Associates, LP
Approximate Lot Size	1.16 acres
Approximate Bldg. Size	21,500 square feet
Construction Date	1998

In addition to the current address listed in Table 1, a historical address of 110 North 27th Street was identified during our review of historical Sanborn fire insurance maps. The historical address also were researched during this Phase I ESA.

2.2 CURRENT/PROPOSED USE OF THE PROPERTY

The current and proposed uses of the property are summarized in Table 2.

Table 2. Current and Proposed Uses

Current Use	Multi-tenant commercial building
Proposed Use	Mixed-use commercial and residential development

2.3 SITE SETTING AND ADJOINING PROPERTY USE

Land use in the general Site vicinity appears to be primarily commercial. Based on our Site vicinity reconnaissance, adjoining Site uses are summarized below in Table 3.

Table 3. Adjoining Property Uses

Northeast	Railroad right-of-way and undeveloped property
Northwest	Portuguese Band of San José (performance & event venue)
Southeast	McDonald's restaurant
Southwest	Auto repair shops, across North 27th Street, including Valencia Brothers Upholstery, E&J Electric Auto Repair and Hermanos Juarez Automotive

SECTION 3: USER PROVIDED INFORMATION

The ASTM standard defines the User as the party seeking to use a Phase I ESA to evaluate the presence of Recognized Environmental Conditions associated with a property. For the purpose of this Phase I ESA, the User is HC Investment Associates, LP. The "All Appropriate Inquiries" Final Rule (40 CFR Part 312) requires specific tasks be performed by or on behalf of the party seeking to qualify for Landowner Liability Protection under CERCLA (*i.e.*, the User).

Per the ASTM standard, if the User has information that is material to Recognized Environmental Conditions, such information should be provided to the Environmental Professional. This information includes: 1) specialized knowledge or experience of the User, 2) commonly known or reasonably ascertainable information within the local community, and 3) knowledge that the purchase price of the Site is lower than the fair market value due to contamination. A search of title records for environmental liens and activity and use limitations also is required.

3.1 ENVIRONMENTAL LIENS OR ACTIVITY AND USE LIMITATIONS

An environmental lien is a financial instrument that may be used to recover past environmental cleanup costs. Activity and use limitations (AULs) include other environmental encumbrances, such as institutional and engineering controls. Institutional controls (ICs) are legal or regulatory restrictions on a property's use, while engineering controls (ECs) are physical mechanisms that restrict property access or use.

The regulatory agency database report described in Section 4.1 did not identify the Site as being in 1) US EPA databases that list properties subject to land use restrictions (*i.e.*, engineering and institutional controls) or Federal Superfund Liens or 2) lists maintained by the California Department of Toxic Substances Control (DTSC) of properties that are subject to AULs or environmental liens where the DTSC is a lien holder.

A Preliminary Title Report by Old republic Title Company (dated March 12, 2020) was provided for our review. No environmental liens were listed in the title report.

3.2 SPECIALIZED KNOWLEDGE AND/OR COMMONLY KNOWN OR REASONABLY ASCERTAINABLE INFORMATION

Based on information provided by or discussions with HC Investment Associates, LP, we understand that HC Investment Associates, LP does not have specialized knowledge or experience, commonly known or reasonably ascertainable information regarding the Site, or other information that is material to Recognized Environmental Conditions.

3.3 DOCUMENTS PROVIDED BY HC INVESTMENT ASSOCIATES, LP

To help evaluate the presence of Recognized Environmental Conditions at the Site, Cornerstone reviewed and relied upon the documents provided by HC Investment Associates, LP listed in Table 4. Please note that Cornerstone cannot be liable for the accuracy of the information presented in these documents. ASTM E1527-13 does not require the Environmental Professional to verify independently the information provided; the Environmental Professional may rely on the information unless they have actual knowledge that certain information is incorrect. A summary of the provided documents is provided below; please refer to the original reports for complete details.

Table 4. Documents Provided by HC Investment Associates, LP

Date	Author	Title
September 1, 2015	eScreenLogic	Phase 1 EPA All Appropriate Inquiry (AAI), Commercial Property, 70-80 N 27th Street, San Jose, California

Based on the information reviewed, the Site reportedly was historically developed with a portion of a warehouse building occupied by Giordano & Son's, a vegetable packing business, along with a railroad spur. The existing on-Site multi-tenant commercial building was noted to have been constructed in 1998. Tenants at the time of the 2015 report were noted to include a boxing studio, a gym, a sheetrock/plastering business and office spaces. eScreenLogic stated that their assessment revealed no Recognized Environmental Conditions (RECs) in connection with the Site.

SECTION 4: RECORDS REVIEW

4.1 STANDARD ENVIRONMENTAL RECORD SOURCES

Cornerstone conducted a review of federal, state and local regulatory agency databases provided by Environmental Data Resources (EDR) to evaluate the likelihood of contamination incidents at and near the Site. The database sources and the search distances are in general accordance with the requirements of ASTM E 1527-13. A list of the database sources reviewed, a description of the sources, and a radius map showing the location of reported facilities relative to the project Site are attached in Appendix B.

The purpose of the records review was to obtain reasonably available information to help identify Recognized Environmental Conditions. Accuracy and completeness of record information varies among information sources, including government sources. Record information is often inaccurate or incomplete. The Environmental Professional is not obligated to identify mistakes or insufficiencies or review every possible record that might exist with the Site. The customary practice is to review information from standard sources that is reasonably available within reasonable time and cost constraints.

4.1.1 On-Site Database Listings

Martin Auto Color Inc. was identified at the Site address on the Certified Unified Program Agency (CUPA) database as a facility that stores hazardous materials and generates hazardous waste.

Martin Auto Color was listed on the HAZNET database, which contains data extracted from the copies of hazardous waste manifests received each year by the DTSC. Wastes disposed in 2019 were categorized as off-specification, aged or surplus organic; and unspecified organic liquid mixtures.

Martin Auto Color also was listed on the RCRA NonGen/NLR database. This database lists facilities that generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate RCRA hazardous waste. NLR means that the business is no longer registered. No violations were reported.

4.1.2 Nearby Spill Incidents

Based on the information presented in the agency database report, no off-Site spill incidents were reported that appear likely to significantly impact soil, soil vapor or groundwater beneath the Site. The potential for impact was based on our interpretation of the types of incidents, the locations of the reported incidents in relation to the Site and the assumed groundwater flow direction.

4.2 ADDITIONAL ENVIRONMENTAL RECORD SOURCES

The following additional sources of readily ascertainable public information for the Site also were reviewed during this Phase I ESA.

4.2.1 City and County Agency File Review

Cornerstone requested available files pertaining to 70-80 North 27th Street at the following public agencies: the San Jose Building Department (BD), San Jose Fire Department (FD), and the Santa Clara County Department of Environmental Health (DEH). The information reviewed is summarized in Table 5. The DEH indicated that they have no files pertaining to the Site. As of the date of this report, the Fire Department had not responded to our records request.

Table 5. File Review Information

Agency Name	Date	Occupant	Remarks
BD	1971	NA	Demolition permit. Owner listed as Western Pacific Railroad
BD	1997	Office/warehouse	Public notice of a Draft Negative Declaration pertaining to the proposed construction of the existing commercial building. M&R Construction was noted as one of the planned occupants. The Site was noted to have been purchased in 1996 from the "railroad" and had been vacant for at least 20 years. Prior to that, the railroad was noted to have operated a long loading dock for transfer of goods from railroad box cars to trucks for local delivery.
BD	1997	NA	Grading plan for construction of the existing commercial building
BD	1997/1998	Office/warehouse	Permits for a new commercial building.
BD	1999	Office	Permit for tenant improvements (office/HVAC)
BD	1999	NA	Permit for installation of storage racks
BD	1999	Golden West Drywall Supply	Request for certificate of occupancy
BD	1999	Office/warehouse	Certificate of occupancy
BD	2001	Machine shop	Electrical permit application
BD	2003	Office/storage	Permit and inspection reports for tenant improvements
BD	2003	Office	Certificate of occupancy (Suite 74)
BD	2004	Emporio Das Importacoes	Permit for tenant improvements for import sales and storage
BD	2017	NA	Correspondence and plans for a mezzanine addition
BD	1999	Dulceria El Confetti and Van Hong Lam	Letters to the City noting planned occupants including Dulceria El Confetti (a Mexican candy warehouse and distribution center) and Van Hong Lam, who intended to operate a hard drive refurbishing business.

SECTION 5: PHYSICAL SETTING

We reviewed readily available geologic and hydrogeologic information to evaluate the likelihood that chemicals of concern released on a nearby property could pose a significant threat to the Site and/or its intended use.

5.1 RECENT USGS TOPOGRAPHIC MAP

A recent USGS 7.5 minute topographic map was reviewed to evaluate the physical setting of the Site. The Site's elevation is approximately 90 feet above mean sea level; topography in the

vicinity of the Site slopes downward gently to the northwest towards Coyote Creek and the San Francisco Bay.

5.2 HYDROGEOLOGY

Based on our experience and information presented in the California Geotracker database pertaining to nearby properties, the shallow groundwater beneath the Site is likely present at depths of approximately 10 to 20 feet. Groundwater likely flows toward the northwest.

5.3 GEOLOGY

The Site is located in the northeast portion of the Santa Clara Valley, which is a broad northwest-trending alluvial valley situated between the Diablo Range on the east and the Santa Cruz mountains to the west. The Santa Clara Valley alluvium ranges in thickness between approximately 100 and 1,500 feet and is generally comprised of interbedded gravels, sands, silts, and clays. The alluvium is mostly Quaternary age and was deposited by alluvial fans and associated streams originating from the higher elevations to the east and west. Generally, the alluvium tends to be finer grained near the center of the valley and coarser grained adjacent to the higher elevations. The alluvium of the Santa Clara Valley generally contains the most significant water-bearing units in the area. Mesozoic age rocks underlie the Santa Clara Valley alluvium and outcrop in the mountain ranges to the east and west

Based on our review of geologic hazard maps available from the City of San Jose online map viewing service (https://www.sanjoseca.gov/your-government/departments/planning-building-code-enforcement/planning-division/data-and-maps) and the California Geological Survey geologic hazards maps (https://maps.conservation.ca.gov/geologichazards/), the Site is located within a State-designated Liquefaction Hazard Zone and a Santa Clara County Liquefaction Hazard Zone. Note that the evaluation of geologic hazards is outside of the scope of the ASTM standard, and the User should retain a qualified geotechnical engineer to perform a thorough geologic hazard investigation.

SECTION 6: HISTORICAL USE INFORMATION

The objective of the review of historical use information is to develop a history of the previous uses of the Site and surrounding area in order to help identify the likelihood of past uses having led to Recognized Environmental Conditions at the property. The ASTM standard requires the identification of all obvious uses of the property from the present back to the property's first developed use, or back to 1940, whichever is earlier, using reasonably ascertainable standard historical sources.

6.1 HISTORICAL SUMMARY OF SITE

The historical sources reviewed are summarized below. The results of our review of these sources are summarized in Table 6.

- **Historical Aerial Photographs:** We reviewed aerial photographs dated between 1939 and 2016 obtained from EDR of Shelton, Connecticut; copies of aerial photographs reviewed are presented in Appendix C.

- **Historical Topographic Maps:** We reviewed USGS 15-minute and 7.5-minute historical topographic maps dated 1889, 1897, 1899, 1953, 1961, 1968, 1973, 1980 and 2012; copies of historical topographic maps reviewed are presented in Appendix C.

- **Historical Fire Insurance Maps:** We reviewed Sanborn fire insurance maps dated 1915, 1950 and 1969 obtained from EDR; copies of Sanborn maps are presented in Appendix C.

- **Local Street Directories:** We reviewed city directories obtained from EDR that were researched at approximately 5 year intervals between 1922 and 2017 to obtain information pertaining to past Site occupants. The city directory summary is presented in Appendix D.

Table 6. Summary of Historical Source Information for Site

Date	Source	Comment
1889, 1897, and 1899	Topographic maps	No structures are shown on-Site.
1915	Sanborn map	The Site is shown as undeveloped land. Barnes Avenue traverses the northern portion of the Site.
1939, 1948, 1950, 1956, 1963 and 1968	Aerial photographs	The Site is shown to be developed with a portion of two commercial building, along with several railroad track spurs.
1950	Sanborn map	The Site is shown to be developed with a portion of two commercial buildings occupied by J.C. Hering Company and Giordano & Sons. The buildings are shown to have been used for vegetable packing and box nailing, and as a shook warehouse. Several railroad track spur are depicted on-Site on the northeast side of the structures.
1953, 1961, 1968 and 1973	Topographic maps	The Site is shown within the urban developed area of San Jose. Several railroad track spurs and shown the traverse the Site.
1955, 1960 and 1963	City Directories	Occupant listed as A. Levy & J. Zentner Company fruit packers
1966 and 1970	City Directories	Occupant listed as Central Produce Company
1969	Sanborn map	The Site appears similar to that shown on the 1950 Sanborn map, except that A. Levy & Zentner is shown to occupy the building formerly occupied by Giordano & Sons.
1974	Aerial photograph	The Site appears similar to that shown on the 1968 aerial photograph except that the northern most building has been removed.
1980	Topographic map	No structures or other Site features are depicted.
1982	Aerial photograph	The Site appears to be undeveloped; the prior buildings are shown to have been removed.
1998 to 2016	Aerial photographs	The existing on-Site commercial building is shown.
2004	City Directory	Occupant listed as Emporio Das Importacoes
2006	City Directory	Occupants listed as Babylon Financial, Harryz Homez, Edwardo Martinez, Compurbina and Tekxcel
2014	City Directory	Occupants listed as Cornejos Event Planner and Fairy Godmother
2017	City Directory	Occupant listed as Harryz Homez, Cornejos Event Planner, Fairy Godmother and Timeless Linen Rentals

SECTION 7: SITE RECONNAISSANCE

We performed a Site reconnaissance to evaluate current Site conditions and to attempt to identify Site Recognized Environmental Conditions. The results of the reconnaissance are discussed below. Additional Site observations are summarized in Table 7. Photographs of the Site are presented in Section 7.2.1.

7.1 METHODOLOGY AND LIMITING CONDITIONS

To observe current Site conditions (readily observable environmental conditions indicative of a significant release of hazardous materials), Cornerstone staff Stason I. Foster, P.E. visited the Site on April 26, 2021. The Site reconnaissance was conducted by walking representative areas of the Site, including the interior of the on-Site structure, the periphery of the structure and the Site periphery. Cornerstone staff only observed those areas that were reasonably accessible, safe, and did not require movement of equipment, materials or other objects. Physical obstructions that limited our ability to view the ground surface at the Site included the existing building and associated asphalt paved parking areas and vehicle drives (typical of developed properties).

7.2 OBSERVATIONS

At the time of our visit, the Site was developed with a multi-tenant commercial building and was divided into six tenant spaces. Units 70 and 72 were occupied by Martin Autocolor, an auto paint retail sales business. Unit 76 was occupied by Real Events Y Floreria, an event and party rental business, and used as an event venue and for storage. Unit 80 was occupied by C&M imports and used for storage of vaping supplies. Units 74 and 78 were unoccupied.

Hazardous materials were observed only within the Martin Autocolor space and consisted of automobile paints and paint-related products that were stored on shelving for retail sale. Waste paint cans, cups and liners generated during paint mixing activities were stored in several 55-gallon drums for off-Site disposal. No evidence of significant spills was readily apparent.

Electricity and/or natural gas fuel sources appeared to be used for building heating/cooling purposes. Potable water appeared to be supplied by the local water service provider. The building presumably is connected to the publicly owned sanitary sewer system; no on-Site septic systems were obvious. On-Site storm water catch basins appeared to discharge via below ground piping to the City's storm water drainage system. An electrical transformer owned by PG&E was observed on a concrete pad on the southwest side of the building. No evidence of transformer oil leaks was observed.

Table 7. Summary of Readily Observable Site Features

General Observation	Comments
Aboveground Storage Tanks	Not Observed
Agricultural Wells	Not Observed
Air Emission Control Systems	Not Observed
Boilers	Not Observed
Burning Areas	Not Observed
Chemical Mixing Areas	Paint mixing area associate with retail sales at Martin Autocolor
Chemical Storage Areas	Observed as described above
Clean Rooms	Not Observed
Drainage Ditches	Not Observed
Elevators	Not Observed
Emergency Generators	Not Observed
Equipment Maintenance Areas	Not Observed
Fill Placement	Not Observed
Groundwater Monitoring Wells	Not Observed
High Power Transmission Lines	Not Observed
Hoods and Ducting	Not Observed
Hydraulic Lifts	Not Observed
Incinerator	Not Observed
Petroleum Pipelines	Not Observed
Petroleum Wells	Not Observed
Ponds or Streams	Not Observed
Railroad Lines	Not Observed
Row Crops or Orchards	Not Observed
Stockpiles of Soil or Debris	Not Observed
Sumps or Clarifiers	Not Observed
Transformers	Observed as described above
Underground Storage Tanks	Not Observed
Vehicle Maintenance Areas	Not Observed
Vehicle Wash Areas	Not Observed
Wastewater Neutralization Systems	Not Observed

The comment “Not Observed” does not warrant that these features are not present on-Site; it only indicates that these features were not readily observed during the Site visit.

7.2.1 Site Photographs

Photograph 1. View of the on-Site building looking north.

Photograph 2. View of the on-Site building looking south.

Photograph 3. Interior of Unit 76 (event and storage space).

Photograph 4. Unoccupied tenant space.

Photograph 5. Paint storage shelving at Martin Autocolor.

Photograph 6. Paint mixing area and waste drums at Martin Autocolor.

SECTION 8: ENVIRONMENTAL QUESTIONNAIRE AND INTERVIEWS

8.1 ENVIRONMENTAL QUESTIONNAIRE / OWNER INTERVIEW

To help obtain information on current and historical Site use and use/storage of hazardous materials on-Site, we provided an environmental questionnaire to the Site owner. The completed questionnaire is attached in Appendix E. The information provided on the questionnaire appears generally consistent with our on-Site observations and information obtained from other data sources. No information indicative of Recognized Environmental Conditions was reported on the questionnaire. Fill was noted to have been imported to the Site. Based on subsequent email correspondence and a provided grading plan, it was anticipated that approximately 190 cubic yards of fill would be needed for grading during construction of the existing building in 1998; the source and actual quantity of imported fill is not known.

8.2 INTERVIEWS WITH PREVIOUS OWNERS AND OCCUPANTS

Contact information for previous Site owners and occupants was not provided to us. Therefore, interviews with previous Site owners and occupants could not be performed.

SECTION 9: FINDINGS, OPINIONS AND CONCLUSIONS (WITH RECOMMENDATIONS)

Cornerstone performed this Phase I ESA in general accordance with ASTM E1527-13 to support HC Investment Associates, LP in evaluation of Recognized Environmental Conditions. Our findings, opinions and conclusions are summarized below.

9.1 HISTORICAL SITE USAGE

Based on the information obtained during this study, the Site was developed by the 1930s with a portion of two commercial buildings occupied by J.C. Hering Company and Giordano & Sons. The buildings were used for vegetable packing and box nailing, and as a shook[1] warehouse. Several railroad track spurs were located on-Site on the northeast side of the structures. Later occupants of these buildings included A. Levy & J. Zentner Company fruit packers (1955-1969) and Central Produce Company (1966-1970). These former buildings were demolished during the 1970s.

The existing multi-tenant commercial building was constructed in 1998. Past occupants have included M&R Construction, Golden West Drywall Supply, a machine shop, Emporio Das Importacoes, Dulceria El Confetti (a Mexican candy warehouse and distribution center), Van Hong Lam (a hard drive refurbishing business), Babylon Financial, Harryz Homez, Edwardo Martinez, Compurbina and Tekxcel, Cornejos Event Planner, Fairy Godmother, and Timeless Linen Rentals. Current occupants include Martin Autocolor, Real Events Y Floreria and C&M Imports.

[1] Shook refers to sets of box parts (sides, tops, bottoms and ends) that are ready to assemble.

9.2 CHEMICAL STORAGE AND USE

During our visit, hazardous materials were observed only within the Martin Autocolor space and consisted of automobile paints and paint-related products that were stored on shelving for retail sale. Waste paint cans, cups and liners generated during paint mixing activities were stored in several 55-gallon drums for off-Site disposal. No evidence of significant spills was readily apparent and general housekeeping appeared orderly.

Past occupants, such as the machine shop (a tenant in 2001), may also have used hazardous materials at the Site, however, no reported spills were identified within the available data sources researched during this study.

9.3 RAILROAD TRACKS

Several railroad track spurs previously traversed the Site. Assorted chemicals historically were commonly used for dust suppression and weed control along rail lines. Common contaminants along railroad lines include metals, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and pesticides. Prior to redevelopment of the Site, we recommend performing soil sampling to evaluate if residual contaminants are present in shallow soil in the vicinity of the former railroad spurs.

9.4 IMPORTED SOIL

If the planned development will require importing soil for Site grading, we recommend documenting the source and quality of imported soil. The DTSC's October 2001 Clean Fill Advisory provides useful guidance on evaluating imported fill.

9.5 POTENTIAL ENVIRONMENTAL CONCERNS WITHIN THE SITE VICINITY

Based on the information obtained during this study, no hazardous material spill incidents have been reported in the Site vicinity that would be likely to significantly impact the Site. However, as is typical to many commercial areas, several facilities in the vicinity were reported as hazardous materials users. If leaks or spills occur at these facilities, contamination could impact the Site, depending upon the location of the property, the magnitude of the release, and the effectiveness of cleanup efforts.

9.6 ASBESTOS CONTAINING BUILDING MATERIALS (ACBMS)

Based on the age of the existing building, it is unlikely that the building materials contain asbestos. However, if demolition, renovation, or re-roofing of the building is planned, an asbestos survey may be required by local authorities or National Emissions Standards for Hazardous Air Pollutants (NESHAP) guidelines. NESHAP guidelines require the removal of potentially friable ACBMs prior to building demolition or renovation that may disturb the ACBM.

9.7 LEAD-BASED PAINT

In 1978, the Consumer Product Safety Commission banned lead-containing paints and coatings sold for consumer use. Some lead-containing products, such as industrial coatings, however, are still allowed. Based on the age of the existing structures, lead-containing paint is not likely to be present.

9.8 DATA GAPS

ASTM Standard Designation E 1527-13 requires the Environmental Professional to comment on significant data gaps that affect our ability to identify Recognized Environmental Conditions. A data gap is a lack of or inability to obtain information required by ASTM Standard Designation E 1527-13 despite good faith efforts by the Environmental Professional to gather such information. A data gap by itself is not inherently significant; it only becomes significant if it raises reasonable concerns. The following data gaps were identified:

- As of the date of this report, the San Jose Fire Department had not responded to our records request. The absence of these records, if any, may diminish our ability to identify Recognized Environmental Conditions. The general environmental setting of the Site, however, appears to have been established based on the information reviewed from other data sources.

- Contact information for the former occupants and owners of the Site was not provided to us. Thus, former occupants and owners were not interviewed during this study. The general environmental setting of the Site appears to have been established based on the information reviewed from other data sources. We do not consider this data gap to be significant.

9.9 DATA FAILURES

As described by ASTM Standard Designation E 1527-13, a data failure occurs when all of the standard historical sources that are reasonably ascertainable and likely to be useful have been reviewed and yet the historical research objectives have not been met. Data failures are not uncommon when attempting to identify the use of a Site at five year intervals back to the first use or to 1940 (whichever is earlier). ASTM Standard Designation E 1527-13 requires the Environmental Professional to comment on the significance of data failures and whether the data failure affects our ability to identify Recognized Environmental Conditions. A data failure by itself is not inherently significant; it only becomes significant if it raises reasonable concerns. No significant data failures were identified during this Phase I ESA.

9.10 RECOGNIZED ENVIRONMENTAL CONDITIONS

Cornerstone has performed a Phase I ESA in general conformance with the scope and limitations of ASTM E 1527-13 of 70-80 North 27th Street, San Jose, California. This assessment identified the following Recognized Environmental Conditions[2].

- Several railroad track spurs formerly traversed the Site. Assorted chemicals historically may have been used for dust suppression and weed control along the rail lines, and residual concentrations may remain in Site soil.

[2] The presence or likely presence of hazardous substances or petroleum products on the Site: 1) due to any release to the environment; 2) under conditions indicative of a release to the environment; or 3) under conditions that pose a material threat of a future release to the environment.

SECTION 10: LIMITATIONS

Cornerstone performed this Phase I ESA to support HC Investment Associates, LP in evaluation of Recognized Environmental Conditions associated with the Site. HC Investment Associates, LP understands that no Phase I ESA can wholly eliminate uncertainty regarding the potential for Recognized Environmental Conditions to be present at the Site. This Phase I ESA is intended to reduce, but not eliminate, uncertainty regarding the potential for Recognized Environmental Conditions. HC Investment Associates, LP understands that the extent of information obtained is based on the reasonable limits of time and budgetary constraints.

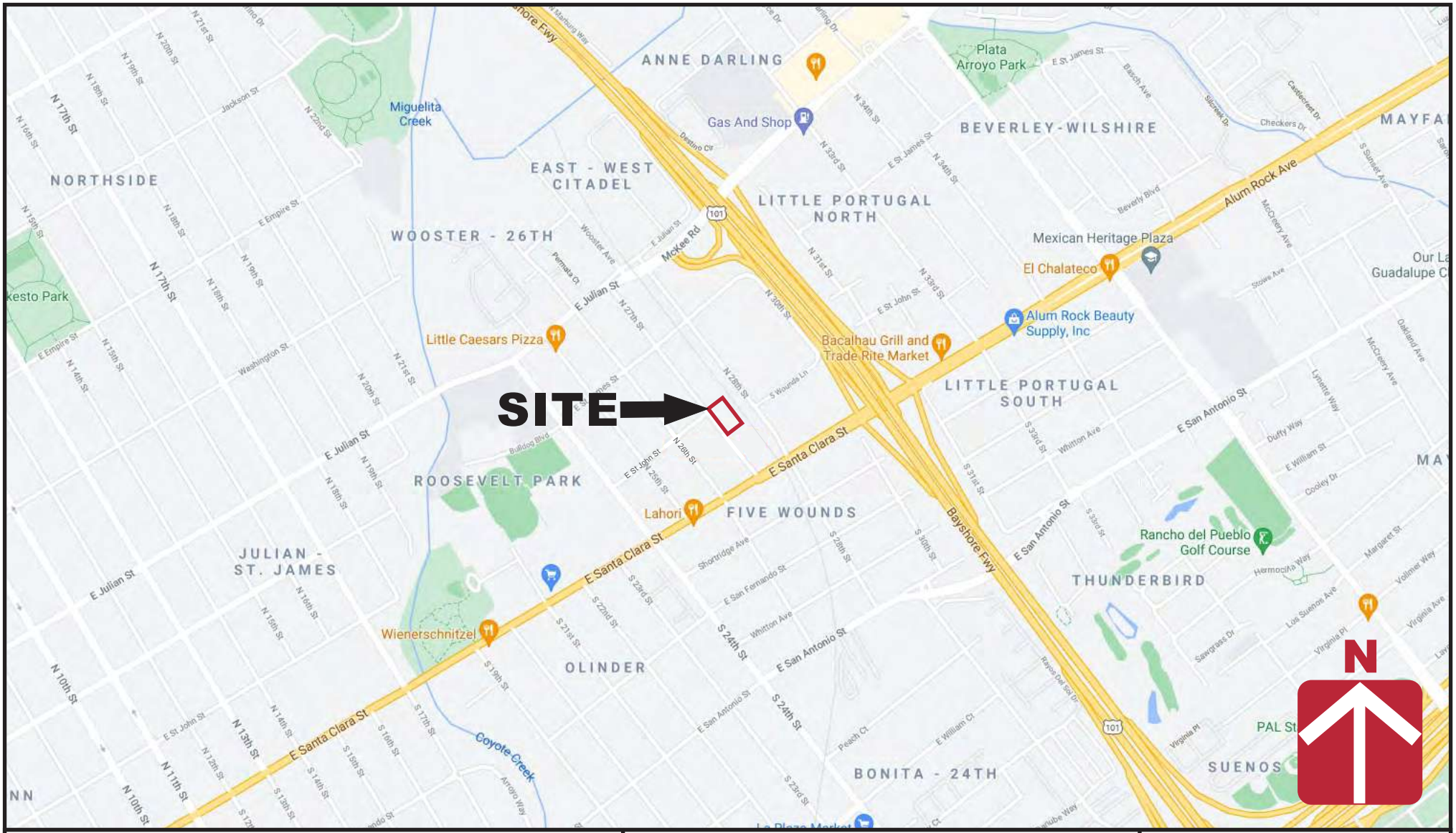
Findings, opinions, conclusions and recommendations presented in this report are based on readily available information, conditions readily observed at the time of the Site visit, and/or information readily identified by the interviews and/or the records review process. Phase I ESAs are inherently limited because findings are developed based on information obtained from a non-intrusive Site evaluation. Cornerstone does not accept liability for deficiencies, errors, or misstatements that have resulted from inaccuracies in the publicly available information or from interviews of persons knowledgeable of Site use. In addition, publicly available information and field observations often cannot affirm the presence of Recognized Environmental Conditions; there is a possibility that such conditions exist. If a greater degree of confidence is desired, soil, groundwater, soil vapor and/or air samples should be collected by Cornerstone and analyzed by a state-certified laboratory to establish a more reliable assessment of environmental conditions.

Cornerstone acquired an environmental database of selected publicly available information for the general area of the Site. Cornerstone cannot verify the accuracy or completeness of the database report, nor is Cornerstone obligated to identify mistakes or insufficiencies in the information provided (ASTM E 1527-13, Section 8.1.3). Due to inadequate address information, the environmental database may have mapped several facilities inaccurately or could not map the facilities. Releases from these facilities, if nearby, could impact the Site.

HC Investment Associates, LP may have provided Cornerstone environmental documents prepared by others. HC Investment Associates, LP understands that Cornerstone reviewed and relied on the information presented in these reports and cannot be responsible for their accuracy.

This report, an instrument of professional service, was prepared for the sole use of HC Investment Associates, LP and may not be reproduced or distributed without written authorization from Cornerstone. It is valid for 180 days. An electronic transmission of this report may also have been issued. While Cornerstone has taken precautions to produce a complete and secure electronic transmission, please check the electronic transmission against the hard copy version for conformity.

Cornerstone makes no warranty, expressed or implied, except that our services have been performed in accordance with the environmental principles generally accepted at this time and location.

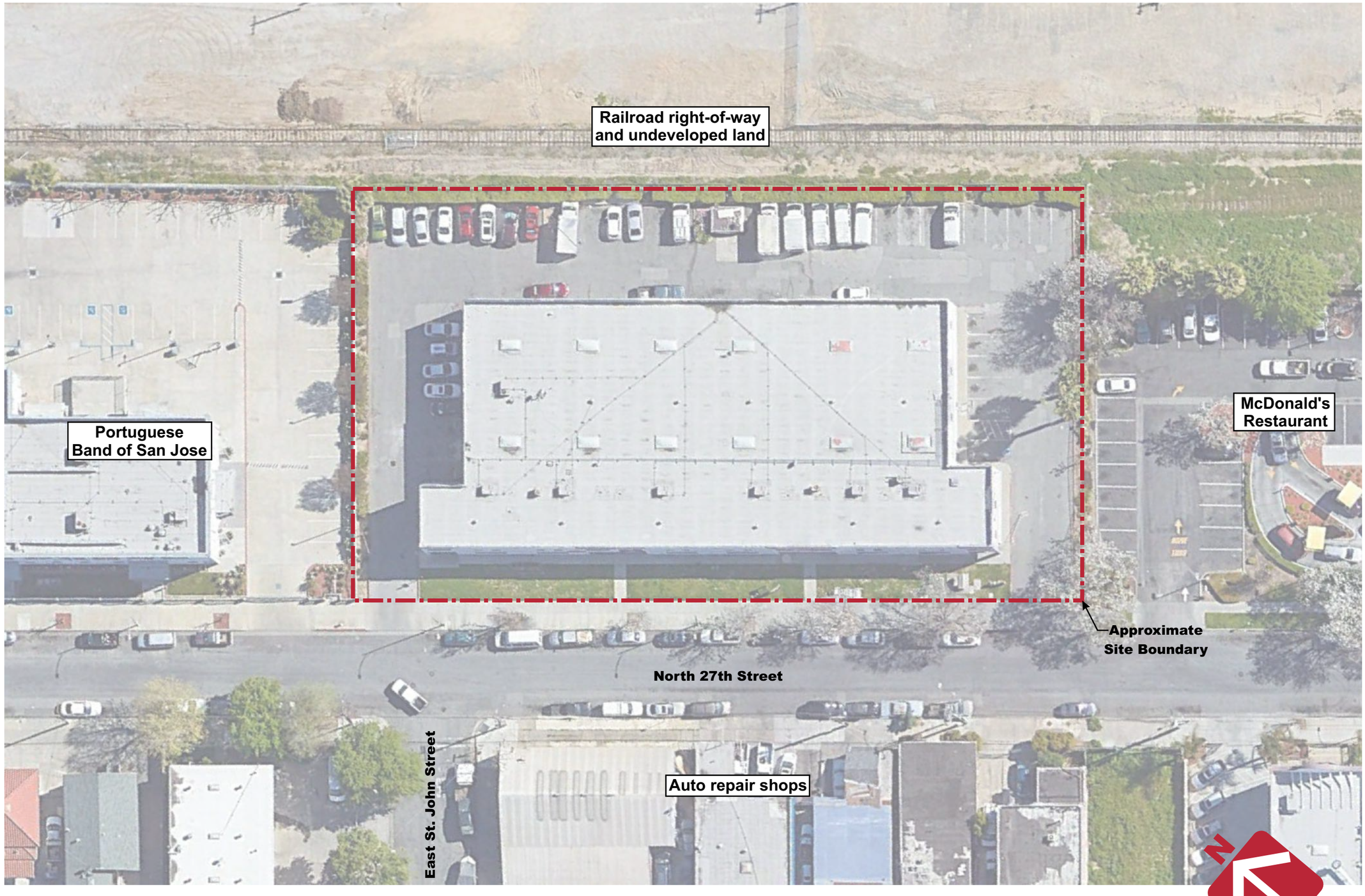


CORNERSTONE EARTH GROUP

Vicinity Map

70-80 North 27th Street
San Jose, CA

Project Number	1285-1-1
Figure Number	Figure 1
Date	April 2021
Drawn By	RRN



Base by Google Earth, dated 03/28/2018

Project Number 1285-1-1

Figure Number Figure 2

Date April 2021

Drawn By RRN

Site Plan

70-80 North 27th Street
San Jose, CA

CORNERSTONE EARTH GROUP

APPENDIX G

NOISE AND VIBRATION ASSESSMENT

NORTH 27TH STREET
NOISE AND VIBRATION ASSESSMENT

San José, California

September 28, 2022

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INTRODUCTION

The proposed project is a Special Use Permit to demolish a partially occupied 21,454-square-foot (sf), two-story commercial retail building and construct a new mixed-use building consisting of five floors of residential units (198 in total) over 7,118 sf of ground floor commercial and podium parking, for a total building height of 70 feet. The ground floor will have 15 parking spaces for the 3,518 sf of commercial along North 27th Street and 198 residential parking spaces in a three-level puzzle parking system. Access to the future Five Wounds Trail on the east side of the site will be provided at the southeast corner and along the south side of the proposed building.

This report evaluates the project's potential to result in significant 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 ambient noise conditions in the project vicinity; 2) the Plan Consistency Analysis 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 mitigation measures, where necessary, to mitigate project impacts to a less-than-significant level.

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* (*DNL* or L_{dn}) 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.

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.

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 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, April 2020.

Regulatory Background - Noise

The California Environmental Quality Act (CEQA) Guidelines, Appendix G, are used to assess the potential significance of impacts pursuant to local General Plan policies, Municipal Code standards, or the applicable standards of other agencies. A summary of the applicable regulatory criteria is provided below.

Federal

Federal Transit Administration's Transit Noise and Vibration Impact Assessment Manual. The Federal Transit Administration's (FTA) Transit Noise and Vibration Impact Assessment Manual includes general assessment criteria for construction noise. During daytime hours, the hourly average noise level limit is 80 dBA L_{eq} at residential land uses and 90 dBA L_{eq} at commercial and industrial land uses.

State of California

State CEQA Guidelines. The California Environmental Quality Act (CEQA) contains guidelines to evaluate the significance of effects of environmental noise attributable to a proposed project. Under CEQA, noise impacts would be considered significant if the project would result in:

(a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

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

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

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.

California Building Code, 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 2019 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 or additional envelope or altered 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 within the 65 dBA CNEL or L_{dn} noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway noise source, as determined by the Noise Element of the General Plan.

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 or addition envelope or altered 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

Santa Clara County Airport Land Use Commission Comprehensive Land Use Plan. The Comprehensive Land Use Plan (CLUP) 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

N-1 The Community Noise Equivalent Level (CNEL) method of representing noise levels shall be used to determine if a specific land use is consistent with the CLUP.

N-2 In addition to the other policies herein, the Noise Compatibility Policies presented in Table 4-1 shall be used to determine if a specific land use is consistent with this CLUP.

N-3 Noise impacts shall be evaluated according to the Aircraft Noise Contours presented on Figure 5 (not shown in this report).

N-6 Noise level compatibility standards for other types of land uses shall be applied in the same manner as the above residential noise level criteria. Table 4-1 presents acceptable noise levels for other land uses in the vicinity of the Airport.

Table 4 - 1

NOISE COMPATIBILITY POLICIES

LAND USE CATEGORY	CNEL					
	55-60	60-65	65-70	70-75	75-80	80-85
Residential – low density Single-family, duplex, mobile homes	*	**	***	****	****	****
Residential – multi-family, condominiums, townhouses	*	**	***	****	****	****
Transient lodging - motels, hotels	*	*	**	****	****	****
Schools, libraries, indoor religious assemblies, hospitals, nursing homes	*	***	****	****	****	****
Auditoriums, concert halls, amphitheaters	*	***	***	****	****	****
Sports arena, outdoor spectator sports, parking	*	*	*	**	***	****
Playgrounds, neighborhood parks	*	*	***	****	****	****
Golf courses, riding stables, water recreation, cemeteries	*	*	*	**	***	****
Office buildings, business commercial and professional, retail	*	*	**	***	****	****
Industrial, manufacturing, utilities, agriculture	*	*	*	***	***	****
* Generally 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. Mobile homes may not be acceptable in these areas. Some outdoor activities might be adversely affected.					
** Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Outdoor activities may be adversely affected. Residential: Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.					
*** Generally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor activities are likely to be adversely affected.					
**** Unacceptable	New construction or development shall not be undertaken.					

Source: Based on General Plan Guidelines, Appendix C (2003), Figure 2 and Santa Clara County ALUC 1992 Land Use Plan, Table 1

Source: Comprehensive Land Use Plan Santa Clara County, Norman Y Mineta San José International Airport, May 25, 2011, Amended May 23, 2019.

City of San José

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.

Source: Envision San José 2040 General Plan, Adopted November 1, 2011, As Amended on May 16, 2019.

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-1.7 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 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

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 at 70-80 North 27th Street in San José, California. The site is approximately 900 feet west of the center of US Highway 101 and approximately 370 feet north of the center of East Santa Clara Street. The Portuguese Band of San Jose (non-profit organization) bounds the site to the north, the future Five Wounds trail and North 28th Street bound the site to the east, a McDonald's restaurant bounds the site to the south, and several automotive repair businesses along North 27th Street bound the site to the west. The existing noise environment at the site results primarily from local vehicular traffic. Secondary sources of noise include distant traffic and aircraft.

A noise monitoring survey was performed to quantify and characterize ambient noise levels at the site and in the project vicinity between Wednesday, September 7, 2022 and Friday, September 9, 2022. The monitoring survey included two long-term noise measurements (LT-1 and LT-2) and two short-term measurements (ST-1 and ST-2), as shown in Figure 1.

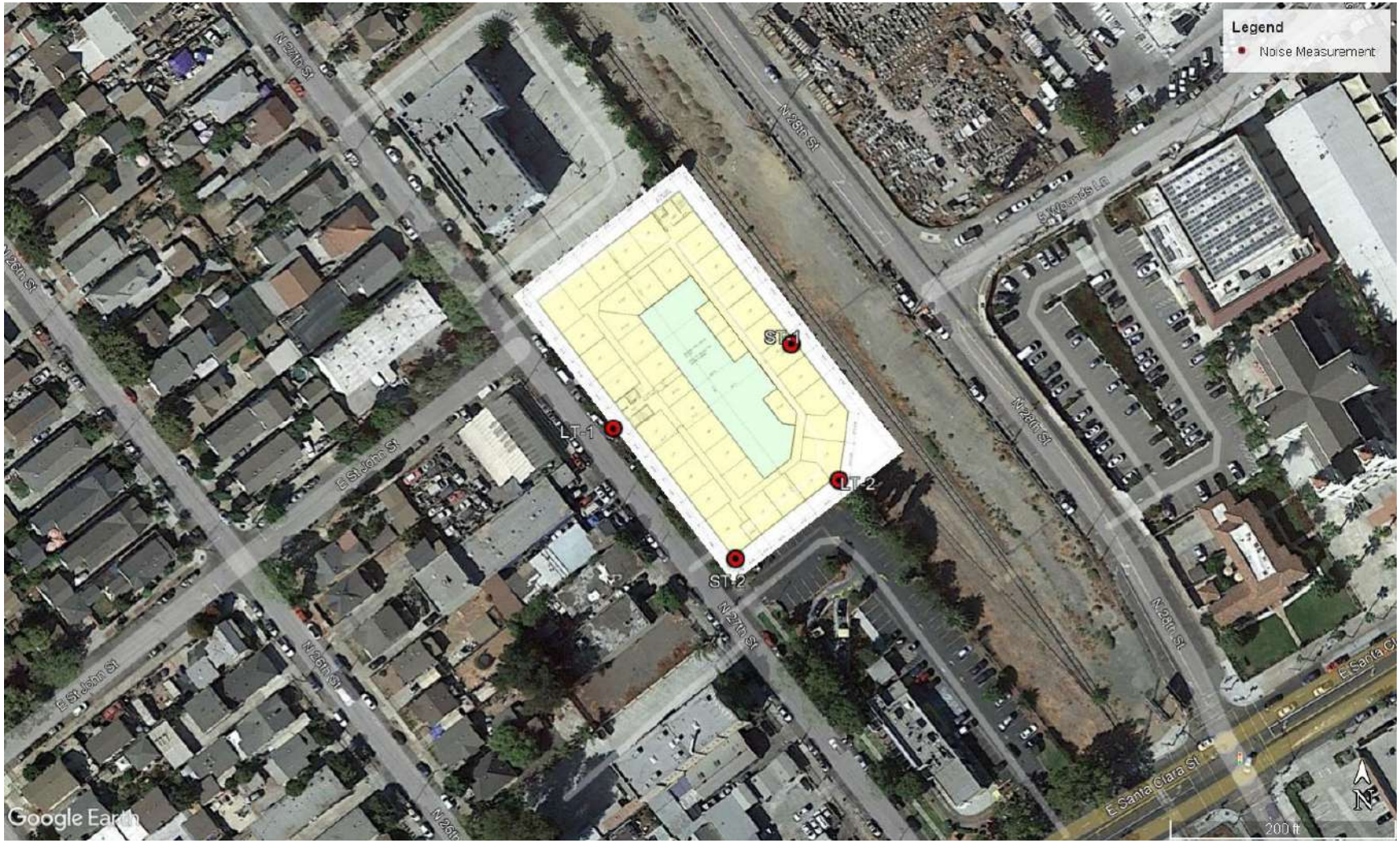
Long-term noise measurement LT-1 was made along North 27th Street, approximately 22 feet east of the centerline. This location was selected to quantify traffic noise levels and to estimate noise levels at the proposed building façade along North 27th Street. Hourly average noise levels at this location typically ranged from 56 to 62 dBA L_{eq} during the day and from 45 to 60 dBA L_{eq} at night. The day-night average noise level on Thursday, September 8, 2022 was 62 dBA DNL. The daily trend in noise levels at LT-1 is shown in Figures 2 through 4.

Long-term noise measurement LT-2 was made near the southeast corner of the site adjacent to the McDonald's drive-thru and parking lot. Hourly average noise levels at this location typically ranged from 56 to 60 dBA L_{eq} during the day and from 50 to 59 dBA L_{eq} at night. The day-night average noise level on Thursday, September 8, 2022 was 62 dBA DNL. The daily trend in noise levels at LT-2 is shown in Figures 5 through 7.

Short-term noise measurement ST-1 was made along the easternmost site boundary. This location was selected to quantify noise levels at the proposed eastern façade of the building. The 10-minute average noise level measured at this location between 11:40 a.m. and 11:50 a.m. on Wednesday, September 7, 2022 was 54 dBA L_{eq}. During the noise measurement, jets produced noise levels of approximately 53 dBA. Local traffic along North 28th Street typically produced noise levels ranging from 50 to 60 dBA, with loud vehicle generating noise levels of 67 dBA. Distant US Highway 101 noise levels were approximately 51 to 53 dBA.

Short-term noise measurement ST-2 was made at the southwest corner of the project site, approximately 35 feet east of the centerline of the roadway. This location was selected to quantify noise levels at receptors along North 27th Street, as well as noise levels at the proposed western façade of the building. The 10-minute average noise level measured at this location between 12:00 p.m. and 12:10 p.m. on Wednesday, September 7, 2022 was 58 dBA L_{eq}. During the noise measurement, jets produced noise levels ranging from 53 to 55 dBA. Local traffic noise levels produced by 12 autos and one truck ranged from 55 to 76 dBA. Table 4 summarizes the results of the short-term measurements.

FIGURE 1 Noise Measurement Locations



Source: Google Earth, 2022.

Noise Levels at Noise Measurement Site LT-1
~22 feet from the Center of N. 27th Street
Wednesday, September 7, 2022

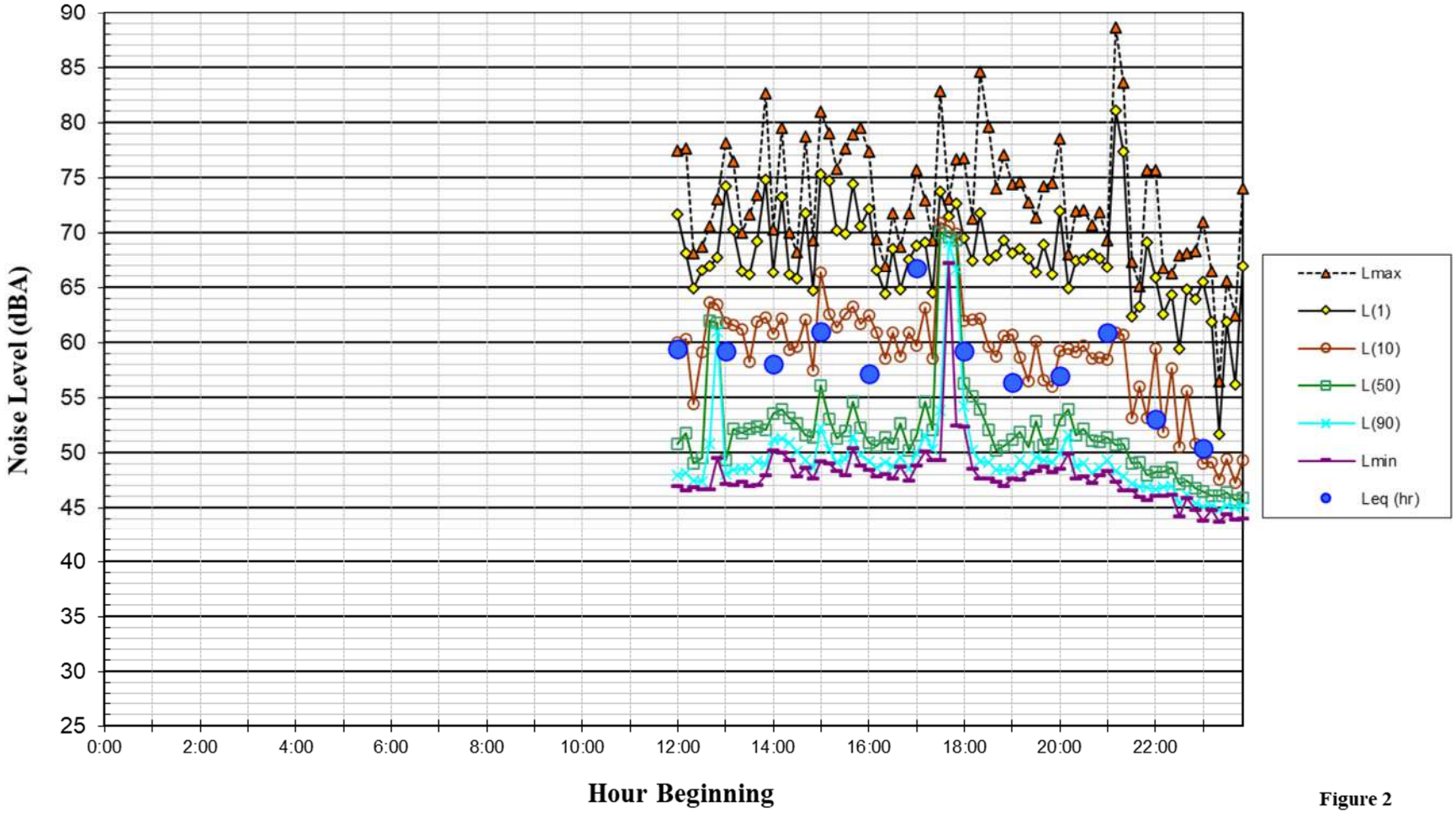


Figure 2

Noise Levels at Noise Measurement Site LT-1
~22 feet from the Center of N. 27th Street
Thursday, September 8, 2022

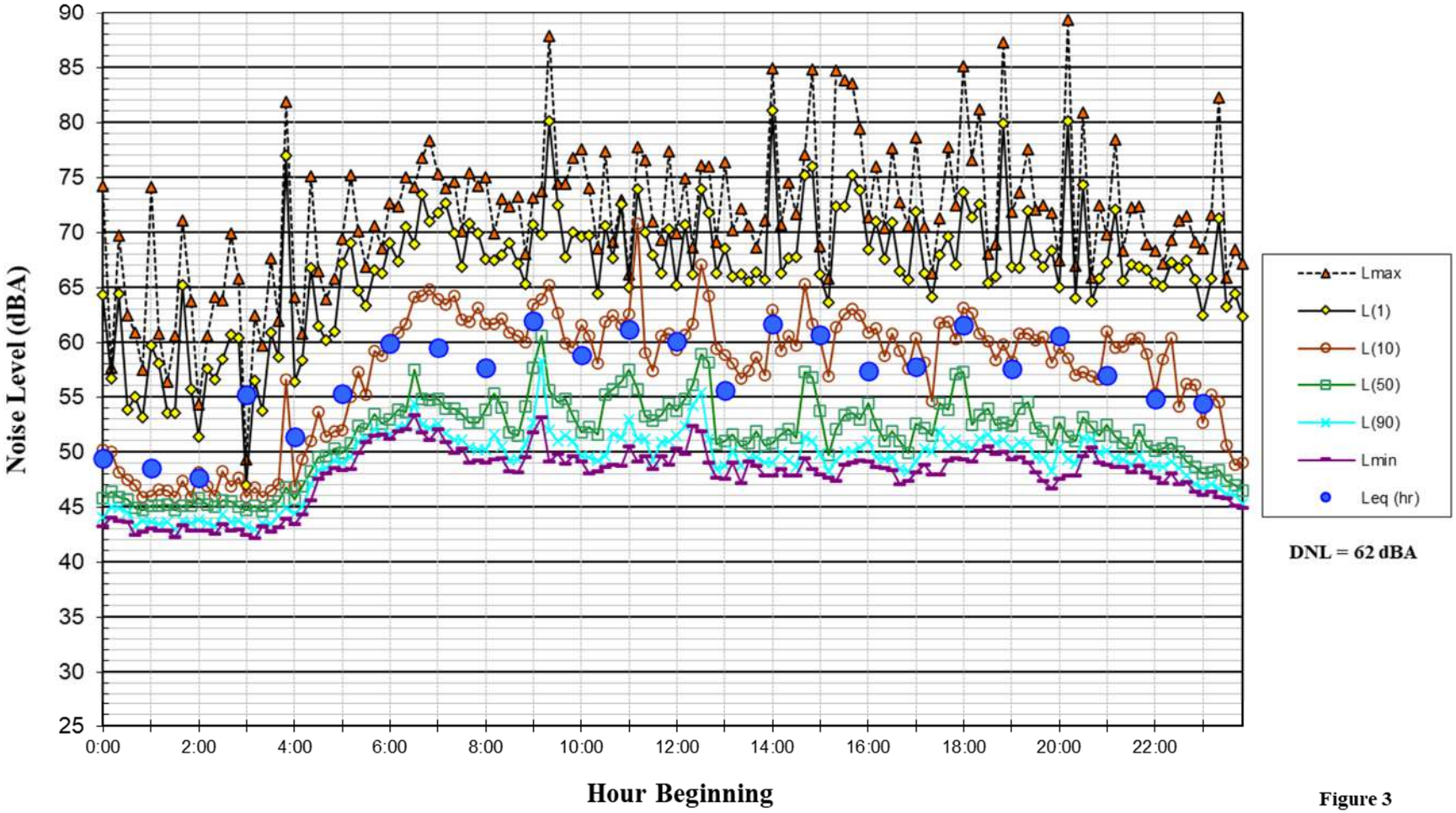


Figure 3

Noise Levels at Noise Measurement Site LT-1
~22 feet from the Center of N. 27th Street
Friday, September 9, 2022

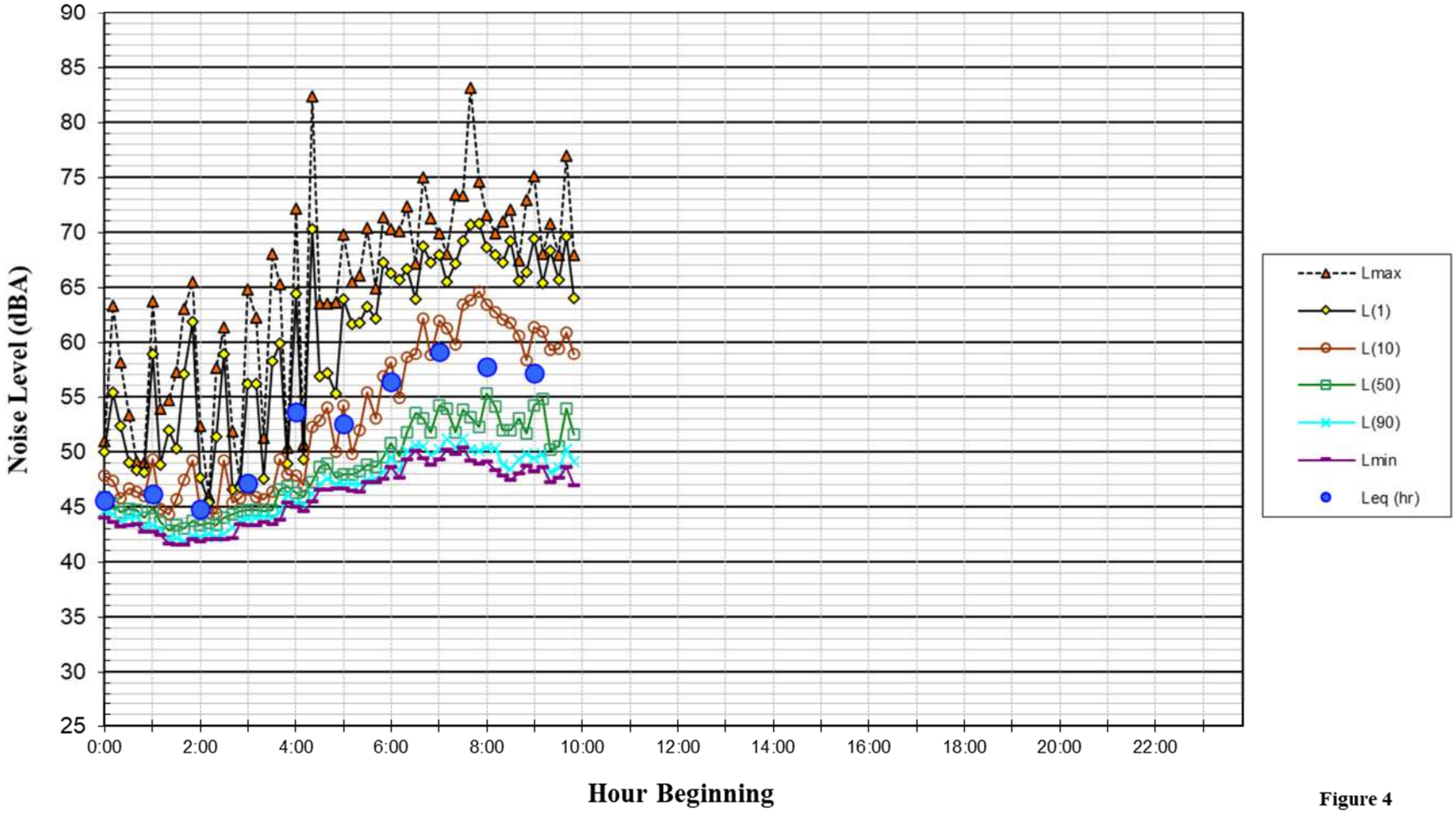


Figure 4

Noise Levels at Noise Measurement Site LT-2
Near Southeast Corner of Site
Wednesday, September 7, 2022

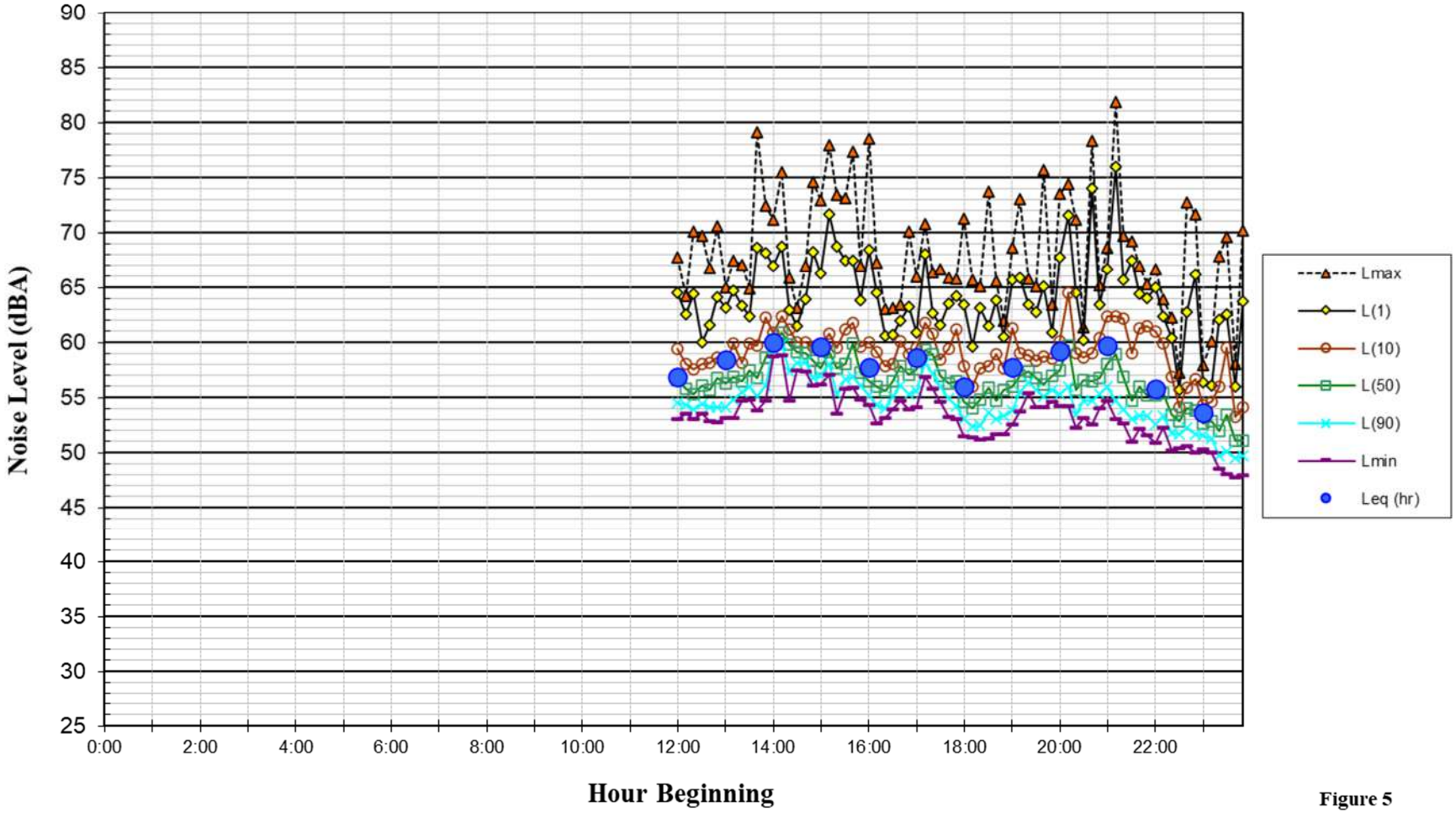
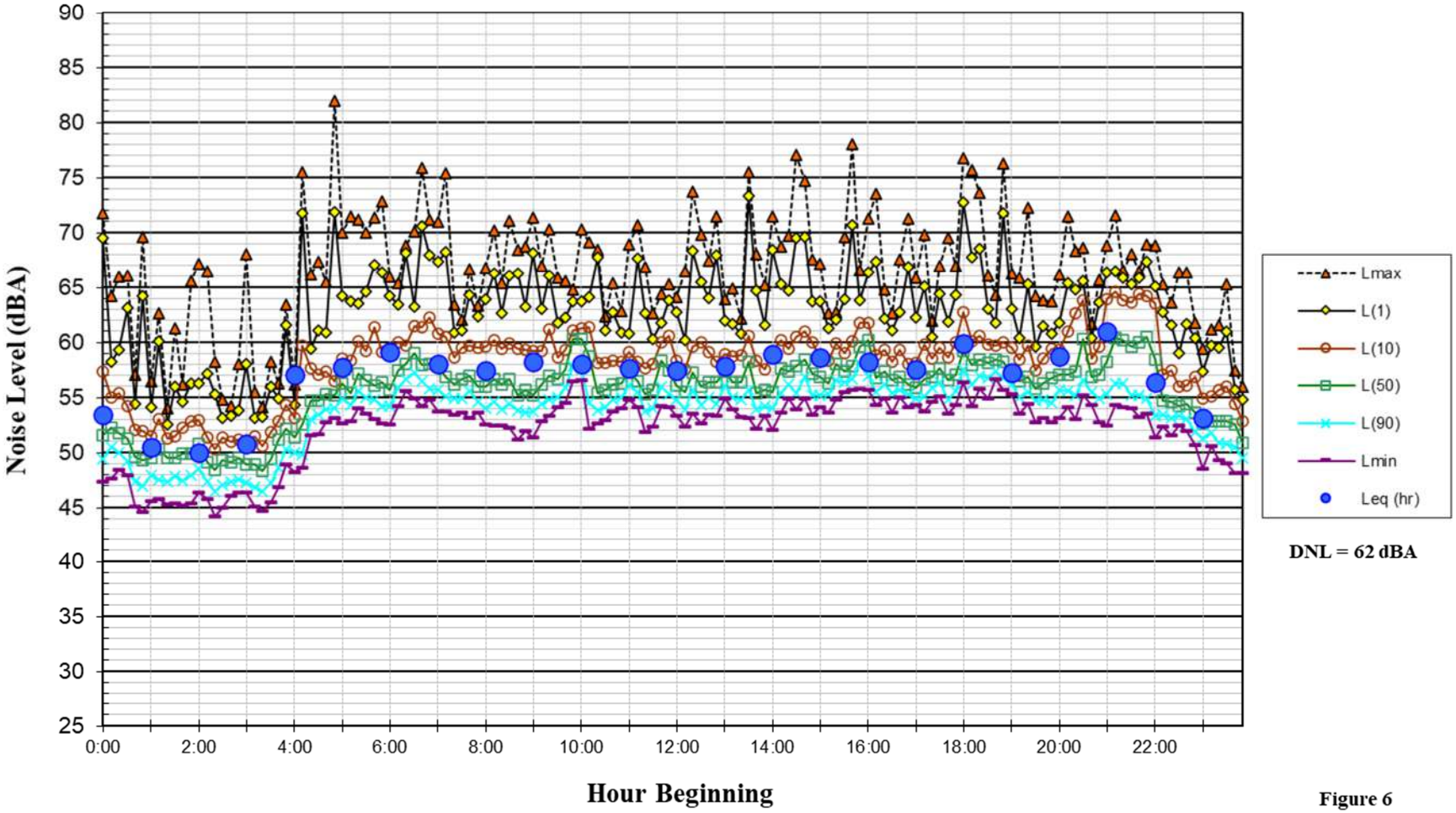


Figure 5

Noise Levels at Noise Measurement Site LT-2
Near Southeast Corner of Site
Thursday, September 8, 2022



DNL = 62 dBA

Figure 6

Noise Levels at Noise Measurement Site LT-2
Near Southeast Corner of Site
Friday, September 9, 2022

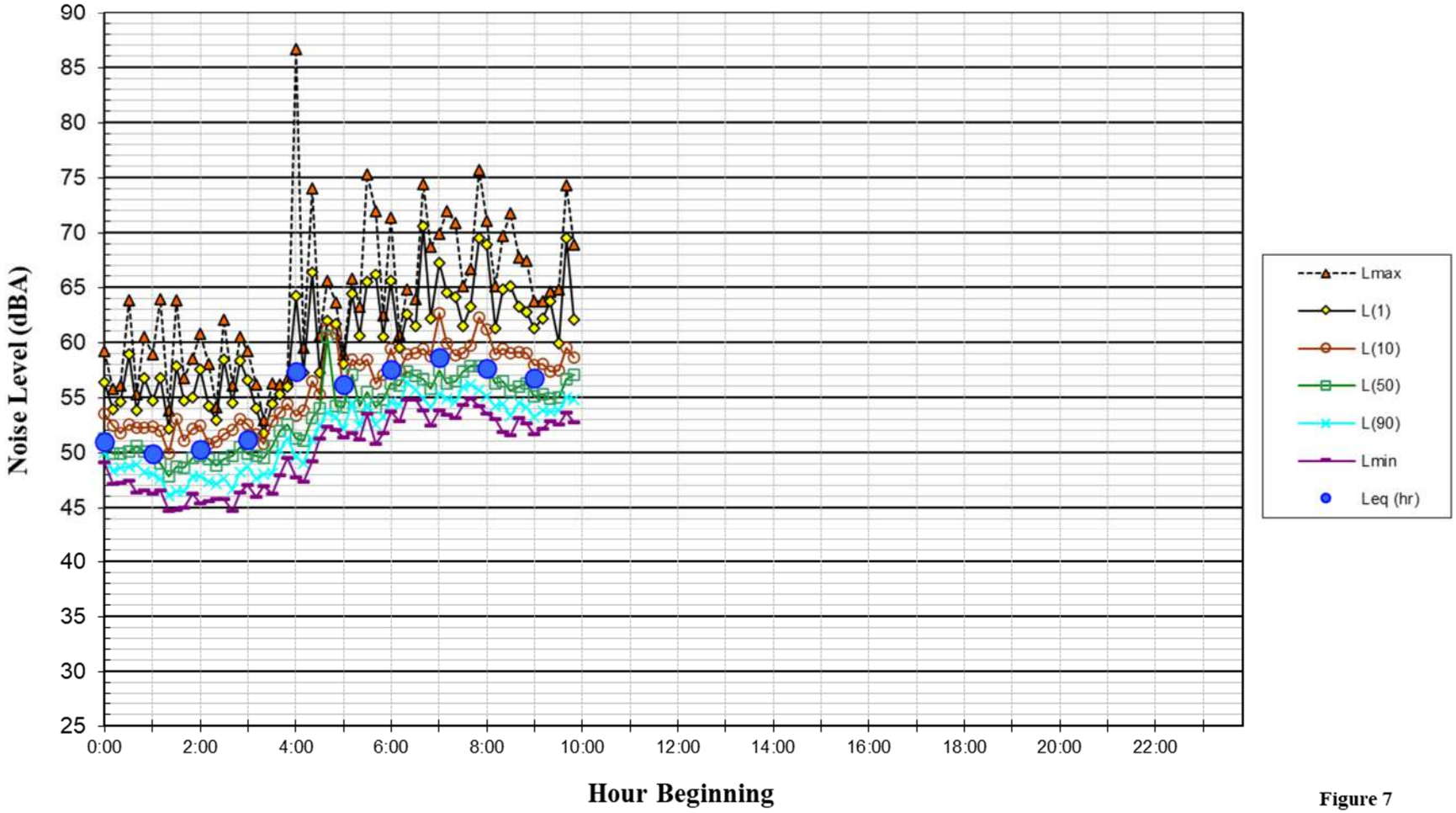


Figure 7

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

Noise Measurement Location (Date, Time)	L_{max}	$L_{(1)}$	$L_{(10)}$	$L_{(50)}$	$L_{(90)}$	L_{eq}
ST-1: East property line. (9/7/2022, 11:40 a.m. - 11:50 a.m.)	68	61	56	53	51	54
ST-2: Southwest corner of site. (9/7/2022, 12:00 p.m. - 12:10 p.m.)	76	69	60	53	50	58

PLAN CONSISTENCY ANALYSIS

Noise and Land Use Compatibility

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 applicable General Plan policies were presented in detail in the Regulatory Background section and are summarized below for the proposed project:

- The City's acceptable exterior noise level standard is 60 dBA DNL or less for the proposed residential land uses.

- The City's acceptable interior noise level standard is 45 dBA DNL or less for the proposed residential land uses.

Future Exterior Noise Environment

The future noise environment at the site would continue to result primarily from vehicular traffic along nearby roadways, as well as from aircraft noise associated with Mineta San José International Airport. Traffic noise levels are anticipated to increase by up to 1 dBA DNL and would reach 63 dBA DNL along the west boundary of the building adjoining North 27th Street and near the southeast corner of the building nearest to Santa Clara Street and North 28th Street.

The project proposes a podium level courtyard that would be fully shielded from local traffic noise by the building itself. Future exterior noise levels at the podium level courtyard would be 55 dBA DNL or less assuming the acoustical shielding provided by the building. A roof deck is also proposed. Assuming the shielding provided by the 5-foot shed roofs and parapet walls, exterior noise levels at the roof deck is expected to be 58 dBA DNL or less. 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.

Future Interior Noise Environment

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 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.

Residential units located on floors two through six would be exposed to exterior noise levels reaching 63 dBA DNL. Interior noise levels within worst-case residential units would be 48 dBA DNL, assuming that windows are open for ventilation.

Ground floor commercial uses are proposed along the west side of the building adjacent to North 27th Street and along the east side of the building adjacent to the future Five Wounds Trail. Future exterior noise levels are calculated to reach 63 dBA DNL and 61 dBA L_{eq} during the worst hour. Standard construction materials for commercial uses would provide about 25 dBA of noise reduction in interior spaces. The inclusion of adequate forced-air mechanical ventilation systems is normally required so that windows may be kept closed at the occupant's discretion and would provide an additional 5 dBA reduction. The standard construction materials in combination with forced-air mechanical ventilation would satisfy the daytime threshold 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 to 45 dBA DNL or less at residential interiors:

- Provide a suitable form of forced-air mechanical ventilation, as determined by the local building official, so that windows can be kept closed at the occupant's discretion to control interior noise and achieve the interior noise standards. Preliminary calculations indicate that standard dual-thermal pane windows (minimum rating of 26 STC) would be sufficient to achieve the interior noise thresholds of 45 dBA DNL and 50 dBA $L_{eq(1\text{-}hr)}$.

Conditions of Approval

A qualified acoustical specialist shall prepare a detailed analysis of interior noise levels resulting from all exterior sources during the design phase pursuant to requirements set forth in the State Building Code. 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 less and commercial interior noise levels to 50 dBA $L_{eq(1\text{-}hr)}$ or less. 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.

NOISE IMPACTS AND MITIGATION MEASURES

This section describes the significance criteria used to evaluate project impacts under CEQA, provides a discussion of each project impact, and presents mitigation measures, where necessary, to reduce project impacts to less-than-significant levels.

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 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. After a period of 12 months, a significant temporary noise impact would occur if construction noise levels would exceed 80 dBA L_{eq} at residential land uses near the site or 90 dBA L_{eq} at commercial land uses near the site.

    - A significant permanent noise level increase would occur if the project 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 at surrounding receptors. Groundborne vibration levels exceeding 0.08 in/sec PPV would have the potential to result in cosmetic damage to historic buildings, and groundborne vibration levels exceeding 0.2 in/sec PPV would have the potential to result in cosmetic damage to normal 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 substantial temporary increase in ambient noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. **This is a significant impact.**

The 1.2-acre project site is currently occupied by an approximately 21,400-square-foot (sf) commercial building with associated parking surrounding the building. The project proposes to demolish the existing use to construct a 106,350-sf, 198-dwelling unit, six-story residential building that would include one level of parking on the first floor. The residential dwelling units would be found on floors two through six. The grade level parking will provide 213 parking spaces. Also on the first floor will be approximately 7,100-sf of retail space. Construction is expected to begin in January 2024 and be completed by May 2026.

Construction phases utilizing such equipment or tools would include demolition, site preparation, grading/excavation, trenching/foundation, building construction-exterior, building construction-interior/architectural coating, and paving. Foundation construction techniques involving impact or vibratory pile driving equipment, which can cause excessive noise, are not expected with the proposed project. During each phase of construction, there would be a different mix of equipment operating, and noise levels would vary by phase and vary within phases, based on the amount of equipment in operation and the location at which the equipment is operating.

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 that is 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.

However, the City of San José does not establish noise level thresholds for construction activities. As an alternative, this analysis uses the noise limits established by the Federal Transit Administration (FTA) to identify the potential for impacts due to substantial temporary construction noise. The FTA identifies construction noise limits in the *Transit Noise and Vibration Impact Assessment Manual*.[1] During daytime hours, an exterior threshold of 80 dBA L_{eq} shall be enforced at residential land uses and 90 dBA L_{eq} shall be enforced at commercial and industrial land uses.

1 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123, September 2018.

The typical range of maximum instantaneous noise levels for the proposed project would be 70 to 90 dBA L_{max} at a distance of 50 feet (see Table 5) from the equipment. Table 6 shows the hourly average noise level ranges, by construction phase, typical for various types of projects. Hourly average noise levels generated by construction are about 65 to 88 dBA L_{eq} for residential buildings, measured at a distance of 50 feet from the center of a busy construction site. 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 often result in lower construction noise levels at distant receptors.

Equipment expected to be used in each construction phase are summarized in Table 7, along with the quantity of each type of equipment, the reference noise level at 50, 125, 200, and 400 feet assuming the operation of the two loudest pieces of construction equipment, and the estimated noise levels at the nearest property lines projected from the center of the construction activity by phase. 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 the two loudest pieces of equipment would operate simultaneously, as recommend by the FTA for construction noise evaluations. 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.

TABLE 5 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

Equipment Category	L_{max} Level (dBA)[1,2]	Impact/Continuous
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 6 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 7 Construction Noise Levels

Phase (Work Days)	Construction Equipment (Quantity)	Calculated Hourly Average L_{eq} (dBA) at Nearest Property Lines From Operation of Two Loudest Pieces of Construction Equipment at Acoustic Center of the Site			
		Noise Level at 50 feet	West (125 feet)	North and South (200 feet)	East (400 feet)
Demolition (15 days)	Concrete/Industrial Saw (2)* Excavator (2) Rubber-Tired Dozer (1) Tractor/Loader/Backhoe (1)	86	78	74	68
Site Preparation (20 days)	Grader (2)* Rubber-Tired Dozer (1) Tractor/Loader/Backhoe (1)	84	76	72	66
Grading (18 days)	Excavator (2) Grader (2)* Rubber Tired Dozer (1) Tractor/Loader/Backhoe (1)	84	76	72	66
Trenching (24 days)	Excavator (2)* Tractor/Loader/Backhoe (2)*	82	74	70	64
Building - Exterior (250 days)	Crane (1) Forklift (2) Generator Set (1)* Tractor/Loader/Backhoe (2)* Welders (2)	82	74	70	64
Building – Interior (250 days)	Aerial Lift (1) Air Compressor (2)*	77	69	65	59
Paving (25 days)	Cement and Mortar Mixer (2)* Paver (1) Paving Equipment (1) Roller (1) Tractor/Loader/Backhoe (2)*	82	74	70	58

*Denotes two loudest pieces of construction equipment per phase

As shown in Table 7, construction noise levels would intermittently range from 77 to 86 dBA L_{eq} when activities occur approximately 50 feet from nearby receptors. Construction noise levels would not exceed 90 dBA L_{eq} at the commercial land uses that border the site to the north, west, or south. Similarly, the nearest residences to the site would be located 150 feet or further from construction activities and would not be subject to construction noise levels exceeding 80 dBA L_{eq}. However, since project construction is expected to last for a period of approximately 29 months, and considering that the project site is within 500 feet of existing residential uses and within 200 feet of existing commercial uses, this temporary construction impact would be considered significant in accordance with Policy EC-1.7 of the City's General Plan.

Mitigation Measure 1a: Pursuant to General Plan Policy EC-1.7, a construction noise logistics plan shall be prepared 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. Project construction operations shall use best available noise suppression devices and techniques including, but not limited to, the following:

- Limit construction hours to between 7:00 a.m. and 7:00 p.m., Monday through Friday, unless permission is granted with a development permit or other planning approval. No construction activities are permitted on the weekends at sites within 500 feet of a residence. 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 PBCE that the construction noise mitigation plan is adequate to prevent noise disturbance of affected residential uses.

- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.

- Prohibit unnecessary idling of internal combustion engines.

- Locate stationary noise-generating equipment, such as air compressors or portable power generators, as far as possible from sensitive receptors. Construct temporary noise barriers to screen stationary noise-generating equipment when located near adjoining sensitive land uses.

- Utilize "quiet" air compressors and other stationary noise sources where technology exists.

- Control noise from construction workers' radios to a point where they are not audible at existing residences bordering the project site.

- Notify all adjacent business, residences, and other noise-sensitive land uses of the construction schedule, in writing, and provide a written schedule of "noisy" construction activities to adjacent land uses and nearby residences.

- Designate a "disturbance coordinator" who would be responsible for responding to any complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., bad muffler, etc.) and will require that reasonable measures be implemented to current the problem. 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, Zoning Code requirements, and the above measures, the temporary construction noise impact would be **less-than-significant**.

Impact 1b: **Permanent Noise Level Increase/Exceed Applicable Standards.** The proposed project is not expected to cause a substantial permanent noise level increase at existing noise-sensitive land uses in the project vicinity or generate noise levels in excess of standards established in the City's General Plan. **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 nearby 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 the proposed project would permanently increase ambient levels by 3 dBA DNL.

Project Generated Traffic

The traffic study included peak hour turning movement data for existing, background, background plus project, and cumulative traffic conditions at six intersections in the vicinity of the project site. AM and PM peak hour traffic volumes under each of the scenarios were compared to the existing traffic volumes to conservatively estimate the project's contribution to increased traffic noise levels. Based on these comparisons, the project would result in an increase of 1 dBA DNL or less along all roadway segments included in the traffic study, as shown in Table 8. Traffic noise level increases due to the project would not be considered substantial.

TABLE 8 PM Peak Hour Traffic Volumes and Anticipated Traffic Noise Increases Along Area Roadways

Roadway	Location	PM Peak Hour Volumes					Traffic Noise Increase (dBA)			
		Existing	Existing Plus Project	Background	Background Plus Project	Cumulative	Existing Plus Project Versus Existing	Background Versus Existing	Background Plus Project Versus Existing	Cumulative Versus Existing
Santa Clara Street	W. of US 101 SB Ramp	2005	2028	2019	2042	2064	0	0	0	0
Santa Clara Street	W. of 28th Street	1605	1629	1621	1645	1668	0	0	0	0
Santa Clara Street	W. of 27th Street	1575	1585	1591	1601	1624	0	0	0	0
28th Street	N. of Santa Clara Street	276	276	276	276	327	0	0	0	1
27th Street	N. of Santa Clara Street	122	156	122	156	156	1	0	1	1
27th Street	N. of St. John Street	98	109	98	109	109	0	0	0	0
27th Street	S. of St. John Street	107	140	107	140	140	1	0	1	1
St. John Street	W. of 27th Street	41	42	41	42	42	0	0	0	0

Mechanical Equipment

Various mechanical equipment for heating, ventilation, and cooling purposes, exhaust fans, and other similar equipment would likely be located on the roof of the proposed building or within the parking garage. Noise levels received at nearby sensitive land uses would depend on system design level specifications, including the equipment location, type, size, capacity, and enclosure design. These details are typically not available until later phases of the project design and development review process. However, no equipment is anticipated for a project of this scale that would make it difficult to meet the applicable noise limits with standard noise control measures. If properly controlled, the operational noise levels produced by the project would be well below ambient noise levels produced by local vehicle traffic, and would not substantially increase the ambient noise environment at the nearest noise-sensitive receptors.

Condition of Approval

As a project condition of approval, mechanical equipment shall be selected and designed to reduce noise levels to meet City requirements at the nearby noise-sensitive land uses. A qualified acoustical consultant shall be retained to review mechanical noise as these systems are selected to determine specific noise reduction measures necessary to reduce noise to comply with the City's noise level requirements. Noise reduction measures could include, but are not limited to, selection of equipment that emits low noise levels and installation of noise barriers, such as enclosures and parapet walls, to block the line-of-sight between the noise source and the nearest receptors. Other alternate measures may be optimal, such as locating equipment in less noise-sensitive areas, such as along the building façades farthest from adjacent neighbors, where feasible.

Mitigation Measure 1b: None required.

Impact 2: Exposure to Excessive Groundborne Vibration. Vibration levels resulting from project demolition or construction would not exceed applicable vibration thresholds at nearby buildings. **This is a less-than-significant impact.**

The construction of the project may generate perceptible vibration when heavy equipment or impact tools are used. Construction phases utilizing such equipment or tools would include demolition, site preparation, grading/excavation, trenching/foundation, building construction-exterior, building construction-interior/architectural coating, and paving. Foundation construction techniques involving impact or vibratory pile driving equipment, which can cause excessive vibration, are not expected with the proposed project.

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 0.2 in/sec PPV shall be used to minimize damage at buildings of normal conventional construction. Cosmetic damage (also known as threshold damage) is defined as hairline cracking in plaster, the opening of old cracks, the loosening of paint or the dislodging of loose objects. Minor damage is defined as hairline cracking in masonry or the loosening of plaster. Major structural damage is defined as wide cracking or the shifting of foundation or bearing walls.

The vibration limits contained in this policy are conservative and designed to provide the ultimate level of protection for existing buildings in San José.

A review of the City of San José Historic Resource Inventory[2] identified the Church of the Five Wounds as the nearest historic buildings in the site vicinity. The church is located at 1375 East Santa Clara Street, approximately 345 feet from the project site. The remaining buildings in the project vicinity are assumed to be of normal, conventional construction.

Vibration levels would vary depending on soil conditions, construction methods, and equipment used. Table 9 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet and also summarizes the minimum safe setback distances to maintain in order to achieve the 0.08 in/sec PPV threshold for historical buildings and the 0.2 in/sec PPV threshold for all other buildings. Vibration levels are highest close to the source, and then attenuate with increasing distance at the rate $(D_{ref}/D)^{1.1}$, where D is the distance from the source in feet and D_{ref} is the reference distance of 25 feet. Table 10 summarizes the vibration levels expected at nearby buildings.

TABLE 9 Vibration Source Levels for Construction Equipment and Minimum Safe Setbacks

Equipment		PPV at 25 ft. (in/sec)	0.08 in/sec PPV Minimum Safe Setback (feet)	0.20 in/sec PPV Minimum Safe Setback (feet)
Clam shovel drop		0.202	59	26
Hydromill (slurry wall)	in soil	0.008	4	2
	in rock	0.017	7	3
Vibratory Roller		0.210	61	27
Hoe Ram		0.089	28	13
Large bulldozer		0.089	28	13
Caisson drilling		0.089	28	13
Loaded trucks		0.076	24	11
Jackhammer		0.035	12	6
Small bulldozer		0.003	2	<1

Source: Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, Office of Planning and Environment, U.S. Department of Transportation, September 2018, as modified by Illingworth & Rodkin, Inc., September 2022.

2 City of San José Historic Resources Inventory, https://www.sanjoseca.gov/your-government/departments/planning-building-code-enforcement/planning-division/historic-preservation/historic-resources-inventory

TABLE 10 Calculated Vibration Levels at Nearest Buildings (in/sec PPV)

Equipment		PPV at 25 ft. (in/sec)	PPV at North/West Conventional (60 feet)	PPV at South Conventional (150 feet)	PPV at East Historic (345 feet)
Clam shovel drop		0.202	0.077	0.028	0.011
Hydromill (slurry wall)	in soil	0.008	0.003	0.001	0.000
	in rock	0.017	0.006	0.002	0.001
Vibratory Roller		0.210	0.080	0.029	0.012
Hoe Ram		0.089	0.034	0.012	0.005
Large bulldozer		0.089	0.034	0.012	0.005
Caisson drilling		0.089	0.034	0.012	0.005
Loaded trucks		0.076	0.029	0.011	0.004
Jackhammer		0.035	0.013	0.005	0.002
Small bulldozer		0.003	0.001	0.000	0.000

Source: Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, Office of Planning and Environment, U.S. Department of Transportation, September 2018, as modified by Illingworth & Rodkin, Inc., September 2022.

Groundborne vibration levels due to project construction activities would not exceed the City's 0.08 in/sec PPV threshold at the Church of the Five Wounds, which represents the nearest historic building to the project site. All other structures in the project vicinity would be located at least 60 feet or further from the project site, and groundborne vibration levels attributable to project construction would not exceed the 0.20 in/sec PPV threshold. Neither cosmetic, minor, or major damage is expected as a result of the project at historic or conventional buildings near 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.

Mitigation Measure 2: None required.

Impact 3: **Excessive Aircraft Noise.** The project site is located approximately 2.6 miles east-southeast of Norman Y. Mineta International Airport. The noise environment attributable to aircraft is considered normally acceptable under the Santa Clara County ALUC noise compatibility policies for residential land uses. This is a **less-than-significant** impact.

Norman Y. Mineta San José International Airport is a public-use airport located approximately 2.6 miles east-southeast of the project site. According to the City's new Airport Master Plan Environmental Impact Report,[3] the project site lies outside the 60 dBA CNEL contour line (see Figure 8). Aircraft noise levels less than 65 dBA CNEL would be considered compatible at exterior use areas and within buildings proposed by the project, and this is a less-than-significant impact.

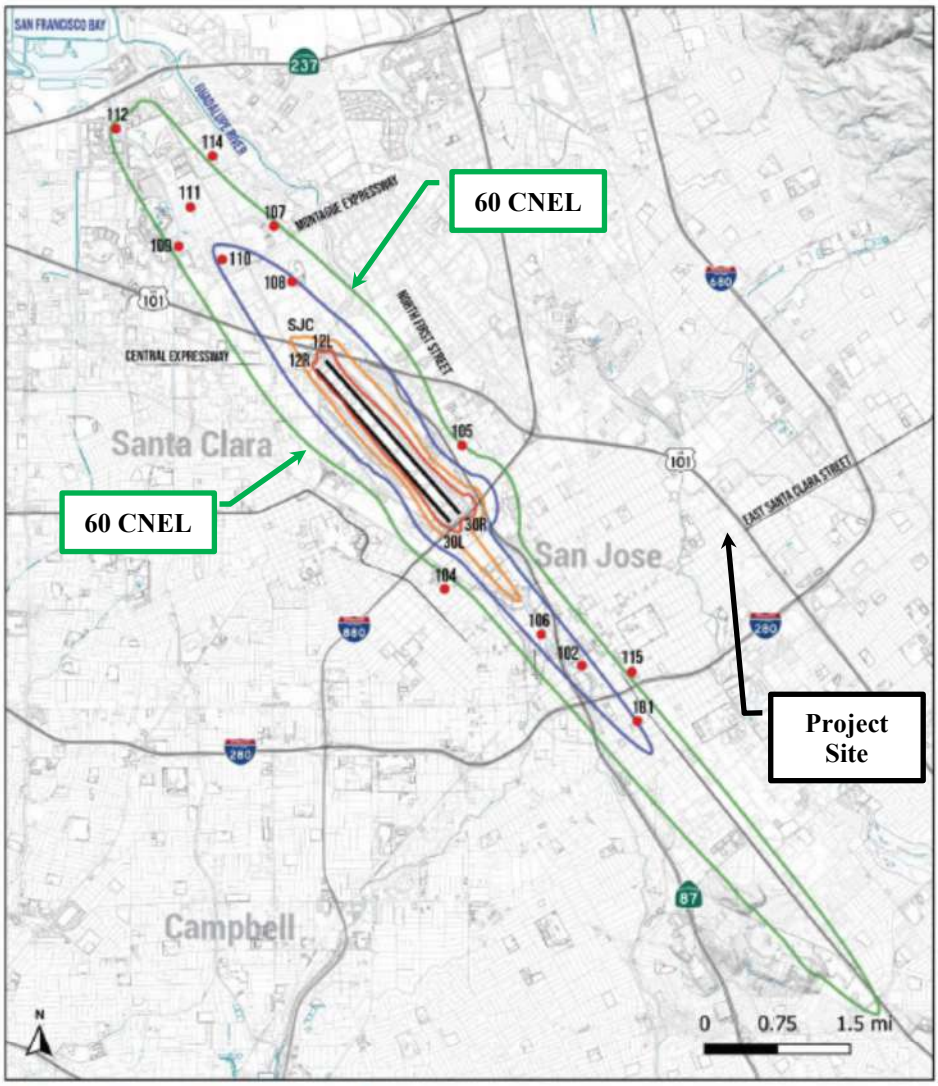
Mitigation Measure 3: **None required.**

[3] David J. Powers & Associates, Inc., Integrated Final Environmental Impact Report, Amendment to Norman Y. Mineta San Jose International Airport Master Plan, April 2020.

FIGURE 8 2037 CNEL Noise Contours for SJIA Relative to Project Site

Figure 5
Scenario 2: With Project 2037 Noise Contour Map

SAN JOSE INTERNATIONAL AIRPORT | Environmental Impact Report FINAL | October 2019



NORMAN Y. MINETA SAN JOSE INTERNATIONAL AIRPORT

- Noise Monitoring Station
- 101 Site ID
- Runway
- 75 dBA and Greater CNEL Contour
- 70 dBA and Greater CNEL Contour
- 65 dBA and Greater CNEL Contour
- 60 dBA and Greater CNEL Contour

Figure 5 Scenario 2: With Project 2037 Noise Contour Map

Source: BridgeNet International 2019

APPENDIX H

LOCAL TRANSPORTATION ANALYSIS

HEXAGON TRANSPORTATION CONSULTANTS, INC.

70 N. 27th Street Residential

Local Transportation Analysis

Prepared for:

Starbird Consulting LLC

February 7, 2023

Hexagon Transportation Consultants, Inc.
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Hexagon Job Number: 22BJ06
Phone: 408.971.6100
Client: Starbird Consulting LLC

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Executive Summary

This report presents the results of the transportation analysis conducted for a proposed residential project at 70 N. 27th Street in San Jose, California. The project would demolish a partially occupied 21,454 square-foot (s.f.) two-story commercial building and construct a new building consisting of five floors of residential units (up to 200 units, including approximately 5% affordable units) over podium parking. The ground floor would provide 210 residential parking spaces in a three-level automated puzzle parking system. The project would provide direct access to the future Five Wounds Creek Trail. Vehicular access to the project site would be provided via two driveways on N. 27th Street (similar to the existing site layout).

This study was conducted for the purpose of identifying the potential transportation impacts and operational issues related to the proposed development. The transportation impacts of the project were evaluated following the standards and methodologies established in the City of San Jose's *Transportation Analysis Handbook,* adopted in April 2020. Based on the City of San Jose's Transportation Analysis Policy (Council Policy 5-1) and the *Transportation Analysis Handbook,* the study includes a non-CEQA local transportation analysis (LTA).

The LTA analyzes AM and PM peak hour traffic conditions for four signalized intersections and two unsignalized intersections in the vicinity of the project site. The LTA also includes an analysis of site access, on-site circulation, parking, vehicle queuing, and effects to transit services and bicycle and pedestrian access.

Vehicle Miles Traveled (VMT) Analysis

The City of San Jose's *Transportation Analysis Handbook, 2020* includes screening criteria for projects that are expected to result in a less-than-significant VMT impact based on the project description, characteristics and/or location. Projects that meet the screening criteria do not require a CEQA transportation analysis but are typically required to provide a Local Transportation Analysis (LTA) to identify potential operational issues that may arise due to the project. The project would meet the residential screening criteria set forth in the City's *Transportation Analysis Handbook.* Therefore, the residential project is exempt from preparing a detailed VMT analysis.

Cumulative Analysis

Developments within the Five Wounds Urban Village may include residential mixed-use projects with residential above retail. Residential projects that do not include a commercial component are not consistent with the *Urban Village* designation within the Five Wounds Urban Village.

The proposed project at 70 N. 27th Street consists of a high-density transit-oriented residential development, including an affordable housing component (approximately 5% affordable). The project

site is situated adjacent to the future Five Wounds Creek multi-use trail and is within walking distance of the future 28th Street/Little Portugal BART station. Additionally, the project is proposing a residential development density of 172 DU/AC (200 DU/1.16 AC = 172 DU/AC), which would meet the minimum development density of 35 DU/AC as defined in the City's screening criteria for VMT analysis and would be less than the maximum allowable density of 250 DU/AC as defined in the Five Wounds Urban Village Plan. However, the project does not propose to include any ground floor retail space. To address this inconsistency, the project is proposing a Density Bonus, which would eliminate the retail requirement within the Five Wounds Urban Village.

With the proposed Density Bonus, the project would be consistent with the Five Wounds Urban Village Plan and, thus, would conform to the General Plan. The residential project would be considered part of the cumulative solution to meet the General Plan's long-range transportation goals and would result in a less-than-significant cumulative impact.

Project Trip Generation

After applying the appropriate ITE trip rates, applicable trip adjustments and reductions, and existing trip credits, the proposed project is estimated to generate 636 new daily vehicle trips, with 46 new trips (24 inbound and 22 outbound) occurring during the AM peak hour and 30 new trips (12 inbound and 18 outbound) occurring during the PM peak hour.

Intersection Traffic Operations

Based on the City of San Jose intersection operations analysis criteria, none of the study intersections would be adversely affected by the project.

Other Transportation Issues

The proposed site plan shows generally adequate site access and on-site circulation. The project would not have an adverse effect on the existing pedestrian, bicycle or transit facilities in the study area. Below are recommendations resulting from the site plan review.

Recommendations

- If security gates are to be provided, keep the entry security gate open during the periods of the day when most inbound vehicle trips are likely to occur to avoid any inbound queuing issues.
- Establish no parking zones (at least 15 feet of red curb) immediately adjacent to the outbound project driveway to ensure adequate sight distance.
- Increase the southern east-west oriented drive aisle width from 22 feet to 24 feet.
- Verify the height limit of the vehicle stacker system would accommodate all possible resident vehicle types: passenger cars, trucks, SUVs and vans.
- Coordinate with City staff during the implementation phase to determine the appropriate location and size for an on-site or on-street freight loading area to serve the proposed residential project.
- Coordinate with the City of San Jose to ensure the site plan is consistent with the future alignment of the Five Wounds Creek Class I trail and future development associated with the BSV-BART 28th Street Station project.
- Coordinate with the VTA to ensure proper building shoring and foundation locations due to the project site being within the zone of influence of the BSV tunnel.

- Widen the proposed 6-foot-wide path on the south side of the building and 8-foot-wide path on the north side of the building to be at least 10 feet wide per the City of San Jose's Class I trail design standards. The future pedestrian connection should have a public access easement.
- Coordinate with City of San Jose staff to ensure the proposed residential development and the future Five Wounds Creek trail would have no conflicting design elements.
- Implement the planned multimodal improvements at the N. 27th Street/E. St. John Street intersection that are identified as a Connection to BART project in the East San Jose MTIP.
- Provide on-site EV parking spaces and EV Ready spaces to the satisfaction of the City of San Jose Planning Department.
- Provide on-site motorcycle parking to the satisfaction of the City of San Jose Planning Department.

1. Introduction

This report presents the results of the transportation analysis conducted for a proposed residential project at 70 N. 27th Street in San Jose, California (see Figure 1). The project would demolish a partially occupied 21,454 square-feet (s.f.) two-story commercial building and construct a new building consisting of five floors of residential units (up to 200 units, including approximately 5% affordable units) over podium parking. The ground floor would provide 210 residential parking spaces in a three-level automated puzzle parking system. The project would provide direct access to the future Five Wounds Creek Trail. Vehicular access to the project site would be provided via two driveways on N. 27th Street (similar to the existing site layout). The project site plan is shown on Figure 2.

This study was conducted for the purpose of identifying the potential transportation impacts and operational issues related to the proposed development. The transportation impacts of the project were evaluated following the standards and methodologies established in the City of San Jose's *Transportation Analysis Handbook,* adopted in April 2020. Based on the City of San Jose's Transportation Analysis Policy (Council Policy 5-1) and the *Transportation Analysis Handbook,* the study includes a non-CEQA local transportation analysis (LTA).

Transportation Policies

In adherence with State of California Senate Bill 743 (SB 743) and the City's goals as set forth in the Envision San Jose 2040 General Plan, the City of San Jose has adopted a new Transportation Analysis Policy, Council Policy 5-1. The Policy establishes the thresholds for transportation impacts under CEQA based on vehicle miles traveled (VMT) instead of intersection level of service (LOS). The intent of this change is to shift the focus of transportation analysis under CEQA from vehicle delay and roadway auto capacity to a reduction in vehicle emissions, and the creation of robust multimodal networks that support integrated land uses. Council Policy 5-1 requires all projects to analyze transportation impacts using the VMT metric.

The Transportation Analysis Policy 5-1 aligns with the Envision San Jose 2040 General Plan which seeks to focus new development growth within Planned Growth Areas, bringing together office, residential, and service land uses to internalize trips and reduce VMT. VMT-based policies support dense, mixed-use, infill projects as established in the General Plan's Planned Growth Areas.

The project site is located within the Five Wounds BART Urban Village (i.e., planned growth area), according to the Envision San Jose 2040 General Plan. Urban Villages are walkable, bicycle-friendly, transit-oriented, mixed-use settings that provide high-density housing and promote job growth, thus supporting the General Plan's policies and goals. Projects that are located within an Urban Village boundary are eligible for a 20% parking reduction.

Figure 1
Site Location and Study Intersections

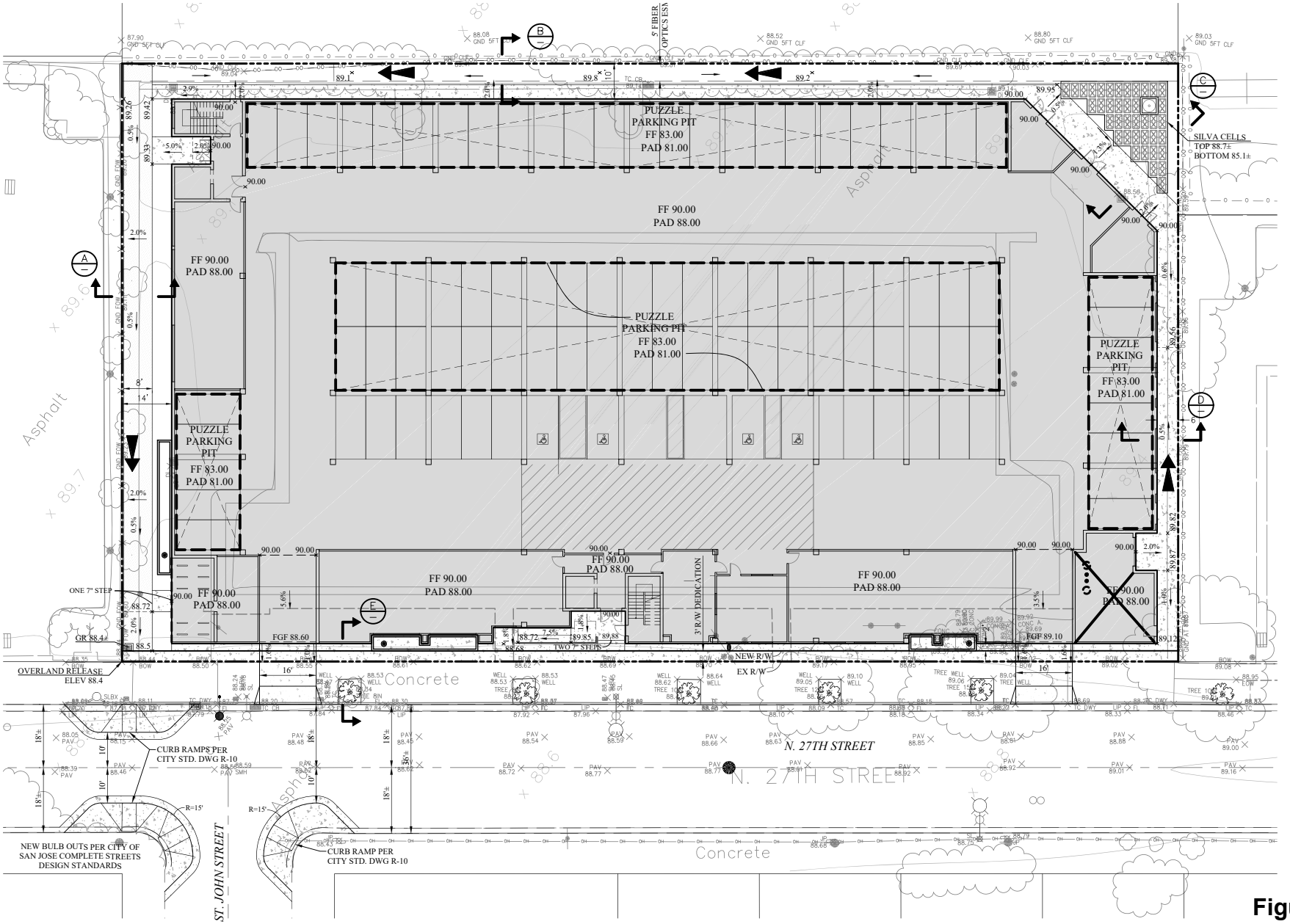

Figure 2
Site Plan

HEXAGON

NORTH
Not to Scale

The Envision San Jose 2040 General Plan contains policies to encourage the use of non-automobile transportation modes to minimize vehicle trip generation and reduce VMT, including the following:

- Accommodate and encourage the use of non-automobile transportation modes to achieve San Jose's mobility goals and reduce vehicle trip generation and VMT (TR-1.1);
- Consider impacts on overall mobility and all travel modes when evaluating transportation impacts of new developments or infrastructure projects (TR-1.2);
- Increase substantially the proportion of commute travel using modes other than the single-occupant vehicle in order to meet the City's mode split targets for San Jose residents and workers (TR-1.3);
- Through the entitlement process for new development, projects shall be required to fund or construct needed transportation improvements for all transportation modes, giving first consideration to improvement of bicycling, walking and transit facilities and services that encourage reduced vehicle travel demand (TR-1.4);
- Actively coordinate with regional transportation, land use planning, and transit agencies to develop a transportation network with complementary land uses that encourage travel by bicycling, walking and transit, and ensure that regional greenhouse gas emissions standards are met (TR-1.8);
- Give priority to the funding of multimodal projects that provide the most benefit to all users. Evaluate new transportation projects to make the most efficient use of transportation resources and capacity (TR-1.9);
- Coordinate the planning and implementation of citywide bicycle and pedestrian facilities and supporting infrastructure. Give priority to bicycle and pedestrian safety and access improvements at street crossings and near areas with higher pedestrian concentrations (school, transit, shopping, hospital, and mixed-use areas) (TR-2.1);
- Provide a continuous pedestrian and bicycle system to enhance connectivity throughout the City by completing missing segments. Eliminate or minimize physical obstacles and barriers that impede pedestrian and bicycle movement on City streets. Include consideration of grade-separated crossings at railroad tracks and freeways. Provide safe bicycle and pedestrian connections to all facilities regularly accessed by the public, including the Mineta San Jose International Airport (TR-2.2);
- Integrate the financing, design and construction of pedestrian and bicycle facilities with street projects. Build pedestrian and bicycle improvements at the same time as improvements for vehicular circulation (TR-2.5);
- Require new development where feasible to provide on-site facilities such as bicycle storage and showers, provide connections to existing and planned facilities, dedicate land to expand existing facilities or provide new facilities such as sidewalks and/or bicycle lanes/paths, or share in the cost of improvements (TR-2.8);
- Coordinate and collaborate with local School Districts to provide enhanced, safer bicycle and pedestrian connections to school facilities throughout San Jose (TR-2.10);
- As part of the development review process, require that new development along existing and planned transit facilities consist of land use and development types and intensities that contribute towards transit ridership, and require that new development is designed to accommodate and provide direct access to transit facilities (TR-3.3);

- Support the development of amenities and land use and development types and intensities that increase daily ridership on the VTA, BART, Caltrain, ACE and Amtrak California systems and provide positive fiscal, economic, and environmental benefits to the community (TR-4.1);
- Promote transit-oriented development with reduced parking requirements and promote amenities around transit hubs and stations to facilitate the use of transit services (TR-8.1);
- Balance business viability and land resources by maintaining an adequate supply of parking to serve demand while avoiding excessive parking supply that encourages auto use (TR-8.2);
- Support using parking supply limitations and pricing as strategies to encourage the use of non-automobile modes (TR-8.3);
- Discourage, as part of the entitlement process, the provision of parking spaces significantly above the number of spaces required by code for a given use (TR-8.4);
- Allow reduced parking requirements for mixed-use developments and for developments providing shared parking or a comprehensive transportation demand management (TDM) program, or developments located near major transit hubs or within Urban Villages and other Growth Areas (TR-8.6);
- Within new development, create and maintain a pedestrian-friendly environment by connecting the internal components with safe, convenient, accessible, and pleasant pedestrian facilities and by requiring pedestrian connections between building entrances, other site features, and adjacent public streets (CD-3.3);
- Create a pedestrian-friendly environment by connecting new residential development with safe, convenient, accessible, and pleasant pedestrian facilities. Provide such connections between new development, its adjoining neighborhood, transit access points, schools, parks, and nearby commercial areas (LU-9.1);
- Facilitate the development of housing close to jobs to provide residents with the opportunity to live and work in the same community (LU-10.5);
- Encourage all developers to install and maintain trails when new development occurs adjacent to a designated trail location. Use the City's Parkland Dedication Ordinance and Park Impact Ordinance to have residential developers build trails when new residential development occurs adjacent to a designated trail location, consistent with other parkland priorities. Encourage developers or property owners to enter into formal agreements with the City to maintain trails adjacent to their properties (PR-8.5).

CEQA Transportation Analysis Exemption

The City of San Jose's Transportation Analysis Policy (Policy 5-1) establishes procedures for determining project impacts on VMT based on project description, characteristics, and/or location. The City of San Jose defines VMT as the total miles of travel by personal motorized vehicles a project is expected to generate in a day. VMT is calculated for residential, office, and industrial projects using the Origin-Destination VMT method, which measures the full distance of personal motorized vehicle-trips with one end within the project.

A project's VMT is compared to the appropriate thresholds of significance based on the project location and type of development. When assessing a residential project, the project's VMT is divided by the number of residents expected to occupy the project to determine the VMT per capita. When assessing an office or industrial project, the project's VMT is divided by the number of employees to determine VMT per worker. The thresholds of significance for development projects, as established in the

Transportation Analysis Policy, are based on the existing citywide average VMT level for residential uses and the existing regional average VMT level for employment uses.

To determine whether a project would result in CEQA transportation impacts related to VMT, the City has developed the San Jose VMT Evaluation Tool to streamline the analysis for residential, office, and industrial projects with local traffic. The tool estimates a project's VMT and compares it to the appropriate thresholds of significance based on the project location (i.e., assessor's parcel number) and type of development.

Figure 3 shows the current VMT levels estimated by the City for residents based on the locations of residences. Developments in the green-colored areas are estimated to have VMT levels that are below the thresholds of significance, while the yellow-colored areas are estimated to have VMT levels at the City average. The orange- and pink-colored areas are estimated to have VMT levels that are above the thresholds of significance. Projects located in areas where the existing VMT is above the established threshold are referred to as being in "high-VMT areas". Projects in high-VMT areas are required to include a set of VMT reduction strategies that would reduce the project VMT to the extent possible. The project is subject to the VMT screening criteria as described below.

Screening Criteria for VMT Analysis Exemption

The City of San Jose's *Transportation Analysis Handbook, 2020* includes screening criteria for projects that are expected to result in a less-than-significant VMT impact based on the project description, characteristics and/or location. The proposed residential project would meet the City's residential screening criteria. The City's screening criteria and an explanation of how the project satisfies the criteria are included in Chapter 3. Projects that meet the screening criteria do not require a CEQA transportation analysis (i.e., VMT analysis) but are typically required to provide a Local Transportation Analysis (LTA) to identify potential operational issues that may arise due to the project.

Local Transportation Analysis Scope

The non-CEQA Local Transportation Analysis (LTA) supplements the VMT analysis by identifying potential adverse operational effects that may arise due to a new development, as well as evaluating the effects of a new development on site access, on-site circulation, vehicle queuing, and transit, bicycle, and pedestrian facilities in the proximate area of the project. As part of the LTA, a project is generally required to conduct an intersection operations analysis if the project is expected to add 10 or more vehicle trips per hour per lane to any signalized intersection that is located within a half-mile of the project site. Based on these criteria, as outlined in the City's *Transportation Analysis Handbook,* a list of study intersections is then developed for the LTA. Note, however, that signalized intersections that do not meet all the criteria may still be added to the list of study intersections at the City's discretion. Unsignalized intersections may also be added; though, unlike signalized intersections, unsignalized intersections typically are not typically evaluated for level of service.

The LTA analyzes AM and PM peak hour traffic conditions for the following six intersections:

1. US 101 Northbound Ramps and Alum Rock Avenue – CMP intersection
2. US 101 Southbound Ramps and Santa Clara Street – CMP intersection
3. 28th Street and Santa Clara Street
4. 24th Street and Santa Clara Street
5. 27th Street and Santa Clara Street (unsignalized)
6. 27th Street and St. John Street (unsignalized)

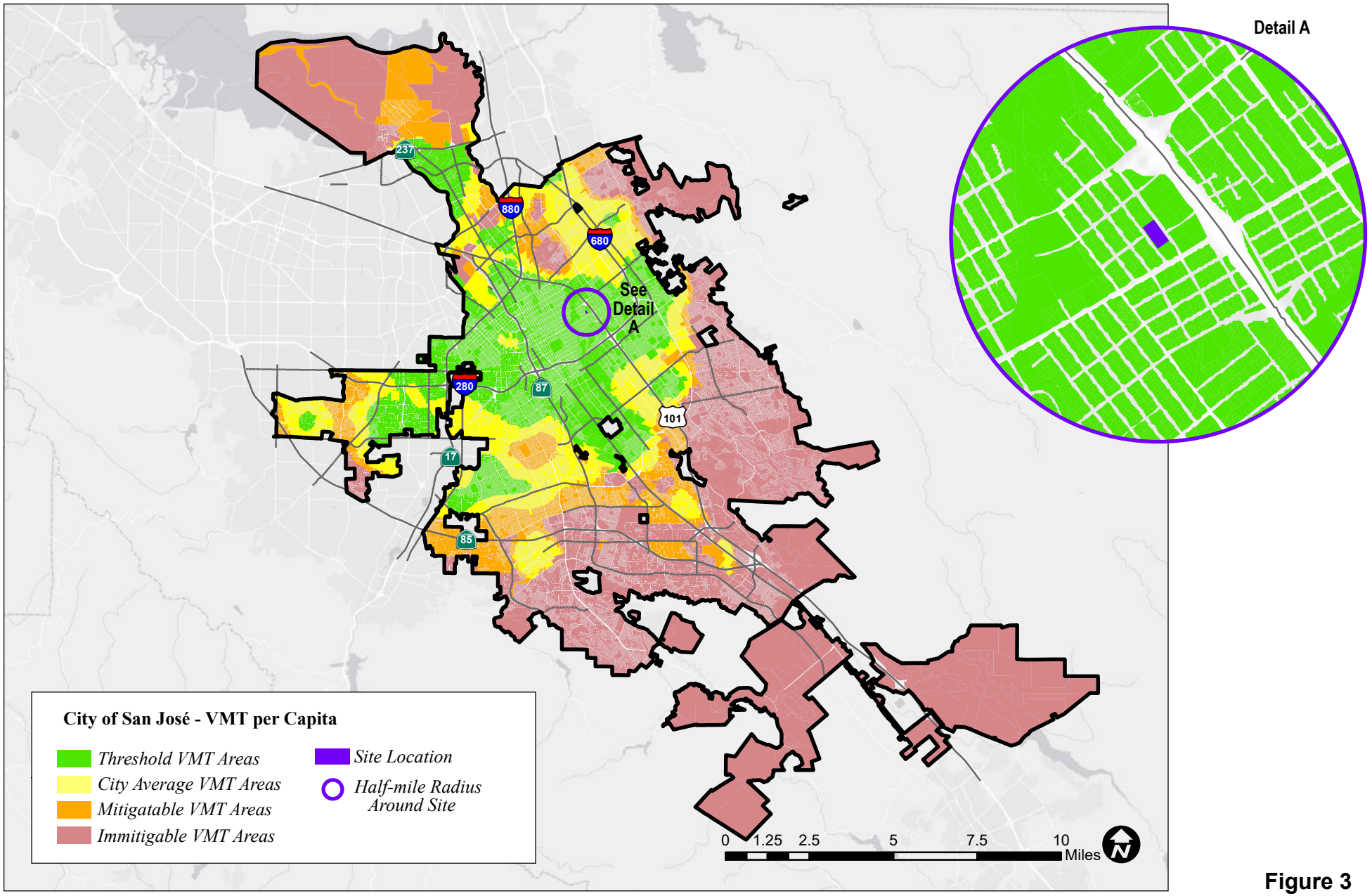

Figure 3
VMT Heat Map for Residents in San Jose

The list of study intersections was approved by City of San Jose staff. Traffic conditions at the study intersections were analyzed for both the weekday AM and PM peak hours of adjacent street traffic. The AM peak hour typically occurs between 7:00 AM and 9:00 AM and the PM peak hour typically occurs between 4:00 PM and 6:00 PM on a regular weekday. It is during these periods that the most congested traffic conditions occur on a typical weekday. Traffic conditions were evaluated for the following scenarios:

- ***Existing Conditions.*** Existing AM and PM peak hour traffic volumes for the signalized study intersections were obtained from 2018 and 2019 counts. The 2018 and 2019 counts were provided by the City of San Jose and also obtained from the 2018 CMP Annual Monitoring Report. Note that although new 2022 traffic counts were collected at all the study intersections, the current traffic volumes in the study area have not yet returned to pre-pandemic levels, so the new counts were not used for the signalized intersections. The new 2022 counts were used for the unsignalized intersections, however, since historical count data is not available for unsignalized intersections.
- ***Background Conditions*.** Background traffic volumes were estimated by adding to existing peak hour volumes the projected volumes from approved but not yet completed or occupied developments. The added traffic from approved but not yet completed or occupied developments was provided by the City of San Jose in the form of the Approved Trips Inventory (ATI). Background conditions represent the baseline conditions to which project conditions are compared for the purpose of determining potential adverse operational effects of the project. The ATI sheets are contained in Appendix A.
- ***Background Plus Project Conditions.*** Project conditions reflect traffic volumes with completion of the project and approved developments. Project traffic volumes were estimated by adding to background traffic volumes the additional trips generated by the project.
- ***Cumulative Conditions.*** Cumulative traffic volumes were estimated by adding to existing volumes the ATI provided by City staff, project-generated trips, and trips generated by pending developments in the study area. For the purpose of this study, cumulative traffic volumes include traffic generated by the following nearby pending projects: 1298 Tripp Avenue residential mixed-use project, 1347 E. Julian Street residential mixed-use project, and 1325 E. Julian Street residential mixed-use project. This traffic scenario is provided for informational purposes at the request of the City of San Jose.

Intersection Operations Analysis Methodology

This section presents the methods used to determine the traffic conditions at the study intersections and the potential adverse operational effects due to the project. It includes descriptions of the data requirements, the analysis methodologies, the applicable intersection level of service standards, and the criteria used to determine adverse effects on intersection operations.

Data Requirements

The data required for the study were obtained from new 2022 traffic counts, the City of San Jose (2018 and 2019 counts), the 2018 CMP Annual Monitoring Report, and field observations. The following data were collected from these sources:

- existing traffic volumes
- intersection lane configurations
- signal timing and phasing
- a list of approved and pending projects

Analysis Methodologies and Level of Service Standards

Traffic conditions at the study intersections were evaluated using level of service (LOS). *Level of Service* is a qualitative description of operating conditions ranging from LOS A, or free-flow conditions with little or no delay, to LOS F, or jammed conditions with excessive delays. The analysis methods are described below.

City of San Jose Signalized Intersections

The City of San Jose level of service methodology for signalized intersections is the 2000 *Highway Capacity Manual* (HCM) method. This method is applied using the TRAFFIX software. The 2000 HCM operations method evaluates signalized intersection operations on the basis of average control delay time for all vehicles at the intersection. The City of San Jose level of service standard for the City's signalized intersections is LOS D or better. The correlation between average control delay and level of service is shown in Table 1.

Table 1
Signalized Intersection Level of Service Definitions Based on Average Control Delay

Level of Service	Description	Average Control Delay Per Vehicle (sec.)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	up to 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.1 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	Greater than 80.0

Source: Transportation Research Board, *2010 Highway Capacity Manual,* (Washington, D.C., 2010).

CMP Signalized Intersections

Since TRAFFIX is the designated level of service methodology for the CMP and the City of San Jose, the CMP study intersections are not analyzed separately, but rather is among the signalized intersections analyzed using TRAFFIX. The only difference between the City of San Jose and CMP analyses is that the CMP level of service standard for signalized intersections is LOS E or better.

Unsignalized Intersections

Two of the study intersections are unsignalized. The City of San Jose has not established a level of service standard for unsignalized intersections. The need for signalization of unsignalized intersections is assessed based on the Peak Hour Volume Warrant (Warrant 3) described in the *Manual on Uniform Traffic Control Devices (MUTCD)*. This method makes no evaluation of intersection level of service, but simply provides an indication whether vehicular peak hour traffic volumes are, or would be, sufficient to justify installation of a traffic signal. Intersections that meet the peak hour warrant are subject to further analysis before determining that a traffic signal is necessary. Additional analysis may include unsignalized intersection level of service analysis and/or operations analysis such as evaluating vehicle queuing and delay. Other types of traffic control devices, signage, or geometric changes may be preferable based on existing field conditions and intersection spacing.

Adverse Intersection Operations Effects

According to the City of San Jose's *Transportation Analysis Handbook, 2020*, an adverse effect on signalized intersection operations would occur if for either peak hour:

1. The level of service at the intersection degrades from an acceptable level (LOS D or better) under background conditions to an unacceptable level under background plus project conditions, or
2. The level of service at the intersection is an unacceptable level (LOS E or F) under background conditions and the addition of project trips cause both the critical-movement delay at the intersection to increase by four (4) or more seconds *and* the volume-to-capacity ratio (V/C) to increase by one percent (.01) or more.

The exception to this threshold is when the addition of project traffic reduces the amount of average control delay for critical movements, i.e., the change in average control delay for critical movements is negative. In this case, the threshold is when the project increases the critical v/c value by 0.01 or more.

Adverse effects at signalized intersections can be addressed by one of the following approaches:

- Construct improvements to the subject intersection or other roadway segments of the citywide transportation system to increase overall capacity, or
- Reduce project-generated vehicle trips (e.g., implement a "trip cap") to eliminate the adverse operational effects and restore intersection operations to background conditions. The extent of trip reduction should be set at a level that is realistically attainable through proven methods of reducing trips.

Intersection Vehicle Queuing Analysis

The analysis of intersection operations was supplemented with a vehicle queuing analysis at study intersections where the project would add a noteworthy number of trips to the left-turn movements. The queuing analysis is presented for informational purposes only, since the City of San Jose has not defined a policy related to queuing. Vehicle queues were estimated using a Poisson probability distribution, which estimates the probability of "n" vehicles for a vehicle movement using the following formula:

$$P(x=n) = \frac{\lambda^n e^{-(\lambda)}}{n!}$$

Where:

P (x=n) = probability of "n" vehicles in queue per lane
n = number of vehicles in the queue per lane
λ = average # of vehicles in the queue per lane (vehicles per hr per lane/signal cycles per hr)

The basis of the analysis is as follows: (1) the Poisson probability distribution is used to estimate the 95th percentile maximum number of queued vehicles for a particular left-turn movement; (2) the estimated maximum number of vehicles in the queue is translated into a queue length, assuming 25 feet per vehicle; and (3) the estimated maximum queue length is compared to the existing or planned available storage capacity for the left-turn movement. This analysis thus provides a basis for estimating future turn pocket storage requirements at intersections.

For signalized intersections, the 95th percentile queue length value indicates that during the peak hour, a queue of this length or less would occur on 95 percent of the signal cycles. Or, a queue length larger than the 95th percentile queue would only occur on 5 percent of the signal cycles (about 3 cycles during the peak hour for a signal with a 60-second cycle length). Thus, turn pocket storage designs based on the 95th percentile queue length would ensure that storage space would be exceeded only 5 percent of the time for a signalized movement.

US 101/Oakland/Mabury Transportation Development Policy

The City of San Jose has identified operational problems along the Oakland Road corridor at the US 101 interchange, which are due primarily to the capacity constraints of the interchange. As a result, the City has identified two key capital improvement projects: 1) modification of the US 101/Oakland Road interchange, including improvements to the Oakland Road/Commercial Street intersection, and 2) construction of a new US 101/Mabury Road interchange. To fund these interchange improvements, the City has developed the US 101/Oakland/Mabury Transportation Development Policy (TDP).

As part of the Policy, a fee to fund the planned interchange improvements has been adopted. Any project that would add traffic to the US 101/Oakland Road interchange is required to participate in the TDP program. The fee for the US 101/Oakland/Mabury TDP is based on the number of PM peak hour vehicular trips that a project would add to the interchange. The 2023 TDP traffic impact fee is $48,226 per each new PM peak hour vehicle trip that would be added to the interchange. This fee is subject to an annual escalation on January 1st per the Engineering News-Record Construction Cost Index for San Francisco.

Based on the project site's proximity to the US 101/Santa Clara Street-Alum Rock Avenue interchange (1/4-mile from the site) and the project trip distribution patterns discussed in Chapter 3, it is reasonable to assume that the project would not add vehicle trips to the US 101/Oakland Road interchange (2.5-mile drive from the site). Therefore, the project would not be required to pay the TDP impact fee.

Report Organization

This report has a total of five chapters. Chapter 2 describes the existing roadway network, transit services, and bicycle and pedestrian facilities. Chapter 3 describes the CEQA transportation analysis exemption criteria. Chapter 4 describes the local transportation analysis (LTA) including the method by which project traffic is estimated, intersection operations analysis, any adverse intersection operations effects caused by the project, intersection vehicle queuing analysis, site access and on-site circulation review, effects on bicycle, pedestrian, and transit facilities, and parking. Chapter 5 presents the conclusions of the local transportation analysis.

2. Existing Transportation Conditions

This chapter describes the existing conditions of the transportation system within the study area of the project. It describes transportation facilities in the vicinity of the project site, including the roadway network, transit service, and pedestrian and bicycle facilities. The analysis of existing intersection operations is included as part of the Local Transportation Analysis (see Chapter 3).

Existing Roadway Network

Regional access to the project site is provided via US 101. Local access to the project site is provided via Alum Rock Avenue, Santa Clara Street, 24th Street, and 27th Street. These facilities are described below.

US 101 is an eight-lane freeway (three mixed-flow lanes and one HOV lane in each direction) in the vicinity of the site. US 101 extends northward through San Francisco and southward through Gilroy. Access to and from the site is provided via the Santa Clara Street/Alum Rock Avenue interchange.

Alum Rock Avenue is an east-west oriented Grand Boulevard that extends from US 101 to Alum Rock Park near the foothills in East San Jose with interchanges at US 101 and at I-680. Alum Rock Avenue is a Vision Zero Corridor, which is a commitment to prioritizing street safety and ensuring all road users – whether walking, biking, riding transit, or driving – are safe. West of the I-680 interchange, Alum Rock Avenue has a posted speed limit of 30 mph and consists of four travel lanes with median transit lanes (i.e., BRT service). Alum Rock Avenue has sidewalks on both sides of the street but has no bicycle facilities. Curb parking is prohibited along most segments of Alum Rock Avenue. Alum Rock Avenue provides access to the project site via its transition to Santa Clara Street.

Santa Clara Street is a four-lane east-west Grand Boulevard that extends from US 101 westward through Downtown San Jose. West of Montgomery/Autumn Street, Santa Clara Street becomes The Alameda and extends into the City of Santa Clara. East of US 101, Santa Clara Street becomes Alum Rock Avenue. Santa Clara Street has sidewalks on both sides of the street but has no bicycle facilities. Santa Clara Street has a posted speed limit of 25 mph and provides access to and from the project site via 27th Street.

24th Street is a two-lane north-south local street with a posted speed limit of 25 mph. It extends from Julian Street southward to William Street, where it becomes McLaughlin Avenue. McLaughlin Avenue is a four-lane north-south City Connector Street (south of I-280) that begins at William Street and extends southward to Tuers Road, just south of Yerba Buena Road. McLaughlin Avenue provides access to westbound I-280 and from eastbound I-280 via a partial interchange. 24th Street has sidewalks on both sides of the street and is a designated bike route (contains sharrows). 24th Street provides access to the project site via its intersection with Santa Clara Street.

27th Street is a two-lane undivided local street that runs north to south between Santa Clara Street and Julian Street. 27th Street has a posted speed limit of 25 mph and curb parking is allowed on both sides of the street. 27th Street has sidewalks on both sides of the street but has no bicycle facilities. 27th Street provides direct access to the project site.

Existing Intersection Lane Configurations

The existing lane configurations at the study intersections were determined by observations in the field and are shown on Figure 4.

Existing Pedestrian, Bicycle and Transit Facilities

San Jose desires to provide a safe, efficient, fiscally, economically, and environmentally sensitive transportation system that balances the needs of bicyclists, pedestrians, and public transit riders with those of automobiles and trucks. The existing bicycle, pedestrian and transit facilities in the study area are described below.

Existing Pedestrian Facilities

Pedestrian facilities in the project area consist primarily of sidewalks along the streets and crosswalks with pedestrian signal heads at intersections. Sidewalks are found along all previously described local roadways in the study area. The existing network of sidewalks and crosswalks provides adequate connectivity for pedestrians between the project site and other surrounding land uses and transit stops. Crosswalks with pedestrian signal heads and push buttons are located at all the signalized intersections in the study area. Curb ramps with truncated domes are also provided at all the intersections near the site, including Santa Clara Street and 27th Street. Truncated domes are the standard ADA design requirement for detectable warnings which enable people with visual disabilities to determine the boundary between the sidewalk and the street.

Existing Bicycle Facilities

In the project area, Class II striped bike lanes are present on 21st Street south of Santa Clara Street, San Antonio Street east of 28th Street, and King Road south of McKee Road. 24th Street, 33rd Street, and San Antonio Street are all designated bike routes and contain sharrows (see Figure 5).

Existing Transit Services

Existing bus service in the project vicinity is provided by the Santa Clara Valley Transportation Authority (VTA). The project area is served by frequent bus routes 22, 23, 64A, 64B, and Rapid 522. Bus routes 22 and 23 stop within walking distance of the project site on Santa Clara Street (see Figure 6). The three existing bus stops within walking distance of the project site include shelters with benches.

Local Route 22 provides service between the Palo Alto Transit Center and the Eastridge Transit Center. Route 22 operates along Santa Clara Street in the project study area, with 15-minute headways during the weekday peak commute hours. Bus stops are located on Santa Clara Street within walking distance of the project site at 26th Street, 27th Street, and 28th Street.

Local Route 23 provides service between De Anza College and the Alum Rock Transit Center. Route 23 operates along Santa Clara Street in the project study area, with 15-minute headways during the weekday peak commute hours. Bus stops are located on Santa Clara Street within walking distance of the project site at 26th Street, 27th Street, and 28th Street.

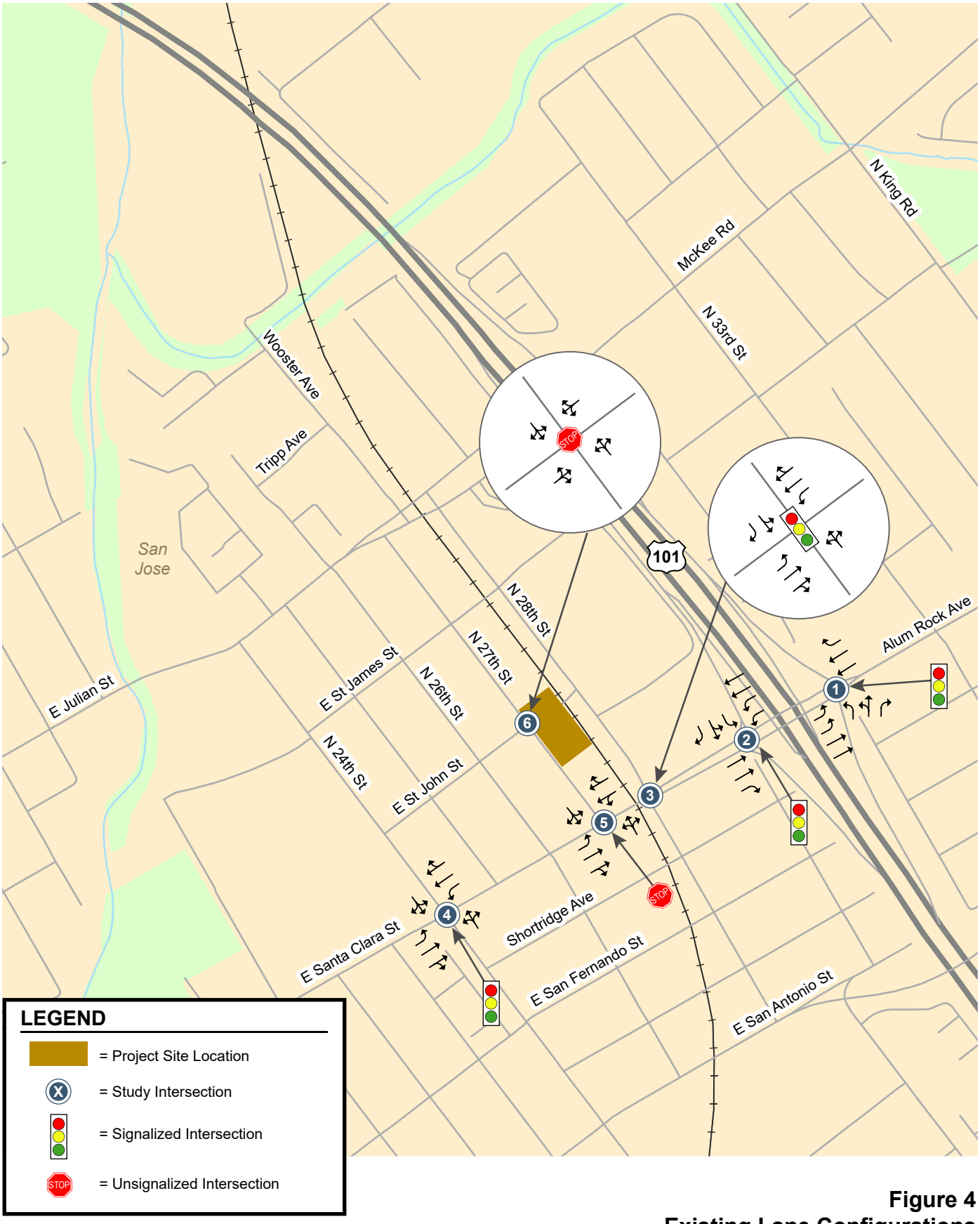

Figure 4
Existing Lane Configurations

Figure 5
Existing Bicycle Facilities

Figure 6
Existing Transit Services

Local Route 64A provides service between the Ohlone-Chynoweth LRT Station and the McKee Road/White Road intersection. Route 64A operates along Julian Street/McKee Road in the project study area, with 30-minute headways during the weekday commute hours. The closest bus stops are located at the Julian Street/26th Street intersection, approximately ¼ mile north of the project site.

Local Route 64B provides service between the Almaden Expressway/Camden Avenue intersection and the McKee Road/White Road intersection. Route 64B operates along Julian Street/McKee Road in the project study area, with 30-minute headways during the weekday commute hours. The closest bus stops are located at the Julian Street/26th Street intersection, approximately ¼ mile north of the project site.

Rapid Route 522 provides Bus Rapid Transit (BRT) service between the Palo Alto Transit Center and the Eastridge Transit Center. East of US 101, Route 522 runs within the median transit lanes along Alum Rock Avenue, with 15-minute headways during the weekday peak commute hours. The closest bus stops are located at the 24th Street/Santa Clara Street intersection, approximately ¼ mile west of the project site.

Observed Existing Traffic Conditions

Traffic conditions were observed in the field to identify any existing operational deficiencies occurring within an approximately ½-mile radius of the project site. Overall, the study intersections operated well during both the AM and PM peak commute periods. No noteworthy operational issues were observed during the field observation periods.

3. CEQA Transportation Analysis Exemption

This chapter describes the CEQA transportation analysis exemption criteria set forth in the City of San Jose's *Transportation Analysis Handbook, 2020* for projects that are expected to result in a less-than-significant VMT impact based on the project description, characteristics and/or location. Projects that meet the screening criteria do not require a CEQA-level transportation analysis. The City's screening criteria for residential projects and an explanation of how the project would satisfy the criteria are described in this chapter. Also included is a cumulative transportation impact analysis used to determine the project's consistency with the City of San Jose's General Plan.

The City's screening criteria set forth in the *Transportation Analysis Handbook* for residential projects are described below.

Screening Criteria for Residential Projects

1. **Planned Growth Areas**: Located within a Planned Growth Area as defined in the Envision San Jose 2040 General Plan; and
2. **High-Quality Transit**: Located within ½ mile of an existing major transit stop or an existing stop along a high-quality transit corridor; and
3. **Low VMT Areas**: Located in an area in which the per-capita VMT is less than or equal to the CEQA significance threshold for the land use; and
4. **Transit-Supporting Project Density**:
   - Minimum of 35 units per acre for residential projects or components;
   - If located in a Planned Growth Area with a maximum density below 0.75 FAR or 35 units per acre, the maximum density allowed in the Planned Growth Area must be met; and
5. **Parking**:
   - No more than the minimum number of parking spaces required;
   - If located in Urban Villages or Downtown, the number of parking spaces must be adjusted to the lowest amount allowed; however, if the parking is shared, publicly available, and/or "unbundled", the number of parking spaces can be up to the zoned minimum; and
6. **Active Transportation**: Not negatively impact transit, bike or pedestrian infrastructure.

The residential project would meet all the above criteria as follows:

- Is located within a Planned Growth Area (based on VMT Evaluation Tool) = Criterion 1 met;
- Is located within ½-mile of high-quality transit (future 28th Street/Little Portugal BART station) = Criterion 2 met;

- Is located in an area in which the per-capita VMT is less than or equal to the CEQA significance threshold = Criterion 3 met;
- Would have a residential density of 172 DU/AC (200 DU / 1.16 AC = 172 DU/AC) = Criterion 4 met;
- Would provide the minimum amount of parking required = Criterion 5 met; and
- Would not negatively impact transit, bike or ped infrastructure = Criterion 6 met.

Since the project would meet the residential screening criteria, no CEQA Transportation Analysis (i.e., VMT analysis) is required. Appendix E contains the VMT Evaluation Tool Summary Report for informational purposes.

Cumulative Analysis (Compliance with the General Plan)

Projects must demonstrate consistency with the Envision San Jose 2040 General Plan to address potential cumulative impacts. Consistency with the City's General Plan is based on the project's density, design, and conformance to the General Plan goals and policies. If a project is determined to be inconsistent with the General Plan, a cumulative impact analysis is required as part of the City's *Transportation Analysis Handbook*.

According to the Envision San Jose 2040 General Plan, the project site is designated as *Urban Village* and is located within the Five Wounds Urban Village. Considered a Regional Transit Urban Village, the Five Wounds Urban Village Plan supports high density, mixed-use residential/commercial development. Within the Five Wounds Urban Village, the *Urban Village* designation is a commercial designation that also allows residential uses (up to a density of 250 DU/AC) in a mixed-use format. Developments within this Urban Village may include residential mixed-use projects with residential above retail. Residential projects that do not include a commercial component are not consistent with the *Urban Village* designation within the Five Wounds Urban Village.

The proposed project at 70 N. 27th Street consists of a high-density transit-oriented residential development, including an affordable housing component (approximately 5% affordable). The project site is situated adjacent to the future Five Wounds Creek multi-use trail and is within walking distance of the future 28th Street/Little Portugal BART station. Additionally, the project is proposing a residential development density of 172 DU/AC (200 DU/1.16 AC = 172 DU/AC), which would meet the minimum development density of 35 DU/AC as defined in the City's screening criteria for VMT analysis and would be less than the maximum allowable density of 250 DU/AC as defined in the Five Wounds Urban Village Plan. However, the project does not propose to include any ground floor retail space. To address this inconsistency, the project is proposing a Density Bonus, which would eliminate the retail requirement within the Five Wounds Urban Village.

With the proposed Density Bonus, the project would be consistent with the Five Wounds Urban Village Plan and, thus, would conform to the General Plan. The residential project would be considered part of the cumulative solution to meet the General Plan's long-range transportation goals and would result in a less-than-significant cumulative impact.

4. Local Transportation Analysis

This chapter describes the local transportation analysis (LTA) including the method by which project traffic is estimated, intersection operations analysis, any adverse effects to intersection level of service caused by the project, intersection vehicle queuing analysis, site access and on-site circulation review, effects on bicycle, pedestrian and transit facilities, and parking.

Intersection Operations Analysis

The intersection operations analysis is intended to quantify the operations of the study intersections and to identify potential negative effects due to the addition of project traffic. Information required for the intersection operations analysis related to project trip generation, trip distribution, and trip assignment are presented in this section. The study intersections are located in the City of San Jose and are evaluated based on the City of San Jose's intersection analysis methodology and standards in determining potential adverse operational effects due to the project, as described in Chapter 1. It is assumed in this analysis that the future transportation network with the project would be the same as the existing transportation network.

Project Trip Estimates

The magnitude of traffic produced by a new development and the locations where that traffic would appear are estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. In determining project trip generation, the magnitude of traffic entering and exiting the site is estimated for the AM and PM peak hours. As part of the project trip distribution, the directions to and from which the project trips would travel are estimated. In the project trip assignment, the project trips are assigned to specific streets and intersections. These procedures are described below.

Trip Generation

Trips generated by any new development are typically estimated based on counts of existing developments of the same land use type. A compilation of typical trip generation rates can be found in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual.* Project trip generation was estimated by applying to the size and use of the proposed development the appropriate trip generation rates obtained from the ITE *Trip Generation Manual, 11th Edition* (2021).

Trips that would be generated by the residential project were estimated using the ITE average trip rates for "Multifamily Housing Mid-Rise Close to Rail Transit" (ITE Land Use 221) located in a General Urban/Suburban setting. This rate was used because the residential building would have a height of between 4 and 10 floors and would be situated within ½-mile of the future 28th Street/Little Portugal BART Station.

Trip Adjustments and Reductions

In accordance with San Jose's *Transportation Analysis Handbook* (April 2020, Section 4.8, "Intersection Operations Analysis"), the project is eligible for adjustments and reductions from the baseline trip generation described above. The applicable trip adjustments and reductions are described below.

Location-Based Trip Adjustment

Based on the 2020 San Jose guidelines, the project qualifies for a location-based adjustment. The location-based adjustment reflects the project's vehicle mode share based on the "place type" in which the project is located as per the San Jose Travel Demand Model. The project's place type was obtained from the San Jose VMT Evaluation Tool and is based on existing conditions (i.e., the current place type does not consider the future 28th Street/Little Portugal BART station). Based on the tool, the project site is located within the place type "Urban Low Transit" (see VMT Evaluation Tool Summary Report in Appendix E). Therefore, the baseline project trips were adjusted to reflect the corresponding mode share. Residential developments within Urban Low Transit areas have a vehicle mode share of 87% (according to Table 6 of the City's *Transportation Analysis Handbook*). Thus, a 13% reduction was applied to the project trip generation estimates based on the location-based vehicle mode share outputs produced from the San Jose Travel Demand Model. The 13% trip reduction is based on the percent of mode share for other modes of travel besides motor vehicles.

Project-Specific Residential Trip Reduction

According to the *Transportation Analysis Handbook*, the VMT reduction resulting from the project characteristics and implementing any VMT reduction strategies in the evaluation tool should be included as part of the trip generation estimates. It is assumed that every percent reduction in VMT per capita is equivalent to one percent reduction in peak hour vehicle trips. The VMT Evaluation Tool calculated a 3% external trip reduction. This trip reduction reflects the project characteristics including increases in residential density for the site.

Existing Trip Credits

Trips that are generated by existing occupied uses can be subtracted from the gross project trip generation estimates. Accordingly, trip credits were applied to account for the commercial building that would be removed as part of the project. The trip credits are based on trip generation counts of the existing occupied commercial uses conducted on May 10, 2022. The existing driveway count data are contained in Appendix F.

Net Project Trips

After applying the appropriate ITE trip rates, applicable trip adjustments and reductions, and existing trip credits described above, the proposed residential project is estimated to generate 636 new daily vehicle trips, with 46 new trips (24 inbound and 22 outbound) occurring during the AM peak hour and 30 new trips (12 inbound and 18 outbound) occurring during the PM peak hour (see Table 2).

Table 2
Project Trip Generation Estimates

Land Use	Size	Daily Rate	Daily Trips	AM Peak Hour Pk-Hr Rate	AM In	AM Out	AM Total	PM Peak Hour Pk-Hr Rate	PM In	PM Out	PM Total
Proposed Uses											
Multifamily Housing [1]	200 DU	4.75	950	0.32	36	28	64	0.29	25	33	58
Location-Based Vehicle Mode Share (13%) [2]			*(124)*		*(4)*	*(4)*	*(8)*		*(4)*	*(4)*	*(8)*
Project-Specific Trip Reduction (3%) [3]			*(25)*		*(1)*	*(1)*	*(2)*		*(1)*	*(1)*	*(2)*
Gross New Trips:			**801**		**31**	**23**	**54**		**20**	**28**	**48**
Existing Uses (To Be Removed)											
Commercial Building [4]			(165)		(7)	(1)	(8)		(8)	(10)	(18)
Net New Trips:			**636**		**24**	**22**	**46**		**12**	**18**	**30**

Notes:
[1] Trip generation based on average rates contained in the *ITE Trip Generation Manual, 11th Edition*, for Multifamily Housing Mid-Rise Close to Rail Transit (Land Use 221) located in a General Urban/Suburban setting. Rates are expressed in trips per dwelling unit (DU).

[2] A 13% trip reduction was applied based on the location-based vehicle mode share % outputs (Table 6 of the City's *Transportation Analysis Handbook*) produced from the San Jose Travel Demand Model for the place type Urban Low Transit. The 13% reduction is based on the % mode share for other modes of travel besides autos.

[3] A 3% trip reduction was applied based on the external trip adjustments obtained from the City's VMT Evaluation Tool.

[4] The AM and PM peak hour trips generated by the existing commercial building to be removed are based on driveway counts conducted on May 10, 2022. Existing daily trips were estimated.

Trip Distribution and Assignment

The project trip distribution pattern was estimated based on existing residential travel patterns on the surrounding roadway network that reflect typical weekday AM and PM commute patterns, the locations of complementary land uses, and freeway access points. The peak hour vehicle trips generated by the project were assigned to the roadway network in accordance with the trip distribution pattern.

Figure 7 shows the residential project trip distribution pattern and gross trip assignment. Figure 8 shows the existing trip credits based on the driveway counts. Figure 9 shows the net project trip assignment at the study intersections.

Approximately 75 percent of inbound project trips would approach from the south via Santa Clara Street, and 25 percent would approach from the north via Julian Street. Since the majority of project-generated trips would originate from the south, very few inbound vehicle trips (7 AM peak hour trips and 4 PM peak hour trips) would pass through the mixed-use portion of the neighborhood north of the project site. Note that N. 27th Street contains a mix of residential and commercial uses along its entirety (between Santa Clara and Julian Streets). The land uses along 24th, 25th and 26th Streets west of the project site are almost entirely residential uses. The project would not add trips through the residential neighborhood to the west. Accordingly, the project would not result in any “cut-through” traffic.

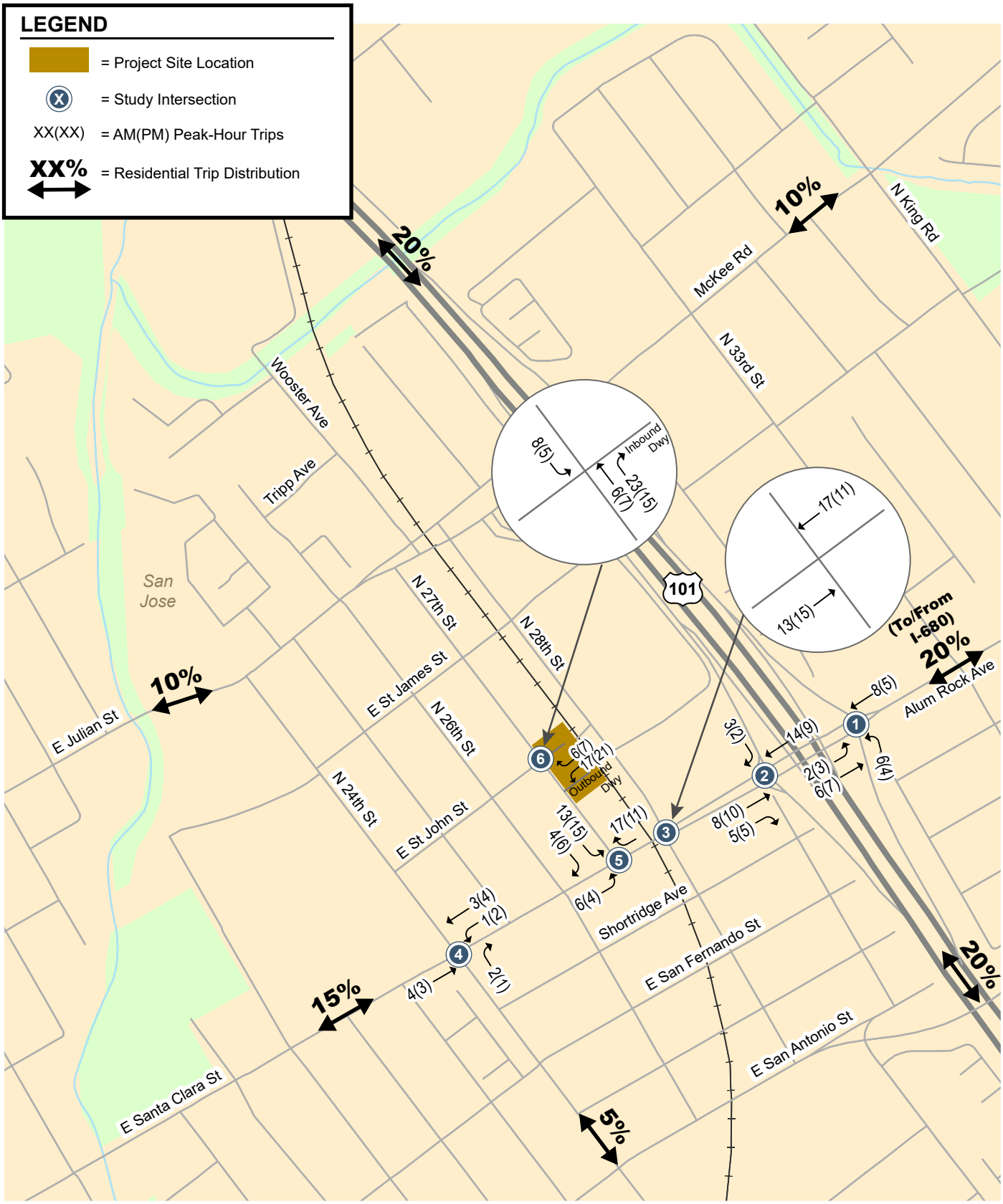

Figure 7
Residential Project Trip Distribution Pattern and Gross Trip Assignment

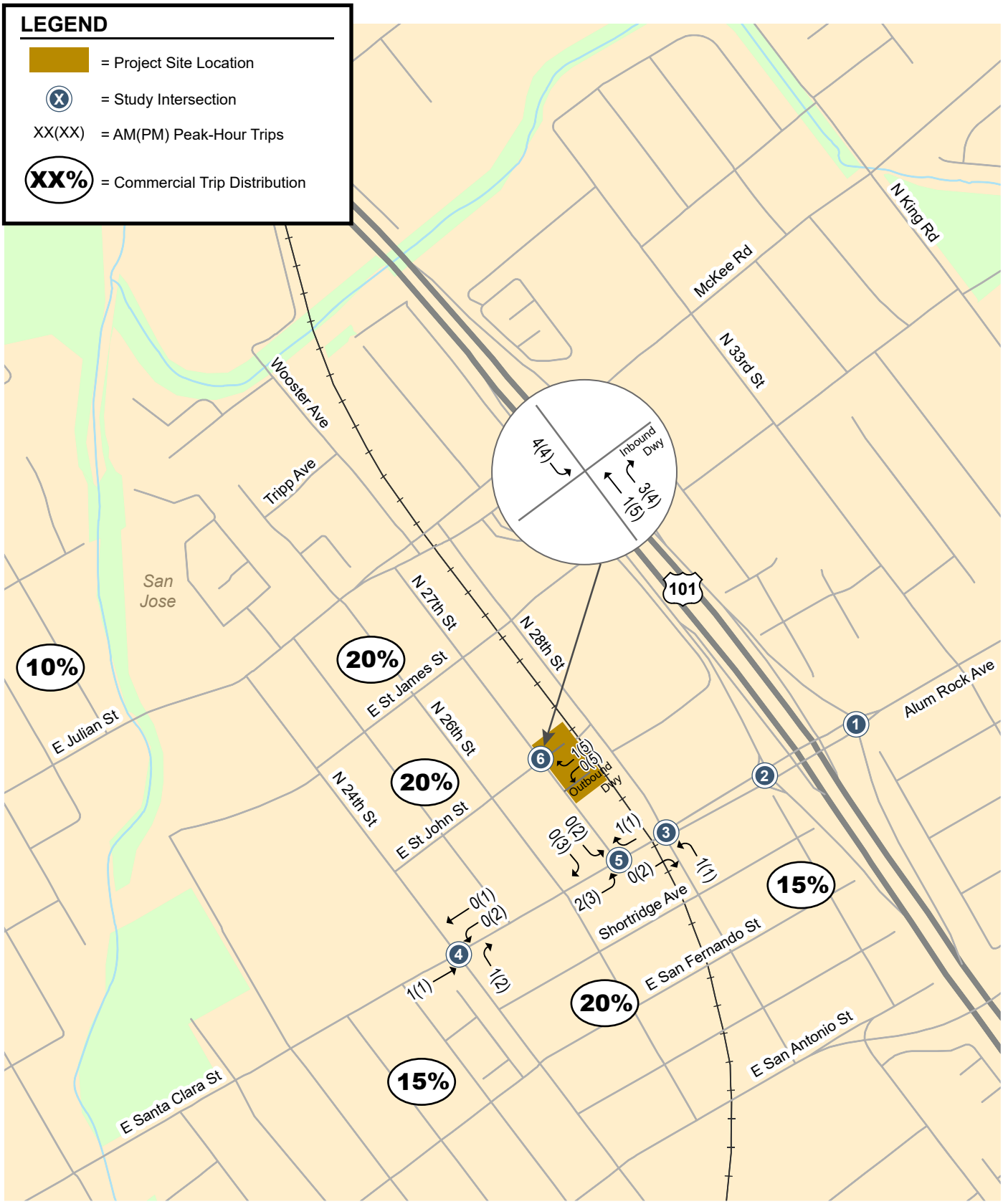

Figure 8
Existing Trip Credits

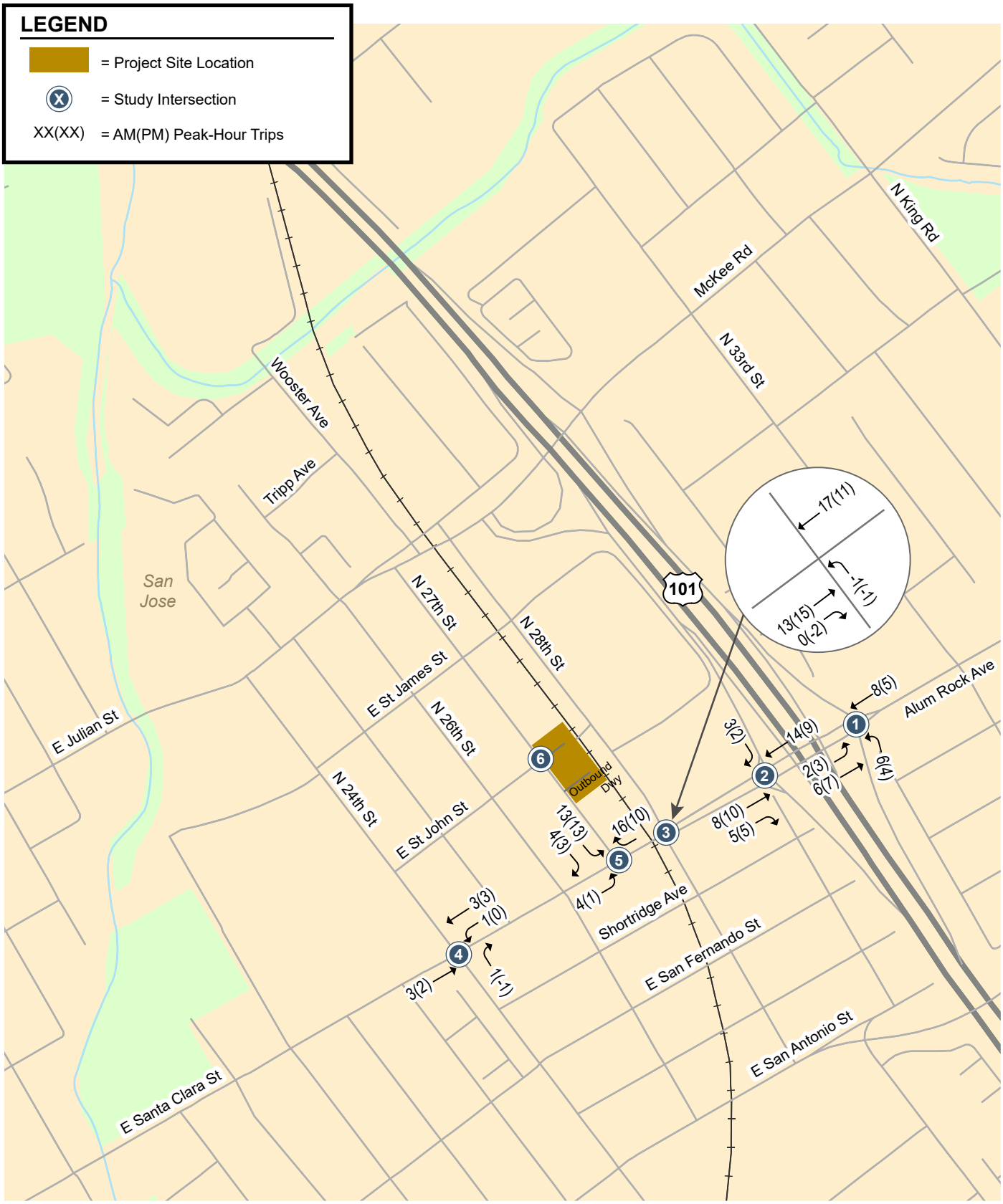

Figure 9
Net Project Trip Assignment

Traffic Volumes Under All Scenarios

Existing Traffic Volumes

Existing AM and PM peak hour traffic volumes for the signalized study intersections were obtained from 2018 and 2019 counts. The 2018 and 2019 counts were provided by the City of San Jose and also obtained from the 2018 CMP Annual Monitoring Report. Note that although new 2022 traffic counts were collected at all the study intersections, the current traffic volumes in the study area have not yet returned to levels prior to the COVID-19 pandemic, so the new counts were not used for the signalized intersections. The new 2022 counts were used for the unsignalized intersections, however, since historical count data is not available for unsignalized intersections. The existing peak hour intersection volumes are shown graphically on Figure 10.

Background Traffic Volumes

Background traffic volumes were estimated by adding to existing peak hour volumes the projected volumes from approved but not yet completed or occupied developments. The added traffic from approved but not yet completed or occupied developments was provided by the City of San Jose in the form of the Approved Trips Inventory (ATI). The ATI sheets are contained in Appendix A. Background conditions represent the baseline conditions to which project conditions are compared for the purpose of determining potential adverse operational effects of the project. The background peak-hour intersection volumes are shown on Figure 11.

Background Plus Project Traffic Volumes

Project peak hour trips were added to background peak hour traffic volumes to obtain project peak hour traffic volumes (see Figure 12).

Cumulative Traffic Volumes

Cumulative traffic volumes were estimated by adding to existing volumes the ATI provided by City staff, project-generated trips, and trips generated by pending developments in the study area. For the purpose of this study, cumulative traffic volumes include traffic generated by the following nearby pending projects: 1298 Tripp Avenue residential mixed-use project (235 affordable DU + 2,815 s.f. of retail), 1347 E. Julian Street residential mixed-use project (45 affordable DU + 2,454 s.f. of retail), and 1325 E. Julian Street residential mixed-use project (633 DU + 11,021 s.f. of retail. This traffic scenario is provided for informational purposes at the request of the City of San Jose. The cumulative peak-hour intersection volumes are shown on Figure 13. Traffic volumes for all traffic scenarios are tabulated in Appendix B.

Signalized Intersection Traffic Operations

Signalized intersection levels of service were evaluated against the standards of the City of San Jose. The results of the analysis show that all the signalized study intersections are currently operating at acceptable levels of service (LOS D or better) during the AM and PM peak hours of traffic and would continue to operate acceptably under background, background plus project, and cumulative conditions (see Table 3). The detailed intersection level of service calculation sheets are included in Appendix C.

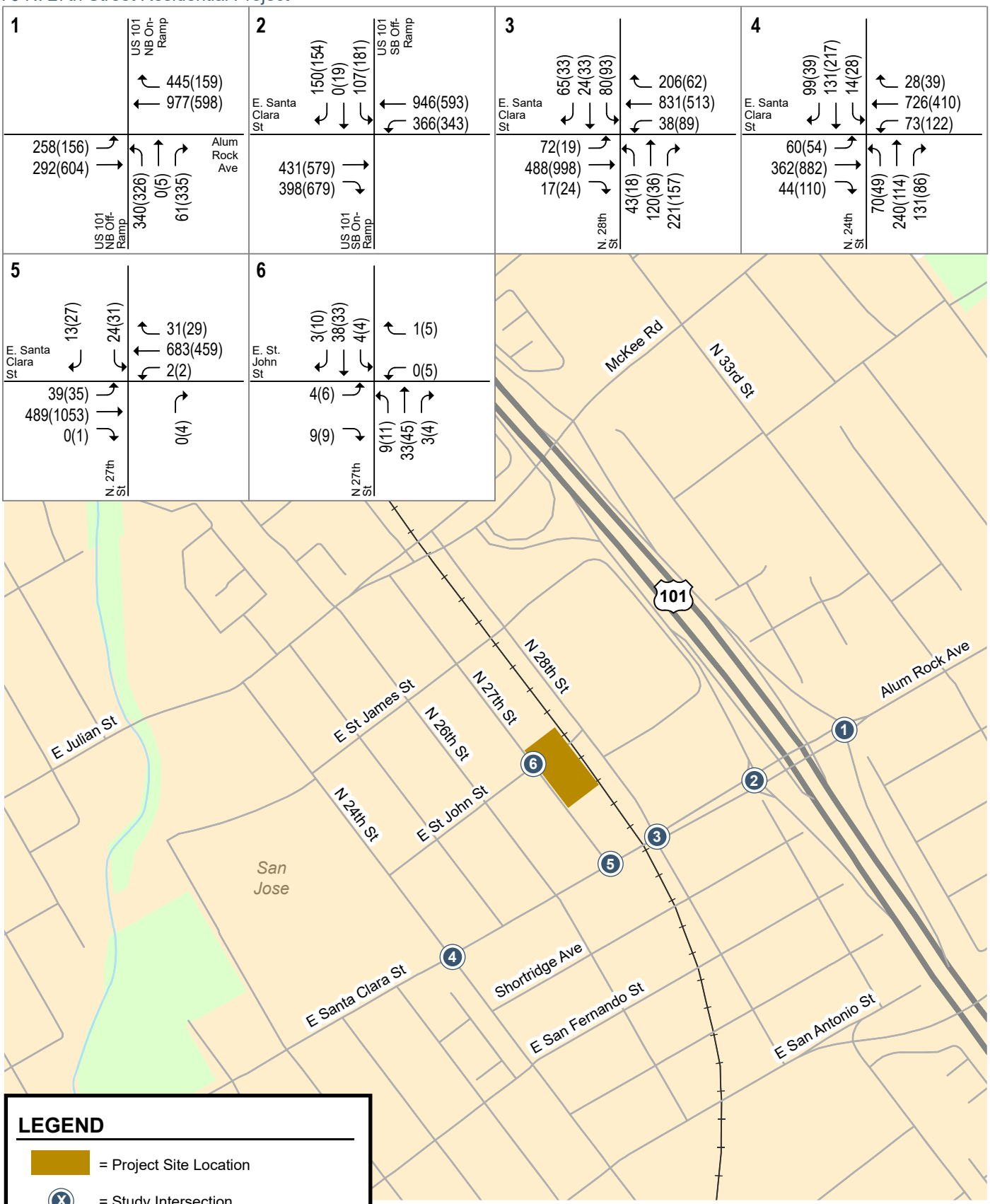

Figure 10
Existing Traffic Volumes

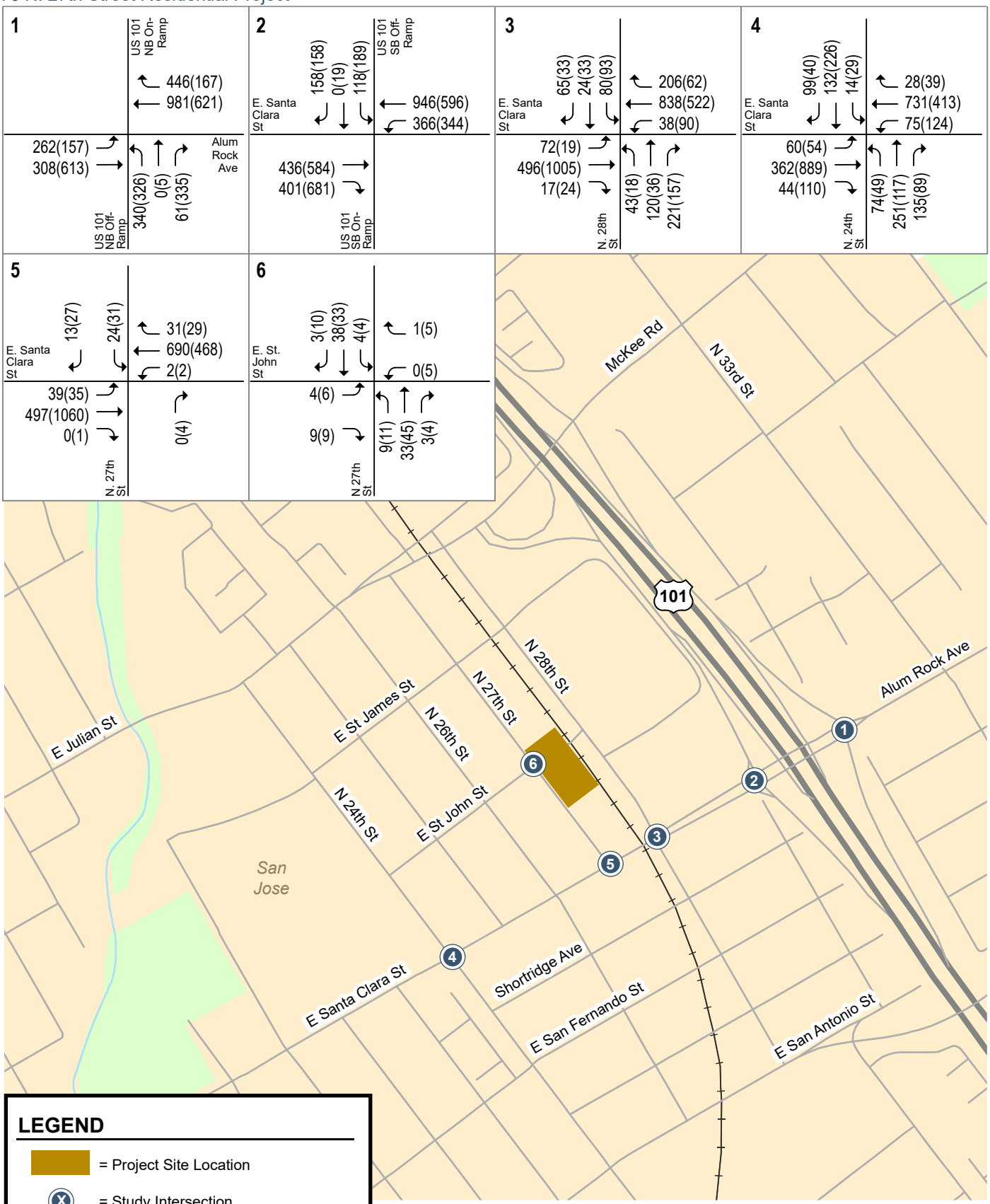

Figure 11
Background Traffic Volumes

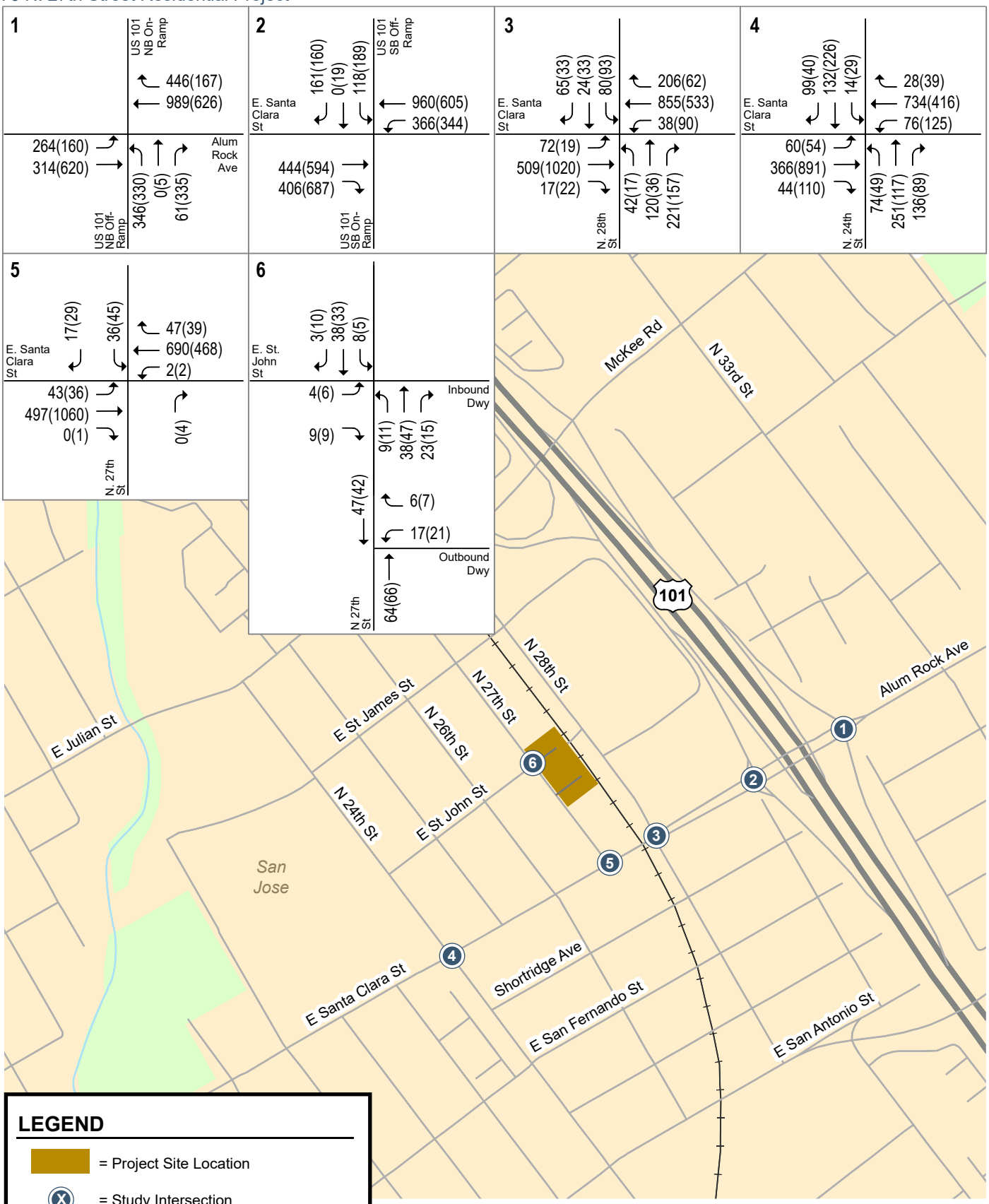

Figure 12
Background Plus Project Traffic Volumes

NORTH
Not to Scale

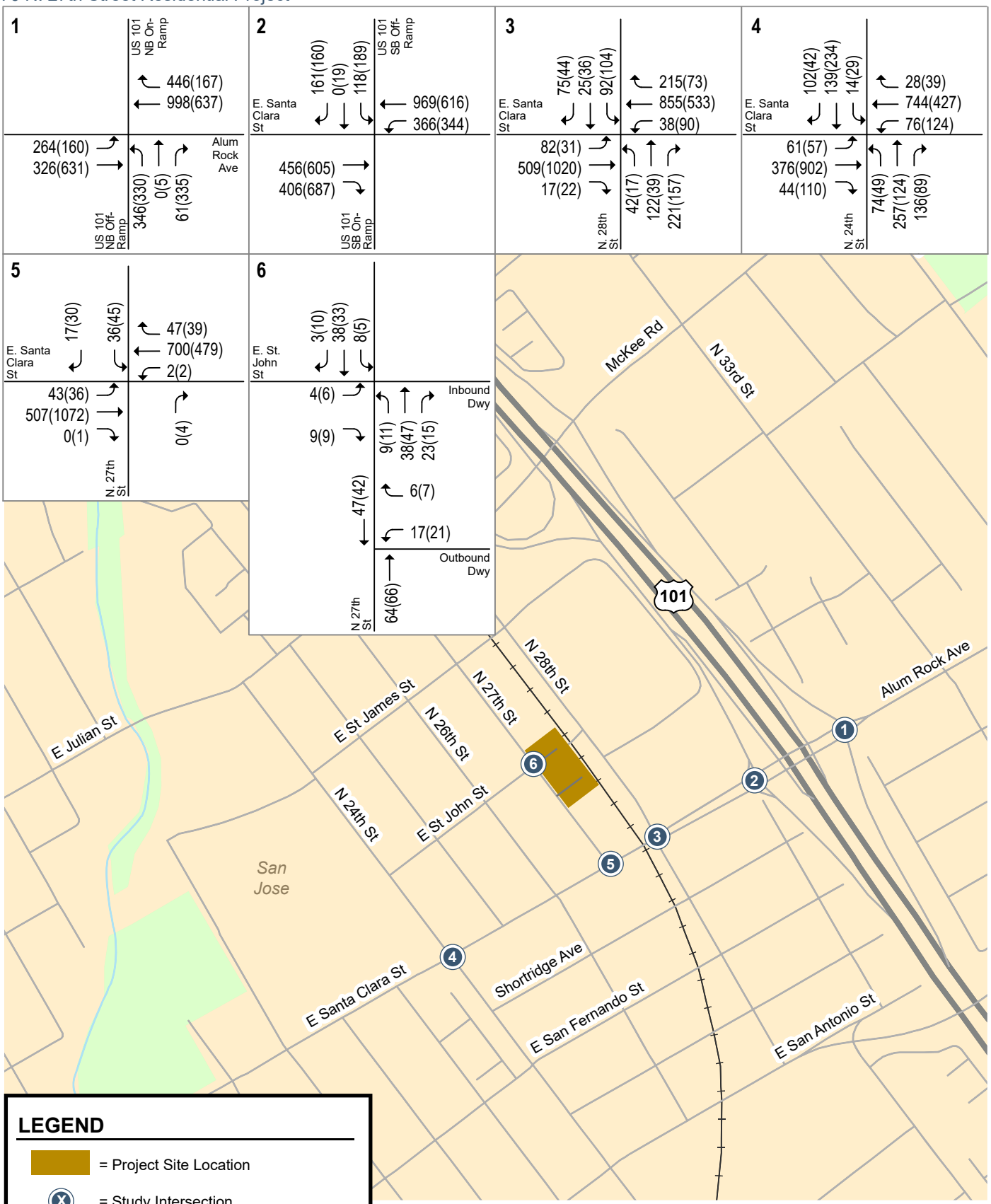

Figure 13
Cumulative Traffic Volumes

Table 3
Intersection Level of Service Summary

#	Signalized Intersection	Peak Hour	Count Date	Existing Avg. Delay (sec)	Existing LOS	Background Avg. Delay (sec)	Background LOS	Background + Project Avg. Delay (sec)	Background + Project LOS	Background + Project Incr. In Crit. Delay (sec)	Background + Project Incr. In Crit. V/C	Cumulative Avg. Delay (sec)	Cumulative LOS
1	US 101 NB Ramps & Alum Rock Av *	AM	9/19/2019	12.4	B	12.4	B	12.4	B	0.1	0.005	12.4	B
		PM	12/13/2018	13.6	B	13.6	B	13.6	B	0.0	0.003	13.6	B
2	US 101 SB Ramps & Santa Clara St *	AM	9/19/2019	11.6	B	11.8	B	11.9	B	0.1	0.003	11.9	B
		PM	12/13/2018	14.2	B	14.4	B	14.4	B	0.1	0.004	14.3	B
3	28th St & Santa Clara St	AM	9/19/2019	21.1	C	21.1	C	21.0	C	0.0	0.004	21.2	C
		PM	9/19/2019	17.3	B	17.3	B	17.2	B	-0.1	0.003	17.3	B
4	24th St & Santa Clara St	AM	9/20/2018	22.3	C	22.5	C	22.5	C	0.0	0.002	22.6	C
		PM	9/20/2018	21.1	C	21.4	C	21.4	C	0.0	0.001	21.5	C

Notes:
* Denotes CMP intersection

Unsignalized Intersection Traffic Operations

Signal Warrant – N. 27th Street and Santa Clara Street

Traffic conditions at the unsignalized study intersection of N. 27th Street and Santa Clara Street were assessed to determine whether a traffic signal would be warranted based on the peak-hour volume signal warrant (Warrant #3) described in the *California Manual on Uniform Traffic Control Devices* (CA MUTCD). The results of the signal warrant check indicate that the AM and PM peak-hour volumes at the unsignalized study intersection currently do not meet the signal warrant and would not meet the warrant with the addition of project-generated trips. The signal warrant sheets are included in Appendix D.

Multiway Stop Warrant – N. 27th Street and E. St. John Street

The northern project driveway would serve as the east leg of the unsignalized study intersection of N. 27th Street and E. St. John Street. The east and west legs of the intersection (project driveway and E. St. John Street, respectively) are stop-controlled. As proposed, N. 27th Street would remain uncontrolled in both directions. Since the traffic volumes on the east and west legs of the intersection would continue to be very low under project conditions, two-way stop control is the most efficient configuration, and the intersection would continue to operate adequately. Multiway stop control at this intersection is not recommended due to the low traffic volumes on the east and west legs. Multiway stop control is most often used where the volume of traffic on all legs is approximately equal. Note also that due to the proposed one-way driveway configuration, the east leg of the intersection (inbound project driveway) would have no approach volume (outbound/westbound volume). Furthermore, the enhanced pedestrian crosswalk on the north leg and bulbouts at the northwest and southeast corners of the intersection that are planned as part of the East San Jose MTIP would enhance pedestrian visibility, shorten the crossing distances, and slow vehicle traffic along N. 27th Street. Thus, for these reasons multiway stop control would not be necessary at this intersection.

Intersection Queuing Analysis

The intersection queuing analysis (see Table 4) is based on vehicle queuing for left-turn movements at intersections near the project site where the project would add a noteworthy number of trips. Based on

the project trip generation and trip distribution pattern, the southbound and eastbound left-turn movements at the unsignalized intersection of 27th Street and Santa Clara Street were evaluated as part of the queuing analysis for this project. The project would not add a noteworthy number of trips to any other study intersection.

Table 4
Intersection Queuing Analysis Summary

	27th Street and Santa Clara Street			
	Southbound L-T-R		Eeastbound LT	
Measurement	AM	PM	AM	PM
Existing				
Cycle/Delay [1] (sec)	19.0	22.2	9.2	8.4
Volume (vphpl)	37	58	39	35
95th %. Queue (veh/ln.)	1	2	1	1
95th %. Queue (ft./ln) [2]	25	50	25	25
Storage (ft./ ln.) [3]	550	550	100	100
Adequate (Y/N)	Y	Y	Y	Y
Background				
Cycle/Delay [1] (sec)	19.3	22.6	9.2	8.5
Volume (vphpl)	37	58	39	35
95th %. Queue (veh/ln.)	1	2	1	1
95th %. Queue (ft./ln)	25	50	25	25
Storage (ft./ ln.) [3]	550	550	100	100
Adequate (Y/N)	Y	Y	Y	Y
Background Plus Project				
Cycle/Delay [1] (sec)	21.2	26.8	9.3	8.5
Volume (vphpl)	53	74	43	36
95th %. Queue (veh/ln.)	1	2	1	1
95th %. Queue (ft./ln) [2]	25	50	25	25
Storage (ft./ ln.) [3]	550	550	100	100
Adequate (Y/N)	Y	Y	Y	Y

Notes:

[1] Vehicle queue calculations based on cycle length for signalized intersections and average approach delay for unsignalized intersections.

[2] Assumes 25 Feet Per Vehicle Queued.

[3] The Southbound approach at this intersection is a shared lane approach (L-T-R). Thus, the vehicle queues reported reflect the total SB L-T-R volume. 27th St provides 550 ft of storage between Santa Clara St and St. John St.

27th Street at Santa Clara Street

The queuing analysis indicates that the shared southbound approach and the eastbound left-turn pocket at the intersection of 27th Street/Santa Clara Street provide adequate storage capacity to accommodate the maximum vehicle queues that currently occur and would continue to occur under background and background plus project conditions during the AM and PM peak hours of traffic.

Site Access and On-Site Circulation

The site access evaluation is based on the October 31, 2022 site plan prepared by LPMD Architects (see Figure 2). Site access was evaluated to determine the adequacy of the site's driveways with regard to the following: traffic volume, geometric design, sight distance and operations (e.g., queuing and delay). On-site vehicular circulation and parking layout were reviewed in accordance with generally accepted traffic engineering standards and transportation planning principles.

Vehicular Site Access

As proposed, the project would remove two existing commercial driveways on 27th Street and construct two new driveways: one 16-foot-wide inbound only driveway and one 16-foot-wide outbound only driveway. The driveways would provide access to and from the parking garage containing 210 on-site residential parking spaces. The proposed driveway widths would meet the City's standard width for one-way driveway operations.

Driveway Operations

As proposed, the northern project driveway would serve inbound trips only, and the southern driveway would serve outbound trips only. The northern (inbound) driveway would serve as the east leg of the N. 27th Street/E. St. John Street unsignalized intersection. As proposed, the driveway would be offset. However, since the northern project driveway would serve inbound trips only, the offset would not create any significant operational issues.

The east and west legs of the unsignalized intersection (project driveway and E. St. John Street, respectively) would be stop-controlled. As proposed, N. 27th Street would remain uncontrolled. Since the traffic volumes on the east and west legs of the intersection would continue to be very low under project conditions, two-way stop control is the most efficient configuration, and the intersection would continue to operate adequately. Multiway stop control at this intersection is not recommended due to the low traffic volumes on the east and west legs. Multiway stop control is most often used where the volume of traffic on all legs is approximately equal. Note also that due to the proposed one-way driveway configuration, the east leg of the intersection (inbound project driveway) would have no approach volume (westbound/outbound volume).

The project-generated trips that are estimated to occur at the project driveways are 31 inbound trips and 23 outbound trips during the AM peak hour, and 20 inbound trips and 28 outbound trips during the PM peak hour. This equates to one vehicle trip every two to three minutes at each driveway during both the AM and PM peak periods of traffic. Due to the low number of AM and PM peak hour project-generated trips and the low traffic volumes on 27th Street adjacent to the site, operational issues related to vehicle queueing and/or delays are not expected to occur at the project driveways.

The City typically requires developments to provide adequate on-site stacking space for at least two inbound vehicles (40 to 50 feet) between the face of curb and any entry gates or on-site drive aisles or parking spaces. This prevents vehicles from queuing onto the street and blocking traffic. Approximately 45 feet of vehicle stacking space would be provided between the on-site drive aisle/first parking space and the face of curb at the northern inbound only driveway. Accordingly, the project would meet the City's standard for inbound vehicle stacking space.

It is not clear if the project plans to provide security gates at the project entrance and exit. If security gates are to be provided, the gate at the inbound driveway should remain open during the periods of the day when most inbound vehicle trips are likely to occur to avoid potential queuing issues.

Recommendation: If security gates are to be provided, keep the entry security gate open during the periods of the day when most inbound vehicle trips are likely to occur to avoid any inbound queuing issues.

Sight Distance

There are no existing landscaping, roadway curves, or other visual obstructions along the project frontage that could obscure sight distance at the project driveway, and the site plan does not indicate any new landscaping that could affect the sight distance at the driveway. Although street trees are present, the existing trees have high canopies and do not hinder sight distance.

Street parking is currently allowed along the project frontage on 27th Street and would continue to be permitted. Therefore, no parking zones (red curb) should be established immediately adjacent to the outbound project driveway.

Recommendation: Establish no parking zones (at least 15 feet of red curb) immediately adjacent to the outbound project driveway to ensure adequate sight distance.

Providing the appropriate sight distance reduces the likelihood of a collision at a driveway or intersection and provides drivers with the ability to locate sufficient gaps in traffic. Sight distance generally should be provided in accordance with Caltrans standards. The minimum acceptable sight distance is often considered the Caltrans stopping sight distance. Sight distance requirements vary depending on the roadway speeds. For 27th Street, which has a speed limit of 25 mph, the Caltrans stopping sight distance is 200 feet (based on a design speed of 30 mph). This means that a driver must be able to see 200 feet down 27th Street to locate a sufficient gap to turn out of the project driveway. This also gives drivers traveling along 27th Street adequate time to react to vehicles exiting the project driveway. Assuming the recommended red curb, the project driveways would meet the Caltrans stopping sight distance requirement.

On-Site Vehicular Circulation and Parking Layout

On-site vehicular circulation was reviewed in accordance with generally accepted traffic engineering standards and City of San Jose design guidelines. Access to the parking garage would be provided via two driveways on 27th Street. The drive aisles were evaluated for vehicle access by the method of turning-movement templates. Analysis using the appropriate Passenger Car turning templates shows that standard passenger vehicles (turning template “Pm”) and larger passenger vehicles (Passenger Car turning template “P”) could adequately access the on-site parking spaces and circulate through the parking garage efficiently (no dead-end drive aisles).

The City’s standard minimum width for two-way drive aisles is 26 feet wide where 90-degree parking is provided. This allows sufficient room for vehicles to back out of the parking spaces. Due to the structural supports shown on the site plan, the northern, eastern and western two-way drive aisles measure 24 feet wide. The southern east-west oriented drive aisle measures 22 feet wide. Although the proposed drive aisle widths do not meet the City’s minimum standard, the 24-foot-wide drive aisles would provide adequate room for drivers to access the parking spaces and circulate through the garage. City of San Jose Public Works staff have confirmed that the proposed 24-foot internal drive aisle widths would be adequate to serve the residential project. However, City staff are requesting that the 22-foot-wide southern drive aisle be widened to 24 feet.

Recommendation: Increase the southern east-west oriented drive aisle width from 22 feet to 24 feet.

Parking Stall Dimensions

The project proposes to utilize a three-level mechanical puzzle parking lift system (pit + at-grade + overhead levels), which allows the stacked parking spaces to be shifted vertically and horizontally.

There would be four separate systems so four cars could wait simultaneously. This would ensure that no back-ups would occur within the garage due to vehicles waiting for a space. The City of San Jose Zoning Code does not include standards for mechanical-stack parking systems. According to the site plan, the stacked parking spaces would measure 8.5 feet wide by 18 feet long. Although not indicated on the site plan provided, it is assumed that the height limit of the vehicle stacker system would accommodate passenger cars, trucks, and most SUVs and vans. Four ADA accessible parking stalls measuring 9 feet wide by 18 feet long would be provided on-site, including two van accessible stalls. The site plan only labels one van accessible stall.

Recommendation: Verify the height limit of the vehicle stacker system would accommodate all possible resident vehicle types: passenger cars, trucks, SUVs and vans.

Truck Access and Circulation

The project site plan was reviewed for truck access including delivery and moving trucks, garbage trucks and emergency vehicles.

Residential Move-In and General Loading Operations

The current site plan does not show any freight loading areas for residential move-in/move-out or commercial/delivery vehicles. Based on the centrally-located lobby and elevator, it is assumed that loading activities would occur along 27th Street halfway between the project driveways. If on-site or on-street loading spaces are not provided, moving trucks and delivery vehicles could be forced to double park. This would block some street parking and the northbound direction of travel on 27th Street. The project should coordinate with City staff to determine the appropriate location and size for an on-street freight loading area. Note, however, that the City of San Jose typically prefers that loading activities occur on-site and not within the public right-of-way. The site plan shows a 15-foot first floor height. Thus, it appears that adequate vertical clearance would be provided for most delivery and moving vehicles.

Recommendation: Coordinate with City staff during the implementation phase to determine the appropriate location and size for an on-site or on-street freight loading area to serve the proposed residential project.

Garbage Collection

Similar to other properties within the neighborhood, garbage collection activities for the project would occur within the public right-of-way on 27th Street. The site plan shows a trash room with an adjacent trash staging area at the southwest corner of the site. Trash bins would be wheeled out to 27th Street on garbage collection days and returned to the trash room after garbage pick-up.

Emergency Vehicle Access

The City of San Jose Fire Department requires that all portions of the buildings be within 150 feet of a fire department access road, requires a minimum of 6 feet clearance from the property line along all sides of the building, and requires a minimum of 13 feet 6 inches of vertical clearance to enter a parking structure. According to the site plan, the project appears to meet all three fire access requirements, including the vertical clearance requirement (the site plan shows a 15-foot first floor height).

Site Plan Layout

The project should work closely with City staff to guarantee the proposed site plan is consistent with the future alignment of the Five Wounds Creek Class I trail and future development (i.e., transit-oriented development) associated with the BART Silicon Valley (BSV) 28th Street Station project. The project

should also coordinate with the VTA to ensure proper building shoring and foundation locations due to the project site being within the zone of influence of the BSV tunnel.

Recommendation: Coordinate with the City of San Jose to ensure the site plan is consistent with the future alignment of the Five Wounds Creek Class I trail and future development associated with the BSV-BART 28th Street Station project.

Recommendation: Coordinate with the VTA to ensure proper building shoring and foundation locations due to the project site being within the zone of influence of the BSV tunnel.

Construction Activities

Typical activities related to the construction of any development could include lane narrowing and/or lane closures, sidewalk and pedestrian crosswalk closures, and bike lane closures. In the event of any type of closure, clear signage (e.g., sidewalk closure and detour signs) must be provided to ensure vehicles, pedestrians and bicyclists are able to adequately reach their intended destinations safely. Per City standard practice, the project would be required to submit a construction management plan for City approval that addresses the construction schedule, street closures and/or detours, construction staging areas and parking, and the planned truck routes.

Pedestrian, Bicycle and Transit Evaluation

All new development projects in San Jose should encourage multi-modal travel, consistent with the goals and policies of the City's General Plan. It is the goal of the General Plan that all development projects accommodate and encourage the use of non-automobile transportation modes to achieve San Jose's mobility goals and reduce vehicle trip generation and vehicle miles traveled. In addition, the adopted City Bike Master Plan establishes goals, policies and actions to make bicycling a daily part of life in San Jose. The Master Plan includes designated bike lanes along many City streets, as well as on designated bike corridors. In order to further the goals of the City, pedestrian and bicycle facilities should be encouraged with new development projects.

Pedestrian and Bicycle Facilities

Pedestrian Facilities

A complete network of sidewalks and crosswalks is found within the project study area. Crosswalks with pedestrian signal heads are located at all the signalized intersections in the study area. The existing pedestrian facilities provide adequate connectivity between the project site and nearby bus stops and other points of interest.

The site plan indicates that portions of the existing attached 12-foot-wide sidewalk and curb along the project frontage on 27th Street would be reconstructed (existing driveways removed and new driveways added). The site plan shows a 3-foot-wide paved area with modular bioretention features would be added between the building and the existing sidewalk, creating a 15-foot-wide attached sidewalk with tree wells. The sidewalk would provide direct access to the residential lobby, mail room, and leasing office that would front 27th Street. The site plan shows a paved pedestrian path would encircle the building and provide access to a secondary elevator and staircase and the future Five Wounds Creek Class I trail that will ultimately run along the eastern boundary of the site (area between the site and 28th Street). The pedestrian path would vary in width. The plan shows a 6-foot-wide path on the south, a 10-foot-wide path on the east, and an 8-foot-wide path on the north side of the building.

Recommendation: Widen the proposed 6-foot-wide path on the south side of the building and 8-foot-wide path on the north side of the building to be at least 10 feet wide per the City

of San Jose's Class I trail design standards. The future pedestrian connection should have a public access easement.

Bicycle Facilities

Existing bicycle facilities in the study area are very limited. There are no Class II striped bike lanes in the immediate vicinity of the project site. 24th Street is a designated bike route with shared lane markings (Sharrows). No other bicycle facilities exist within ¼-mile of the project site.

The project would not remove any bicycle facilities, nor would it conflict with any adopted plans or policies for new bicycle facilities. However, as mentioned above, the future Five Wounds Creek trail will be situated adjacent to the eastern boundary of the project site and N. 28th Street. The trail would provide bicyclists with a paved path that is separated from automobiles. The project should work closely with the City of San Jose to ensure the proposed residential development and the future trail would have no conflicting design elements.

Recommendation: Coordinate with City of San Jose staff to ensure the proposed residential project and the future Five Wounds Creek trail would have no conflicting design elements.

Short-term bike parking is shown on the site plan near the lobby on 27th Street and at the back of the site near the future Five Wounds Creek trail entrance.

Planned Pedestrian and Bicycle Connections to BART

According to the East San Jose Multimodal Transportation Improvement Plan (MTIP), future pedestrian and bicycle improvements are planned to enhance pedestrian and bicycle connections to the 28th Street/Little Portugal BART station. East St. John Street, which serves the 70 N. 27th Street project site directly, has been identified as one of the three "Connection to BART" projects in the area. Planned improvements along the segment of E. St. John Street between Roosevelt Park and the BART station include enhanced pedestrian and bicycle crossings and wayfinding elements. Planned improvements at the N. 27th Street/E. St. John Street intersection include an enhanced pedestrian crosswalk on the north leg of the intersection, bulbouts at the northwest and southwest corners of the intersection, and an additional bulbout on the east side of N. 27th Street at the northwest corner of the project site. The bulbouts would include ADA-compliant directional curb ramps. These pedestrian improvements are shown on the site plan (see Figure 2).

Recommendation: Implement the planned multimodal improvements at the N. 27th Street/E. St. John Street intersection that are identified as a Connection to BART project in the East San Jose MTIP.

Pedestrian and Bicycle Access to Schools

The following schools are located within 1-mile walking/biking distance of the project site:

High Schools

- Cristo Rey San Jose Jesuit High School, located ¼-mile walk to the east on Santa Clara Street
- San Jose High School, located ¼-mile walk to the west on N. 24th Street

Middle Schools

- ACE Inspire Academy Middle School, located ½-mile walk to the northwest on Julian Street
- Sunrise Middle School, located ½-mile walk to the northwest on Julian Street

Elementary Schools

- Rocketship Discovery Prep Middle School, located ½-mile walk to the north on Wooster Avenue
- Anne Darling Elementary School, located ¾-mile walk to the north on N. 33rd Street

- Empire Gardens Elementary School, located 1-mile walk to the northwest on Empire Street
- Olinder Elementary School, located 1-mile walk to the south on William Street
- KcKinley Elementary School, located 1-mile walk to the south on Macredes Avenue
- San Antonio/LUCHA Elementary School, located 1-mile walk to the east on San Antonio Street

Safe pedestrian access to all 10 schools is provided via a continuous network of sidewalks in the study area. Crosswalks with pedestrian signal heads are provided at all the signalized intersections, and some signalized and unsignalized intersections near the schools have high visibility crosswalks. Curb ramps are provided at all intersections along the routes between the project site and the schools, though not all meet current ADA design standards.

Bicycle facilities in the area are limited to 21st Street, 24th Street, 33rd Street, and San Antonio Street. The lack of bicycle facilities in the area would make bicycling to and from most of the nearby middle schools and elementary schools undesirable.

The project should work closely with these nearby schools to implement a Safe Routes to Schools program, or participate in a program if one already exists, since some students attending these schools may reside at the project site. Safe Routes to Schools is designed to decrease traffic and pollution and increase the health of children and the community as a whole. The program promotes walking and biking to school through education and incentives. The program also addresses the safety concerns of parents by encouraging greater enforcement of traffic laws, educating the public, and exploring ways to create safer streets. A comprehensive Safe Routes to Schools program should identify a focused area surrounding the school, provide a map with the routes that children can take to and from school, and recommend improvements to routes if necessary. It should address such pedestrian safety issues as dangerous intersections and missing or ineffective crosswalks, sidewalks, and curb ramps.

Transit Services

Existing bus service in the project vicinity is provided by the Santa Clara Valley Transportation Authority (VTA). The project area is served by frequent bus routes 22, 23, 64A, 64B, and Rapid 522. Bus routes 22 and 23 stop within walking distance of the project site on Santa Clara Street. The three existing bus stops within walking distance of the project site included shelters with benches and are easily accessible via the network of sidewalks and crosswalks along Santa Clara Street.

Since the project site is served by two bus routes, it is reasonable to assume that some residents would utilize the bus service. It is estimated that the small increase in transit demand generated by the project could be accommodated by the current available ridership capacity of the VTA bus service.

Parking

The project's off-street parking requirements for automobiles, motorcycles and bicycles are based on the City of San Jose parking standards (*San Jose Municipal Code Chapter 20.90, Tables 20-210 and 20-250*).

Residential Vehicle Parking

The City of San Jose's off-street parking requirements as described in the City's Zoning Code (Chapter 20.90, Table 20-210) for multiple dwellings with all open parking are as follows: 1.25 parking spaces for studio and one-bedroom units, 1.7 parking spaces for two-bedroom units, and 2.0 parking spaces for three-bedroom units. Based on the City's off-street parking requirements and prior to applying any relevant parking reductions, the 200-unit project, which would consist of 26 studios and 174 one-bedroom units, would require a total of 250 parking spaces (200 DU x 1.25 = 250 spaces).

Residential Parking Reduction for Proximity to a Major Transit Station

Since the project site is located within 2,000 feet of a future 28th Street/Little Portugal BART station, the project qualifies for a 20 percent reduction in the City's parking requirement. After applying a 20 percent parking reduction, the project would be required to provide a total of 200 residential parking spaces (250 x 0.8 = 200 spaces).

Proposed Residential Parking Supply

The project is proposing to provide 210 residential parking stalls as part of a three-level puzzle parking system within the parking garage (pit + at-grade + overhead levels). The automated parking system would allow the stacked parking spaces to be shifted vertically and horizontally, allowing residents to retrieve their vehicle without the need to move the other accompanying vehicles. Comprised of multiple parking spaces including one open space, the vehicle stackers would present an open parking space that, once occupied, would automatically shift downward or rotate, presenting another open space. There would be four separate systems so four cars could wait simultaneously, ensuring that no back-ups would occur within the garage due to vehicles waiting for a space.

The City of San Jose Zoning Code does not specify standard dimensions for mechanical-stack parking systems. However, the project site plan shows the mechanical parking stalls would measure approximately 8.5 feet wide by 18 feet long (equivalent to a full-size car space), which would accommodate passenger cars and most trucks, SUVs and vans. As proposed, the 210-space puzzle parking system would meet the City's residential parking requirement. The project would provide 4 standard ADA accessible spaces (non-puzzle parking spaces), including one van-accessible space.

Electric Vehicle Parking Requirements

Per the San Jose Municipal Code (Section 24.10.200), new multifamily dwellings must provide 100 percent electric vehicle (EV) Capable parking spaces, including at least 10 percent EVSE Spaces (EVSE = Electric Vehicle Supply Equipment) and 20 percent EV Ready Spaces. The proposed puzzle parking system must be designed to meet these EV parking standards.

Recommendation: Provide on-site EV parking spaces and EV Ready spaces to the satisfaction of the City of San Jose Planning Department.

Motorcycle Parking

The City requires one motorcycle parking space for every four residential units (per Chapter 20.90, Table 20-250 of the City's Zoning Code). This equates to 50 residential motorcycle spaces. Applying a 20 percent reduction to the residential project (Urban Village reduction) equates to a total parking requirement of 40 motorcycle spaces. Based on the site plan, the project is not proposing to provide any motorcycle parking.

Recommendation: Provide on-site motorcycle parking to the satisfaction of the City of San Jose Planning Department.

Bicycle Parking

The City requires one bicycle parking space for every four residential units (per Chapter 20.90, Table 20-210 of the City's Zoning Code). Thus, the project is required to provide a total of 50 bicycle parking spaces to serve the residents.

According to the site plan, the project is proposing to provide a total of 55 bicycle parking spaces, which would exceed the City's bicycle parking requirements. The site plan shows 50 long-term bicycle parking spaces would be provided within the residential building on floors 2 through 6 (10 spaces on each floor) and 5 short-term spaces would be provided within a small bike room at the northwest corner of the building near the inbound driveway on N. 27th Street.

5. Conclusions

This report presents the results of the transportation analysis conducted for a proposed residential project at 70 N. 27th Street in San Jose, California. The project would demolish a partially occupied 21,454 square-feet (s.f.) two-story commercial building and construct a new building consisting of five floors of residential units (up to 200 units, including approximately 5% affordable units) over podium parking. The ground floor would provide 210 residential parking spaces in a three-level automated puzzle parking system. The project would provide direct access to the future Five Wounds Creek Trail. Vehicular access to the project site would be provided via two driveways on N. 27th Street (similar to the existing site layout).

This study was conducted for the purpose of identifying the potential transportation impacts and operational issues related to the proposed development. The transportation impacts of the project were evaluated following the standards and methodologies established in the City of San Jose's *Transportation Analysis Handbook,* adopted in April 2020. Based on the City of San Jose's Transportation Analysis Policy (Council Policy 5-1) and the *Transportation Analysis Handbook,* the study includes a non-CEQA local transportation analysis (LTA).

The LTA analyzes AM and PM peak hour traffic conditions for four signalized intersections and two unsignalized intersections in the vicinity of the project site. The LTA also includes an analysis of site access, on-site circulation, parking, vehicle queuing, and effects to transit services and bicycle and pedestrian access.

Vehicle Miles Traveled (VMT) Analysis

The City of San Jose's *Transportation Analysis Handbook, 2020* includes screening criteria for projects that are expected to result in a less-than-significant VMT impact based on the project description, characteristics and/or location. Projects that meet the screening criteria do not require a CEQA transportation analysis but are typically required to provide a Local Transportation Analysis (LTA) to identify potential operational issues that may arise due to the project. The project would meet the residential screening criteria set forth in the City's *Transportation Analysis Handbook.* Therefore, the residential project is exempt from preparing a detailed VMT analysis.

Cumulative Analysis

Developments within the Five Wounds Urban Village may include residential mixed-use projects with residential above retail. Residential projects that do not include a commercial component are not consistent with the *Urban Village* designation within the Five Wounds Urban Village.

The proposed project at 70 N. 27th Street consists of a high-density transit-oriented residential development, including an affordable housing component (approximately 5% affordable). The project site is situated adjacent to the future Five Wounds Creek multi-use trail and is within walking distance of

the future 28th Street/Little Portugal BART station. Additionally, the project is proposing a residential development density of 172 DU/AC (200 DU/1.16 AC = 172 DU/AC), which would meet the minimum development density of 35 DU/AC as defined in the City's screening criteria for VMT analysis and would be less than the maximum allowable density of 250 DU/AC as defined in the Five Wounds Urban Village Plan. However, the project does not propose to include any ground floor retail space. Therefore, the proposed project would be inconsistent with the mixed-use format requirement within the Five Wounds Urban Village.

Since the project would be inconsistent with the Five Wounds Urban Village Plan, it would not conform to the General Plan and would require a General Plan Amendment (GPA) to proceed. The residential project would not meet the General Plan's long-range transportation goals and would result in a significant cumulative impact. The project should coordinate with the City of San Jose Planning Department to determine what would be required to bring the project into conformance with the General Plan.

Project Trip Generation

After applying the appropriate ITE trip rates, applicable trip adjustments and reductions, and existing trip credits, the proposed project is estimated to generate 636 new daily vehicle trips, with 46 new trips (24 inbound and 22 outbound) occurring during the AM peak hour and 30 new trips (12 inbound and 18 outbound) occurring during the PM peak hour.

Intersection Traffic Operations

Based on the City of San Jose intersection operations analysis criteria, none of the study intersections would be adversely affected by the project.

Other Transportation Issues

The proposed site plan shows generally adequate site access and on-site circulation. The project would not have an adverse effect on the existing pedestrian, bicycle or transit facilities in the study area. Below are recommendations resulting from the site plan review.

Recommendations

- If security gates are to be provided, keep the entry security gate open during the periods of the day when most inbound vehicle trips are likely to occur to avoid any inbound queuing issues.
- Establish no parking zones (at least 15 feet of red curb) immediately adjacent to the outbound project driveway to ensure adequate sight distance.
- Increase the southern east-west oriented drive aisle width from 22 feet to 24 feet.
- Verify the height limit of the vehicle stacker system would accommodate all possible resident vehicle types: passenger cars, trucks, SUVs and vans.
- Coordinate with City staff during the implementation phase to determine the appropriate location and size for an on-site or on-street freight loading area to serve the proposed residential project.
- Coordinate with the City of San Jose to ensure the site plan is consistent with the future alignment of the Five Wounds Creek Class I trail and future development associated with the BSV-BART 28th Street Station project.
- Coordinate with the VTA to ensure proper building shoring and foundation locations due to the project site being within the zone of influence of the BSV tunnel.

- Widen the proposed 6-foot-wide path on the south side of the building and 8-foot-wide path on the north side of the building to be at least 10 feet wide per the City of San Jose's Class I trail design standards. The future pedestrian connection should have a public access easement.
- Coordinate with City of San Jose staff to ensure the proposed residential development and the future Five Wounds Creek trail would have no conflicting design elements.
- Implement the planned multimodal improvements at the N. 27th Street/E. St. John Street intersection that are identified as a Connection to BART project in the East San Jose MTIP.
- Provide on-site EV parking spaces and EV Ready spaces to the satisfaction of the City of San Jose Planning Department.
- Provide on-site motorcycle parking to the satisfaction of the City of San Jose Planning Department.