HELIX Environmental Planning

Briggs Road Development Project

Acoustical Analysis Report

October 2019 | WIT-01

Prepared for:

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ACRONYMS AND ABBREVIATIONS

ADT	average daily trips
ANSI	American National Standards Institute
APN	Assessor's Parcel Number
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
County	County of Riverside
dB	decibel
dBA	A-weighted decibel
HVAC	heating, ventilation, and air conditioning
Hz	Hertz
kHz	kilohertz
L_{DN}	Day Night sound level
L_{EQ}	time-averaged noise level
L_{MAX}	maximum sound level
mph	miles per hour
mPa	micro Pascal
NSLU	noise sensitive land use
PPV	peak particle velocity
RCNM	Roadway Construction Noise Model
SPL	sound pressure level
TNM	Traffic Noise Model
USDOT	U.S. Department of Transportation

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EXECUTIVE SUMMARY

This report presents an assessment of potential construction and operational noise impacts associated with the proposed Briggs Road Development Project (project) located in unincorporated County of Riverside (County).

The proposed project is a residential development consisting of 101 single-family residential homes on 22.7 acres, recreation uses on 1.2 acres, open space uses on 53.9 acres, and a water quality detention basin on 1.4 acres. The project would also include approximately 2.2 acres for off-site roadway improvements.

Operational noise from the project's heating, ventilation, and air conditioning (HVAC) units would not exceed the County Noise Ordinance thresholds at nearby noise sensitive land uses (NSLUs). Additionally, the County exempts HVAC noise from exterior noise standards. Project-generated traffic would also result in less than significant noise impacts to off-site receptors.

Project construction would result in elevated noise levels for nearby NSLUs; however, construction would be exempt from noise standards if conducted within the hours described in the County Noise Ordinance. Impacts from construction would be less than significant.

Vibration impacts from construction would not exceed thresholds for sensitive receptors.

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1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

The Briggs Road Development Project (project) is located on an approximately 78-acre site in unincorporated County of Riverside (County), northeast of the intersection of Old Newport Road and Briggs Road (see Figure 1, *Regional Location*, and Figure 2, *Project Vicinity*). The project is surrounded by a mixture of agricultural and residential uses to the west, an egg ranch to the south, and open space to the north and east. The project is located on Assessor's Parcel Number (APN) 461-170-001.

The proposed project is a residential development consisting of 101 single-family residential homes on 22.7 acres, recreation uses on 1.2 acres, open space uses on 53.9 acres, and a water quality detention basin on 1.4 acres. Per the County, the project would also be conditioned to provide offsite improvements to Briggs Road along the frontage the proposed development (outside of the property) and a secondary access route (outside the property) to the project site by extending Briggs Road north to Domenigoni Parkway. The Briggs Road improvements include but are not limited to undergrounding a man-made swale currently east of Briggs Road and installing new curb, sidewalks, and gutters, between Old Newport Road and approximately 330 feet north of Angler Lane. The secondary access would extend north from the limits of the Briggs Road improvements and would consist of a 32-foot-wide road located within the planned future build-out alignment of Briggs Road. The environmental processes for the Briggs Road improvements and ultimate build-out of Briggs Road will be conducted under the entitlements for Tentative Map 37671; thus, such off-site efforts are not included in the project analysis herein (Note: TM 37671 is a new TM being proposed for the area previously covered by TM32101). Refer to Figure 3, *Site Plan*.

The project site is zoned R-R (Rural Residential), with a land use designation of Low Density Residential.

2.0 ENVIRONMENTAL SETTING

2.1 NOISE AND SOUND LEVEL DESCRIPTORS AND TERMINOLOGY

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels of one hour are expressed by the symbol L_{EQ}, unless a specified duration is provided. The Community Noise Equivalent Level (CNEL) is a 24-hour average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dBA weighting, and sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dBA weighting. This is similar to the Day Night sound level (L_{DN}), which is a 24-hour average with an added 10 dBA weighting on the same nighttime hours but no added weighting on the evening hours. Sound levels expressed in CNEL are always based on dBA. The maximum sound level (L_{MAX}) is the maximum level during a measurement period or noise event. These metrics are used to express noise levels for both measurement and municipal regulations, as well as for land use guidelines and enforcement of noise ordinances.

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver contribute to the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

The amplitude of pressure waves generated by a sound source determines the loudness of that source. A logarithmic scale is used to describe sound pressure level (SPL) in terms of dBA units. The threshold of hearing for the human ear is about 0 dBA, which corresponds to 20 micro Pascals (mPa).

Because decibels are logarithmic units, SPL cannot be added or subtracted through standard arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3 dBA increase. In other words, 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.

2.2 NOISE AND VIBRATION SENSITIVE LAND USES

Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise, such as residential dwellings, schools, transient lodging (hotels), hospitals, educational facilities, and libraries. Industrial and commercial land uses are generally not considered sensitive to noise. NSLUs in the project area include the single-family residences to the west (see Figure 2).

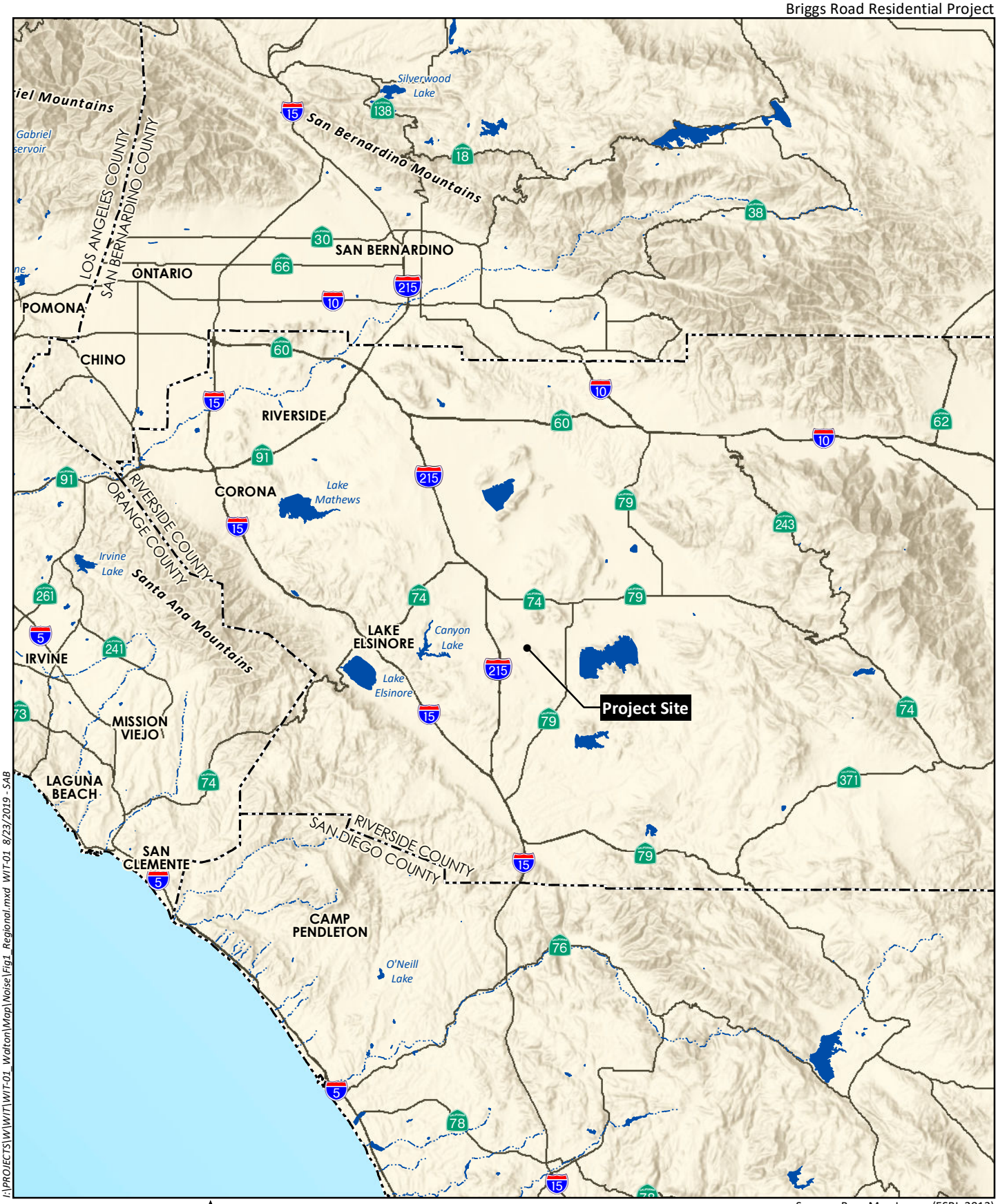
Land uses in which ground-borne vibration could potentially interfere with operations or equipment, such as research, manufacturing, hospitals, and university research operations (California Department of Transportation [Caltrans] 2013a) are considered “vibration-sensitive.” The degree of sensitivity depends on the specific equipment that would be affected by the ground-borne vibration. In addition, excessive levels of ground-borne vibration of either a regular or an intermittent nature can result in annoyance to residential uses or schools. Land uses in the project area that are subject to annoyance from vibration include the single-family residences to the west.

2.3 REGULATORY FRAMEWORK

Applicable noise standards for the proposed project are codified in the following County regulations.

2.3.1 County of Riverside General Plan Noise Element

The Noise Element of the County of Riverside General Plan (County 2015) provides a systematic approach to identifying and appraising noise problems in the community; quantifying existing and projected noise levels; addressing excessive noise exposure; and community planning for the regulation of noise. Table 1, *County of Riverside Land Use Compatibility for Community Noise Exposure*, summarizes the County’s exterior land use-noise compatibility guidelines. Shading in this table represents the noise



Source: Base Map Layers (ESRI, 2013)

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Regional Location

Figure 1

Source: Aerial (NAIP, 2016)

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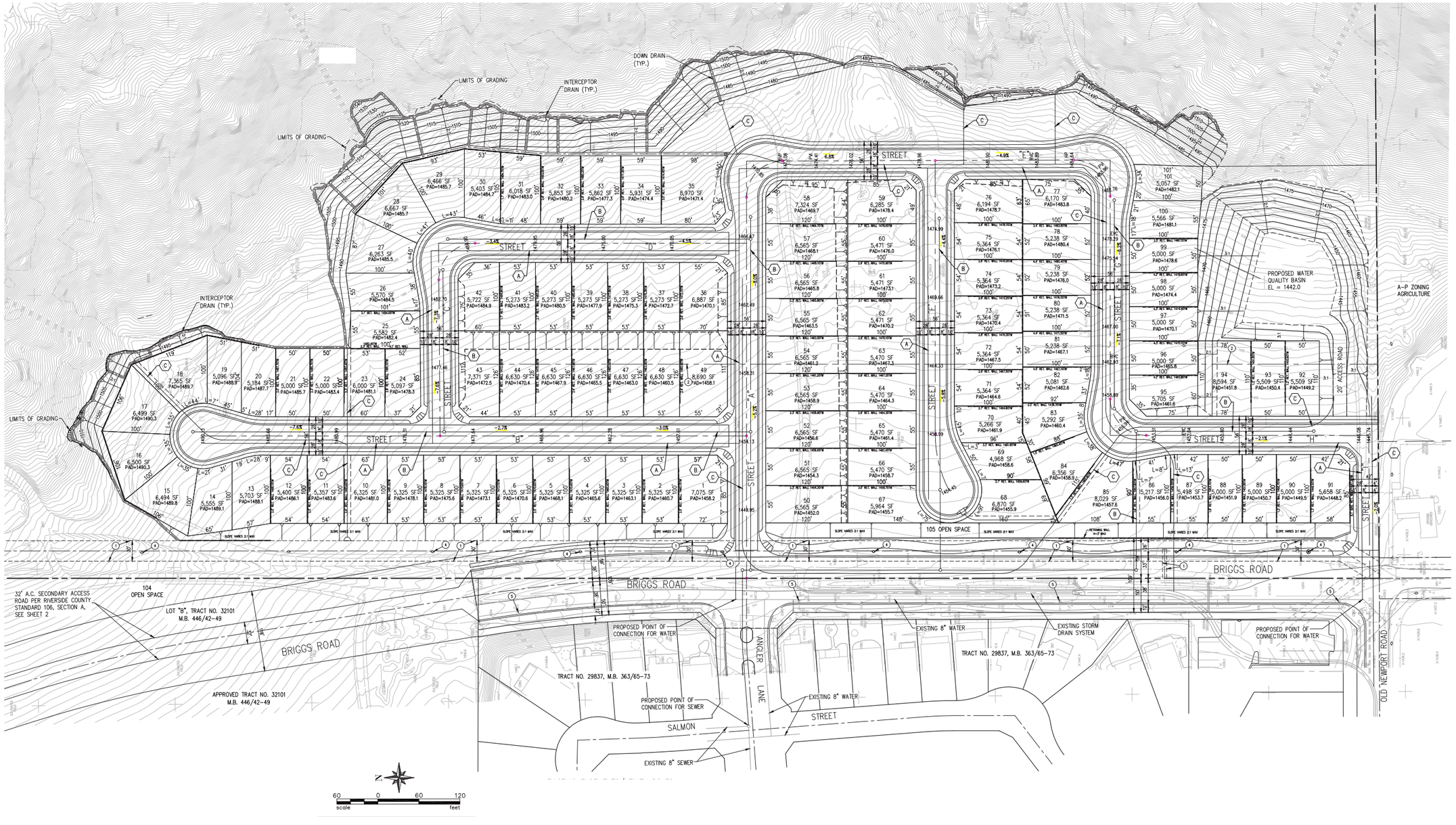
Project Vicinity

Figure 2



Source: David Evans & Associates, 2019

exposure level considered compatible for each land use category. The normally acceptable noise levels in a low-density single-family residential area is 60 CNEL or less.

Table 1
COUNTY OF RIVERSIDE LAND USE COMPATIBILITY FOR COMMUNITY NOISE EXPOSURE

Land Use Category	Community Noise Exposure Level (L_{DN} or CNEL, dBA)						
	55	60	65	70	75	80	85
Residential – Low Density Single Family, Duplex, and Mobile Homes							
Residential – Multiple Family							
Transient Lodging – Motels, Hotels							
Schools, Libraries, Churches, Hospitals, and Nursing Homes							
Auditoriums, Concert Halls, Amphitheaters							
Sports Arena, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Business, Commercial, and Professional							
Industrial, Manufacturing, Utilities, Agriculture							

Source: County of Riverside General Plan Noise Element 2015
Notes:
Light shading represents the maximum noise exposure level considered normally acceptable for each land use category.
Dark shading represents the maximum noise exposure level considered conditionally acceptable for each land use category.

The interior noise limit for residential land uses would be 45 CNEL in accordance with the California Building Standards, per County Noise Element Policy N 14.1.

Policy N 2.3 of the County of Riverside General Plan Noise Element requires projects to mitigate residential exterior and interior noise to the levels listed in Table 2, *Stationary Source Residential Land Use Standards*, to the extent feasible for stationary sources.

Table 2
STATIONARY SOURCE RESIDENTIAL LAND USE STANDARDS

Time Period	Standard (dBA L_{EQ} [10 minute])	
	Interior	Exterior
10:00 p.m. to 7:00 a.m.	40	45
7:00 a.m. to 10:00 p.m.	55	65

Source: County of Riverside General Plan Noise Element 2015
dBA = A-weighted decibel; L_{EQ} = time-averaged noise level

2.3.2 County of Riverside Municipal Code (Noise Ordinance)

Riverside Ordinance No. 847 establishes countywide standards regulating noise. Section 4 establishes general sound level standards for exterior noise levels within the boundaries of occupied properties. The exterior noise limits for each General Plan use designation are summarized in Table 3, *County of Riverside Exterior Sound Level Standards.*

Table 3
COUNTY OF RIVERSIDE EXTERIOR SOUND LEVEL STANDARDS

General Plan Foundation Component	General Plan Land Use Designation Code	General Plan Land Use Designation Name	Density	Maximum Decibel Level (dBA L_{MAX})	
				Daytime (7:00 a.m. – 10:00 p.m.)	Nighttime (10:00 p.m. – 7:00 a.m.)
Community Development	EDR	Estate Density Residential	2 ac	55	45
	VLDR	Very Low Density Residential	1 ac	55	45
	LDR	Low Density Residential	½ ac	55	45
	MDR	Medium Density Residential	2-5 du/ac	55	45
	MHDR	Medium High Density Residential	5-8 du/ac	55	45
	HDR	High Density Residential	8-14 du/ac	55	45
	VHDR	Very High Density Residential	14-20 du/ac	55	45
	H'TDR	Highest Density Residential	20+ du/ac	55	45
	CR	Retail Commercial	N/A	65	55
	CO	Office Commercial	N/A	65	55
	CT	Tourist Commercial	N/A	65	55
	CC	Community Center	N/A	65	55
	LI	Light Industrial	N/A	75	55
	HI	Heavy Industrial	N/A	75	75
	BP	Business Park	N/A	65	45
	PF	Public Facility	N/A	65	45
	SP	Specific Plan – Residential	N/A	55	45
		Specific Plan – Commercial	N/A	65	55
		Specific Plan – Light Industrial	N/A	75	55
		Specific Plan – Heavy Industrial	N/A	75	75
Rural Community	EDR	Estate Density Residential	2 ac	55	45
	VLDR	Very Low Density Residential	1 ac	55	45
	LDR	Low Density Residential	½ ac	55	45
Rural	RR	Rural Residential	5 ac	45	45
	RM	Rural Mountainous	10 ac	45	45
	RD	Rural Desert	10 ac	45	45
Agriculture	AG	Agriculture	10 ac	45	45
Open Space	C	Conservation	N/A	45	45
	CH	Conservation Habitat	N/A	45	45
	REC	Recreation	N/A	45	45
	RUR	Rural	20 ac	45	45
	W	Watershed	N/A	45	45
	MR	Mineral Resources	N/A	75	45

Source: County of Riverside Municipal Code Ord. 847
ac = acre; du/ac = dwelling unit per acre

Section 2 provides exemptions for construction activities from the noise limits in Table 3. For projects located within one-quarter of a mile from an inhabited dwelling, construction noise is exempt if construction occurs outside the hours of 6:00 p.m. and 6:00 a.m. from June and September and 6:00 p.m. and 7:00 a.m. from October to May. Projects located one-quarter of a mile or more from an inhabited dwelling are exempt with no hour restrictions.

Section 2 also provides an exemption for heating and air conditioning equipment from the noise limits provided in Table 3.

2.4 EXISTING CONDITIONS

2.4.1 Surrounding Land Uses

Surrounding land uses include a mixture of agricultural land and single family residences to the west, an egg ranch to the south, and open space to the north and east (see Figure 2).

2.4.2 Existing Noise Conditions

2.4.2.1 Ambient Noise Survey

Two short-term ambient noise measurements (M1 and M2) were conducted during a site visit on March 19, 2019. The measured noise levels and related environmental conditions are shown in Table 4, *Noise Measurement Results*. See Figure 2 for noise measurement locations and Appendix A, *Site Survey Measurement Sheets*, for survey notes.

Table 4
NOISE MEASUREMENT RESULTS

Measurement M1 – Traffic Counts	
Date:	March 19, 2019
Conditions:	Temperature: 70°F. Wind Speed: 5 mph. 44% humidity.
Time:	11:21 a.m. – 11:36 a.m.
Location:	Adjacent to the east side of Briggs Road at the intersection of Briggs Road and Old Newport Road
Measured Noise Level:	56.3 dBA L_{EQ}
Notes:	Noise from ambient nature sounds and infrequent traffic on Briggs Road.
Measurement M2 - Ambient	
Date:	March 19, 2019
Conditions:	Temperature: 70°F. Wind Speed: 5 mph. 44% humidity.
Time:	11:40 a.m. – 11:50 a.m.
Location:	Approximately 400 feet east of the intersection of Briggs Road and Old Newport Road
Measured Noise Level:	47.9 dBA L_{EQ}
Notes:	Noise from ambient nature sounds and distant traffic on Briggs Road.

Measurement M1 was taken at the east edge of Briggs Road, at the intersection of Briggs Road and Old Newport Road. Measurement M2 was taken approximately 400 feet east of the intersection of Briggs Road and Old Newport Road, on a dirt trail that extends into the open space.

Traffic counts were recorded for Measurements M1 for automobiles, medium-size trucks (double-tires/ two axles), and heavy trucks (three or more axles). Traffic counts for the timed measurement and the one-hour equivalent volume are shown in Table 5, *Recorded Traffic Volume and Vehicle Mix*.

Table 5
RECORDED TRAFFIC VOLUME AND VEHICLE MIX

Measurement	Roadway	Traffic	Autos	MT[1]	HT[2]
M1	Briggs Road	15-minute count	13	0	0
		One-hour equivalent	52	0	0
		Percent	100%	0%	0%

[1] Medium Trucks (double tires/two axles)
[2] Heavy Trucks (three or more axles)

3.0 ANALYSIS METHODOLOGY AND ASSUMPTIONS

3.1 METHODOLOGY AND EQUIPMENT

The following equipment was used to measure existing noise levels at the project site:

- Larson Davis 831 Noise Meter
- Larson Davis Model CAL250 Calibrator
- Windscreen and tripod for the sound level meter
- Digital camera

The sound level meter was field-calibrated immediately prior to the noise measurements to ensure accuracy. All sound level measurements conducted and presented in this report were made with a sound level meter that conforms to the American National Standards Institute (ANSI) specifications for sound level meters (ANSI SI.4-1983 R2006). All instruments were maintained with National Institute of Standards and Technology traceable calibration per the manufacturers' standards.

Modeling of the exterior noise environment for this report was accomplished using Traffic Noise Model (TNM) version 2.5. TNM was released in February 2004 by the U.S. Department of Transportation (USDOT) and calculates the daytime average hourly L_{EQ} from three-dimensional model inputs and traffic data (Caltrans 2004). Input variables included projected traffic volumes, estimated truck composition percentages, and vehicle speeds.

Peak-hour traffic volumes are estimated based on the assumption that approximately 10 percent of the average daily traffic would occur during a peak hour. The one-hour L_{EQ} noise level is calculated utilizing peak-hour traffic. Peak hour L_{EQ} can be converted to CNEL using the following equation, where $L_{EQ}(h)pk$ is the peak hour L_{EQ}, P is the peak hour volume percentage of the average daily trips (ADT), d and e are divisions of the daytime fraction of ADT to account for daytime and evening hours, and N is the nighttime fraction of ADT:

$$CNEL = L_{EQ}(h)pk + 10\log10\ 4.17/P + 10\log10(d + 4.77e + 10N)$$

The model-calculated one-hour L_{EQ} noise output is therefore approximately equal to the CNEL (Caltrans 2013a).

Project construction noise was analyzed using the Roadway Construction Noise Model (RCNM; USDOT 2008), which utilizes estimates of sound levels from standard construction equipment.

3.2 ASSUMPTIONS

3.2.1 Construction

Construction would require the use of equipment throughout the site for the full term of construction. Construction activities would include site preparation, grading, installation of underground utilities, building construction, paving, and architectural coating. The most likely source of vibration during project construction would be a vibratory roller, which may be used to achieve soil compaction as part of foundation construction and fill compaction. See Table 6, *Construction Phases and Equipment*, for typical equipment information by phase.

Table 6
CONSTRUCTION PHASES AND EQUIPMENT

Construction Phase	Equipment
Site Preparation	Rubber Tired Dozers
	Tractors/Loaders/Backhoes
Grading	Graders
	Rubber Tired Dozers
	Tractors/Loaders/Backhoes
	Scrapers
	Water Truck
Underground Utilities	Backhoe
Building Construction	Cranes
	Forklifts
	Generator Sets
	Tractors/Loaders/Backhoes
	Welders
Paving	Pavers
	Paving Equipment
	Rollers
Architectural Coating	Air Compressors

3.2.2 Operation

The proposed operational noise sources include heating, ventilation, and air conditioning (HVAC) systems, and vehicular traffic.

3.2.2.1 Heating, Ventilation, and Air Conditioning Units

The analysis assumes that the design for the residential buildings would use a typical to larger-sized residential condenser mounted on ground level pads provides a reasonable basis for analysis. The unit used in this analysis is a Carrier 38HDR060 split system condenser (see Appendix B, *Carrier 38HDR060 Split System Condenser*). The manufacturer's noise data is provided below in Table 7, *Carrier HDR060 Condenser Noise*.

Table 7
CARRIER HDR060 CONDENSER NOISE

Noise Levels in Decibels[1] (dB) Measured at Octave Frequencies							Overall Noise Level in A-weighted Scale (dBA)[1]
125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	
63.0	61.5	64.0	66.5	66.0	64.5	55.5	72.0

[1] Sound Power Levels (S_{WL})
kHz = kilohertz

3.2.2.2 Vehicular Traffic

Traffic data for the project includes ADT volumes for surrounding street segments with and without the project (David Evans and Associates 2019). Two scenarios are analyzed for off-site noise impacts. Existing conditions are based on existing traffic counts and reflect current conditions in the project area. Existing + Project conditions addresses impacts if the project were completed today, assuming no ambient growth and existing intersections. As a conservative assessment, both scenarios assume that the roadway extension of Briggs Road connecting to Domenigoni Parkway is incomplete. Upon completion, roadway traffic on the modeled roads would be reduced. These traffic volumes are shown in Table 8*, Existing and Existing + Project Traffic Volumes*. Anticipated project impacts are based on changes to the existing baseline traffic levels.

Table 8
EXISTING AND EXISTING + PROJECT TRAFFIC VOLUMES

Roadway Segment	Peak Hour	
	Existing	Existing + Project[1]
Briggs Road		
North of Old Newport Road	70	170
Old Newport Road		
West of Briggs Road	140	320
Rockport Road		
West of Laguna Vista Drive	420	590
East of Laguna Vista Drive	200	280

Source: David Evans and Associates 2017

[1] Existing + Project conditions assumes the "restricted access" scenario, which is the more conservative scenario for nearby roadways.

A Cumulative Restricted Access scenario is analyzed for on-site noise impacts (David Evans and Associates 2019). This scenario is based on ambient growth and construction of future projects. On-site noise levels were modeled based on an ADT of 4,000 vehicles, with a modeled peak hour traffic of 400 vehicles for the segment of Briggs Road north of Old Newport Road.

The posted speed limits for all the analyzed roads are 40 miles per hour (mph). Site visit observations, shown in Table 4, revealed no heavy and medium trucks near the project site, however a conservative breakdown of 97.5 percent automobiles, 2 percent medium trucks, and 0.5 percent heavy trucks was used for modeling existing and future noise conditions in the vicinity of the project for all segments in both the off-site and on-site scenarios. The aforementioned TNM software was used to calculate the noise-level distances for the off-site receptors.

Aircraft

The project is subject to some distant aircraft noise, though the site is not located near any active airports. The nearest airports to the project site are Pines Airpark, located 3 miles to the southeast and Perris Valley Airport, located 7 miles northwest.

3.3 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE AND CONDITIONS OF APPROVAL

Based on Appendix G of the CEQA Guidelines, implementation of the project would result in a significant adverse impact if it would exceed the following thresholds based on the County General Plan EIR and Noise Ordinance, as applicable to the project:

Threshold 1: *Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the County General Plan or noise ordinance.*

Impacts would be significant if the project would expose persons to or generate noise levels exceeding the following standards established in the County of Riverside General Plan or Noise Ordinance:

- According to the County of Riverside General Plan, exposure of persons to noise levels would be significant if the new residential uses are subjected to levels above 60 CNEL from transportation noise.

- According to the County of Riverside General Plan, noise generated by the project would be significant if operation of the project produces noise levels at off-site residential land uses to the west exceeding the County noise limits provided in Table 2. Noise generated by heating and air conditioning equipment are exempt.

- Traffic noise impacts would occur if implementation of the proposed project results in an ambient noise level that meets or exceeds the noise compatibility standards established in the County General Plan (Table 1). Because the County does not have specific thresholds for traffic-related noise, this report uses the FTA's Transit Noise and Vibration Impact Assessment criteria. A permanent increase in traffic noise at the following levels would be substantial and significant:

    i. 3 dBA increase on roadways where the baseline noise level is less than 60 CNEL

    ii. 2 dBA for roadways where the baseline noise level is 60-64 CNEL

    iii. 1 dBA for roadways where the baseline noise level is 65 CNEL or over

- The County Noise Ordinance prohibits construction and building work between the hours of 6:00 p.m. and 6:00 a.m. of the next day during the months of June through September and 6:00 p.m. and 7:00 a.m. during the months of October through May. These limits would be in effect for private construction projects located within one-quarter of a mile from an inhabited dwelling.

Threshold 2: *Generate excessive ground-borne vibration or ground-borne noise levels.*

Excessive ground-borne vibration would occur if construction-related ground-borne vibration exceeds the "strongly perceptible" vibration annoyance potential criteria for human receptors, as specified by Caltrans (2013b), of 0.1 inches per second peak particle velocity (PPV), and 0.5 inches per second PPV for damage to older residential structures for continuous/frequent intermittent construction sources (such as impact pile drivers, vibratory pile drivers, and vibratory compaction equipment).

Threshold 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 use airport or private airstrip, expose people residing or working in the project area to excessive noise*.

An impact would occur if the project would expose land uses to noise levels that exceed the standards in the County noise compatibility standard for that use.

4.0 IMPACTS

4.1 ISSUE 1: EXCESSIVE NOISE LEVELS

4.1.1 Project Exposure to Excessive Noise

As noted in Section 3.2.2.2, traffic noise levels presented in this analysis are based on the Cumulative Restricted Access Traffic scenario for the segment of Briggs Road north of Old Newport Road (David Evans and Associates 2019). Exposure of persons to noise levels would be significant if exterior use areas of the new residential uses are subjected to levels above 60 CNEL. The loudest residential exterior use areas would be the backyards adjacent to Briggs Road. These yards would be located approximately 85 feet from the roadway centerline. Using TNM software to calculate the noise contour distances for the Cumulative Restricted Access Traffic scenario, noise levels at this distance would be 56.3 CNEL, assuming no solid fences or walls. Traffic noise levels at the project would not exceed 60 CNEL, and exterior impacts would be less than significant.

Because exterior noise levels are not expected to exceed 60 CNEL at the project's residential structures, interior noise levels are not expected to exceed 45 CNEL, and interior impacts would be less than significant.

4.1.2 Operational Noise

Specific planning data for the future HVAC systems and exact building site locations are not available; however, analysis using a typical to larger-sized residential condenser mounted on ground-level pads in residences' backyards provides a reasonable basis for analysis. As mentioned in Section 3.2.2.1, modeling assumed that the HVAC unit would be a Carrier 38HDR060 split system condenser. A single unit typically generates a noise level of 56 dBA at a distance of 7 feet. Residences would be approximately 150 feet from off-site receptors. At this distance, noise levels from a single HVAC unit would be less than 30 dBA, which would not exceed the County's nighttime allowable hourly limit of 45 dBA L_{EQ} for residential zones. Furthermore, noise generated by HVAC units are exempt from these standards. Impacts would be less than significant.

4.1.3 Off-site Transportation Noise

TNM software was used to calculate the noise contour distances for off-site roadway segments in the project vicinity for the Existing and Existing + Project scenarios. The off-site roadway modeling represents a conservative analysis that does not account for topography or attenuation provided by existing structures. The results of this analysis for the CNEL at the nearest NSLU to the roadway segments are shown below in Table 9, *Off-site Traffic Noise Levels*.

Table 9
OFF-SITE TRAFFIC NOISE LEVELS

Roadway Segment	Distance to Nearest NSLU[1]	CNEL at Nearest NSLU		
		Existing	Existing + Project	Change in CNEL
Briggs Road				
North of Old Newport Road	55 feet	52.6	56.9	+4.3
Old Newport Road				
West of Briggs Road	55 feet	56.0	59.6	+3.6
Rockport Road				
West of Laguna Vista Drive	55 feet	60.7	62.2	+1.5
East of Laguna Vista Drive	55 feet	57.5	58.9	+1.4

[1] Distance measured from roadway centerline

A direct significant impact would occur if the project would result in exterior noise levels that meet or exceed the 60 CNEL noise level limits established by the County General Plan shown in Table 1. If noise levels meet or exceed these limits, a direct significant impact would occur if off-site uses are exposed to a 3 dBA increase on roadways where the baseline (Existing) noise level is less than 60 CNEL; a 2 dBA increase for roadways where the baseline noise level is 60-64 CNEL; and a 1 dBA increase for roadways where the baseline noise level is 65 CNEL or above. The nearest NSLUs for each roadway are single-family residences.

At Briggs Road and Old Newport Road, noise levels would increase by 4.3 CNEL and 3.6 CNEL, respectively. However, as measured at nearby NSLUs, these levels would not meet or exceed the 60 CNEL exterior noise limits established by the County General Plan. The two segments of Rockport Road would increase by 1.5 and 1.4 CNEL. Therefore, direct off-site transportation noise impacts would be less than significant.

4.1.4 Construction Noise

4.1.4.1 Construction Equipment

Construction of the project that would produce substantial noise include grading, erecting new buildings, and paving of the site. The magnitude of the noise impact would depend on the type of construction activity, equipment used, duration of each construction phase, distance between the noise source and receiver, and any intervening structures. Construction would generate elevated noise levels that may disturb nearby NSLUs.

Construction equipment would not all operate at the same time or location. Additionally, construction equipment would not be in constant use during the 8-hour operating day. Construction was

conservatively estimated as being an average of approximately 150 feet from the nearest NSLUs, the single-family residence to the east across Briggs Road. Although equipment would be used within this distance, it is not likely that equipment would idle or be in constant use within 150 feet during a typical workday. A loader and dump truck were analyzed together for construction noise impacts due to their likelihood of being used in conjunction with one another. Table 10, *Construction Equipment Noise Levels,* provides the RCNM noise level results for expected construction equipment using the 150-foot distance.

Table 10
CONSTRUCTION EQUIPMENT NOISE LEVELS

Unit	Percent Operating Time	dBA L_{EQ} at 150 feet
Backhoe	40	64.0
Compressor	40	64.1
Concrete Mixer Truck	40	65.3
Concrete Pump Truck	20	64.9
Crane	16	63.0
Dozer	40	68.1
Dump Truck	40	62.9
Grader	40	71.5
Excavator	40	67.2
Front End Loader	40	65.6
Paver	50	64.7
Roller	20	63.5
Loader/Dump Truck	40	67.5

Source: RCNM

As shown in Table 10, most equipment would generate noise levels below 70 dBA at adjacent residences. A grader would generate noise levels of 71.5 dBA (see Appendix C, *Construction Noise Modeling Outputs*).

As described in Section 2.3.2, noise generated by construction is exempt from the County's exterior noise standards if construction is conducted outside the hours of 6:00 p.m. and 6:00 a.m. from June and September and 6:00 p.m. and 7:00 a.m. from October to May. Because construction is expected to occur between these hours, construction noise impacts to nearby NSLUs would be less than significant.

4.1.5 Mitigation Measures

Because impacts related to Issue 1 would be less than significant, no mitigation is required.

4.1.6 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

4.2 ISSUE 2: EXCESSIVE GROUND-BORNE VIBRATION

4.2.1 Impact Analysis

4.2.1.1 Construction Vibration

Construction activities known to generate excessive ground-borne vibration, such as pile driving, would not be conducted by the project. A possible source of vibration during general project construction activities would be a vibratory roller, which may be used within 100 feet of the nearest off-site residence. A vibratory roller would create approximately 0.210 inch per second PPV at a distance of 25 feet (Caltrans 2013b). A 0.210 inch per second PPV vibration level would equal 0.046 inch per second PPV at a distance of 200 feet.[1] This would be lower than what is considered a "strongly perceptible" impact for humans of 0.1 inches per second PPV, and the structural damage impact to older residential structures of 0.5 inch per second PPV. Therefore, although a vibratory roller may be perceptible to nearby human receptors, temporary impacts associated with the roller (and other potential equipment) would be less than significant.

4.2.1.2 Operational Vibration

The proposed land uses do not include equipment that would generate substantial vibration. Therefore, operational vibration impacts are less than significant.

4.2.2 Mitigation Measures

Because impacts related to Issue 2 would be less than significant, no mitigation is required.

4.2.3 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

4.3 ISSUE 3: AIRPORT NOISE LEVELS

4.3.1 Impact Analysis

The closest airports to the project site are Pines Airpark, located 3 miles to the southeast and Perris Valley Airport, located 7 miles northwest. At these distances, airport noise would not create substantial noise at the project site, and impacts associated with airports would be less than significant.

4.3.2 Mitigation Measures

Because impacts related to Issue 3 would be less than significant, no mitigation is required.

4.3.3 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

[1] Equipment PPV = Reference PPV * $(25/D)^n$ (in/sec), where Reference PPV is PPV at 25 feet, D is distance from equipment to the receiver in feet, and n = 1.1 (the value related to the attenuation rate through the ground); formula from Caltrans 2013b.

5.0 LIST OF PREPARERS

Jason Runyan	Acoustic Analyst
Brendan Sullivan	Acoustic Analyst
Thomas Liddicoat	Project Manager
Joanne M. Dramko, AICP	Senior Technical Specialist, Quality Assurance Reviewer

6.0 REFERENCES

California Department of Transportation (Caltrans). 2013a. Technical Noise Supplement to the Traffic Noise Protocol. September.

2013b. Transportation and Construction Vibration Guidance Manual, Environmental Engineering, Hazardous Waste, Air, Noise, Paleontology Office. September.

2004. Traffic Noise Model (TNM).

County of Riverside. 2015. General Plan. December 8. Available at: http://planning.rctlma.org/ZoningInformation/GeneralPlan.aspx

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Appendix A

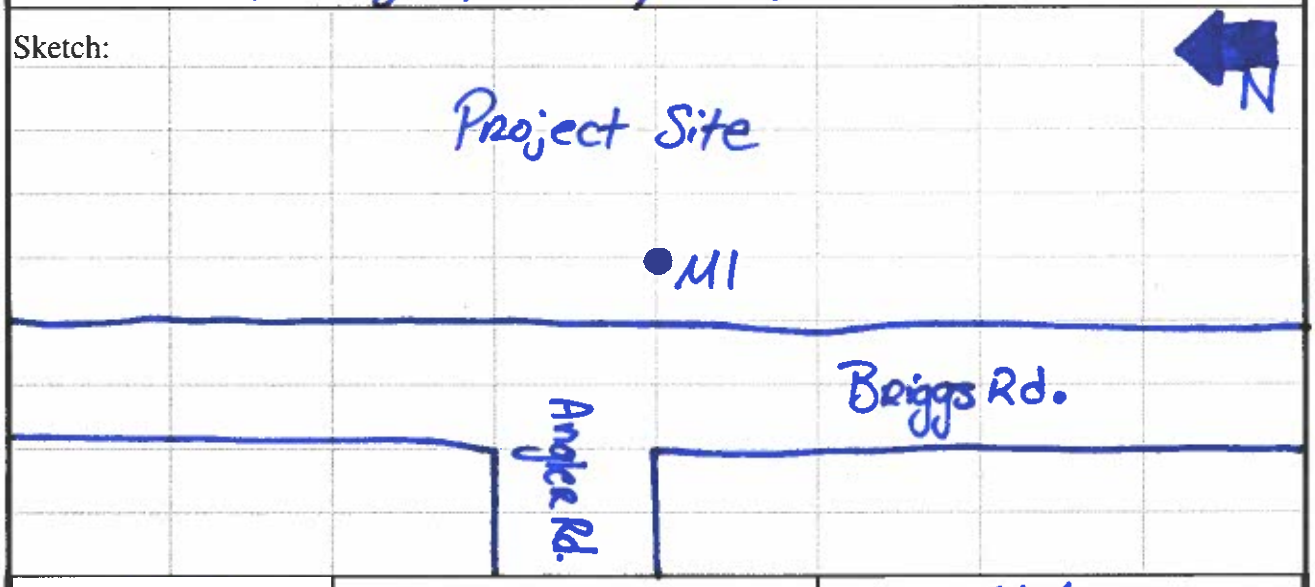
Site Survey Measurement Sheets

Site Survey

Job # WIT-01	Project Name: BRIGGS ROAD		
Date: 3/19/19	Site #: M1	Engineer: BRENDAN SULLIVAN	
Address:			
Meter: LD 831	Serial #: 1741	Calibrator: CA 250	Serial #: 1544

Notes: Sunny, clear skies. Light breeze from the South
Ambient Nature Sounds: Leaves rustling, birds chirping.
Cars passing by infrequently on the Road.

Sketch:



Temp: 70°	Wind Spd: 5 mph	Humidity: 44 %
Start of Measurement: 11:21	End of Measurement: 11:36	56.3 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
13 Total Cars		

Noise Measurement for Information Only

No Through Roadways

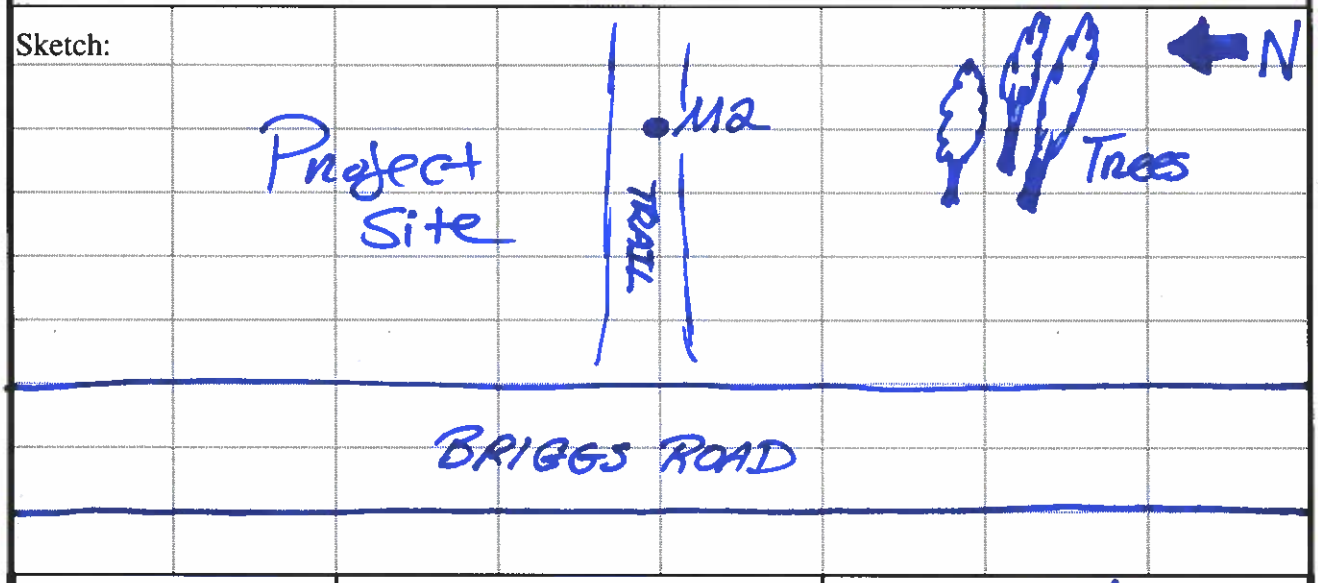
No Calibration Analysis Will Be Provided

Site Survey

Job # WIT-01	Project Name: Briggs Road		
Date: 3/19/19	Site #: M2	Engineer: Brendan Sullivan	
Address:			
Meter: LD831	Serial #: 1741	Calibrator: CA250	Serial #: 1544

Notes: Sunny, clear skies. Ambient nature sounds. Distant cars on Briggs Rd

Sketch:



Temp: 70°	Wind Spd: 5	mph	Humidity: 44	%	
Start of Measurement: 11:40	End of Measurement: 11:50		47.9	dBA L_{EQ}	

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

No Calibration Analysis Will Be Provided

Appendix B

Condenser Manufacturer's Specifications

ELECTRICAL DATA

38HDR UNIT SIZE	V–PH–Hz	VOLTAGE RANGE*		COMPRESSOR		OUTDOOR FAN MOTOR			MIN CKT AMPS	FUSE/ HACR BKR AMPS
		Min	Max	RLA	LRA	FLA	NEC Hp	kW Out		
018	208/230–1–60	187	253	9.0	48.0	0.80	0.125	0.09	12.1	20
024	208/230–1–60	187	253	12.8	58.3	0.80	0.125	0.09	16.8	25
030	208/230–1–60	187	253	14.1	73.0	1.45	0.25	0.19	19.1	30
036	208/230–1–60	187	253	14.1	77.0	1.45	0.25	0.19	19.1	30
	208/230–3–60	187	253	9.0	71.0	1.45	0.25	0.19	12.7	20
	460–3–60	414	506	5.6	38.0	0.80	0.25	0.19	7.8	15
048	208/230–1–60	187	253	21.8	117.0	1.45	0.25	0.19	28.7	50
	208/230–3–60	187	253	13.7	83.1	1.45	0.25	0.19	18.6	30
	460–3–60	414	506	6.2	41.0	0.80	0.25	0.19	8.6	15
060	208/230–1–60	187	253	26.4	134.0	1.45	0.25	0.19	34.5	60
	208/230–3–60	187	253	16.0	110.0	1.45	0.25	0.19	21.5	35
	460–3–60	414	506	7.8	52.0	0.80	0.25	0.19	10.6	15

* Permissible limits of the voltage range at which the unit will operate satisfactorily

FLA – Full Load Amps
HACR – Heating, Air Conditininng, Refrigeration
LRA – Locked Rotor Amps
NEC – National Electrical Code
RLA – Rated Load Amps (compressor)

NOTE: Control circuit is 24–V on all units and requires external power source. Copper wire must be used from service disconnect to unit.
All motors/compressors contain internal overload protection.

SOUND LEVEL

Unit Size	Standard Rating (dB)	Typical Octave Band Spectrum (dBA) (without tone adjustment)						
		125	250	500	1000	2000	4000	8000
018	68	52.0	57.5	60.5	63.5	60.5	57.5	46.5
024	69	57.5	61.5	63.0	61.0	60.0	56.0	45.0
030	72	56.5	63.0	65.0	66.0	64.0	62.5	57.0
036	72	65.0	61.5	63.5	65.0	64.5	61.0	54.5
048	72	58.5	61.0	64.0	67.5	66.0	64.0	57.0
060	72	63.0	61.5	64.0	66.5	66.0	64.5	55.5

CHARGING SUBCOOLING (TXV-TYPE EXPANSION DEVICE)

UNIT SIZE–VOLTAGE, SERIES	REQUIRED SUBCOOLING °F (°C)
018	12 (6.7)
024	12 (6.7)
030	12 (6.7)
036	12 (6.7)
048	12 (6.7)
060	12 (6.7)

Appendix C

Construction Noise Model Outputs

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 8/22/2019
Case Description:

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
1	Residential	40	40	40

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	150	0
Compressor (air)	No	40		77.7	150	0
Concrete Mixer Truck	No	40		78.8	150	0
Concrete Pump Truck	No	20		81.4	150	0
Crane	No	16		80.6	150	0
Dozer	No	40		81.7	150	0
Dump Truck	No	40		76.5	150	0
Grader	No	40	85		150	0
Excavator	No	40		80.7	150	0
Front End Loader	No	40		79.1	150	0
Paver	No	50		77.2	150	0
Roller	No	20		80	150	0
Front End Loader	No	40		79.1	150	0
Dump Truck	No	40		76.5	150	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax
Backhoe	68	64	N/A	N/A	N/A	N/A	N/A
Compressor (air)	68.1	64.1	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	69.3	65.3	N/A	N/A	N/A	N/A	N/A
Concrete Pump Truck	71.9	64.9	N/A	N/A	N/A	N/A	N/A
Crane	71	63	N/A	N/A	N/A	N/A	N/A
Dozer	72.1	68.1	N/A	N/A	N/A	N/A	N/A
Dump Truck	66.9	62.9	N/A	N/A	N/A	N/A	N/A
Grader	75.5	71.5	N/A	N/A	N/A	N/A	N/A
Excavator	71.2	67.2	N/A	N/A	N/A	N/A	N/A
Front End Loader	69.6	65.6	N/A	N/A	N/A	N/A	N/A
Paver	67.7	64.7	N/A	N/A	N/A	N/A	N/A
Roller	70.5	63.5	N/A	N/A	N/A	N/A	N/A
Front End Loader	69.6	65.6	N/A	N/A	N/A	N/A	N/A
Dump Truck	66.9	62.9	N/A	N/A	N/A	N/A	N/A

Total	75.5	77.5	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 8/22/2019
Case Description:

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
1	Residential	40	40	40

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	150	0
Compressor (air)	No	40		77.7	150	0
Concrete Mixer Truck	No	40		78.8	150	0
Concrete Pump Truck	No	20		81.4	150	0
Crane	No	16		80.6	150	0
Dozer	No	40		81.7	150	0
Dump Truck	No	40		76.5	150	0
Grader	No	40	85		150	0
Excavator	No	40		80.7	150	0
Front End Loader	No	40		79.1	150	0
Paver	No	50		77.2	150	0
Roller	No	20		80	150	0
Front End Loader	No	40		79.1	150	0
Dump Truck	No	40		76.5	150	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax
Backhoe	68	64	N/A	N/A	N/A	N/A	N/A
Compressor (air)	68.1	64.1	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	69.3	65.3	N/A	N/A	N/A	N/A	N/A
Concrete Pump Truck	71.9	64.9	N/A	N/A	N/A	N/A	N/A
Crane	71	63	N/A	N/A	N/A	N/A	N/A
Dozer	72.1	68.1	N/A	N/A	N/A	N/A	N/A
Dump Truck	66.9	62.9	N/A	N/A	N/A	N/A	N/A
Grader	75.5	71.5	N/A	N/A	N/A	N/A	N/A
Excavator	71.2	67.2	N/A	N/A	N/A	N/A	N/A
Front End Loader	69.6	65.6	N/A	N/A	N/A	N/A	N/A
Paver	67.7	64.7	N/A	N/A	N/A	N/A	N/A
Roller	70.5	63.5	N/A	N/A	N/A	N/A	N/A
Front End Loader	69.6	65.6	N/A	N/A	N/A	N/A	N/A
Dump Truck	66.9	62.9	N/A	N/A	N/A	N/A	N/A

Total	75.5	77.5	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.