

Air Quality Analysis 1364 E. Green Street Project



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I. INTRODUCTION AND SUMMARY

1. PURPOSE OF ANALYSIS AND STUDY OBJECTIVES

The purpose of this air quality and Climate Action Plan consistency analysis is to provide an assessment of the impacts resulting from development of the 1364 E. Green Street Project and to identify measures that may be necessary to reduce potentially significant impacts. This study was performed to address the possibility of regional/local air quality impacts from project-related pollutant emissions and to determine the project's consistency with the City's Climate Action Plan. The objectives of the study include:

- documentation of the atmospheric setting
- discussion of criteria pollutants
- discussion of the air quality regulatory framework
- discussion of the air quality thresholds of significance
- analysis of the construction related air quality emissions
- analysis of the operations related air quality emissions
- analysis of the conformity of the proposed project with the SCAQMD AQMP
- Climate Action Plan consistency analysis
- recommendations for emissions reduction measures

The City of Pasadena is the lead agency for this air quality and Climate Action Plan (CAP) consistency analysis in accordance with the California Environmental Quality Act authorizing legislation. Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with terms unique to air quality and global climate change, a definition of terms has been provided in Appendix A.

2. PROJECT LOCATION

The project site is located at 1364 E. Green Street, in the City of Pasadena. The 41,573-square-foot project site is comprised of three adjoining parcels located at the southeast corner of East Green Street and South Holliston Avenue and is currently developed with a surface parking lot with 115 parking spaces. Immediate adjacencies include a surface parking lot to the north on the opposite side of Green Street, St. Philip the Apostle Church and Parish Center to the south and east, and Pasadena City College Child Development Center is located west of the site on the opposite side of S. Holliston Avenue.

Pedestrian and vehicular access to the site/building and subterranean parking would be achieved from East Green Street, while access to the loading zone would be provided from South Holliston Avenue. A vicinity map showing the project location of the Site is provided on **Figure 1, Project Location Map**.



Source: Google, 2025



Figure 1
Project Location Map

3. PROJECT DESCRIPTION

The proposed project involves construction of a new four-story, 93,539-square-foot, research and development project above three levels of subterranean parking for 280 spaces situated on an approximately 1-acre corner parcel. A large rooftop terrace is also proposed on the fourth floor that extends across the entire façade facing East Green Street. All existing improvements would be demolished to facilitate the redevelopment of the site. **Figure 2, Site Plan**, illustrates the Site.

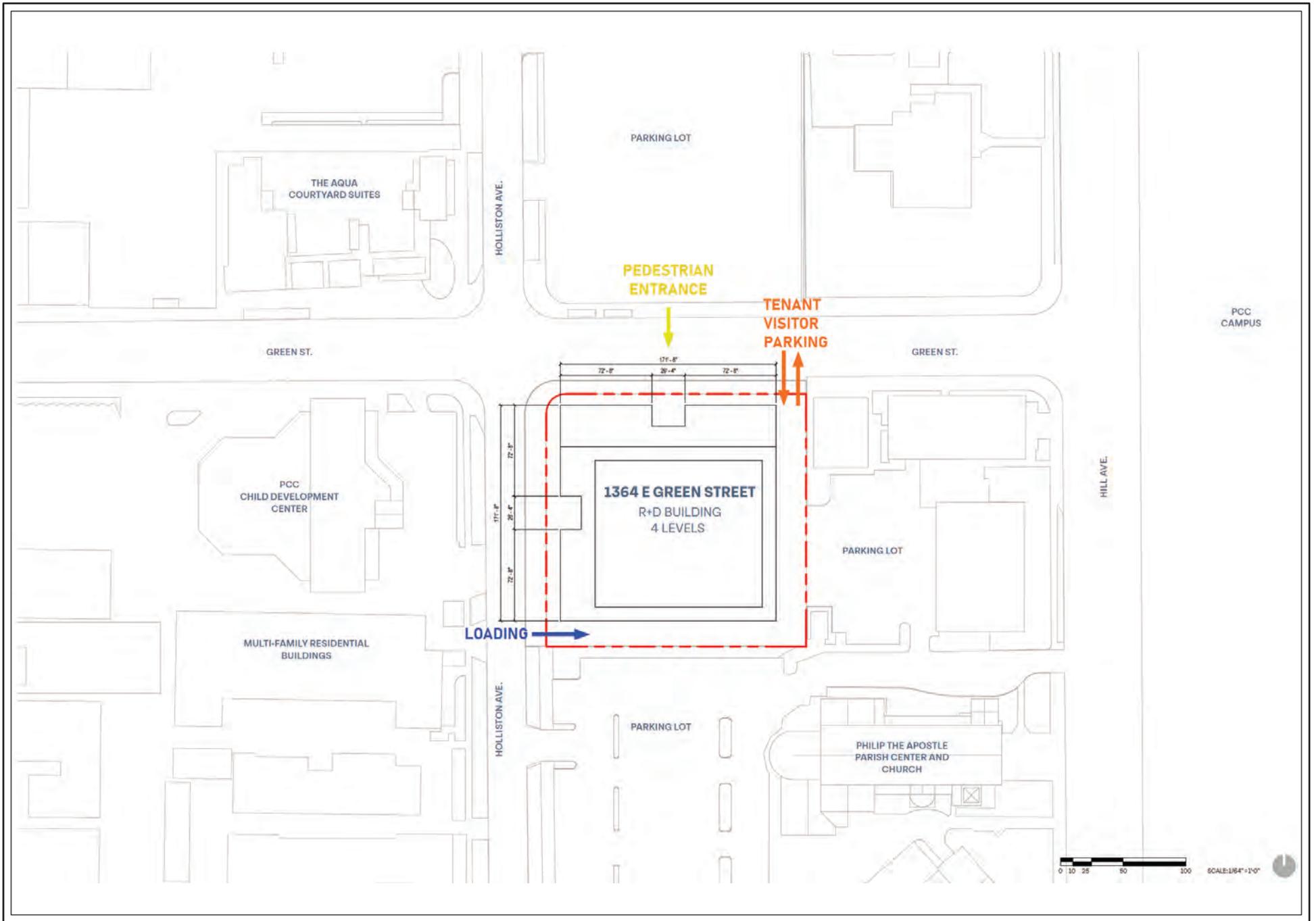
The project is anticipated to start construction no sooner than January 2026 and take approximately 20 months to complete. The Project is anticipated to be operational in 2027. The Project would include approximately 950 tons of demolished material during demolition and 60,000 cubic yards (CY) of export during excavation. Even if construction was to occur any time after the respective dates, the analysis represents “worst-case” since emission factors for construction decrease as time passes and the analysis year increases due to emission regulations becoming more stringent.¹

4. SENSITIVE RECEPTORS IN PROJECT VICINITY

Those who are sensitive to air pollution include children, the elderly, and persons with preexisting respiratory or cardiovascular illness. For purposes of CEQA, the SCAQMD considers a sensitive receptor to be a location where a sensitive individual could remain for 24 hours, such as residences, hospitals, or convalescent facilities (South Coast Air Quality Management District 2008). Commercial and industrial facilities are not included in the definition because employees do not typically remain on-site for 24 hours. Sensitive sites are land uses where sensitive receptors are most likely to spend time, including schools and schoolyards, parks and playgrounds, day care centers, nursing homes, hospitals, and residential communities.

The nearest sensitive receptors to the Site are: the rectory of the St. Philip the Apostle Catholic Church, located adjacent to the northeastern corner of the project site; the Pasadena City College Child Development Center Day Care, located approximately 60 feet west of the site; the apartment building located at 107 S. Holliston, approximately 60 feet west of the site; the St. Philip the Apostle Newman Center (a Catholic community center), located approximately 64 feet east of the site; the apartment building located at 125 S. Holliston Avenue, approximately 100 feet south west of the site; the Aqua Courtyard Suites apartment building located at 1299 E. Green Street, approximately 105 feet northwest of the site; the St. Philip the Apostle School located approximately 150 feet southwest of the site; the apartment building located at 135 S. Holliston Avenue, approximately 150 feet southwest of the site; the

¹ *As shown in the California Emissions Estimator Model (CalEEMod) User’s Guide Version 2020.4.0, Section 4.3.2 “OFFROAD Equipment” as the analysis year increases, emission factors for the same equipment pieces decrease due to the natural turnover of older equipment being replaced by newer less polluting equipment and new regulatory requirements.*



Source: Gensler, 2025

Figure 2
Site Plan

apartment building located at 145 S. Holliston Avenue, approximately 220 feet southwest of the site; the apartment building located at 165 S. Holliston Avenue, approximately 285 feet southwest of the site; and the tennis courts belonging to Pasadena City College, located approximately 280 feet east of the site. Other air quality sensitive land uses are located further from the project site and would experience lower impacts.

5. SUMMARY OF IMPACTS

A. Construction-Source Emissions

Project construction-source emissions would not exceed applicable regional or local thresholds of significance established by the South Coast Air Quality Management District (SCAQMD).

As discussed herein, the project will comply with all applicable SCAQMD construction-source emission reduction rules and guidelines. Project construction source emissions would not cause or substantively contribute to violation of the California Ambient Air Quality Standards (CAAQS) or National Ambient Air Quality Standards (NAAQS) or result in toxic air contaminant (TAC)-related impacts.

Established requirements addressing construction equipment operations, and construction material use, storage, and disposal requirements act to minimize odor impacts that may result from construction activities. Moreover, construction-source odor emissions would be temporary, short-term, and intermittent in nature and would not result in persistent impacts that would affect substantial numbers of people. Potential construction-source odor impacts are therefore considered less than significant.

B. Operational-Source Emissions

The project operational-sourced emissions would not exceed applicable regional or local thresholds of significance established by the SCAQMD. Additionally, project-related trips will not cause or result in CO concentrations exceeding applicable state and/or federal standards (CO hotspots). Project operational-source emissions would therefore not adversely affect sensitive receptors within the project vicinity of the project. The project's emissions are below SCAQMD regional thresholds and would not result in a significant cumulative impact. The project does not propose any such uses or activities that would result in potentially significant operational-source toxic air contaminants or odor impacts. Potential operational-source odor impacts are therefore considered less than significant.

C. Climate Action Plan Consistency

The project will comply with the actions of the City's Climate Action Plan (CAP) Checklist. Therefore, the project would not conflict with an applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases and impacts are considered to be less than significant.

II. AIR QUALITY ANALYSIS

1. EXISTING AIR QUALITY CONDITIONS

A. Local Air Quality

The project site is located within the City of Pasadena, within the west San Gabriel Valley portion of Los Angeles County; which is part of the South Coast Air Basin (Basin). The Basin includes all of Orange County and the non-desert portions of Los Angeles, San Bernardino, and Riverside Counties. Bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east, the Basin is an area of high air pollution potential. The regional climate within the Basin is considered semi-arid and is characterized by warm summers, mild winters, infrequent seasonal rainfall, moderate daytime onshore breezes, and moderate humidity. Air quality within the Basin is influenced by a wide range of emissions sources—such as dense population centers, heavy vehicular traffic, and industry. Climate change within the Basin is influenced by a wide range of emission sources, such as utility usage, heavy vehicular traffic, industry, and meteorology.

The annual average temperature varies throughout the Basin, ranging from the low to mid 60s to over 100 degrees during the summer, measured in Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas.

The Basin experiences a persistent temperature inversion, which is characterized by increasing temperature with increasing altitude. This inversion limits the vertical dispersion of air contaminants, holding them relatively near the ground. As the sun warms the ground and the lower air layer, the temperature of the lower air layer approaches the temperature of the base of the inversion (upper) layer until the inversion layer finally breaks, allowing vertical mixing with the lower layer.

Aside from a persistent temperature inversion, the vertical dispersion of air contaminants in the Basin is also affected by wind conditions. The combination of stagnant wind conditions and low inversions produces the greatest pollutant concentrations. Conversely, on days of no inversion or high wind speeds, ambient air pollutant concentrations are the lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas in the Basin are transported eastward, predominantly into Riverside and San Bernardino Counties. Santa Ana winds, which are strong and dry north or northeasterly winds that occur during the fall and winter months, disperse air contaminants differently through the Basin, generally resulting in worse air conditions in the inner basin areas. Santa Ana conditions tend to last for several days at a time. Wind speeds in Pasadena area average about 6.9 miles per hour (mph).²

² *Weather Spark, Average Weather in Pasadena, website: <https://weatherspark.com/y/1718/Average-Weather-in-Pasadena-California-United-States-Year-Round>.*

The majority of annual rainfall in the Basin occurs between December and March. Summer rainfall is minimal and generally limited to scattered thundershowers in coastal regions. The annual average total of rainfall in the Pasadena area is approximately 21 inches.³

In the winter, light nocturnal winds result mainly from the drainage of cool air off of the mountains toward the valley floor while the air aloft over the valley remains warm. This forms a type of inversion known as a radiation inversion. Such winds are characterized by stagnation and poor local mixing and trap pollutants such as automobile exhaust near their source. While these inversions may lead to air pollution “hot spots” in heavily developed coastal areas of the basin, there is not enough traffic in inland valleys to cause any winter air pollution problems. Despite light wind conditions, especially at night and in the early morning, winter is generally a period of good air quality in the project vicinity.

The temperature and precipitation levels for the Pasadena area (Pasadena, CA Station), the closest monitoring station to the project site, are shown below in **Table 1, Local Monthly Climate Data**. Table 1 shows that August is typically the warmest month and December is typically the coolest month. Rainfall in the project area varies considerably in both time and space. Almost all the annual rainfall comes from the fringes of mid-latitude storms from late November to early April, with summers being almost completely dry.

Table 1
Local Monthly Climate Data

Descriptor	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. Max. Temperature	66.5	67.8	69.9	73.4	76.3	81.7	88.4	89.2	87.1	80.6	73.8	67.2
Avg. Min. Temperature	42.6	44.1	45.1	48.8	52.2	55.7	59.9	60.3	58.5	53.4	47.2	43.2
Avg. Total Precipitation (in.)	4.39	4.54	3.39	1.39	0.43	0.13	0.03	0.08	0.36	0.7	1.67	3.14

*Source: <https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca6719>
Data from the Pasadena, CA station (046719) for period 1/1/1898 to 6/10/2016*

B. Pollutants

Pollutants are generally classified as either criteria pollutants or non-criteria pollutants. Federal ambient air quality standards have been established for criteria pollutants, whereas no ambient standards have been established for non-criteria pollutants. For some criteria pollutants, separate standards have been set for different periods. Most standards have been set to protect public health. For some pollutants, standards have been based on other values (such as protection of crops, protection of materials, or

³ *Best Places, Climate in Pasadena, California, website:
<https://www.bestplaces.net/climate/city/california/Pasadena>.*

avoidance of nuisance conditions). A summary of federal and state ambient air quality standards is provided in the Regulatory Framework section.

i) Criteria Pollutants

The criteria pollutants consist of: ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, lead, and particulate matter. These pollutants can harm your health and the environment, and cause property damage. The Environmental Protection Agency (EPA) calls these pollutants “criteria” air pollutants because it regulates them by developing human health-based and/or environmentally-based criteria for setting permissible levels. The following provides descriptions of each of the criteria pollutants.

ii) Nitrogen Dioxides

Nitrogen Oxides (NO_x) is the generic term for a group of highly reactive gases which contain nitrogen and oxygen. While most NO_x is colorless and odorless, concentrations of nitrogen dioxide (NO₂) can often be seen as a reddish-brown layer over many urban areas. NO_x form when fuel is burned at high temperatures, as in a combustion process. The primary manmade sources of NO_x are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuel. NO_x reacts with other pollutants to form, ground-level ozone, nitrate particles, acid aerosols, as well as NO₂, which cause respiratory problems. NO_x and the pollutants formed from NO_x can be transported over long distances, following the patterns of prevailing winds. Therefore, controlling NO_x is often most effective if done from a regional perspective, rather than focusing on the nearest sources.

iii) Ozone

Ozone (O₃) is not usually emitted directly into the air but at ground-level is created by a chemical reaction between NO_x and volatile organic compounds (VOC) in the presence of sunlight. Motor vehicle exhaust, industrial emissions, gasoline vapors, chemical solvents as well as natural sources emit NO_x and VOC that help form ozone. Ground-level ozone is the primary constituent of smog. Sunlight and hot weather cause ground-level ozone to form with the greatest concentrations usually occurring downwind from urban areas. Ozone is subsequently considered a regional pollutant. Ground-level ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Because NO_x and VOC are ozone precursors, the health effects associated with ozone are also indirect health effects associated with significant levels of NO_x and VOC emissions.

iv) Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56 percent of all CO

emissions nationwide. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust.

Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are indoor sources of CO. The highest levels of CO in the outside air typically occur during the colder months of the year when inversion conditions are more frequent. The air pollution becomes trapped near the ground beneath a layer of warm air. CO is described as having only a local influence because it dissipates quickly. Since CO concentrations are strongly associated with motor vehicle emissions, high CO concentrations generally occur in the immediate vicinity of roadways with high traffic volumes and traffic congestion, active parking lots, and in automobile tunnels. Areas adjacent to heavily traveled and congested intersections are particularly susceptible to high CO concentrations.

CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. The health threat from lower levels of CO is most serious for those who suffer from heart disease such as angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise; repeated exposures may contribute to other cardiovascular effects. High levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can cause death.

v) Sulfur Dioxide

Sulfur Oxide (SOx) gases (including sulfur dioxide [SO₂]) are formed when fuel containing sulfur, such as coal and oil is burned, and from the refining of gasoline. SOx dissolves easily in water vapor to form acid and interacts with other gases and particles in the air to form sulfates and other products that can be harmful to people and the environment.

vi) Lead

Lead (Pb) is a metal found naturally in the environment as well as manufactured products. The major sources of lead emissions have historically been motor vehicles and industrial sources. Due to the phase out of leaded gasoline, metal processing is now the primary source of lead emissions to the air. High levels of lead in the air are typically only found near lead smelters, waste incinerators, utilities, and lead-acid battery manufacturers. Exposure of fetuses, infants, and children to low levels of lead can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased lead levels are associated with increased blood pressure.

vii) Particulate Matter

Particulate matter (PM) is the term for a mixture of solid particles and liquid droplets found in the air. Particulate matter is made up of a number of components including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health problems. Particles that are less than 10 micrometers in diameter (PM10) are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. Particles that are less than 2.5 micrometers in diameter (PM2.5) have been designated as a subset of PM10 due to their increased negative health impacts and its ability to remain suspended in the air longer and travel further.

viii) Reactive Organic Gases (ROG)

Although not a criteria pollutant, reactive organic gases (ROGs), or volatile organic compounds (VOCs), are defined as any compound of carbon—excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate—that participates in atmospheric photochemical reactions. Although there are slight differences in the definition of ROGs and VOCs, the two terms are often used interchangeably. Indoor sources of VOCs include paints, solvents, aerosol sprays, cleansers, tobacco smoke, etc. Outdoor sources of VOCs are from combustion and fuel evaporation. A reduction in VOC emissions reduces certain chemical reactions that contribute to the formulation of ozone. VOCs are transformed into organic aerosols in the atmosphere, which contribute to higher PM10 and lower visibility.

C. Other Pollutants of Concern**i) Toxic Air Contaminants**

In addition to the above-listed criteria pollutants, toxic air contaminants (TACs) are another group of pollutants of concern. Sources of toxic air contaminants include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least forty different toxic air contaminants. The most important of these toxic air contaminants, in terms of health risk, are diesel particulates, benzene, formaldehyde, 1,3-butadiene, and acetaldehyde. Public exposure to toxic air contaminants can result from emissions from normal operations as well as from accidental releases. Health effects of toxic air contaminants include cancer, birth defects, neurological damage, and death.

Toxic air contaminants are less pervasive in the urban atmosphere than criteria air pollutants, however they are linked to short-term (acute) or long-term (chronic or carcinogenic) adverse human health effects. There are hundreds of different types of toxic air contaminants with varying degrees of toxicity. Sources

of toxic air contaminants include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust.

According to the 2013 California Almanac of Emissions and Air Quality (CARB 2013), the majority of the estimated health risk from toxic air contaminants can be attributed to relatively few compounds, the most important of which is diesel particulate matter (DPM). Diesel particulate matter is a subset of PM_{2.5} because the size of diesel particles are typically 2.5 microns and smaller. The identification of diesel particulate matter as a toxic air contaminant in 1998 led the California Air Resources Board (CARB) to adopt the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-fueled Engines and Vehicles in September 2000. The plan's goals are a 75-percent reduction in diesel particulate matter by 2010 and an 85-percent reduction by 2020 from the 2000 baseline. Diesel engines emit a complex mixture of air pollutants, composed of gaseous and solid material. The visible emissions in diesel exhaust are known as particulate matter or PM, which includes carbon particles or "soot". Diesel exhaust also contains a variety of harmful gases and over 40 other cancer-causing substances. California's identification of diesel particulate matter as a toxic air contaminant was based on its potential to cause cancer, premature deaths, and other health problems. Exposure to diesel particulate matter is a health hazard, particularly to children whose lungs are still developing and the elderly who may have other serious health problems. Overall, diesel engine emissions are responsible for the majority of California's potential airborne cancer risk from combustion sources.

ii) Asbestos

Asbestos is listed as a TAC by the ARB and as a Hazardous Air Pollutant by the EPA. Asbestos occurs naturally in mineral formations and crushing or breaking these rocks, through construction or other means, can release asbestiform fibers into the air. Asbestos emissions can result from the sale or use of asbestos-containing materials, road surfacing with such materials, grading activities, and surface mining. The risk of disease is dependent upon the intensity and duration of exposure. When inhaled, asbestos fibers may remain in the lungs and with time may be linked to such diseases as asbestosis, lung cancer, and mesothelioma. Naturally occurring asbestos is not present in Los Angeles County. The nearest likely locations of naturally occurring asbestos, as identified in the General Location Guide for Ultramafic Rocks in California prepared by the California Division of Mines and Geology, is located at Asbestos Mountain in the San Jacinto Valley, over 102 miles southeast of the Site. Due to the distance to the nearest natural occurrences of asbestos, the project site is not likely to contain asbestos.

2. REGULATORY SETTING

The proposed project is addressed through the efforts of various international, federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality

through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for improving the air quality are discussed below.

A. Federal – United States Environmental Protection Agency

The EPA is responsible for setting and enforcing the National Ambient Air Quality Standards (NAAQS) for atmospheric pollutants. It regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives. The NAAQS pollutants were identified using medical evidence and are shown below in **Table 2, State and Federal Criteria Pollutant Standards**.

The EPA and the California Air Resource Board (CARB) designate air basins where ambient air quality standards are exceeded as “nonattainment” areas. If standards are met, the area is designated as an “attainment” area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered “unclassified.” National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Each standard has a different definition, or ‘form’ of what constitutes attainment, based on specific air quality statistics. For example, the Federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the Federal annual PM_{2.5} standard is met if the three-year average of the annual average PM_{2.5} concentration is less than or equal to the standard. Attainment status is shown in **Table 3, South Coast Air Basin Attainment Status**.

As part of its enforcement responsibilities, the EPA requires each state with federal nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the national standards. The SIP must integrate federal, state, and local components and regulations to identify specific measures to reduce pollution, using a combination of performance standards and market-based programs within the timeframe identified in the SIP.

As indicated below in Table 3, the South Coast Air Basin has been designated by the EPA as a non-attainment area for ozone (O₃), suspended particulates (PM_{2.5}), and lead. Currently, the Basin is in attainment with the ambient air quality standards for carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂) and particulate matter (PM₁₀).

Table 2
State and Federal Criteria Pollutant Standards

Air Pollutant	Concentration / Averaging Time		Most Relevant Effects
	California Standards	Federal Primary Standards	
Ozone (O ₃)	0.09 ppm/1-hour 0.07 ppm/8-hour	0.070 ppm/8-hour	(a) Decline in pulmonary function and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; and (f) Property damage.
Carbon Monoxide (CO)	20.0 ppm/1-hour 9.0 ppm/8-hour	35.0 ppm/1-hour 9.0 ppm/8-hour	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and (d) Possible increased risk to fetuses.
Nitrogen Dioxide (NO ₂)	0.18 ppm/1-hour 0.03 ppm/annual	100 ppb/1-hour 0.053 ppm/annual	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and (c) Contribution to atmospheric discoloration.
Sulfur Dioxide (SO ₂)	0.25 ppm/1-hour 0.04 ppm/24-hour	75 ppb/1-hour 0.14 ppm/annual	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.
Suspended Particulate Matter (PM ₁₀)	50 µg/m ³ /24-hour 20 µg/m ³ /annual	150 µg/m ³ /24-hour	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; (c) Increased risk of premature death from heart or lung diseases in elderly.
Suspended Particulate Matter (PM _{2.5})	12 µg/m ³ / annual	35 µg/m ³ /24-hour 9 µg/m ³ /annual	
Sulfates	25 µg/m ³ /24-hour	No Federal Standards	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) property damage.
Lead	1.5 µg/m ³ /30-day	0.15 µg/m ³ /3-month rolling	(a) Learning disabilities; (b) Impairment of blood formation and nerve conduction.
Visibility Reducing Particles	Extinction coefficient of 0.23 per kilometer-visibility of 10 miles or more due to particles when humidity is less than 70 percent.	No Federal Standards	Visibility impairment on days when relative humidity is less than 70 percent.

Sources: <https://ww2.arb.ca.gov/resources/national-ambient-air-quality-standards> and <https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards>.

Table 3
South Coast Air Basin Attainment Status

Pollutant	State Status	National Status
Ozone	Nonattainment	Nonattainment (Extreme)
Carbon monoxide	Attainment	Attainment/Unclassified
Nitrogen dioxide	Attainment	Attainment/Unclassified
Sulfur dioxide	Attainment	Attainment/Unclassified
PM10	Nonattainment	Attainment (Maintenance)
PM2.5	Nonattainment	Nonattainment (Moderate)
Lead (Pb)	Attainment	Nonattainment
<i>Source: (Federal and State Status): California Air Resources Board, 2023, https://ww2.arb.ca.gov/resources/documents/maps-state-and-federal-area-designations and SCAQMD 2022 Air Quality Management Plan, December 2022, http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16.</i>		

B. State – California Air Resources Board

The CARB, which is a part of the California Environmental Protection Agency, is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, the CARB conducts research, sets the California Ambient Air Quality Standards (CAAQS), compiles emission inventories, develops suggested control measures, provides oversight of local programs, and prepares the SIP. The CAAQS for criteria pollutants are shown in Table 2. In addition, the CARB establishes emission standards for motor vehicles sold in California, consumer products (e.g., hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

The SCAQMD-portion of the South Coast Air Basin (SCAB) has been designated by the CARB as a nonattainment area for ozone, PM10 and PM2.5. Currently, the SCAB is in attainment with the ambient air quality standards for CO, lead, SO₂, NO₂, and sulfates and is unclassified for visibility reducing particles and Hydrogen Sulfide.

On June 20, 2002, the CARB revised the PM10 annual average standard to 20 µg/m³ and established an annual average standard for PM2.5 of 12 µg/m³. The national annual average PM2.5 standard was most recently revised in 2024 following an exhaustive review of new literature pointing to evidence for continued risk of premature mortality and other health effects at lower PM2.5 concentrations than the existing standard. The latest review resulted in retention of the existing 24-hour average PM2.5 and PM10 standards. The South Coast Air Basin is designated as an "extreme" nonattainment area for the 2015 8-hour ozone standard and is required to meet the standard by 2037. On December 2, 2022, South Coast AQMD adopted the 2022 Air Quality Management Plan (AQMP), which provides the blueprint for how the Basin will meet the standard by 2037. While the 2022 AQMP largely fulfilled Clean Air Act requirements for "extreme" nonattainment areas, it did not formally address contingency measure requirements as U.S. EPA was in the process of developing updated contingency measure guidance. The 2022 AQMP committed

to address these requirements once new guidance was issued. On December 3, 2024, the U.S. EPA released updated guidance for contingency measures. The South Coast Air Basin Contingency Measure SIP Revision for the 2015 8-Hour Ozone NAAQS has been developed in response to U.S. EPA's new guidance to satisfy contingency measure requirements in the Basin.

Effective October 1, 2023, the CARB Advanced Clen Fleets Regulation (ACF) requires certain fleets to phase-in medium- and heavy-duty zero-emission vehicles (ZEV) into their California fleets through 2042; The regulations pertain to three fleet types:

1. State and local government fleets, including city, county, special district, and State agency fleets;
2. Trucks performing drayage operations at seaports and railyards; and
3. High Priority Fleets including federal agencies and entities that have \$50 million or more in gross annual revenue or entities that own, operate, or control 50 or more vehicles.

Beginning January 1, 2024, State and local government fleets, including city, county, special district, and state agency fleets, are required to add ZEVs to the fleet as a percentage of their purchases each year. Starting January 1, 2024, 50% of vehicle purchases must be zero-emission vehicles and 100% of purchases must be zero-emission starting January 1, 2027. Small government fleets (those with 10 or fewer vehicles) and those in designated counties must start their ZEV purchases beginning in 2027. Alternatively, State and local government fleet owners may elect to meet ZEV targets as a percentage of the total fleet starting with vehicle types that are most suitable for electrification. Beginning January 1, 2024, only zero-emission drayage trucks may be reported in the TRUCRS system. All drayage trucks entering seaports and intermodal railyards will be required to be zero-emission by 2035. Starting January 1, 2024 High Priority Fleets, including federal fleets, must comply with the Model Year Schedule OR may choose to use the ZEV Milestones Option to phase zero-emissions vehicles (ZEV) into their fleets Starting January 1, 2024, fleet owners may only add ZEVs to their California fleet and, starting January 1, 2025, must remove internal combustion engine vehicles that have exceeded their useful life as specified in the regulation. Alternatively, fleet owners may elect to meet ZEV targets as a percentage of the total fleet starting with vehicle types that are most suitable for electrification. However, CARB has issued an Enforcement Notice that it has decided to exercise its enforcement discretion for drayage trucks and high priority fleets, and will not take enforcement action as to the reporting requirements or registration prohibitions of the drayage or high priority fleet requirements until U.S. EPA grants California a preemption waiver applicable to those regulatory provisions, or determines a waiver is not necessary.

The CARB is also responsible for regulations pertaining to toxic air contaminants. The Air Toxics “Hot Spots” Information and Assessment Act (AB 2588, 1987, Connelly) was enacted in 1987 as a means to establish a formal air toxics emission inventory risk quantification program. AB 2588, as amended, establishes a process that requires stationary sources to report the type and quantities of certain

substances their facilities routinely release into the South Coast Air Basin. The data is ranked by high, intermediate, and low categories, which are determined by: the potency, toxicity, quantity, volume, and proximity of the facility to nearby receptors.

i) AB 617 Nonvehicular Air Pollution: Criteria Air Pollutants and Toxic Air Contaminants

This bill requires the state board to develop a uniform statewide system of annual reporting of emissions of criteria air pollutants and toxic air contaminants for use by certain categories of stationary sources. The bill requires those stationary sources to report their annual emissions of criteria air pollutants and toxic air contaminants, as specified. This bill required the state board, by October 1, 2018, to prepare a monitoring plan regarding technologies for monitoring criteria air pollutants and toxic air contaminants and the need for and benefits of additional community air monitoring systems, as defined. The bill requires the state board to select, based on the monitoring plan, the highest priority locations in the state for the deployment of community air monitoring systems. The bill requires an air district containing a selected location, by July 1, 2019, to deploy a system in the selected location. The bill would authorize the air district to require a stationary source that emits air pollutants in, or that materially affect, the selected location to deploy a fence-line monitoring system, as defined, or other specified real-time, on-site monitoring. The bill authorizes the state board, by January 1, 2020, and annually thereafter, to select additional locations for the deployment of the systems. The bill requires air districts that have deployed a system to provide to the state board air quality data produced by the system. The bill requires the state board to publish the data on its Internet Web site.

C. Regional

The SCAQMD is the agency principally responsible for comprehensive air pollution control in the South Coast Air Basin. To that end, as a regional agency, the SCAQMD works directly with the Southern California Association of Governments (SCAG), county transportation commissions, and local governments and cooperates actively with all federal and state agencies.

i) SCAG

SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties and addresses regional issues relating to transportation, the economy, community development and the environment. Although SCAG is not an air quality management agency, it is responsible for developing transportation, land use, and energy conservation measures that affect air quality. SCAG's 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) identifies growth forecasts that are used in the development of air quality-related land use and transportation control strategies by the South Coast Air Quality Management District.

On September 3, 2020, SCAG’s Regional Council unanimously voted to approve and fully adopt Connect SoCal (2020–2045 Regional Transportation Plan/Sustainable Communities Strategy), and the addendum to the Connect SoCal Program Environmental Impact Report. Connect SoCal is a long-range visioning plan that builds upon and expands land use and transportation strategies established over several planning cycles to increase mobility options and achieve a more sustainable growth pattern. Connect SoCal outlines more than \$638 billion in transportation system investments through 2045. It was prepared through a collaborative, continuous, and comprehensive process with input from local governments, county transportation commissions, tribal governments, non-profit organizations, businesses, and local stakeholders within the counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura.

ii) South Coast Air Quality Management District (SCAQMD)

The SCAQMD develops rules and regulations, establishes permitting requirements for stationary sources, inspects emission sources, and enforces such measures through educational programs or fines, when necessary. The SCAQMD is directly responsible for reducing emissions from stationary, mobile, and indirect sources. It has responded to this requirement by preparing a sequence of AQMPs.

a) AQMP

In May 2022, the SCAQMD completed the 2022 Draft AQMP. The 2022 Draft AQMP is focused on attaining the 2015 8-hour ozone standard (70 ppb) for the South Coast Air Basin and Coachella Valley. The Draft 2022 AQMP builds upon measures already in place from previous AQMPs. It also includes a variety of additional strategies such as regulation, accelerated deployment of available cleaner technologies (e.g., zero emission technologies, when cost-effective and feasible, and low NOx technologies in other applications), best management practices, co-benefits from existing programs (e.g., climate and energy efficiency), incentives, and other CAA measures to achieve the 2015 8-hour ozone standard. The 2022 AQMP was adopted December 2, 2022, by SCAQMD Governing Board. The 2022 AQMP was approved and adopted by CARB on January 26, 2023. The 2022 AQMP utilizes information from the 2020 RTP/SCS. The 2022 AQMP strategy includes the following:⁴

- Wide adoption of zero emissions technologies anywhere available.
- Low NOx technologies where zero emissions aren’t feasible.
- Federal Action.

⁴ SCAQMD, 2022 AQMP Infographic, <http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/2022-aqmp-infographic>.

- Zero emissions technologies for residential and industrial sources such as water and space heaters in buildings and homes regionwide.
- Incentive funding in environmental justice areas.
- Prioritize benefits on the most disadvantaged communities.

b) SCAQMD Rules

During construction and operation, the project must comply with applicable rules and regulations. The following are rules that the project may be required to comply with, either directly, or indirectly:

1) SCAQMD Rule 402

Prohibits a person from discharging from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

2) SCAQMD Rule 403

Governs emissions of fugitive dust during construction and operation activities. Compliance with this rule is achieved through application of standard Best Management Practices, such as application of water or chemical stabilizers to disturbed soils, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 miles per hour, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph, and establishing a permanent ground cover on finished sites.

Rule 403 requires that fugitive dust be controlled with best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. In addition, SCAQMD Rule 403 requires implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off-site. Applicable dust suppression techniques from Rule 403 are summarized below. Implementation of these dust suppression techniques can reduce the fugitive dust generation (and thus the PM₁₀ component). Compliance with these rules would reduce impacts on nearby sensitive receptors. Rule 403 measures may include but are not limited to the following:

- Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).
- Water active sites at least three times daily. (Locations where grading is to occur will be thoroughly watered prior to earthmoving.)

- Cover all trucks hauling dirt, sand, soil, or other loose materials, or maintain at least 0.6 meters (2 feet) of freeboard (vertical space between the top of the load and top of the trailer) in accordance with the requirements of California Vehicle Code section 23114.

3) SCAQMD Rule 445

Prohibits permanently installed wood burning devices into any new development. A wood burning device means any fireplace, wood burning heater, or pellet-fueled wood heater, or any similarly enclosed, permanently installed, indoor or outdoor device burning any solid fuel for aesthetic or space-heating purposes, which has a heat input of less than one million British thermal units per hour.

4) SCAQMD Rule 481

Applies to all spray painting and spray coating operations and equipment. The rule states that a person shall not use or operate any spray painting or spray coating equipment unless one of the following conditions is met:

- (1) The spray coating equipment is operated inside a control enclosure, which is approved by the Executive Officer. Any control enclosure for which an application for permit for new construction, alteration, or change of ownership or location is submitted after the date of adoption of this rule shall be exhausted only through filters at a design face velocity not less than 100 feet per minute nor greater than 300 feet per minute, or through a water wash system designed to be equally effective for the purpose of air pollution control.
- (2) Coatings are applied with high-volume low-pressure, electrostatic, and/or airless spray equipment.
- (3) An alternative method of coating application or control is used which has effectiveness equal to or greater than the equipment specified in the rule.

5) SCAQMD Rule 1108

Governs the sale, use, and manufacturing of asphalt and limits the volatile organic compound (VOC) content in asphalt used in the South Coast Air Basin. This rule would regulate the VOC content of asphalt used during construction. Therefore, all asphalt used during construction of the project must comply with SCAQMD Rule 1108.

6) SCAQMD Rule 1113

Governs the sale, use, and manufacturing of architectural coating and limits the VOC content in paints and paint solvents. This rule regulates the VOC content of paints available during construction. Therefore, all paints and solvents used during construction and operation of the project must comply with SCAQMD Rule 1113.

7) *SCAQMD Rule 1143*

Governs the manufacture, sale, and use of paint thinners and solvents used in thinning of coating materials, cleaning of coating application equipment, and other solvent cleaning operations by limiting their VOC content. This rule regulates the VOC content of solvents used during construction. Solvents used during the construction phase must comply with this rule.

8) *SCAQMD Rule 1186*

Limits the presence of fugitive dust on paved and unpaved roads and sets certification protocols and requirements for street sweepers that are under contract to provide sweeping services to any federal, state, county, agency, or special district such as water, air, sanitation, transit, or school district.

9) *SCAQMD Rule 1403*

Asbestos Emissions from Demolition/Renovation Activities, specifies work practice requirements to limit asbestos emissions from building demolition and renovation activities, including the removal and associated disturbance of asbestos-containing materials (ACM).

c) *SCAQMD and CEQA*

Although the SCAQMD is responsible for regional air quality planning efforts, it does not have the authority to directly regulate air quality issues associated with plans and new development projects throughout the South Coast Air Basin. Instead, this is controlled through local jurisdictions in accordance with the California Environmental Quality Act (CEQA). In order to assist local jurisdictions with air quality compliance issues the CEQA Air Quality Handbook (SCAQMD CEQA Handbook) prepared by the SCAQMD (1993) with the most current updates found at <https://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook>, was developed in accordance with the projections and programs of the AQMP. The purpose of the SCAQMD CEQA Handbook is to assist Lead Agencies, as well as consultants, project proponents, and other interested parties in evaluating a proposed project's potential air quality impacts. Specifically, the SCAQMD CEQA Handbook explains the procedures that the SCAQMD recommends be followed for the environmental review process required by CEQA. The SCAQMD CEQA Handbook provides direction on how to evaluate potential air quality impacts, how to determine whether these impacts are significant, and how to mitigate these impacts. SCAQMD is in the process of developing an "Air Quality Analysis Guidance Handbook" to replace the CEQA Air Quality Handbook approved by the AQMD Governing Board in 1993. The 1993 CEQA Air Quality Handbook is still available but not online. In addition, there are sections of the 1993 Handbook that are obsolete. In order to assist the CEQA practitioner in conducting an air quality analysis while the new Handbook is being prepared, supplemental information

regarding: significance thresholds and analysis, emissions factors, cumulative impacts emissions analysis, and other useful subjects, are available at the SCAQMD website⁵.

D. Local – City of Pasadena

Local jurisdictions, such as the City of Pasadena, have the authority and responsibility to reduce air pollution through its police power and decision-making authority. Specifically, the City is responsible for the assessment and mitigation of air emissions resulting from its land use decisions. The City is also responsible for the implementation of transportation control measures as outlined in the 2016 AQMP and SCAQMD Attainment Plans. Examples of such measures include bus turnouts, energy-efficient streetlights, and synchronized traffic signals. In accordance with CEQA requirements and the CEQA review process, the City assesses the air quality impacts of new development projects, requires mitigation of potentially significant air quality impacts by conditioning discretionary permits, and monitors and enforces implementation of such mitigation.

3. MONITORED AIR QUALITY

The air quality at any site is dependent on the regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the air basin. Estimates of the existing emissions in the Basin provided in the Final 2022 Air Quality Management Plan prepared by SCAQMD (December 2022) indicate that collectively, mobile sources account for 46 percent of the VOC, 85 percent of the NO_x emissions, 89 percent of the CO emissions and 29 percent of directly emitted PM_{2.5}, with another 18 percent of PM_{2.5} from road dust.

The EPA and the CARB designate air basins where ambient air quality standards are exceeded as “nonattainment” areas. If standards are met, the area is designated as an “attainment” area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered “unclassified”. National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Each standard has a different definition, or ‘form’ of what constitutes attainment, based on specific air quality statistics. For example, the Federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the Federal annual PM_{2.5} standard is met if the three-year average of the annual average PM_{2.5} concentration is less than or equal to the standard.

The SCAQMD has divided the South Coast Air Basin into 38 air-monitoring areas with a designated ambient air monitoring station representative of each area. The project site is located in the West San Gabriel Valley Source Receptor Area (SRA 8). The nearest air monitoring station to the project site is the Pasadena

⁵ <https://www.aqmd.gov/home/rules-compliance/ceqa>.

– S. Wilson Avenue Monitoring Station (Pasadena Station). The Pasadena Station is located approximately 0.77 miles southwest of the Site, at 752 S. Wilson Avenue, Pasadena. **Table 4, Air Quality Monitoring Summary**, presents the monitored pollutant levels from the Pasadena Station. However, it should be noted that due to the air monitoring station distance from the project site, recorded air pollution levels at the air monitoring station reflect with varying degrees of accuracy, local air quality conditions at the project site. As PM-10 data was not available for the Pasadena station, data was obtained from the Los Angeles- North Main Street Station.

Table 4 summarizes 2022 through 2024 published monitoring data, which is the most recent 3-year period available. The data shows that during the past few years; the project area has exceeded the State ozone and Particulate Matter (PM10) standards.

**Table 4
Air Quality Monitoring Summary**

Pollutant (Standard) ¹		Year		
		2022	2023	2024
Ozone:	Maximum 1-Hour Concentration (ppm)	0.143	0.109	0.143
	Days > CAAQS (0.09 ppm)	12	24	21
	Maximum 8-Hour Concentration (ppm)	0.102	0.090	0.099
	Days > NAAQS/CAAQS (0.070 ppm)	22	33	42
Carbon Monoxide:	Maximum 8-Hour Concentration (ppm)	*	*	*
	Days > CAAQS (9 ppm)	0	0	0
	Days > NAAQS (9 ppm)	0	0	0
Nitrogen Dioxide:	Maximum 1-Hour Concentration (ppm)	0.0659	0.0492	0.0615
	Days > CAAQS (0.18 ppm)	0	0	0
Inhalable Particulates (PM10): ²	Maximum 24-Hour Concentration (µg/m ³)	61.0	58.0	78.0
	Days > NAAQS (150 µg/m ³)	0	*	*
	Days > CAAQS (50 µg/m ³)	0	1	2
	Annual Average (µg/m ³)	24.1	21.8	21.8
Ultra-Fine Particulates (PM2.5):	Maximum 24-Hour Concentration (µg/m ³)	22.1	52.0	117.2
	Days > NAAQS (35 µg/m ³)	0	1	3
	Annual Average (µg/m ³)	9.1	9.0	11.7

Source: <http://www.arb.ca.gov/adam/topfour/topfour1.php>. Data from the Pasadena-S. Wilson Avenue Monitoring Station, unless otherwise noted.

(1) CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard; ppm = parts per million

(2) Data obtained from the Los Angeles - North Main Street Station.

* Means there was insufficient data available to determine value.

A. Ozone

During the 2022 to 2024 monitoring period, the State 1-hour concentration standard for ozone was exceeded between 12 and 24 days per year at the Pasadena Station. The State/Federal 8-hour ozone standard has been exceeded between 22 and 42 days each year over the past three years at the Pasadena

Station. Ozone is a secondary pollutant as it is not directly emitted. Ozone is the result of chemical reactions between other pollutants, most importantly hydrocarbons and NO₂, which occur only in the presence of bright sunlight. Pollutants emitted from upwind cities react during transport downwind to produce the oxidant concentrations experienced in the area. Many areas of the SCAQMD contribute to the ozone levels experienced at the monitoring station, with the more significant areas being those directly upwind.

B. Carbon Monoxide

CO is another important pollutant that is due mainly to motor vehicles. The Pasadena Station did not record an exceedance of the state or federal 8-hour CO standard for the last three years.

C. Nitrogen Dioxide

The Pasadena Station did not record an exceedance of the State or Federal NO₂ standards for the last three years.

D. Particulate Matter

From 2022 to 2024, the State 24-hour concentration standard for PM₁₀ was exceeded between 1 and 2 days per year at the Los Angeles Station. There was no exceedance of the Federal standards for PM₁₀. Over the past three years, the Federal 24-hour standards for PM_{2.5} were exceeded between 1 and 3 days at the Pasadena Station.

According to the EPA, some people are much more sensitive than others to breathing fine particles (PM₁₀ and PM_{2.5}). People with influenza, chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death due to breathing these fine particles. People with bronchitis can expect aggravated symptoms from breathing in fine particles. Children may experience decline in lung function due to breathing in PM₁₀ and PM_{2.5}. Other groups considered sensitive are smokers and people who cannot breathe well through their noses. Exercising athletes are also considered sensitive, because many breathe through their mouths during exercise.

4. AIR QUALITY STANDARDS

A. Significance Thresholds

i) Appendix G of the State CEQA Guidelines

Pursuant to Appendix G, the project would result in a significant impact related to air quality if it would:

- Conflict with or obstruct the implementation of the applicable air quality plan;

- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The CEQA Guidelines Section 15064.7 provides the significance criteria established by the applicable air quality management district or air pollution control district, when available, may be relied upon to make determinations of significance. The potential air quality impacts of the Project are, therefore, evaluated according to thresholds developed by SCAQMD in their CEQA Air Quality Handbook, Air Quality Analysis Guidance Handbook, and subsequent guidance, which are listed below.⁶ Therefore, the project would result in a potentially significant impact to air quality if it would:

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

AIR-2: Violate any air quality standard or contribute substantially to an existing or projected air quality violation as a result of:

- Criteria pollutant emissions during construction (direct and indirect) in excess of the SCAQMD's regional significance thresholds,
- Criteria pollutant emissions during operation (direct and indirect) in excess of the SCAQMD's regional significance thresholds.

AIR-3: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);

AIR-4: Expose sensitive receptors to substantial pollutant concentrations that would:

- Exceed SCAQMD's localized significance thresholds,
- Cause or contribute to the formation of CO hotspots.

AIR-5: Create objectionable odors affecting a substantial number of people.

B. Regional Air Quality

Many air quality impacts that derive from dispersed mobile sources, which are the dominate pollution generators in the basin, often occurs hours later and miles away after photochemical processes have

⁶ *While the SCAQMD CEQA Air Quality Handbook contains significance thresholds for lead, Project construction and operation would not include sources of lead emissions and would not exceed the established thresholds for lead. Unleaded fuel and unleaded paints have virtually eliminated lead emissions from industrial land use projects such as the Project. As a result, lead emissions are not further evaluated herein.*

converted primary exhaust pollutants into secondary contaminants such as ozone. The incremental regional air quality impact of an individual project is generally very small and difficult to measure. Therefore, the SCAQMD has developed significance thresholds based on the volume of pollution emitted rather than on actual ambient air quality because the direct air quality impact of a project is not quantifiable on a regional scale. The SCAQMD CEQA Handbook states that any project in the South Coast Air Basin with daily emissions that exceed any of the identified significance thresholds should be considered as having an individually and cumulatively significant air quality impact. For the purposes to this air quality impact analysis, a regional air quality impact would be considered significant if emissions exceed the SCAQMD mass daily thresholds identified in **Table 5, SCQAMD Air Quality Significance Thresholds**.

**Table 5
SCAQMD Air Quality Significance Thresholds**

Mass Daily Thresholds		
Pollutant	Construction (lbs/day)	Operation (lbs/day)
NOx	100	55
VOC	75	55
PM10	150	150
PM2.5	55	55
SOx	150	150
CO	550	550
Lead	3	3
Toxic Air Contaminants, Odor and GHG Thresholds		
TACs	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index > 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
GHG	10,000 MT/yr CO ₂ e for industrial projects	
Ambient Air Quality Standards		
Pollutant	SCAQMD Standards	
NO ₂ -1-hour average Annual arithmetic mean	0.18 ppm (338 $\mu\text{g}/\text{m}^3$) 0.03 ppm (state) and 0.0534 (federal)	
PM10 -24-hour average Construction Operations Annual average	10.4 $\mu\text{g}/\text{m}^3$ 2.5 $\mu\text{g}/\text{m}^3$ 1.0 $\mu\text{g}/\text{m}^3$	
PM2.5 -24-hour average Construction Operations	10.4 $\mu\text{g}/\text{m}^3$ 2.5 $\mu\text{g}/\text{m}^3$	
SO ₂ 1-hour average 24-hour average	0.25 ppm (state) and 0.075 ppm (federal – 99 th percentile) 0.04 ppm (state)	
CO 1-hour average 8-hour average	20 ppm (23,000 $\mu\text{g}/\text{m}^3$) 9 ppm (10,000 $\mu\text{g}/\text{m}^3$)	

Table 5
SCAQMD Air Quality Significance Thresholds

Lead	
30-day average	1.5 µg/m ³
Rolling 3-month average	0.15 µg/m ³
Quarterly average	1.5 µg/m ³
Source: https://www.aqmd.gov/docs/default-source/ceqa/handbook/south-coast-aqmd-air-quality-significance-thresholds.pdf?sfvrsn=f7601d61_25	

C. Local Air Quality and Localized Significance Thresholds

Project-related construction air emissions may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the South Coast Air Basin. In order to assess local air quality impacts the SCAQMD has developed Localized Significance Thresholds (LSTs) to assess the project-related air emissions in the project vicinity. The SCAQMD has also provided Final Localized Significant Threshold Methodology (LST Methodology), revised July 2008, which details the methodology to analyze local air emission impacts. The Localized Significant Threshold Methodology found that the primary emissions of concern are NO₂, CO, PM10, and PM2.5.

The significance thresholds for the local emissions of NO₂ and CO are determined by subtracting the highest background concentration from the last three years of these pollutants from Table 4 above, from the most restrictive ambient air quality standards for these pollutants that are outlined in the Localized Significant Thresholds. Table 5 shows the ambient air quality standards for NO₂, CO, and PM10 and PM2.5.

D. Toxic Air Contaminants (TACs)

i) Construction

Temporary TAC emissions associated with DPM emissions from heavy construction equipment would occur during the construction phase of the Project. According to the Office of Environmental Health Hazard Assessment (OEHHA)⁷ and the SCAQMD *Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis* (August 2003),⁸ health effects from TACs are described in terms of individual cancer risk. “Individual Cancer Risk” is the likelihood that a person exposed to concentrations of TACs over a 30-year lifetime will contract cancer based on the use of standard risk-assessment methodology. Additionally, the SCAQMD CEQA guidance does not require

⁷ Office of Environmental Health Hazard Assessment, *Air Toxic Hot Spots Program Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessment*, February 2015, <https://oehha.ca.gov/media/downloads/crnrr/2015guidancemanual.pdf>.

⁸ South Coast Air Quality Management District, *Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis*, August 2003, <http://www.aqmd.gov/docs/default-source/ceqa/handbook/mobile-source-toxics-analysis.doc?sfvrsn=2>.

a HRA for short-term construction emissions. Construction activities associated with the project would be sporadic, transitory, and short-term in nature (approximately 20 months). Thus, construction of the project would not result in a substantial, long-term (i.e., 30-year) source of TAC emissions. Nonetheless, a qualitative assessment of TAC emissions associated with short-term construction TAC emissions is provided in the analysis section below.

ii) Operation

CARB published the *Air Quality and Land Use Handbook* in April 2005 to serve as a general guide for considering impacts to sensitive receptors from facilities that emit TAC emissions. The recommendations provided therein are voluntary and do not constitute a requirement or mandate for either land use agencies or local air districts. The goal of the guidance document is to protect sensitive receptors, such as children, the elderly, acutely ill, and chronically ill persons, from exposure to TAC emissions. Some examples of CARB's siting recommendations include the following: (1) avoid siting sensitive receptors within 500 feet of a freeway, urban road with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day; (2) avoid siting sensitive receptors within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units per day, or where transport refrigeration unit operations exceed 300 hours per week); (3) avoid siting sensitive receptors within 300 feet of any dry cleaning operation using perchloroethylene and within 500 feet of operations with two or more machines; and (4) avoid siting sensitive receptors within 300 feet of a large gasoline dispensing facility (3.6 million gallons per year or more) or 50 feet of a typical gasoline dispensing facility (less than 3.6 million gallons per year). However, the project will be an R & D facility and is not considered to be a sensitive receptor.

E. Odor Impacts

The SCAQMD CEQA Handbook states that an odor impact would occur if the proposed project creates an odor nuisance pursuant to SCAQMD Rule 402, which states:

A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

The provisions of this rule shall not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.

If the proposed project results in a violation of Rule 402 with regards to odor impacts, then the proposed project would create a significant odor impact.

5. SHORT-TERM CONSTRUCTION EMISSIONS

Construction activities associated with the proposed project would have the potential to generate air emissions, toxic air contaminant emissions, and odor impacts. Assumptions for the phasing, duration, and required equipment for the construction of the proposed project were obtained from the project applicant. The construction activities for the proposed project are anticipated to include: Demolition of the existing asphalt parking lot, grading/excavation of the approximately 1-acre site, construction of a 93,539 square foot, 4-story R & D building on top of 3 levels of underground parking (with 280 parking spaces), and application of architectural coatings. The project is anticipated to export 950 tons of material during the demolition phase, and 60,000 CY of material during the grading/excavation phase. See Appendix A for more details.

The project is anticipated to start construction no sooner than January 2025 and be complete by September 2027. The project is anticipated to be operational in 2027.

A. Methodology

The following provides a discussion of the methodology used to calculate regional construction air emissions and an analysis of the proposed project's short-term construction emissions for the criteria pollutants. The construction-related regional air quality impacts have been analyzed for both criteria pollutants and GHGs.

Emissions are estimated using the CalEEMod (Version 2022.1.1.30) software, which is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions from a variety of land use projects. CalEEMod was developed in collaboration with the air districts of California. Regional data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California air districts to account for local requirements and conditions. The model is considered to be an accurate and comprehensive tool for quantifying air quality and GHG impacts from land use projects throughout California.

Daily regional emissions during construction are forecasted by assuming a conservative estimate of construction activities (i.e., assuming all construction occurs at the earliest feasible date) and applying the mobile source and fugitive dust emissions factors. The input values used in this analysis were adjusted to be project-specific for the construction schedule and the equipment used was based on CalEEMod defaults. The CalEEMod program uses the EMFAC2021 computer program to calculate the emission rates specific for Los Angeles County for construction-related employee vehicle trips and the OFFROAD2017 computer program to calculate emission rates for heavy truck operations. EMFAC2021 and OFFROAD2017 are computer programs generated by CARB that calculates composite emission rates for vehicles. Emission rates are reported by the program in grams per trip and grams per mile or grams per running

hour. Daily truck trips and CalEEMod default trip length data were used to assess roadway emissions from truck exhaust. The maximum daily emissions are estimated values for the worst-case day and do not represent the emissions that would occur for every day of project construction. The maximum daily emissions are compared to the SCAQMD daily regional numeric indicators. Detailed construction equipment lists, construction scheduling, and emission calculations are provided in Appendix A.

The project will be required to comply with existing SCAQMD rules for the reduction of fugitive dust emissions. SCAQMD Rule 403 establishes these procedures. Compliance with this rule is achieved through application of standard best management practices in construction and operation activities, such as application of water or chemical stabilizers to disturbed soils, managing haul road dust by application of water, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 mph, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph and establishing a permanent, stabilizing ground cover on finished sites. In addition, projects that disturb 50 acres or more of soil or move 5,000 cubic yards of materials per day are required to submit a Fugitive Dust Control Plan or a Large Operation Notification Form to SCAQMD. Based on the size of the Project area (approximately 1.16 acres) a Fugitive Dust Control Plan or Large Operation Notification would not be required.

SCAQMD's Rule 403 minimum requirements require that the application of the best available dust control measures is used for all grading operations and include the application of water or other soil stabilizers in sufficient quantity to prevent the generation of visible dust plumes. Compliance with Rule 403 would require the use of water trucks during all phases where earth moving operations would occur. Compliance with Rule 403 has been included in the CalEEMod modeling for the proposed project.

Per SCAQMD Rule 1113 as amended on June 3, 2011, the architectural coatings that would be applied to buildings will be limited to an average of 50 grams per liter or less. CalEEMod defaults have been adjusted accordingly.

The phases of the construction activities which have been analyzed below for each phase are: (1) demolition, (2) grading/excavation, (3) building construction, and (4) application of architectural coatings. Details pertaining to the project's construction timing and the type of equipment modeled for each construction phase are available in the CalEEMod output in Appendix A of this technical report.

B. Construction-Related Regional Impacts

The construction-related criteria maximum daily pollutant emissions for each phase are shown below in **Table 6 Construction-Related Regional Pollutant Emissions**. Table 6 shows the worst-case of either summer or winter criteria pollutant emissions and that none of the project's emissions would exceed regional thresholds. Therefore, a less than significant regional air quality impact would occur from construction of the proposed project.

**Table 6
Construction-Related Regional Pollutant Emissions**

Activity	Maximum Pollutant Emissions (pounds/day)					
	ROG	NOx	CO	SO ₂	PM10	PM2.5
Maximum Daily Emissions ^{1,2}	21.7	11.2	17.8	0.04	1.78	0.62
SCAQMD Thresholds	75	100	550	150	150	55
Exceeds Thresholds?	No	No	No	No	No	No
<i>(1) Includes emissions from both on-site and off-site emissions. Site preparation and excavation PM-10 and PM-2.5 emissions show compliance with SCAQMD Rule 403.</i> <i>(2) Construction and painting phases may overlap.</i> <i>Source: CalEEMod Version 2022.1.1.30.</i>						

C. Construction-Related Local Impacts

Construction-related air emissions may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the South Coast Air Basin. The proposed project has been analyzed for the potential local air quality impacts created from: construction-related fugitive dust and diesel emissions; from toxic air contaminants; and from construction-related odor impacts. The local air quality emissions from construction were analyzed using the SCAQMD’s Mass Rate Localized Significant Threshold Look-up Tables and the methodology described in Localized Significance Threshold Methodology prepared by SCAQMD (revised July 2008). The Look-up Tables were developed by the SCAQMD in order to readily determine if the daily emissions of CO, NOx, PM10, and PM2.5 from the proposed project could result in a significant impact to the local air quality. The emission thresholds were calculated based on the West San Gabriel Valley source receptor area (SRA) 8 and a disturbance value of one acre per day (the site is 1.16 acres). According to LST Methodology, any receptor located closer than 25 meters (82 feet) shall be based on the 25-meter thresholds.

The nearest sensitive receptors to the Site are: the rectory of the St. Philip the Apostle Catholic Church, located adjacent to the northeastern corner of the project site; the Pasadena City College Child Development Center Day Care, located approximately 60 feet west of the site; the apartment building located at 107 S. Holliston, approximately 60 feet west of the site; the St. Philip the Apostle Newman Center (a Catholic community center), located approximately 64 feet east of the site; the apartment building located at 125 S. Holliston Avenue, approximately 100 feet south west of the site; the Aqua Courtyard Suites apartment building located at 1299 E. Green Street, approximately 105 feet northwest of the site; the St. Philip the Apostle School located approximately 150 feet southwest of the site; the apartment building located at 135 S. Holliston Avenue, approximately 150 feet southwest of the site; the apartment building located at 145 S. Holliston Avenue, approximately 220 feet southwest of the site; the apartment building located at 165 S. Holliston Avenue, approximately 285 feet southwest of the site; and the tennis courts belonging to Pasadena City College, located approximately 280 feet east of the site; therefore, the SCAQMD 25-meter Look-up Tables was used. **Table 7, Local Construction Emissions at the**

Nearest Receptors, shows the on-site emissions from the CalEEMod model for the different construction phases and the LST screening criteria. As stated previously, other air quality sensitive land uses are located further from the project site and would experience lower impacts.

The data provided in Table 7 shows that none of the analyzed criteria pollutants would exceed the LST screening criteria at the nearest sensitive receptors. Therefore, a less than significant local air quality impact would occur from construction of the proposed project.

**Table 7
Local Construction Emissions at the Nearest Receptors**

Activity	On-Site Pollutant Emissions (pounds/day)			
	NOx	CO	PM10	PM2.5
Demolition	5.93	7.36	0.78	0.323
Excavation/Grading	4.78	7.62	0.12	0.11
Building Construction	8.84	10.65	0.28	0.26
Architectural Coating	0.83	1.13	0.02	0.02
SCAQMD LST Screening Criteria¹	69	535	4	3
Exceeds Screening Criteria?	No	No	No	No

Notes:
 (1) The nearest sensitive receptors to the site are: the rectory of the St. Philip the Apostle Catholic Church, located adjacent to the northeastern corner of the project site; the Pasadena City College Child Development Center Day Care, located approximately 60 feet west of the site; the apartment building located at 107 S. Holliston, approximately 60 feet west of the site; the St. Philip the Apostle Newman Center (a Catholic community center), located approximately 64 feet east of the site; the apartment building located at 125 S. Holliston Avenue, approximately 100 feet south west of the site; the Aqua Courtyard Suites apartment building located at 1299 E. Green Street, approximately 105 feet northwest of the site; the St. Philip the Apostle School located approximately 150 feet southwest of the site; the apartment building located at 135 S. Holliston Avenue, approximately 150 feet southwest of the site; the apartment building located at 145 S. Holliston Avenue, approximately 220 feet southwest of the site; the apartment building located at 165 S. Holliston Avenue, approximately 285 feet southwest of the site; and the tennis courts belonging to Pasadena City College, located approximately 280 feet east of the site; therefore, the 25-meter threshold was used.
 Source: Calculated from CalEEMod and SCAQMD's Mass Rate Look-up Tables for 1 acre, at a distance of 25 m in SRA 8 West San Gabriel Valley.

D. Construction-Related Toxic Contaminant Impacts

The greatest potential for toxic air contaminant emissions would be related to diesel particulate emissions associated with heavy equipment operations during construction of the proposed project. According to the Office of Environmental Health Hazard Assessment (OEHHA) and the SCAQMD Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis (August 2003), health effects from TACs are described in terms of individual cancer risk and non-cancer (chronic) health impacts based on a lifetime (i.e., 30-year) resident exposure duration. Given the temporary and short-term construction schedule (approximately 20 months), the Project would not result in a long-term (i.e., lifetime or 30-year) exposure as a result of project construction. Furthermore, construction-based particulate matter (PM) emissions (including diesel exhaust emissions) do not exceed any local or regional thresholds.

The project would comply with the CARB Air Toxics Control Measure that limits diesel powered equipment and vehicle idling to no more than 5 minutes at a location, and the CARB In-Use Off-Road Diesel Vehicle Regulation; compliance with these would further minimize emissions of TACs during construction. Therefore, impacts from TACs during construction would be less than significant.

E. Construction-Related Odor Impacts

Potential sources that may emit odors during construction activities include the application of materials such as asphalt pavement. The objectionable odors that may be produced during the construction process are short-term in nature and the odor emissions are expected to cease upon the drying or hardening of the odor producing materials. Due to the short-term nature and limited amounts of odor producing materials being utilized, no significant impact related to odors would occur during construction of the proposed project. Diesel exhaust and VOCs would be emitted during construction of the project, which are objectionable to some; however, emissions would disperse rapidly from the project site and therefore should not reach an objectionable level at the nearest sensitive receptors.

6. LONG-TERM OPERATIONAL EMISSIONS

The on-going operation of the proposed project would result in a long-term increase in air emissions. This increase would be due to emissions from the project-generated vehicle trips and through other operational emissions from the on-going use of the proposed project. The following section provides an analysis of potential long-term air quality impacts due to regional air quality impacts with the on-going operations of the proposed project.

A. Operations-Related Regional Air Quality Impacts

The operations-related criteria air quality impacts created by the proposed project have been analyzed through the use of the CalEEMod model. The operating emissions were based on the year 2027, which is the anticipated opening year for the proposed project. The operations daily emissions printouts from the CalEEMod model are provided in Appendix A. The CalEEMod analyzes operational emissions from area sources, energy usage, and mobile sources, which are discussed below.

i) Mobile Sources

Mobile sources include emissions from the additional vehicle miles generated from the proposed project. Per the *Transportation Analysis Memorandum of Understanding* (Pasadena Department of Transportation/Fehr and Peers, June 2025), the Project will generate 11.08 daily trips/KSF. The Saturday and Sunday trip generation rates were based on CalEEMod default trip generation rates for the R and D land use. The highest mobile source emissions for weekdays and weekends were reported in **Table 8, Regional Operational Pollutant Emissions**. The CalEEMod program then applies the emission factors for

each trip, which is provided by the EMFAC2021 model, to determine the vehicular traffic pollutant emissions.

ii) Area Sources

Area sources include emissions from consumer products, landscape equipment and architectural coatings. Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers, as well as air compressors, generators, and pumps. As specifics were not known about the landscaping equipment fleet, CalEEMod defaults were used to estimate emissions from landscaping equipment. It was assumed that heating would be electric to meet current building code requirements. No other changes were made to the default area source parameters.

iii) Energy Usage

Energy usage includes emissions from the generation of electricity and natural gas used on-site. No changes were made to the default energy usage parameters.

**Table 8
Regional Operational Pollutant Emissions**

Activity	Pollutant Emissions (pounds/day)					
	ROG	NOx	CO	SO2	PM10	PM2.5
Maximum Daily Emissions	7.01	3.23	37.3	0.07	6.45	1.71
SCAQMD Thresholds	55	55	550	150	150	55
Exceeds Threshold?	No	No	No	No	No	No
<i>Notes:</i> Source: CalEEMod Version 2022.1.1.30. the higher of summer or winter emissions (see Appendix A for details).						

iv) Project Impacts

The worst-case summer or winter maximum daily criteria pollutant emissions created from the proposed project’s long-term operations have been calculated and are shown in Table 8 above. Table 8 shows that none of the analyzed criteria pollutants would exceed the regional emissions thresholds. Therefore, a less than significant regional air quality impact would occur from the operation of the proposed project.

B. Operations-Related Local Air Quality Impacts

Project-related air emissions may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the South Coast Air Basin. The proposed project has been analyzed for the potential local CO emission impacts from the project-generated vehicular trips and from the potential local air

quality impacts from on-site operations. The following analysis analyzes the vehicular CO emissions, local impacts from on-site operations per SCAQMD LST methodology, and odor impacts.

i) Local CO Emission Impacts from Project-Related Vehicular Trips

CO is the pollutant of major concern along roadways because the most notable source of CO is motor vehicles. For this reason, CO concentrations are usually indicative of the local air quality generated by a roadway network and are used as an indicator of potential local air quality impacts. Local air quality impacts can be assessed by comparing future without and with project CO levels to the State and Federal CO standards which were presented above.

To determine if the proposed project could cause emission levels in excess of the CO standards discussed above, a sensitivity analysis is typically conducted to determine the potential for CO “hot spots” at a number of intersections in the general project vicinity. Because of reduced speeds and vehicle queuing, “hot spots” potentially can occur at high traffic volume intersections with a Level of Service E or worse.

The analysis prepared for CO attainment in the South Coast Air Basin by the SCAQMD can be used to assist in evaluating the potential for CO exceedances in the South Coast Air Basin. CO attainment was thoroughly analyzed as part of the SCAQMD's 2003 Air Quality Management Plan (2003 AQMP) and the 1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan). As discussed in the 1992 CO Plan, peak carbon monoxide concentrations in the South Coast Air Basin are due to unusual meteorological and topographical conditions, and not due to the impact of particular intersections. Considering the region's unique meteorological conditions and the increasingly stringent CO emissions standards, CO modeling was performed as part of 1992 CO Plan and subsequent plan updates and air quality management plans. In the 1992 CO Plan, a CO hot spot analysis was conducted for four busy intersections in Los Angeles at the peak morning and afternoon time periods. The intersections evaluated included: South Long Beach Boulevard and Imperial Highway (Lynwood); Wilshire Boulevard and Veteran Avenue (Westwood); Sunset Boulevard and Highland Avenue (Hollywood); and La Cienega Boulevard and Century Boulevard (Inglewood). These analyses did not predict a violation of CO standards. The busiest intersection evaluated was that at Wilshire Boulevard and Veteran Avenue, which has a daily traffic volume of approximately 100,000 vehicles per day. The Los Angeles County Metropolitan Transportation Authority evaluated the Level of Service in the vicinity of the Wilshire Boulevard/Veteran Avenue intersection and found it to be Level of Service E during the morning peak hour and Level of Service F during the afternoon peak hour.

The 1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan) showed that an intersection which has a daily traffic volume of approximately 100,000 vehicles per day would not violate the CO standard. The project generates 1,036 daily vehicle trips, with 96 peak hour trips. Therefore, as the peak hour volumes at intersections in the project vicinity fall far short of 100,000 vehicles per day, no CO “hot spot” modeling was necessary, as clearly no significant long-term air quality impact would occur to local air quality with the operation of the proposed Project.

i) Local Air Quality Impacts from On-Site Operations

Project-related air emissions from on-site sources such as architectural coatings, landscaping equipment, on-site usage of natural gas appliances as well as the operation of vehicles on-site may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the South Coast Air Basin.

The nearest sensitive receptors to the Site are: the rectory of the St. Philip the Apostle Catholic Church, located adjacent to the northeastern corner of the project site; the Pasadena City College Child Development Center Day Care, located approximately 60 feet west of the site; the apartment building located at 107 S. Holliston, approximately 60 feet west of the site; the St. Philip the Apostle Newman Center (a Catholic community center), located approximately 64 feet east of the site; the apartment building located at 125 S. Holliston Avenue, approximately 100 feet south west of the site; the Aqua Courtyard Suites apartment building located at 1299 E. Green Street, approximately 105 feet northwest of the site; the St. Philip the Apostle School located approximately 150 feet southwest of the site; the apartment building located at 135 S. Holliston Avenue, approximately 150 feet southwest of the site; the apartment building located at 145 S. Holliston Avenue, approximately 220 feet southwest of the site; the apartment building located at 165 S. Holliston Avenue, approximately 285 feet southwest of the site; and the tennis courts belonging to Pasadena City College, located approximately 280 feet east of the site.

According to SCAQMD LST methodology, LSTs would apply to the operational phase of a project, if the project includes stationary sources, or attracts mobile sources (such as heavy-duty trucks) that may spend long periods queuing and idling at the site; such as industrial warehouse/transfer facilities. The proposed project consists of a commercial R & D facility, and does not include such industrial uses. Therefore, due the lack of stationary source emissions, no long-term localized significance threshold analysis is warranted.

C. Operations-Related Odor Impacts

Potential sources that may emit odors during the on-going operations of the proposed project would include odor emissions from the intermittent trash truck emissions and trash storage areas. Due to the distance of the nearest receptors from the project site and through compliance with SCAQMD's Rule 402 no significant impact related to odors would occur during the on-going operations of the proposed project.

7. CUMULATIVE AIR QUALITY IMPACTS

There are a number of cumulative projects in the project area that have not yet been built or are currently under construction. Since the timing or sequencing of the cumulative projects is unknown, any quantitative analysis to ascertain daily construction emissions that assumes multiple, concurrent

construction projects would be speculative. Further, cumulative projects include local development as well as general growth within the project area. However, as with most development, the greatest source of emissions is from mobile sources, which travel well out of the local area. Therefore, from an air quality standpoint, the cumulative analysis would extend beyond any local projects and when wind patterns are considered would cover an even larger area. The SCAQMD recommends using two different methodologies: (1) that project-specific air quality impacts be used to determine the potential cumulative impacts to regional air quality;⁹ and (2) that a project's consistency with the current AQMP be used to determine its potential cumulative impacts.

A. Project Specific Impacts

A significant impact may occur if a project would add a cumulatively considerable contribution of a federal or state non-attainment pollutant. As stated previously, the Air Basin is currently in non-attainment for ozone, PM10, and PM2.5. In accordance with the SCAQMD methodology, projects that do not exceed the SCAQMD criteria or can be mitigated to less than criteria levels are not significant and do not add to the overall cumulative impact.

The project would result in the emission of criteria pollutants for which the region is in nonattainment during both construction and operation. The emissions from construction of the project are not predicted to exceed any applicable SCAQMD regional or local impact threshold and therefore, are not expected to result in ground level concentrations that exceed the NAAQS or CAAQS. Therefore, the project would not result in a cumulatively considerable net increase of non-attainment pollutants or ozone precursors and would result in a less than significant impact for construction emissions.

Project operations would generate emissions of NO_x, ROG, CO, PM10, and PM2.5, which would not exceed the SCAQMD regional or local thresholds and would not be expected to result in ground level concentrations that exceed the NAAQS or CAAQS. Since the project would not introduce any substantial stationary sources of emissions, CO is the benchmark pollutant for assessing local area air quality impacts from post-construction motor vehicle operations. As indicated earlier, no violations of the state and federal CO standards are projected to occur for the project, based on the magnitude of traffic the project is anticipated to create. Therefore, operation of the project would not result in a cumulatively considerable net increase for non-attainment of criteria pollutants or ozone precursors. As a result, the project would result in a less than significant cumulative impact for operational emissions.

⁹ *South Coast Air Quality Management District, Potential Control Strategies to Address Cumulative Impacts from Air Pollution White Paper, 1993, <http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook>.*

B. Air Quality Management Plan Consistency

The California Environmental Quality Act (CEQA) requires a discussion of any inconsistencies between a proposed project and applicable General Plans and Regional Plans (CEQA Guidelines Section 15125). The regional plan related to air quality that applies to the proposed project is the SCAQMD Air Quality Management Plan (AQMP). Therefore, this section discusses any potential inconsistencies of the proposed project with the AQMP.

The purpose of this discussion is to set forth the issues regarding consistency with the assumptions and objectives of the AQMP and discuss whether the proposed project would interfere with the region's ability to comply with Federal and State air quality standards.

The SCAQMD CEQA Handbook states that "New or amended General Plan Elements (including land use zoning and density amendments), Specific Plans, and significant projects must be analyzed for consistency with the AQMP". Strict consistency with all aspects of the plan is not required. A proposed project should be considered to be consistent with the AQMP if it furthers one or more policies and does not obstruct other policies. The SCAQMD CEQA Handbook identifies two key indicators of consistency:

- (1) Whether the project will result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP.
- (2) Whether the project will exceed the assumptions in the AQMP in 2022 or increments based on the year of project buildout and phase.

Both of these criteria are evaluated below.

i) AQMP Consistency Analysis

a) Criteria 1 – Increase in the Frequency or Severity of Violations

Based on the air quality modeling analysis contained in this Air Quality Analysis, short-term construction impacts would not result in significant impacts based on the SCAQMD regional and local thresholds of significance. This Air Analysis also found that long-term operations impacts would not result in significant impacts based on the SCAQMD local and regional thresholds of significance. Therefore, the proposed project is not projected to contribute to the exceedance of any air pollutant concentration standards and is found to be consistent with the AQMP for the first criterion.

b) Criteria 2 – Exceed Assumptions in the AQMP?

Consistency with the AQMP assumptions is determined by performing an analysis of the proposed project with the assumptions in the AQMP. The emphasis of this criterion is to ensure that the analyses conducted for the proposed project are based on the same forecasts as the AQMP. The 2020-2045 Regional Transportation/Sustainable Communities Strategy prepared by SCAG (2020) includes chapters on: the

challenges in a changing region, creating a plan for our future, and the road to greater mobility and sustainable growth. These chapters currently respond directly to federal and state requirements placed on SCAG. Local governments are required to use these as the basis of their plans for purposes of consistency with applicable regional plans under CEQA.

For this project, the City of Pasadena General Plan defines the assumptions that are represented in the AQMP. The project consists of the construction and operation of a 93,539 square foot, 4-story R & D building with 3 levels of underground parking (280 parking spaces). The project is located in the EC-MU-N East Colorado Specific Plan Zoning District and has a Mixed-Use General Plan Land Use designation.

Therefore, as stated above, the City's General Plan is based on the requirements laid out in the AQMP, which, in turn is based on the latest RTP/SCS. A project that is consistent with the existing zoning/land use, would not exceed the AQMP assumptions for the project site. Therefore, as the project is consistent with the existing zoning/land use, the proposed project is found to be consistent with the AQMP for the second criterion.

Based on the analysis above, the project meets both criteria and the proposed project will not result in an inconsistency with the SCAQMD AQMP. Therefore, a less than significant impact will occur.

III. CLIMATE ACTION PLAN CONSISTENCY ANALYSIS

1. EXISTING GREENHOUSE GAS ENVIRONMENT

Constituent gases of the Earth’s atmosphere, called atmospheric greenhouse gases (GHG), play a critical role in the Earth’s radiation amount by trapping infrared radiation emitted from the Earth’s surface, which otherwise would have escaped to space. Prominent greenhouse gases contributing to this process include carbon dioxide (CO₂), methane (CH₄), ozone, water vapor, nitrous oxide (N₂O), and chlorofluorocarbons (CFCs). This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate. Anthropogenic (caused or produced by humans) emissions of these greenhouse gases in excess of natural ambient concentrations are responsible for the enhancement of the Greenhouse Effect and have led to a trend of unnatural warming of the Earth’s natural climate, known as global warming or climate change. Emissions of gases that induce global warming are attributable to human activities associated with industrial/manufacturing, agriculture, utilities, transportation, and residential land uses. Transportation is responsible for 41 percent of the State’s greenhouse gas emissions, followed by electricity generation. Emissions of CO₂ and nitrous oxide (NO_x) are byproducts of fossil fuel combustion. Methane, a potent greenhouse gas, results from off-gassing associated with agricultural practices and landfills. Sinks of CO₂, where CO₂ is stored outside of the atmosphere, include uptake by vegetation and dissolution into the ocean.

2. GREENHOUSE GAS STANDARDS AND REGULATION

A. Local – City of Pasadena

The City of Pasadena adopted the Pasadena Climate Action Plan (CAP) on March 5, 2018. The purpose of the CAP is to analyze GHG emissions at a programmatic-level, outline a strategy to reduce and mitigate municipal and community-wide GHG emissions, demonstrate Pasadena’s commitment to achieving the state-wide emissions reduction targets, and serve as a qualified GHG reduction plan consistent with the California Environmental Quality Act (CEQA) Guidelines Section 15183.5. The timeframe for the CAP extends from the date of adoption through the year 2035, consistent with the horizon year of Pasadena’s 2015 General Plan Land Use Element. The CAP includes the following components:

- Summary of existing state and local initiatives addressing climate change;
- Community-wide GHG inventory and emissions forecasts;
- GHG reduction goals, measures, and actions;
- Implementation and monitoring of the plan; and
- Adaptation strategies and climate change preparedness.

The Climate Action Plan Consistency Checklist (Checklist) is intended to be a tool for new development projects to demonstrate consistency with Pasadena’s CAP. CEQA Guidelines Section 15183.5 allows lead

agencies to analyze the impacts associated with GHG emissions at a programmatic level in plan-level documents such as CAPs, so that project-level environmental documents may tier from the programmatic review. Projects that meet the requirements of the CAP Consistency Checklist are deemed to be consistent with Pasadena’s CAP and will be found to have a less than significant contribution to cumulative GHG (i.e., the project’s incremental contribution to cumulative GHG effects is not cumulatively considerable), pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b).

Projects subject to CEQA review have three options to demonstrate consistency with the CAP: Option A, incorporate mandatory and selective sustainable development actions that will become conditions of the entitlement; Option B, quantify the project’s GHG emission levels and demonstrate that the project is below Pasadena’s service population efficiency threshold; and Option C, quantify the project’s GHG emission levels and demonstrate that the project would not result in a net increase in GHG emissions.

3. METHODOLOGY

This analysis uses Option A, to demonstrate that the proposed project is consistent with the Pasadena CAP by incorporating applicable actions intended to ensure that the project contributes its fair share to the City’s cumulative GHG reduction goals. The City’s CAP Checklist was completed by the applicant and can be found in Appendix B of this report.

4. CONSISTENCY WITH APPLICABLE GREENHOUSE GAS REDUCTION PLANS AND POLICIES

As stated above, the Climate Action Plan Consistency Checklist is intended to be a tool for new development projects to demonstrate consistency with Pasadena’s CAP, which is a qualified greenhouse gas (GHG) emissions reduction plan in accordance with California Environmental Quality Act (CEQA) Guidelines Section 15183.5.

The Checklist is only required for discretionary projects¹⁰ that are subject to and not exempt from CEQA. Projects that are exempt from CEQA are deemed to be consistent with Pasadena’s CAP, and no further review is necessary, except for the Class 32 “In-Fill Development Projects” categorical exemption (CEQA Guidelines Section 15332), for which Projects are required to demonstrate consistency with the CAP through this Checklist.

Per the CAP Checklist, the Project can demonstrate consistency with Pasadena’s CAP through one of three options:

¹⁰ *City of Pasadena, Pasadena Climate Action Plan (CAP), March 5, 2018, page 90.*

- Option A: Sustainable Development Actions – Demonstrate that the proposed project is consistent with the Pasadena CAP by incorporating applicable actions intended to ensure that the project contributes its fair share to the City’s cumulative GHG reduction goals
- Option B: GHG Efficiency - Demonstrate that the proposed project is consistent with Pasadena’s per person GHG efficiency thresholds
- Option C: Net Zero GHG Emissions – Demonstrate that the proposed project would not result in a net increase in GHG emissions

As shown in the CAP Checklist in Appendix B of this report, the project is consistent with the Land Use Element in the General Plan, will complete all of the mandatory sustainable development actions. In addition to the mandatory actions, the proposed project must implement the following:

- One additional action in the Energy Efficiency and Conservation category
- One additional action in the Sustainable Mobility and Land Use category
- Three additional actions from any category

The project will complete all six of the CAP Checklist mandatory actions:

- **Action T-1.2:** Continue to improve bicycle and pedestrian safety;
- **Action T-3.1:** Decrease annual commuter miles traveled by single occupancy vehicles;
- **Action T-4.1:** Expand the availability and use of alternative fuel vehicles and fueling infrastructure;
- **Action E-1.2:** Encourage the use of energy conservation devices and passive design concepts that make use of the natural climate to increase energy efficiency;
- **Action WC-1.1:** Reduce potable water usage throughout Pasadena; and
- **Action WR-1.1:** Continue to reduce solid waste and landfill GHG emissions.

In addition, the project would implement the following CAP Checklist GHG Reduction Strategy Actions:

- Energy Efficiency and Conservation, **Action E-1.1:** Increase energy efficiency requirements of new buildings to perform better than 2016 Title 24 Standards, satisfying the Energy Efficiency and Conservation category;
- Sustainable Mobility and Land Use, **Action T-4.1:** Expand the availability and use of alternative fuel vehicles and fueling infrastructure, satisfying the Sustainable Mobility and Land Use category;
- Additional Actions, **Action T-5.1:** Facilitate high density, mixed-use, transit-oriented, and infill development,; **Action UG-1.1:** Continue to preserve, enhance, and acquire additional green space throughout Pasadena to improve carbon sequestration, reduce the urban heat-island effect, and increase opportunities for active recreation, and **Action UG-2.1:** Continue to protect

existing trees and plant new ones to improve and ensure viability of Pasadena's urban forest, satisfying the requirement for three additional actions from any category.

The project will complete a total of 11 Actions and 11 Actions are required to be consistent with the CAP. Please see Appendix B of this report, CAP Checklist, for details and an explanation of how the project complies with such actions.

As the project meets the requirements of the CAP Checklist, it is deemed to be consistent with Pasadena's CAP and has a less than significant contribution to cumulative GHG, pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b). Impacts are considered to be less than significant, and no mitigation is required.

IV. EMISSIONS REDUCTION MEASURES

1. CONSTRUCTION MEASURES

Adherence to SCAQMD Rule 403 is required.

2. OPERATIONAL MEASURES

No measures required.

V. LIST OF ACRONYMS AND ABBREVIATIONS

AQMP	Air Quality Management Plan
BACT	Best Available Control Technologies
CAAQS	California Ambient Air Quality Standards
CalEPA	California Environmental Protection Agency
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCAR	California Climate Action Registry
CEQA	California Environmental Quality Act
CFCs	Chlorofluorocarbons
CH ₄	Methane
CNG	Compressed natural gas
CO	Carbon monoxide
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DPM	Diesel particulate matter
EPA	U.S. Environmental Protection Agency
GHG	Greenhouse gas
GWP	Global warming potential
HIDPM	Hazard Index Diesel Particulate Matter
HFCs	Hydrofluorocarbons
IPCC	International Panel on Climate Change
LCFS	Low Carbon Fuel Standard
LST	Localized Significant Thresholds
MTCO ₂ e	Metric tons of carbon dioxide equivalent
MMTCO ₂ e	Million metric tons of carbon dioxide equivalent
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NO _x	Nitrogen Oxides
NO ₂	Nitrogen dioxide
N ₂ O	Nitrous oxide
O ₃	Ozone
OPR	Governor's Office of Planning and Research
PFCs	Perfluorocarbons
PM	Particulate matter
PM ₁₀	Particles that are less than 10 micrometers in diameter
PM _{2.5}	Particles that are less than 2.5 micrometers in diameter

PMI	Point of maximum impact
PPM	Parts per million
PPB	Parts per billion
RTIP	Regional Transportation Improvement Plan
RTP	Regional Transportation Plan
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SF ₆	Sulfur hexafluoride
SIP	State Implementation Plan
SO _x	Sulfur Oxides
TAC	Toxic air contaminants
VOC	Volatile organic compounds

VI. REFERENCES

California Air Resources Board (CARB)

- 2008 Resolution 08-43
- 2008 Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act
- 2008 Climate Change Scoping Plan, a framework for change.
- 2011 Supplement to the AB 32 Scoping Plan Functional Equivalent Document
- 2013 California Almanac of Emissions and Air Quality – 2013 Edition.
Source: <https://ww2.arb.ca.gov/our-work/programs/resource-center/technical-assistance/air-quality-and-emissions-data/almanac>
- 2014 First Update to the Climate Change Scoping Plan, Building on the Framework Pursuant to AB32, the California Global Warming Solutions Act of 2006. May.
- 2017 California's 2017 Climate Change Scoping Plan. November.
- 2022 2022 Scoping Plan for Achieving Carbon Neutrality. November 16.
- 2025 Historical Air Quality, Top 4 Summary

City of Pasadena

- 2015 General Plan Draft EIR. January
- 2018 Pasadena Climate Action Plan. March 5.
- 2025 Transportation Analysis Memorandum of Understanding. June.

Governor's Office of Planning and Research

- 2008 CEQA and Climate: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review
- 2018 CEQA Guideline Sections to be Added or Amended

Intergovernmental Panel on Climate Change (IPCC).

- 2014 IPCC Fifth Assessment Report, Climate Change 2014: Synthesis Report

South Coast Air Quality Management District (SCAQMD)

- 1993 CEQA Air Quality Handbook
- 2005 Rule 403 Fugitive Dust
- 2008 Final Localized Significance Threshold Methodology, Revised

2016 2016 Air Quality Management Plan

2022 2022 Air Quality Management Plan

Southern California Association of Governments

2020 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy

U.S. Environmental Protection Agency (EPA)

2017 Understanding Global Warming Potentials

(Source: <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials>)

U.S. Geological Survey

2011 Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California

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1364 E. Green Street Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	1364 E. Green Street
Construction Start Date	1/5/2026
Operational Year	2027
Lead Agency	City of Pasadena
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	0.50
Precipitation (days)	20.4
Location	Parking lot, 1364 E Green St, Pasadena, CA 91106, USA
County	Los Angeles-South Coast
City	Pasadena
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	4939
EDFZ	7
Electric Utility	Pasadena Water & Power
Gas Utility	Southern California Gas
App Version	2022.1.1.30

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Research & Development	93.5	1000sqft	0.00	93,539	0.00	—	—	—

Enclosed Parking with Elevator	280	Space	1.16	112,000	0.00	—	—	—
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1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	21.7	10.9	17.8	0.04	0.30	1.50	1.78	0.27	0.40	0.62	—	6,159	6,159	0.34	0.79	11.3	6,413
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.31	11.2	15.5	0.04	0.30	1.47	1.65	0.27	0.40	0.58	—	6,153	6,153	0.34	0.79	0.29	6,396
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.01	7.34	9.59	0.02	0.18	0.92	1.10	0.17	0.23	0.40	—	3,180	3,180	0.15	0.27	2.29	3,265
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.55	1.34	1.75	< 0.005	0.03	0.17	0.20	0.03	0.04	0.07	—	526	526	0.03	0.04	0.38	541

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
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Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	1.31	10.9	16.2	0.04	0.30	1.47	1.65	0.27	0.40	0.58	—	6,159	6,159	0.34	0.79	11.3	6,413
2027	21.7	10.8	17.8	0.03	0.28	1.50	1.78	0.26	0.36	0.62	—	4,334	4,334	0.18	0.20	6.51	4,406
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	1.31	11.2	15.5	0.04	0.30	1.47	1.65	0.27	0.40	0.58	—	6,153	6,153	0.34	0.79	0.29	6,396
2027	1.26	10.0	15.1	0.03	0.26	1.29	1.56	0.24	0.32	0.56	—	3,943	3,943	0.14	0.19	0.15	4,005
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.73	7.34	9.59	0.02	0.18	0.92	1.10	0.17	0.23	0.40	—	3,180	3,180	0.15	0.27	2.29	3,265
2027	3.01	4.42	6.77	0.01	0.11	0.57	0.69	0.11	0.14	0.24	—	1,736	1,736	0.06	0.08	1.12	1,764
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.13	1.34	1.75	< 0.005	0.03	0.17	0.20	0.03	0.04	0.07	—	526	526	0.03	0.04	0.38	541
2027	0.55	0.81	1.24	< 0.005	0.02	0.10	0.13	0.02	0.03	0.04	—	287	287	0.01	0.01	0.19	292

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.01	3.08	37.3	0.07	0.11	6.34	6.45	0.10	1.61	1.71	92.0	8,148	8,240	10.0	0.51	23.6	8,667
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.51	3.23	26.2	0.07	0.09	6.34	6.43	0.09	1.61	1.70	92.0	7,824	7,915	10.0	0.53	2.94	8,326
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unmit.	5.70	2.66	26.5	0.05	0.09	4.71	4.81	0.09	1.20	1.28	92.0	6,270	6,362	9.96	0.46	9.27	6,757
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.04	0.49	4.83	0.01	0.02	0.86	0.88	0.02	0.22	0.23	15.2	1,038	1,053	1.65	0.08	1.54	1,119

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.26	2.37	27.8	0.07	0.04	6.34	6.39	0.04	1.61	1.65	—	6,916	6,916	0.32	0.27	21.2	7,026
Area	3.72	0.08	8.94	< 0.005	0.02	—	0.02	0.01	—	0.01	—	36.8	36.8	< 0.005	< 0.005	—	36.9
Energy	0.04	0.64	0.53	< 0.005	0.05	—	0.05	0.05	—	0.05	—	1,138	1,138	0.26	0.02	—	1,151
Water	—	—	—	—	—	—	—	—	—	—	88.1	56.9	145	9.07	0.22	—	437
Waste	—	—	—	—	—	—	—	—	—	—	3.83	0.00	3.83	0.38	0.00	—	13.4
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.39	2.39
Total	7.01	3.08	37.3	0.07	0.11	6.34	6.45	0.10	1.61	1.71	92.0	8,148	8,240	10.0	0.51	23.6	8,667
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.22	2.59	25.6	0.06	0.04	6.34	6.39	0.04	1.61	1.65	—	6,629	6,629	0.34	0.28	0.55	6,722
Area	2.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.04	0.64	0.53	< 0.005	0.05	—	0.05	0.05	—	0.05	—	1,138	1,138	0.26	0.02	—	1,151
Water	—	—	—	—	—	—	—	—	—	—	88.1	56.9	145	9.07	0.22	—	437
Waste	—	—	—	—	—	—	—	—	—	—	3.83	0.00	3.83	0.38	0.00	—	13.4
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.39	2.39
Total	5.51	3.23	26.2	0.07	0.09	6.34	6.43	0.09	1.61	1.70	92.0	7,824	7,915	10.0	0.53	2.94	8,326
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	2.41	1.97	19.8	0.05	0.03	4.71	4.75	0.03	1.20	1.23	—	5,050	5,050	0.25	0.21	6.88	5,127
Area	3.26	0.05	6.12	< 0.005	0.01	—	0.01	0.01	—	0.01	—	25.2	25.2	< 0.005	< 0.005	—	25.3
Energy	0.04	0.64	0.53	< 0.005	0.05	—	0.05	0.05	—	0.05	—	1,138	1,138	0.26	0.02	—	1,151
Water	—	—	—	—	—	—	—	—	—	—	88.1	56.9	145	9.07	0.22	—	437
Waste	—	—	—	—	—	—	—	—	—	—	3.83	0.00	3.83	0.38	0.00	—	13.4
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.39	2.39
Total	5.70	2.66	26.5	0.05	0.09	4.71	4.81	0.09	1.20	1.28	92.0	6,270	6,362	9.96	0.46	9.27	6,757
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.44	0.36	3.61	0.01	0.01	0.86	0.87	0.01	0.22	0.22	—	836	836	0.04	0.04	1.14	849
Area	0.59	0.01	1.12	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.17	4.17	< 0.005	< 0.005	—	4.18
Energy	0.01	0.12	0.10	< 0.005	0.01	—	0.01	0.01	—	0.01	—	188	188	0.04	< 0.005	—	191
Water	—	—	—	—	—	—	—	—	—	—	14.6	9.42	24.0	1.50	0.04	—	72.3
Waste	—	—	—	—	—	—	—	—	—	—	0.63	0.00	0.63	0.06	0.00	—	2.22
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.40	0.40
Total	1.04	0.49	4.83	0.01	0.02	0.86	0.88	0.02	0.22	0.23	15.2	1,038	1,053	1.65	0.08	1.54	1,119

3. Construction Emissions Details

3.1. Demolition (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.63	5.93	7.36	0.01	0.27	—	0.27	0.24	—	0.24	—	1,227	1,227	0.05	0.01	—	1,231

Demoliti	—	—	—	—	—	0.52	0.52	—	0.08	0.08	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.39	0.48	< 0.005	0.02	—	0.02	0.02	—	0.02	—	80.7	80.7	< 0.005	< 0.005	—	81.0
Demoliti on	—	—	—	—	—	0.03	0.03	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.07	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	13.4	13.4	< 0.005	< 0.005	—	13.4
Demoliti on	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.69	0.00	0.00	0.16	0.16	0.00	0.04	0.04	—	161	161	0.01	0.01	0.01	163
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.88	0.37	< 0.005	0.01	0.17	0.18	0.01	0.05	0.06	—	648	648	0.04	0.10	0.04	679
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.7	10.7	< 0.005	< 0.005	0.02	10.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.06	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	42.6	42.6	< 0.005	0.01	0.04	44.7

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.77	1.77	< 0.005	< 0.005	< 0.005	1.80
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	7.05	7.05	< 0.005	< 0.005	0.01	7.40

3.3. Excavation (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.46	4.78	7.62	0.01	0.12	—	0.12	0.11	—	0.11	—	1,167	1,167	0.05	0.01	—	1,171
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.46	4.78	7.62	0.01	0.12	—	0.12	0.11	—	0.11	—	1,167	1,167	0.05	0.01	—	1,171
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.10	1.05	1.67	< 0.005	0.03	—	0.03	0.02	—	0.02	—	256	256	0.01	< 0.005	—	257
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.19	0.30	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	42.4	42.4	< 0.005	< 0.005	—	42.5
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.81	0.00	0.00	0.16	0.16	0.00	0.04	0.04	—	169	169	0.01	0.01	0.57	172
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.09	6.08	2.51	0.03	0.06	1.30	1.37	0.06	0.36	0.42	—	4,822	4,822	0.28	0.77	10.7	5,069
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.69	0.00	0.00	0.16	0.16	0.00	0.04	0.04	—	161	161	0.01	0.01	0.01	163
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.08	6.33	2.54	0.03	0.06	1.30	1.37	0.06	0.36	0.42	—	4,825	4,825	0.28	0.77	0.28	5,062
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.16	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	35.7	35.7	< 0.005	< 0.005	0.05	36.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.02	1.40	0.55	0.01	0.01	0.28	0.30	0.01	0.08	0.09	—	1,057	1,057	0.06	0.17	1.01	1,110
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.91	5.91	< 0.005	< 0.005	0.01	5.99
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.26	0.10	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	175	175	0.01	0.03	0.17	184

3.5. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.00	8.84	10.6	0.02	0.28	—	0.28	0.26	—	0.26	—	1,943	1,943	0.08	0.02	—	1,950
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.00	8.84	10.6	0.02	0.28	—	0.28	0.26	—	0.26	—	1,943	1,943	0.08	0.02	—	1,950
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.42	3.75	4.52	0.01	0.12	—	0.12	0.11	—	0.11	—	825	825	0.03	0.01	—	828
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.08	0.68	0.83	< 0.005	0.02	—	0.02	0.02	—	0.02	—	137	137	0.01	< 0.005	—	137
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.28	0.30	4.97	0.00	0.00	1.01	1.01	0.00	0.24	0.24	—	1,043	1,043	0.04	0.04	3.53	1,058
Vendor	0.03	1.16	0.56	0.01	0.02	0.29	0.30	0.01	0.08	0.09	—	1,050	1,050	0.04	0.15	2.84	1,099
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.28	0.34	4.24	0.00	0.00	1.01	1.01	0.00	0.24	0.24	—	989	989	0.04	0.04	0.09	1,001
Vendor	0.03	1.21	0.57	0.01	0.02	0.29	0.30	0.01	0.08	0.09	—	1,051	1,051	0.04	0.15	0.07	1,097
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.15	1.89	0.00	0.00	0.42	0.42	0.00	0.10	0.10	—	426	426	0.02	0.02	0.65	432
Vendor	0.01	0.52	0.24	< 0.005	0.01	0.12	0.13	< 0.005	0.03	0.04	—	446	446	0.02	0.06	0.52	466
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.34	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	70.5	70.5	< 0.005	< 0.005	0.11	71.5
Vendor	< 0.005	0.09	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	73.9	73.9	< 0.005	0.01	0.09	77.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Building Construction (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.96	8.56	10.6	0.02	0.25	—	0.25	0.23	—	0.23	—	1,943	1,943	0.08	0.02	—	1,950
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.96	8.56	10.6	0.02	0.25	—	0.25	0.23	—	0.23	—	1,943	1,943	0.08	0.02	—	1,950
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.41	3.67	4.54	0.01	0.11	—	0.11	0.10	—	0.10	—	833	833	0.03	0.01	—	836
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.67	0.83	< 0.005	0.02	—	0.02	0.02	—	0.02	—	138	138	0.01	< 0.005	—	138
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.27	0.27	4.62	0.00	0.00	1.01	1.01	0.00	0.24	0.24	—	1,023	1,023	0.04	0.04	3.19	1,038
Vendor	0.03	1.11	0.53	0.01	0.01	0.29	0.30	0.01	0.08	0.09	—	1,030	1,030	0.04	0.14	2.69	1,076
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.27	0.33	3.92	0.00	0.00	1.01	1.01	0.00	0.24	0.24	—	970	970	0.01	0.04	0.08	981
Vendor	0.03	1.15	0.54	0.01	0.01	0.29	0.30	0.01	0.08	0.09	—	1,031	1,031	0.04	0.14	0.07	1,074
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.14	1.76	0.00	0.00	0.43	0.43	0.00	0.10	0.10	—	422	422	0.01	0.02	0.59	427
Vendor	0.01	0.50	0.23	< 0.005	< 0.005	0.12	0.13	< 0.005	0.03	0.04	—	442	442	0.02	0.06	0.50	461
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.32	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	69.8	69.8	< 0.005	< 0.005	0.10	70.7
Vendor	< 0.005	0.09	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	73.1	73.1	< 0.005	0.01	0.08	76.3
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Architectural Coating (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.83	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	20.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.01	0.10	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	16.1	16.1	< 0.005	< 0.005	—	16.1
Architectural Coatings	2.45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.66	2.66	< 0.005	< 0.005	—	2.67
Architectural Coatings	0.45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.92	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	205	205	0.01	0.01	0.64	208
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.10	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	23.7	23.7	< 0.005	< 0.005	0.03	24.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.93	3.93	< 0.005	< 0.005	0.01	3.98
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
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4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Research & Development	3.26	2.37	27.8	0.07	0.04	6.34	6.39	0.04	1.61	1.65	—	6,916	6,916	0.32	0.27	21.2	7,026
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	3.26	2.37	27.8	0.07	0.04	6.34	6.39	0.04	1.61	1.65	—	6,916	6,916	0.32	0.27	21.2	7,026
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Research & Development	3.22	2.59	25.6	0.06	0.04	6.34	6.39	0.04	1.61	1.65	—	6,629	6,629	0.34	0.28	0.55	6,722
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	3.22	2.59	25.6	0.06	0.04	6.34	6.39	0.04	1.61	1.65	—	6,629	6,629	0.34	0.28	0.55	6,722
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Researc & Development	0.44	0.36	3.61	0.01	0.01	0.86	0.87	0.01	0.22	0.22	—	836	836	0.04	0.04	1.14	849
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.44	0.36	3.61	0.01	0.01	0.86	0.87	0.01	0.22	0.22	—	836	836	0.04	0.04	1.14	849

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Researc h & Development	—	—	—	—	—	—	—	—	—	—	—	303	303	0.15	0.02	—	312
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	75.1	75.1	0.04	< 0.005	—	77.4
Total	—	—	—	—	—	—	—	—	—	—	—	378	378	0.19	0.02	—	390
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Researc h & Development	—	—	—	—	—	—	—	—	—	—	—	303	303	0.15	0.02	—	312

Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	75.1	75.1	0.04	< 0.005	—	77.4
Total	—	—	—	—	—	—	—	—	—	—	—	378	378	0.19	0.02	—	390
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Research & Development	—	—	—	—	—	—	—	—	—	—	—	50.1	50.1	0.02	< 0.005	—	51.7
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	—	12.4	12.4	0.01	< 0.005	—	12.8
Total	—	—	—	—	—	—	—	—	—	—	—	62.6	62.6	0.03	< 0.005	—	64.5

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Research & Development	0.04	0.64	0.53	< 0.005	0.05	—	0.05	0.05	—	0.05	—	760	760	0.07	< 0.005	—	762
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.04	0.64	0.53	< 0.005	0.05	—	0.05	0.05	—	0.05	—	760	760	0.07	< 0.005	—	762
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Research	0.04	0.64	0.53	< 0.005	0.05	—	0.05	0.05	—	0.05	—	760	760	0.07	< 0.005	—	762
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.04	0.64	0.53	< 0.005	0.05	—	0.05	0.05	—	0.05	—	760	760	0.07	< 0.005	—	762
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Research & Development	0.01	0.12	0.10	< 0.005	0.01	—	0.01	0.01	—	0.01	—	126	126	0.01	< 0.005	—	126
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.01	0.12	0.10	< 0.005	0.01	—	0.01	0.01	—	0.01	—	126	126	0.01	< 0.005	—	126

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	2.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Landscape Equipment	1.47	0.08	8.94	< 0.005	0.02	—	0.02	0.01	—	0.01	—	36.8	36.8	< 0.005	< 0.005	—	36.9
Total	3.72	0.08	8.94	< 0.005	0.02	—	0.02	0.01	—	0.01	—	36.8	36.8	< 0.005	< 0.005	—	36.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	2.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	2.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.18	0.01	1.12	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.17	4.17	< 0.005	< 0.005	—	4.18
Total	0.59	0.01	1.12	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.17	4.17	< 0.005	< 0.005	—	4.18

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
----------	-----	-----	----	-----	-------	-------	-------	--------	--------	--------	------	-------	------	-----	-----	---	------

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Research & Development	—	—	—	—	—	—	—	—	—	—	88.1	56.9	145	9.07	0.22	—	437
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	88.1	56.9	145	9.07	0.22	—	437
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Research & Development	—	—	—	—	—	—	—	—	—	—	88.1	56.9	145	9.07	0.22	—	437
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	88.1	56.9	145	9.07	0.22	—	437
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Research & Development	—	—	—	—	—	—	—	—	—	—	14.6	9.42	24.0	1.50	0.04	—	72.3
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	14.6	9.42	24.0	1.50	0.04	—	72.3

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Research & Development	—	—	—	—	—	—	—	—	—	—	3.83	0.00	3.83	0.38	0.00	—	13.4
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	3.83	0.00	3.83	0.38	0.00	—	13.4
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Research & Development	—	—	—	—	—	—	—	—	—	—	3.83	0.00	3.83	0.38	0.00	—	13.4
Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	3.83	0.00	3.83	0.38	0.00	—	13.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Research & Development	—	—	—	—	—	—	—	—	—	—	0.63	0.00	0.63	0.06	0.00	—	2.22

Enclosed Parking with Elevator	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	0.63	0.00	0.63	0.06	0.00	—	2.22

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Research & Development	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.39	2.39
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.39	2.39
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Research & Development	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.39	2.39
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.39	2.39
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Research & Development	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.40	0.40
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.40	0.40

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	1/5/2026	2/5/2026	5.00	24.0	—
Excavation	Grading	2/6/2026	5/28/2026	5.00	80.0	—
Building Construction	Building Construction	5/29/2026	8/7/2027	5.00	311	—
Architectural Coating	Architectural Coating	8/2/2027	9/30/2027	5.00	44.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Crawler Tractors	Diesel	Average	1.00	8.00	87.0	0.43
Demolition	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Demolition	Rough Terrain Forklifts	Diesel	Average	1.00	8.00	96.0	0.40
Demolition	Scrapers	Diesel	Average	1.00	1.00	423	0.48
Excavation	Bore/Drill Rigs	Diesel	Average	1.00	8.00	83.0	0.50
Excavation	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Excavation	Rough Terrain Forklifts	Diesel	Average	1.00	8.00	96.0	0.40
Building Construction	Cranes	Diesel	Average	1.00	6.00	367	0.29
Building Construction	Rough Terrain Forklifts	Diesel	Average	2.00	6.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Welders	Diesel	Average	3.00	8.00	46.0	0.45
Building Construction	Skid Steer Loaders	Diesel	Average	1.00	8.00	71.0	0.37
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	12.5	18.5	LDA,LDT1,LDT2
Demolition	Vendor	—	10.2	HHDT,MHDT
Demolition	Hauling	15.0	12.5	HHDT
Demolition	Onsite truck	—	—	HHDT
Excavation	—	—	—	—
Excavation	Worker	12.5	18.5	LDA,LDT1,LDT2
Excavation	Vendor	—	10.2	HHDT,MHDT
Excavation	Hauling	93.8	15.0	HHDT
Excavation	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	77.0	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	33.7	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	15.4	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%

Limit vehicle speeds on unpaved roads to 25 mph	44%	44%
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5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	0.00	0.00	142,573	47,021	3,019

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (Ton of Debris)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	950	—
Excavation	—	60,000	0.00	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%
Water Demolished Area	2	36%	36%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Research & Development	0.00	0%
Enclosed Parking with Elevator	1.16	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2026	0.00	68.5	0.03	< 0.005
2027	0.00	66.3	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Research & Development	1,036	178	104	284,888	8,946	1,534	896	2,458,992
Enclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	142,573	47,021	3,019

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Research & Development	1,666,892	66.3	0.0330	0.0040	2,370,883
Enclosed Parking with Elevator	413,440	66.3	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Research & Development	45,992,560	0.00
Enclosed Parking with Elevator	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Research & Development	7.11	—
Enclosed Parking with Elevator	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
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Research & Development	Household refrigerators and/or freezers	R-134a	1,430	0.45	0.60	0.00	1.00
Research & Development	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
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5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
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5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)
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5.17. User Defined

Equipment Type	Fuel Type
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5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
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5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres
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5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)
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6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	20.8	annual days of extreme heat
Extreme Precipitation	7.85	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	6.20	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about $\frac{3}{4}$ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	76.9
AQ-PM	52.3
AQ-DPM	64.5
Drinking Water	86.5
Lead Risk Housing	37.8
Pesticides	0.00
Toxic Releases	65.8
Traffic	34.1
Effect Indicators	—
CleanUp Sites	68.9
Groundwater	30.9
Haz Waste Facilities/Generators	89.0
Impaired Water Bodies	0.00
Solid Waste	52.9
Sensitive Population	—
Asthma	14.2
Cardio-vascular	14.2
Low Birth Weights	0.56

Socioeconomic Factor Indicators	—
Education	0.42
Housing	41.9
Linguistic	54.6
Poverty	18.2
Unemployment	35.0

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	67.0088541
Employed	57.44899269
Median HI	67.1885025
Education	—
Bachelor's or higher	98.19068395
High school enrollment	100
Preschool enrollment	57.19235211
Transportation	—
Auto Access	9.174900552
Active commuting	97.12562556
Social	—
2-parent households	93.82779417
Voting	50.17323239
Neighborhood	—
Alcohol availability	21.27550366
Park access	12.47273194
Retail density	99.62787117

Supermarket access	84.69138971
Tree canopy	65.49467471
Housing	—
Homeownership	15.97587579
Housing habitability	43.59040164
Low-inc homeowner severe housing cost burden	19.64583601
Low-inc renter severe housing cost burden	86.46220968
Uncrowded housing	65.16104196
Health Outcomes	—
Insured adults	88.23302964
Arthritis	97.1
Asthma ER Admissions	81.8
High Blood Pressure	96.6
Cancer (excluding skin)	60.5
Asthma	96.9
Coronary Heart Disease	94.7
Chronic Obstructive Pulmonary Disease	98.1
Diagnosed Diabetes	97.5
Life Expectancy at Birth	96.2
Cognitively Disabled	44.8
Physically Disabled	60.6
Heart Attack ER Admissions	83.0
Mental Health Not Good	95.0
Chronic Kidney Disease	97.1
Obesity	97.0
Pedestrian Injuries	88.3
Physical Health Not Good	98.5
Stroke	95.7

Health Risk Behaviors	—
Binge Drinking	10.6
Current Smoker	94.0
No Leisure Time for Physical Activity	97.2
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	56.6
Elderly	61.3
English Speaking	41.1
Foreign-born	70.2
Outdoor Workers	90.7
Climate Change Adaptive Capacity	—
Impervious Surface Cover	42.6
Traffic Density	61.8
Traffic Access	70.8
Other Indices	—
Hardship	7.2
Other Decision Support	—
2016 Voting	44.3

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	20.0
Healthy Places Index Score for Project Location (b)	85.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	93,539 SF, 4 story R+D building with 3 levels of underground parking (280 spaces) on 1.155 acres
Construction: Construction Phases	Demolition and construction to start January 2026 and be complete by September 2027
Construction: Off-Road Equipment	Equipment list provided by client. No asphalt paving per client.
Construction: Trips and VMT	Round trip distance to dump site during demolition = 25 miles, 15 trips per day during demo. Round trip to soil disposal site during excavation = 30 miles.
Operations: Vehicle Data	Per MOU, daily trip generation rate is 11.08 trips/TSF

APPENDIX B: CAP CHECKLIST

APPENDIX D

CLIMATE ACTION PLAN CONSISTENCY CHECKLIST

Climate Action Plan Consistency Checklist

Introduction

The Climate Action Plan Consistency Checklist (Checklist) is intended to be a tool for new development projects to demonstrate consistency with Pasadena’s Climate Action Plan (CAP), which is a qualified greenhouse gas (GHG) emissions reduction plan in accordance with California Environmental Quality Act (CEQA) Guidelines Section 15183.5. This Checklist has been developed as part of the CAP implementation and monitoring process and will support the achievement of individual CAP measures as well as Pasadena’s overall GHG reduction goals. In addition, this Checklist will further Pasadena’s sustainability goals and policies that encourage sustainable development and aim to conserve and reduce the consumption of resources, such as energy and water, among others.

CEQA Guidelines Section 15183.5 allows lead agencies to analyze the impacts associated with GHG emissions at a programmatic level in plan-level documents such as CAPs, so that project-level environmental documents may tier from the programmatic review. Projects that meet the requirements of this Checklist will be deemed to be consistent with Pasadena’s CAP and will be found to have a less than significant contribution to cumulative GHG (i.e., the project’s incremental contribution to cumulative GHG effects is not cumulatively considerable), pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b). Projects that do not meet the requirements in this Checklist will be deemed to be inconsistent with Pasadena’s CAP and must prepare a project-specific analysis of GHG emissions, including quantification of existing and projected GHG emissions and incorporation of the measures in this Checklist to the extent feasible.

Applicability

This Checklist is only required for discretionary projects¹ that are subject to and not exempt from CEQA. Projects that are exempt from CEQA are deemed to be consistent with Pasadena’s CAP, and no further review is necessary, with the exception of the Class 32 “In-Fill Development Projects” categorical exemption (CEQA Guidelines Section 15332), for which Projects are required to demonstrate consistency with the CAP through this Checklist.

¹ In this context a project is any action that meets the definition of a “Project” in Section 15378 of the State CEQA Guidelines.

Climate Action Plan Consistency Checklist Application Form

When required, the Checklist must be included in the project submittal package. The requirements in the Checklist will be included in the project’s conditions of approval. The applicant is required to provide supporting documentation on how the proposed project will implement the measures identified in the Checklist to the satisfaction of the Planning & Community Development Department.

Step 1: Complete a Master Land Use Application Form (separate attachment)

Step 2: Demonstrate consistency with the Land Use Element of the General Plan

The growth projections outlined in the 2015 General Plan Land Use Element were used in Pasadena’s CAP to estimate community-wide GHG emissions over time. Therefore, new development projects must be consistent with the Land Use Element to be consistent with Pasadena’s CAP. In order for City staff to determine a project’s consistency with the Land Use Element, please answer the following question and provide explanation with supporting documentation for each response.

Is the proposed project consistent with the existing land use designation of the Land Use Element?

Yes No

If “Yes,” proceed and complete Step 3 of the Checklist.

If “No,” the proposed project may not tier from this document and must prepare a comprehensive project-specific analysis of GHG emissions and incorporate the measures in this Checklist to the extent feasible.

The project consists of the construction and operation of a 93,539 square foot, 4-story R & D building with 3 levels of underground parking (280 parking spaces). The project is located in the EC-MU-N East Colorado Specific Plan Zoning District and has a Mixed-Use General Plan Land Use designation.

Step 3: Demonstrate consistency with Pasadena’s CAP

Proposed projects which complete one of the following three options will be deemed to be consistent with Pasadena’s CAP and will be found to have a less than significant contribution to cumulative GHG emissions (i.e., the project’s incremental contribution to cumulative GHG effects is not cumulatively considerable), pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b).

Please select one of the following options:

- Option A: Sustainable Development Actions – Demonstrate that the proposed project is consistent with the Pasadena CAP by incorporating applicable actions intended to ensure that the project contributes its fair share to the City’s cumulative GHG reduction goals
- Option B: GHG Efficiency - Demonstrate that the proposed project is consistent with Pasadena’s per person GHG efficiency thresholds
- Option C: Net Zero GHG Emissions – Demonstrate that the proposed project would not result in a net increase in GHG emissions

Option A: Sustainable Development Actions

In order to complete this option, a proposed project must incorporate applicable Sustainable Development Actions to the satisfaction of the applicable City Departments. Incorporating these actions will ensure that the project is reducing its fair share of GHG emissions and support the achievement of Pasadena’s overall GHG emissions reduction goals. For each action selected, please submit the requested documentation. If a mandatory action is not applicable to the project, please provide a description as to why that action cannot be implemented.

Mandatory Actions (all of the actions below are required)

GHG Reduction Strategy (Measure in Pasadena’s CAP)	Sustainable Development Actions	Yes	N/A
		Check the appropriate box and provide explanation	
T-1.2: Continue to improve bicycle and pedestrian safety	Bicycle Storage: Does the project provide bicycle storage lockers, racks, or other bicycle storage facilities for residents/employees? Check “N/A” only if the project does not include residents or employees.	X	
T-3.1: Decrease annual commuter miles traveled by single occupancy vehicles	Transportation Demand Management (TDM): Does the project include a TDM plan? A TDM plan is required for the following projects: multifamily residential development that are 100 or more units; mixed-use developments with 50 or more residential units or 50,000 square feet or more of non-residential development; or non-residential projects which exceed 75,000 square feet. If applicable, please submit the TDM plan for review.	X	
T-4.1: Expand the availability and use of alternative fuel vehicles and fueling infrastructure	Alternative Vehicle Fueling Wiring: For projects with more than three parking spaces, does the project provide wiring for at least one 240V Type II electric car charger? Please include specifications on the project plans. Check “N/A” only if the project does not include more than three parking spaces.	X	
E-1.2: Encourage the use of energy conservation devices and passive design concepts that make use of the natural climate to increase energy efficiency	Passive Design Features: Does the project utilize passive design techniques such as awnings or overhangs on the east, west, and south facing windows which block the high summer sun but allow in lower winter sun? Please include specifications on the project plans.	X	
WC-1.1: Reduce potable water usage throughout Pasadena	Irrigation Efficiency: Will the project utilize drought tolerant landscaping and/or drip irrigation and/or weather controllers to reduce outdoor water use? Please include specifications on the project plans. Check “N/A” only if the project does not include any landscaping.	X	
WR-1.1: Continue to reduce solid waste and landfill GHG emissions	Facilitate Recycling: Does the project include a space for separate trash and recycling bins as well as provide informational signage/handouts for residents/employees outlining materials to be recycled? Please include specifications on the project plans.	X	

Selective Actions

In addition the mandatory actions, the proposed project must implement the following:

- One additional action in the Energy Efficiency and Conservation category
- One additional action in the Sustainable Mobility and Land Use category
- Three additional actions from any category



Energy Efficiency and Conservation (select a minimum of one action)

GHG Reduction Strategy (Measure in Pasadena’s CAP)	Sustainable Development Actions	Yes	No
E-1.1: Increase energy efficiency requirements of new buildings to perform better than 2016 Title 24 Standards	Zero-Net Energy (ZNE): Does the project generate 100% of electricity required on site? ZNE calculations must be provided.		
E-1.1: Increase energy efficiency requirements of new buildings to perform better than 2016 Title 24 Standards	Energy Efficiency (Exceed 2016 Title 24): Does the project exceed the 2016 Title 24 Efficiency Standards by at least 5%? Please include Title 24 energy model.	X	
E-4.1: Increase city-wide use of carbon-neutral energy by encouraging and/or supporting carbon-neutral technologies	Renewable Energy: Does the project generate at least 60% of the building’s projected electricity needs through renewable energy? Please include specifications on the project plans.		



Sustainable Mobility and Land Use (select a minimum of one action)

GHG Reduction Strategy (Measure in Pasadena’s CAP)	Sustainable Development Action	Yes	No
T-1.1: Continue to expand Pasadena’s bicycle and pedestrian network	End-of-Trip Bicycle Facilities (Commercial Development): Does the project provide at least one shower for every 50 employees? Please include these specifications on the project plans.		
T-1.1: Continue to expand Pasadena’s bicycle and pedestrian network	Bike Share: Does the project include a bike share station? Please include these specifications on the project plans.		
T-3.1: Decrease annual commuter miles traveled by single occupancy vehicles	Car Sharing: Does the project provide/facilitate car sharing by providing a designated car share space on or within the immediate vicinity of the project site? Examples of car share options include ZipCar, PitCarz, and Getaround. Please include these specifications on the project plans.		
T-3.1: Decrease annual commuter miles traveled by single occupancy vehicles	Parking De-Coupling: Does the project separate the cost of parking from the cost of commercial space and/or residential housing by charging for each individually? Please include these specifications on the project plans.		
T-3.1: Decrease annual commuter miles traveled by single occupancy vehicles	Transportation Demand Management (TDM): Does the project include a TDM plan? Please submit the TDM plan for review (Note: this measure cannot be combined with the mandatory measure that requires a TDM plan for projects that meet certain size thresholds.)		
T-4.1: Expand the availability and use of alternative fuel vehicles and fueling infrastructure	Alternative Vehicle Fueling Infrastructure: Does the proposed project include functioning 240V Type II electric car chargers at 3% of parking spaces (at least one charger) AND conduit to allow for future charger installation to 25% of spaces?	X	
T-5.1: Facilitate high density, mixed-use, transit-oriented, and infill development	Transit Oriented Development: Is the project located within 0.25 mile of a major transit stop as defined in the Zoning Code. Please include a map outlining the nearest transit stop.	X	
T-6.1: Reduce GHG emissions from heavy-duty construction equipment and vehicles	Reduce GHG emissions from heavy-construction equipment: Will the project utilize at least 30% alternative fueled construction equipment (by pieces of equipment) and implement an equipment idling limit of 3 minutes? Please provide idling limit plan including implementation strategies along with the total pieces of equipment and those utilizing alternative fuels.		

Water Conservation

GHG Reduction Strategy (Measure in Pasadena’s CAP)	Sustainable Development Action	Yes	No
WC-1.1: Reduce potable water use throughout Pasadena	Indoor Water Efficiency: Will the project achieve at least a 35% reduction in indoor water use per the LEED V4 Indoor Water Use Reduction Calculator? Please attach the calculator output.		
WC-2.1: Increase access to and use of non-potable water	Rainwater Capture and Reuse: Does the project utilize a rainwater capture and reuse system to reduce the amount of potable water consumed on site? Please include these specifications on the project plans.		
WC-2.1: Increase access to and use of non-potable water	Indoor & Outdoor Recycled Water: Will the project be plumbed to utilize recycled water for either indoor or outdoor water use? Please include these specifications on the project plans.		
WC-2.1: Increase access to and use of non-potable water	Greywater: Will the project be plumbed to take advantage of greywater produced on site such as a laundry to landscape system or another on-site water reuse system? Please include these specifications on the project plans.		
WC-3.1: Improve storm water to slow, sink, and treat water run-off, recharge groundwater, and improve water quality	Permeable Surfaces: Is at least 30% of the hardscape (e.g., surface parking lots, walkways, patios, etc.) permeable to allow infiltration? Please include these specifications on the project plans.		
WC-3.1: Improve storm water to slow, sink, and treat water run-off, recharge groundwater, and improve water quality	Stormwater Capture: Is the project designed to retain stormwater resulting from the 95 th percentile, 24 hour rain event as defined by the Los Angeles County 95 th percentile precipitation isohyetal map? Please provide the engineered stormwater retention plan with the project plans (http://dpw.lacounty.gov/wrd/hydrologygis/)		

Waste Reduction

GHG Reduction Strategy (Measure in Pasadena’s CAP)	Sustainable Development Action	Yes	No
WR-1.1: Continue to reduce solid waste and landfill GHG emissions	Recycled Materials: Does the project utilize building materials and furnishings with at least 50% (pre- or post-consumer) recycled content or products which are designed for reuse? At a minimum, projects must show at least 10% of the material by cost meets the recycled content requirement? Please submit the plan for review.		
WR-3.1: Implement a city-wide composting program to limit the amount of organic material entering landfills	On-Site Composting: Does the project include an area specifically designated for on-site composting? Please include these specifications on the project plans.		

Urban Greening

GHG Reduction Strategy (Measure in Pasadena’s CAP)	Sustainable Development Action	Yes	No
UG-1.1: Continue to preserve, enhance, and acquire additional green space throughout Pasadena to improve carbon sequestration, reduce the urban heat-island effect, and increase opportunities for active recreation	Greenspace: Does the project include at least 500 sq. ft. of public use greenspace (landscaped yards, parklets, rooftop garden, etc.)? At a minimum, 50% of the required greenspace must include softscape landscaping (e.g., trees, plants, grass, etc.).	X	
UG-2.1: Continue to protect existing trees and plant new ones to improve and ensure viability of Pasadena’s urban forest	Trees: Does the project result in a net gain of trees? Please include these specifications on the project plans.	X	

Total Actions Taken

Sector	Actions Selected (#)	Actions Required
Mandatory Actions	6	6
Energy Efficiency and Conservation	1	1
Sustainable Mobility and Land Use	2	1
Water Conservation		0
Waste Reduction		0
Urban Greening	2	0
Total # of Actions Selected	11	
<i>Total Required</i>	<i>11</i>	

Supporting Documentation

Use the section below to provide supporting information describing how each selected Sustainable Development Action will be implemented in the proposed project. Additional information such as model outputs, invoices, and project plans should be noted below and attached to this submittal as needed.

Sustainable Development Action	Description of Project Implementation
T-1.2: Continue to improve bicycle and pedestrian safety	The Project will provide bicycle parking in compliance with LEED requirements. Locations and quantities to be submitted with Concept Design Review.
T-3.1: Decrease annual commuter miles traveled by single occupancy vehicles	Traffic Demand Management plan is currently being completed by City of Pasadena Traffic consultant.
T-4.1: Expand the availability and use of alternative fuel vehicles and fueling infrastructure	The Project will provide EV ready and EV capable stalls in the garage. Locations and specifications will be provided with Concept Design Review.
E-1.2: Encourage the use of energy conservation devices and passive design concepts that make use of the natural climate to increase energy efficiency	The Project will use a combination of architectural projections and overhangs to make use of the natural climate to increase energy efficiency. Specifications will be included in the Concept Design Review.

Sustainable Development Action	Description of Project Implementation
<p>WC-1.1: Reduce potable water usage throughout Pasadena</p>	<p>The Project will utilize drought tolerant landscaping and/or drip irrigation and/or weather controllers to reduce outdoor water use. Specifications will be submitted with Concept Design Review.</p>
<p>WR-1.1: Continue to reduce solid waste and landfill GHG emissions</p>	<p>The Project will provide space for separate trash and recycling bins as well as provide informational signage/handouts for residents/employees outlining materials to be recycled. Specifications will be submitted with Concept Design Review.</p>
<p>E-1.1: Increase energy efficiency requirements of new buildings to perform better than 2016 Title 24 Standards</p>	<p>The Project will submit Title 24 calculations that surpass the 2016 Title 24 Standards requirements by at least 5%. T24 model will be submitted during building plan check.</p>
<p>T-4.1: Expand the availability and use of alternative fuel vehicles and fueling infrastructure</p>	<p>The Project will include functioning 240V Type II electric car chargers at 3% of parking spaces (at least one charger) AND conduit to allow for future charger installation to 25% of spaces. Specifications will be submitted with Concept Design Review</p>
<p>T-5.1: Facilitate high density, mixed-use, transit-oriented, and infill development</p>	<p>The Project is located within 0.25m of a major bus route. Map attached for reference.</p>
<p>UG-1.1: Continue to preserve, enhance, and acquire additional green space throughout Pasadena to improve carbon sequestration, reduce the urban heat-island effect, and increase opportunities for active recreation</p>	<p>The Project will include at least 500 sq. ft. of public use green space including at least 50% soft-scape. Location and specifications to be included with Concept Design Review.</p>

UG-2.1: Continue to protect existing trees and plant new ones to improve and ensure viability of Pasadena’s urban forest

The Project will improve the overall quantity of trees when compared to the existing conditions. Locations and quantities to be submitted in Concept Design Review.

Option B: GHG Efficiency

The efficiency threshold assesses the GHG efficiency of a proposed project on a service person (residents + full time employees) basis. This method recognizes that highly efficient projects (e.g., compact and mixed-use development) with relatively high mass emissions may nevertheless meet the local and State GHG reduction goals/targets. Using the demographic projections developed for the CAP, Pasadena has developed service person efficiency thresholds for the years of 2020, 2025, 2030 and 2035 which are consistent with Pasadena’s GHG emission goals included in the CAP and the State targets it is designed to achieve (AB 32, SB 32, and substantial progress towards EO S-3-05). Applicants may decide to assess their proposed project’s GHG emissions relative to Pasadena’s GHG efficiency thresholds in lieu of completing the Sustainable Development Actions. Applicants should utilize standard GHG modeling techniques (such as CalEEMod²) to estimate total GHG emissions associated with the proposed project. Models should include all construction emissions (amortized over 30 years) and operational emissions. Total annual emissions should be divided by the proposed project’s service population (residents + full time employees) to determine the efficiency of the proposed project using the following equation:

$$\text{Proposed Project's GHG Efficiency} = \text{Annual GHG Emissions} / \text{Service Population (Residents + Full Time Employees)}$$

The proposed project must be able to demonstrate a GHG efficiency which is less than or equal to the threshold listed below for the projects first operational year to be considered consistent with the Pasadena CAP and State targets it is designed to achieve. Refer to Appendix B for a complete description of the methodology used to calculate the efficiency thresholds.

Project First Operational Year	Threshold
2017 – 2020	5.63 MT CO ₂ e/Service Person
2021 – 2025	4.56 MT CO ₂ e/Service Person
2026 – 2030	3.57 MT CO ₂ e/Service Person
2031 – 2035	2.73 MT CO ₂ e/Service Person

² The California Emissions Estimator Model® (**CalEEMod**) is a statewide land use emissions computer model designed to provide a uniform platform for assessing air quality and GHG impacts associated with construction projects. Available at: <http://www.caleemod.com/>

Option C: Net Zero GHG Emissions

In lieu of Option A or B, applicants can demonstrate consistency with this CAP by demonstrating their proposed project would result in no net increase of GHG emissions. A proposed project can reduce its GHG emissions through the purchasing of carbon offsets issued by Climate Action Reserve³ or other validated carbon offset registry to a level which results in zero net GHG emissions. The following methodology must be followed to prove zero net GHG emissions.

1. The applicant must model the proposed project's annual emissions using the most recent version of CalEEMod or equivalent model accepted by SCAQMD and/or CARB for CEQA purposes. Each model must include all emissions associated with the project including land clearing, demolition, earth moving, construction activities and operational related emissions such as energy use, water use, waste generation, transportation, area sources, and vegetation change, if applicable. The total annual operational emissions over 30 years as projected by the model should then be summed and added to the construction emissions to estimate the total lifetime GHG emissions associated with the project. CalEEMod is able to estimate operation related emissions over time taking into account changes to grid mix and vehicle fleet mandated by state legislation such as Renewable Portfolio Standard (RPS) and Pavley. Applicants should use CalEEMod forecasting to show overall GHG emissions and existing conditions (if applicable) should be modeled separately using CalEEMod for operations only and then subtracted from the project total to show the net change in GHG emissions.

Example:

Construction Emissions (1,000 MT of CO₂e) + Sum of Annual Emissions over 30 years (90,000 MT of CO₂e) – Existing Conditions (500 MT CO₂e) = 90,500 MT of CO₂e

2. The total emissions for the project must then be offset by Climate Reserve Tonnes or CRT's through the Climate Action Reserve marketplace. In the above example, the proposed project would be required to purchase 90,500 CRT's through the carbon marketplace. Offsets cost between \$12-\$15 as of September 2017 but prices are subject to changes in the carbon market. The marketplace can be found here:
<http://www.climateactionreserve.org/how/crt-marketplace/>

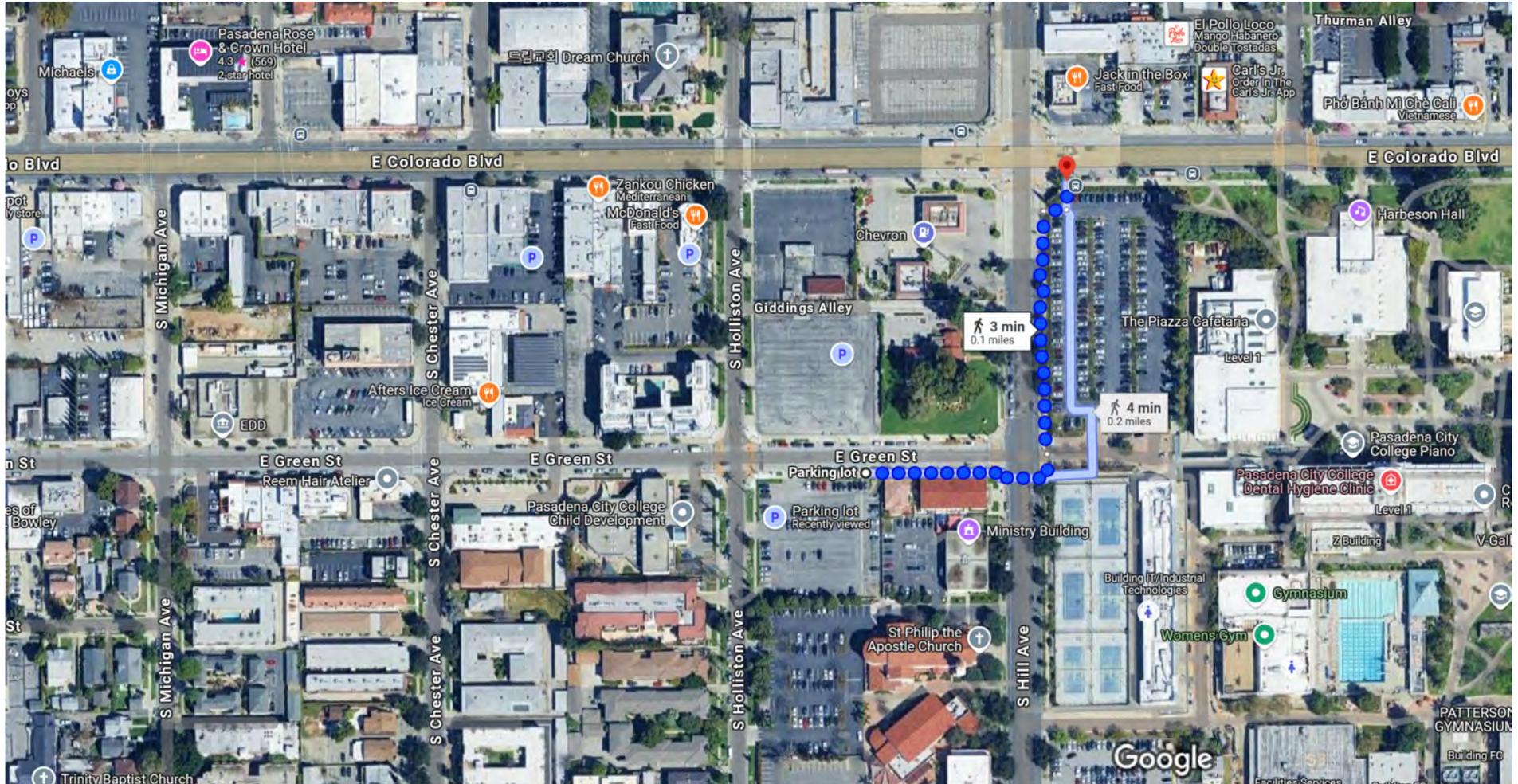
The full CalEEMod output and verification of the CRT's purchased must be provided to the City of Pasadena as part of the review process.

³ The Climate Action Reserve can be considered a bank which holds credits that amount to 1 metric ton of CO₂e per Climate Reserve Tonne (CRT). These credits get their reduction value through projects which reduce GHG emissions such as renewable energy development or through carbon sequestration. Those projects can sell CRT's equal to the amount of GHG emissions reduced. Other projects, can then purchase those CRT's to offset their own emissions. For more information see the Technical Appendix B of the Climate Action Plan



Parking lot, 1364 E Green St, Pasadena, CA 91106 to Staff Parking Lot No. 1, S Hill Ave, Pasadena, CA 91106

Walk 0.1 mile, 3 min



Imagery ©2025 Airbus, Maxar Technologies, Map data ©2025 Google 100 ft

via E Green St and S Hill Ave 3 min
0.1 mile

via E Green St 4 min
0.2 mile

Noise Analysis

1364 E. Green Street Project



Lead Agency:

CITY OF PASADENA
Planning and Community Development Department
Planning Division
2100 Thousand Oaks Boulevard
Thousand Oaks, California 91362

Consultant to Lead Agency:



633 W. 5th Street, 26th Floor
Los Angeles, California 90071

December 2025

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I. INTRODUCTION AND SUMMARY

1. PURPOSE OF ANALYSIS AND STUDY OBJECTIVES

This Noise Impact Study has been prepared by EcoTierra Consulting to determine the offsite and onsite noise impacts associated with the 1364 E. Green Street Project. The following is provided in this report:

- A description of the study area and the proposed project.
- Information regarding the fundamentals of noise.
- Information regarding the fundamentals of vibration.
- A description of the local noise guidelines and standards.
- An evaluation of the current noise environment.
- An analysis of the potential short-term construction-related noise and vibration impacts from the proposed project.
- An analysis of long-term operations-related noise and vibration impacts from the proposed project.
- An evaluation of airport-related noise impacts to the proposed project.

2. PROJECT LOCATION

The project site is located at 1364 E. Green Street, in the City of Pasadena. The 41,573-square-foot project site is comprised of three adjoining parcels located at the southeast corner of East Green Street and South Holliston Avenue and is currently developed with a surface parking lot with 115 parking spaces. Immediate adjacencies include a surface parking lot to the north on the opposite side of Green Street, St. Philip the Apostle Church and Parish Center to the south and east, and Pasadena City College Child Development Center is located west of the site on the opposite side of S. Holliston Avenue. Pedestrian and vehicular access to the site/building and subterranean parking would be achieved from East Green Street, while access to the loading zone would be provided from South Holliston Avenue. A vicinity map showing the project location of the Site is provided on **Figure 1, Project Location Map**.

3. PROJECT DESCRIPTION

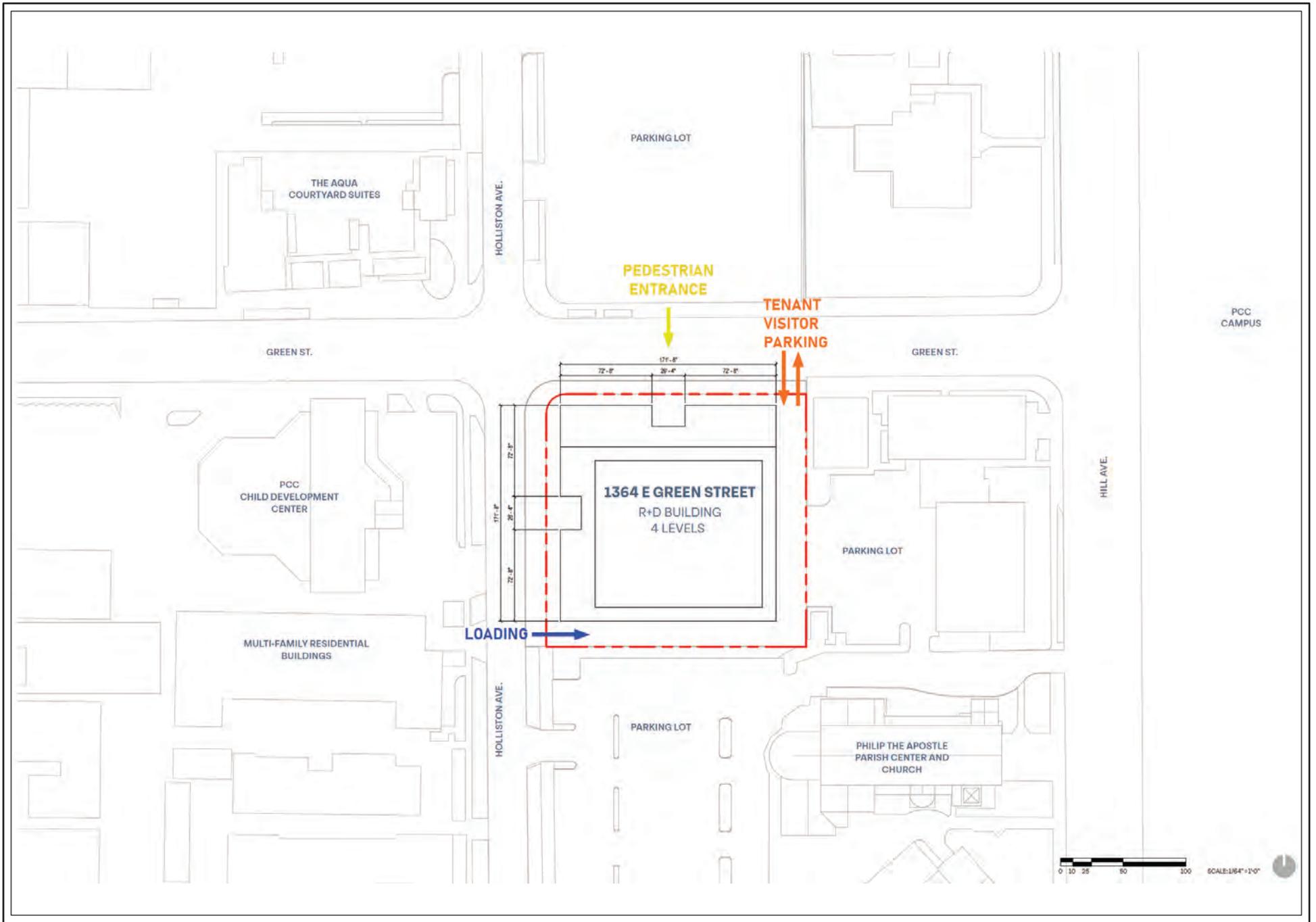
The proposed project involves construction of a new four-story, 93,539-square-foot, research and development project above three levels of subterranean parking for 280 spaces situated on an approximately 1-acre corner parcel. A large rooftop terrace is also proposed on the fourth floor that extends across the entire façade facing East Green Street. All existing on-site improvements will be demolished to facilitate the redevelopment of the site. **Figure 2, Site Plan**, illustrates the Site. The project is anticipated to start construction no sooner than January 2026 and take approximately 20 months to complete. The Project is anticipated to be operational in 2027. The Project would include approximately 950 tons of demolished material during demolition and 60,000 cubic yards (CY) of export during excavation.



Source: Google, 2025



Figure 1
Project Location Map



Source: Gensler, 2025

Figure 2
Site Plan

4. SUMMARY OF IMPACTS

A. Construction Noise Impacts

Construction noise levels were modeled for each phase using methodology presented in the Road Construction Noise Model (RCNM) User's Guide. Modeled unmitigated noise levels will not exceed 85 dBA when measured within a radius of 100 feet from the source. Construction noise levels are considered to be less than significant.

B. Operational Noise Impacts

The proposed project would not result in a perceptible increase in noise due to the increase of project-related traffic on roadways in the project vicinity. As the project-related increase in traffic noise would not exceed 5 dBA, the project would not contribute to a substantial permanent increase in ambient noise levels in the project vicinity. Impacts are considered less than significant.

On-site noise sources (HVAC and parking structure noise) associated with the proposed project would not result in a significant increase in ambient noise levels at closest receptor locations. Impacts related to project operational noise would be less than significant.

C. Vibration Impacts

The groundborne vibration levels associated with vibration-generating equipment that may be utilized during project construction would not exceed any FTA damage criteria. The project would not be a significant source of operational vibration.

D. Airport Impacts

The project is not located within an airport noise contour and airport-related noise impacts are considered to be less than significant.

II. NOISE FUNDAMENTALS

Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit, which expresses the ratio of the sound pressure level being measured to a standard reference level. A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies that are audible to the human ear.

1. NOISE DESCRIPTIONS

Noise equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in dBA. The equivalent sound level (L_{ea}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The peak traffic hour L_{ea} is the noise metric used by California Department of Transportation (Caltrans) for all traffic noise impact analyses.

The Day-Night Average Sound Level (L_{dn}) is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time-of-day corrections require the addition of ten decibels to sound levels at night between 10 p.m. and 7 a.m. While the Community Noise Equivalent Level (CNEL) is similar to the L_{dn} , except that it has another addition of 4.77 dB to sound levels during the evening hours between 7 p.m. and 10 p.m. These additions are made to the sound levels at these times because during the evening and nighttime hours, when compared to daytime hours, there is a decrease in the ambient noise levels, which creates an increased sensitivity to sounds. For this reason, the sound is perceived to be louder in the evening and nighttime hours and is weighted accordingly. Many cities rely on the CNEL noise standard to assess transportation-related impacts on noise sensitive land uses.

Another noise descriptor that is used primarily for the assessment of aircraft noise impacts is the Sound Exposure Level, which is also called the Single Event Level (SEL). The SEL descriptor represents the acoustic energy of a single event (i.e., an aircraft overflight) normalized to one-second event duration. This is useful for comparing the acoustical energy of different events involving different durations of the noise sources. The SEL is based on an integration of the noise during the period when the noise first rises within 10 dBA of its maximum value and last falls below 10 dBA of its maximum value. The SEL is often 10 dBA greater, or more, than the L_{MAX} since the SEL logarithmically adds the L_{eq} for each second of the duration of the noise.

2. TONE NOISE

A pure tone noise is a noise produced at a single frequency and laboratory tests have shown the humans are more perceptible to changes in noise levels of a pure tone (Caltrans 1998). For a noise source to contain a “pure tone,” there must be a significantly higher A-weighted sound energy in a given frequency band than in the neighboring bands, thereby causing the noise source to “stand out” against other noise sources. A pure tone occurs if the sound pressure level in the one-third octave band with the tone exceeds the average of the sound pressure levels of the two contiguous one-third octave bands by: 5 dB for center frequencies of 500 Hertz (Hz) and above; by 8 dB for center frequencies between 160 and 400 Hz; and by 15 dB for center frequencies of 125 Hz or less (Department of Health Services 1977).

3. NOISE PROPAGATION

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects, and refraction, and shielding by natural and manmade features. Sound from point sources, such as air conditioning condensers, radiate uniformly outward as it travels away from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD). Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

4. GROUND ABSORPTION

The sound drop-off rate is highly dependent on the conditions of the land between the noise source and receiver. To account for this ground-effect attenuation (absorption), two types of site conditions are commonly used in traffic noise models: soft-site and hard-site conditions. Soft-site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. For point sources, a drop-off rate of 7.5 dBA/DD is typically observed over soft ground with landscaping, as compared with a 6.0 dBA/DD drop-off rate over hard ground such as asphalt, concrete, stone, and very hard packed earth. For line sources a 4.5 dBA/DD is typically observed for soft-site conditions compared to the 3.0 dBA/DD drop-off rate for hard-site conditions. To be conservative, hard-site conditions were used in this analysis where applicable.

5. TRAFFIC NOISE PREDICTION

The level of traffic noise depends on the three primary factors: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater number of trucks. Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires. Because of the logarithmic nature of traffic noise levels, a doubling of the traffic volume (assuming that the speed and truck mix do not change) results in a noise level increase of 3 dBA. Based on the Federal Highway Administration (FHWA) community noise assessment criteria, this change is “barely perceptible,” for reference a doubling of perceived noise levels would require an increase of approximately 10 dBA. However, the 1992 findings of Federal Interagency Committee on Noise (FICON), which assessed changes in ambient noise levels resulting from aircraft operations, found that noise increases as low as 1.5 dB can cause annoyance, when the existing noise levels are already greater than 65 dB. The truck mix on a given roadway also has an effect on community noise levels. As the number of heavy trucks increases and becomes a larger percentage of the vehicle mix, adjacent noise levels increase.

6. NOISE BARRIER ATTENUATION

Effective noise barriers, such as those found along freeways, can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. For a noise barrier to work, it must be high enough and long enough to block the view of a road. A noise barrier is most effective when placed close to the noise source or receiver. A noise barrier can achieve a minimum of 5-dBA noise level reduction when it is tall enough to break the line-of-sight. When the noise barrier is a berm instead of a wall, the noise attenuation can be increased by another 3 dBA.¹

¹ Source: FHWA Noise Barrier Design Handbook. February 2000. Section 3. https://www.fhwa.dot.gov/Environment/noise/noise_barriers/design_construction/design/design03.cfm.

III. GROUND BORNE VIBRATION FUNDAMENTALS

Groundborne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of groundborne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although groundborne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Groundborne noise is an effect of groundborne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

1. VIBRATION DESCRIPTORS

Several different methods are used to quantify vibration amplitude such as the maximum instantaneous peak in the vibrations velocity, which is known as the peak particle velocity (PPV) or the root mean square (RMS) amplitude of the vibration velocity. Because of the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels and is denoted as L_v and is based on the RMS velocity amplitude. A commonly used abbreviation is VdB, which in this text, is when vibration level (L_v) is based on the reference quantity of 1 microinch per second.

2. VIBRATION PERCEPTION

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Offsite sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible groundborne noise or vibration.

3. VIBRATION PROPAGATION

The propagation of groundborne vibration is not as simple to model as airborne noise. This is because noise in the air travels through a relatively uniform median, while groundborne vibrations travel through the earth, which may contain significant geological differences. There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

4. CONSTRUCTION-RELATED VIBRATION LEVEL PREDICTION

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the construction site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. **Table 1, Vibration Source Levels for Construction Equipment**, gives approximate vibration levels for particular construction activities. The data in Table provides a reasonable estimate for a wide range of soil conditions.

Table 1
Vibration Source Levels for Construction Equipment

Equipment	Peak Particle Velocity (inches/second) at 25 feet	Approximate Vibration Level (L _v) at 25 feet
Pile driver (impact)	1.518 (upper range) 0.644 (typical)	112 104
Pile driver (sonic)	0.734 upper range 0.170 typical	105 93
Clam shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall)	0.008 in soil 0.017 in rock	66 75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, Table 7-4. September 2018.

There are no federal vibration standards or regulations adopted by any agency that are applicable to evaluating vibration impacts from land use development projects such as the proposed Project. However, the Federal Transit Administration (FTA) has adopted vibration criteria for use in evaluating vibration impacts from construction activities.¹ The vibration damage criteria adopted by the FTA are shown in **Table 2, Construction Vibration Damage Criteria**.

Table 2
Construction Vibration Damage Criteria

Building Category	PPV (in/sec)
I. Reinforced-concrete, steel or timber (no plaster)	0.50
II. Engineered concrete and masonry (no plaster)	0.30
III. Non-engineered timber and masonry buildings	0.20
IV. Buildings extremely susceptible to vibration damage	0.12
<i>Source: FTA, Transit Noise and Vibration Impact Assessment Manual, September 2018.</i>	

¹ Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual, Table 7-5, page 186, 2018.*

IV. REGULATORY SETTING

The proposed project is located in the City of Pasadena and noise regulations are addressed through the efforts of various federal, State, and local government agencies. The agencies responsible for regulating noise are discussed below.

1. FEDERAL REGULATIONS

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three purposes:

- Promulgating noise emission standards for interstate commerce.
- Assisting state and local abatement efforts.
- Promoting noise education and research.

The Federal Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency limits noise exposure of workers to 90 dB L_{eq} or less for 8 continuous hours or 105 dB L_{eq} or less for 1 continuous hour. The Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies. The Federal Aviation Administration (FAA) regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the Federal Transit Administration (FTA). Transit noise is regulated by the federal Urban Mass Transit Administration (UMTA), while freeways that are part of the interstate highway system are regulated by the Federal Highway Administration (FHWA). Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that “noise sensitive” uses are either prohibited from being sited adjacent to a highway or, alternately that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by the transportation sources, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

2. STATE REGULATIONS

Though not adopted by law, the State of California General Plan Guidelines 2017, published by the California Governor’s Office of Planning and Research (OPR) (OPR Guidelines), provides guidance for the compatibility of projects within areas of specific noise exposure. The OPR Guidelines identify the suitability of various types of construction relative to a range of outdoor noise levels and provide each local community some flexibility in setting local noise standards that allow for the variability in community

preferences. Findings presented in the Levels of Environmental Noise Document (EPA 1974) influenced the recommendations of the OPR Guidelines, most importantly in the choice of noise exposure metrics (i.e., Ldn or CNEL) and in the upper limits for the normally acceptable outdoor exposure of noise-sensitive uses.

The OPR Guidelines include a Noise and Land Use Compatibility Matrix which identifies acceptable and unacceptable community noise exposure limits for various land use categories. Where the “normally acceptable” range is used, it any special acoustical is defined as the highest noise level that should be considered for the construction of the buildings which do not incorporate treatment or noise mitigation. The “conditionally acceptable” or “normally unacceptable” ranges include conditions calling for detailed acoustical study prior to the construction or operation of the proposed project. The City of Pasadena has adopted their own version of the State Land Use Compatibility Guidelines for land use planning and to assess potential transportation noise impacts to proposed land uses (see Table 3).

Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that provides an annual average noise level of no more than 45 dBA CNEL. When such structures are located within a 60-dBA CNEL (or greater) noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold. In addition, Title 21, Chapter 6, Article 1 of the California Administrative Code requires that all habitable rooms, hospitals, convalescent homes, and places of worship shall have an interior CNEL of 45 dB or less due to aircraft noise.

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

A. California Environmental Quality Act

The California Environmental Quality Act Guidelines (Appendix G) establishes thresholds for noise impact analysis. This noise study includes analysis of noise and vibration impacts necessary to assess the project in light of the following Appendix G Checklist Thresholds.

Would the project 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?

Substantial increases in ambient noise levels are usually associated with project construction noise (temporary) and project operational noise (permanent).

Project Construction Noise (temporary): The City of Pasadena's noise ordinance regulates the timing of construction activities. No construction is permitted within 500 feet of a residential district outside of the hours specified under Section 9.36.070 of the City of Pasadena's Municipal Code (7:00 AM to 7:00 PM, Monday through Friday, 8:00 AM to 5:00 PM on Saturday, and at no time on Sundays or holidays). Section 9.36.080 of the City Municipal Code prohibits noise from operation of any powered construction equipment from exceeding 85 dBA Leq at a distance of 100 feet. The City of Pasadena restricts construction activities to the daytime hours. The potential for construction noise impacts to be objectionable depends on the magnitude of noise generated by the construction equipment, the frequency of noise sources during a construction day, and total duration of construction activities. Although construction activity may be exempt from the noise standards in the City's Municipal Code, CEQA requires that potential noise impacts still be evaluated for significance.

Project Operational Noise (permanent): Potential noise impacts are evaluated by local criteria established by the City of Pasadena for stationary source noise control. Section 9.36.090 of the City Municipal Code regulates machinery, equipment, and fans and air conditioning units and prohibits these sources from generating noise that exceeds the ambient noise level by more than 5 dB at the property line of the receiving property.

The City of Pasadena does not have adopted thresholds to assess off-site project-related traffic noise impacts. Therefore, the significance threshold for off-site traffic noise is based on human perceptibility to changes in noise levels (increases), with consideration of existing ambient noise conditions, and the City's guidelines for noise compatible land use. For off-site project generated noise, increases in ambient noise along affected roadways due to project generated vehicle traffic is considered substantial if they result in an increase of at least 5 dBA CNEL and: (1) the existing noise levels already exceed the applicable land use compatibility standard for the affected sensitive receptors set forth in the Noise Element of the City's General Plan; or (2) the project increases noise levels by at least 5 dBA CNEL and raises the ambient noise level from below the applicable standard to above the applicable standard.

b) Generate excessive groundborne vibration or groundborne noise levels?

The City of Pasadena does not have an adopted significance threshold to assess vibration impacts during construction. The vibration level at which there is a risk of architectural damage is based on the FTA structural damage criteria (0.12 in/sec for historic structures, 0.2 in/sec for typical wood-framed buildings, or 0.5 in/sec for reinforced concrete, steel, or timber).

3. LOCAL REGULATIONS

The City of Pasadena General Plan and Municipal Code establish the following applicable goals policies related to noise and vibration.

A. City of Pasadena General Plan

The Noise Element of the City's General Plan (revised in December 2002) incorporates noise standards for various land uses, which are based on the California Office of Planning and Research's (OPR) Noise Element Guidelines. **Table 3, City of Pasadena Noise Compatibility Guidelines**, presents the City's noise guidelines for land use planning. The objective of the noise compatibility guidelines is to provide a means of identifying acceptable noise exposure levels for a proposed use in relation to the existing noise environment. Since the proposed project at 1364 E. Green Street is a commercial use, the clearly acceptable noise level would be below 70 dBA CNEL, the normally acceptable noise levels would be below 75 dBA CNEL, the conditionally acceptable noise levels would be less than 85 dBA CNEL.

B. City of Pasadena Municipal Code

In addition to any measures to reduce noise levels recommended in this report, project operations will be subject to City ordinances.

Chapter 9.36, Noise Restrictions (Noise Ordinance), of the Pasadena Municipal Code (PMC) establishes exterior noise standards by land use and the maximum duration of time that the noise standards may be exceeded without being considered a nuisance punishable by law. As such, the City's Noise Ordinance prohibits any "unnecessary, excessive, or annoying noises" in the City. The Noise Ordinance does not control traffic noise but applies to all noise sources located on private property.

According to Section 9.36.050 of the PMC, the City generally limits intrusive noises from exceeding the ambient level at the property line by more than 5 dB, with adjustments made for steady audible tones, impulsive noise, and noise emitted for limited durations. The ambient noise is the actual measured noise level. In addition, Section 9.36.060 sets the interior noise limit for multi-family residential uses to 60 dB during 7:00 AM to 10:00 PM and 50 dB during 10:00 PM to 7:00 AM. This section of the PMC pertains to General Noise sources and does not apply to noise sources that are otherwise specified in the Noise Ordinance (e.g., construction noise).

The Noise Ordinance also includes restrictions for construction activities in residential districts. PMC Section 9.36.070 prohibits noise levels generated by construction in or within 500 feet of a residential district from 7:00 PM to 7:00 AM on weekdays, 5:00 PM to 8:00 AM on Saturday, or anytime on Sundays and holidays. Also, PMC Section 9.36.080 prohibits the operation of powered construction equipment if such equipment emits noise at a level in excess of 85 dB when measured within a radius of 100 feet from

the source. PMC Section 9.36.120 states that it is unlawful for any person to create any noise on any street, sidewalk or public place adjacent to any school, institution of learning, or church while the same is in use or adjacent to any hospital, which noise unreasonably interferes with the workings of such institution or which disturbs or unduly annoys patients in the hospital, provided conspicuous signs are displayed in such streets, sidewalk or public place indicating the presence of a school, church or hospital.

Table 3: City of Pasadena Noise Compatibility Guidelines

Land Use Category	Exterior Noise Level (CNEL dBA)						
	50	55	60	65	70	75	80
Residential – low density single family, duplex, mobile homes							
Residential- multiple family and mixed-use commercial/residential uses							
Transient lodging – motels, hotels							
Schools, libraries, churches, hospitals, nursing homes							
Auditoriums, concert halls, amphitheaters							
Sports arena, outdoor spectator sports							
Playground, neighborhood parks							
Golf courses, riding stables, water recreation, cemeteries							
Office buildings, business commercial and professional							
Industrial, manufacturing, utilities Agriculture, mining							
	Clearly Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal construction, without any special noise insulation requirements.					
	Normally Acceptable	New construction or development should be undertaken after an analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.					
	Conditionally Acceptable	New construction or development proceeds, an analysis of the noise reduction requirements should be made and needed noise insulation features included in the design					
	Normally Unacceptable	New construction or development should generally not be undertaken, unless it can be demonstrated that an interior level of 45 dBA can be achieved.					
<i>Source: City of Pasadena General Plan Noise Element</i>							

V. EXISTING NOISE CONDITIONS

To determine the existing noise level environment, short-term noise measurements were taken in the project study area at four locations in the project vicinity. The following describes the measurement procedures, measurement locations, and the noise measurement results.

1. MEASUREMENT PROCEDURE AND CRITERIA

To ascertain the existing noise at and adjacent to the project site, field monitoring was conducted on June 4, 2025. The field survey noted that noise within the proposed project area is generally characterized by traffic noise. The nearest airport is the San Gabriel Valley Airport, which is located approximately 6.3 miles southeast of the project site. The project site falls well outside the 65 dBA airport noise contour, and is not considered as a source that contributes to the ambient noise levels on the project site.

A. Noise Measurement Equipment

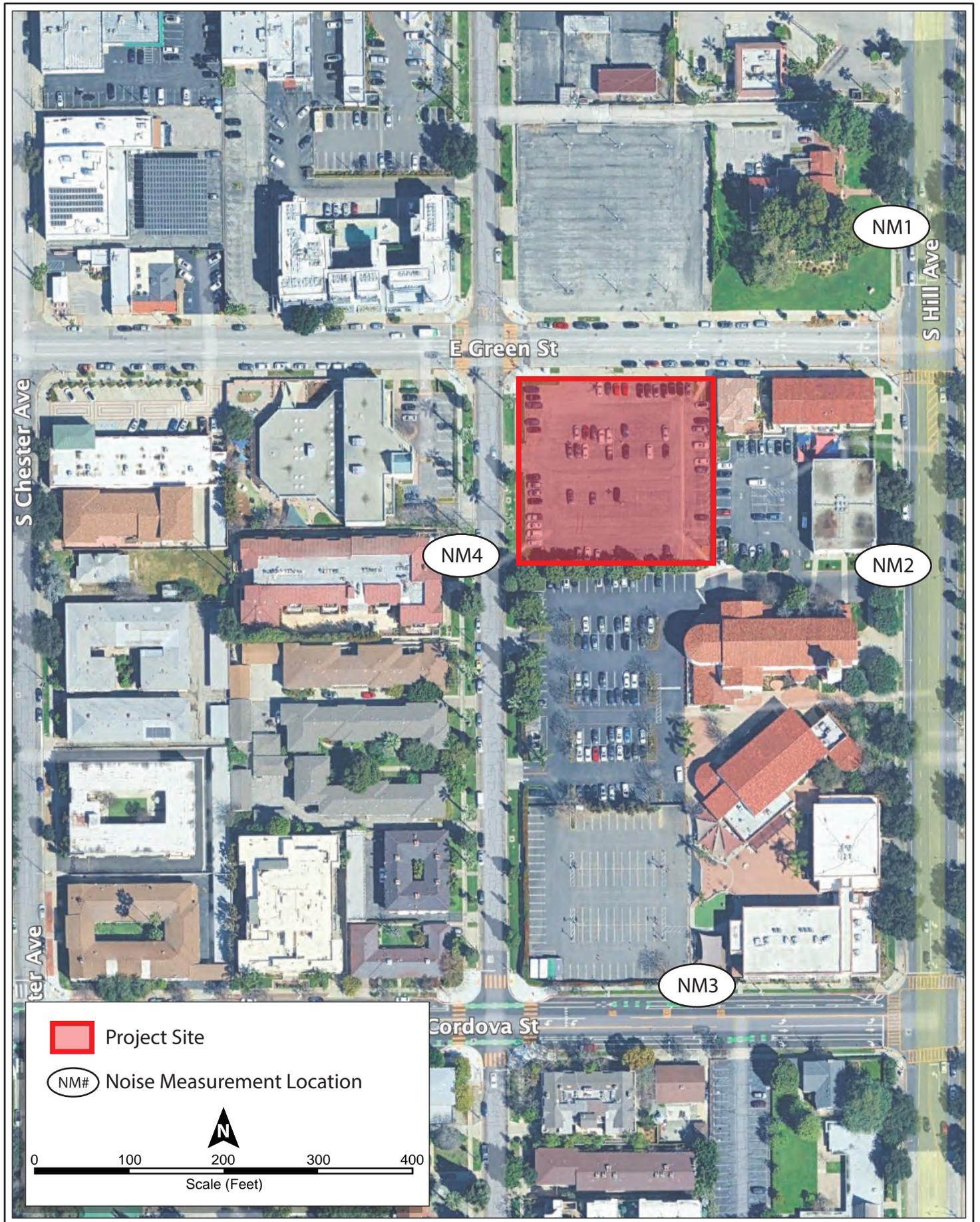
Noise monitoring was performed using an American National Standards Institute (ANSI Section S14 1979, Type 1) Larson Davis model LxT sound level meter. The sound level meter was programmed in “slow” mode to record the sound pressure level at one second intervals for in A-weighted form. The sound level meter and microphone were mounted approximately five feet above the ground and equipped with a windscreen during all measurements. The sound level meter was calibrated before monitoring using Larson Davis Cal 250. The noise level measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA).

B. Noise Measurement Locations

The noise monitoring locations were selected in order to obtain noise measurements of the current noise sources impacting the vicinity of the project site and to provide a baseline for any potential noise impacts that may be created by development of the proposed project. The site is shown in **Figure 3, Noise Monitoring Locations**, on the following pages. **Appendix A** (of this analysis technical report) includes a photographic index of the study areas and noise level measurement locations.

C. Noise Measurement Timing and Climate

The noise measurements were recorded between 2:52 PM and 4:30 PM on June 4, 2025. At the start of the noise monitoring, the temperature was 72°F, 60 percent humidity, 5 percent clouds, hazy sunshine, and calm wind conditions (6 mph).



Source: GoogleEarth Pro, 2025

Figure 3
Noise Monitoring Locations

2. NOISE MEASUREMENT RESULTS

The noise measurements were taken at four (4) locations in the project vicinity. The results of the noise level measurements are provided below in **Table 4, Existing Noise Level Measurements (dBA)**. The dominant noise source in the area was traffic, with secondary noise from the Pasadena City College Campus east of the site, city ambiance, pedestrians, birds, and the occasional overhead aircraft.

Table 4
Existing Noise Level Measurements (dBA)

Site Location	Description	L _{eq}	L _{MAX}	L _{MIN}
NM 1	North of the site, adjacent to the Hill Avenue Branch Library at 55 S. Hill Avenue	65.3	75.0	53.5
NM 2	East of the site, adjacent to the church building at 151 S. Hill Avenue	65.3	78.2	52.9
NM 3	South of the site, on the sidewalk adjacent to Saint Philip the Apostle School located at 1363 Cordova Street.	69.2	85.2	57.1
NM 4	West of the site, in proximity to the Pasadena City College Child Development Day Care Center located at 1324 E. Green Street and the multi-family residential use at 107 S. Holliston Avenue.	55.5	70.5	45.3

As shown in **Table 4**, receptors in the project vicinity are subject to average noise levels ranging from 55.5 dBA leq to 69.2 dBA leq, with maximum noise levels reaching as high as 85.2 dBA adjacent to the property line of the Saint Philip the Apostle School located at 1363 Cordova Street, approximately 175 feet southeast of the site.

VI. NOISE AND VIBRATION IMPACT ANALYSES

Consistent with the California Environmental Quality Act (CEQA) and the CEQA Guidelines, a significant impact related to noise would occur if a proposed project were determined to result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies.
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- Exposure of persons residing or working in the project area to excessive noise levels from aircraft.

To determine whether impacts to noise resources are significant environmental effects, the following topics are analyzed and evaluated:

- Exceedance of noise standards for construction and operational noise.
- Construction noise.
- Groundborne vibration.
- Operational noise.
- Airport noise.

Each of these topics is analyzed below.

1. EXCEEDANCE OF NOISE STANDARDS

This impact discussion analyzes the potential for project construction noise to cause an exposure of persons to or generation of noise levels in excess of established City of Pasadena noise standards or applicable standards of other agencies.

Noise levels in the project area would be influenced by construction activities.

A. Construction Noise

As stated previously, according to Section 9.36.070, noise from construction activity is prohibited within 500 feet of a residential district from 7:00 PM to 7:00 AM on weekdays, 5:00 PM to 8:00 AM on Saturday, or anytime on Sundays and holidays. In addition, PMC Section 9.36.080 prohibits the operation of powered construction equipment if such equipment emits noise at a level in excess of 85 dBA when measured at a radius of 100 feet from the source.

The State of California defines sensitive receptors as those land uses that require serenity or are otherwise adversely affected by noise events or conditions. Schools, libraries, churches, hospitals, single and multiple-family residential, including transient lodging, motels and hotel use make up the majority of

these areas. The nearest noise sensitive receptors to the Site include: the rectory of the St. Philip the Apostle Catholic Church, located adjacent to the northeastern corner of the project site; the St. Philip the Apostle Church located approximately 43 feet southeast of the site; the Pasadena City College Child Development Center Day Care, located approximately 60 feet west of the site; the apartment building located at 107 S. Holliston, approximately 60 feet west of the site; the St. Philip the Apostle Newman Center (a Catholic community center), located approximately 64 feet east of the site; the apartment building located at 125 S. Holliston Avenue, approximately 100 feet south west of the site; the Aqua Courtyard Suites apartment building located at 1299 E. Green Street, approximately 105 feet northwest of the site; the St. Philip the Apostle School located approximately 150 feet southwest of the site; the apartment building located at 135 S. Holliston Avenue, approximately 150 feet southwest of the site; the apartment building located at 145 S. Holliston Avenue, approximately 220 feet southwest of the site; the apartment building located at 165 S. Holliston Avenue, approximately 285 feet southwest of the site; and the tennis courts belonging to Pasadena City College, located approximately 280 feet east of the site. Please see **Figure 3, Noise Monitoring Locations** above, and **Table 5** below.

Short-term noise impacts could occur during construction activities from either the noise impacts created from the transport of workers and movement of construction materials to and from the project site, or from the noise generated onsite during demolition, excavation/grading, building, and architectural coating activities.

Construction noise levels would vary significantly based upon the size and topographical features of the active construction zone, duration of the work day, and types of equipment employed, as indicated in **Table 5, Typical Construction Equipment Noise Levels**. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Although there would be a relatively high single event noise exposure potential, resulting in potential short-term intermittent annoyances, the effect in long-term ambient noise levels would be small when averaged over longer time. As shown by the ambient noise level measurements in **Table 3, Existing Noise Level Measurements** (see Section V. Existing Noise Conditions of this report), the project vicinity is already exposed to a maximum noise level of 85.2 dBA L_{max} .

Construction noise levels associated with the Project were calculated utilizing noise prediction methodology presented in the FTA Transit Noise and Vibration Impact Assessment Manual (2018) together with several key construction parameters including: distance to each sensitive receiver, equipment usage, percent usage factor, and baseline parameters for the Project Site (see Appendix C for details). Such noise levels are compared with the noise standard in PMC Section 9.36.080, which prohibits the operation of powered construction equipment if such equipment emits noise at a level in excess of 85 dB when measured at a radius of 100 feet from the source.

Table 6
Construction Noise by Phase - 100 feet from Source

Construction Phase and Equipment Type	No. of Equipment	Equipment L_{max} at 50 feet, dbA ^{1,2}	Equipment Usage Percent	Noise Level L_{eq} (dBA) at 100 feet
Demolition				
Crawler Tractor	1	84	40	74.0
Excavators	2	81	40	74.0
Forklift	1	58	50	49.0
Scrapers	1	84	40	74.0
Total Noise Level For Phase				78.8
Excavation/Grading				
Bore/drill rig	1	79	20	66.0
Excavators	3	81	40	75.8
Forklift	1	58	50	49.0
Total Noise Level For Phase				76.2
Building Construction				
Cranes	1	81	16	67.0
Forklifts	2	58	50	52.0
Generator Sets	1	81	50	72.0
Tractors/Loaders/Backhoes	2	79	40	72.0
Welders	3	73	40	67.8
Total Noise Level For Phase				76.3
Architectural Coating				
Air Compressors	1	78	40	68.0
Total Noise Level For Phase				68.0
<i>Notes:</i>				
<i>(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018).</i>				
<i>(2) Source: Seixas, N. and Neitzel, R. (2004) "Noise exposure and hearing protection device use among construction workers in Washington state," Univ. of Washington Dept. of Env. and Occup. Health Sciences Rept., accessed Sept 10 2005 at http://staff.washington.edu/rneitzel/Noise_HPDPdf</i>				

As shown in **Table 6, Construction Noise by Phase – 100 feet from Source**, the highest construction noise level, 78.8 dBA, would occur during the demolition phase. Therefore, construction noise levels would not exceed 85 dBA at a distance of 100 feet from the source.¹

Impacts from construction noise are considered to be less than significant, no noise reduction measures are required.

2. GROUNDBORNE VIBRATION

This impact discussion analyzes the potential for the proposed project to cause an exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Vibration levels in the project area would be influenced by construction activities and from the ongoing operations of the proposed project.

As described in the Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment Manual*, groundborne vibration can be a serious concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard.² In contrast to airborne noise, groundborne vibration is not a common environmental problem, as it is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of groundborne vibration are trains, heavy trucks traveling on rough roads, and certain construction activities, such as blasting, pile-driving, and operation of heavy earth-moving equipment.³ Ground-borne vibration generated by man-made activities (e.g., road traffic, construction operations) typically weakens with greater horizontal distance away from the source of the vibration.

The types of construction vibration impact include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Ground vibrations from construction activities rarely reach levels that can damage structures but can achieve the audible and perceptible ranges in buildings close to a construction site. The City of Pasadena does not consider annoyance from construction vibration in an urban environment a significant impact. Significant impacts would only occur for building damage and/or if the vibrations would interfere with the use of sensitive receptors.

A. Construction Vibration

Construction activities can produce vibration that may be felt by adjacent uses. The construction of the proposed project would not require the use of equipment such as pile drivers, which are known to

¹ See Appendix C for calculations at a distance of 100 feet from the source.

² Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, Section 7, 2018.

³ Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, Section 7, 2018.

generate substantial construction vibration levels. The highest degree of groundborne vibration would be generated during the excavation/grading phase due to the use of a both a drilled and a vibrated pile driver used for shoring. Based on the Federal Transit Administration (FTA) data (see Table 1), vibration velocities from sonic pile driver operations are estimated to be approximately 0.170 inch-per-second PPV at 25 feet from the source of activity.⁴ Drilled piles create much less vibration and used when pile driving is needed close to structures. Drilled piles generate approximately 0.1 inch-per-second or less PPV at a distance of 10 feet from the source.⁵ Per the project applicant, only drilled piles would occur along the eastern and southern property lines, for a distance of 50 feet along the southern edge of the western property line, and for a distance of 50 feet along the western edge of the northern property line. The remaining project property line would have vibratory (sonic) pile driving. Please see the graphic of the location and types of the pile installation methods included in Appendix C of this report.

As shown in **Table 7, Closest Receptors to the Project Site**, the nearest buildings that could incur vibration damage from construction-related activities at the site would be the buildings located on the St. Philip the Apostle Parish Center campus, located at 101 S. Hill Avenue, as there is the rectory building façade located approximately 7 feet from the project site's eastern boundary. The project site is separated from this church building by a concrete block wall. The next closest building that may be affected by vibration is the St. Philip the Apostle Church, located at 151 S. Hill Avenue, with the façade of the church located approximately 43 feet from the southeastern portion of the project site. The façade of the St. Philip the Apostle Newman Center (a Catholic community center) is located approximately 64 feet east of the site. The multi-family residential use apartments located at 107 S. Holliston Avenue have a building façade located approximately 80 feet from the project's western boundary. The building façade of the Pasadena City College Child Development Day Care Center located at 1324 E. Green Street is approximately 115 feet from the project's western boundary. Other vibration-sensitive buildings are located further than 115 feet from the project boundaries and would not be affected by vibration from construction activities (see Table 7 for details and other receptors).

⁴ Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

⁵ Duoterra. News. <https://tinyurl.com/264s9ybs>

**Table 7
Closest Receptors to the Project Site**

Type of use	Description	Closest Noise Measurement Location ID	Structure type/FTA building category	Distance from the façade of the receptor to the project boundary
Institutional	Hill Avenue Branch Public Library at 55 S. Hill Avenue (Historic)	NM1	IV. Buildings extremely susceptible to vibration damage	~180 feet
Institutional	St. Philip the Apostle Parish Center Rectory at 101 S. Hill Avenue	NM2	III. Non-engineered timber and masonry buildings	~7 feet
Institutional	St. Philip the Apostle Church at 151 S. Hill Avenue	NM2	III. Non-engineered timber and masonry buildings	~43 feet
Institutional	The Newman Center (community center), St. Philip the Apostle, located at 101 S. Hill Avenue	NM2	III. Non-engineered timber and masonry buildings	~64 feet
Institutional	St. Philip the Apostle School at 1363 Cordova Street	NM3	III. Non-engineered timber and masonry buildings	~175 feet
Institutional	Pasadena City College Child Development Day Care Center at 1324 E. Green Street	NM4	II. Engineered concrete and masonry (no plaster)	~115 feet
Residential	Multi-family residential building located at 107 S. Holliston Avenue	NM4	III. Non-engineered timber and masonry buildings	~80 feet
Residential	Multi-family residential Aqua Courtyard Suites apartment building located at 1299 E. Green Street.	NM4	II. Engineered concrete and masonry (no plaster)	~120 feet

At a distance of 7 feet, the vibration level from the drilled piles would be 0.171 inches-per-second PPV, which would not exceed the 0.20 inches-per-second PPV threshold for category III buildings (non-engineered timber and masonry buildings). The façade of the St. Philip the Apostle Church is located approximately 43 feet from the southeastern boundary of the project. As the distance is greater than the 7 feet analyzed above, and vibration levels decrease with distance, the vibration level at the church would also not exceed the 0.02 inches-per-second PPV threshold. This also holds true for the Newman Center (community center), whose closest façade is located approximately 64 feet from the project's eastern

boundary, and the St. Philip the Apostle School, whose closest building façade is located approximately 175 feet from the site, even further from the project's southeastern boundary.

A bulldozer/excavator would also be used onsite. At a distance of 7 feet, the bulldozer would generate a vibration level of 0.02 inches-per-second PPV which also would not exceed the 0.2 inches-per-second PPV threshold for category III buildings (non-engineered timber and masonry buildings). No church-related buildings would be impacted by construction-related vibration impacts and there would not be any vibration-impacts related to the functionality of the church or community center uses.

The closest residential use that could be affected by construction vibration would be the multi-family residential apartment building located at 107 S. Holliston, with a building façade approximately 80 feet from the project's western boundary. The project would be drilling piles along the boundary at this location. At a distance of 80 feet, the drilled piles would have a vibration level of 0.004 inches-per-second PPV, which would not exceed the 0.20 inches-per-second PPV threshold for category III buildings (non-engineered timber and masonry buildings). The Hill Avenue Branch Public Library at 55 S. Hill Avenue is a historic land use and has a building façade located approximately 180 feet from the project's northeastern boundary. As the vibration level from drilled piles is 0.004 inches-per-second PPV at 80 feet, and vibration levels decrease with distance, the vibration level at the library (100 feet further away) would not exceed the 0.12 inches-per-second PPV threshold for category IV buildings (buildings extremely susceptible to vibration damage).

The building located closest to the area where vibratory (sonic) pile driving would occur is the Pasadena City College Child Development Day Care Center, with the building façade located approximately 115 feet from the western project boundary. At 115 feet, vibratory pile driving would generate a vibration level of 0.017 inches-per-second PPV, which would not exceed the 0.30 inches-per-second PPV threshold for category II buildings (engineered concrete and masonry [no plaster]). The multi-family residential Aqua Courtyard Suites apartment building located at 1299 E. Green Street would also be subject to vibratory pile driving, but at a distance of approximately 120 feet to the façade, the vibration level would be less than 0.017 inches-per-second PPV and would also not exceed the 0.20 inches-per-second PPV threshold for category III buildings (non-engineered timber and masonry buildings). Other land uses further from the project site would experience even lower vibration-related impacts. Therefore, the project would not exceed any FTA damage criteria to nearby buildings and construction-related impacts are considered to be less than significant.

B. Operational Vibration

As the proposed project consists of proposed R & D facility uses, the project does not include any significant sources of operational vibration. The project itself would be sensitive to vibrations (as precision equipment would be used on-site). Given the vibration-free needs of the proposed facility, and the distance to offsite receptors, operation of the project would not generate vibrations in a manner that

could damage any nearby structures. Therefore, operational vibration impacts would be less than significant.

3. OPERATIONAL NOISE

This impact discussion analyzes the potential for a substantial permanent increase in ambient noise levels in the project vicinity associated with operation of the proposed project, including impacts related to offsite vehicular noise and exposure of neighboring land uses to onsite noise.

A. Parking Noise

The proposed parking areas have the potential to generate noise due to cars entering and exiting, engines accelerating, braking, car alarms, squealing tires, and other general activities associated with people using the parking areas (i.e., talking, opening/closing doors, etc.). Noise levels within the parking areas would fluctuate with the amount of automobile and human activity. Activity levels would be highest in the early morning and evening when the largest number of people would enter and exit. However, these events would occur at low exiting and entering speeds, which would not generate high noise levels. During these times, the noise levels can range from 44 to 63 dBA Leq⁶. The parking area at project site is subterranean and, other than the driveway ramp leading down to the parking spaces, would be shielded by the walls of the parking structure. Therefore, noise generated from within the parking areas would not adversely affect off-site sensitive receptors. Chapter 9.36, of the PMC establishes exterior noise standards by land use and the maximum duration of time that the noise standards may be exceeded without being considered a nuisance punishable by law. As such, the City's Noise Ordinance prohibits any "unnecessary, excessive, or annoying noises" in the City. The Noise Ordinance does not control traffic noise but applies to all noise sources located on private property. Therefore, through project design, and compliance with existing PMC regulations, noise impacts associated with parking would be less than significant and no mitigation measures are required.

B. Stationary Noise Sources

As part of the Project, HVAC units are anticipated to be installed for the proposed use. A typical HVAC unit operates at a noise level of 66 dBA Leq at 3 feet from the source.⁷ If ten HVAC systems were running simultaneously, the resulting noise level would be 76 dBA Leq at 3 feet from the source. The HVAC units would be placed on the flat roof in the middle of the building, shielded from the neighboring uses by a screen for mechanical equipment that would 18 feet tall, and would completely block the HVAC units from view. The closest receptor would be located at least 80 feet from the closest HVAC unit⁸, at this distance,

⁶ Source: Gordon Bricken & Associates, 1996. Estimates are based on actual noise measurements taken at various parking lots.

⁷ Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, June 26, 2015. No details were provided regarding the number and type of HVAC systems to be installed; therefore, ten HVAC systems were estimated to be simultaneously used on-site.

⁸ Using a distance of 66 feet from the edge of the building to the MEP mechanical equipment wall, and a height of approximately 45 feet above the height of the closest receptor (the 2nd story of the rectory adjacent to the northeastern corner of the project site). Based on the site plan dated 03.05.2025.

the noise level from the HVAC would be 47 dBA L_{eq} (not including any attenuation from the 18-foot-tall barrier). As the existing noise levels in the project vicinity exceed range between 55.5 to 69.2 dBA L_{eq} (see Table 4), the HVAC would not exceed the ambient noise levels at the closest receptors in the project vicinity.

The design of all mechanical equipment would be required to comply with the regulations. According to Section 9.36.050 of the PMC, the City generally limits intrusive noises from exceeding the ambient level at the property line by more than 5 dB, with adjustments made for steady audible tones, impulsive noise, and noise emitted for limited durations. The project would also be subject to Section 9.36.090 of the PMC that regulates machinery, equipment, and fans and air conditioning units and prohibits these sources from generating noise that exceeds the ambient noise level by more than 5 dB at the property line of the receiving property. The project is required to comply with the PMC. Therefore, as the HVAC noise level would not exceed ambient noise levels and the project is required to comply with the PMC, impacts related to stationary noise sources are considered to be less than significant.

C. Traffic Noise

For off-site project generated noise, increases in ambient noise along affected roadways due to project generated vehicle traffic is considered substantial if they result in an increase of at least 5 dBA CNEL. In order for a new noise source to be audible, there would need to be a 3 dBA or greater CNEL noise increase⁹. Potential noise impacts associated with the operations of the proposed project are a result of project-generated vehicular traffic on the project vicinity roadways. Per the *Transportation Analysis Memorandum of Understanding* (Pasadena Department of Transportation/Fehr and Peers, June 2025), the project generates 1,036 daily vehicle trips, with 96 peak hour trips. The traffic volume on any given roadway would need to double in order for a 3 dBA increase in ambient noise to occur.¹⁰ With only 96 peak hour trips on roadways within the project's vicinity, the project would not cause a doubling in the traffic volume on these streets. Therefore, the noise impact from project-related traffic is considered to be less than significant.

4. AIRPORT NOISE

This impact discussion analyzes the potential for nearby airports or private airstrips to expose people residing or working in the project area to excessive noise levels. The nearest airport is the San Gabriel Valley Airport, which is located approximately 6.3 miles southeast of the project site. The project site falls well outside the 65 dBA noise contour¹¹ and is not considered as a source that contributes to the ambient noise levels on the project site. Impacts are considered to be less than significant.

⁹ FTA Highway Traffic Noise: Analysis and Abatement Guidance, page 9.

¹⁰ 2018. FTA Noise and Vibration Impact Assessment Manual. Page 210. and <https://www.codot.gov/programs/research/assets/Brochures/NoiseBrochureFinal.pdf>

¹¹ Los Angeles County Airport Land Use Plan – 12-19-91 website: <https://planning.lacounty.gov/wp-content/uploads/2022/10/Los-Angeles-County-Airport-Land-Use-Plan.pdf>

VII. NOISE/VIBRATION REDUCTION TECHNIQUES

1. CONSTRUCTION TECHNIQUES

None required.

2. OPERATIONAL TECHNIQUES

None required.

VIII. LIST OF ACRONYMS AND ABBREVIATIONS

ADT	average daily traffic
ANSI	American National Standards Institute
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dB	decibel
dBA	A-weighted decibel
dBA/DD	A-weighted decibel per each doubling of distance
DOT	Department of Transportation
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FICON	Federal Interagency Committee on Noise
FTA	Federal Transit Administration
Hz	Hertz
L_{dn}	Day-Night Average Sound Level
L_{eq}	Equivalent Sound Level
L_{max} , L_{min}	RMS (root mean squared) maximum level of a noise source or environment measured on a sound level meter, during a designated time interval, using fast meter response. L_{min} is the minimum level.
L_v	Vibration Level
ONAC	Federal Office of Noise Abatement Control
ONC	California Department of Health Services Office of Noise Control
OSHA	Occupational Safety and Health Administration
PPV	peak particle velocity
PMC	Pasadena Municipal Code
RMS	root mean square
SEL	Single Event Level
sq ft	square feet
UMTA	Urban Mass Transit Administration
VdB	L_v at 1 microinch per second

IX. REFERENCES

- Anon. 1977. Model Community Noise Control Ordinance. Berkley, CA: California Department of Health Services, Office of Noise Control.
- California, State of. Department of Transportation (Caltrans). 2004. Transportation- and Construction-Induced Vibration Guidance Manual. June. Website: <http://www.dot.ca.gov/hq/env/noise/pub/vibrationmanFINAL.pdf>
- California, State of. Department of Transportation (Caltrans). 2009 and 1998. Technical Noise Supplement. November. Website: http://www.dot.ca.gov/hq/env/noise/pub/tens_complete.pdf
- Federal Transit Administration. 2018. Transit Noise and Vibration Impact Assessment. September. Website: http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf.
- Pasadena, City of. 2025. Transportation Analysis Memorandum of Understanding. June
- Pasadena, City of. 2021. Municipal Code, Section 9.36.080, Noise Ordinance
- Pasadena, City of. 2002. Revised Noise Element of the General Plan. December
- Pasadena, City of. 2015. General Plan Draft EIR. January
- U.S. Department of Transportation. 2006. FHWA Roadway Construction Noise Model User's Guide. January. Website: <http://www.fhwa.dot.gov/environment/noise/rcnm/rcnm.pdf>.

APPENDICES

Appendix A: Study Area Photographic Index and Noise Measurement Data

Appendix B: Noise Meter Print Outs

Appendix C: RCNM Construction Noise and FHWA Road Noise Calculations

APPENDIX A: STUDY AREA PHOTOGRAPHIC INDEX AND NOISE MEASUREMENT DATA

15-Minute Noise Measurement Datasheet

Project: 1364 East Green Street Project, Pasadena
Site Address/Location: 1364 East Green Street Project, Pasadena, CA 91106

Site Observations:

Main noise sources are ground traffic & residential ambiance from human activity. Traffic noise from passing vehicles on E Green St, Cordova St, S Holliston Ave, S Hill Ave & other surrounding roads. Site area & E of site area college campus. W of site area mostly residential. The bldgs reflect & refract much of the sound. Other noise sources include general residential ambiance, bird song & pedestrians. Occasional overhead air traffic. Leaf rustle due 6mph to breeze.

Date: 6/4/2025
Field Tech/Engineer: Ian Edward Gallagher
General Location: 1364 East Green Street Project, Pasadena, CA 91106
Sound Meter: Larson Davis Sound Track LxT1 **SN:** 3099
Settings: A-weighted, slow, 10-sec, 15-minute interval
Meteorological Con.: 72 deg F, 6 mph wind, 60% humidity, <5% cloud, hazy sunshine.
Site ID: NM-1 thru 4

Site Topo: Urban, campus. M & SF medium density residences to the W.

Ground Type: Urban like conditions, acoustically refractive, absorptive but mostly reflective off of buildings and hard surfaces.

NM locations, latitude , longitude :

NM1 Meter: 34° 8'42.08"N 118° 7'17.39"W NM3 Meter: 34° 8'33.85"N 118° 7'19.78"W
 NM2 Meter: 34° 8'38.41"N 118° 7'17.38"W NM4 Meter: 34° 8'38.59"N 118° 7'22.73"W

Figure 1: Monitoring Locations



15-Minute Noise Measurement Datasheet - Cont.

Project: 1364 East Green Street Project, Pasadena
Site Address/Location: 1364 East Green Street Project, Pasadena, CA 91106
Site ID: NM-1 thru 4

Figure 2: NM1 Photo



NM1 looking WNW from S Hill Avenue sidewalk towards Hill Avenue Branch Library, building 55 S Hill Avenue, Pasadena.

Figure 3: NM2 Photo

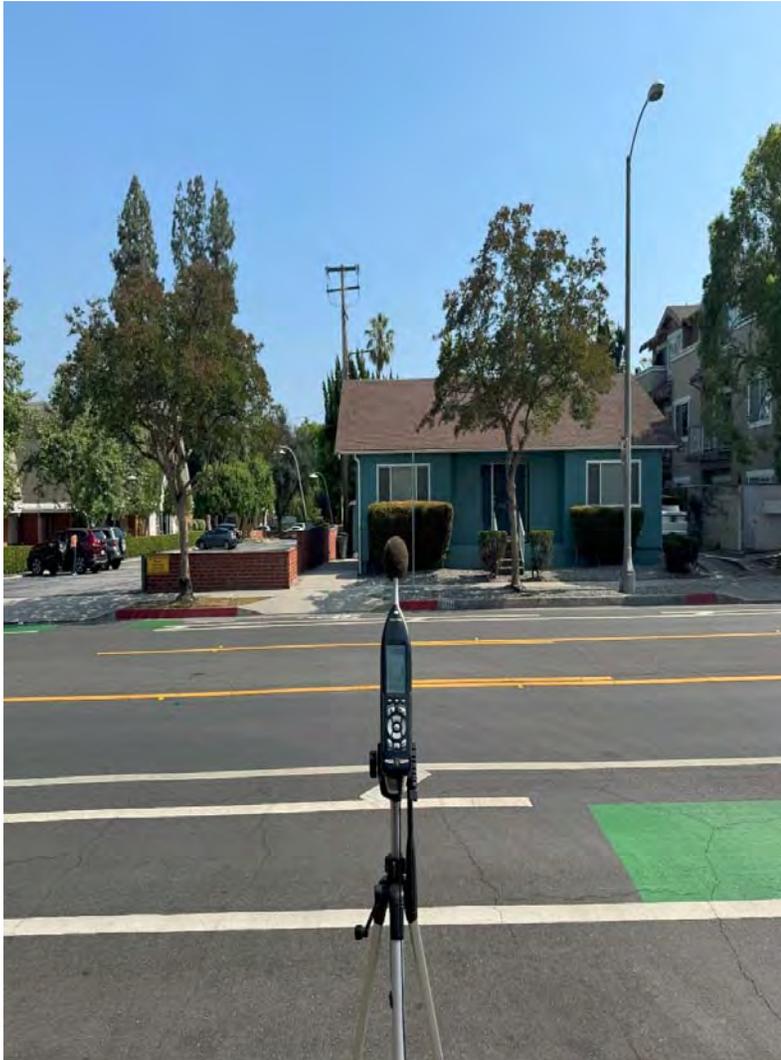


NM2 looking SSW from S Hill Avenue sidewalk, across exit way to parking lot. S Hill Avenue on the left, church building 151 S Hill Avenue, Pasadena on the right.

15-Minute Noise Measurement Datasheet - Cont.

Project: 1364 East Green Street Project, Pasadena
 Site Address/Location: 1364 East Green Street Project, Pasadena, CA 91106
 Site ID: NM-1 thru 4

Figure 4: NM3 Photo



NM3 looking S from sidewalk across Cordova Street towards residence 1364 Cordova Street, Pasadena.

Figure 5: NM4 Photo



NM4 looking SW from sidewalk S Holliston Avenue towards multifamily residence 107 S Holliston Avenue Pasadena.

15-Minute Noise Measurement Datasheet - Cont.

Project: 1364 East Green Street Project, Pasadena
Site Address/Location: 1364 East Green Street Project, Pasadena, CA 91106
Site ID: NM-1 thru 4

Table 1: Noise Measurement Summary

Location	Start	Stop	Leq/ dB	Lmax/ dB	Lmin/ dB	L2/ dB	L8/ dB	L25/ dB	L50/ dB	L90/ dB
NM1	2:52 PM	3:07 PM	65.3	75.0	53.5	71.7	69.5	66.4	63.2	57.4
NM2	3:18 PM	3:33 PM	65.3	78.2	52.9	71.3	69.0	66.2	63.5	57.6
NM3	3:47 PM	4:02 PM	69.2	85.2	57.1	75.0	72.1	69.7	67.5	67.5
NM4	4:15 PM	4:30 PM	55.5	70.5	45.3	63.1	60.0	55.4	51.4	47.5

APPENDIX B: NOISE METER PRINTOUTS

Measurement Report

Report Summary

Meter's File Name	LxT_Data.588.s	Computer's File Name	LxT_0003099-20250604 145209-LxT_Data.588.ldbin
Meter	LxT1 0003099		
Firmware	2.404		
User	Ian Edward Gallagher	Location	NM1 34° 8'42.08"N 118° 7'17.39"W
Job Description	15 minute noise measurement		
Note	KWAQN 1364 E Green Street, Pasadena		
Start Time	2025-06-04 14:52:09	Duration	0:15:00.0
End Time	2025-06-04 15:07:09	Run Time	0:15:00.0
		Pause Time	0:00:00.0

Results

Overall Metrics

LA _{eq}	65.3 dB		
LAE	94.8 dB	SEA	--- dB
EA	337.6 µPa²h	LAFTM5	69.1 dB
EA8	10.8 mPa²h		
EA40	54.0 mPa²h		
LA _{peak}	96.7 dB	2025-06-04 15:02:16	
LAS _{max}	75.0 dB	2025-06-04 15:01:09	
LAS _{min}	53.5 dB	2025-06-04 14:56:01	
LA _{eq}	65.3 dB		
LC _{eq}	73.9 dB	LC _{eq} - LA _{eq}	8.6 dB
LAI _{eq}	66.8 dB	LAI _{eq} - LA _{eq}	1.5 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	24	0:06:52.0
LAS > 85.0 dB	0	0:00:00.0
LAPeak > 135.0 dB	0	0:00:00.0
LAPeak > 137.0 dB	0	0:00:00.0
LAPeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight	
	--- dB	--- dB	0.0 dB	
	LDEN	LDay	LEve	LNight
	--- dB	--- dB	--- dB	--- dB

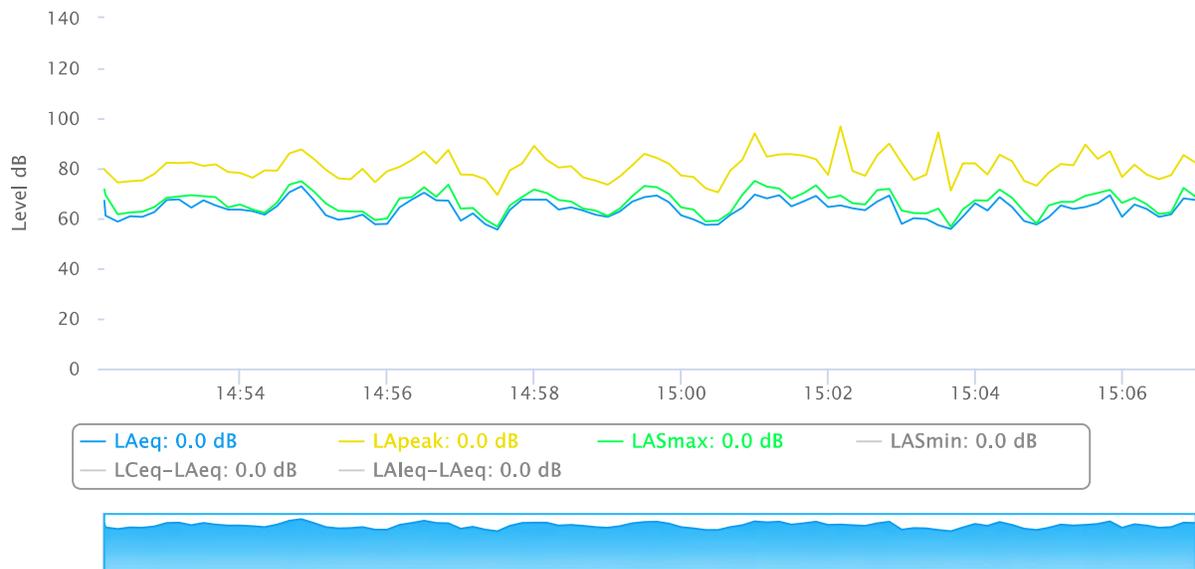
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L _{eq}	65.3 dB		73.9 dB		--- dB	
LS _(max)	75.0 dB	2025-06-04 15:01:09	--- dB		--- dB	
LS _(min)	53.5 dB	2025-06-04 14:56:01	--- dB		--- dB	
L _{Peak(max)}	96.7 dB	2025-06-04 15:02:16	--- dB		--- dB	

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

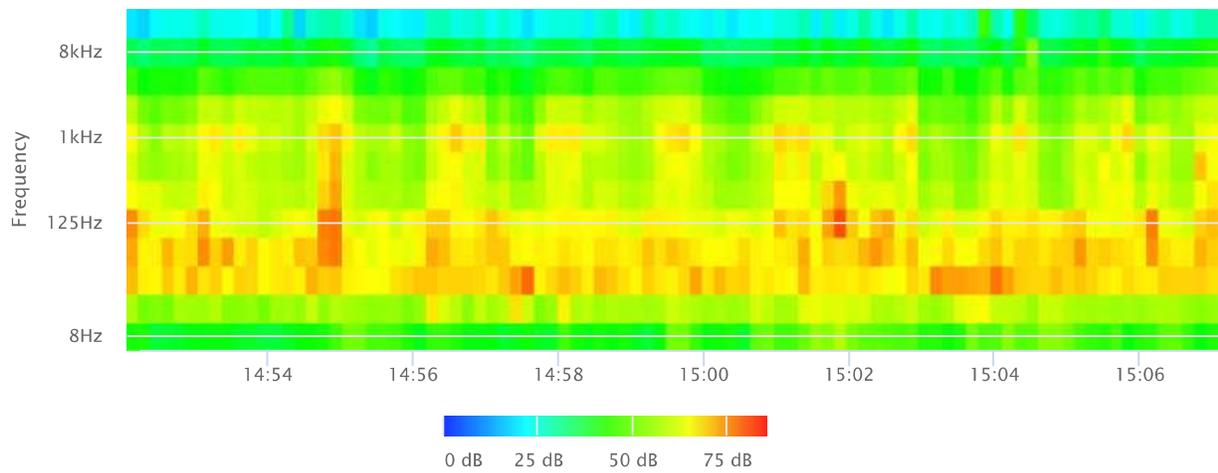
Statistics

LAS 2.0	71.7 dB
LAS 8.0	69.5 dB
LAS 25.0	66.4 dB
LAS 50.0	63.2 dB
LAS 66.6	61.3 dB
LAS 90.0	57.4 dB

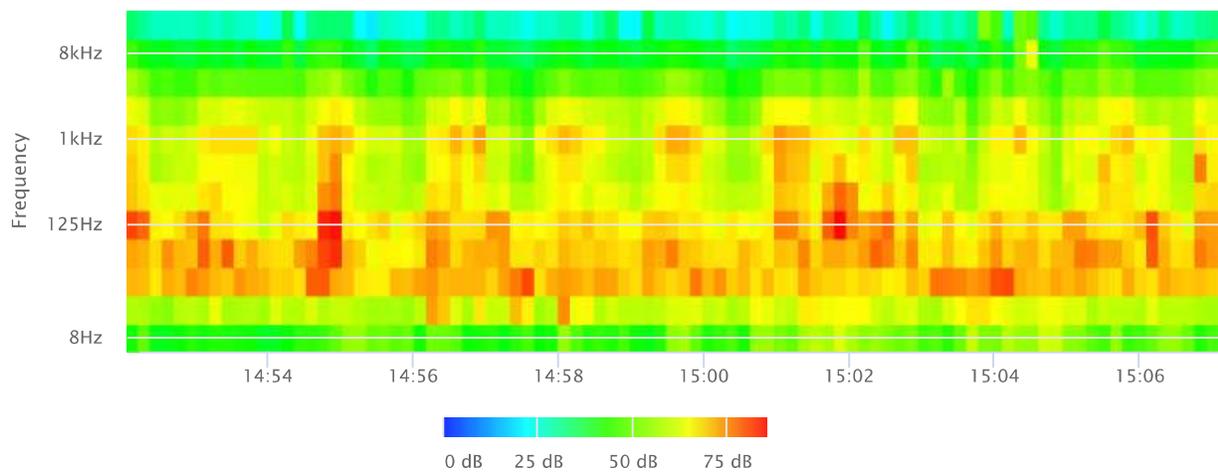
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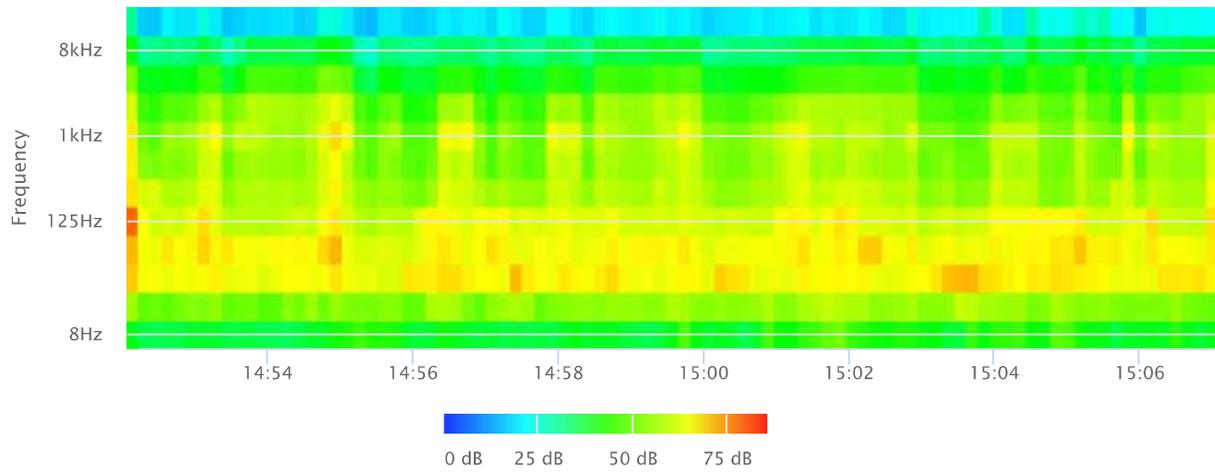
OBA 1/1 Leq



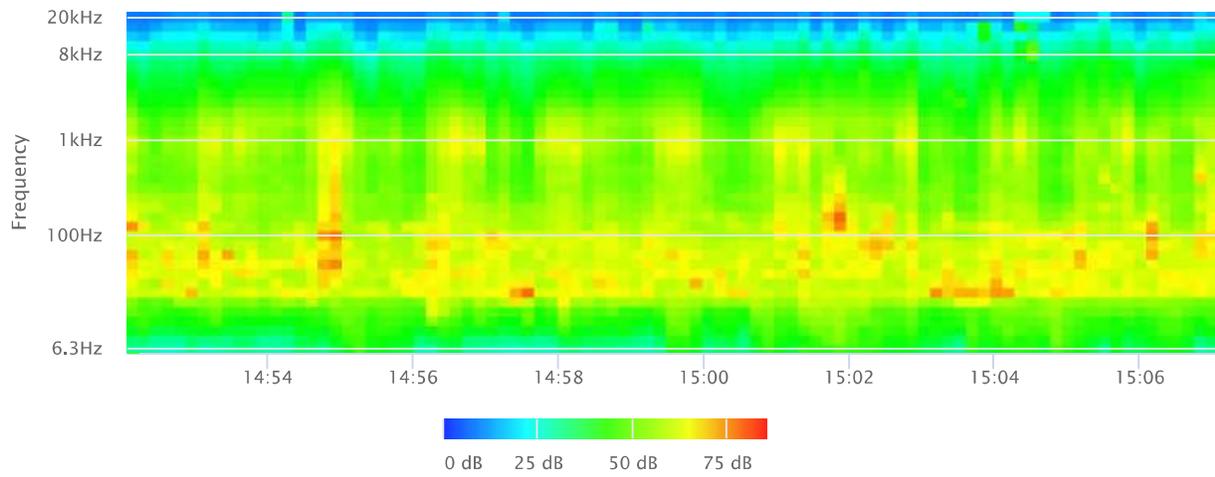
OBA 1/1 Lmax



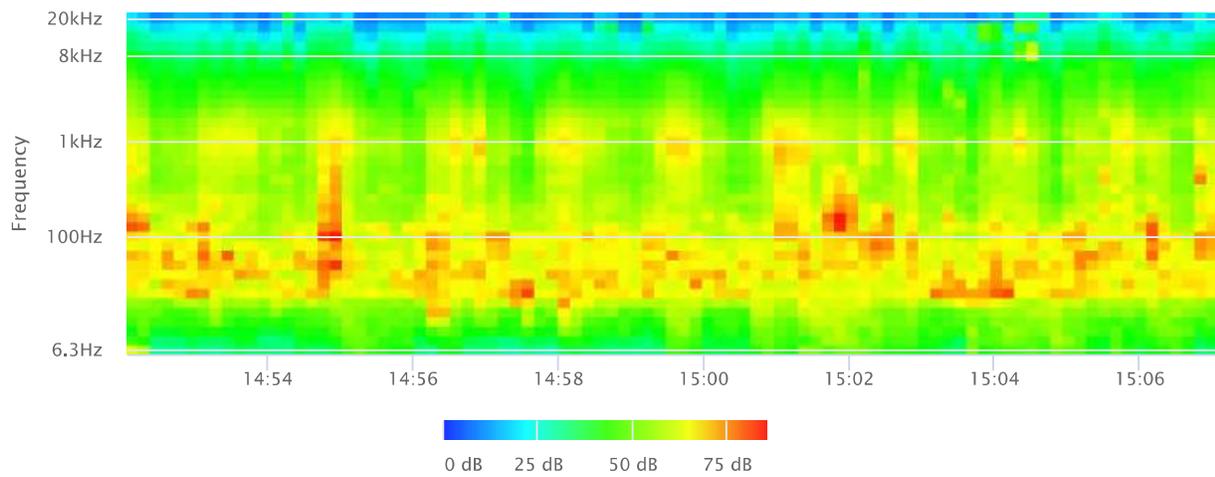
OBA 1/1 Lmin



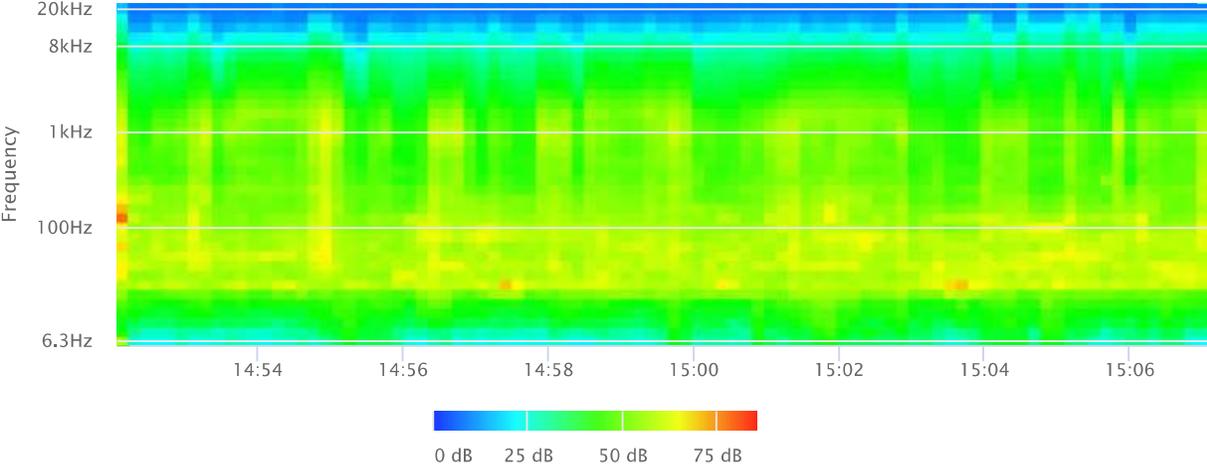
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin



Measurement Report

Report Summary

Meter's File Name LxT_Data.589.s Computer's File Name LxT_0003099-20250604 151817-LxT_Data.589.ldbin
Meter LxT1 0003099
Firmware 2.404
User Ian Edward Gallagher Location NM2 34° 8'38.41"N 118° 7'17.38"W
Job Description 15 minute noise measurement
Note KWAQN 1364 E Green Street, Pasadena
Start Time 2025-06-04 15:18:17 Duration 0:15:00.0
End Time 2025-06-04 15:33:17 Run Time 0:15:00.0 Pause Time 0:00:00.0

Results

Overall Metrics

LA _{eq}	65.3 dB		
LAE	94.8 dB	SEA	--- dB
EA	338.2 µPa²h	LAFTM5	69.3 dB
EA8	10.8 mPa²h		
EA40	54.1 mPa²h		
LA _{peak}	98.7 dB	2025-06-04 15:27:17	
LAS _{max}	78.2 dB	2025-06-04 15:27:51	
LAS _{min}	52.9 dB	2025-06-04 15:26:04	
LA _{eq}	65.3 dB		
LC _{eq}	74.7 dB	LC _{eq} - LA _{eq}	9.4 dB
LAI _{eq}	67.0 dB	LAI _{eq} - LA _{eq}	1.7 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	29	0:07:16.3
LAS > 85.0 dB	0	0:00:00.0
LAPeak > 135.0 dB	0	0:00:00.0
LAPeak > 137.0 dB	0	0:00:00.0
LAPeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
--- dB	--- dB	0.0 dB

LDEN	LDay	LEve	LNight
--- dB	--- dB	--- dB	--- dB

Any Data

	Level	A Time Stamp	Level	C Time Stamp	Level	Z Time Stamp
L _{eq}	65.3 dB		74.7 dB		--- dB	
LS _(max)	78.2 dB	2025-06-04 15:27:51	--- dB		--- dB	
LS _(min)	52.9 dB	2025-06-04 15:26:04	--- dB		--- dB	
L _{Peak(max)}	98.7 dB	2025-06-04 15:27:17	--- dB		--- dB	

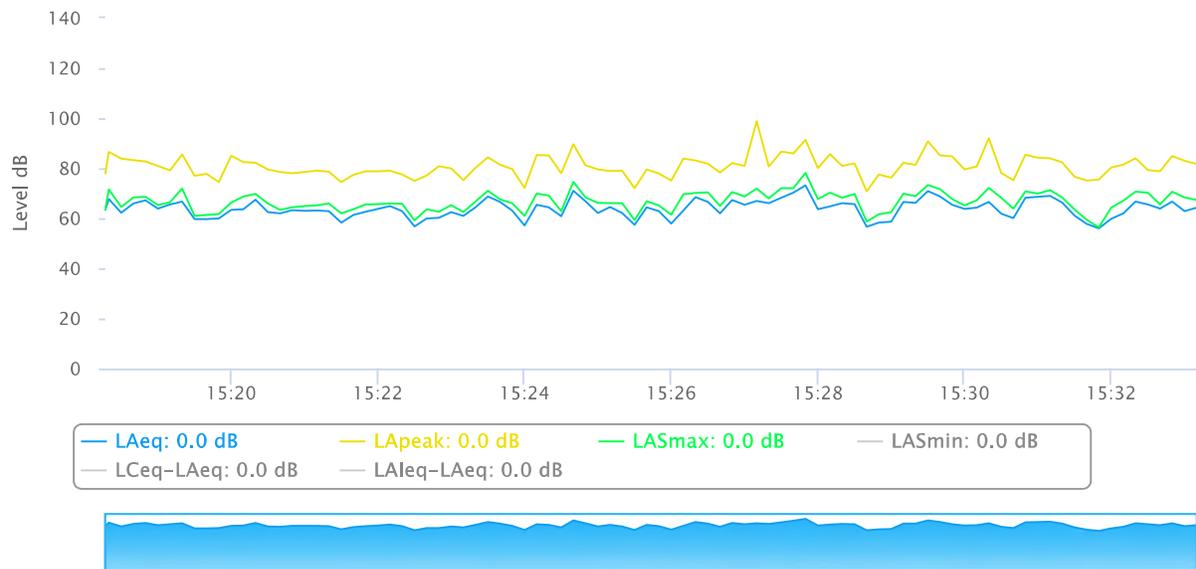
Overloads

Count	Duration	OBA Count	OBA Duration
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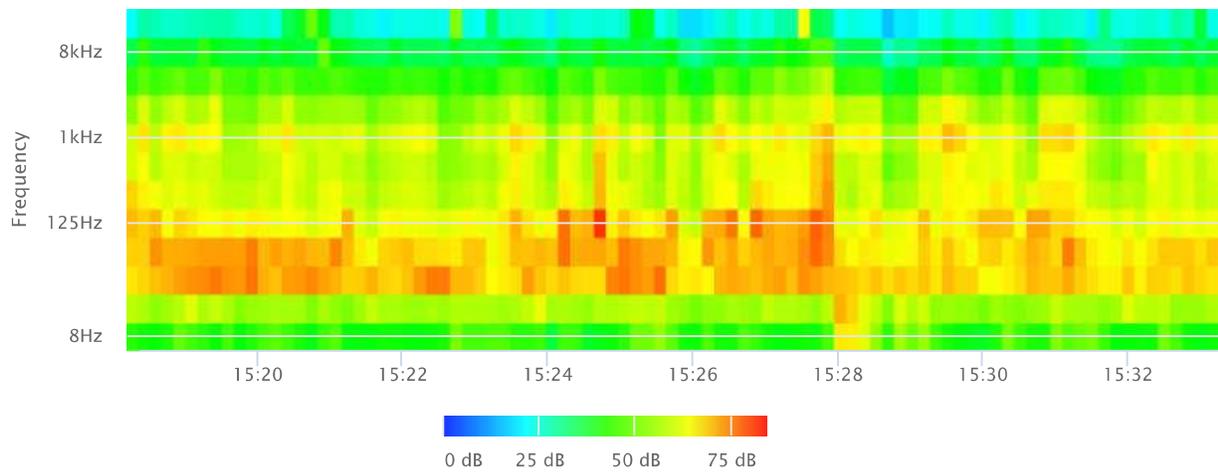
Statistics

LAS 2.0	71.3 dB
LAS 8.0	69.0 dB
LAS 25.0	66.2 dB
LAS 50.0	63.5 dB
LAS 66.6	61.5 dB
LAS 90.0	57.6 dB

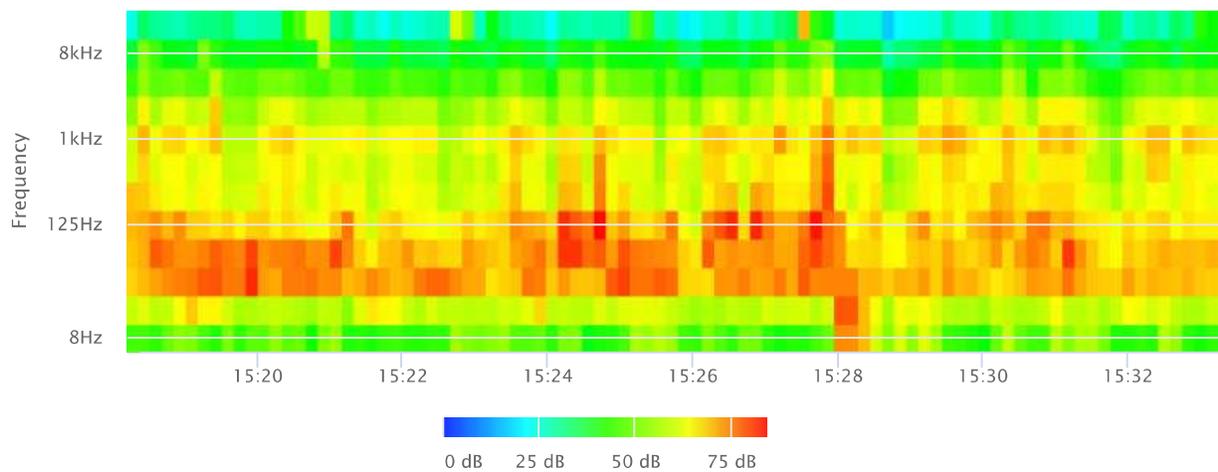
Time History



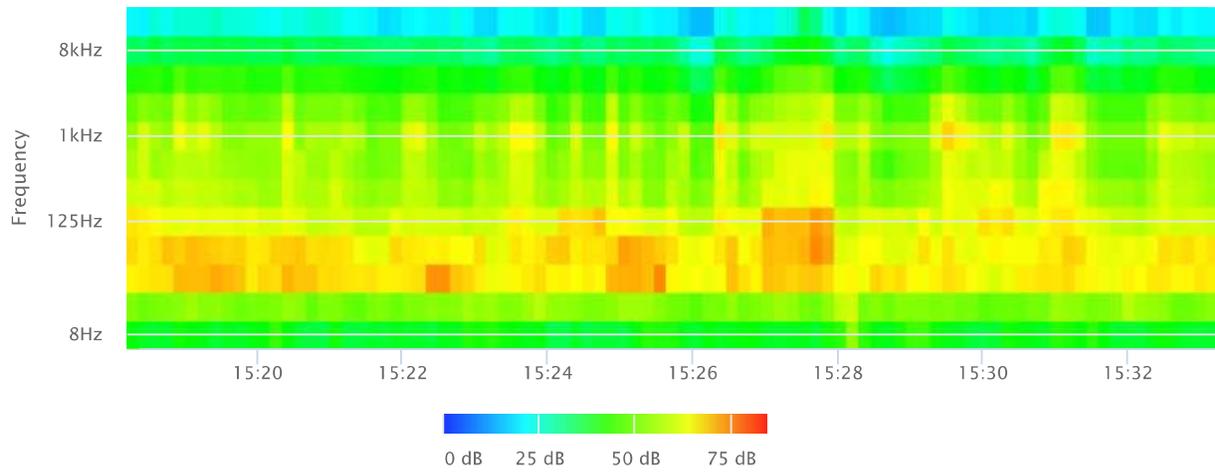
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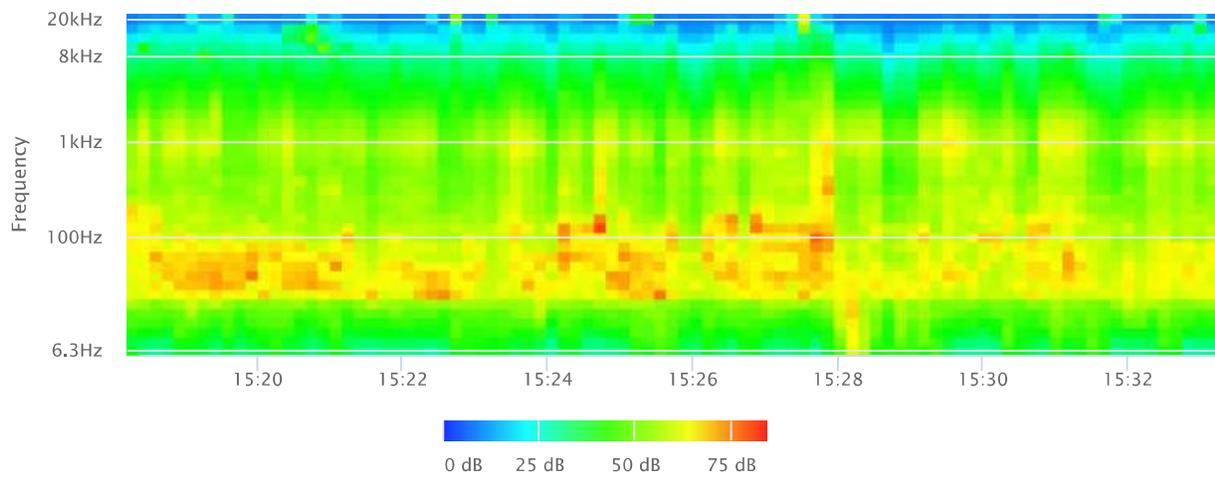
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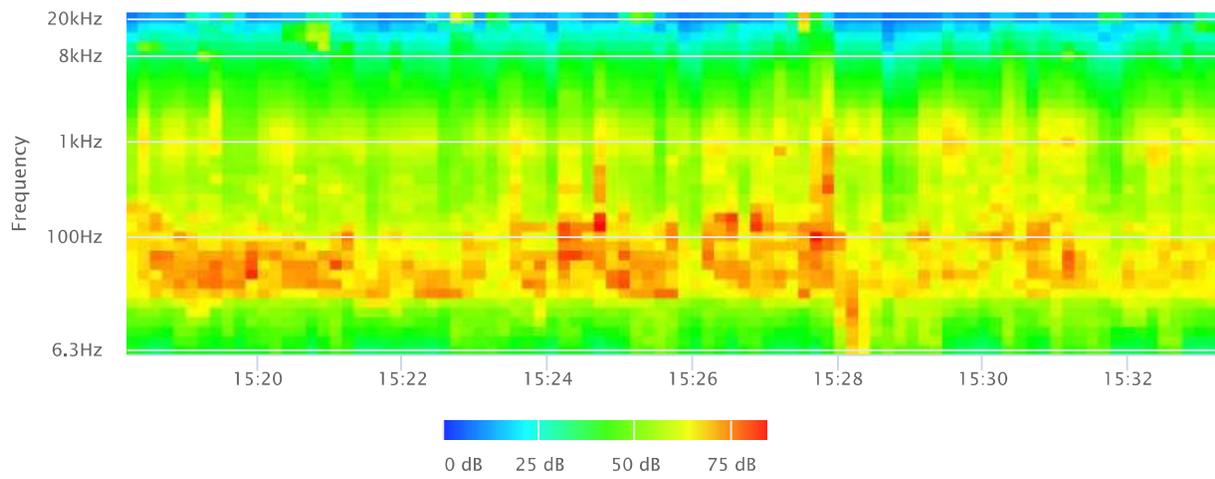
OBA 1/1 Lmin



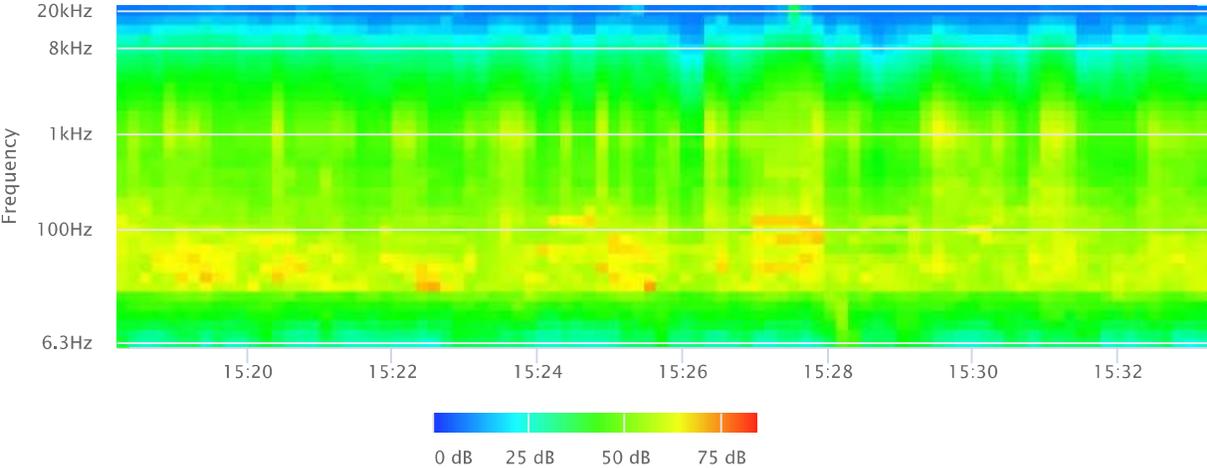
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin



Measurement Report

Report Summary

Meter's File Name LxT_Data.590.s Computer's File Name LxT_0003099-20250604 154738-LxT_Data.590.ldbin
Meter LxT1 0003099
Firmware 2.404
User Ian Edward Gallagher Location NM3 34° 8'33.85"N 118° 7'19.78"W
Job Description 15 minute noise measurement
Note KWAQN 1364 E Green Street, Pasadena
Start Time 2025-06-04 15:47:38 Duration 0:15:00.0
End Time 2025-06-04 16:02:38 Run Time 0:15:00.0 Pause Time 0:00:00.0

Results

Overall Metrics

LA _{eq}	69.2 dB		
LAE	98.7 dB	SEA	--- dB
EA	826.9 µPa²h	LAFTM5	75.4 dB
EA8	26.5 mPa²h		
EA40	132.3 mPa²h		
LA _{peak}	98.3 dB	2025-06-04 15:58:49	
LAS _{max}	85.2 dB	2025-06-04 15:58:50	
LAS _{min}	57.1 dB	2025-06-04 16:01:35	
LA _{eq}	69.2 dB		
LC _{eq}	74.0 dB	LC _{eq} - LA _{eq}	4.9 dB
LAI _{eq}	73.2 dB	LAI _{eq} - LA _{eq}	4.0 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	38	0:13:14.10
LAS > 85.0 dB	1	0:00:01.0
LA _{peak} > 135.0 dB	0	0:00:00.0
LA _{peak} > 137.0 dB	0	0:00:00.0
LA _{peak} > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
--- dB	--- dB	0.0 dB

LDEN	LDay	LEve	LNight
--- dB	--- dB	--- dB	--- dB

Any Data

	Level	A Time Stamp	Level	C Time Stamp	Level	Z Time Stamp
L _{eq}	69.2 dB		74.0 dB		--- dB	
LS _(max)	85.2 dB	2025-06-04 15:58:50	--- dB		--- dB	
LS _(min)	57.1 dB	2025-06-04 16:01:35	--- dB		--- dB	
L _{Peak(max)}	98.3 dB	2025-06-04 15:58:49	--- dB		--- dB	

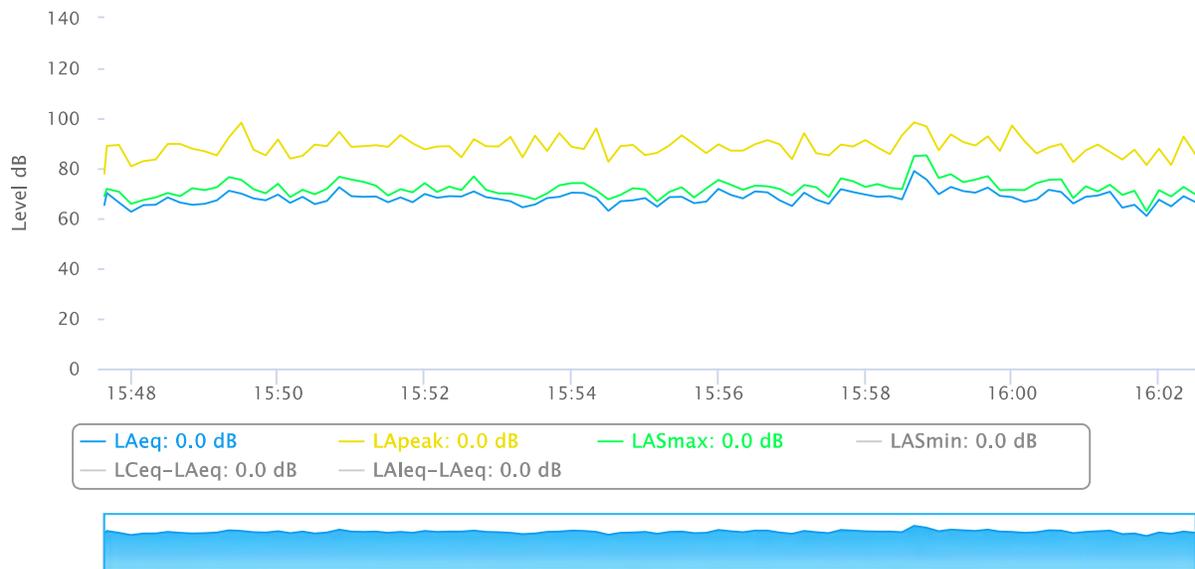
Overloads

Count	Duration	OBA Count	OBA Duration
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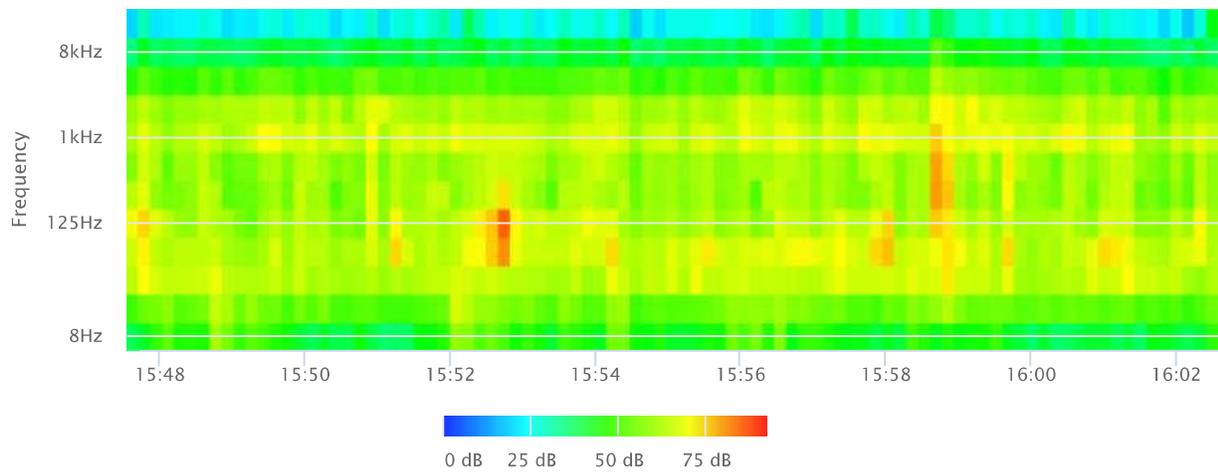
Statistics

LAS 2.0	75.0 dB
LAS 8.0	72.1 dB
LAS 25.0	69.7 dB
LAS 50.0	67.5 dB
LAS 66.6	66.1 dB
LAS 90.0	63.2 dB

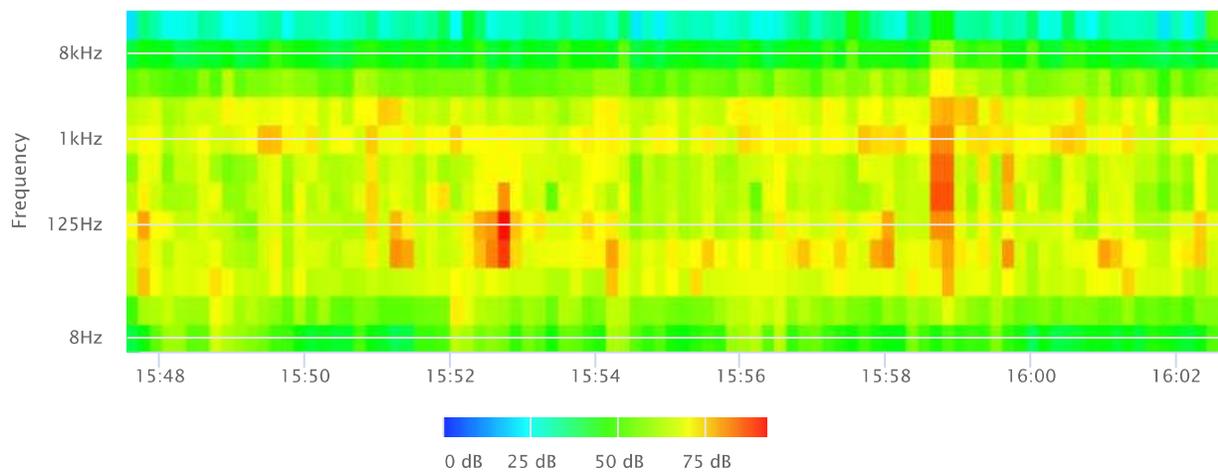
Time History



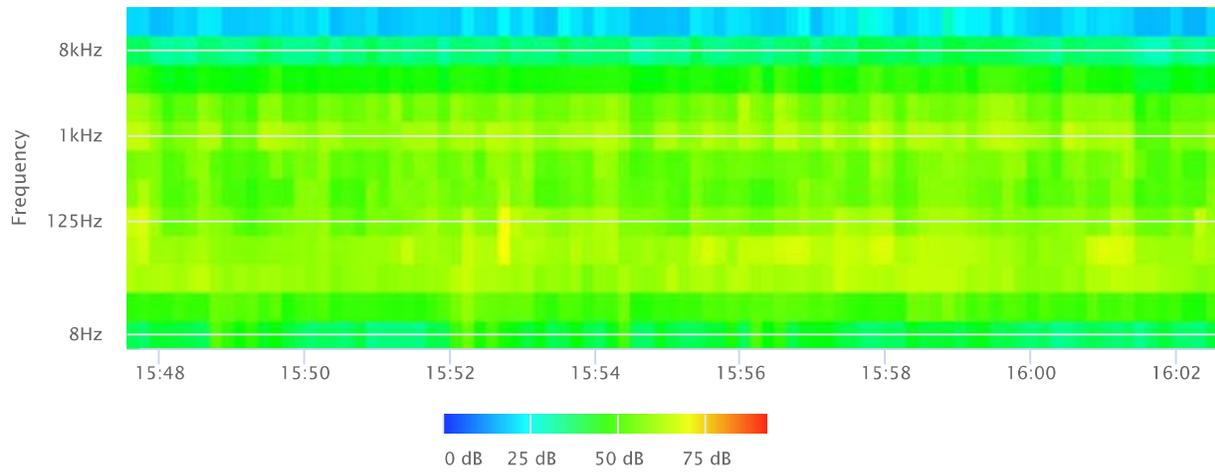
OBA 1/1 Leq



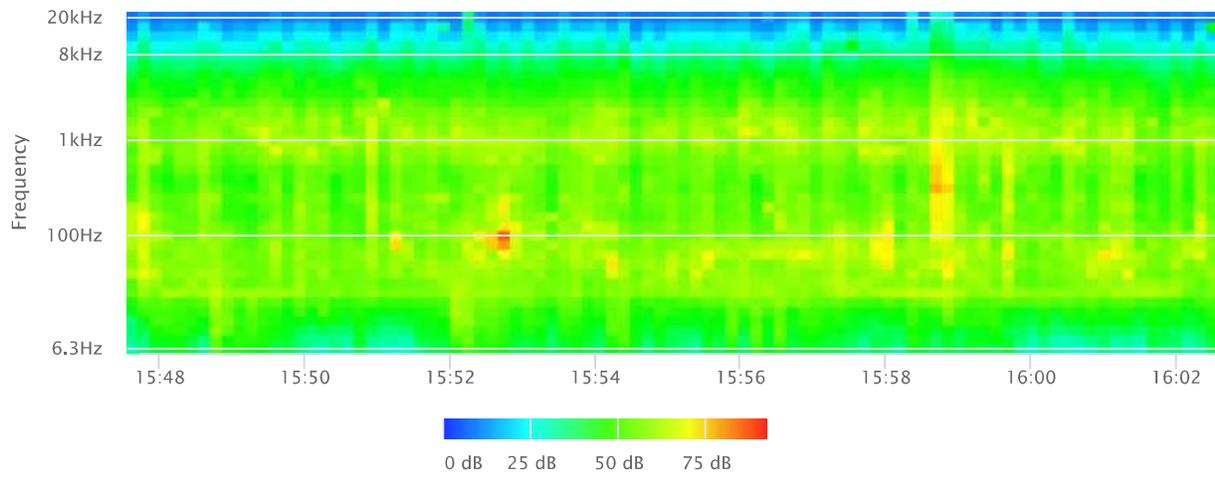
OBA 1/1 Lmax



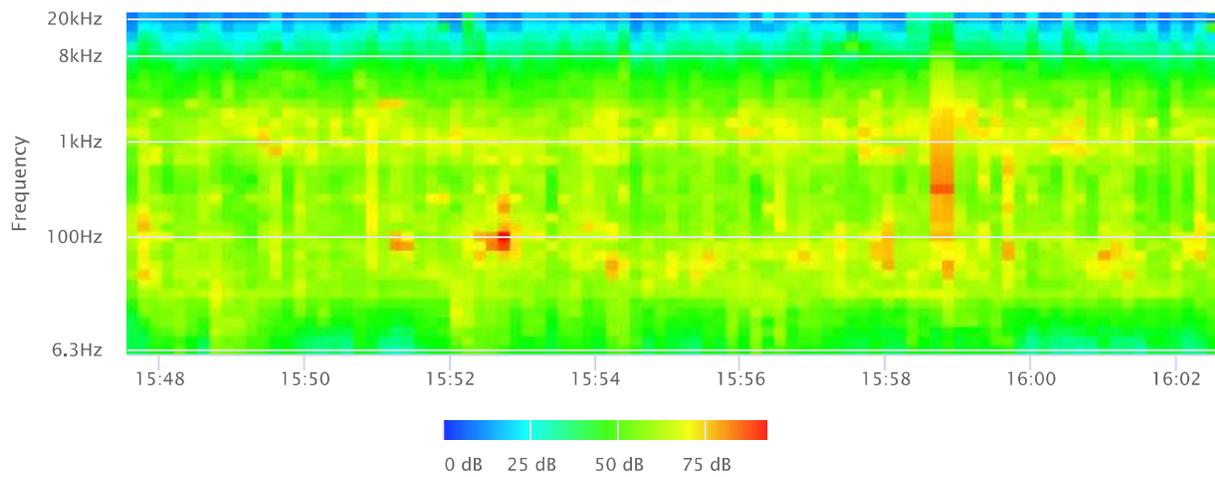
OBA 1/1 Lmin



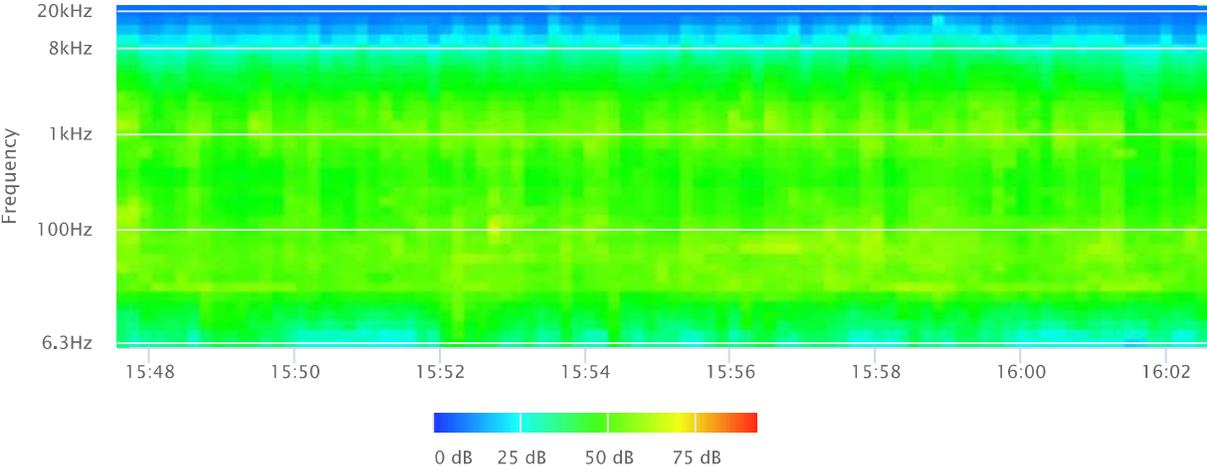
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin



Measurement Report

Report Summary

Meter's File Name LxT_Data.591.s Computer's File Name LxT_0003099-20250604 161507-LxT_Data.591.ldbin
Meter LxT1 0003099
Firmware 2.404
User Ian Edward Gallagher Location NM4 34° 8'38.59"N 118° 7'22.73"W
Job Description 15 minute noise measurement
Note KWAQN 1364 E Green Street, Pasadena
Start Time 2025-06-04 16:15:07 Duration 0:15:00.0
End Time 2025-06-04 16:30:07 Run Time 0:15:00.0 Pause Time 0:00:00.0

Results

Overall Metrics

L _{Aeq}	55.5 dB		
L _{AE}	85.1 dB	SEA	--- dB
E _A	35.8 µPa²h	LAFTM5	60.6 dB
E _{A8}	1.1 mPa²h		
E _{A40}	5.7 mPa²h		
L _{Apeak}	88.5 dB	2025-06-04 16:17:58	
L _{ASmax}	70.5 dB	2025-06-04 16:19:54	
L _{ASmin}	45.3 dB	2025-06-04 16:15:45	
L _{Aeq}	55.5 dB		
L _{Ceq}	68.5 dB	L _{Ceq} - L _{Aeq}	12.9 dB
L _{AIeq}	58.6 dB	L _{AIeq} - L _{Aeq}	3.1 dB

Exceedances

	Count	Duration
L _{AS} > 65.0 dB	4	0:00:10.9
L _{AS} > 85.0 dB	0	0:00:00.0
L _{Apeak} > 135.0 dB	0	0:00:00.0
L _{Apeak} > 137.0 dB	0	0:00:00.0
L _{Apeak} > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight	
--- dB	--- dB	0.0 dB	
LDEN	LDay	LEve	LNight
--- dB	--- dB	--- dB	--- dB

Any Data

	Level	A Time Stamp	Level	C Time Stamp	Level	Z Time Stamp
L _{eq}	55.5 dB		68.5 dB		--- dB	
L _{S(max)}	70.5 dB	2025-06-04 16:19:54	--- dB		--- dB	
L _{S(min)}	45.3 dB	2025-06-04 16:15:45	--- dB		--- dB	
L _{Peak(max)}	88.5 dB	2025-06-04 16:17:58	--- dB		--- dB	

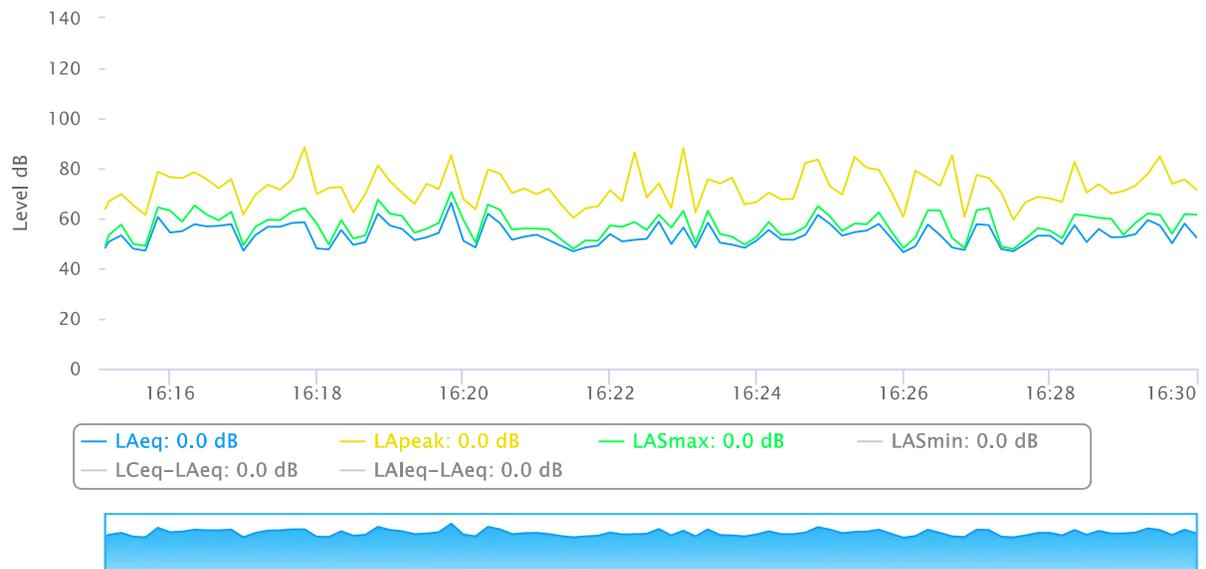
Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

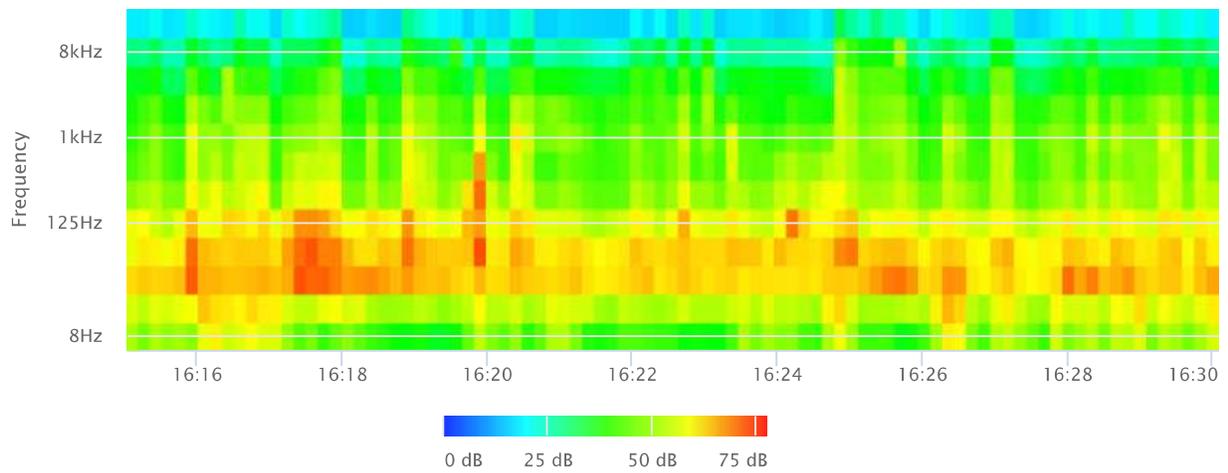
Statistics

L _{AS} 2.0	63.1 dB
L _{AS} 8.0	60.0 dB
L _{AS} 25.0	55.4 dB
L _{AS} 50.0	51.4 dB
L _{AS} 66.6	49.6 dB
L _{AS} 90.0	47.5 dB

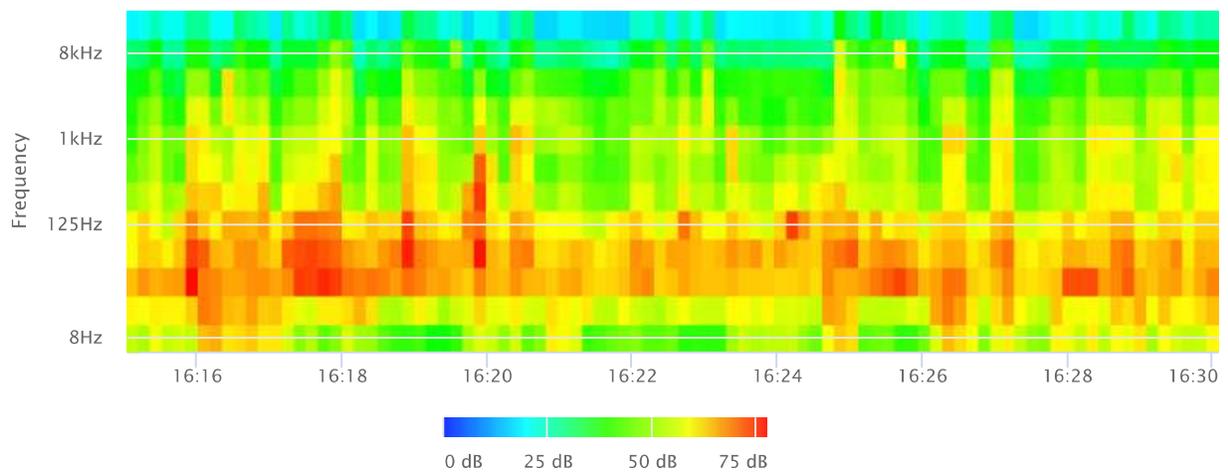
Time History



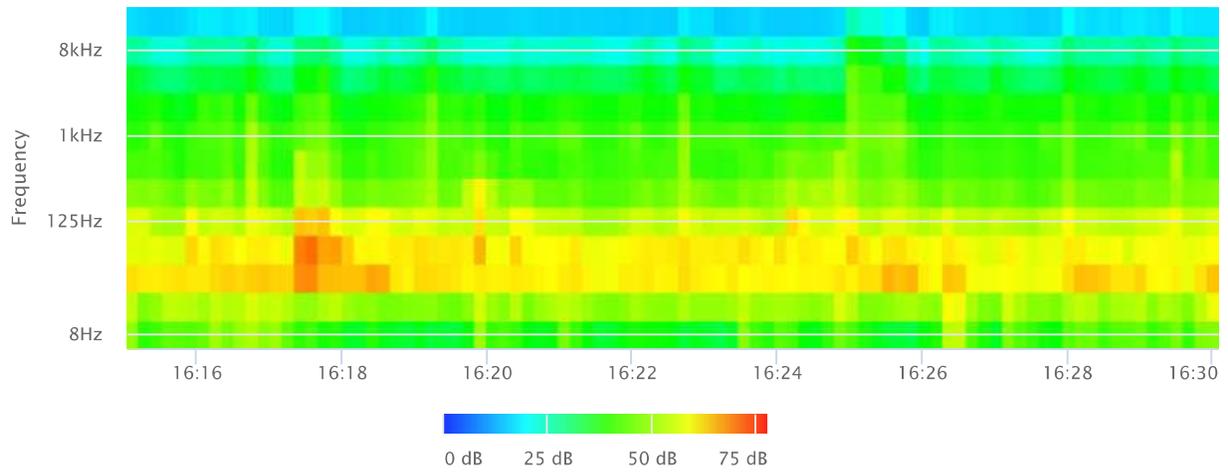
OBA 1/1 Leq



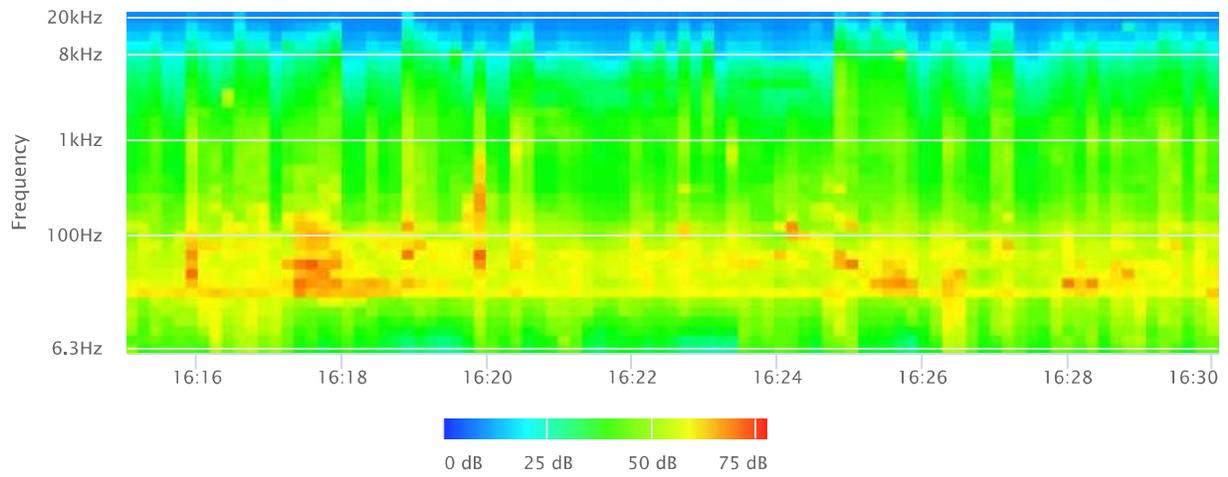
OBA 1/1 Lmax



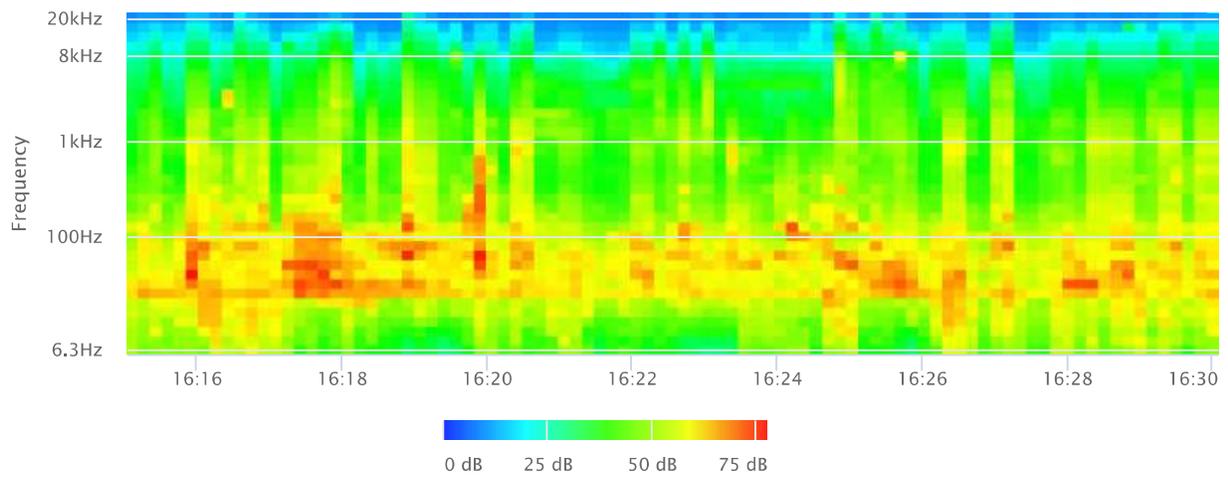
OBA 1/1 Lmin



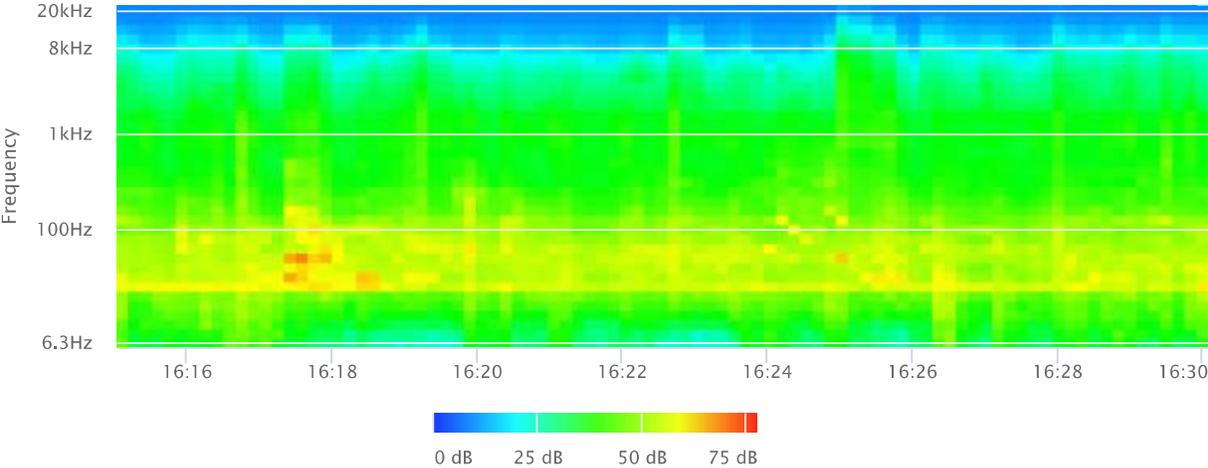
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin



APPENDIX C: RCNM CONSTRUCTION NOISE CALCULATIONS

Table A
Construction Noise by Phase - 100 feet from Source

A	B	C	D	E	F	G	H	I
Equipment Type	# of Equipment	Equipment Lmax at 50 feet, dBA ^{1,2}	Distance to Receptor ³	Equipment Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Noise Level Leq (dBA) at Receptor
Demolition								
Crawler Tractor	1	84	100	40	0.40	-6.0	-4.0	74.0
Excavators	2	81	100	40	0.80	-6.0	-1.0	74.0
Forklift	1	58	100	50	0.50	-6.0	-3.0	49.0
Scrapers	1	84	100	40	0.40	-6.0	-4.0	74.0
							Log Sum	78.8
Excavation/Grading								
Bore/drill rig	1	79	100	20	0.20	-6.0	-7.0	66.0
Excavators	3	81	100	40	1.20	-6.0	0.8	75.8
Forklift	1	58	100	50	0.50	-6.0	-3.0	49.0
							Log Sum	76.2
Building Construction								
Cranes	1	81	100	16	0.16	-6.0	-8.0	67.0
Forklifts	2	58	100	50	1.00	-6.0	0.0	52.0
Generator Sets	1	81	100	50	0.50	-6.0	-3.0	72.0
Tractors/Loaders/Backhoes	2	79	100	40	0.80	-6.0	-1.0	72.0
Welders	3	73	100	40	1.20	-6.0	0.8	67.8
							Log Sum	76.3
Architectural Coating								
Air Compressors	1	78	100	40	0.40	-6.0	-4.0	68.0
							Log Sum	68.0

Notes:

- (1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018).
- (2) Source: Seixas, N. and Neitzel, R. (2004) "Noise exposure and hearing protection device use among construction workers in Washington state," Univ. of Washington Dept. of Env. and Occup. Health Sciences Rept., accessed Sept 10 2005 at http://staff.washington.edu/rneitzel/Noise_HPDPdf

GROUNDBORNE VIBRATION ANALYSIS			
Project:	1364 E. Green St	Date:	9/12/25
Source:	Drilled piles		
Scenario:	At the eastern boundary		
Location:	Project Site		
Address:	church uses adjacent to eastern boundary		
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	3	Drilled Pile	INPUT SECTION IN GREEN
PPVref =	0.1	Reference PPV (in/sec) at 10 ft.	
D =	7.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2013, pgs 35-40.			
RESULTS			
PPV =	0.171	IN/SEC	OUTPUT IN BLUE

Equipment PPV Reference Levels

Type	Equipment	Reference PPV at 25 ft. (in/sec)*
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Drilled Pile	0.100
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

*Drilled pile reference PPV is at 10 feet (in/sec)(source: <https://tinyurl.com/264s9ybs>)

GROUNDBORNE VIBRATION ANALYSIS			
Project:	1364 E. Green St	Date:	9/12/25
Source:	Drilled piles		
Scenario:	At the western boundary		
Location:	Project Site		
Address:	Multi-family residential use 80 feet from the western boundary		
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	3	Drilled Pile	INPUT SECTION IN GREEN
PPVref =	0.1	Reference PPV (in/sec) at 10 ft.	
D =	80.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2013, pgs 35-40.			
RESULTS			
PPV =	0.004	IN/SEC	OUTPUT IN BLUE

Equipment PPV Reference Levels

Type	Equipment	Reference PPV at 25 ft. (in/sec)*
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Drilled Pile	0.100
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

*Drilled pile reference PPV is at 10 feet (in/sec)(source: <https://tinyurl.com/264s9ybs>)

GROUNDBORNE VIBRATION ANALYSIS

Project: 1364 E. Green St Date: 9/12/25
Source: Vibrated piles
Scenario: At the northern boundary
Location: Project Site
Address: Historical library use 180 feet to the north
PPV = $PPV_{ref}(25/D)^n$ (in/sec)

INPUT

Equipment = 3 Pile Driver (sonic) INPUT SECTION IN GREEN
Type
PPVref = 0.17 Reference PPV (in/sec) at 25 ft.
D = 180.00 Distance from Equipment to Receiver (ft)
n = 1.50 Vibration attenuation rate through the ground

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2013, pgs 35-40.

RESULTS

PPV = 0.009 IN/SEC OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project: 1364 E. Green St Date: 9/12/25
Source: Vibrated piles
Scenario: At western boundary
Location: Project Site
Address: PCC child care located 115 feet from western boundary
PPV = $PPV_{ref}(25/D)^n$ (in/sec)

INPUT

Equipment = 3 Pile Driver (sonic) INPUT SECTION IN GREEN
Type
PPVref = 0.17 Reference PPV (in/sec) at 25 ft.
D = 115.00 Distance from Equipment to Receiver (ft)
n = 1.50 Vibration attenuation rate through the ground

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2013, pgs 35-40.

RESULTS

PPV = 0.017 IN/SEC OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project: 1364 E. Green St Date: 9/12/25
Source: Small Bulldozer
Scenario: At the area of activity
Location: Project Site
Address: Church building use adjacent to eastern boundary
PPV = $PPV_{ref}(25/D)^n$ (in/sec)

INPUT

Equipment = **6** Small Bulldozer INPUT SECTION IN GREEN
Type
PPVref = 0.003 Reference PPV (in/sec) at 25 ft.
D = **7.00** Distance from Equipment to Receiver (ft)
n = **1.50** Vibration attenuation rate through the ground

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2013, pgs 35-40.

RESULTS

PPV = **0.020** IN/SEC OUTPUT IN BLUE

1364 E. Green St - Shoring Pile Legend

- Drilled Pile 
- Vibrated Pile 

E GREEN STREET

CENTERLINE OF STREET

S HOLLISTON AVENUE



SHEET NOTES

CALTECH INNOVATION CENTER

1364 East Green Street
Pasadena, CA 91106

Gensler

500 South Figueroa Street
Los Angeles, California 90071
United States
Tel 213.327.3600
Fax 213.327.3601

Trammell Crow Company

2221 Rosecrans Ave
Suite 200
El Segundo, CA 90245
Tel 310.363.4700

DPR CONSTRUCTION
4665 MacArthur Ct
Suite 100
Newport Beach, CA 92660
Tel 949.955.3771

SAIFUL BOUQUET
STRUCTURAL ENGINEERS
725 S Figueroa St
37th Floor
Los Angeles, CA 90017
Tel 213.315.2277

EXP
330 N Brand Blvd
#550
Glendale, CA 91203
Tel 818.539.1110

KPFF
700 S Flower St
Suite 2100
Los Angeles, CA 90017
Tel 213.418.0201

SWA
811 W 7th St
8th Floor
Los Angeles, CA 90017
Tel 213.236.9090

LEGEND

Date	Description
1 08/08/2025	CONCEPT DESIGN REVIEW SUBMITTAL

Seal / Signature

NOT FOR CONSTRUCTION

Project Name
CALTECH INNOVATION CENTER

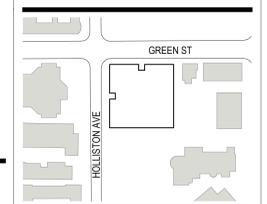
Project Number
05.4988.000

Description
PROPOSED SITE PLAN

Scale
As indicated

PAS-A1.102

VICINITY MAP



Fehr & Peers

1364 E. Green Street

Final CEQA Report

Prepared for:
City of Pasadena

Submitted on:
December 4, 2025



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1. Introduction

This report summarizes the results of a transportation analysis for the proposed Research and Development building located at 1364 E. Green Street (Project) in the City of Pasadena. This report provides California Environmental Quality Act (CEQA) transportation analysis including the net changes in vehicle miles traveled (VMT) per capita, vehicle trips (VT) per capita, the project impact on service population proximity access to transit and bike facilities and walk accessibility score.

1.1 Project Description

The Project site is located at 1364 E. Green Street and is currently improved with 115 stalls of existing surface parking spanning all 3 parcels. The proposed project will be a 4-story Research and Development building, with Lab/Office spaces on the ground level, a terrace on the top occupiable floor, along with 3 subterranean levels of parking. Vehicle access to the parking garage will be provided via an inbound driveway on Holliston Avenue, at the west side of the site, and an outbound driveway on Green Street, at the north side of the site. **Figure 1** shows the project site plan.

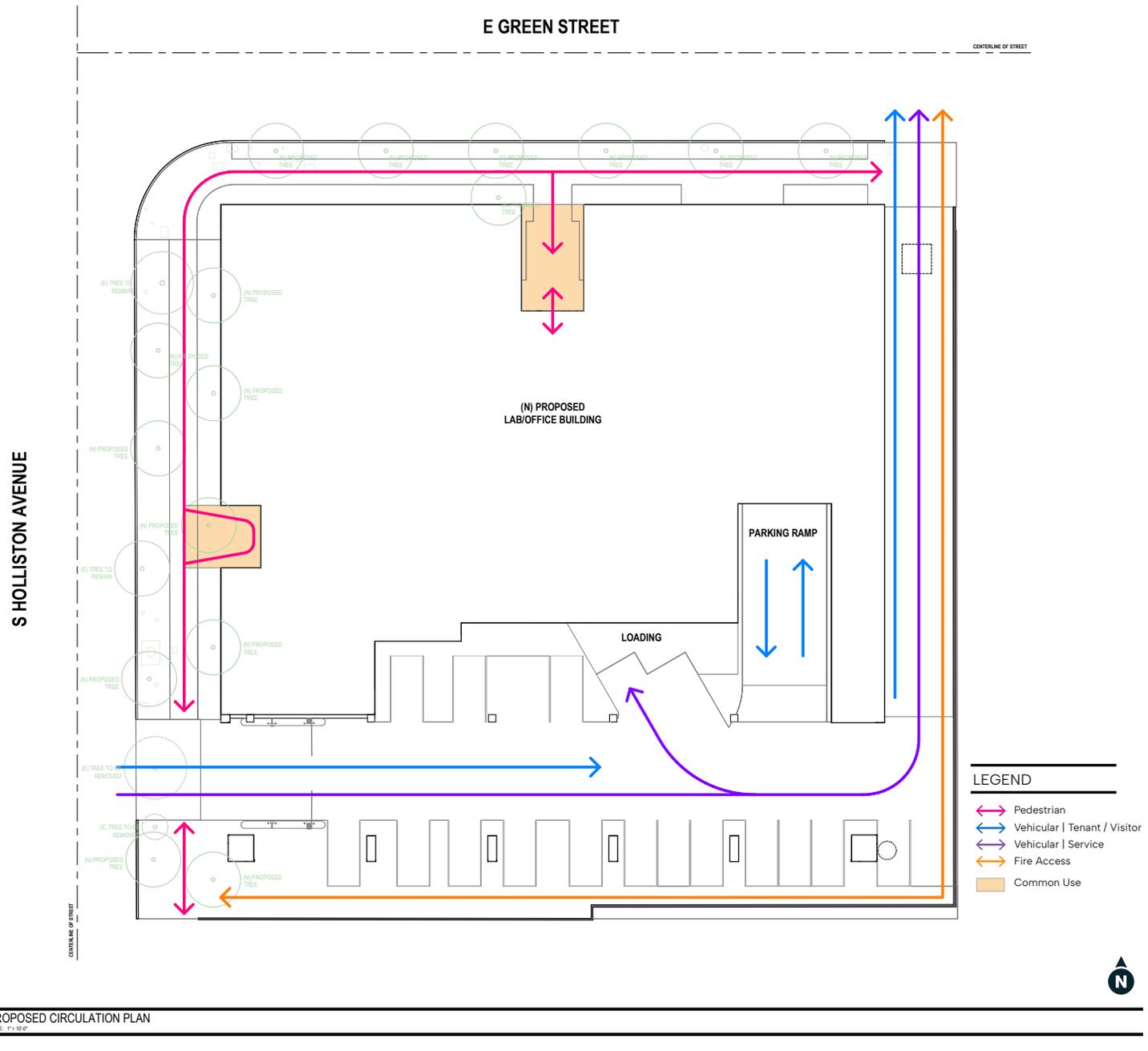


FIGURE 1

Project Site Plan

2. Existing Transportation Network

This chapter describes the roadway system in the vicinity of the Project. The existing configurations of the transportation network within the study area are described below.

2.1 Existing Street System

Colorado Boulevard, oriented in an east–west direction, is designated as a City Connector. The roadway consists of two lanes in each direction with a painted median within the study area. The roadway has a posted speed limit of 30 mph and on–street parking is provided.

Green Street, oriented in an east–west direction, is designated as a City Connector. The roadway is a one–way street in the eastbound direction that consists of three lanes. The roadway has a posted speed limit of 30 mph and on–street parking is provided.

Cordova Street, oriented in an east–west direction, is designated as a Neighborhood Connector. The roadway consists of one lane in each direction with a center two–way left–turn lane and a Class II bicycle lane. The roadway has a posted speed limit of 35 mph and on–street parking is provided.

Del Mar Boulevard, oriented in an east–west direction, is designated as a City Connector. The roadway consists of two lanes in each direction. The roadway has a posted speed limit of 35 mph and on–street parking is provided.

Wilson Avenue, oriented in a north–south direction, is designated as a Neighborhood Connector. The roadway consists of one lane in each direction, with a Class II bicycle lane. On–street parking is provided.

Michigan Avenue, oriented in a north–south direction, is designated as an Access roadway. The roadway consists of one lane in each direction and has an offset configuration at Colorado Boulevard. On–street parking is provided on the west side of the street north of Colorado Boulevard and both sides of the street south of Colorado Boulevard.

Chester Avenue, oriented in a north–south direction, is designated as an Access roadway. The roadway consists of one lane in each direction and has an offset configuration at Colorado Boulevard. On–street parking is provided.

Holliston Avenue, oriented in a north–south direction, is designated as an Access roadway. The roadway consists of one lane in each direction. On–street parking is provided on the west side of the street except between Colorado Boulevard and Green Street where parking is on the east side of the street.

Hill Avenue, oriented in a north–south direction, is designated as a City Connector within the study area. The roadway consists of two lanes in each direction in the study area. The roadway has a posted speed limit of 30 mph and on–street parking is generally provided on both sides of the street.

Figure 2 shows the existing street network and classifications in the study area.

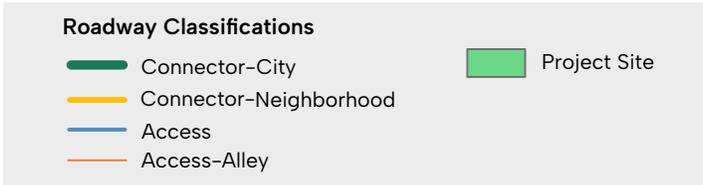
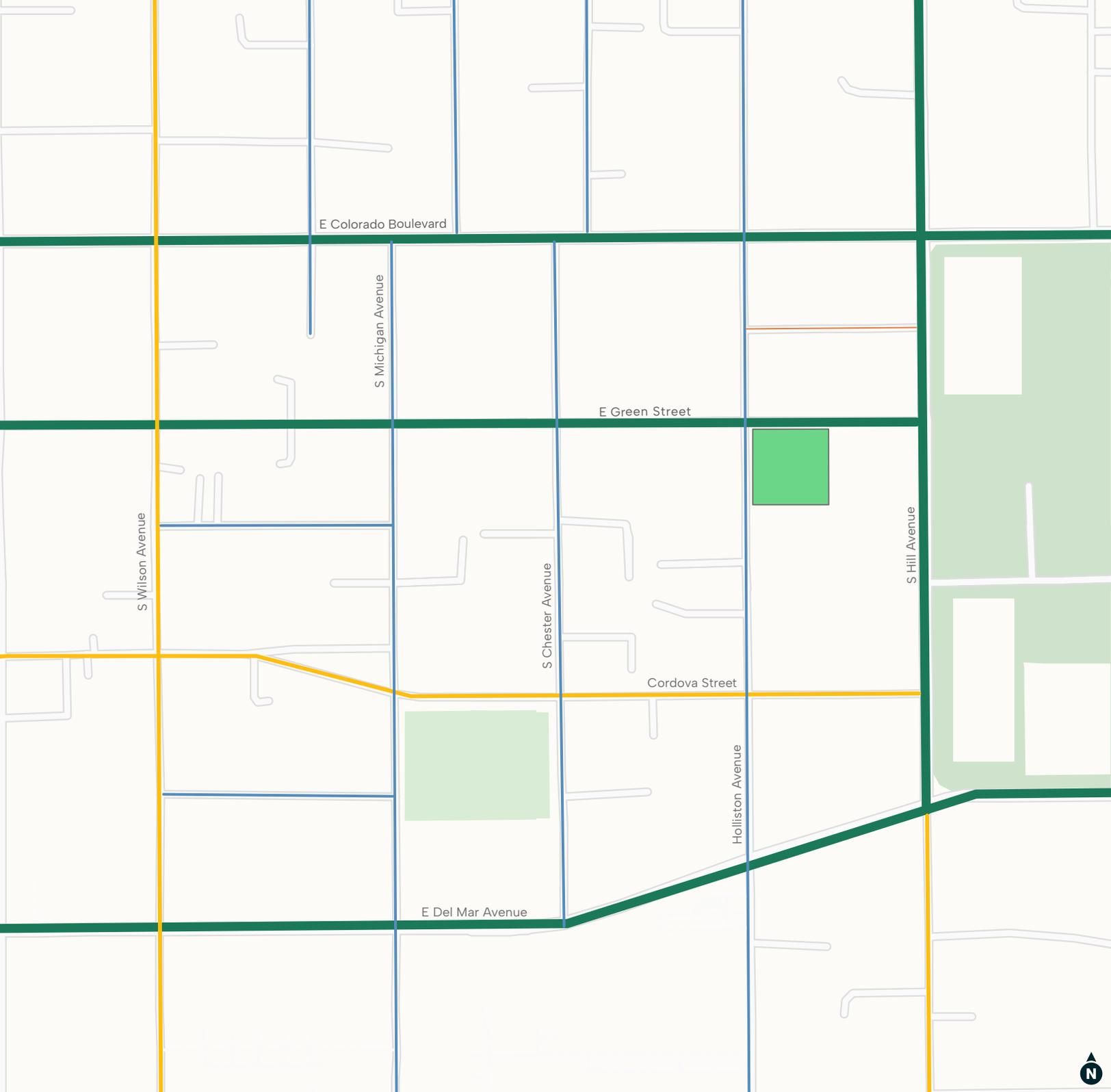


FIGURE 2

Roadway Classifications

2.2 Existing Transit Service

LA Metro, Pasadena Transit and Foothill Transit provide transit services in the study area. The bus stop locations, per line, are summarized in **Table 1**.

Table 1. Existing Transit Service Stop Locations

Location	LA Metro Route	Foothill Transit	Pasadena Transit
Colorado Blvd / Hill Ave			
Northwest corner	180	187	None
	267		
Southeast corner	180	None	None
	267		
Del Mar Blvd / Hill Ave			
Northwest corner	267	None	10
Southwest corner	267	None	10

Source: Fehr & Peers.

3. Transportation Analysis Methodology

This chapter discusses the methodologies and thresholds used in the CEQA transportation analysis. As detailed in **Table 2**, several performance measures were analyzed for this study to assess the quality of walking, biking, transit, and vehicular activity in the City. After calculating each of the performance measures, the resulting values were compared to the City of Pasadena CEQA thresholds of significance to determine impact significance.

Table 2. City of Pasadena CEQA Performance Measures & Thresholds of Significance

Metric	Description	Impact Threshold
VMT Per Capita	Vehicle Miles Traveled (VMT) in the City of Pasadena per service population (population + jobs).	Net change in VMT per SP is 16.8% below Citywide average baseline. 2017 Baseline: 35.6 16.8% Below Baseline Threshold: 29.6
VT per Capita	Vehicle Trips (VT) in the City of Pasadena per service population (population + jobs).	Net change in VT per SP is 16.8% below Citywide average baseline. 2017 Baseline: 4.2 16.8% Below Baseline Threshold: 3.5
Proximity and Quality of Bicycle Network	Percent of service population (population + jobs) within a ¼ mile of bicycle facility types.	Any decrease in baseline Citywide SP within a ¼ mile of Levels 1 & 2 bike facilities. 2017 Baseline: 32.3% Threshold: 32.3%
Proximity and Quality of Transit Network	Percent of service population (population + jobs) located within a ¼ mile of transit facility types.	Any decrease in baseline Citywide SP within a ¼ mile of Levels 1 & 2 transit facilities. 2017 Baseline: 66.8% Threshold: 66.8%
Pedestrian Accessibility	The Pedestrian Accessibility Score uses the mix of destinations and a network-based walk shed to evaluate walkability.	Any decrease in the Citywide Pedestrian Accessibility Score. 2017 Baseline: 3.9 Threshold: 3.9

Source: Fehr & Peers.

3.1 Vehicle Miles Traveled per Capita

The Vehicle Miles Traveled (VMT) per Capita measure sums the vehicle miles traveled using the current City of Pasadena Citywide Travel Demand Model. The total VMT considers trips that begin inside Pasadena, end inside Pasadena, or both, and includes 100% of the distance traveled on these trips. The City's VMT is then divided by the City's total service population, defined as the population plus the number of jobs.

A project's contribution to the citywide VMT per capita is determined by comparing the citywide VMT per service population without the project to the citywide VMT per service population with the project. The project's incremental influence/contribution on Citywide VMT per capita is compared to the adopted CEQA threshold to determine the significance of environmental impacts.

Although VMT itself will likely increase with the addition of new residents, the City can reduce VMT on a per-capita basis with land use policies that help Pasadena residents meet their daily needs within a short distance from home, reducing trip lengths, and by encouraging development in areas with access to various modes of transportation other than auto.

3.2 Vehicle Trips per Capita

Vehicle Trips (VT) per Capita is a measure of motor vehicle trips associated with the City. The measure sums the trips with origins and destinations within the City of Pasadena, as generated by the current City of Pasadena Citywide Travel Demand Model. The total VT is calculated by adding the VT associated with trips generated and attracted within the City of Pasadena boundaries, and 100% of the VT associated with trips that either begin or end in the City, but have one trip end outside of the City. The City's VT is then divided by the City's total service population, defined as the population plus the number of jobs.

A project's contribution to the citywide VT per capita is determined by comparing the citywide VT per service population without the project to the citywide VT per service population with the project. The project's incremental influence/contribution on Citywide VT per capita is compared to the adopted CEQA threshold to determine the significance of environmental impacts.

As with VMT, VT itself will likely increase with the addition of new residents, but the City can reduce VT on a per-capita basis with land use policies that help Pasadena residents meet their daily needs within a short distance from home, reducing trip lengths, and by encouraging development in areas with access to various modes of transportation other than auto.

3.3 Proximity and Quality of Bicycle Network

The Proximity and Quality of Bicycle Network provides a measure of the percent of the City's service population (population + jobs) within 0.25-miles of each of three bicycle facility types. The facility types are aggregated into three hierarchy levels, obtained from the City's Bicycle Transportation Action Plan categories shown in **Table 3** below.

Table 3. Bicycle Facilities Hierarchy

Level	Description	Facilities Included
1	Advanced Facilities	<ul style="list-style-type: none"> • Bike Paths • Multipurpose Paths • Cycle Tracks/Protected Bike Lanes
2	Dedicated Facilities	<ul style="list-style-type: none"> • Buffered Bike Lanes • Bike Lanes • Bike Boulevards
3	Basic Facilities	<ul style="list-style-type: none"> • Bike Routes • Enhanced Bike Routes • Emphasized Bikeways

Source: Fehr & Peers.

The proximity and quality of the bicycle network is assessed by estimating the percent of service population access within 0.25-miles of Levels 1 and 2 bicycle facilities with the construction and occupancy of a proposed project. The resulting percent of service population is compared to the adopted CEQA threshold to determine the significance of environmental impacts.

The City can improve the measure of Bike Facility Access by improving and expanding existing bike facilities and by encouraging residential and commercial development in areas with high-quality bike facilities.

3.4 Proximity and Quality of Transit Network

The Proximity and Quality of Transit Network provides a measure of the percent of the City's service population (population + jobs) within 0.25-miles of each of three transit facility types, as defined in the City's Streets Types Plan and shown in **Table 4** below.

Table 4. Transit Facilities Hierarchy

Level	Facilities Included
1	Includes all L ("Gold") Line stops as well as corridors with transit service, whether it be a single route or multiple routes combined, with headways of five minutes or less during the peak periods.
2	Includes corridors with transit headways between 6 and 15 minutes in peak periods.
3	Includes corridors with transit headways of 16 minutes or more in peak periods.

Source: Fehr & Peers.

The proximity and quality of the transit network is assessed by estimating the percent of service population access within 0.25-miles of Levels 1 and 2 transit facilities with the construction and occupancy of a proposed project. The resulting percent of service population is compared to the adopted CEQA threshold to determine the significance of environmental impacts.

The City can improve the measure of Transit Proximity and Quality by reducing headways on existing transit routes, by expanding transit routes to cover new areas, and by encouraging residential and commercial development to occur in areas with an already high-quality transit service.

3.5 Pedestrian Accessibility

The Pedestrian Accessibility metric provides a measure of the average walkability in the transportation analysis zone (TAZ) surrounding Pasadena residents. The metric is a simple count of the number of land use types accessible to a Pasadena resident or employee in a given TAZ within a 5-minute walk. The ten categories of land uses are:

- Retail
- Personal Services
- Restaurant
- Entertainment
- Office (including private sector and government offices)
- Medical (including medical office and hospital uses)
- Culture (including churches, religious, and other cultural uses)
- Park and Open Space
- School (including elementary and high schools)
- College

The City can improve the Pedestrian Accessibility Score by:

- Encouraging residential and commercial development in areas with high existing Pedestrian Accessibility Scores; and
- Attracting mixed-use development and new land use types to increase the Pedestrian Accessibility metric values of other areas

4. Transportation Impact Analysis

This chapter presents the results of the CEQA transportation impact analysis utilizing the methodologies described in Chapter 3.

4.1 VMT and VT Analysis

VMT per Capita and VT per Capita are analyzed using the City of Pasadena travel demand model (model) which utilizes the TransCAD software environment. The proposed Project land use was entered into the model’s land use database as a 93,539 square foot office¹. **Table 5** summarizes the results of the proposed Project’s VMT and VT impacts on the transportation system. The results are based on the Project’s motorized and non-motorized travel patterns, trip lengths, surrounding land uses, the City’s transportation network, and the VMT reducing effects of proposed project design features that would encourage non-motorized travel to and from the Project site. The proposed project design features comprise a combination of transportation demand management (TDM) strategies detailed in the California Air Pollution Control Officers Association (CAPCOA) *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity (2024)*, including implementation of a commute trip reduction program with mandatory monitoring (Strategy T-6) and employee parking cash-out (Strategy T-13). The CAPCOA Handbook summarizes the state of the practice regarding the quantification of greenhouse gas emission and VMT reduction measures, with a focus on project-level actions.

Appendix A includes the model post-processor worksheet used to calculate the performances measures and the worksheet used to calculate the reduction in project-related VMT resulting from implementation of the proposed project design features.

Table 5. VMT and VT Performance Measures Analysis Results

Performance Measure	16.8% Baseline Threshold	Project-Related Incremental Change	Significant Impact?
VMT per Capita	29.6 VMT per Capita	28.0 VMT per Capita	No
VT per Capita	3.5 VT per Capita	2.4 VT per Capita	No

Source: Fehr & Peers.

As summarized in **Table 5**, the incremental/net change in VMT per capita and VT per capita is not forecasted to exceed the City’s adopted thresholds.

¹ While the City of Pasadena travel demand model does not include an R&D land use category, the proposed Project’s daily trip generation and arrival/departure patterns are anticipated to be similar to the model’s ‘General Office’ land use category.

4.2 Proximity and Quality of Bicycle and Transit Networks

The proposed Project is located within 0.1 miles of the bicycle lanes on Cordova Street, which qualifies as a Level 2 facility. As such, the proposed Project would result in a small increase in the service population that lives or works within 0.1 miles of a Level 1 or Level 2 bicycle facility and would not result in a significant impact to the Proximity and Quality of the Bicycle Network. Additionally, the proposed Project would result in a small increase in the service population that lives or works within 0.25 miles of a Level 1 or Level 2 transit facility. As such, the proposed Project would not result in a significant impact to the Proximity and Quality of the Transit Network. **Table 6** summarizes the existing and existing plus project evaluation of the Proximity and Quality of Bicycle and Transit networks.

Table 6. Proximity and Quality of Bicycle and Transit Network Performance Measures Analysis Results

Performance Measure	Existing Value	Existing Plus Project Value	Significant Impact?
Proximity and Quality of Bicycle Network	32.3% of population and jobs	32.3% of population and jobs	No
Proximity and Quality of Transit Network	66.8% of population and jobs	66.8% of population and jobs	No

Source: Fehr & Peers.

As summarized in **Table 6**, the project is not forecasted to exceed the Proximity and Quality of Bicycle and Transit Network thresholds.

4.3 Pedestrian Accessibility

Given the average walkability in the zone because of the number of land use types accessible to the service population, the Pedestrian Accessibility score would not be decreased. Therefore, the project is not forecasted to result in a decrease in the existing Pedestrian Accessibility Score threshold. **Table 7** summarizes the existing and existing plus project evaluation of the pedestrian accessibility.

Table 7. Pedestrian Accessibility Analysis Results

Performance Measure	Existing Value	Existing Plus Project Value	Significant Impact?
Pedestrian Accessibility	C – 3.9 land use types	C – 3.9 land use types	No

Source: Fehr & Peers.

As summarized in **Table 7**, the project is not forecasted to exceed the pedestrian accessibility threshold.

5. Conclusions

Fehr & Peers prepared a CEQA transportation impact analysis for the proposed Research and Development building located at 1364 E. Green Street in the City of Pasadena. The following describes the results of the CEQA analysis:

- The project is not forecasted to exceed the VMT per capita threshold.
- The project is not forecasted to exceed the VT per capita threshold.
- The project is not forecasted to exceed the proximity and quality of bicycle network thresholds.
- The project is not forecasted to exceed the proximity and quality of transit network thresholds.
- The project is not forecasted to exceed the pedestrian accessibility threshold.

Appendix A. TDF Model Outputs



Daily Trips	Internal	External
Internal	381,586	335,959
External	335,959	534,534

Pop	136,911
Emp	113,476
Ext. Factor	100%

FINAL REDUCED DAILY VMT BY SPEED BIN					EMFAC
Speed	Internal	External	Regional	Total	INPUT
5	178	0	5,275	5,453	0%
10	1,338	900	28,857	31,096	0%
15	9,948	2,873	89,142	101,963	1%
20	19,066	11,182	184,705	214,953	2%
25	107,910	24,258	344,511	476,678	5%
30	513,907	115,301	677,271	1,306,479	15%
35	856,449	262,423	761,197	1,880,070	21%
40	156,157	89,795	477,917	723,869	8%
45	100,998	41,610	366,607	509,215	6%
50	79,414	14,077	441,598	535,089	6%
55	70,105	169,499	460,985	700,589	8%
60	97,106	37,221	425,498	559,825	6%
65	506,504	90,600	319,819	916,922	10%
70	1,883	412	802,501	804,796	11%
75	0	0	137,793	137,793	
80	0	0	0	0	
85	0	0	0	0	
SUM	2,520,961	860,152	5,523,679	8,904,791	100%

TOTAL RAW DAILY SUMMARY					
Metric	Internal	External	Regional	Total	Capita
VMT	2,520,961	860,152	5,523,679	8,904,791	35.6
VT	381,586	671,918	-	1,053,503	4.2
Length	6.6	1.3	-	8.5	-

REDUCED DAILY SUMMARY					
Metric	Internal	External	Regional	Total	Capita
VMT	2,520,961	860,152	5,523,679	8,904,791	35.6
VT	381,586	671,918	-	1,053,503	4.2
Length	6.6	1.3	-	8.5	-

FINAL DAILY SCENARIO SUMMARY					
Pop	Emp	VMT	VT	VMT/Cap	VT/Cap
136,911	113,476	8,904,791	1,053,503	35.6	4.2

2017 EXISTING SUMMARY					
Pop	Emp	VMT	VT	VMT/Cap	VT/Cap
136,911	113,160	8,893,871	1,052,731	35.6	4.2

INCREMENTAL SCENARIO RESULTS					
Pop	Emp	VMT	VT	VMT/Cap	VT/Cap
0	316	10,920	773	34.6	2.4
				PASS	PASS

VMT Reduction Calculations for Project Design Features

Project Design Feature	CAPCOA Strategy	Calculated VMT Reduction	Percent of VMT Remaining
Commuter Trip Reduction Program with Mandatory Monitoring and Reporting ¹	T-6	26%	74%
Employee Parking Cash-Out ²	T-13	12%	88%
Product			65%
VMT Reduction			35%
Employee Share of Total VMT			55%
Total VMT Reduction			19.18%
Project-Related VMT per Capita Without Project Design Features			34.6
Project-Related VMT per Capita With Project Design Features			28.0

Notes:

¹ Per the requirements described in the CAPCOA Handbook, this program must include commuter trip reduction marketing (Strategy T-7), provision of a ridesharing program (Strategy T-8), implementation of subsidized or discounted transit program (Strategy T-9), provision of end-of-trip bicycle facilities (Strategy T-10), and provision of employer-sponsored vanpool (Strategy T-11).

² The calculated reduction assumes that all employees would be eligible to participate in the employee parking cash-out program.