11.8 Noise and Vibration Assessment

Noise and Vibration Assessment
First Citizens Bank – Long Beach Project
City of Long Beach, California

Prepared by:

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May 2024

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LIST OF ABBREVIATED TERMS

APN	Assessor's Parcel Number
dBA	A-weighted sound level
CEQA	California Environmental Quality Act
ADT	Average daily traffic
LBMC	City of Long Beach Municipal Code
ATM	Automated Teller Machine
PV	Photovoltaic
GFA	Gross floor area
CNEL	Community equivalent noise level
L_{dn}	Day-night noise level
dB	Decibel
L_{eq}	Equivalent noise level
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HVAC	Heating ventilation and air conditioning
Hz	Hertz
HOA	Homeowner's association
in/sec	Inches per second
L_{max}	Maximum noise level
µPa	Micropascals
L_{min}	Minimum noise level
PPV	Peak particle velocity
RMS	Root mean square
VdB	Vibration velocity level

1 INTRODUCTION

This report documents the results of a Noise and Vibration Assessment completed for the First Citizens Bank Trust (First Citizens Bank) ("Applicant")– Long Beach Project ("Project" or "proposed Project"). The purpose of this Noise and Vibration Assessment is to evaluate the potential construction and operational noise and vibration levels associated with the Project and determine the level of impact the Project would have on the environment.

1.1 Project Location and Setting

The proposed Project site is in the county of Los Angeles (County) in the city of Long Beach (City), approximately 20 miles south of downtown Los Angeles; see **Exhibit 1: Regional Vicinity Map**. The approximately 36,775 SF (0.87 acre) proposed Project site consists of three parcels (APN: 7145-006-010, -011, 012) located at 3450-3470 Long Beach Boulevard. Regional access to the proposed Project site is provided via Interstate Highway 405 (I-405), that runs west and south of the proposed Project site. Local access to the proposed Project site is provided via Long Beach Boulevard and Wardlow Road.

As shown on **Exhibit 2: Local Vicinity Map**, the proposed Project site is vacant and highly disturbed. The proposed Project site was previously used for oil drilling and three decommissioned and plugged oil wells are located on the eastern, western, and southern portions of the site. A fourth decommissioned oil well is located on the southeastern periphery of the site. The proposed Project site is largely devoid of vegetation, excluding a narrow band of vegetation featuring patches of grass and four palm trees bordering Long Beach Boulevard, a cluster of two palm trees located in the northeast corner of the proposed Project site, and a single palm tree located on the eastern side of the proposed Project site, towards the southeast corner. Several large branches of a ficus tree planted on an adjacent property overhang the proposed Project site in the northeast corner of the site.

1.2 Project Description

Project Overview

The proposed Project is depicted on **Exhibit 3: Conceptual Site Plan**. As shown, the Applicant proposes to develop an approximately 12,469 GSF, two-story office/bank building on three parcels (APN: 7145-006-010, -011, -012). A lot merger is proposed as part of the Project to combine the three parcels into one. The building would have a FAR of 0.34. The net occupiable building space is 7,821 SF. The proposed building height would be 34 feet and would not exceed two stories, with the exception of a 51-foot tower.[1] The proposed building would be situated in the northeast corner of the proposed Project site with parking areas provided to the west and south of the building. A total of 44 vehicular parking stalls are proposed. Eight of the proposed parking stalls would accommodate electric vehicles, providing access to an electric vehicle charging station. Vehicular access to the proposed Project site would be provided via a single driveway from Long Beach Boulevard. A marked pedestrian walkway would connect the sidewalk along Long Beach Boulevard with the front of the proposed building. The proposed Project would include a walk-up Automated Teller Machine (ATM); however, the proposed Project would not include a drive-thru teller or drive-thru ATM facility.

[1] LBMC zoning regulations (§ 21.15.1330) define the height of a building with a sloped roof as "the vertical distance above grade to the midpoint height of the highest sloped roof." For the proposed building, this distance amounts to 34 feet, although the peak of the building (the roof ridge) is 42 feet above grade and the tower is 51 feet above grade.

The proposed Project would include grading and minimal amounts of excavation necessary for installation of utilities to the proposed building. The proposed land use is typically a permitted use by right in the CCA Zoning District. However, because of Project-related excavation, the proposed Project's location in the City's methane zone, and the presence of decommissioned and plugged oil wells on the Project site, the proposed Project is subject to the City's methane gas mitigation ordinance, which states that methane gas mitigation is required for all newly constructed buildings to be located "…less than or equal to three hundred (300) feet from any active, or one hundred (100) feet of an idle and/or abandoned oil/gas well."[2]

To comply with Section 18.78.080 and Chapter 18.79 of the LBMC, the Applicant is proposing to install a Vapor Intrusion Mitigation System (VIMS) to limit potential vapor intrusion impacts and to develop a site-specific Soil Management Plan to excavate and treat contaminated soils during construction. A waiver from LBE Abandonment Standards for the two unverified wells described in Section 2.2.1 has not been granted by the City as of the date of this Initial Study. However, if approved, project design features and/or mitigation measures determined to be acceptable by the City will be included as part of the Project and described in an EIR.

Architectural Design

The proposed building would be located toward the northeastern corner of the proposed Project site, with parking areas situated to the west and south. The building would feature two stories, approximately 15-feet each, and an approximately 16-foot hipped roof. The main building height would be approximately 34 feet in height, and 42 feet above grade. An approximately 51-foot tower, featuring a square bell roof topped with a finial, would be incorporated in the center front of the building. The roof would be copper clad, featuring copper rain gutters and downspouts, underlaid by dark wood corbels. The building exterior would be treated with a white exterior insultation finish system (stucco). The first floor of the building would feature an arcade along the front of the building. An array of photovoltaic (PV) solar panels would be mounted on the roof at the rear of the building and channelized signage identifying the bank would be mounted on the front tower. An eight-foot, stucco-covered perimeter wall would be constructed along the northern, eastern, and southern edges of the property. The western side fronting Long Beach Boulevard, would remain open to the street. The proposed building would be architecturally distinct, in terms of scale and color, but would be of similar size and height as surrounding buildings and would contribute to the eclectic architecture of the surrounding area.

Open Spaces and Landscaping

The existing landscaping on the proposed Project site, as described in Section 2.2.1, would be removed and the proposed Project would include landscaping throughout the parking area, around the periphery of the proposed Building, and along the proposed Project site boundaries. The proposed vegetation includes various trees, shrubs, and other ground cover vegetation. The proposed Project's open space/landscaping would represent approximately 20 percent of the proposed Project site. Landscaping for the proposed Project would be consistent with the requirements of the City's Municipal Code (LBMC) Chapter 21.42, *Landscaping Standards*.

[2] LBMC, Chapter 18.79.

Parking and Access

The City's parking regulations, found in LBMC Chapter 21.41, *Off-Street Parking and Loading Requirements,* identify the required number of parking spaces for particular land uses. Banks require a minimum of five parking spaces per 1,000 SF of gross floor area (GFA). The net occupiable building space is 7,821 SF, and it is anticipated a minimum of 39 parking spaces would be required based on the LBMC's definition of GFA.[3] However, under the most conservative estimates accounting for all 12,469 SF of the proposed building, the LBMC could require up to a minimum of 63 parking spaces.

As previously described, a total of 44 vehicular parking stalls are proposed. Eight of the proposed parking stalls would accommodate electric vehicles, providing access to an electric vehicle charging station. While Zoning Regulations establish a minimum parking standard, new State Legislation such as Assembly Bill 2097 (AB 2097), adopted September 2022, prohibits a public agency from imposing any minimum automobile parking requirement on any residential, commercial, or other development project, that is located within 1/2 mile of public transportation. The Project Site is located within one half-mile of high-quality public transportation. As such, the Project is not required to provide the 63 parking spaces determined by the Zoning Regulation. However, the proposed parking spaces are still subject to development standards of the Zoning Regulations.

Vehicular access to the proposed Project site would be provided via one driveway at Long Beach Boulevard. The driveway would provide access to the on-site parking spaces. Adjacent to the driveway, a marked pedestrian walkway would connect the sidewalk along Long Beach Boulevard with the walk-up ATM at the front of the proposed building.

Utilities and Infrastructure

Electric power would be provided to the proposed Project site by Southern California Edison and supplemented by a PV solar panel array installed on the back side of the proposed building roof. Water and sewer service would be provided by Long Beach Water. The proposed Project would not use natural gas; however natural gas service in the area is provided by the City of Long Beach Utility Services. Trash and recycling collection would be provided by City of Long Beach Utility Services.

[3] Per LBMC Chapter 21.41 (§ 21.41.216), Gross Floor Area (GFA) excludes utility and elevator cores, stairwells and restrooms.

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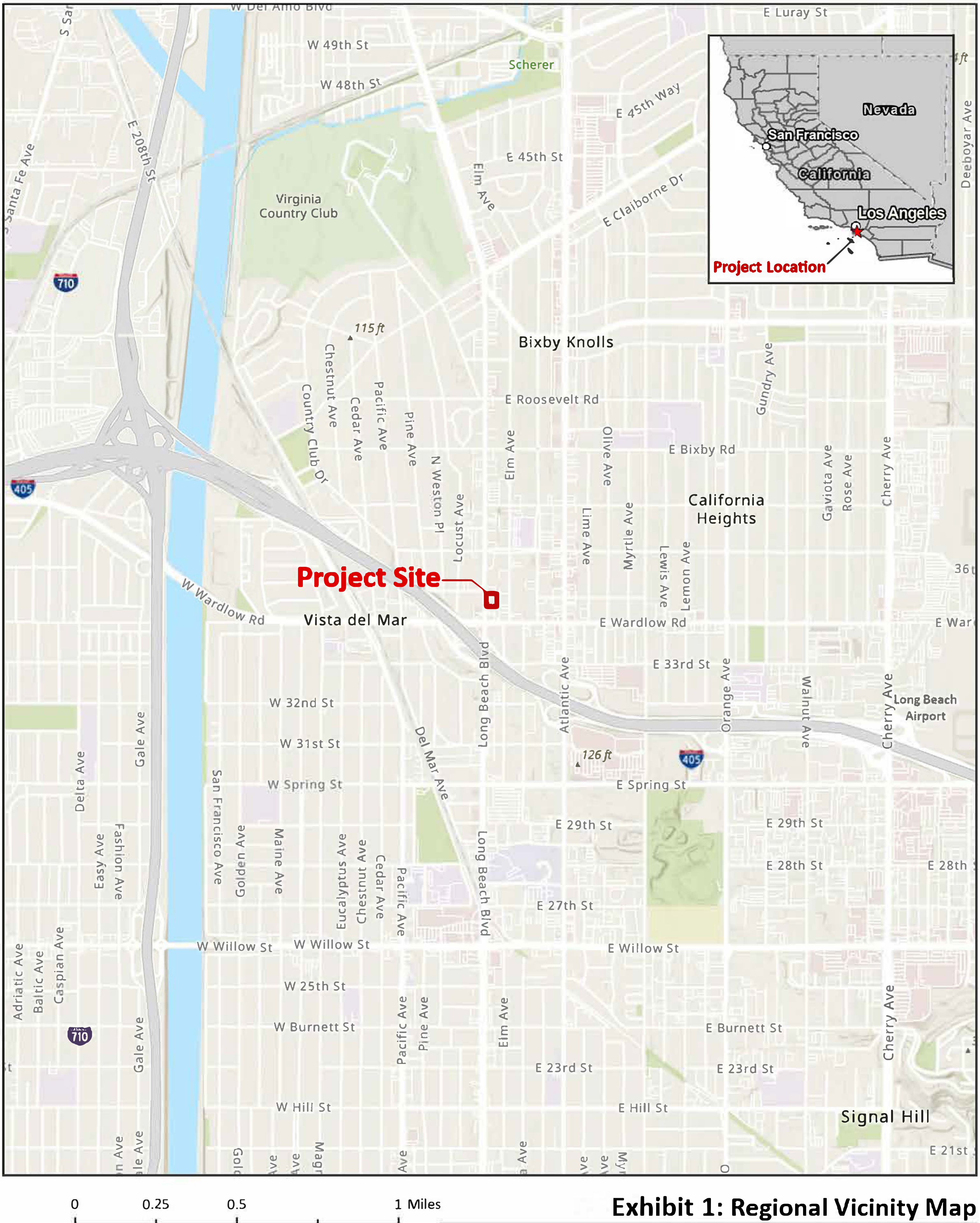

Exhibit 1: Regional Vicinity Map

FIRST CITIZENS BANK - LONG BEACH PROJECT

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Exhibit 2: Local Vicinity Map

FIRST CITIZENS BANK - LONG BEACH PROJECT

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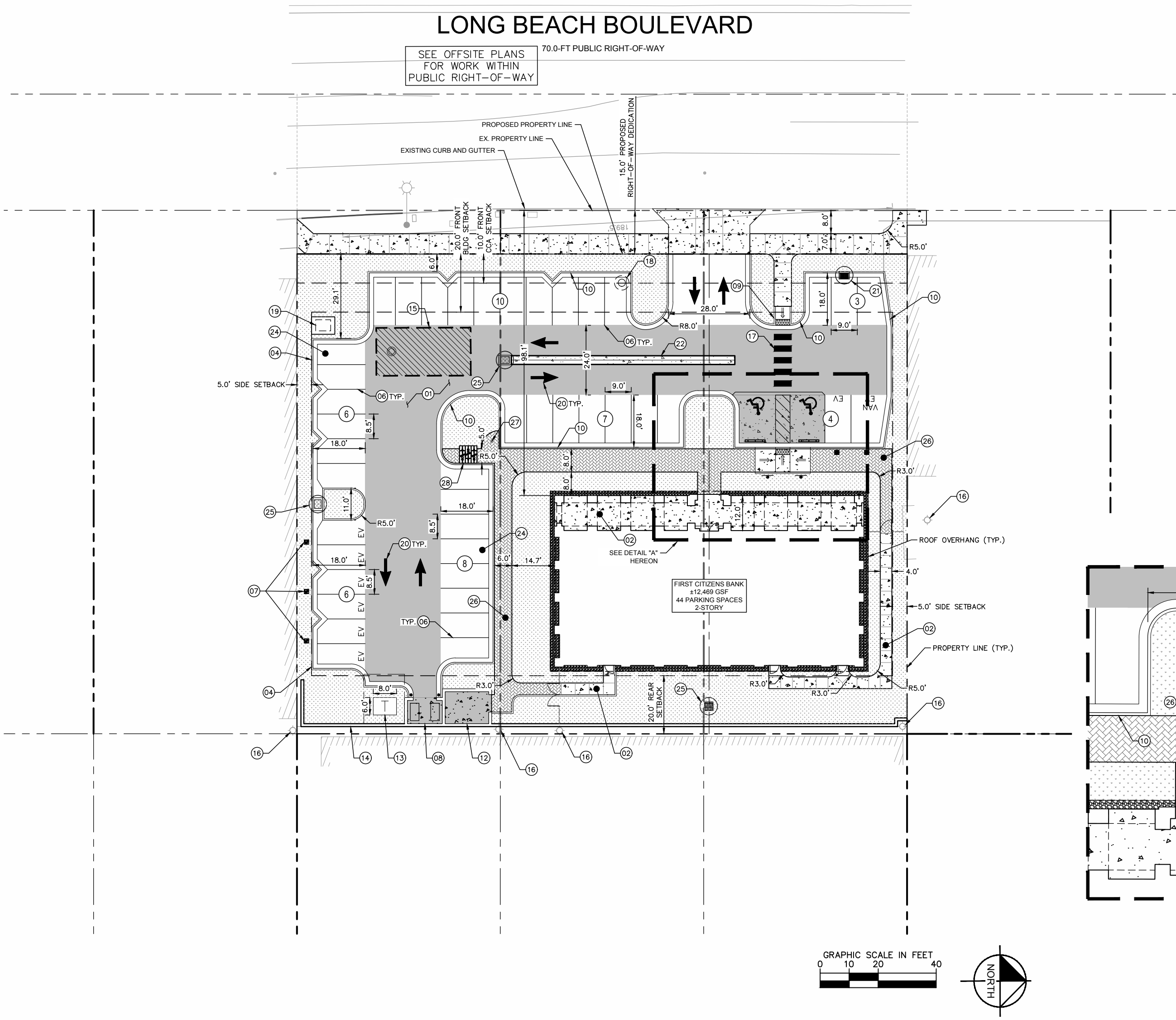
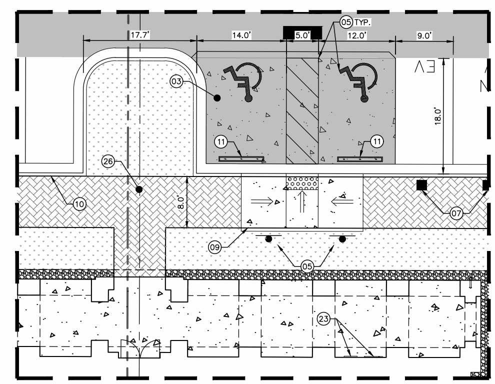


SITE CONSTRUCTION NOTES

01	CONSTRUCT HEAVY DUTY ASPHALT.
02	CONSTRUCT STANDARD DUTY CONCRETE.
03	CONSTRUCT HEAVY DUTY CONCRETE.
04	CONSTRUCT 6" CURB AND GUTTER.
05	INSTALL ADA SIGNAGE AND MARKINGS.
06	INSTALL STANDARD PARKING STRIPING.
07	INSTALL ELECTRIC VEHICLE CHARGING STATION (EVCS).
08	CONSTRUCT TRASH ENCLOSURE. SEE ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION.
09	CONSTRUCT DEPRESSED CURB RAMP.
10	CONSTRUCT 6" SPILL CURB AND GUTTER.
11	INSTALL WHEEL STOP.
12	CONSTRUCT MECHANICAL COURTYARD. SEE ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION.
13	CONSTRUCT TRANSFORMER EASEMENT AREA.
14	CONSTRUCT EIFS CLAD BLOCK WALL.
15	PRE-CAST CONCRETE RAINWATER HARVESTING TANK.
16	EXISTING POWER POLE TO REMAIN.
17	CONSTRUCT 6.0' WIDE CROSSWALK.
18	STORM WATER QUALITY PRETREATMENT UNIT.
19	PROPOSED MECHANICAL SKID.
20	INSTALL DIRECTIONAL ARROWS.
21	PROPOSED SIDEWALK INLET STRICTURE.
22	CONSTRUCT CONCRETE VALLEY GUTTER.
23	ATM AND NIGHT DEPOSIT BOX CONNECTED TO BUILDING.
24	CONSTRUCT STANDARD DUTY ASPHALT.
25	CATCH BASIN.
26	INSTALL PAVERS LAID IN HERRINGBONE PATTERN ON 45-DEGREE BIAS TO BUILDING ENTRANCE. SEE HARDSCAPE PLANS FOR ADDITIONAL INFORMATION.
27	PROPOSED FLAG POLE.
28	PROPOSED BICYCLE RACK.

SITE LEGEND

- PROPERTY LINE
- SETBACK LINE
- STANDARD CURB AND GUTTER
- SPILL CURB AND GUTTER
- PARKING SPACE COUNT
- SIGN (SEE PLAN)
- WHEEL STOP
- ACCESSIBLE PARKING MARKING (V INDICATES VAN ACCESSIBLE)
- DIRECTIONAL PAVEMENT ARROWS
- DEPRESSED CURB RAMP
- STANDARD DUTY ASPHALT
- HEAVY DUTY ASPHALT
- STANDARD DUTY CONCRETE
- HEAVY DUTY CONCRETE
- PAVERS - SEE HARDSCAPE PLAN FOR ADDITIONAL INFORMATION
- LANDSCAPE PER LANDSCAPE PLANS



DETAIL "A"

SCALE: 1"=10"

SITE DATA TABLE

SITE ADDRESS:	3450 LONG BEACH BOULEVARD, LONG BEACH, CALIFORNIA, 90807
COORDINATES:	33.81984 N, 118.18895 W
AIN #:	7145-006-010; -011; & -012
LOT AREA:	0.86 AC.
ZONING:	COMMUNITY COMMERCIAL AUTOMOBILE ORIENTED (CCA) AND WITHIN HIGH-RISE OVERLAY DISTRICT (HR-4).
WATERSHED:	COMPTON CREEK-LOS ANGELES RIVER WATERSHED
FLOOD PLAIN:	ZONE X
BUILDING SETBACKS:	FRONT: 10-FT (CCA); 10-FT (HR-4 IF BUILDING UNDER 45-FT); 20' (HR-4 IF BUILDING OVER 45-FT);
	REAR AND SIDE: 5-FT IF ADJACENT TO NON-RESIDENTIAL & 20-FT IF ADJACENT TO REAR YARD OF RESIDENTIAL DISTRICT (CCA)
LANDSCAPE BUFFER:	REQUIRED ON ALL 4 SIDES IF BUILDING HEIGHT OVER 45-FT
MAX. IMPERVIOUS:	NO MORE THAN 30% OF ON-SITE AREA NOT COVERED BY STRUCTURES, DRIVEWAYS, AND APPROVED PARKING.
PROP. IMPERVIOUS:	28,615 SF (0.66 AC.) 0.66 / 0.86 = 77% IMPERVIOUS
SIDEWALK AND ENCLOSURE AREA:	SIDEWALK: 2,600 SF ENCLOSURES: 275 SF TOTAL IMPERVIOUS NOT STRUCTURES/DRIVEWAY/PARKING: 15,130 SF
PROP. PERVIOUS:	8,611 SF 0.2 / 0.86 = 23% < 30%
MAX. F.A.R.:	NO F.A.R. REQUIREMENT PER CCA ZONING
MAX. BUILDING HEIGHT:	2 STORIES, 28-FT (CCA); 4 STORIES (HR-4)
PROP. BUILDING HEIGHT:	41'-9"
MIN. LOT SIZE:	10,000 SF
MAX. BUILDING SIZE PER PARKING REQUIREMENT:	12,469 SF GROSS FLOOR AREA (GFA)
PROP. BUILDING SIZE:	7,907 SF
PARKING REQUIRED:	5 SPACES PER 1,000 GFA 12,469 SF / 1,000 SF = 12.5 12.5 * 5 SPACES = 63 SPACES REQUIRED 7 EV SPACES REQ., 2 EVCS REQ.
PARKING PROVIDED:	2 ADA SPACES, 8 EV SPACES, 34 STANDARD SPACES TOTAL: 44 SPACES

BUILDING DATA:
8,600 SF ALLOWABLE > 7,907 SF PROVIDED
3,347 SF (1ST OCC)
4,560 SF (2ND OCC)

SPRINKLED
(1,251 SF EXTERIOR ARCADE)
6,167 GSF FOOTPRINT (1ST FLR)
6,302 GSF (2ND FLR PERIMETER)
12,469 GROSS BUILDING SF

SOURCE: Conceptual Site Plan Preliminary Layout dated April 12, 2023

Exhibit 3: Conceptual Site Plan

FIRST CITIZENS BANK - LONG BEACH PROJECT

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2 ACOUSTIC FUNDAMENTALS

2.1 Sound and Environmental Noise

Acoustics is the science of sound. Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a medium (e.g., air) to human (or animal) ear. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second, or hertz (Hz).

Noise is defined as loud, unexpected, or annoying sound. The fundamental model consists of a noise source, a receptor, and the propagation path between the two. The loudness of the noise source, obstructions, or atmospheric factors affecting the propagation path, determine the perceived sound level and noise characteristics at the receptor. Acoustics deal primarily with the propagation and control of sound. A typical noise environment consists of ambient noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this ambient noise is the sound from individual local sources. These sources can vary from an occasional aircraft or train passing by to continuous noise from traffic on a major highway. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a large range of numbers. To avoid this, the decibel (dB) scale was devised. The dB scale uses the hearing threshold of 20 micro-pascals (μPa) as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The dB scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels correspond closely to human perception of relative loudness. **Table 1: Typical Noise Levels** provides typical noise levels.

Table 1: Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	– 110 –	Rock Band
Jet fly-over at 1,000 feet		
	– 100 –	
Gas lawnmower at 3 feet		
	– 90 –	
Diesel truck at 50 feet at 50 miles per hour		Food blender at 3 feet
	– 80 –	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower, 100 feet	**– 70 –**	Vacuum cleaner at 10 feet
Commercial area		Normal Speech at 3 feet
Heavy traffic at 300 feet	**– 60 –**	
		Large business office
Quiet urban daytime	**– 50 –**	Dishwasher in next room
Quiet urban nighttime	**– 40 –**	Theater, large conference room (background)
Quiet suburban nighttime		
	– 30 –	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	– 20 –	
		Broadcast/recording studio
	– 10 –	
Lowest threshold of human hearing	**– 0 –**	Lowest threshold of human hearing

Source: California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.

Noise Descriptors

The dB scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The equivalent noise level (Leq) represents the equivalent continuous sound pressure level over the measurement period, while the day-night noise level (Ldn) and Community Equivalent Noise Level (CNEL) are measures of sound energy during a 24-hour period, with dB weighted sound levels from 7:00 p.m. to 7:00 a.m. Most commonly, environmental sounds are described in terms of Leq that has the same acoustical energy as the summation of all the time-varying events. Each is applicable to this analysis and defined in **Table 2: Definitions of Acoustical Terms**.

Table 2: Definitions of Acoustical Terms

Term	Definitions
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in μPa (or 20 micronewtons per square meter), where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in dB as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g. 20 μPa). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level (dBA)	The sound pressure level in dB as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level (L_{eq})	The average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
Maximum Noise Level (L_{max}) Minimum Noise Level (L_{min})	The maximum and minimum dBA during the measurement period.
Exceeded Noise Levels (L_{01}, L_{10}, L_{50}, L_{90})	The dBA values that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day-Night Noise Level (L_{dn})	A 24-hour average L_{eq} with a 10-dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity at nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.
Community Noise Equivalent Level (CNEL)	A 24-hour average L_{eq} with a 5-dBA weighting during the hours of 7:00 a.m. to 10:00 a.m. and a 10-dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

The A-weighted decibel (dBA) sound level scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events.

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

A-Weighted Decibels

The perceived loudness of sounds is dependent on many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by dBA values. There is a strong correlation between dBA and the way the human ear perceives sound. For this reason, the dBA has become the standard tool of environmental noise assessment. All noise levels reported in this document are in terms of dBA, but are expressed as dB, unless otherwise noted.

Addition of Decibels

The dB scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic dB is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound.[4] When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than one source under the same conditions.[5] Under the dB scale, three sources of equal loudness together would produce an increase of approximately 5 dBA.

Sound Propagation and Attenuation

Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB for each doubling of distance from a stationary or point source. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern. Sound levels attenuate at a rate of approximately 3 dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics.[6] No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed.

Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA.[7] The way older homes in California were constructed generally

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4 FHWA, *Noise Fundamentals,* 2017. Available at: https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm
5 Ibid.
6 California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, Page 2-29, September 2013.
7 James P. Cowan, *Handbook of Environmental Acoustics,* 1994.

provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units is generally 30 dBA or more.

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA.[8] Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). Regarding increases in dBA, the following relationships should be noted.[9]

- Except in carefully controlled laboratory experiments, a 1-dBA change cannot be perceived by humans.
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.
- A minimum 5-dBA change is required before any noticeable change in community response would be expected. A 5-dBA increase is typically considered substantial.
- A 10-dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

Effects of Noise on People

Hearing Loss. While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise. The Occupational Safety and Health Administration has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over 8 hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

Annoyance. Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes

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8 Compiled from James P. Cowan, *Handbook of Environmental Acoustics,* 1994 and Cyril M. Harris, Handbook of Noise Control, 1979.

9 Compiled from California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013, and FHWA, *Noise Fundamentals,* 2017.

for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. A noise level of about 55 dBA L_{dn} is the threshold at which a substantial percentage of people begin to report annoyance.[10]

2.2 Ground-Borne Vibration

Sources of ground-borne vibrations include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or man-made causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions or heavy equipment use during construction). Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is vibration decibels (VdB) (the vibration velocity level in decibel scale). Other methods are the peak particle velocity (PPV) and the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

Table 3: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations, displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where ground-borne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Ground vibration can be a concern in instances where buildings shake, and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. Common sources for ground-borne vibration are planes, trains, and construction activities such as earth-moving which requires the use of heavy-duty earth moving equipment. For the purposes of this analysis, a PPV descriptor with units of inches per second (in/sec) is used to evaluate construction-generated vibration for building damage and human complaints.

[10] Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, August 1992.

Table 3: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations

Maximum PPV (in/sec)	Vibration Annoyance Potential Criteria	Vibration Damage Potential Threshold Criteria	FTA Vibration Damage Criteria
0.008	–	Extremely fragile historic buildings, ruins, ancient monuments	–
0.01	Barely Perceptible	–	–
0.04	Distinctly Perceptible	–	–
0.1	Strongly Perceptible	Fragile buildings	–
0.12	–	–	Buildings extremely susceptible to vibration damage
0.2	–	–	Non-engineered timber and masonry buildings
0.25	–	Historic and some old buildings	–
0.3	–	Older residential structures	Engineered concrete and masonry (no plaster)
0.4	Severe	–	–
0.5	–	New residential structures, Modern industrial/commercial buildings	Reinforced-concrete, steel or timber (no plaster)
PPV = peak particle velocity; in/sec = inches per second; FTA = Federal Transit Administration			
Source: California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, 2020 and Federal Transit administration, *Transit Noise and Vibration Assessment Manual*, 2018.			

3 REGULATORY SETTING

To limit population exposure to physically or psychologically damaging as well as intrusive noise levels, the Federal government, the State of California, various county governments, and most municipalities in the State have established standards and ordinances to control noise.

3.1 Federal

Federal Transit Administration Noise and Vibration Guidance

The Federal Transit Administration (FTA) has published the Transit Noise and Vibration Impact Assessment Manual (FTA Transit Noise and Vibration Manual) to provide guidance on procedures for assessing impacts at different stages of transit project development. The report covers both construction and operational noise impacts and describes a range of measures for controlling excessive noise and vibration. In general, the primary concern regarding vibration relates to potential damage from construction. The guidance document establishes criteria for evaluating the potential for damage for various structural categories from vibration.

3.2 State of California

California Government Code

California Government Code Section 65302(f) mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines established 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" noise levels for various land use types. Single-family homes are "normally acceptable" in exterior noise environments up to 60 CNEL and "conditionally acceptable" up to 70 CNEL. Multiple-family residential uses are "normally acceptable" up to 65 CNEL and "conditionally acceptable" up to 70 CNEL. Schools, libraries, and churches are "normally acceptable" up to 70 CNEL, as are office buildings and business, commercial, and professional uses.

Title 24 – Building Code

The State's noise insulation standards are codified in the California Code of Regulations, Title 24: Part 1, Building Standards Administrative Code, and Part 2, California Building Code. These noise standards are applied to new construction in California for interior noise compatibility from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, or hospitals, are located near major transportation noise sources, and where such noise sources create an exterior noise level of 65 dBA CNEL or higher. Acoustical studies that accompany building plans must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new multi-family residential buildings, the acceptable interior noise limit for new construction is 45 dBA CNEL.

3.3 Local

City of Long Beach Municipal Code

The LBMC has a number of policies directed at controlling or mitigating environmental noise effects. LBMC Chapter 8.80 provides all noise regulations to control and limit unnecessary and excessive noise and vibration in the City. LBMC § 8.80.150 provides exterior noise standards dependent on noise-specific land use districts identified by the City's noise control program. There are five receiving land use districts based on the predominant land use in the area. Each district has specific exterior noise level limits. The Project site is within Receiving Land Use District One. Receiving Land Use District One is characterized as predominantly residential with other land use types present.[11]

Table 4: City of Long Beach Exterior Noise Limits for District One identifies the exterior noise level standards listed in LBMC for Land Use District One. These standards and criteria are incorporated into the City's land use planning process to reduce future noise and land use incompatibilities. **Table 4** is the primary tool that allows the city to ensure integrated planning for compatibility between land uses and exterior noise levels.

Table 4: City of Long Beach Exterior Noise Limits for District One

Receiving Land Use District**	Time Period	Noise Level
District One*	Night: 10:00 p.m.—7:00 a.m.	45
	Day: 7:00 a.m.—10:00 p.m.	50
Notes: * District One: Predominantly residential with other land use types also present ** Districts Three and Four limits are intended primarily for use at their boundaries rather than for noise control within those districts. If measured ambient noise levels exceed permissible noise limit categories, allowable noise exposure standards shall be increased by 5 dB. Source: LBMC Chapter 8: Noise, § 8.80.160 – Exterior Noise Limits – Correction for Character of Sound.		

LBMC § 8.80.150(C), *Exterior Noise Limits – Sound levels by receiving land use district*, states that if measured ambient sound levels near a Project site are higher than the City's daytime exterior noise standards, allowable noise exposure standard shall be increased by 5 dBA increments to encompass the Project's current existing ambient noise levels.

The ambient noise measurements taken near the Project site as shown in **Table 7: Existing Noise Measurements** (refer to Section 4 below) are higher than the City's daytime exterior standards for Land Use District One listed in **Table 4**. In accordance with LBMC § 8.80.150(C), if the measured ambient noise levels exceed the exterior noise standards for the Project site's land use district, the allowable noise exposure standard for the Project site shall increase by 5 dBA. **Table 5: City of Long Beach Adjusted Exterior Noise Standards for District One** lists adjusted exterior ambient noise levels around the Project site.

[11] LBMC § 8.80.160, *Exterior noise limits—Correction for character of sound*, Table A.

Table 5: City of Long Beach Adjusted Exterior Noise Standards for District One

Noise Measurement	Noise Measurement Locations	Original Noise Threshold for District One (dBA, L_{eq})	Monitored Noise Levels (dBA, L_{eq})[1]	Adjusted Standard (dBA, L_{50})[2]
ST-1	Project site – Southwestern Boundary along Long Beach Boulevard	50	71.8	75
ST-2	Project site – Projects northeastern boundary	50	58.8	60
ST-3	Project Site – Projects southeastern boundary, multi-family residential area	50	62.6	65
ST-4	Southwest of Project site – Near single-family residences to the southwest	50	64.9	65

1. L_{eq} is the average noise level equivalent to the energy content of the time period.
2. In accordance with LBMC § 8.80.150(C), if the measured ambient noise levels exceed the exterior noise standards for the project sites land use district, the allowable noise exposure standard for the project site shall increase by 5 dBA.
Source: Kimley-Horn and Associates, field visit April 26, 2023. Measured using a Larson Davis LxT Sound Level Meter meeting the American National Standards Institute (ANSI) Type 1 Standard.
Source: LBMC, Chapter 8: Noise, § 8.80.160 – Exterior Noise Limits – Correction for Character of Sound.

LBMC § 8.80.202, *Construction Activity – Noise Regulation*, states allowable hours for construction. LBMC has not established quantitative standards for construction noise but is regulated through allowable hours of construction. All construction must occur outside of the hours of 7:00 p.m. to 7:00 a.m., Monday through Friday, and federal holidays occurring on weekdays. Construction equipment operation shall only be permitted outside of the hours of 7:00 p.m. on Friday and 9:00 a.m. on Saturday and after 6:00 pm on Saturday. Construction work shall not be conducted on Sunday. To perform construction on Sundays, only between the hours of 9:00 a.m. and 6:00 p.m., a Sunday work Permit must be issued by the Noise Control Officer.

LBMC § 8.20.200(N), *Noise Disturbance – Act Specific*, requires that air-conditioning and/or refrigeration equipment noise shall not exceed 55 dBA at the closest property line, 50 dB at a neighboring patio, or 50 dBA outside a neighboring living area window closest to the equipment's location.

LBMC § 8.80.340(A), *Variance – Exemption from regulations*, states that variance may be obtained from a noise control officer to grant exemptions from any provision in the Noise Regulations in Chapter 8.80 of the LBMC.

City of Long Beach General Plan

The City of Long Beach General Plan Noise Element (Noise Element) has a number of policies directed at controlling or mitigating environmental noise effects.

Table 6: Recommended Criteria for Maximum Acceptable Noise Levels In A-Weighted Decibels (dBA) identifies U.S. EPA's 1974 established guidelines for maximum noise levels for each land use occurring in the City. These standards and criteria are incorporated into the City's land use planning process to reduce future noise and land use incompatibilities. **Table 5** lists the recommended criteria for maximum acceptable noise levels for the City's land uses to ensure integrated planning for compatibility between land uses and outdoor noise.

Table 6: Recommended Criteria for Maximum Acceptable Noise Levels1 In A-Weighted Decibels (dBA)

Land Use Category	Outdoor			Indoor
	Maximum Single Hourly Peak	L_{10}[2]	L_{50}[3]	Indoor (L_{dn})[4]
Residential[5] 7:00 a.m. – 10:00 p.m.	70	55	45	45
Residential[5] 10:00 p.m. – 7 a.m.	60	45	35	35
Commercial (anytime)	75	65	55	(6)
Industrial (anytime)	85	70	60	(6)

Notes:

[1] Based on existing ambient level ranges in Long Beach and recommended U.S. Environmental Protection Agency ratios and standards for interference and annoyance.

[2] Noise levels exceeded ten percent of the time.

[3] Noise levels exceeded fifty- percent of the time.

[4] Day-night average sound level. The 24-hour A-weighted equivalent sound level with a 10 decibel penalty applied to nighttime levels.

[5] Includes all residential categories and all noise sensitive land uses such as hospitals, schools, etc.

[6] Since different types of commercial and industrial activities appear to be associated with different noise levels, identification of a maximum indoor level for activity interference is unfeasible.

Source: U.S. Office of Noise Abatement Control: *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, Arlington Virginia; U.S. Environmental Protection Agency, arch 1975, pp. 3,29.

Source: City of Long Beach, *General Plan*, Chapter 5: Community Safety, Section G: Noise, Table N-1.

The Noise Element was last updated in 1975 and implemented through a noise ordinance in 1977. The City's demographics, uses, regional characteristics, and regulatory guidance for noise have since changed. In 2019, the City published a draft Noise Element to tailor the City's noise policies to updated Long Beach demographics and neighborhoods while staying consistent with the City's development plans and Land Use Element. As of May 2023, the Noise Element is still in draft form; however, the adoption hearing is scheduled for June 6, 2023.

4 EXISTING CONDITIONS

4.1 Existing Noise Sources

The Project site is impacted by various noise sources. Existing noise sources are primarily from traffic along Long Beach Boulevard to the west, Wardlow Drive to the south, the San Diego Freeway to the south, the Long Beach Freeway to the west, and the operational noise from commercial uses along Long Beach Boulevard. The primary sources of stationary noise near the Project site include parking lot noise at the nearby office and commercial buildings, mechanical equipment (e.g., HVAC units) and other urban-related activities (e.g., idling cars/trucks, pedestrians, car radios and music playing, dogs barking, etc.). The noise associated with these sources may represent a single-event noise occurrence or short-term noise.

4.2 Noise Measurements

Transportation systems are a primary source of urban noise. Management of noise from the most significant of these sources (aircraft, trains, and freeways) is generally preempted by federal and State authority. The primary local authority is municipal regulation of land use (i.e., land use planning) and establishment and enforcement of noise ordinances. Management of noise emanating from freeways is generally within the authority of federal and state jurisdictions, namely, the Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans).

Ambient noise levels were measured in 15-minute intervals at 4 locations (short term, or ST), one location near the proposed Project's southwestern boundary along Long Beach Boulevard, one near the proposed Projects northeastern boundary, one in the residential neighborhood southwest of the Project site, and one near the proposed Project's southeastern boundary. The average noise levels and sources of noise measured at each location are listed in **Table 7: Existing Noise Measurements** and shown on **Exhibit 4: Noise Measurement Locations**.

Table 7: Existing Noise Measurements

Site	Location	Duration	Time	L_{eq}[1] (dBA)	CNEL (dBA)	Primary Noise Sources
ST-1	Project site – Southwestern Boundary along Long Beach Boulevard	15 minutes	9:20 a.m.	71.8	--	Traffic on the Long Beach Boulevard, Freeway noise, pedestrian activities.
ST-2	Project site – Projects northeastern boundary	15 minutes	9:44 a.m.	58.8	--	Traffic on Long Beach Boulevard, parking lot noise, pedestrian activities.
ST-3	Project Site – Projects southeastern boundary, multi-Family residential area	15 minutes	11:08 a.m.	62.6	--	Traffic on Long Beach and Wardlow Boulevard, parking lot noise, pedestrian activities.
ST-4	Southwest of Project site – Near single-family residences to the southwest	15 minutes	10:10 a.m.	64.9	--	Traffic on surrounding freeways.

Notes:
1. L_{eq} is the average noise level equivalent to the energy content of the time period.
Source: Kimley-Horn and Associates, field visit April 26, 2023. Measured using a Larson Davis LxT Sound Level Meter meeting the American National Standards Institute (ANSI) Type 1 Standard. See **Appendix A**, *Noise Measurement and Calculation Results*.

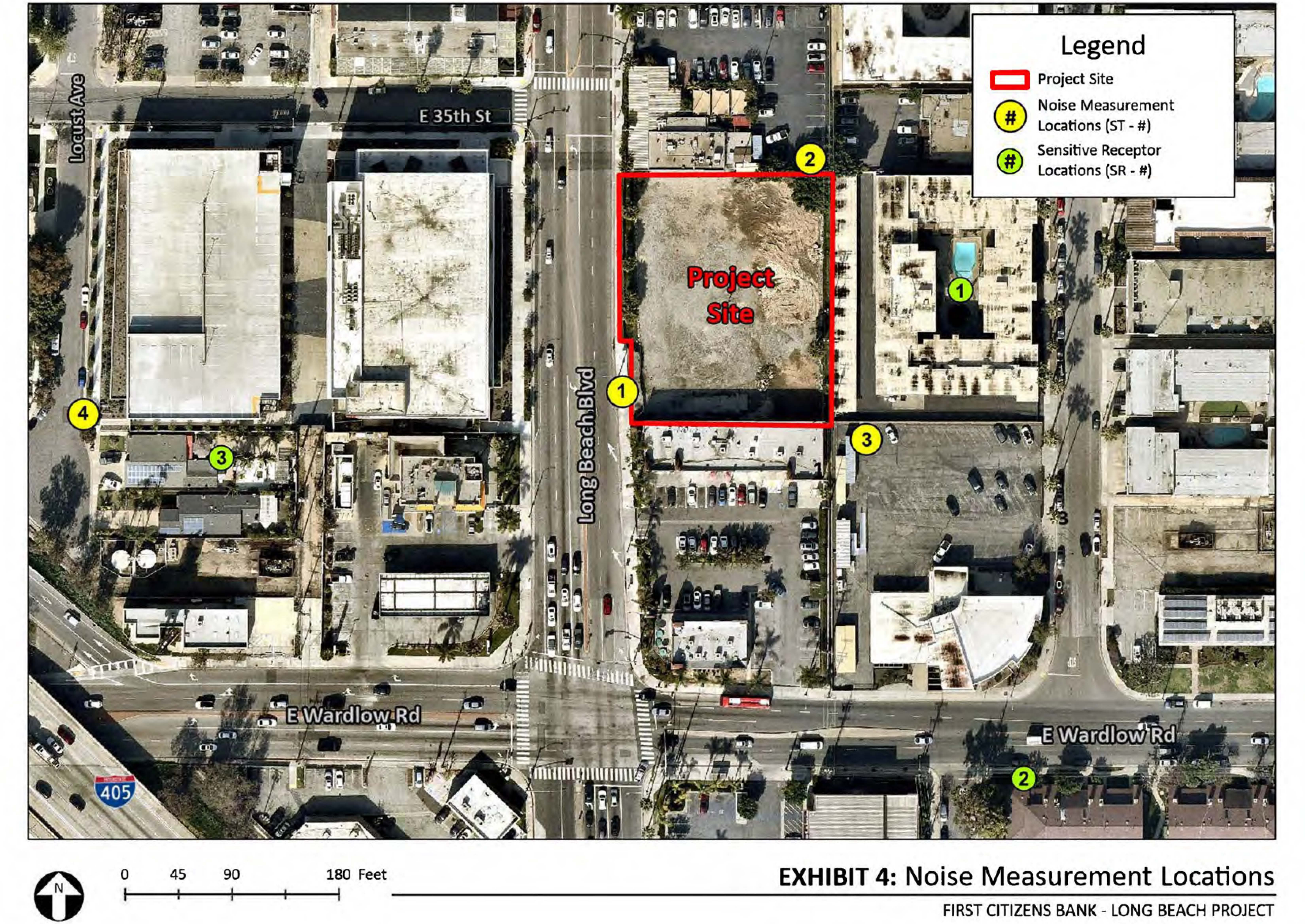

EXHIBIT 4: Noise Measurement Locations

FIRST CITIZENS BANK - LONG BEACH PROJECT

Kimley»Horn

4.3 Sensitive Receptors

Noise exposure standards and guidelines for various types of land uses reflect the varying noise sensitivities associated with each of these uses. Residences, hospitals, schools, guest lodging, libraries, and churches are treated as the most sensitive to noise intrusion and therefore have more stringent noise exposure targets than do other uses, such as manufacturing or agricultural uses that are not subject to impacts such as sleep disturbance. The nearest sensitive receptors to the Project site are shown in **Table 8: Sensitive Receptors** and in **Exhibit 4.**

Table 8: Sensitive Receptors

Sensitive Receptor (SR - #)	Receptor Description	Distance and Direction from the Closest Project Boundary
SR-1	Multi-Family Residential Dwellings	40 feet to the east
SR-2	Single-Family Residential Dwellings	300 feet to the southwest
SR-3	Single-Family Residential Dwellings	350 feet to the southeast
Source: Google Maps, 2023.		

5 SIGNIFICANCE CRITERIA AND METHODOLOGY

5.1 CEQA Thresholds

Appendix G of the California Environmental Quality Act (CEQA) Guidelines contains analysis guidelines related to noise impacts. These guidelines have been used by the City to develop thresholds of significance for this analysis. A project would create a significant environmental impact if it would:

- **Threshold NOI-1:** Generate 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;
- **Threshold NOI-2:** Generate excessive ground-borne vibration or ground-borne noise levels; and
- **Threshold NOI-3:** For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the Project area to excessive noise levels.

5.2 Methodology

Construction

Construction noise levels were based on typical noise levels generated by construction equipment published by the Federal Transit Administration (FTA) and FHWA. Construction noise is assessed in dBA L_{eq}. This unit is appropriate because Leq can be used to describe noise level from operation of each piece of equipment separately, and levels can be combined to represent the noise level from all equipment operating during a given period.

Reference noise levels are used to estimate operational noise levels at nearby sensitive receptors based on a standard noise attenuation rate of 6 dB per doubling of distance (line-of-sight method of sound attenuation for point sources of noise). Noise level estimates do not account for the presence of intervening structures or topography, which may reduce noise levels at receptor locations. Therefore, the noise levels presented herein represent a conservative, reasonable worst-case estimate of actual temporary construction noise.

The City of Long Beach has not adopted a numerical threshold that identifies what a substantial increase would be, but noise is regulated through allowable hours of construction. For purposes of this analysis, the criteria from the FTA Transit Noise and Vibration Manual is used to establish significance thresholds. The FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction. The FTA Noise and Vibration Manual identifies a maximum 8-hour noise level standard of 80 dBA L_{eq} at residential uses and 90 dBA L_{eq} at commercial and industrial uses for short-term construction activities. In compliance with LBMC, it is assumed that construction would not occur during the noise-sensitive nighttime hours.

Operations

The analysis of the Project's noise environment is based on noise prediction modeling and empirical observations. Reference noise level data are used to estimate the Project's operational noise impacts from stationary sources. Noise levels were collected from published sources from similar types of activities and used to estimate noise levels expected with the Project's stationary sources. The reference noise levels are used to represent a worst-case noise environment as noise level from stationary sources can vary throughout the day. Operational noise is evaluated based on the standards within the City's noise standards and General Plan (refer to Section 3.3).

Further, the Federal Interagency Committee on Noise (FICON) guidance provides an established source of criteria to assess the impacts of substantial permanent increase in ambient noise levels. Based on the FICON criteria, the amount to which a given noise level increase is considered acceptable is reduced when the without Project noise levels are already shown to exceed certain land-use specific exterior noise level criteria. The specific levels are based on typical responses to noise level increases of 5 dBA or readily perceptible, 3 dBA or barely perceptible, and 1.5 dBA depending on the underlying without Project noise levels for noise-sensitive uses. These levels of increases and their perceived acceptance are consistent with guidance provided by both the Federal Highway Administration and Caltrans. As stated in the FICON guidance, a significant impact would occur if Project noise levels would result in an incremental increase of more than 3 dBA over existing ambient noise levels. [12]

Vibration

Ground-borne vibration levels associated with construction activities for the Project were evaluated utilizing typical ground-borne vibration levels associated with construction equipment, obtained from FTA published data for construction equipment. Potential ground-borne vibration impacts related to building/structure damage and interference with sensitive existing operations were evaluated, considering the distance from construction activities to nearby land uses and typically applied criteria for structural damage and human annoyance. Per FTA guidance, a vibration limit of 12.7 millimeters per second (mm/sec; 0.5 inch/sec) PPV is used for buildings that are structurally sound and designed to modern engineering standards. A conservative vibration limit of five mm/sec (0.2 inches/sec) PPV has been used for buildings that are found to be structurally sound but where structural damage is a major concern. For historic buildings or buildings that are documented to be structurally weakened, a conservative limit of two mm/sec (0.08 inches/sec) PPV is used to provide the highest level of protection.

[12] Federal Interagency Committee on Noise. *Federal Agency Review of Selected Airport Noise Analysis Issues*. August 1992.

6 POTENTIAL IMPACTS AND MITIGATION

6.1 Acoustical Impacts

Threshold NOI-1: Would the Project generate 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?

Construction

Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. During construction, exterior noise levels could affect the buildings near the construction site.

Construction activities would include site preparation, grading, building construction, paving, and architectural coating. Such activities may require graders, tractors/loaders/backhoes and dozers during site preparation; graders, dozers, and tractors/loaders/backhoes during grading; forklifts, generator sets, tractors/loaders/backhoes, and welders during building construction; pavers, rollers, mixers, tractors/loaders/backhoes, and paving equipment during paving; and air compressors during architectural coating. 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. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. The site preparation and grading phases of proposed Project construction tend to be the shortest in duration and create the highest construction noise levels due to the operation of heavy equipment required to complete these activities. It should be noted that only a limited amount of equipment can operate near a given location at a particular time. Typical noise levels associated with individual construction equipment are listed in **Table 9: Typical Construction Noise Levels.**

Table 9: Typical Construction Noise Levels

Equipment	Typical Noise Level (dBA) at 50 feet from Source
Air Compressor	80
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Mobile	83
Dozer	85
Generator	82
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	80

Table 9: Typical Construction Noise Levels

Equipment	Typical Noise Level (dBA) at 50 feet from Source
Paver	80
Pneumatic Tool	85
Pump	77
Roller	85
Saw	76
Scraper	85
Shovel	82
Truck	84
Source: Federal Transit Administration, 2018. *Transit Noise and Vibration Impact Assessment Manual.*	

Following the methodology for quantitative construction noise assessments in the Federal Transit Administration's (FTA's) *Transit Noise and Vibration Impact Assessment Manual* (FTA Noise and Vibration Manual), the FHWA Roadway Construction Noise Model (RCNM) was used to predict construction noise at the nearest receptors. The FTA Noise and Vibration Manual identifies a maximum 8-hour noise level standard of 80 dBA L_{eq} at residential uses and 90 dBA L_{eq} at commercial and industrial uses for short-term construction activities. Reference noise levels are used to estimate noise levels at nearby sensitive receptors based on a standard noise attenuation rate of 6 dB per doubling of distance (line-of-sight method of sound attenuation for point sources of noise).

Construction noise level estimates do not account for the presence of intervening structures or topography, which may reduce noise levels at receptor locations. Therefore, the noise levels presented herein represent a conservative, reasonable worst-case estimate of actual temporary construction noise. Following FTA methodology, construction equipment is assumed to operate at the center of a project site because equipment operates throughout the site rather than a fixed location for extended periods of time. The nearest noise sensitive receptors (SR-1) are multifamily residences located directly east of the property line and 90 feet from the center of construction activity. Assumptions represent a worst-case scenario as construction activities would routinely be spread throughout the construction site further away from noise sensitive receptors. **Table 10: Project Construction Equipment Noise Levels** shows the estimated exterior construction noise levels at the nearest sensitive receptors.

Table 10: Project Construction Equipment Noise Levels

Construction Phase	Receptor Location			Worst Case Modeled Exterior Noise Level (dBA L_{eq})	Noise Threshold (dBA L_{eq})[1]	Exceeded?
	Land Use	Direction	Distance (feet) [1]			
Site Preparation	Residential	East	90	78.5	80	No
	Residential	Southwest	380	68.8	80	No
	Commercial	Southwest	100	77.5	90	No
	Commercial	Northeast	130	75.3	90	No
Grading	Residential	East	90	79.5	80	No
	Residential	Southwest	380	69.9	80	No
	Commercial	Southwest	100	78.5	90	No
	Commercial	Northeast	130	76.3	90	No
Construction	Residential	East	90	78.3	80	No
	Residential	Southwest	380	69.3	80	No
	Commercial	Southwest	100	77.4	90	No
	Commercial	Northeast	130	75.1	90	No
Paving	Residential	East	90	79.2	80	No
	Residential	Southwest	380	69.2	80	No
	Commercial	Southwest	100	78.3	90	No
	Commercial	Northeast	130	76.0	90	No
Architectural Coating	Residential	East	90	68.6	80	No
	Residential	Southwest	380	65.0	80	No
	Commercial	Southwest	100	67.7	90	No
	Commercial	Northeast	130	65.4	90	No

Notes:
1. In accordance with methodology from the FTA Noise and Vibration Manual, the equipment distance is assumed at the center of the project site.
2. Threshold from the FTA *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

Source: Federal Highway Administration, *Roadway Construction Noise Model*, 2006. Refer to **Appendix A** for noise modeling results.

As shown in **Table 10**, the proposed Project's anticipated construction noise levels at the nearest sensitive receptor would not exceed the FTA noise thresholds of 80 dBA L_{eq} for residential uses and 90 dBA L_{eq} for commercial uses during all phases of construction.

Project construction would not result in a violation of the construction noise regulation hours established by LMBC § 8.8.2020 because Project construction activities would occur within the allowable hours of construction in the LBMC, which are 7:00 a.m. to 7:00 p.m. Monday through Friday, 9:00 a.m. to 6:00 p.m. on Saturday, and no construction activity on Sundays. Because the City has not set a quantitative standard for construction noise, and is regulated through allowable hours of construction, construction activities do not result in a violation of construction noise regulations established by LMBC § 8.8.2020.

Construction noise may exceed the existing ambient levels in the area; however, construction noise would be intermittent and temporary, dependent on the proposed Project's construction phase, equipment type, and duration of use and would not result in a permanent increase in ambient noise levels in the area. All construction activity would comply with allowable hours of construction defined in LBMC § 8.8.2020, and construction noise would be temporary and intermittent. The proposed Project's construction noise would result in a less than significant impact.

Operations

The proposed Project proposes one, two-story bank and bank office building with associated surface parking on an approximately 0.87-acre vacant site. The proposed Project would include a walk-up ATM; however, the proposed Project does not include a drive-thru teller or ATM facility. The primary noise sources associated with the proposed Project would be parking lot noise, mechanical equipment, and mobile traffic noise. A discussion of each of these proposed Project noise sources is provided below.

Parking Lot Noise. Traffic associated with parking lots is typically not of sufficient volume to exceed community noise standards, which are based on a time-averaged scale such as the one-hour L_{eq} and CNEL scales. The instantaneous maximum sound levels generated by a car door slamming, engine starting up, and car pass-by range from 53 to 61 dBA[13] and may be an annoyance to adjacent noise-sensitive receptors. Conversations in parking areas may also be an annoyance to adjacent sensitive receptors. Sound levels of speech typically range from 33 dBA at 50 feet for normal speech to 50 dBA at 50 feet for very loud speech.[14]

The proposed building would be situated in the northeast corner of the Project site with parking areas provided to the west and south of the building. A total of 44 vehicular parking stalls are proposed. Eight of the proposed parking stalls would accommodate electric vehicles, providing access to an electric vehicle charging station.

Parking lot noise would occur at the proposed surface parking lot directly adjacent to the residences to the east of the Project site. Ambient noise measurements were taken southeast of the Project site near the multi-family residences. As shown in **Table 6**, the dBA L_{eq} from a 15-minute measurement ranged from 58.8 (ST-1) to 71.8 (ST-1). These noise levels are used as the existing daytime ambient noise levels in this analysis. Noise associated with parking would be a maximum of 58.9 dBA at 80 feet. Parking lot noise would also be partially masked by the background noise from traffic along Long Beach Boulevard and would not exceed the City's adjusted 65 dBA standard for District One residential uses. Further, as shown in **Table 11: Project Operational Noise Level Increases** below, parking lot noise would not result in an incremental increase of 3 dBA over existing ambient noise levels and impacts would be less than significant.

Mechanical Equipment. During operations, the proposed Project's rooftop HVAC units could be a source of noise affecting existing ambient noise levels in the immediate vicinity. The proposed Project's rooftop HVAC would be most active during the daytime as the proposed Project would develop a bank and office building. This analysis assumes that the proposed Project would include one commercial packaged rooftop HVAC unit for the proposed building. HVAC units typically generate noise levels of approximately 52 dBA at 50 feet.[15] The nearest mechanical equipment would be at the closest approximately 80 feet from the nearest sensitive receptor (SR-1). At this distance, HVAC equipment noise would be approximately 47.9 dBA based on distance attenuation alone (using the inverse square law of sound propagation) and would not exceed the LBMC § 8.20.200(N)'s Noise Disturbance standards for air-conditioning and refrigeration equipment of 55 dBA at the closest property line.

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13 Kariel, H. G., 1991. *Noise in Rural Recreational Environments*, Canadian Acoustics 19(5). Page 3-10.

14 Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, 2015. *Noise Navigator Sound Level Database with Over 1700 Measurement Values*.

15 Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, 2010. *Noise Navigator Sound Level Database with Over 1700 Measurement Values*.

During operations, the proposed Project would also utilize one portable emergency generator if needed. One generator would generate a noise level of 70.2 dB at 23 feet.[16] The proposed emergency generator would be located. The nearest sensitive receptor (SR-1) would be located 90 feet from the potential portable emergency generator location. At the nearest sensitive receptor location (SR-1), the estimated operative noise level from the proposed emergency generator would be a maximum of 58.3 dBA L_{eq}. These noise levels would not exceed adjusted 65 dBA standards for District One Residential Uses. Additionally, as shown in **Table 11** below, noise associated with the proposed mechanical equipment would not result in an incremental increase of 3 dBA over existing ambient noise levels and impacts would be less than significant.

Table 11: Project Operational Noise Level Increases

Noise Source	Reference Level (dBA)	Reference Distance (feet)	Distance to Receptor (feet)	Ambient Level (dBA)[3]	Combined Noise at Receptor (dBA)	Incremental Increase (dBA)	Exceed Threshold?[4]
Mechanical Equipment[1]	52	50	80	58.8	59.1	0.3	No
Emergency Generator[1]	63.5	50	90	58.8	61.6	2.8	No
Parking[2]	61	50	80	58.8	61	2.2	No

Notes:
1.Source for reference level: Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, Noise Navigator Sound Level Database with Over 1700 Measurement Values, July 6, 2010.
2. Source for reference level: Kariel, H. G., Noise in Rural Recreational Environments, Canadian Acoustics 19(5), 3-10, 1991.
3. Measured ambient noise levels ranged from 58.8 dBA and 71.8 dBA (refer to **Table 7**). The lowest measured level at the closest residential receptor is conservatively used for this evaluation.
4. As stated in the FICON guidance, a significant impact would occur if Project noise levels would result in an incremental increase of more than 3 dBA over existing ambient noise levels.

Traffic Noise. In general, a 3-dBA increase in traffic noise is barely perceptible to people, while a 5-dBA increase is readily noticeable. Traffic volumes (measured by ADT) on proposed Project area roadways would have to approximately double (i.e., result in a 100 percent increase) for the resulting traffic noise levels to generate a 3 dBA increase. Project implementation would generate increased traffic volumes along surrounding roadway segments. Project-related trips would occur along Long Beach Boulevard and Wardlow Boulevard. Long Beach Boulevard is categorized as a boulevard according to the City of Long Beach 2013 Mobility Element. Boulevards are characterized by a long-distance, medium-speed corridors that traverse urbanized areas, consisting of four or fewer vehicle travel lanes, with ADT volumes between 20,000 and 30,000 trips. Wardlow Boulevard is categorized as a minor avenue, which is characterized as traffic routes leading to neighborhood activity centers, routes between neighborhoods, primary bicycle routes, and local transit routes. According to the City's Traffic Map,[17] Long Beach Boulevard and Wardlow Avenue have ADT volumes of 27,200 and 17,300 daily vehicles nearest to the Project site, respectively. The proposed Project would generate approximately 293 daily vehicle trips, which would not double the existing traffic volumes and would not result in a perceivable noise increase.

Therefore, proposed Project operations would not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the proposed Project in excess of standards established

16 *Id.*
17 City of Long Beach, *2014 Citywide Traffic Flow Map*, <https://www.longbeach.gov/globalassets/pw/media-library/documents/resources/general/maps-and-gis/2014-citywide-traffic-flow> (accessed May 17, 2023).

in the local general plan or noise ordinance, or applicable standards of other agencies, and impacts would be less than significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

Threshold NOI-2: Would the Project generate excessive ground-borne vibration or ground-borne noise levels?

Construction

Increases in groundborne vibration levels attributable to the proposed Project would be primarily associated with short-term construction-related activities. Project construction would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved.

The FTA has published standard vibration velocities for construction equipment operations. In general, the FTA architectural damage criterion for continuous vibrations (i.e., 0.2 in/sec) appears to be conservative. The types of construction vibration impacts 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. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. For example, for a building that is constructed with reinforced concrete with no plaster, the FTA guidelines show that a vibration level of up to 0.50 in/sec is considered safe and would not result in any construction vibration damage. This evaluation uses the FTA architectural damage criterion for continuous vibrations at non-engineered timber and masonry buildings of 0.2 inch-per-second peak particle velocity (PPV) and human annoyance criterion of 0.4 inch-per-second PPV in accordance with Caltrans guidance.[18]

Table 12: Typical Construction Equipment Vibration Levels lists vibration levels at 25 feet for typical construction equipment. Groundborne vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. As indicated in the table, based on FTA data, vibration velocities from typical heavy construction equipment operations that would be used during Project construction range from 0.003 to 0.089 in/sec PPV at 25 feet from the source of activity.

Table 12: Typical Construction Equipment Vibration Levels

Equipment	Peak Particle Velocity at 25 Feet (in/sec)
Large Bulldozer	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small Bulldozer/Tractors	0.003
Source: FTA, *Transit Noise and Vibration Impact Assessment Manual, September 2018.*	

The concentration of construction activities would occur at least 25 feet from the nearest off-site structures/receptors. As shown in **Table 12**, at 25 feet, construction equipment vibration velocities could reach approximately 0.089 in/sec PPV, which is below the FTA's 0.20 PPV threshold and Caltrans' 0.4

[18] California Department of Transportation, 2013. *Transportation and Construction Vibration Guidance Manual.* Table 20.

in/sec PPV threshold for human annoyance. It is also acknowledged that construction activities would occur throughout the Project site and would not be concentrated at the point closest to the nearest off-site structure. Impacts from construction vibration would be less than significant.

Operations

The Project proposes an office building that would not involve railroads or substantial heavy truck operations. Therefore, proposed Project operations would not generate excessive groundborne vibration. Impacts from operational vibration would be less than significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

Threshold NOI-3: For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?

The Project site is located in a highly developed, urbanized area, and there are no private airstrips in the vicinity of the Project site. The nearest airport to the Project site is Long Beach Municipal Airport, located approximately 1.5 miles east of the Project site. The Airport Land Use Commission for Los Angeles County has adopted a comprehensive Airport Land Use Plan (ALUP) for the County's public use airports, including Long Beach Municipal Airport. The ALUP establishes an Airport Influence Areas (AIAs) for Long Beach Municipal Airport. The AIA represents a composite of the airport property, runway protection zones, and the noise contour developed for the ALUP. The Project site is located approximately 1.35 miles outside the AIA, including the ALUP noise contours. Accordingly, the proposed Project would not expose people residing or working in the Project area to excessive noise levels and there would be no impact.

Mitigation Measures: No mitigation is required.

Level of Significance: No Impact.

6.2 Cumulative Noise Impacts

Cumulative Construction Noise

The Project's construction activities would not result in a substantial temporary increase in ambient noise levels. Construction noise would be periodic and temporary noise impacts that would cease upon completion of construction activities. The Project would contribute to other proximate construction Project noise impacts if construction activities were conducted concurrently. However, based on the noise analysis above, the Project's construction-related noise impacts would be less than significant following the City of Long Beach and FTA Construction Noise Standards.

Construction activities at other planned and approved projects near the Project site would be required to comply with applicable City rules related to noise and would take place during daytime hours on the days permitted by the applicable Municipal Code, and projects requiring discretionary City approvals would be required to evaluate construction noise impacts, comply with the City's standard conditions of approval, and implement mitigation, if necessary, to minimize noise impacts. Construction noise impacts are by nature localized. Based on the fact that noise dissipates as it travels away from its source, noise impacts would be limited to the Project site and vicinity. Therefore, Project construction would not result in a cumulatively considerable contribution to significant cumulative impacts, assuming such a cumulative impact existed, and impacts in this regard are not cumulatively considerable.

Cumulative Operational Noise

Cumulative Off-Site Traffic Noise. Cumulative noise impacts describe how much noise levels are projected to increase over existing conditions with the development of the proposed Project and other foreseeable projects. Cumulative noise impacts generally occur as a result of increased traffic on local roadways due to buildout of the proposed Project and other projects in the vicinity. However, the Project is projected to result in 293 daily vehicle trips and would result in a minimal traffic noise increase (less than 3.0 dBA) along local roadways. Therefore, the proposed Project's contribution would not be cumulatively considerable.

Cumulative Stationary Noise. Stationary noise sources of the proposed Project would result in an incremental increase in non-transportation noise sources in the vicinity of the site. However, as discussed above, operational noise caused by the proposed Project would be less than significant. Similar to the proposed Project, other planned and approved projects would be required to mitigate for stationary noise impacts at nearby sensitive receptors, if necessary. As stationary noise sources are generally localized, there is a limited potential for other projects to contribute to cumulative noise impacts.

No known present or reasonably foreseeable projects would combine with the operational noise levels generated by the Project to increase noise levels above acceptable standards because each project must comply with applicable City regulations that limit operational noise. Therefore, the Project, together with other projects, would not create a significant cumulative impact, and even if there was such a significant cumulative impact, the Project would not make a cumulatively considerable contribution to significant cumulative operational noises.

Given that noise dissipates as it travels away from its source, operational noise impacts from on-site activities and other stationary sources would be limited to the Project site and immediate vicinity. Thus, cumulative operational noise impacts from related projects, in conjunction with Project-specific noise impacts, would not be cumulatively significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

7 REFERENCES

1. California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.
2. City of Long Beach, *2014 Citywide Traffic Flow Map*, https://www.longbeach.gov/globalassets/pw/media-library/documents/resources/general/maps-and-gis/2014-citywide-traffic-flow. Accessed May 17, 2023.
3. City of Long Beach, *General Plan*, Chapter 5: Community Safety, Section G: Noise, Table N-1.
4. Cyril M. Harris, *Handbook of Noise Control*, 1979.
5. Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, 2010. *Noise Navigator Sound Level Database with Over 1700 Measurement Values*.
6. Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, 2015. *Noise Navigator Sound Level Database with Over 1700 Measurement Values*.
7. Federal Highway Administration, *Noise Fundamentals,* 2017. Available at: https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm.
8. Federal Highway Administration, *Roadway Construction Noise Model,* 2006.
9. Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, August 1992.
10. Federal Transit Administration, *Transit Noise and Vibration Assessment Manual,* 2018.
11. James P. Cowan, *Handbook of Environmental Acoustics,* 1994.
12. Kariel, H. G., 1991. *Noise in Rural Recreational Environments*, Canadian Acoustics 19(5). Page 3-10.
13. City of Long Beach Municipal Code Chapter 8: Noise.
14. U.S. Office of Noise Abatement Control: *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, Arlington Virginia; U.S. Environmental Protection Agency, arch 1975, pp. 3,29.

Appendix A

NOISE DATA

Project:	**FCB Long Beach**	
Construction Noise Impact on Sensitive Receptors		
Parameters		
Construction Hours:	Daytime hours (7 am to 7 pm)	8
	Evening hours (7 pm to 10 pm)	0
	Nighttime hours (10 pm to 7 am)	0
Leq to L10 factor		3

	Receptor (Land Use)	Distance (feet)	Shielding	Direction
1	Multi Family Residential	90	0	E
2	Single Family Residential	380	0	SW
3	Commercial	100	0	SW
4	Commercial	130	0	NE

					RECEPTOR 1		RECEPTOR 2		RECEPTOR 3		RECEPTOR 4	
Construction Phase	**Equipment Type**	**No. of Equip.**	**Acoustical Usage Factor**	**Reference Noise Level at 50ft per Unit, Lmax**	**Noise Level at Receptor 1, Lmax**	**Noise Level at Receptor 1, Leq**	**Noise Level at Receptor 2, Lmax**	**Noise Level at Receptor 2, Leq**	**Noise Level at Receptor 3, Lmax**	**Noise Level at Receptor 3, Leq**	**Noise Level at Receptor 4, Lmax**	**Noise Level at Receptor 4, Leq**
Site Preparation												
	Grader	1	40%	85	79.9	75.9	67.4	63.4	79.0	75.0	76.7	72.7
	Tractor	1	40%	84	78.9	74.9	66.4	62.4	78.0	74.0	75.7	71.7
Combined LEQ						**78.5**		**65.9**		**77.5**		**75.3**
Grading												
	Grader	1	40%	85	79.9	75.9	67.4	63.4	79.0	75.0	76.7	72.7
	Dozer	1	40%	82	76.6	72.6	64.1	60.1	75.7	71.7	73.4	69.4
	Tractor	1	40%	84	78.9	74.9	66.4	62.4	78.0	74.0	75.7	71.7
Combined LEQ						**79.5**		**66.9**		**78.5**		**76.3**
Building Construction												
	Crane	1	16%	81	75.5	67.5	63.0	55.0	74.6	66.6	72.3	64.3
	Forklift*	2	40%	61	58.9	54.9	46.4	42.4	58.0	54.0	55.7	51.7
	Tractor	2	40%	84	81.9	77.9	69.4	65.4	81.0	77.0	78.7	74.7
* Warehouse & Forklift Workplace Noise Levels, The Main Noise Exposed SEG – Forklift Drivers, https://www.noisetesting.info/blog/warehouse-forklift-workplace-noise-levels/, Accessed July 26, 2022.												
Combined LEQ						**78.3**		**65.8**		**77.4**		**75.1**
Paving												
	Tractor	1	40%	84	78.9	74.9	66.4	62.4	78.0	74.0	75.7	71.7
	Concrete Mixer Truck	4	40%	79	79.7	75.7	67.2	63.2	78.8	74.8	76.5	72.5
	Paver	1	50%	77	72.1	69.1	59.6	56.6	71.2	68.2	68.9	65.9
	Roller	1	20%	80	74.9	67.9	62.4	55.4	74.0	67.0	71.7	64.7
Combined LEQ						**79.2**		**66.7**		**78.3**		**76.0**
Architectural Coating												
	Compressor (air)	1	40%	78	72.6	68.6	60.1	56.1	71.7	67.7	69.4	65.4
	All Other Equipment > 5 HP	0	50%	85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Combined LEQ						**68.6**		**56.1**		**67.7**		**65.4**

Source for Ref. Noise Levels: RCNM, 2005

Noise Measurement Field Data

Project:	11737402	**Job Number:**	011737402.2.500
Site No.:	1	**Date:**	4/26/2023
Analyst:	Simran Singh & Moody Ali	**Time:**	9:20 AM
Location:	Long Beach Blvd at the Southwest Coerner of the Project Site		
Noise Sources:	Cars, traffic, pedestrians, freeways, machines, and airports		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
71.8	57.5	78.4	106.5

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	63°
Wind (mph):	3 mph
Sky:	Partly Cloudy
Bar. Pressure:	29.98 Hg
Humidity:	72%

Photo:

Kimley»Horn

Noise Measurement Field Data

Project:	11737402	**Job Number:**	011737402.2.500
Site No.:	2	**Date:**	4/26/2023
Analyst:	Simran Singh & Moody Ali	**Time:**	9:44 AM
Location:	Northeastern corner at perimeter of Project Site		
Noise Sources:	cars, traffic, pedestrians, AC Unit		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
58.8	53.1	75.0	86.5

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	65°
Wind (mph):	3 mph
Sky:	Partly Cloudy
Bar. Pressure:	29.9 Hg
Humidity:	68%

Photo:

Kimley»Horn

Noise Measurement Field Data

Project:	11737402	**Job Number:**	011737402.2.500
Site No.:	3	**Date:**	4/26/2023
Analyst:	Simran Singh & Moody Ali	**Time:**	11:08:00 AM
Location:	East Wardlow Road on the Southeast corner of Project Site		
Noise Sources:	Cars, traffic, pedestrians, freeways, machines, and airports		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
62.6	52.5	82.0	95.1

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	70°
Wind (mph):	4 mph
Sky:	Clear
Bar. Pressure:	29.97 Hg
Humidity:	58%

Photo:

Kimley»Horn

Noise Measurement Field Data

Project:	11737402	**Job Number:**	011737402.2.500
Site No.:	4	**Date:**	4/26/2023
Analyst:	Simran Singh and Moody Ali	**Time:**	10:16 AM
Location:	Corner of East Wardlow Road and Elm Ave. Southeast of Project Site.		

Noise Sources:	Freeway, birds chriping, vehicle movement
Comments:	

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
64.9	61.8	74.6	93.4

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	66°
Wind (mph):	3 mph
Sky:	Partly Cloudy
Bar. Pressure:	29.98 Hg
Humidity:	64%

Photo:

Kimley»Horn