

APPENDIX H:
ACCOUSTICAL ASSESSMENT

Acoustical Assessment
2245 W. Valley Boulevard Project
City of Colton, California

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LIST OF ABBREVIATED TERMS

APN	Assessor's Parcel Number
ADT	average daily traffic
dBA	A-weighted sound level
CEQA	California Environmental Quality Act
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
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 an Acoustical Assessment completed for the 2245 W. Valley Boulevard Project (“Project” or “proposed Project”). The purpose of this Acoustical 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 2245 W. Valley Boulevard (Project) site is in the northwestern portion of the City of Colton in the southwestern portion of the County San Bernardino, California; refer to [Exhibit 1, Regional Location Map](#). The Project site is a nine net acre site (Assessor Parcel Number [APN] 0254-041-04 with I-10 and W. Valley Boulevard to the south, E. San Bernardino Avenue to the far north, S. Riverside Avenue and the City of Rialto to the west, and Wildrose Avenue to the east; refer to [Exhibit 2, Local Vicinity Map](#). The Project site is located in the Colton’s Hub City Centre Specific Plan (CHCCSP).

The Project site is predominately paved and developed with an existing industrial building. The Project site also includes segments of perimeter fencing, several mature trees, and scattered vegetation at the northern portion of the Project site. The Project site is overall flat and utilized for truck and trailer parking, storage and other transportation related activities. The following uses surround the Project site:

- North: Chuze Fitness, Vacant Land, and E San Bernardino Avenue
- South: E Valley Boulevard, Clutch Master Auto Parts Store, and I-10 Freeway
- East: Brill CSM Bakery Solutions Warehouse and Wildrose Avenue
- West: Vacant land, commercial businesses, S Riverside Avenue, and City of Rialto

1.2 Project Description

The Project proposes to develop four tilt-up concrete industrial buildings, totaling approximately 149,204 square feet (SF) of warehouse space, and approximately 37,301 SF of office space for an overall building area of 186,505 SF. Refer to [Exhibit 3, Conceptual Site Plan](#) which illustrates the proposed Project buildings.

The Project would include the minimal production, use, storage, transport and disposal of hazardous materials for construction and operational activities. The Project does not include cold storage. The Project is speculative in nature; the end user(s) and their hours of operation are unknown at this time. However, to be conservative, it has been assumed that each building would operate 24 hours per day/7 days per week. The Project will be subject to a condition of approval providing that there shall be no refrigerated uses on site, unless a future tenant who proposes to have such uses conducts an update of the CEQA document and any applicable studies/memorandums to amend the condition.

Site Access

Regional access to the Project site is provided via I-10 at S. Riverside Avenue and local access to the Project site is provided via W. Valley Boulevard which is a four-lane divided roadway, trending in an east-west direction. Building 1 through Building 4 would be sited near each corner of the Project site. Immediate

ingress and egress access to Buildings 1 and 4 would be provided via two 35-foot-wide driveways located on the southwest and southeast corners of the Project site and one 40-foot-wide driveway. Buildings 2 and 3 would be accessible via 26' internal drive aisles that will allow for on-site movement for workers and emergency vehicles alike.

Parking

The Project is anticipated to provide 251 vehicle parking stalls and 21 dock doors. Vehicle parking would be provided throughout the Project site. Dock doors and truck/trailer parking would be located on the east side of Buildings 1 and 3. Dock doors and truck/trailer parking would be located on the west side of Buildings 2 and 4.

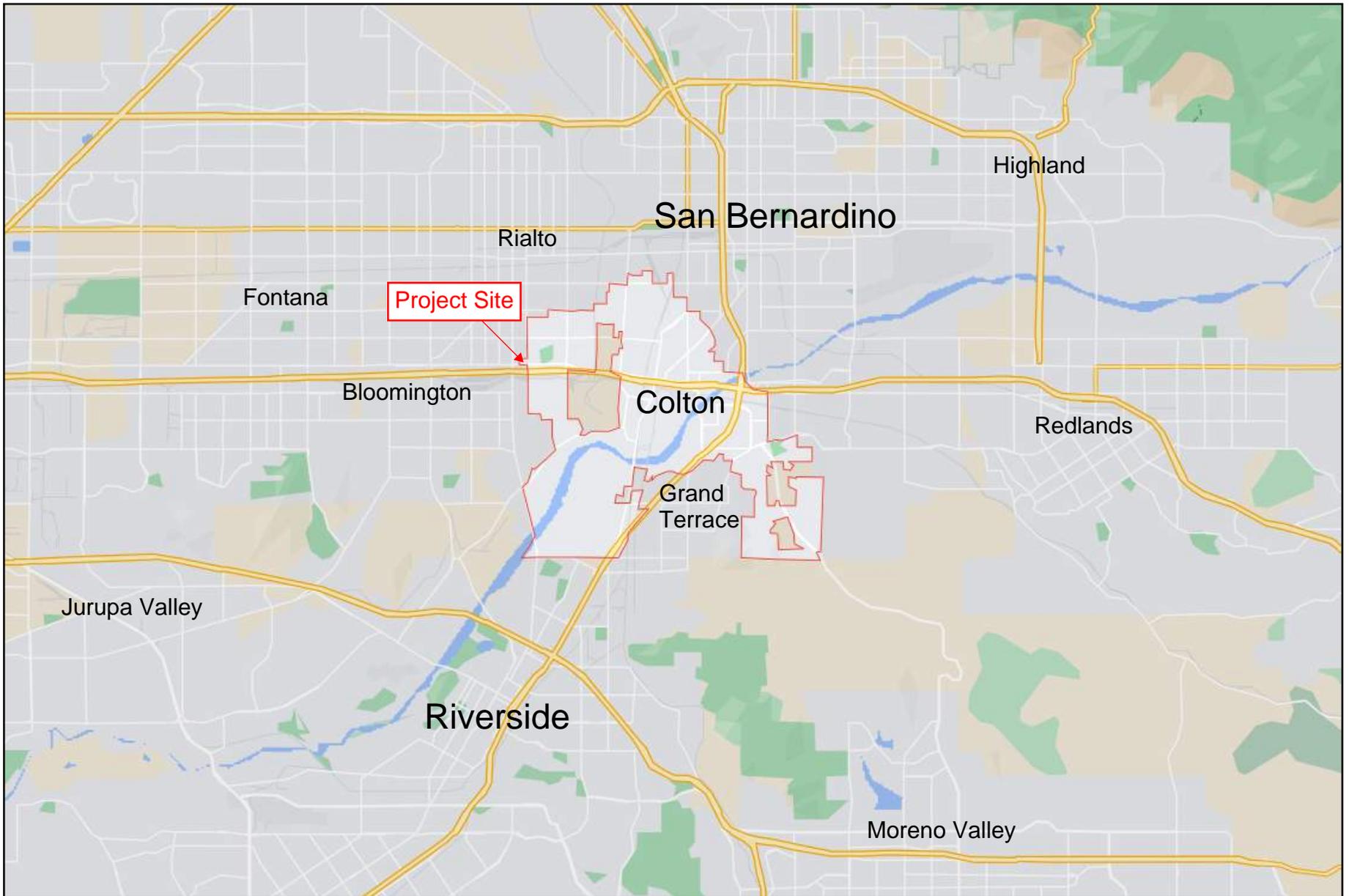
Project Construction Schedule

Construction activities are anticipated to begin in the second quarter of 2023 and are anticipated to be completed during the second quarter of 2024.

Demolition Activities

The Project site is currently developed with an existing building previously utilized for industrial usage. Prior to the approval and issuance of any demolition or building permits, the proposed demolition activities would be conducted in compliance with the City's municipal code (Colton MC) Section 15.58.040, Construction and Demolition Recycling Requirements, which includes construction and demolition requirements for the removal, remodeling or new construction of any structure on a site.¹

¹ City of Colton. (2022). City of Colton Municipal Code. Available at: https://library.municode.com/ca/colton/codes/code_of_ordinances?nodeId=TIT15BUCO_CH15.58RERE_15.58.040CODERERE (accessed November 15, 2022).



Source: Google Maps

Exhibit 1: Regional Location Map
City of Colton
2245 W. Valley Boulevard



Not to Scale

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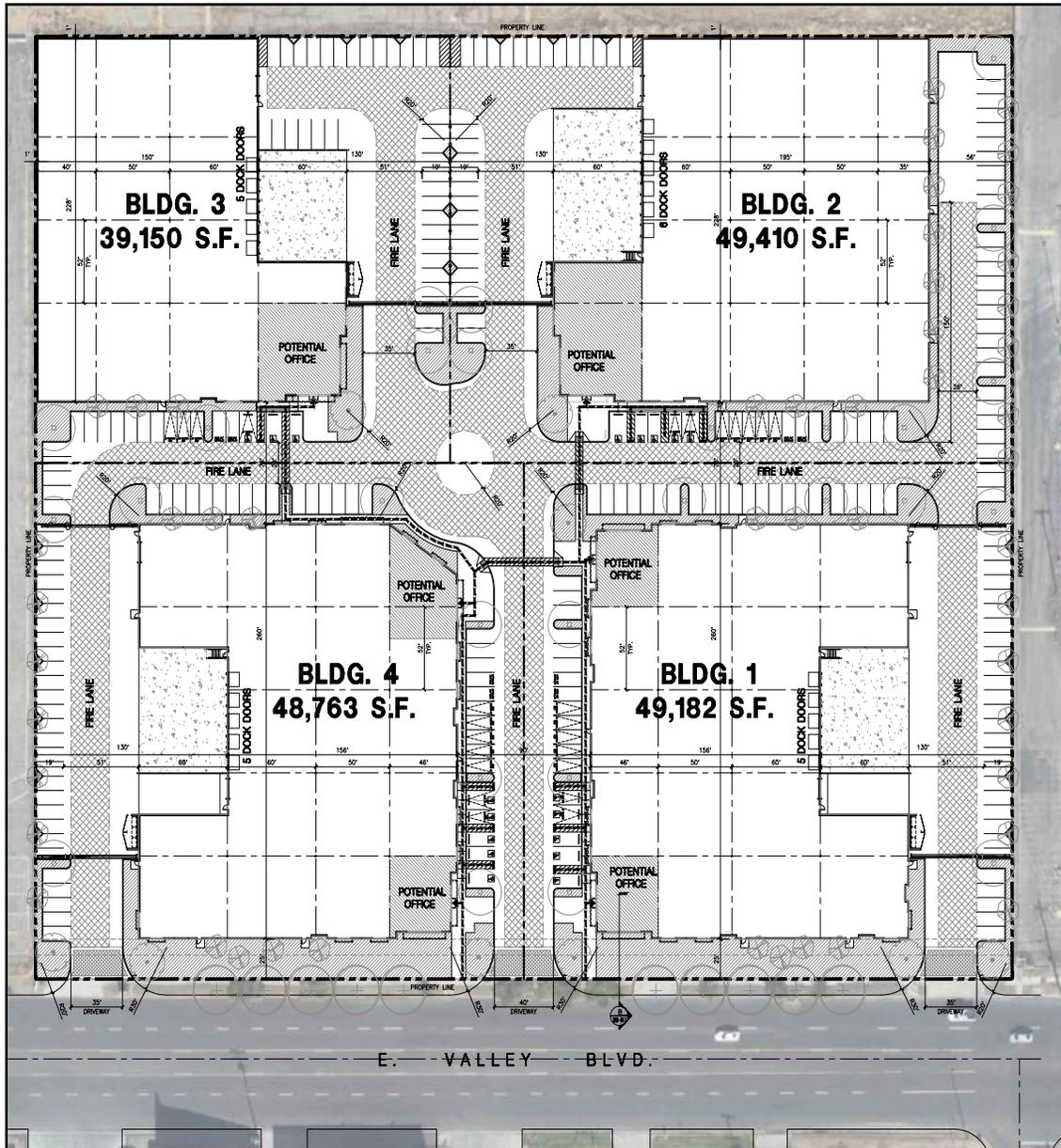
Source: Nearmap Imagery September 5, 2022

Exhibit 2: Local Vicinity Map
City of Colton
2245 W. Valley Boulevard



Not to Scale

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LEGEND

	BLDG. 1	BLDG. 2	BLDG. 3	BLDG. 4	TOTAL	
SITE AREA						
In s.f.	106,913	101,727	75,027	106,913	390,580	sf
In acres	2.5	2.3	1.7	2.5	9.0	ac
BUILDING AREA						
Office - 20% *	9,836	9,882	7,830	9,753	37,301	sf
Warehouse	39,346	39,528	31,320	39,010	149,204	sf
TOTAL	49,182	49,410	39,150	48,763	186,505	sf
<i>Note: For all uses, the max gross leasable area of a freestanding building, whether one or more users/tenant, shall not exceed 50,000 s.f.</i>						
FLOOR AREA RATIO						
Maximum Allowed			no limit			
Actual	0.460	0.486	0.522	0.456	0.478	
SITE COVERAGE						
Maximum Allowed			no limit			
Actual	46.0%	48.6%	52.2%	45.6%	47.8%	
AUTO PARKING REQUIRED						
Office: 1/250 s.f.	39	40	31	39	149	stalls
Whse: Building under 20K @ 1/1,000 s.f.	n/a	n/a	n/a	n/a	n/a	stalls
* Building over 20K @ 1/2,000 s.f.	20	20	16	20	76	stalls
* Min. 20% of gross building area shall be considered office						
TOTAL	59	60	47	59	225	stalls
AUTO PARKING PROVIDED						
Standard (9' x 19')	57	59	42	49	207	stalls
ADA Standard (9' x 19')	2	2	1	2	7	stalls
ADA Van (12' x 19')	1	1	1	1	4	stalls
EV Standard (9' x 19')	5	5	3	5	18	stalls
EV ADA Standard (9' x 19')	1	1	0	1	3	stalls
EV ADA Van (12' x 19')	1	1	1	1	4	stalls
Clean Air/Vanpool/EV (9' x 19')	2	2	2	2	8	stalls
TOTAL	69	71	50	61	251	stalls
ZONING ORDINANCE						
Zoning - Colton's Hub City Centre SP - Business Park (BP)						
MAXIMUM BUILDING HEIGHT ALLOWED						
Height - 50'						
LANDSCAPE REQUIREMENT						
Percentage - to be verified						
LANDSCAPE PROVIDED						
In s.f.	14,687	8,573	5,112	14,266	42,638	
Percentage	13.7%	8.4%	6.8%	13.3%	10.9%	
SETBACKS						
Building						Landscape
Valley Blvd. - 25'						15'
Public Rd. - 20'						15'
From RMU - 10'						5'
From Open Space - 10'						5'

Source: HPA Architecture. (2022). Master Site Plan

Exhibit 3 Conceptual Site Plan
 City of Colton
 2245 W. Valley Boulevard



Not to Scale

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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 acoustics 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 a base of steady background noise that is the sum of many distant and indistinguishable noise sources. The sound from individual local sources is superimposed on this background noise. 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 micropascals (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. Most commonly, environmental sounds are described in terms of the equivalent noise level (L_{eq}) that has the same acoustical energy as the summation of all the time-varying events. While L_{eq} represents the continuous sound pressure level over a given period, the day-night noise level (L_{dn}) and Community Equivalent Noise Level (CNEL) are measures of energy average during a 24-hour period, with dB weighted sound levels from 7:00 p.m. to 7:00 a.m. 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 pascals 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.

Because sound levels can vary markedly over a short period of time, a method for describing either the average character (L_{eq}) or the variations' statistical behavior (L_{xx}) must be utilized. 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 predicted models' accuracy depends on various factors, such as the distance between the noise receptor and noise source, the character of the ground surface (e.g., hard or soft), and the presence or absence of structures (e.g., walls or buildings) or topography, and how well model inputs reflect these conditions.

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 10.² When the standard logarithmic dB is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness.³ For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound. 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. Under the dB scale, three sources of equal loudness together would produce an increase of 5 dBA.⁴

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.⁵ 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. For line sources, an overall attenuation rate of 3 dB per doubling of distance is assumed in this report.

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 can reduce noise levels by 5 to 15 dBA.⁷ The way older homes in California were constructed generally 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.

² California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.

³ Ibid.

⁴ Ibid.

⁵ Ibid.

⁶ Ibid.

⁷ Federal Highway Administration, *Highway Traffic and Construction Noise - Problem and Response*, April 2006.

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.⁸ 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. 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.¹⁰

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 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

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 Federal Highway Administration, *Noise Fundamentals*, 2017.

¹⁰ U.S. Department of Labor, Occupational Safety and Health Standards, *29 CFR 1910* (Occupational Noise Exposure).

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.¹¹

2.2 Groundborne Vibration

Sources of groundborne 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). 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 the peak particle velocity (PPV); another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave and is expressed in terms of inches-per-second (in/sec). The RMS velocity is defined as the average of the squared amplitude of the signal and is expressed in terms of velocity decibels (VdB). 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 individual's sensitivity. 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 groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

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, <i>Transportation and Construction Vibration Guidance Manual</i> , 2020 and Federal Transit Administration, <i>Transit Noise and Vibration Assessment Manual</i> , 2018.			

¹¹ Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, August 1992.

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 groundborne 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 in/sec is used to evaluate construction-generated vibration for building damage and human complaints.

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 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.

3.2 Local

City of Colton General Plan

The City of Colton General Plan (Colton GP) Noise Element contains noise standards for mobile noise sources. These standards address noise impacts from adjacent roadways and airports. The Colton GP Noise Element identifies the noise standards related to commercial property, indicating a CNEL value of up to 70 dBA CNEL is considered normally acceptable; while noise levels of up to 78 dBA are conditionally acceptable.

The Colton GP Noise Element includes the following principles relevant to the Project:

- **Principle 1**—Establish criteria defining compatible land uses as a function of the level of noise exposure.
- **Principle 2**—Control noise exposure from future noise generators so the ambient environment will be kept within acceptable limits.

- **Principle 3**—Establish acceptable noise standards consistent with health and quality of life goals.

To enforce these principles, the Colton GP Noise Element specifies the following standards:

- **Standard 1**—Residential structures should be constructed to maintain interior noise levels of not greater than 45 dBA, through the use of sound barrier improvements, building design, construction materials and/or insulating techniques.
- **Standard 2**—Residential growth in Community Noise Exposure Areas greater than 70 dBA should be discouraged, unless on-site noise levels can be reduced to 60 dBA or lower via on- and offsite noise alleviating improvements.
- **Standard 3**—Exterior noise levels should not exceed 65 dBA during the day or 55 dBA at night for commercial land uses, including general business and general merchandising.
- **Standard 4**—Exterior noise levels should not exceed 60 dBA at any time for such areas important to public need, and where the preservation of serenity and quietness is essential if the area is to continue to serve its intended purpose. Such areas could include parks, open spaces, amphitheatres, and other areas dedicated for activities requiring special qualities of serenity.

City of Colton Municipal Code

Colton MC § 18.42.010—This chapter is intended to protect properties in all residential zones and the health and safety of persons from environmental nuisances and hazards and to provide a pleasing environment in keeping with the nature of the residential character. The performance standards provided below set maximum tolerability limits on adverse environmental effects created by any use or development of land.

Colton MC § 18.42.040—The maximum sound level radiated by any use of facility, when measured at the boundary line of the property on which the sound is generated, shall not be obnoxious by reason of its intensity, pitch or dynamic characteristics as determined by the City, and shall not exceed 65 dBA.

Colton MC § 18.42.050—All activities shall be operated so as not to generate ground vibration by equipment other than motor vehicles, trains, or by temporary construction or demolition, which is perceptible without instruments by the average person at or beyond any lot line of the lot containing the activities.

4 EXISTING CONDITIONS

4.1 Existing Noise Sources

The City is impacted by various noise sources. Mobile sources of noise, especially cars, trucks, and trains are the most common and significant sources of noise. Other noise sources are the various land uses (i.e. residential, commercial, institutional, and recreational and parks activities) throughout the City that generate stationary-source noise. Existing noise sources in the project area include noise from traffic on the Valley Boulevard to the south, Riverside Avenue to the west, and I-10 is located approximately 600 feet to the south. The primary sources of stationary noise in the Project vicinity are urban-related activities (i.e., mechanical equipment, commercial/light industrial uses, parking areas, and pedestrians). The noise associated with these sources may represent a single-event noise occurrence, short-term, or long-term/continuous noise.

4.2 Noise Measurements

The Project applicant proposes the development of four industrial buildings totaling approximately 186,505 SF of industrial warehouse space (including office space). The Project would include 251 parking stalls and 21 dock doors. To quantify existing ambient noise levels in the Project area, Kimley-Horn conducted five short-term noise measurements; see [Appendix A: Existing Ambient Noise Measurements](#). The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the Project site. The 10-minute measurements were taken between 2:54 p.m. and 4:25 p.m. on January 31, 2023. Measurements of L_{eq} are considered representative of the noise levels throughout the day. The average noise levels and sources of noise measured at each location are listed in [Table 4: Existing Noise Measurements](#) and shown on [Exhibit 4: Noise Measurement Locations](#).

Site	Location ¹	Measurement Period	Duration	L_{eq} (dBA)
ST-1	Off of Riverside Avenue, south of Rialto Assisted Living, north of Chuze Fitness. 925 feet northwest of Project site.	2:54 – 3:04 p.m.	10 Minutes	58.6
ST-2	Off of Riverside Avenue, southeast corner of Chuze Fitness parking lot. 175 feet north of Project site.	3:25 – 3:35 p.m.	10 Minutes	57.8
ST-3	East Valley Blvd, in parking lot northeast of American Tire Depot. 330 feet west of Project site.	3:41 – 3:51 p.m.	10 Minutes	58.8
ST-4	West Valley Blvd, parking lot north of Woodspring Suites and west of Welcome Inn. 380 feet southeast of Project Site	4:00 – 4:10 p.m.	10 Minutes	67.5
ST-5	Residences off of Wildrose Avenue, 830 feet northeast of Project Site	4:15 – 4:25 p.m.	10 Minutes	56.9

1. Noise monitoring locations were selected to represent the ambient conditions at sensitive receptors in the vicinity of the Project site.
Source: Noise measurements taken by Kimley-Horn, January 31, 2023. See Appendix A for noise measurement results.

4.3 Sensitive Receptors

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. Noise sensitive uses typically include residences, hospitals, schools, childcare facilities, and places of assembly. Vibration sensitive receivers are generally similar to noise sensitive receivers but may also include businesses, such as research facilities and laboratories that use vibration-sensitive equipment. Land uses surrounding the Project consist mostly of commercial and light industrial. The

nearest sensitive receptor is a residential community located approximately 850 feet (259 meters) to the northeast of the Project.



Source: Nearmap Imagery September 9, 2022

Exhibit 4: Noise Measurement Locations
 City of Colton
 2245 W. Valley Boulevard



Kimley»Horn

5 SIGNIFICANCE CRITERIA AND METHODOLOGY

5.1 CEQA Thresholds

State California Environmental Quality Act (CEQA) Guidelines Appendix G contains analysis guidelines related to noise and vibration. 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:

- 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;
- Generate excessive groundborne vibration or groundborne noise levels; and
- 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.

Thresholds

Construction Noise

The City of Colton's noise ordinance has not established noise performance standards for construction activities. Therefore, this noise study uses the construction noise performance standards found in the County of San Bernardino Development Code which restricts such noise producing construction activity to the hours of 7:00 a.m. and 7:00 p.m. Mondays to Saturday, with no such activity permitted on Sundays or Federal holidays.

Like the City of Colton, the County of San Bernardino does not establish quantitative construction noise standards and only limits the construction activities timeframe; therefore, this analysis conservatively uses the Federal Transit Administration's (FTA's) threshold of 80 dBA (8-hour L_{eq}) for residential uses and 90 dBA (8-hour L_{eq}) for non-residential uses to evaluate construction noise impacts.¹²

Operational Noise

The Colton GP states that residential interior noise levels should not exceed 45 dBA and exterior noise levels should not exceed 65 dBA during the day and 55 dBA at night for commercial land uses. Therefore, onsite noise levels should not exceed these noise levels when measured from the nearest property line.

A significant impact from Project-generated traffic would occur if a substantial increase in ambient noise levels occur when compared with those that exist without the proposed Project. The City does not define "substantial increase," therefore for purpose of this analysis, a substantial increase is based on the following criteria. A potentially significant impact would occur if the Project would cause ambient noise levels to increase by 3 dBA CNEL or more and the resulting noise falls on a noise-sensitive land use that exceeds the noise and land use compatibility standards (i.e., causing the noise level of a noise sensitive

¹² Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, Table 7-2, Page 179, September 2018.

land use within an area to be categorized as either “Normally Unacceptable” or “Clearly Unacceptable”). Note that noise level changes less than 3 dBA are not detectable by the human ear.¹³

Vibration

The City’s Municipal Code regulates vibration by restricting a project’s operations so as not to generate ground vibration by equipment (other than motor vehicles, trains or by temporary construction or demolition) which is perceptible without instruments by the average person at or beyond any lot line of the lot containing the activities. The Caltrans 2020 *Transportation and Construction Vibration Guidance Manual* identifies the vibration threshold for human annoyance, vibrations levels of 0.04 in/sec begin to cause annoyance and levels of 0.5 in/sec is used for building damage for the industrial building to the east. Because the City currently does not have a significance threshold to assess vibration impacts the Caltrans threshold is used in this analysis.

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 the Federal Highway Administration (FHWA). Construction noise is assessed in dBA L_{eq} . This unit is appropriate because L_{eq} 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.

Construction noise modeling was conducting using the FHWA Roadway Construction Noise Model (RCNM). 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 Colton does not establish quantitative construction noise standards. As noted above, this analysis conservatively uses the FTA’s threshold of 80 dBA (8-hour L_{eq}) for residential uses and 90 dBA (8-hour L_{eq}) for non-residential uses to evaluate construction noise impacts.

Operations

The analysis of on- and off-site operational noise generated by the Project is based on empirical observations. Reference noise level data is used to estimate the Project operational noise levels from onsite sources. Noise levels are collected from field noise measurements and other published sources from similar types of activities are used to estimate noise levels expected from the Project. The reference noise levels are used to represent a worst-case noise environment as noise levels can vary throughout the day. Operational noise is evaluated based on the City’s Municipal Code and General Plan standards.

A qualitative analysis of the Project’s effect on traffic noise conditions at offsite land uses was prepared using Caltrans’ *Technical Noise Supplement to Traffic Noise Analysis Protocol*. Traffic noise is assumed to

¹³ California Department of Transportation, *Traffic Noise Analysis Protocol*, Page 7-1, April 2020

be significant if the Project would result in noticeable increase in traffic noise. In general, a 3-dBA increase in traffic noise is barely perceptible to people, while a 5-dBA increase is readily noticeable.

Vibration

Ground-borne vibration levels associated with Project construction-related activities 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 a structure built traditionally, without assistance from qualified engineers, the Caltrans guidelines show that a vibration level of up to 0.20 in/sec is considered safe and would not result in any vibration damage. Caltrans guidelines show that modern engineered buildings built with reinforced-concrete, steel or timber can withstand vibration levels up to 0.50 in/sec and not experience vibration damage (see [Table 3](#)).

6 POTENTIAL IMPACTS AND MITIGATION

6.1 Acoustical Impacts

Threshold 6.1 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

On-Site Construction Noise

Construction noise typically occurs intermittently and varies depending on the construction activity's nature or phase (e.g. demolition, 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 noise sensitive receptors near the construction site. However, it is acknowledged that construction activities would occur throughout the Project site and would not be concentrated at a single point near noise sensitive receptors.

Construction activities would include demolition, site preparation, grading, building construction, paving, and architectural coating. Such activities would require:

- Industrial saws, dozers, and tractors during demolition
- Dozers and tractors during site preparation
- Excavators, graders, dozers, scrapers, and tractors during grading
- Cranes, forklifts, generators, tractors, and welders during building construction
- Pavers, rollers, and paving equipment during paving
- 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). Construction equipment noise, including earth movers, material handlers, and portable generators, can reach high levels. Typical noise levels associated with individual construction equipment are listed in [Table 4: Typical Construction Noise Levels](#) and includes noise levels at 850 feet, the distance from the Project boundary to the nearest sensitive receptor. It is noted that the noise levels shown in [Table 5](#) are maximum noise levels (i.e., the equipment engine at maximum speed). However, equipment used on construction sites typically operates under less than full power conditions, or part power.

Equipment	Typical Noise Level (dBA) at 50 feet from Source	Typical Noise Level (dBA) at 850 feet from Source ¹
Air Compressor	80	55
Backhoe	80	55
Compactor	82	57
Concrete Mixer	85	60
Concrete Pump	82	57

Table 5: Typical Construction Noise Levels		
Equipment	Typical Noise Level (dBA) at 50 feet from Source	Typical Noise Level (dBA) at 850 feet from Source¹
Concrete Vibrator	76	51
Dozer	85	60
Generator	82	57
Grader	85	60
Impact Wrench	85	60
Jack Hammer	88	63
Loader	80	55
Paver	85	60
Pneumatic Tool	85	60
Pump	77	52
Roller	85	60
Saw	76	51
Scraper	85	60
Shovel	82	57
Truck	84	59
1. Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1 + 20\log(d_1/d_2)$ Where: dBA_2 = estimated noise level at receptor; dBA_1 = reference noise level; d_1 = reference distance; d_2 = receptor location distance		
Source: Federal Transit Administration, <i>Transit Noise and Vibration Impact Assessment Manual</i> , September 2018.		

Although the construction equipment noise levels in [Table 5](#) are from FTA's 2018 *Transit Noise and Vibration Impact Assessment Manual*, the noise levels are based on measured data from a U.S. Environmental Protection Agency report which uses data from the 1970s,¹⁴ the FHWA Roadway Construction Noise Model uses data from the early 1990s, and other measured data. Since that time, construction equipment has been required to meet more stringent emissions standards and the additional necessary exhaust systems also reduce noise from what is shown in the table.

Project Construction Noise Levels

[Table 6: Project Construction Noise Levels](#) shows the exterior construction noise for the Project without accounting for attenuation from existing physical barriers or topography. Construction noise has been calculated with FHWA's Roadway Construction Noise Model (RCNM). The nearest noise sensitive receptor is a residential community 850 feet to the northeast, along Wildrose Avenue. Construction equipment was assumed to operate simultaneously to represent a worst-case noise scenario as construction activities would routinely be spread throughout the construction site and would operate at different intervals.

The City of Colton does not establish quantitative construction noise standards; therefore, this analysis conservatively uses the FTA's threshold of 80 dBA (8-hour L_{eq}) for residential uses to evaluate construction noise impacts. FTA's construction threshold is an 8-hour L_{eq} , which accounts for the percentage of time each individual piece of equipment operates under full power in that period. Additionally, construction equipment would move throughout the site during that period.

¹⁴ U.S. Environmental Protection Agency, *Noise from Construction Equipment and Operations, Building Equipment and Home Appliances*, NTID300.1, December 31, 1971.

Construction Phase	Land Use	Receptor Location Relative to Construction Activity			Noise Threshold (dBA L _{eq}) ³	Exceeded?
		Direction	Distance (feet) ¹	Worst Case Modeled Exterior Noise Level (dBA L _{eq}) ²		
Combined Demolition and Site Preparation	Residential	Northeast	1,200	61.7	80	No
	Non-Residential	East	330	72.9	90	No
Combined Grading, Building Construction, Paving, and Architectural Coating	Residential	Northeast	1,200	60.9	80	No
	Non-Residential	East	330	72.1	90	No
1. Following FTA methodology, all equipment should be assumed to operate at the center of the Project site because equipment would operate throughout the Project site and not at a fixed location for extended periods of time. 2. Modeled noise levels conservatively assume the simultaneous operation of all pieces of equipment. 3. Federal Transit Administration noise threshold of 80 dBA for residences and 90 dBA for non-residential uses.						
Source: Federal Highway Administration, <i>Roadway Construction Noise Model</i> , 2006. Refer to Appendix B for noise modeling results.						

Following FTA methodology, when calculating construction noise, all construction equipment is assumed to operate simultaneously at the center of the active construction zone to represent an average distance throughout the day. The distance from the center of the Project site to the nearest sensitive receptor is 1,200 feet. The distance from the center of the Project site to the adjacent non-residential boundary to the east is 330 feet. During construction, equipment would operate throughout the site and not all of the equipment would be operating at the point closest to the receptors. Considering the distance between the center of the Project site is a reasonable assumption for estimating average noise levels throughout the day.

Based on the construction schedule, it is anticipated that demolition and site preparation would occur during the same time, while grading, building construction, paving, and architectural coating activities would all overlap at some time during construction. Therefore, the noise generated by equipment during these activities have been combined. Table 6 shows that the maximum construction noise levels would not exceed the applicable FTA construction threshold. The highest exterior noise level at residential receptors would occur during the combined demolition and site preparation phase and would be 61.7 dBA, which is below the FTA’s 80 dBA threshold. Although receptors may be exposed to elevated noise levels during project construction, these noise levels would be acoustically dispersed throughout the Project site and not concentrated in one area. As such, construction-related noise impacts would not generate a substantial, temporary, or permanent increase in ambient noise levels in excess of applicable standards and impacts would be less than significant in this regard.

Operations

Implementation of the proposed Project would create new sources of noise in the Project vicinity. The major noise sources associated with the Project would include:

- Mechanical equipment (i.e. trash compactors, air conditioners, etc.);
- Slow moving trucks on the Project site, approaching and leaving the loading areas;
- Activities at the loading areas (i.e. maneuvering and idling trucks, equipment noise);
- Parking areas (i.e. car door slamming, car radios, engine start-up, and car pass-by); and
- Off-Site Traffic Noise.

Onsite Operational Noise

Mechanical Equipment

The Project is located in an area surrounded by commercial and light industrial uses. The nearest sensitive receptor to the Project site is approximately 850 feet (259 meters) to the northeast, along Wildrose Avenue. Potential stationary noise sources related to long-term operation of the Project site would include mechanical equipment. Mechanical equipment (e.g. heating ventilation and air conditioning [HVAC] equipment) typically generates noise levels of approximately 52 dBA at 50 feet¹⁵. Based on conceptual site plans, the closest mechanical equipment associated with the Project could be located to the property boundary would be 25 feet. At this distance, mechanical equipment noise would attenuate to 58.0 dBA.¹⁶

Truck and Loading Dock Noise

During loading and unloading activities, noise would be generated by the trucks' diesel engines, exhaust systems, and brakes during low gear shifting' braking activities; backing up toward the docks; dropping down the dock ramps; and maneuvering away from the docks. The proposed warehouse building includes dock-high doors for truck loading/unloading and manufacturing/light industrial operations. Typically, heavy truck operations generate a noise level of 64.4 dBA at a distance of 50 feet.¹⁷ Based on the conceptual site plan, the nearest dock-high doors to the property boundary are approximately 60 feet south of the northern property line. At this distance, truck and loading dock noise would attenuate to 62.8 dBA. Loading dock doors would also be surrounded with protective aprons, gaskets, or similar improvements that, when a trailer is docked, would serve as a noise barrier between the interior activities and the exterior loading area.

Parking Noise

The Project site would have 251 automobile parking stalls. Based on the *Traffic Study for the 2245 W. Valley Boulevard Project* (Kimley-Horn, November 2022) (Traffic Study), the Project would generate 32 vehicle trips during the a.m. peak hour and 34 vehicle trips during the p.m. peak hour. For the purpose of providing a conservative, quantitative estimate of the noise levels that would be generated from the vehicles entering and exiting the parking lot, the methodology recommended by FTA for the general assessment of stationary transit noise sources is used. Using the methodology, the Project's peak hourly noise level that would be generated by the on-site parking levels was estimated using the following FTA equation for a parking lot:

¹⁵ Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.

¹⁶ Distance Attenuation Formula: $dBA2 = dBA1 + 20 \text{Log}10\left(\frac{d1}{d2}\right)$ where: dBA1 = Reference Noise Level, d₁ = Reference Distance, d₂ = Approximate Receptor Location Distance

¹⁷ Loading dock reference noise level measurements conducted by Kimley-Horn on December 18, 2018.

$$L_{eq(h)} = SEL_{ref} + 10 \log (NA/1,000) - 35.6$$

Where:

$L_{eq(h)}$ = hourly L_{eq} noise level at 50 feet

SEL_{ref} = reference noise level for stationary noise source represented in sound exposure level (SEL) at 50 feet

NA = number of automobiles per hour

35.6 is a constant in the formula, calculated as 10 times the logarithm of the number of seconds in an hour

Using the FTA's reference noise level of 92 dBA SEL¹⁸ at 50 feet from the noise source, the Project's highest peak hour vehicle trips would generate noise levels of approximately 41.7 dBA L_{eq} at 50 feet from the parking lot. The nearest sensitive receptor is 850 feet from a parking area. Conservatively assuming that all vehicles would park at a location nearest to sensitive receptors rather than dispersed throughout all available parking and based strictly on distance attenuation, parking lot noise at the nearest receptor would be 17.1 dBA which is below the City's residential noise standard. Therefore, noise impacts from parking lots would be less than significant.

Total Onsite Operational Noise

Using decibel addition,¹⁹ the total exterior noise levels from the mechanical equipment, truck and loading dock noise, and parking lot noise have been combined. The unmitigated noise levels noise generated by the Project would be 65.5 dBA at the property boundary. The City has an exterior noise standard of 65 dBA during the day and 55 dBA at night for commercial land uses, including general business and general merchandising. The proposed Project is subject to the mitigation measures implemented by the CHCCSP FEIR. **MM N-5** of the CHCCSP FEIR requires the Project proponent prepare a detailed noise study to show that Project noise will not exceed 55 dBA L_{eq} during daytime hours or 45 dBA L_{eq} during nighttime hours. The detailed noise study shall be prepared by a qualified acoustical engineer and shall document the noise generation characteristics of the proposed equipment and the projected noise levels at the nearest use. The report shall be completed and approved by the City prior to issuance of building permits. The Project is speculative in nature and the end user(s) and specific noise generation characteristics are unknown at this time. The analysis included herein is based on conservative, worst-case assumptions. Prior to the issuance of building permits, as required by CHCCSP FEIR MM N-5, a detailed noise study will be prepared to ensure that operational noise would not exceed City standards. Therefore, onsite operational noise impacts will be less than significant with mitigation.

Off-Site Traffic Noise

Project implementation would result in minimal traffic trips on Project area roadways. As previously discussed, the Traffic Study shows that the Project would result in 325 total daily trips with 32 a.m. peak hour trips and 34 p.m. peak hour trips. In general, a 3-dBA increase in traffic noise is barely perceptible to people, while a 5-dBA increase is readily noticeable. Traffic volumes on Project area roadways would have to approximately double for the resulting traffic noise levels to generate a barely perceptible 3-dBA

¹⁸ Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

¹⁹ $L = 10 \log_{10}(\sum_{i=1}^n 10^{\frac{L_i}{10}})$

increase.²⁰ As shown in the Traffic Study, due to the Project's low trip generation, the Project would not result in any traffic related effects. The traffic associated with the Project is insufficient to double existing traffic volumes, and thus, would not increase traffic noise on Project area roadways. Therefore, off-site traffic noise impacts would not generate a substantial temporary or permanent increase in ambient noise levels in excess of applicable standards and traffic noise impacts would be less than significant.

The Final EIR includes measures to reduce potential impacts associated with the implementation of the CHCCSP Plan Project. The following measures from the Final EIR are applicable to the proposed Project:

Mitigation Measures from the Final EIR

- N-1** Control of Construction Hours – All construction activities should be limited to the hours between 7:00 AM and 7:00 PM Monday through Saturday. Construction and demolition should be prohibited on Sundays or national holidays.
- N-2** In addition to implementation of Mitigation Measure N-1, the following mitigation measures should be implemented whenever construction activities occur within 1,500 feet of the hotel and residential land uses located between Valley Blvd and the I-10 Freeway; the Colton Golf Club (if in operation); the residential properties, the church and the Rialto City Park all located along San Bernardino Avenue; the Rialto Retirement Home, Vista Cove Care Center and the Cathedral of Praise Church all located near Riverside Drive; the San Bernardino Social Services Building; the Arrowhead Regional Medical Center; the Hermosa Gardens Cemetery; Slover Mountain High School; the residential land uses located along Hermosa Avenue, and adjacent to planning areas set aside for permanent habitat (planning areas 3, 6, 11 and 18) as well as the habitat set aside as part of the HCP within the Cemetery property.
- a) All construction contractors shall limit haul truck deliveries to the same hours specified for construction equipment (7:00 AM and 7:00 PM Monday through Saturday).
 - b) To the extent feasible, haul routes shall not pass sensitive land uses or residential dwellings and should avoid using alleyways adjacent to said uses.
 - c) All construction contractors shall use power construction equipment with state-of-the-art noise shielding and muffling devices.
 - d) During all project site excavation and grading on any site in the CHCCSP project area, construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards.
 - e) All construction contractors shall locate equipment staging in areas that will create the greatest distance between construction-related noise

²⁰ According to the California Department of Transportation, *Technical Noise Supplement to Traffic Noise Analysis Protocol* (September 2013), it takes a doubling of traffic to create a noticeable (i.e., 3 dBA) noise increase.

sources and noise sensitive receptors nearest a project site during all project construction.

- f) All construction contractors shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest a project site.
- N-3** The use of vibratory equipment shall be avoided within 70 feet of existing vibration-sensitive land uses (residential, habitat, ARMC).
- N-4** If vibratory equipment must be used within 26 feet of an existing structure vibration monitoring shall be conducted and work shall be halted and re-evaluated if vibratory levels near 0.20 PPV which is the standard established to protect structures.
- N-5** Prior to issuance of building permits for non-residential land uses within planning areas 5, 9, 16, 21, 22, 23 and 24, all project proponents shall prepare a detailed noise study that shall be prepared to ensure that these sources do not exceed 55 dBA (Leq) and 75 dBA (Lmax) during the daytime (7:00 AM to 10:00 PM), and 45 dBA (Leq) and 65 dBA (Lmax) during the nighttime (10:00 PM to 7:00 AM). The assessment shall be prepared by a qualified acoustical engineer and shall document the noise generation characteristics of the proposed equipment and the projected noise levels at the nearest use. Compliance with these levels shall be demonstrated and any measures required to comply with the Noise Ordinance will be included in the project plans. The report shall be completed and approved by the City prior to issuance of building permits.
- N-6** New non-residential development shall be constructed with roof-ceiling assemblies that make up the building envelope to have an STC of at least 50 and exterior windows must have minimum STC of 30 where sound levels at the property line regularly exceed 65 decibels. This measure shall apply to new non-residential land uses proposed along Valley Boulevard and Pepper Avenue. This measure would reduce interior noise levels to acceptable levels and mitigate any impact to less than significant. Buildings with few or no occupants and where occupants are not likely to be affected by exterior noise, as determined by the enforcement authority, such as factories, stadiums, storage, enclosed parking structures and utility buildings are exempt from this measure.
- N-7** ~~Prior to issuance of building permits for residences in residential planning areas located along San Bernardino Avenue and Wildrose Avenue (planning areas 2, 4, 7, and 13) shall prepare detailed noise exceed the 65 CNEL outdoor noise criteria and the 45 CNEL indoor noise standard. The noise assessment shall be prepared by a qualified acoustical consultant and shall document the sources of noise impacting the areas and describe any measures required to meet the standard. These measures will be incorporated into the project plans. The report shall be completed and approved by the City prior to issuance of building permits.~~ The Project is located in planning area 5 and is not residential, therefore this MM does not apply to the proposed Project.

Level of Significance: Less than significant impact with mitigation. The Project would not result in any new or more severe impacts than previously analyzed in the FEIR.

Threshold 6.2 Would the Project generate excessive groundborne vibration or groundborne noise levels?

Construction Vibration

Construction can generate varying degrees of ground vibration, depending on the construction procedures and equipment. Operation of construction equipment generates vibrations that spread through the ground and diminish with distance from the source. Construction on the Project site would have the potential to result in varying degrees of temporary ground-borne 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 0.20 in/sec is considered safe and would not result in any construction vibration damage.

Table 7: Typical Construction Equipment Vibration Levels lists vibration levels at 25 feet for typical construction equipment. Vibration levels at 60 feet, the nearest that heavy equipment could be to nearest existing building, is also included in Table 7. Ground-borne vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. As indicated in Table 7, based on FTA data, vibration velocities from typical heavy construction equipment operations that would be used during Project construction range from 0.001 to 0.024 in/sec PPV at 60 feet from the source of activity.

Equipment	Peak Particle Velocity at 25 Feet (in/sec)	Peak Particle Velocity at 60 Feet (in/sec) ¹
Large Bulldozer	0.089	0.024
Caisson Drilling	0.089	0.024
Loaded Trucks	0.076	0.020
Jackhammer	0.035	0.009
Small Bulldozer/Tractors	0.003	0.001

¹ Calculated using the following formula: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$, where: PPV_{equip} = the peak particle velocity in in/sec of the equipment adjusted for the distance; PPV_{ref} = the reference vibration level in in/sec from Table 7-4 of the Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018; D = the distance from the equipment to the receiver.

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018.

Table 7 shows that at 60 feet the vibration velocities from construction equipment would not exceed 0.024 in/sec PPV, which is below the FTA's 0.20 in/sec PPV threshold for building damage. 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 structure. As discussed previously, the nearest residence is 850 feet from the Project site. At this distance, construction vibrations would not be perceptible and would not cause annoyance. Therefore, vibration impacts associated with Project construction would be less than significant.

Operational Vibration

Once operational, the Project would not be a significant source of groundborne vibration. Groundborne vibration surrounding the Project currently results from vehicular travel on the nearby local roadways. Operations of the proposed Project would include truck deliveries. Due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity. According to the FTA's Transit Noise and Vibration Impact Assessment Manual (2018), trucks rarely create vibration levels that exceed 70 VdB (equivalent to 0.012 inches per second PPV) when they are on roadways. Therefore, trucks operating at the Project site or along surrounding roadways would not exceed Caltrans thresholds for building damage or annoyance. Impacts would be less than significant in this regard.

Mitigation Measures: No additional mitigation beyond what is identified in the FEIR is required.

Level of Significance: Less than significant impact. The Project would not result in any new or more severe impacts than previously analyzed in the FEIR.

Threshold 6.3 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 nearest airport to the Project site is the San Bernardino International Airport located approximately 6.25 miles to the northeast. The Project is not within 2.0 miles of a public airport or within an airport land use plan. Additionally, there are no private airstrips located within the Project vicinity. Therefore, the Project would not expose people residing or working in the Project area to excessive airport- or airstrip-related noise levels and no mitigation is required.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact. The Project would not result in any new or more severe impacts than previously analyzed in the FEIR.

7 REFERENCES

1. Berger, Elliott H.; Neitzel, Rick; and Kladden, Cynthia A.; *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.
2. California Department of Transportation, *California Vehicle Noise Emission Levels*, 1987.
3. California Department of Transportation, *Traffic Noise Analysis Protocol*, 2020.
4. California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, 2013.
5. California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, 2020.
6. City of Colton, *Colton General Plan Noise Element*, 1987.
7. City of Colton, *Municipal Code*, 2022.
8. Cowan, James P., *Handbook of Environmental Acoustics*, 1994.
9. Federal Highway Administration, *Highway Traffic and Construction Noise - Problem and Response*, April 2006.
10. Federal Highway Administration, *Noise Fundamentals*, 2017.
11. Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, 1992.
12. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018.
13. Harris, Cyril M., *Handbook of Noise Control*, 1979.
14. Kimley-Horn, *Traffic Study for: Colton Ashley Furniture Expansion Project*, November 2022.
15. U.S. Department of Labor, Occupational Safety and Health Standards, *29 CFR 1910* (Occupational Noise Exposure).
16. U.S. Environmental Protection Agency, *Protective Noise Levels (EPA 550/9-79-100)*, 1979.

Appendix A

Existing Ambient Noise Measurements

Noise Measurement Field Data			
Project:	Colton 2245 W. Valley Blvd	Job Number:	195304003.1.033
Site No.:	ST-1	Date:	1/31/2023
Analyst:	Kiana Graham and Skye Hansen	Time:	14:54-15:04
Location:	South of Rialto Assisted Living, North of Chuze Fitness		
Noise Sources:	road traffic and tree in the wind		
Comments:			
Results (dBA):			
	Leq:	Lmin:	Lmax:
Measurement 1:	58.6	49.4	68.4
			Peak:
			97.2

Equipment		Weather	
Sound Level Meter:	LD SoundExpert LxT	Temp. (degrees F):	57
Calibrator:	CAL200	Wind (mph):	19
Response Time:	Slow	Sky:	Clear
Weighting:	A	Bar. Pressure:	30.06"
Microphone Height:	5 feet	Humidity:	17%

Photo:



Summary

File Name on Meter ST-.044.s
File Name on PC LxTse_0007061-20230131 145452-ST-.044.ldbin
Serial Number 0007061
Model SoundExpert® LxT
Firmware Version 2.404
User
Location
Job Description
Note

Measurement

Description

Start 2023-01-31 14:54:52
Stop 2023-01-31 15:04:52
Duration 00:10:00.0
Run Time 00:10:00.0
Pause 00:00:00.0

Pre-Calibration 2023-01-31 08:12:26
Post-Calibration None
Calibration Deviation ---

Overall Settings

RMS Weight A Weighting
Peak Weight A Weighting
Detector Slow
Preamplifier PRMLxT1L
Microphone Correction FF:90 2116
Integration Method Linear
OBA Range Normal
OBA Bandwidth 1/1 and 1/3
OBA Frequency Weighting A Weighting
OBA Max Spectrum At LMax
Overload 123.7 dB

	A	C	Z
Under Range Peak	80.2	77.2	82.2 dB
Under Range Limit	24.6	26.0	32.4 dB
Noise Floor	15.5	16.8	23.2 dB

Instrument Identification **First Second Third**
Kimley-Horn and Associates ry Rd, #700 :, CA 92868

Results

LAeq		58.6 dB
LAE		86.4 dB
EA		48.296 $\mu\text{Pa}^2\text{h}$
L _{Apeak} (max)	2023-01-31 14:55:11	97.2 dB
L _{ASmax}	2023-01-31 14:59:13	68.4 dB
L _{ASmin}	2023-01-31 15:02:04	49.4 dB
SEA		-99.9 dB

	Exceedance Counts	Duration
L _{AS} > 85.0 dB	0	0.0 s
L _{AS} > 115.0 dB	0	0.0 s
L _{Apeak} > 135.0 dB	0	0.0 s
L _{Apeak} > 137.0 dB	0	0.0 s
L _{Apeak} > 140.0 dB	0	0.0 s

Community Noise	L _{den} 17:00-22:00			12:00-07:00			L _{den} 17:00-19:00			9:00-22:00			12:00-07:00		
	58.6	58.6	-99.9	58.6	58.6	-99.9	-99.9								dB

LCeq	78.0 dB
LAeq	58.6 dB
LCeq - LAeq	19.4 dB
L _{Aleq}	61.0 dB
LAeq	58.6 dB
L _{Aleq} - LAeq	2.4 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
Leq	58.6		78.0			
L _S (max)	68.4	/01/31 14:59:13				
L _S (min)	49.4	/01/31 15:02:04				
L _{Peak} (max)	97.2	/01/31 14:55:11				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	64.0 dB
LA 10.00	62.2 dB
LA 33.30	57.2 dB
LA 50.00	55.6 dB
LA 66.60	54.4 dB
LA 90.00	52.3 dB

Measurement Report

Report Summary

Meter's File Name	ST-044.s	Computer's File Name	LxTse_0007061-20230131 145452-ST-044.ldbin
Meter	LxT SE 0007061	Firmware	2.404
User		Location	
Job Description			
Note			
Start Time	2023-01-31 14:54:52	Duration	0:10:00.0
End Time	2023-01-31 15:04:52	Run Time	0:10:00.0
Pre-Calibration	2023-01-31 08:12:26	Pause Time	0:00:00.0
		Post-Calibration	None
		Calibration Deviation	---

Results

Overall Metrics

LA _{eq}	58.6 dB		
LAE	86.4 dB	SEA	--- dB
EA	48.3 μPa ² h		
LA _{peak}	97.2 dB		2023-01-31 14:55:11
LS _{max}	68.4 dB		2023-01-31 14:59:13
LS _{min}	49.4 dB		2023-01-31 15:02:04
LA _{eq}	58.6 dB		
LC _{eq}	78.0 dB	LC _{eq} - LA _{eq}	19.4 dB
LAI _{eq}	61.0 dB	LAI _{eq} - LA _{eq}	2.4 dB

Exceedances

	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 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	58.6 dB	LDay	58.6 dB	LNight	0.0 dB
LDEN	58.6 dB	LDay	58.6 dB	LEve	--- dB
				LNight	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L _{eq}	58.6 dB		78.0 dB		---	
LS _(max)	68.4 dB	2023-01-31 14:59:13	---	None	---	None
LS _(min)	49.4 dB	2023-01-31 15:02:04	---	None	---	None
L _{Peak(max)}	97.2 dB	2023-01-31 14:55:11	---	None	---	None

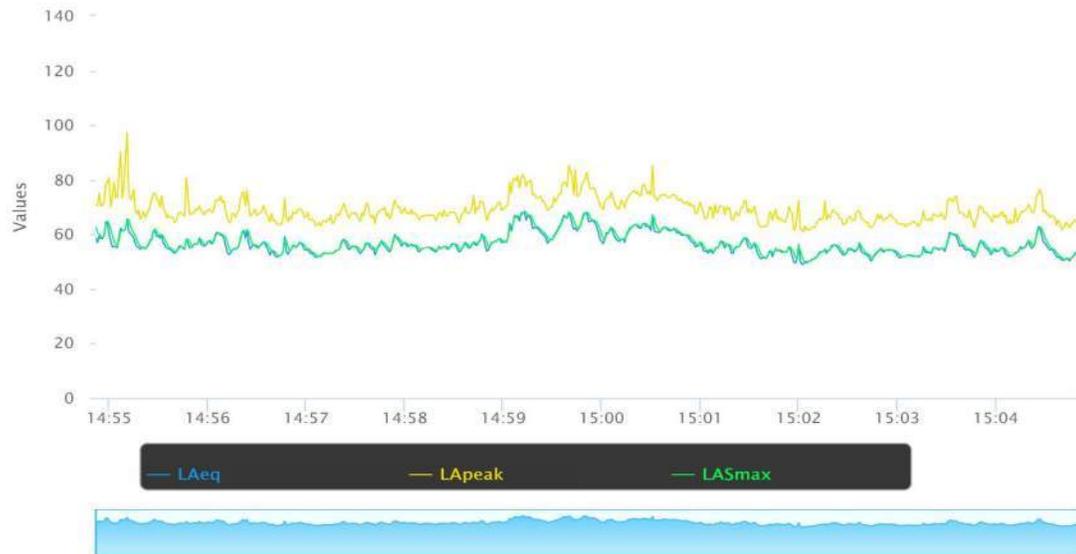
Overloads

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

LAS 5.0	64.0 dB
LAS 10.0	62.2 dB
LAS 33.3	57.2 dB
LAS 50.0	55.6 dB
LAS 66.6	54.4 dB
LAS 90.0	52.3 dB

Time History



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Noise Measurement Field Data			
Project:	Colton 2245 W. Valley Blvd	Job Number:	195304003.1.033
Site No.:	ST-2	Date:	1/31/2023
Analyst:	Kiana Graham and Skye Hansen	Time:	15:25-15:35
Location:	Southeast corner of Chuze Fitness parking lot		
Noise Sources:	road traffic, tree in the wind, parking lot traffic		
Comments:	Semi-truck start at 13:51:31		
Results (dBA):			
	Leq:	Lmin:	Lmax:
Measurement 1:	57.8	51.6	74.4
			Peak:
			106.3

Equipment		Weather	
Sound Level Meter:	LD SoundExpert LxT	Temp. (degrees F):	57
Calibrator:	CAL200	Wind (mph):	19
Response Time:	Slow	Sky:	Clear
Weighting:	A	Bar. Pressure:	30.06"
Microphone Height:	5 feet	Humidity:	19%

Photo:



Summary

File Name on Meter ST-.046.s
File Name on PC LxTse_0007061-20230131 152521-ST-.046.ldbin
Serial Number 0007061
Model SoundExpert® LxT
Firmware Version 2.404
User
Location
Job Description
Note

Measurement

Description

Start 2023-01-31 15:25:21
Stop 2023-01-31 15:35:21
Duration 00:10:00.0
Run Time 00:10:00.0
Pause 00:00:00.0

Pre-Calibration 2023-01-31 08:12:26
Post-Calibration None
Calibration Deviation ---

Overall Settings

RMS Weight A Weighting
Peak Weight A Weighting
Detector Slow
Preamplifier PRMLxT1L
Microphone Correction FF:90 2116
Integration Method Linear
OBA Range Normal
OBA Bandwidth 1/1 and 1/3
OBA Frequency Weighting A Weighting
OBA Max Spectrum At LMax
Overload 123.7 dB

	A	C	Z
Under Range Peak	80.2	77.2	82.2 dB
Under Range Limit	24.6	26.0	32.4 dB
Noise Floor	15.5	16.8	23.2 dB

Instrument Identification **First** **Second** **Third**
Kimley-Horn and Associates ry Rd, #700 3, CA 92868

Results

LAeq		57.8 dB
LAE		85.6 dB
EA		40.171 $\mu\text{Pa}^2\text{h}$
LApeak (max)	2023-01-31 15:31:32	106.3 dB
LASmax	2023-01-31 15:31:32	74.4 dB
LASmin	2023-01-31 15:26:55	51.6 dB
SEA		-99.9 dB

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 137.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	Ldn 17:00-22:00 12:00-07:00			Lden 17:00-19:00 9:00-22:00 12:00-07:00			
	57.8	57.8	-99.9	57.8	57.8	-99.9	-99.9 dB

LCeq	83.1 dB
LAeq	57.8 dB
LCeq - LAeq	25.3 dB
LALeq	64.3 dB
LAeq	57.8 dB
LALeq - LAeq	6.5 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
Leq	57.8		83.1			
LS(max)	74.4	/01/31 15:31:32				
LS(min)	51.6	/01/31 15:26:55				
LPeak(max)	106.3	/01/31 15:31:32				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	61.3 dB
LA 10.00	60.0 dB
LA 33.30	57.6 dB
LA 50.00	56.3 dB
LA 66.60	55.5 dB
LA 90.00	53.7 dB

Measurement Report

Report Summary

Meter's File Name	ST-046.s	Computer's File Name	LxTse_0007061-20230131 152521-ST-046.ldbin
Meter	LxT SE 0007061	Firmware	2.404
User		Location	
Job Description			
Note			
Start Time	2023-01-31 15:25:21	Duration	0:10:00.0
End Time	2023-01-31 15:35:21	Run Time	0:10:00.0
Pre-Calibration	2023-01-31 08:12:26	Post-Calibration	None
		Pause Time	0:00:00.0
		Calibration Deviation	---

Results

Overall Metrics

LA _{eq}	57.8 dB		
LAE	85.6 dB	SEA	--- dB
EA	40.2 µPa ² h		
LA _{peak}	106.3 dB		2023-01-31 15:31:32
LS _{max}	74.4 dB		2023-01-31 15:31:32
LS _{min}	51.6 dB		2023-01-31 15:26:55
LA _{eq}	57.8 dB		
LC _{eq}	83.1 dB	LC _{eq} - LA _{eq}	25.3 dB
LAI _{eq}	64.3 dB	LAI _{eq} - LA _{eq}	6.5 dB

Exceedances

	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 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	57.8 dB	LDay	57.8 dB	LNight	0.0 dB
LDEN	57.8 dB	LDay	57.8 dB	LEve	--- dB
				LNight	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L _{eq}	57.8 dB		83.1 dB		---	
LS _(max)	74.4 dB	2023-01-31 15:31:32	---	None	---	None
LS _(min)	51.6 dB	2023-01-31 15:26:55	---	None	---	None
L _{Peak(max)}	106.3 dB	2023-01-31 15:31:32	---	None	---	None

Overloads

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

LAS 5.0	61.3 dB
LAS 10.0	60.0 dB
LAS 33.3	57.6 dB
LAS 50.0	56.3 dB
LAS 66.6	55.5 dB
LAS 90.0	53.7 dB

Time History



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Noise Measurement Field Data			
Project:	Colton 2245 W. Valley Blvd	Job Number:	195304003.1.033
Site No.:	ST-3	Date:	1/31/2023
Analyst:	Kiana Graham and Skye Hansen	Time:	15:41-15:51
Location:	parking lot northeast of American Tire Depot		
Noise Sources:	cars in parking lot		
Comments:			
Results (dBA):			
	Leq:	Lmin:	Lmax:
Measurement 1:	58.8	53.1	72.5
			Peak:
			88.5

Equipment		Weather	
Sound Level Meter:	LD SoundExpert LxT	Temp. (degrees F):	58
Calibrator:	CAL200	Wind (mph):	18
Response Time:	Slow	Sky:	Clear
Weighting:	A	Bar. Pressure:	30.06"
Microphone Height:	5 feet	Humidity:	18%

Photo:



Summary

File Name on Meter	ST-.047.s
File Name on PC	LxTse_0007061-20230131 154110-ST-.047.ldbin
Serial Number	0007061
Model	SoundExpert® LxT
Firmware Version	2.404
User	
Location	
Job Description	
Note	

Measurement

Description

Start	2023-01-31 15:41:10
Stop	2023-01-31 15:51:10
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre-Calibration	2023-01-31 08:12:26
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	FF:90 2116
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	At LMax
Overload	123.7 dB
	A C Z
Under Range Peak	80.2 77.2 82.2 dB
Under Range Limit	24.6 26.0 32.4 dB
Noise Floor	15.5 16.8 23.2 dB

Instrument Identification

First	Second	Third
Kimley-Horn and Associates y Rd, #700 y, CA 92868		

Results

LAeq	58.8 dB
LAE	86.6 dB
EA	50.572 $\mu\text{Pa}^2\text{h}$
LApeak (max)	2023-01-31 15:41:15 88.5 dB
LASmax	2023-01-31 15:41:15 72.5 dB
LASmin	2023-01-31 15:44:42 53.1 dB
SEA	-99.9 dB

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 137.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	Ldn 7:00-22:00 2:00-07:00			Lden 7:00-19:00 9:00-22:00		
	58.8	58.8	-99.9	58.8	58.8	-99.9

LCeq	75.3 dB
LAeq	58.8 dB
LCeq - LAeq	16.5 dB
LAIeq	60.2 dB
LAeq	58.8 dB
LAIeq - LAeq	1.4 dB

	A		C		Z	
	dB	Time Star	dB	Time Star	dB	Time Star
Leq	58.8		75.3			
LS(max)	72.5	/01/31 15:41:15				
LS(min)	53.1	/01/31 15:44:42				
LPeak(max)	88.5	/01/31 15:41:15				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	62.0 dB
LA 10.00	61.0 dB
LA 33.30	58.9 dB
LA 50.00	57.8 dB
LA 66.60	56.8 dB
LA 90.00	54.8 dB

Measurement Report

Report Summary

Meter's File Name	ST-047.s	Computer's File Name	LxTse_0007061-20230131 154110-ST-047.ldbin
Meter	LxT SE 0007061	Firmware	2.404
User		Location	
Job Description			
Note			
Start Time	2023-01-31 15:41:10	Duration	0:10:00.0
End Time	2023-01-31 15:51:10	Run Time	0:10:00.0
Pre-Calibration	2023-01-31 08:12:26	Post-Calibration	None
		Pause Time	0:00:00.0
		Calibration Deviation	---

Results

Overall Metrics

LA _{eq}	58.8 dB		
LAE	86.6 dB	SEA	--- dB
EA	50.6 $\mu\text{Pa}^2\text{h}$		
LA _{peak}	88.5 dB		2023-01-31 15:41:15
LS _{max}	72.5 dB		2023-01-31 15:41:15
LS _{min}	53.1 dB		2023-01-31 15:44:42
LA _{eq}	58.8 dB		
LC _{eq}	75.3 dB	LC _{eq} - LA _{eq}	16.5 dB
LAI _{eq}	60.2 dB	LAI _{eq} - LA _{eq}	1.4 dB

Exceedances

	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 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	58.8 dB	LDay	58.8 dB	LNight	0.0 dB
LDEN	58.8 dB	LDay	58.8 dB	LEve	--- dB
				LNight	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L _{eq}	58.8 dB		75.3 dB		--- dB	
LS _(max)	72.5 dB	2023-01-31 15:41:15	--- dB	None	--- dB	None
LS _(min)	53.1 dB	2023-01-31 15:44:42	--- dB	None	--- dB	None
L _{Peak(max)}	88.5 dB	2023-01-31 15:41:15	--- dB	None	--- dB	None

Overloads

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

Statistics

LAS 5.0	62.0 dB
LAS 10.0	61.0 dB
LAS 33.3	58.9 dB
LAS 50.0	57.8 dB
LAS 66.6	56.8 dB
LAS 90.0	54.8 dB

Time History



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Noise Measurement Field Data			
Project:	Colton 2245 W. Valley Blvd	Job Number:	195304003.1.033
Site No.:	ST-4	Date:	1/31/2023
Analyst:	Kiana Graham and Skye Hansen	Time:	16:00-16:10
Location:	parking lot North of WoodSpring Suites, west of Welcome Inn		
Noise Sources:	cars in parking lot, traffic on W Valley Blvd		
Comments:			
Results (dBA):			
	Leq:	Lmin:	Lmax:
Measurement 1:	67.5	58.4	76.8
			Peak:
			92.6

Equipment		Weather	
Sound Level Meter:	LD SoundExpert LxT	Temp. (degrees F):	58
Calibrator:	CAL200	Wind (mph):	18
Response Time:	Slow	Sky:	Clear
Weighting:	A	Bar. Pressure:	30.06"
Microphone Height:	5 feet	Humidity:	18%

Photo:



Summary

File Name on Meter ST-.048.s
File Name on PC LxTse_0007061-20230131 160048-ST-.048.ldbin
Serial Number 0007061
Model SoundExpert® LxT
Firmware Version 2.404
User
Location
Job Description
Note

Measurement

Description

Start 2023-01-31 16:00:48
Stop 2023-01-31 16:10:48
Duration 00:10:00.0
Run Time 00:10:00.0
Pause 00:00:00.0

Pre-Calibration 2023-01-31 08:12:26
Post-Calibration None
Calibration Deviation ---

Overall Settings

RMS Weight A Weighting
Peak Weight A Weighting
Detector Slow
Preamplifier PRMLxT1L
Microphone Correction FF:90 2116
Integration Method Linear
OBA Range Normal
OBA Bandwidth 1/1 and 1/3
OBA Frequency Weighting A Weighting
OBA Max Spectrum At LMax
Overload 123.7 dB

	A	C	Z
Under Range Peak	80.2	77.2	82.2 dB
Under Range Limit	24.6	26.0	32.4 dB
Noise Floor	15.5	16.8	23.2 dB

Instrument Identification **First Second Third**
mley-Horn and Associates ry Rd, #700 , CA 92868

Results

LAeq		67.5 dB
LAE		95.3 dB
EA		374.894 $\mu\text{Pa}^2\text{h}$
LApeak (max)	2023-01-31 16:08:00	92.6 dB
LASmax	2023-01-31 16:06:33	76.8 dB
LASmin	2023-01-31 16:06:19	58.4 dB
SEA		-99.9 dB

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 137.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	Ldn 7:00-22:00 2:00-07:00			Lden 7:00-19:00 9:00-22:00		
	67.5	67.5	-99.9	67.5	67.5	-99.9

LCeq	81.7 dB
LAeq	67.5 dB
LCeq - LAeq	14.2 dB
LAleq	68.7 dB
LAeq	67.5 dB
LAleq - LAeq	1.2 dB

	A		C		Z	
	dB	Time Star	dB	Time Star	dB	Time Star
Leq	67.5		81.7			
LS(max)	76.8	/01/31 16:06:33				
LS(min)	58.4	/01/31 16:06:19				
LPeak(max)	92.6	/01/31 16:08:00				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	72.6 dB
LA 10.00	71.0 dB
LA 33.30	67.3 dB
LA 50.00	65.3 dB
LA 66.60	63.5 dB
LA 90.00	61.0 dB

Measurement Report

Report Summary

Meter's File Name	ST-048.s	Computer's File Name	LxTse_0007061-20230131 160048-ST-048.ldbin
Meter	LxT SE 0007061	Firmware	2.404
User		Location	
Job Description			
Note			
Start Time	2023-01-31 16:00:48	Duration	0:10:00.0
End Time	2023-01-31 16:10:48	Run Time	0:10:00.0
Pre-Calibration	2023-01-31 08:12:26	Pause Time	0:00:00.0
		Post-Calibration	None
		Calibration Deviation	---

Results

Overall Metrics

LA _{eq}	67.5 dB		
LAE	95.3 dB	SEA	--- dB
EA	374.9 µPa ² h		
LA _{peak}	92.6 dB		2023-01-31 16:08:00
LAS _{max}	76.8 dB		2023-01-31 16:06:33
LAS _{min}	58.4 dB		2023-01-31 16:06:19
LA _{eq}	67.5 dB		
LC _{eq}	81.7 dB	LC _{eq} - LA _{eq}	14.2 dB
LAI _{eq}	68.7 dB	LAI _{eq} - LA _{eq}	1.2 dB

Exceedances

	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 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	67.5 dB	LDay	67.5 dB	LNight	0.0 dB
LDEN	67.5 dB	LDay	67.5 dB	LEve	--- dB
				LNight	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L _{eq}	67.5 dB		81.7 dB		--- dB	
LS _(max)	76.8 dB	2023-01-31 16:06:33	--- dB	None	--- dB	None
LS _(min)	58.4 dB	2023-01-31 16:06:19	--- dB	None	--- dB	None
L _{Peak(max)}	92.6 dB	2023-01-31 16:08:00	--- dB	None	--- dB	None

Overloads

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

Statistics

LAS 5.0	72.6 dB
LAS 10.0	71.0 dB
LAS 33.3	67.3 dB
LAS 50.0	65.3 dB
LAS 66.6	63.5 dB
LAS 90.0	61.0 dB

Time History



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Noise Measurement Field Data			
Project:	Colton 2245 W. Valley Blvd	Job Number:	195304003.1.033
Site No.:	ST-5	Date:	1/31/2023
Analyst:	Kiana Graham and Skye Hansen	Time:	16:15-16:25
Location:	residences on Richard Prieto Ln		
Noise Sources:	road traffic on N Wildrose Ave		
Comments:			
Results (dBA):			
	Leq:	Lmin:	Lmax:
Measurement 1:	56.9	47.8	70.1
			Peak:
			86.9

Equipment		Weather	
Sound Level Meter:	LD SoundExpert LxT	Temp. (degrees F):	58
Calibrator:	CAL200	Wind (mph):	18
Response Time:	Slow	Sky:	Clear
Weighting:	A	Bar. Pressure:	30.06"
Microphone Height:	5 feet	Humidity:	18%

Photo:



Summary

File Name on Meter ST-.049.s
File Name on PC LxTse_0007061-20230131 161513-ST-.049.lbin
Serial Number 0007061
Model SoundExpert® LxT
Firmware Version 2.404
User
Location
Job Description
Note

Measurement

Description

Start 2023-01-31 16:15:13
Stop 2023-01-31 16:25:13
Duration 00:10:00.0
Run Time 00:10:00.0
Pause 00:00:00.0

Pre-Calibration 2023-01-31 08:12:26
Post-Calibration None
Calibration Deviation ---

Overall Settings

RMS Weight A Weighting
Peak Weight A Weighting
Detector Slow
Preamplifier PRMLxT1L
Microphone Correction FF:90 2116
Integration Method Linear
OBA Range Normal
OBA Bandwidth 1/1 and 1/3
OBA Frequency Weighting A Weighting
OBA Max Spectrum At LMax
Overload 123.7 dB

	A	C	Z
Under Range Peak	80.2	77.2	82.2 dB
Under Range Limit	24.6	26.0	32.4 dB
Noise Floor	15.5	16.8	23.2 dB

Instrument Identification **First Second Third**
nley-Horn and Associates ry Rd, #700 , CA 92868

Results

LAeq		56.9 dB
LAE		84.7 dB
EA		32.652 $\mu\text{Pa}^2\text{h}$
LApeak (max)	2023-01-31 16:23:01	86.9 dB
LASmax	2023-01-31 16:25:12	70.1 dB
LASmin	2023-01-31 16:15:30	47.8 dB
SEA		-99.9 dB

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 137.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	Ldn 7:00-22:00	2:00-07:00	Lden 7:00-19:00	9:00-22:00
	56.9	56.9	-99.9	56.9
				56.9
				-99.9

LCeq	75.2 dB
LAeq	56.9 dB
LCeq - LAeq	18.3 dB
LAlaq	58.9 dB
LAeq	56.9 dB
LAlaq - LAeq	2.0 dB

	A		C		Z	
	dB	Time Star	dB	Time Star	dB	Time Star
Leq	56.9		75.2			
LS(max)	70.1	/01/31 16:25:12				
LS(min)	47.8	/01/31 16:15:30				
LPeak(max)	86.9	/01/31 16:23:01				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	62.0 dB
LA 10.00	60.3 dB
LA 33.30	56.0 dB
LA 50.00	53.2 dB
LA 66.60	51.5 dB
LA 90.00	50.1 dB

Measurement Report

Report Summary

Meter's File Name	ST-049.s	Computer's File Name	LxTse_0007061-20230131 161513-ST-049.ldbin
Meter	LxT SE 0007061	Firmware	2.404
User		Location	
Job Description			
Note			
Start Time	2023-01-31 16:15:13	Duration	0:10:00.0
End Time	2023-01-31 16:25:13	Run Time	0:10:00.0
Pre-Calibration	2023-01-31 08:12:26	Post-Calibration	None
		Pause Time	0:00:00.0
		Calibration Deviation	---

Results

Overall Metrics

LA _{eq}	56.9 dB		
LAE	84.7 dB	SEA	--- dB
EA	32.7 µPa²h		
LA _{peak}	86.9 dB		2023-01-31 16:23:01
LS _{max}	70.1 dB		2023-01-31 16:25:12
LS _{min}	47.8 dB		2023-01-31 16:15:30
LA _{eq}	56.9 dB		
LC _{eq}	75.2 dB	LC _{eq} - LA _{eq}	18.3 dB
LAI _{eq}	58.9 dB	LAI _{eq} - LA _{eq}	2.0 dB

Exceedances

	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 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	56.9 dB	LDay	56.9 dB	LNight	0.0 dB
LDEN	56.9 dB	LDay	56.9 dB	LEve	--- dB
				LNight	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L _{eq}	56.9 dB		75.2 dB		---	
LS _(max)	70.1 dB	2023-01-31 16:25:12	---	None	---	None
LS _(min)	47.8 dB	2023-01-31 16:15:30	---	None	---	None
L _{Peak(max)}	86.9 dB	2023-01-31 16:23:01	---	None	---	None

Overloads

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

Statistics

LAS 5.0	62.0 dB
LAS 10.0	60.3 dB
LAS 33.3	56.0 dB
LAS 50.0	53.2 dB
LAS 66.6	51.5 dB
LAS 90.0	50.1 dB

Time History



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Appendix B

Noise Modeling Data

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 1/12/2023
 Case Description: Demo and Site Prep

---- Receptor #1 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Residential	Residential	1	1	1

Description	Device	Usage(%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	1200	0
Excavator	No	40		80.7	1200	0
Excavator	No	40		80.7	1200	0
Excavator	No	40		80.7	1200	0
Dozer	No	40		81.7	1200	0
Dozer	No	40		81.7	1200	0
Tractor	No	40	84		1200	0
Tractor	No	40	84		1200	0
Tractor	No	40	84		1200	0
Tractor	No	40	84		1200	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)			
	*Lmax	Leq	Day		Evening	
			Lmax	Leq	Lmax	Leq
Concrete Saw	62	55	N/A	N/A	N/A	N/A
Excavator	53.1	49.1	N/A	N/A	N/A	N/A
Excavator	53.1	49.1	N/A	N/A	N/A	N/A
Excavator	53.1	49.1	N/A	N/A	N/A	N/A
Dozer	54.1	50.1	N/A	N/A	N/A	N/A
Dozer	54.1	50.1	N/A	N/A	N/A	N/A
Tractor	56.4	52.4	N/A	N/A	N/A	N/A
Tractor	56.4	52.4	N/A	N/A	N/A	N/A
Tractor	56.4	52.4	N/A	N/A	N/A	N/A
Tractor	56.4	52.4	N/A	N/A	N/A	N/A
Total	62	61.7	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Non-Residential	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
			Concrete Saw	No	20	89.6
Excavator	No	40	80.7	330	0	
Excavator	No	40	80.7	330	0	
Excavator	No	40	80.7	330	0	
Dozer	No	40	81.7	330	0	
Dozer	No	40	81.7	330	0	
Tractor	No	40	84	330	0	
Tractor	No	40	84	330	0	
Tractor	No	40	84	330	0	
Tractor	No	40	84	330	0	

Equipment	Results					
	Calculated (dBA)			Noise Limits (dBA)		
	*Lmax	Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq
Concrete Saw	73.2	66.2	N/A	N/A	N/A	N/A
Excavator	64.3	60.3	N/A	N/A	N/A	N/A
Excavator	64.3	60.3	N/A	N/A	N/A	N/A
Excavator	64.3	60.3	N/A	N/A	N/A	N/A
Dozer	65.3	61.3	N/A	N/A	N/A	N/A
Dozer	65.3	61.3	N/A	N/A	N/A	N/A
Tractor	67.6	63.6	N/A	N/A	N/A	N/A
Tractor	67.6	63.6	N/A	N/A	N/A	N/A
Tractor	67.6	63.6	N/A	N/A	N/A	N/A
Tractor	67.6	63.6	N/A	N/A	N/A	N/A
Total	73.2	72.9	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 1/12/2023
 Case Description: Grading, Building, Paving, Paint

		---- Receptor #1 ----				
Description	Land Use	Baselines (dBA)				
		Daytime	Evening	Night		
Residential	Residential	1	1	1		
Equipment						
Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Excavator	No	40		80.7	1200	0
Grader	No	40	85		1200	0
Dozer	No	40		81.7	1200	0
Tractor	No	40	84		1200	0
Tractor	No	40	84		1200	0
Tractor	No	40	84		1200	0
Crane	No	16		80.6	1200	0
Welder / Torch	No	40		74	1200	0
Paver	No	50		77.2	1200	0
Paver	No	50		77.2	1200	0
Paver	No	50		77.2	1200	0
Paver	No	50		77.2	1200	0
Roller	No	20		80	1200	0
Roller	No	20		80	1200	0

Results						
Equipment	Calculated (dBA)		Noise Limits (dBA)			
	*Lmax	Leq	Day Lmax	Leq	Evening Lmax	Leq
Excavator	53.1	49.1	N/A	N/A	N/A	N/A
Grader	57.4	53.4	N/A	N/A	N/A	N/A
Dozer	54.1	50.1	N/A	N/A	N/A	N/A
Tractor	56.4	52.4	N/A	N/A	N/A	N/A
Tractor	56.4	52.4	N/A	N/A	N/A	N/A
Tractor	56.4	52.4	N/A	N/A	N/A	N/A
Crane	52.9	45	N/A	N/A	N/A	N/A
Welder / Torch	46.4	42.4	N/A	N/A	N/A	N/A
Paver	49.6	46.6	N/A	N/A	N/A	N/A
Paver	49.6	46.6	N/A	N/A	N/A	N/A
Paver	49.6	46.6	N/A	N/A	N/A	N/A
Paver	49.6	46.6	N/A	N/A	N/A	N/A
Roller	52.4	45.4	N/A	N/A	N/A	N/A
Roller	52.4	45.4	N/A	N/A	N/A	N/A
Total	57.4	60.9	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA)			Equipment			
		Daytime	Evening	Night	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Non-Residential	Industrial	1	1	1				
Description		Device	Usage(%)					
Excavator		No	40		80.7	330	0	
Grader		No	40	85		330	0	
Dozer		No	40		81.7	330	0	
Tractor		No	40	84		330	0	
Tractor		No	40	84		330	0	
Tractor		No	40	84		330	0	
Crane		No	16		80.6	330	0	
Welder / Torch		No	40		74	330	0	
Paver		No	50		77.2	330	0	
Paver		No	50		77.2	330	0	
Paver		No	50		77.2	330	0	
Paver		No	50		77.2	330	0	
Roller		No	20		80	330	0	
Roller		No	20		80	330	0	

Equipment	Results					
	Calculated (dBA)			Noise Limits (dBA)		
	*Lmax	Leq	Day Lmax	Leq	Evening Lmax	Leq
Excavator	64.3	60.3	N/A	N/A	N/A	N/A
Grader	68.6	64.6	N/A	N/A	N/A	N/A
Dozer	65.3	61.3	N/A	N/A	N/A	N/A
Tractor	67.6	63.6	N/A	N/A	N/A	N/A
Tractor	67.6	63.6	N/A	N/A	N/A	N/A
Tractor	67.6	63.6	N/A	N/A	N/A	N/A
Crane	64.2	56.2	N/A	N/A	N/A	N/A
Welder / Torch	57.6	53.6	N/A	N/A	N/A	N/A
Paver	60.8	57.8	N/A	N/A	N/A	N/A
Paver	60.8	57.8	N/A	N/A	N/A	N/A
Paver	60.8	57.8	N/A	N/A	N/A	N/A
Paver	60.8	57.8	N/A	N/A	N/A	N/A
Roller	63.6	56.6	N/A	N/A	N/A	N/A
Roller	63.6	56.6	N/A	N/A	N/A	N/A
Total	68.6	72.1	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.