Appendix E

Noise and Vibration Assessment

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October 8, 2021 Project 05034.00001.001

Mr. Dennis Clover
3241C Fruitridge Road
Yuba City, CA 95993

Subject: Noise and Vibration Assessment Letter Report for the California Truck and Trailer Repair Shop Project, Sacramento, California

Dear Mr. Clover:

HELIX Environmental Planning, Inc. (HELIX) has analyzed potential noise and vibration impacts associated with the proposed California Truck and Trailer Repair Shop (project). The analysis includes a description of existing conditions in the project vicinity, an assessment of potential impacts associated with project construction, and an evaluation of project operational impacts. Analysis within this report was prepared to support impact analysis pursuant to the California Environmental Quality Act (Public Resources Code Sections 21000 et seq.), CEQA Guidelines (Title 14, Section 15000 et seq. of the California Code of Regulations) and the Sacramento Local Environmental Regulations (Resolution 91-892) adopted by the City of Sacramento (City). The analysis reviews the discussions of potential impacts and irreversible significant effects analyzed in the 2035 General Plan Master EIR to determine their adequacy for the project (see CEQA Guidelines Section 15178(b),(c)) and identifies any potential new or additional project-specific significant environmental effects that were not analyzed in the Master EIR and any mitigation measures or alternatives that may avoid or mitigate the identified effects to a level of insignificance, if any (City 2014; City 2015).

PROJECT LOCATION AND DESCRIPTION

The project site is comprised of 2.38 acres (Assessor's Parcel Numbers 250-0025-060 and 250-0025-005) located at 121 Morrison Avenue in the City of Sacramento, California. The project site has been designated as Employment Center Low Rise in the 2035 General Plan. Access would be provided via a 45-foot-wide driveway from Harris Avenue on the north side of the project site. See Figure 1, *Regional Location*, and Figure 2, *Surrounding Land Uses*, included in Attachment A of this letter.

The project would develop a 9,100 square foot (SF) truck and trailer repair facility and associated parking lot. The building would be comprised of a two-story, 3,500 SF, office and administrative area and three truck repair bays totaling 5,600 SF. The building would have a maximum height of 30 feet. The repair bays would be accessed by rollup doors, 16 feet wide by 16 feet tall, located on the west and east end of each bay. The parking lot would be comprised of 28 truck/trailer parking spaces secured with a fence/gate in the western portion of the project site, and 31 vehicle parking spaces west and south of

the proposed building. A six-foot high solid masonry wall, set back 25 feet from the sidewalks, would be constructed along Opportunity Street and Morrison Avenue. A six-foot-high wrought iron and masonry wall, set back 25 feet from the sidewalk, would be constructed along Harris Avenue. Additional site improvements would include lighting, a trash enclosure, a security shack, and landscaping. See Figure 3, *Site Plan*.

Project construction would involve site preparation (clearing and grubbing), grading, wet and dry utility installation, building construction, paving, and landscaping improvements. The site is currently vacant and unpaved, and no demolition would be required.

NOISE METRICS

All noise-level and sound-level values presented herein are expressed in terms of decibels (dB), with A-weighting, abbreviated "dBA," to approximate the hearing sensitivity of humans. Time averaged noise levels of one hour are expressed by the symbol "L_{EQ}" unless a different time period is specified. Maximum noise levels are expressed by the symbol "L_{MAX}." Some of the data also may be presented as octave-band-filtered and/or A octave band-filtered data, which are a series of sound spectra centered on each stated frequency, with half of the bandwidth above and half of the bandwidth below, the stated frequency. These data are typically used for machinery noise analysis and barrier-effectiveness calculations. 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.

Noise emission data are often provided based on the industry standard format of sound power (noted by S_{WL}), which represents the total acoustic power level radiated from a given sound source as related to a reference power level. Sound power differs from sound pressure (if notation is needed, the abbreviation is S_{PL}), which measures the fluctuations in air pressure caused by the presence of sound waves and is generally the format that describes noise levels as heard by the receiver. Sound pressure is the actual noise experienced by a human or registered by a sound level instrument. When sound pressure is used to describe a noise source, the distance from the noise source must be provided to provide complete information. Sound power is a specialized analytical method to provide information without the distance requirement, but it may be used to calculate the sound pressure at any desired distance.

Because decibels are logarithmic units, S_{PL} 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 from one source under the same conditions. For example, if one automobile produces an S_{PL} of 70 dBA when it passes an observer, two cars passing simultaneously would not produce 140 dBA—rather, they would combine to produce 73 dBA. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dBA louder than one source.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1 dBA changes in sound levels, when exposed to steady, single-frequency ("pure-tone") signals

in the mid-frequency (1,000 Hertz [Hz]–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dBA are generally not perceptible. It is widely accepted, however, that people begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5 dBA increase is generally perceived as a distinctly noticeable increase, and a 10 dBA increase is generally perceived as a doubling of loudness.

VIBRATION METRICS

Groundborne vibration consists of rapidly fluctuating motions or waves transmitted through the ground with an average motion of zero. Sources of groundborne vibrations include natural phenomena and anthropogenic causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions). Peak particle velocity (PPV) is commonly used to quantify vibration amplitude. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. For the purposes of this analysis, a PPV descriptor with units of inches per second in/sec is used to evaluate construction-generated vibration for building damage and human complaints.

CITY OF SACRAMENTO NOISE STANDARDS

Sacramento Municipal Code

The following noise ordinances are potentially applicable to the project (City 2020):

Section 8.68.60 Exterior Noise Standards – establishes exterior noise standards for noise received by agricultural and residential properties of 55 dBA from 7:00 a.m. to 10:00 p.m. and 50 dBA from 10:00 p.m. to 7:00 a.m. The ordinance allows the exterior standard to be exceeded by 5 dBA for cumulative periods of 15 minutes per hour, by 10 dBA for cumulative periods of 5 minutes per hour, by 15 dBA for cumulative periods of 1 minute per hour, and by 20 dBA maximum for any period.

Section 8.68.60 Interior Noise Standards – establishes residential interior noise limits during the period of 10:00 p.m. to 7:00 a.m. of: 45 dBA for a cumulative period of more than five minutes in any hour; 50 dBA for a cumulative period of more than one minute in any hour; and 55 dBA for any period of time.

Section 8.68.80 Exemptions – exempts noise sources from the exterior noise requirements due to the erection (including excavation), demolition, alteration or repair of any building or structure between the hours of 7:00 a.m. and 6:00 p.m., on Monday, Tuesday, Wednesday, Thursday, Friday and Saturday, and between 9:00 a.m. and 6:00 p.m. on Sunday; provided, however, that the operation of an internal combustion engine shall not be exempt pursuant to this subsection if such engine is not equipped with suitable exhaust and intake silencers which are in good working order.

City of Sacramento 2035 General Plan

The following General Plan policies are potentially applicable to the project (City 2015).

Policy EC 3.1.1 – establishes normally acceptable noise levels of 60 dBA L_{DN} for residential—low-density single-family land uses; 70 dBA for office buildings—business, commercial and professional; and 75 dBA L_{DN} for industrial, manufacturing, utilities, and agriculture uses.

Policy EC 3.1.2 – establishes standards for acceptable increases to existing ambient levels due to development projects. Table EC 2 from the 2035 General Plan is reproduced here as Table 1, *Exterior Incremental Noise Impact Standards for Noise-Sensitive Uses (dBA).*

Table 1
EXTERIOR INCREMENTAL NOISE IMPACT STANDARDS FOR NOISE-SENSITIVE USES

Existing L_{DN} (dBA)	Allowable Noise Increment (dBA
Residences and buildings where people normally sleep	
45	8
50	5
55	3
60	2
65	1
70	1
75	0
80	0
Institutional land uses with primarily daytime and evening uses	
45	12
50	9
55	6
60	5
65	3
70	3
75	1
80	0

Source: City 2015

Policy EC 3.1.8 – require mixed-use, commercial, and industrial projects to mitigate operational noise impacts to adjoining sensitive uses when operational noise thresholds are exceeded.

Policy EC 3.1.10 – requires development projects subject to discretionary approval to assess potential construction noise impacts on nearby sensitive uses and to minimize impacts on these uses, to the extent feasible.

EXISTING CONDITIONS

Noise Sensitive and Surrounding Land Uses

Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise, including residences, hospitals, schools, hotels, resorts, libraries, sensitive wildlife habitat, or similar facilities where quiet is an important attribute of the environment. Noise receptors (receivers) are individual locations that may be affected by noise. The closest NSLUs to the project site are single-family residences located directly across Morrison Avenue to the south of the project site. boundary to the south. Lots east, west (across Opportunity Street), and north (across Harris Avenue) of the project site have a general plan land use designation of Employment Center Low Rise and are developed with commercial/industrial uses, including a truck rental business to the west and a truck sales/service business to the north (see Figure 2).

Existing Noise Sources

Existing noise in the vicinity of the project site is dominated by traffic noise from Interstate 80 (I-80), approximately 1,060 feet north of the project site. Additional traffic noise comes from Harris Avenue, Opportunity Street, and Morrison Avenue, adjacent to the project site. Other noise in the project vicinity includes truck circulation and truck servicing noise from the businesses west and north of the project site and building mechanical systems and parking lot noise from the commercial building on the eastside of the project site. The project site is also subject to periodic noise from aircraft approaching and departing Sacramento International Airport (approximately 8 miles to the northwest) and McClellan Airport (approximately 3.6 miles northeast).

General Site Survey

One long-term (24 hours; LT-1) and three short-term (15 minutes; ST-1, ST-2, ST-3) ambient noise measurements were conducted during a site visit on August 17 and 18, 2021. Site LT-1 is located on a utility pole on the southern edge of the project site along Morrison Avenue. Site ST-1 is located on the southern edge of the project site along Morrison Avenue. Site ST-2 is located on the northern edge of the project site along Harris Avenue. Site ST-3 is located on the west side of Norwood Avenue between I-80 and Harris Avenue. The 24-hour measurement was conducted between August 17th and 18th, 2021, with the meter attached to a utility pole approximately 8-feet above the ground. All of the 15-minute measurements were conducted on August 17, 2021 with the meter mounted on a tripod and positioned 5-feet above the ground. The measurement locations are shown on Figure 2. Traffic counts were conducted during the short-term measurements. The measured noise levels and related weather conditions for the measurements are shown in Table 2, *Noise Measurement Results*. See Attachment B, *On-site Noise Measurements*, for survey notes from the measurements.

Table 2
NOISE MEASUREMENT RESULTS

Measurement	Location	Conditions	Time	Level	Notes
LT-1	Utility pole on Morrison Avenue, approximately 336 feet west of Opportunity Street	At start: 80°F, 9 miles per hour (mph) wind, 39 percent humidity, sunny	8/18/2021 10:00 a.m. 8/17/2021 to 10:00 a.m.	61.6 dBA L_{DN}; 65.0 dBA highest 1-hr L_{EQ}	Meter on utility pole, approximately 8 feet above ground level.
ST-1	Sidewalk north side of Morrison Avenue, approximately 265 feet east of Opportunity Street	80°F, 9 mph wind, 39 percent humidity, sunny	8/17/2021 10:12 a.m. to 10:27 a.m.	49.3 dBA L_{EQ}	1 aircraft departing Sacramento International Airport. 1 car, 0 trucks.
ST-2	Sidewalk south side of Harris Avenue, approximately 300 feet east of Opportunity Street	81°F, 9 mph wind, 33 percent humidity, sunny	8/17/2021 10:34 a.m. to 10:49 a.m.	58.4 dBA L_{EQ}	2 aircraft departing Sacramento International Airport. 12 cars, 5 medium trucks and 2 heavy trucks.
ST-3	West side of Norwood Avenue, approximately 290 feet north of Harris Avenue	83°F, 8 mph wind, 31 percent humidity, sunny	8/17/2021 10:56 a.m. to 11:04 p.m.	70.3 dBA L_{EQ}	294 cars, 17 medium trucks and 7 heavy trucks.

EQUIPMENT AND METHODOLOGY

Ambient Noise Survey

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

- Larson Davis 720 Sound Level Meter
- Larson Davis SoundTrack LxT Sound Level Meter
- Larson Davis Model CAL250 Calibrator
- Microphone windscreen
- Tripod for the SoundTrack LxT Sound Level Meter

The sound-level meters were field-calibrated immediately prior to the noise measurement to ensure accuracy. All measurements were made with meters that conform 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.

Noise Modeling Software

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

Modeling of the exterior noise environment for this report was accomplished using the Computer Aided Noise Abatement (CadnaA) model version 2021. CadnaA is a program developed by DataKustik for predicting noise impacts in a wide variety of conditions. It allows for the input of project-related information, such as noise source data, barriers, structures, and topography to create a detailed model, and uses the methodology from the U.S. Department of Transportation Federal Highway Administration (FHWA) Traffic Noise Model TNM version 2.5 (USDOT 2004). The noise models used in this analysis were developed from Computer Aided Design (CAD) plans provided by the project architect. Input variables included building mechanical equipment reference noise levels, road alignment, elevation, lane configuration, area topography, projected traffic volumes, estimated truck composition percentages, and vehicle speeds. The one-hour L_{EQ} traffic noise level is calculated utilizing peak-hour traffic. The model-calculated one-hour L_{EQ} noise output is the equivalent to the L_{DN} (Caltrans 2009). The modeling includes the project building, the project masonry wall on the south and west sides of the site, and the existing adjacent to the project site to the east. The noise modeling input and output is included in Attachment C to this letter.

Assumptions and Model Input

Construction

Construction would require the use of equipment throughout the site for the full term of construction. Typical construction activities include excavating, grading, compacting, installing utilities, construction the building, and paving. Standard equipment used on the site is assumed to include an excavator, front-

end loader, dump truck, dozer, grader, and roller. Blasting or the use of pile drivers is not anticipated to be required.

Operation

According to the project site plan and information proved by the project applicant, anticipated operational noise sources would include: a roof-mounted heating, ventilation, and air conditioning (HVAC) system; a fixed position shop air compressor; pneumatic impact wrenches (air ratchets); tire mounting machines; compressed air tire bead setting machines; truck circulation and idling; tuck back-up alarms; and vehicular traffic.

Truck Circulation

According to the project applicant, 5 to 8 client trucks are anticipated to be serviced each workday (Monday through Saturday, 8:00 a.m. to 5:30 p.m.). This analysis assumes that up two trucks would circulate around the project site each hour, between the driveway, parking areas, and service bay doors. Although there is no requirement for highway trucks to be equipped with backup alarms, some trucks are equipped with such safety devices. This analysis assumes one truck per hour would operate a backup alarm for 30 seconds. A typical backup alarms can produce up to 109.7 dBA at 1,000 Hz.

Noise from trucks circulating around the project site was modeled using the default truck noise in the CadnaA/TNM software with 100 percent heavy trucks assumed. Trucks were assumed to circulate at an average speed of 5 mph.

HVAC Units

The project would use a commercial-sized HVAC unit located on the rooftop of the office portion of the building. The exact HVAC model has not been determined as of this analysis. For the purposes of this analysis, a Carrier 50PG 12-ton HVAC unit, with a sound power level (S_{WL}) of 80.0 dBA, was used to model the noise impacts from the proposed project's HVAC system (Carrier 2008). The manufacturer's noise data for the HVAC units is provided below in Table 3, *HVAC Condenser Noise Data (SWL dBA).*

Table 3
HVAC CONDENSER NOISE DATA (SWL dBA)

63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	Overall Noise Level
90.4	83.1	80.9	77.8	75.2	70.0	66.1	57.6	80.0

Source: Carrier 2008
S_{WL} = sound power level; Hz = Hertz; kHz = kilohertz

Air Compressor

The specific model of air compressor to be installed in the proposed building has not been determined as of this analysis. This analysis assumes a DeWalt 60 gallon, 155 pounds-per-square-inch compressor with a rated noise level of 80 dBA. The compressor was assumed to be installed on the north side of service bay 1.

Impact Wrenches

The specific model(s) of pneumatic impact wrench to be used in the project has not been determined as of this analysis. It anticipated that a ¾ inch drive impact wrench would be required for removal and installation of truck wheels. Data was not available for ¾ inch impact wrenches. Therefore, the modeling assumes the wrenches would be twice as loud (6 dBA higher) that the measured noise of an Ingersoll-Rand ½" dive impact wrench. The modeled sound power level is shown in Table 4, *Three-Fourth-Inch Impact Wrench Noise Data (SWL dBA).* The modeling assumes that six impact wrenches would be in concurrent operation (three wrenches 15 feet inside the western edge of each service bay and 3 wrenches outside the western doors of the service bays). Each wrench was assumed to be operated 15 minutes per hour.

Table 4
THREE-FOURTH-INCH IMPACT WRENCH NOISE DATA (SWL dBA)

31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	Overall Noise Level
58.9	63.1	71.1	76.0	80.8	81.7	83.4	85.7	86.5	91.3

S_{WL} = sound power level; Hz = Hertz; kHz = kilohertz

Tire Removal and Installation

Machines to remove and install tires on truck wheels were assumed to be required for the project. Typical noise produced by tire removal/installation was taken from measurements done for a Colorado State University study of noise exposure at tire changing facilities. The measured tire removal/installation machine produced 83.2 dBA S_{PL} at 2 feet (approximately equivalent to S_{WL}). A compressed air tire bead seating machine produced 111.3 dBA at 2 feet (Willson-Kerns 2019). One tire removal/installation machine and one tire bead seating machine was assumed to be used once per hour for 30 seconds in each service bay.

Vehicular Traffic

Existing (2021) peak hour traffic data for the road segments on Norwood Avenue and Morristown Street was obtained from City traffic counts (City 1995). Traffic on Norwood Avenue and Morristown Street has likely increased since the City traffic count. The use of the 1995 data is conservative because, in this analysis, it is used to determine noise level increases resulting from the project. Traffic data for I-80 was obtained from California Department of Transportation (Caltrans) traffic counts (Caltrans 2019). Traffic counts were not available for Harris Avenue in the project vicinity. Peak hour traffic for Harris Avenue was estimated using the traffic count taken during the short-term noise measurement—19 vehicles in 15 minutes (approximately 76 vehicles per hour) during the 10:00 AM hour. Peak hour traffic for Harris Avenue was calculated assuming a typical metropolitan area traffic distribution of 5.3 percent of the average daily traffic (ADT) during the 10:00 AM hour and 8.6 percent of the ADT during the peak hour (4:00 p.m.; Ogden International 1986). Traffic on all roadway segments was assumed to be traveling at the posted speed limit: 65 mph for cars and 55 mph for trucks on I-80; 40 mph on Norwood Avenue; and 25 mph on Harris Avenue and Morrison Avenue. Project trips during the p.m. hour were estimated assuming that each of the 6 anticipated employees would generate one trip and 5 client trucks would leave or enter the project site (11 total peak hour trips). All project trips were assumed to use Harris Avenue, Norwood Avenue, and I-80. Because the project does not have driveways that connect to

Morrison Avenue, and because Morison Avenue is not signalized at Norwood Avenue, no project generated trips were assumed to use Morrison Avenue. Traffic volumes for the PM peak hour on the modeled road segments are shown in Table 5, *Traffic Volumes*.

Table 5
TRAFFIC VOLUMES

Roadway Segment	Existing PM Peak Hour	Existing + Project PM Peak Hour
I-80 – Truxel Road to Norwood Avenue	15,700	15,711
Norwood Avenue – I-80 to Harris Avenue	1,182	1,193
Harris Avenue – Norwood Avenue to Opportunity Street	110	121
Morrison Avenue	79	79

Source: Caltrans 2019, City 1995

GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

To be consistent with the analysis in the 2035 General Plan Master EIR, impacts due to noise may be considered significant if construction and/or implementation of the project would result in the following impacts that remain significant after implementation of general plan policies:

A. Result in exterior noise levels in the project area that are above the upper value of the normally acceptable category for nearby land uses due to the project's noise level increases;

B. Result in residential interior noise levels of 45 dBA L_{DN} or greater caused by noise level increases due to the project;

C. Result in construction noise levels that exceed the standards in the City of Sacramento Noise Ordinance;

D. Permit existing and/or planned residential and commercial areas to be exposed to vibration-peak-particle velocities greater than 0.5 inches per second due to project construction;

E. Permit adjacent residential and commercial areas to be exposed to vibration peak particle velocities greater than 0.5 inches per second due to highway traffic and rail operations; or

F. Permit historic buildings and archaeological sites to be exposed to vibration-peak-particle velocities greater than 0.2 inches per second due to project construction and highway traffic.

In addition to the above standards, the allowable incremental increase in exterior noise established in the 2035 General Plan Policy EC 3.1.2 (shown in Table 1, above) would apply.

SUMMARY OF ANALYSIS UNDER THE 2035 GENERAL PLAN MASTER EIR AND APPLICABLE GENERAL PLAN POLICIES

The Master EIR evaluated the potential for development under the 2035 General Plan to increase noise levels in the community. New noise sources include vehicular traffic, aircraft, railways, light rail, and stationary sources. The General Plan policies establish exterior (Policy EC 3.1.1) noise standards. A

variety of policies provide standards for the types of development envisioned in the General Plan. See Policy EC 3.1.8, which requires new mixed-use, commercial and industrial development to mitigate the effects of noise from operations on adjoining sensitive land use, and Policy 3.1.10, which calls for the City to assess potential construction noise impacts on nearby sensitive uses and to minimize impacts on these uses. Notwithstanding application of the General Plan policies, noise impacts for exterior noise levels (Impact 4.8-1) and interior noise levels (Impact 4.8-2), and vibration impacts (Impact 4.8-4) were found to be significant and unavoidable. No mitigation measures were identified in the Master EIR which would reduce the severity of significant noise and vibration impacts. All other noise and vibration impacts were found to be less than significant and would require no mitigation (City 2014; City 2015).

IMPACT ANALYSIS

Question A: *Result in exterior noise levels in the project area that are above the upper value of the normally acceptable category for various land uses due to the project's noise level increases?*

The General Plan Maser EIR found this impact to be significant and unavoidable; no mitigation was identified which would reduce the severity of the impact.

On-Site Operational Noise

Non-transportation (on-site) noise sources associated with operation of the project would include rooftop HVAC systems, air compressors, pneumatic impact wrenches, tire removal/installation machines, tire bead setting machines, and truck circulation (including backup alarms).

On-site operational noise sources were modeled as described above. Receivers were placed along the property lines closest to the project site for the nine closest residences to the project site (across Morrison Avenue to the south), see Figure 2 for modeled receiver locations. The results of the modeling for the 1-hour L_{EQ} and L_{MAX} at each receiver location are compared to the City daytime standard (from the city Municipal Code section 8.68.60) in Table 6, *Operational On-Site Noise, L_{EQ} and L_{MAX}*. The noise modeling input and output is included in Attachment C to this letter.

Table 6
OPERATIONAL ON-SITE NOISE, L_{EQ} and L_{MAX}

Receiver	L_{EQ} (dBA)	L_{EQ} Standard (dBA)	Exceed L_{EQ} Standard?	L_{MAX} (dBA)	L_{MAX} Standard (dBA)	Exceed L_{MAX} Standard?
R1	49.0	55	No	64.3	75	No
R2	52.3	55	No	67.7	75	No
R3	53.3	55	No	68.8	75	No
R4	54.3	55	No	69.6	75	No
R5	54.5	55	No	69.3	75	No
R6	54.2	55	No	68.3	75	No
R7	51.7	55	No	65.3	75	No
R8	57.1	55	No	65.2	75	No
R9	47.3	55	No	62.8	75	No

Source: CadnaA (see Appendix C for model output).

As shown in Table 6, noise levels from combined onsite operational sources would not exceed the daytime L_{EQ} or L_{MAX} limits. The project is anticipated to have operating hours from 8:00 a.m. to 5:30 p.m., Monday through Saturday, and the 50 dBA noise standard from the noise ordinance during the 10:00 p.m. to 7:00 a.m. hours would not apply.

Noise generated on the project site during cumulative periods of the noisiest hour was analyzed with the following assumptions: only the rooftop HVAC and the air compressor would operate for 30 or more minutes per hour; only the rooftop HVAC, air compressor, and pneumatic impact wrenches would operate for 15 or more minute per hour; and only the rooftop HVAC, air compressor, pneumatic impact wrenches, and truck circulation would operate for 5 or more minute per hour. The equipment operating for 1 or more minutes per hour would be the same as the equipment operating 5 or more minutes per hour and was not analyzed (the 1-minute standard is a higher noise level than the 5-minute standard). The results of the modeling for the 30-minute, 15-minute, and 5-minute cumulative periods at each receiver location are compared to the City daytime standard (from the City Municipal Code Section 8.68.60) in Table 7, *Operational On-Site Noise, Cumulative Periods (dBA)*. The noise modeling input and output is included in Attachment C to this letter.

Table 7
OPERATIONAL ON-SITE NOISE, CUMULATIVE PERIODS (dBA)

Receiver	30-Min	30-Min Standard	Exceed Standard?	15-Min	15-Min Standard	Exceed Standard?	5-Min	5-Min Standard	Exceed Standard?
R1	20.0	55	No	35.60	60	No	47.30	65	No
R2	21.8	55	No	38.80	60	No	50.60	65	No
R3	22.4	55	No	40.00	60	No	51.70	65	No
R4	23.3	55	No	41.60	60	No	52.60	65	No
R5	24.3	55	No	43.30	60	No	52.90	65	No
R6	24.9	55	No	44.00	60	No	52.80	65	No
R7	24.6	55	No	38.40	60	No	50.70	65	No
R8	26.6	55	No	40.70	60	No	49.00	65	No
R9	12.5	55	No	28.20	60	No	45.70	65	No

Source: CadnaA (see Appendix C for model output).
min = minutes

As shown in Table 7, noise levels from combined onsite operational sources would not exceed the daytime cumulative period noise limits for residential receivers. The project would therefore not result in the generation of on-site operational noise exceeding City standards established in section 8.68.60 of the City Municipal Code.

Off-site Transportation Noise

Future traffic noise levels presented in this analysis are based on traffic volumes described above. In addition to the residential receiver along Morrison Avenue (R1 through R9), two receivers were placed along roadway segments with only commercial/industrial land uses: Receiver C-1 was placed along the commercial property line opposite the project site on Harris Avenue and receiver C-2 was placed along the property line for the government agency located west of Norwood Avenue. See Figure 2 for receiver locations. The traffic noise modeling accounts for terrain and road geometry does not account for noise reduction resulting from structures and barriers on or off the project site. The results of the traffic noise

analysis are shown below in Table 8, *Off-site Traffic Noise Levels (dBA L_{DN})*. The increase in noise is compared to the allowable increase described in Table 1, above. The noise modeling input and output is included in Attachment C to this letter.

Table 8
OFF-SITE TRAFFIC NOISE LEVELS (dBA L_{DN})

Roadway Segment	Existing AM Peak Hour	Existing + Project PM Peak Hour	Increase	Allowable Increase	Exceed Allowable Increase?
Norwood Avenue – I-80 to Harris Avenue	71.3	71.4	0.1	3	No
Harris Avenue – Norwood Avenue to Opportunity Street	68.9	68.9	0	3	No
Morrison Avenue	66.7	66.7	0	1	No

Source: CadnaA (see Appendix C for model output).

As shown in Table 8, existing ambient noise levels exceed the City's normally acceptable standard of 60 dBA L_{DN} noise level limits for residential land uses along Morrison Avenue and 70 dBA for professional buildings along Norwood Avenue. However, the maximum noise increase as a result of the addition of project traffic would be 0.1 dBA L_{DN}. This increase would not be noticeable and would not exceed the 1 dBA L_{DN} maximum allowable increase for residential uses or the 3 dBA maximum allowable increase for commercial/professional uses. Therefore, transportation noise resulting from long-term operation of the project would not generate a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the General Plan.

Impact Conclusion

Operation of the project would not result in a substantial increase in ambient noise levels in the vicinity of the project in excess of standards established in the City General Plan or noise ordinance. The impact would be less than significant and would have no additional significant environmental effects beyond what has been previously identified in the Master EIR.

Question B: *Result in residential interior noise levels of 45 dBA LDN or greater caused by noise level increases due to the project?*

The General Plan Maser EIR found this impact to be significant and unavoidable; no mitigation was identified which would reduce the severity of the impact (City 2014; City 2015).

Traditional architectural materials typically used in residential construction attenuate noise levels by 15 dBA. Therefore, if the noise level at the exterior of the nearest NSLUs would exceed 60 dBA L_{DN}, the interior noise levels would exceed the City standard established in 2035 General Policy EC 3.1.3. The Exiting and Existing + Project scenario exterior noise levels for the residential receivers along Morrison Avenue (R1 through R9) are shown in Table 9, *Residential Change in Ambient Noise (dBA L_{DN}).*

Table 9
RESIDENTIAL CHANGE IN AMBIENT NOISE (dBA L_{DN})

Receiver	Existing PM Peak Hour	Existing + Project PM Peak Hour	Increase
R1	66.5	66.5	0
R2	66.5	66.5	0
R3	66.6	66.6	0
R4	66.7	66.7	0
R5	66.7	66.7	0
R6	66.7	66.7	0
R7	66.7	66.7	0
R8	66.8	66.8	0
R9	66.8	66.8	0

Source: CadnaA, see Attachment C for model outputs.

As shown in Table 9, the existing ambient exterior noise levels exceed the 60 dBA level which results in interior noise levels above the 45 dBA L_{DN} City standards. However, the addition of project traffic would not result in a noticeable increase in residential exterior or interior noise levels. This impact would be less than significant and would have no additional significant environmental effects beyond what has been previously identified in the Master EIR.

Question C: *Result in construction noise levels that exceed the standards in the City of Sacramento Noise Ordinance?*

The General Plan Master EIR found this impact to be less than significant, and no mitigation would be required (City 2014; City 2015).

The nearest NSLUs to the project site area are approximately 75 feet south of areas anticipated to have significant construction activity. The noisiest heavy construction equipment anticipated to be used near NSLUs would be a dozer, used during site preparations. Modeling with the RCNM shows that noise from a dozer would be 74.2 dBA L_{EQ} at the closest residential property line. This noise level would exceed the City Noise Ordinance standard of 55 dBA from 7:00 a.m. to 10:00 p.m. and 50 dBA from 10:00 p.m. to 7:00 a.m.

According to the City Code Section 8.68.060, *Exemptions*, noise sources associated with construction of the project which are conducted between the hours of 7:00 a.m. and 6:00 p.m., on Monday, Tuesday, Wednesday, Thursday, Friday and Saturday, and between 9:00 a.m. and 6:00 p.m. on Sunday, are exempt for the City noise standard provided that all internal combustion engines used in the construction activities are equipped with suitable exhaust and intake silencers in good working order (City 2020). Project-specific Mitigation Measure NOI-01 would restrict construction hours to the above limitations and require all construction equipment to be equipped with intake and exhaust silencers. Therefore, with implementation of Mitigation Measure NOI-01, construction of the project would not result in exterior noise levels exceeding the City standard and all additional significant environmental effects would be mitigated to a less than significant level.

Mitigation Measures

NOI-01 **Construction Hourly Limits**. The City shall note on all construction permits that any project construction activities that may result in the generation of noise shall not occur outside of the hours of 7:00 a.m. and 6:00 p.m., on Monday, Tuesday, Wednesday, Thursday, Friday and Saturday, and outside the hours of 9:00 a.m. and 6:00 p.m. on Sunday, and that all internal combustion engines used for project construction shall be equipped with intake and exhaust silencers and maintained in accordance with the equipment manufacturer's specifications.

Question D: *Permit existing and/or planned residential and commercial areas to be exposed to vibration-peak-particle velocities greater than 0.5 inches per second due to project construction?*

The General Plan Maser EIR found this impact to be significant and unavoidable, no mitigation was identified which would reduce the severity of the impact (City 2014; City 2015).

Construction activities known to generate excessive ground-borne vibration, such as pile driving or blasting, would not be conducted by the project. A possible source of vibration during project construction activities would be a vibratory roller, which may be used within 25 feet of the nearest off-site building (commercial) to the east. A large vibratory roller would create approximately 0.210 inch per second PPV at a distance of 25 feet (Caltrans 2020). This vibration level would not exceed the 0.5 inches per second PPV threshold risk of architectural damage to non-engineered timber and masonry buildings. Therefore, although a vibratory roller may be perceptible to nearby human receptors, impacts associated with construction vibration impacts would be less than significant and would have no additional significant environmental effects beyond what has been previously identified in the Master EIR.

Question E: *Permit adjacent residential and commercial areas to be exposed to vibration peak particle velocities greater than 0.5 inches per second due to highway traffic and rail operations?*

The General Plan Master EIR found this impact to be less than significant, and no mitigation would be required (City 2014; City 2015).

The project does not propose new highways or railroads and there are no existing highways or railroads within 1,000 feet of the project site. The project would not affect operations on any railroads and the project would not add a substantial amount of truck trips (maximum of 16 truck trips per day) to highways in the City. Therefore, the project would not result in ground-borne vibration in excess of 0.5 inch per second PPV from highway traffic or rail operations and would have no additional significant environmental effects beyond what has been previously identified in the Master EIR.

Question F: *Permit historic buildings and archaeological sites to be exposed to vibration-peak-particle velocities greater than 0.2 inches per second due to project construction and highway traffic?*

The General Plan Master EIR found this impact to be less than significant, and no mitigation would be required (City 2014; City 2015).

Buildings older than 45 years (built before 1976) have the potential to be listed as historically significant in California. Several of the residences across Morrison Avenue from the project site were built prior to 1977. The closest potentially historic building to the project site is a residence constructed around 1920, approximately 90 feet from the project site. A large vibratory roller could create approximately 0.210 inch per second PPV at 25 feet (Caltrans 2020). With typical ground conditions, a large vibratory roller at 90 feet would result in 0.05 inches per second PPV.[1] This vibration level would not exceed the 0.2 inches per second PPV threshold risk of architectural damage to historical buildings. The project would not propose new highways, and there are no highways within 1,000 feet of the identified potentially historic buildings. Therefore, impacts related vibrations from project construction or project affected highways would be less than significant and would have no additional significant environmental effects beyond what has been previously identified in the Master EIR.

CONCLUSION

On-site project operational noise or project-generated traffic noise would not result in noise levels increases in excess of General Plan standards and would result in less than significant noise impacts. The project would not result in new impacts or worsen any impacts that were identified in the Master EIR.

With implementation of mitigation measure NOI-01 to restrict the hours of construction, noise generated by project construction activities would not exceed the standards in the City noise ordinance of the project and the impact would be less than significant with mitigation incorporated.

Construction or operation of the project would not generate excessive ground-borne vibration levels affecting nearby residents or building, and the impact would be less than significant.

Sincerely,

Martin Rolph
Noise Analyst

Joanne M. Dramko, AICP
Senior Technical Specialist, QA/QC

Attachments:

Attachment A – Figures
Attachment B – On-site Noise Measurements
Attachment C – Noise Model Output

[1] $PPV = PPV_{REF} (D_{REF}/D)^N$ where PPV_{REF} = the reference vibration level, D_{REF} = the refence distance, D = the distance from the vibration source to the receiver, and N = 1.1 for typical soils (Caltrans 2020).

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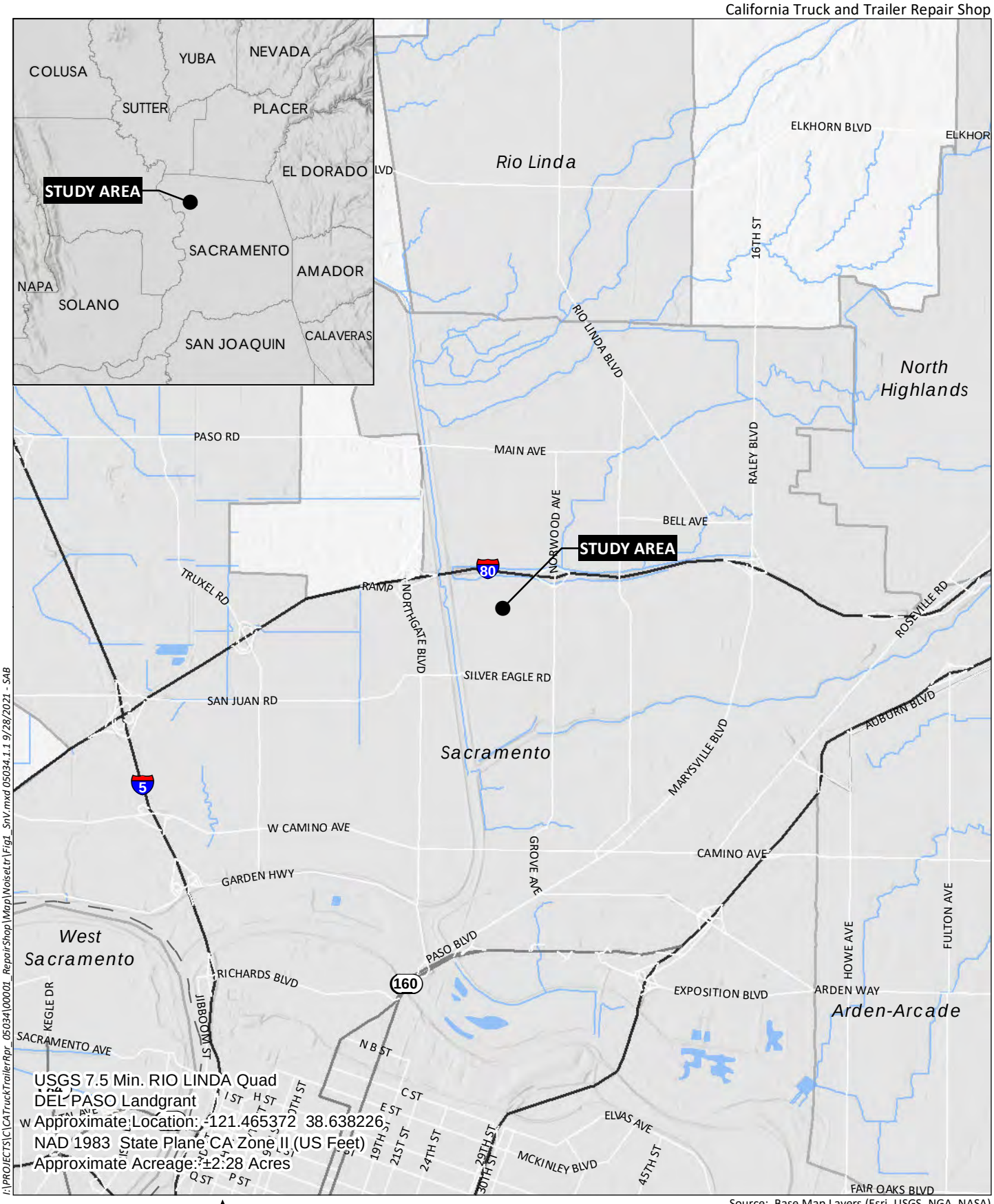
Attachment A

Figures



USGS 7.5 Min. RIO LINDA Quad
DEL PASO Landgrant
Approximate Location: -121.465372 38.638226
NAD 1983 State Plane CA Zone II (US Feet)
Approximate Acreage: ±2.28 Acres

I:\PROJECTS\C\CATruckTrailerRpr_05034\00001_RepairShop\Map\NoiseLtr\Fig1_SnV.mxd 05034.1.1 9/28/2021 - SAB

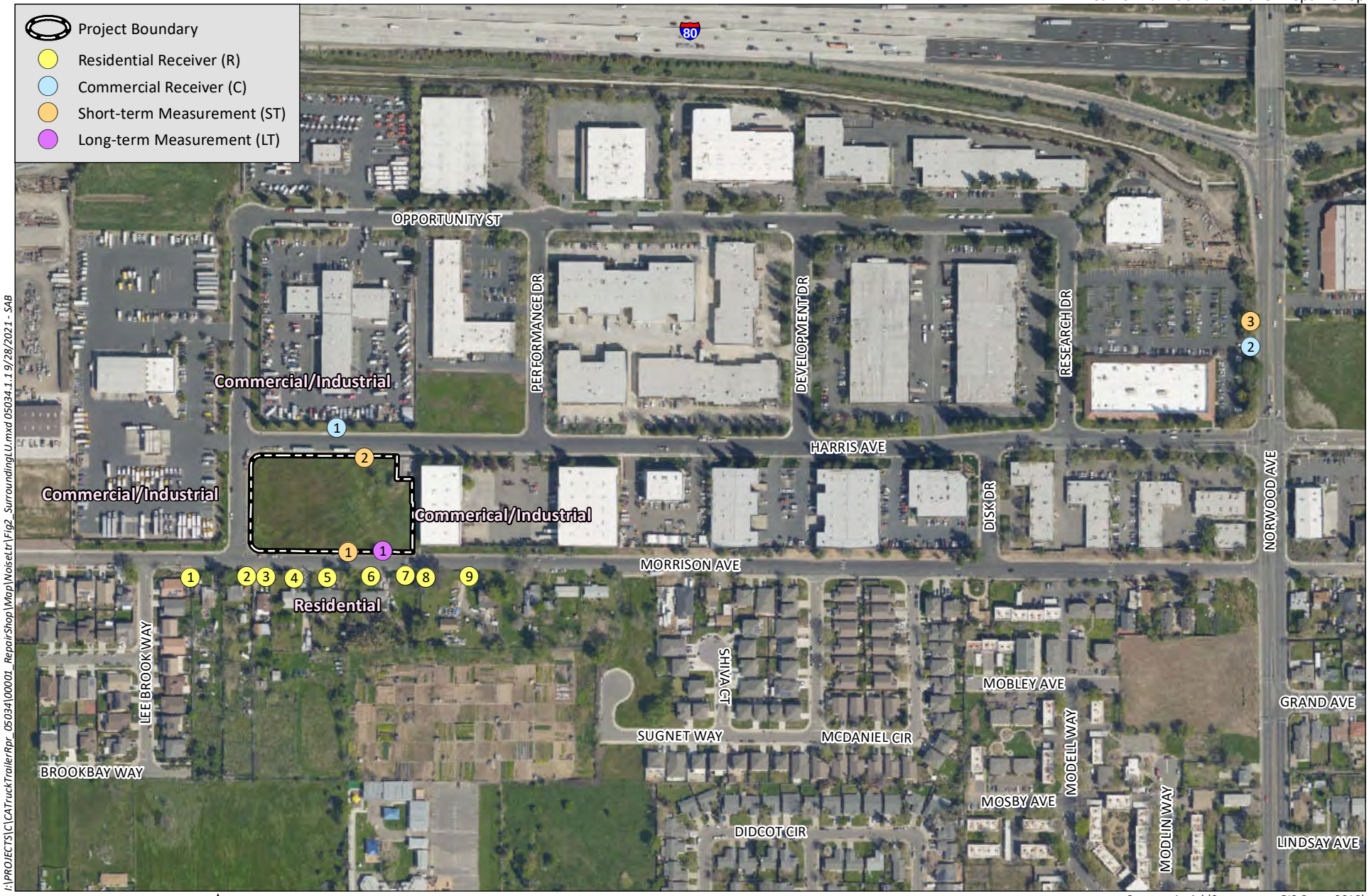
0 1 Miles

Source: Base Map Layers (Esri, USGS, NGA, NASA)

HELIX Environmental Planning

Regional Location

Figure 1

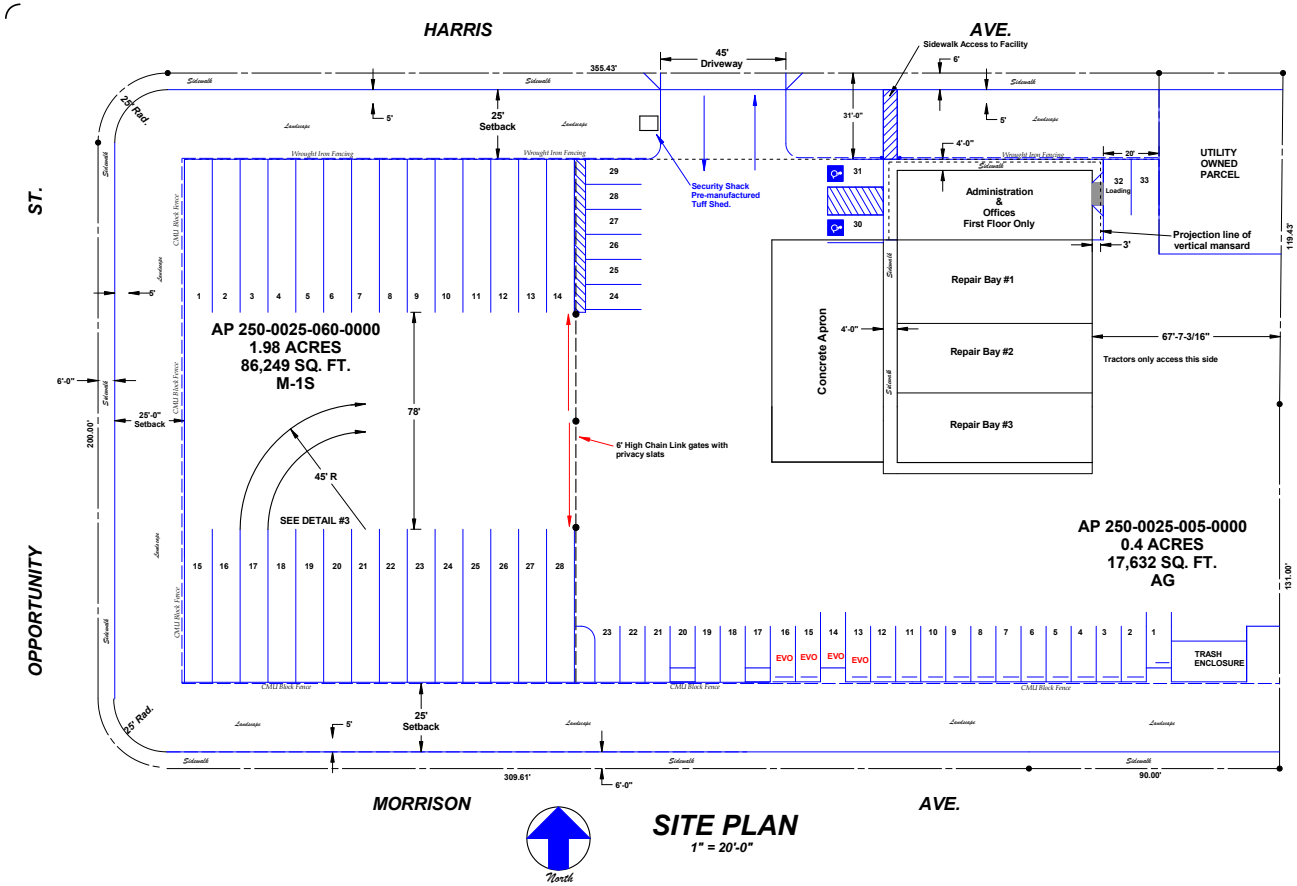


Source: Aerial (Sacramento GIS Coop, 2018)

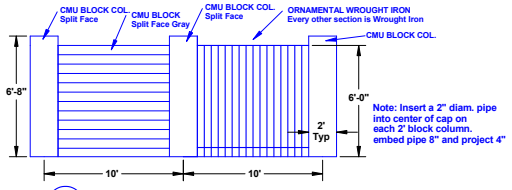
HELIX Environmental Planning

Surrounding Land Uses

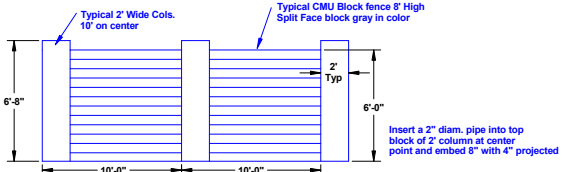
Figure 2



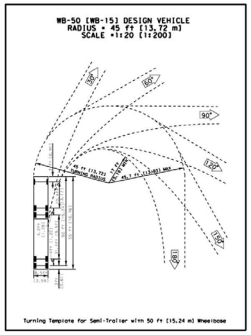
SITE PLAN
1" = 20'-0"



1 **FRONTAGE FENCING FACING HARRIS AVE.**
1/4" = 1'-0"



2 **TYPICAL CMU BLOCK FENCE**
1/4" = 1'-0"



3 **EXHIBIT 'B' DOT TURNING RADIUS**
NTS

T:\PROJECTS\C\CaliforniaTruckTrailer_05034\00001_CaliforniaTruckTrailerRepair\Map\SMND\Fig3_SitePlan.indd

HELIX Environmental Planning

Site Plan

Figure 3

Attachment B

On-site Noise Measurements

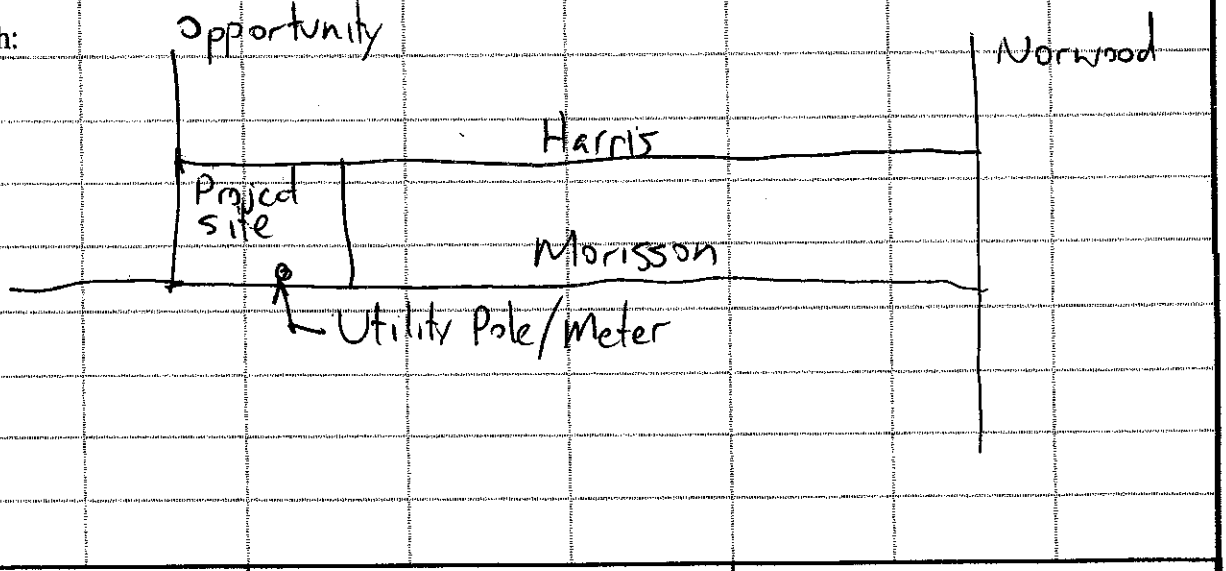
LT-1

Site Survey

Job #		Project Name: CA Truck and Trailer	
Date: 8/17/21	Site #:	Engineer: M. Ralph	
Address:			
Meter: 720	Serial #: 0376	Calibrator: Cal 150	Serial #: 5529

Notes:

Sketch:



Temp: 80° F	Wind Spd: 9 mph	Humidity: 39 %
Start of Measurement: 9:58 a.m.	End of Measurement: 9/18 11:30 a.m.	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

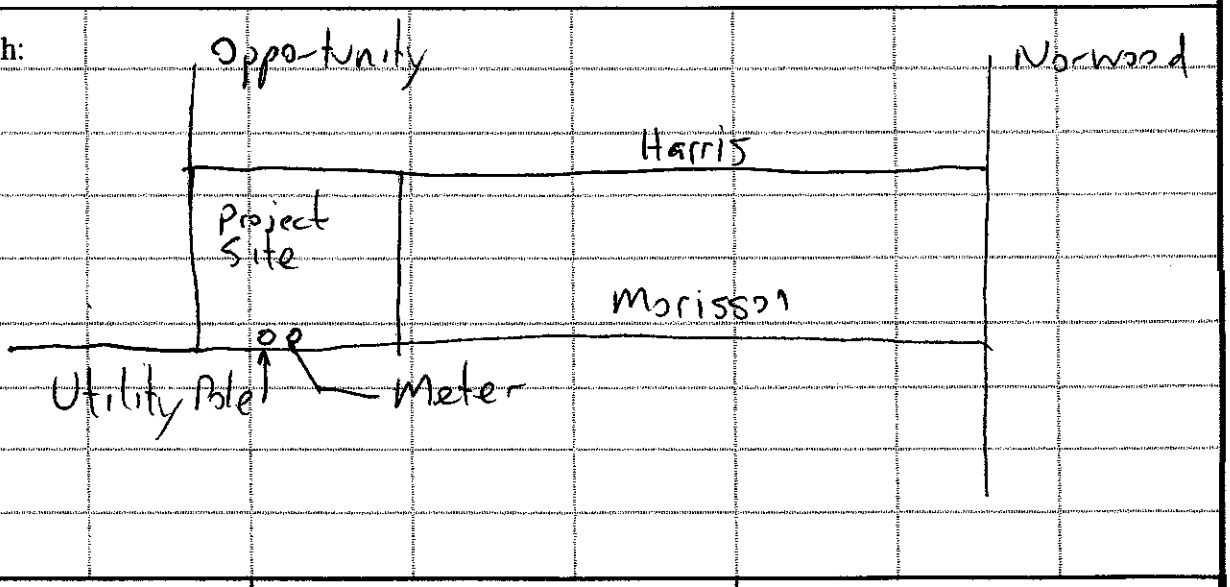
ST-1

Site Survey

Job #		Project Name: CA Truck and Trailer	
Date: 8/17/21	Site #:	Engineer: M. Rolph	
Address:			
Meter: LXT	Serial #: 1013	Calibrator: Cal 150	Serial #: 5529

Notes: 1 aircraft overflight from SMF

Sketch:



Temp: 80°F	Wind Spd: 9	mph	Humidity: 39	%	
Start of Measurement: 10:12 a.m.	End of Measurement: 10:27 a.m.		49.3	dBA L_{EQ}	

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
1 Car	0	0

Noise Measurement for Information Only

No Through Roadways

No Calibration Analysis Will Be Provided

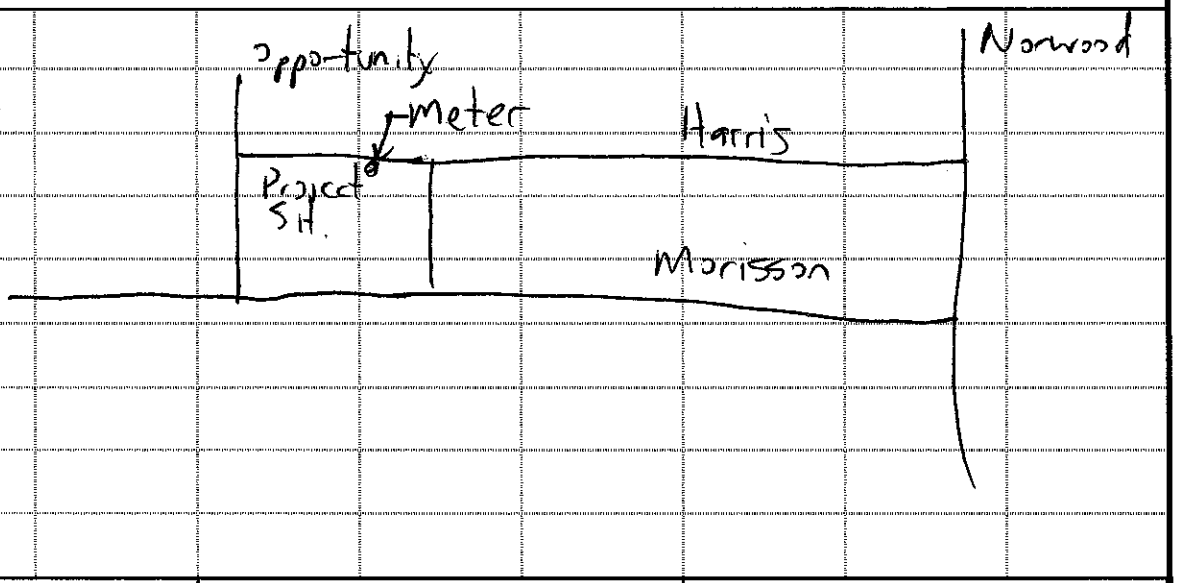
ST-2

Site Survey

Job #	Project Name: CA Truck and Trailer		
Date: 8/17/21	Site #:	Engineer: M. Rolph	
Address:			
Meter: LxT	Serial #: 1013	Calibrator: Cal 150	Serial #: 5529

Notes: 2 aircraft overflights from SMF
Forklifts, backup alarms, air brakes from business to north.

Sketch:



Temp: 81 ~~83~~ °F	Wind Spd: 9	mph	Humidity: 33	%	
Start of Measurement: 10:34 a.m.	End of Measurement: 10:49 a.m.		58.4	dBA L_{EQ}	

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
11 ~~+2~~ (12)	IIII (5)	4 (2)

Noise Measurement for Information Only

No Through Roadways

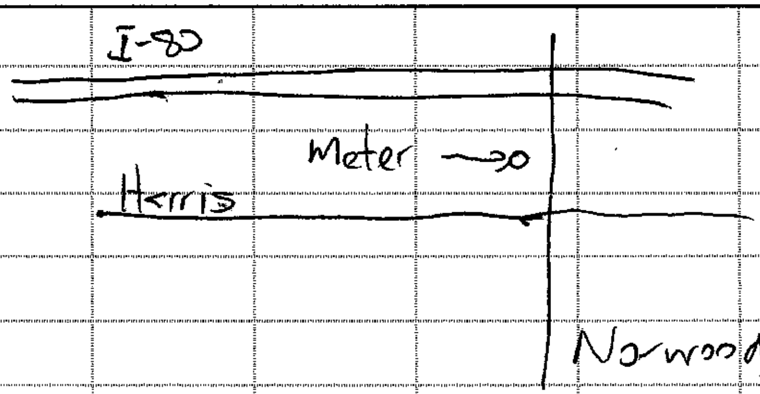
No Calibration Analysis Will Be Provided

ST-3

Site Survey

Job #	Project Name: CA Truck and Trailer
Date: 8/17/21	Site #:
Engineer: M. Rolph	
Address:	
Meter: LXT	Serial #: 1013
Calibrator: Cal 150	Serial #: 5529
Notes:	

Sketch:



Temp: 83	Wind Spd: 8 mph	Humidity: 31 %
Start of Measurement: 10:56 a.m.	End of Measurement: 11:11 a.m.	70.3 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
294	17	7

Noise Measurement for Information Only

No Through Roadways

No Calibration Analysis Will Be Provided

Attachment C

Noise Model Output

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 10/5/2021
Case Descr CA Truck and Trailer Repair

---- Receptor #1 ----

	Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
Residential	Residential	60	60	60

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	75	0
Dump Truck	No	40		76.5	75	0
Front End Loader	No	40		79.1	75	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer	78.1	74.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	72.9	68.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	75.6	71.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	78.1	76.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

CadnaA Point Source Table

Name	M.	ID	Result. PWL			Lw / Li		Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day (dBA)	Evening (dBA)	Night (dBA)	Type	Value	Day (min)	Special (min)	Night (min)	(dB)	(Hz)		(m)		X (m)	Y (m)	Z (m)
HVAC	+	HVAC	83.8	83.8	83.8	Lw	CarrierAC				0		(none)	1.22	g	633573.23	4277789.27	8.23
Ratchet	+	Ratchet	91.2	91.2	91.2	Lw	ImpactW	15	0	0	0		(none)	0.91	r	633557.97	4277780.82	0.91
Ratchet	+	Ratchet	91.2	91.2	91.2	Lw	ImpactW	15	0	0	0		(none)	0.91	r	633557.97	4277773.22	0.91
Ratchet	+	Ratchet	91.2	91.2	91.2	Lw	ImpactW	15	0	0	0		(none)	0.91	r	633557.97	4277765.61	0.91

CadnaA Line Source Table

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li		Operating Time			K0	Freq.	Direct.
			Day (dBA)	Evening (dBA)	Night (dBA)	Day (dBA)	Evening (dBA)	Night (dBA)	Type	Value	Day (min)	Special (min)	Night (min)	(dB)	(Hz)	
Backup Alarm	+		121.2	121.2	121.2	106.6	106.6	106.6	Lw'	BackA	1	0	0	0		(none)

CadnaA Vertical Area Source Table

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li		Operating Time			K0	Freq.	Direct.
			Day (dBA)	Evening (dBA)	Night (dBA)	Day (dBA)	Evening (dBA)	Night (dBA)	Type	Value	Day (min)	Special (min)	Night (min)	(dB)	(Hz)	
Bay 1 West	+		90	90	90	76.2	76.2	76.2	Lw"	76.2				3	1000	(none)
Bay 2 West	+		90	90	90	76.2	76.2	76.2	Lw"	76.2				3	1000	(none)
Bay 3 West	+		90	90	90	76.2	76.2	76.2	Lw"	76.2				3	1000	(none)
Bay 1 East	+		84.3	84.3	84.3	70.5	70.5	70.5	Lw"	70.5				3	1000	(none)
Bay 2 East	+		84.1	84.1	84.1	70.3	70.3	70.3	Lw"	70.3				3	1000	(none)
Bay 3 East	+		84.1	84.1	84.1	70.3	70.3	70.3	Lw"	70.3				3	1000	(none)

CadnaA Road Source Table

Name	M.	ID	Lme			exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
			Day	Evening	Night	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
			(dBA)	(dBA)	(dBA)	Day	Evening	Night	Day	Evening	Night	(km/h)	(km/h)		(dB)		(%)	(dB)	(m)	(m)
Harris	-		47.7	0	0	110	0	0	3	0	0	40	40	0	0	1	0	0		
Norwood	-		63.2	0	0	1182	0	0	3	0	0	64	64	0	0	1	0	0		
Morrison	-		46.2	0	0	79	0	0	3	0	0	40	40	0	0	1	0	0		
I-80 East	-		77.8	0	0	7850	0	0	3	0	0	105	89	0	0	1	0	0		
I-80 West	-		77.8	0	0	7850	0	0	3	0	0	105	89	0	0	1	0	0		
Truck Circulation 1	+		52	0	0	2	0	0	100	0	0	8	8	0	0	1	0	0		
Truck Circulation 2	+		52	0	0	2	0	0	100	0	0	8	8	0	0	1	0	0		
Truck Circulation 3	+		52	0	0	2	0	0	100	0	0	8	8	0	0	1	0	0		

CadnaA Sound Level Table

Name	ID	Type	1/3 Oktave Spectrum (dB)											
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin
Carrier 50PG03-12	CarrierAC	Li			82.4	83.4	81.6	79.1	78.8	76.9	72.9	70.2	83.8	88.9
Ingersol-Rand 1/2"	ImpactW	Li		58.9	63.1	71.1	76	80.8	81.7	83.4	85.7	86.5	91.2	91.3
Backup Alarm	BackA	Li							106.6				106.6	106.6

CadnaA Receiver Table: On-Site LEQ

Name	M.	ID	Level Lr		Limit. Value		Land Use		Height			Coordinates		
			Day (dBA)	Night (dBA)	Day (dBA)	Night (dBA)	Type	Auto	Noise Type	(m)		X (m)	Y (m)	Z (m)
R1			49	38.1	0	0		x	Total	1.52	r	633423.46	4277711.56	1.52
R2			52.3	41.1	0	0		x	Total	1.52	r	633471.66	4277710.49	1.52
R3			53.3	42.3	0	0		x	Total	1.52	r	633487.75	4277711.23	1.52
R4			54.3	43.9	0	0		x	Total	1.52	r	633508.85	4277711.52	1.52
R5			54.5	45.8	0	0		x	Total	1.52	r	633535.11	4277710.99	1.52
R6			54.2	46.7	0	0		x	Total	1.52	r	633558	4277710.74	1.52
R7			51.7	41.2	0	0		x	Total	1.52	r	633597.15	4277709.94	1.52
R8			51.1	46.2	0	0		x	Total	1.52	r	633619.46	4277709.94	1.52
R9			47.3	27.2	0	0		x	Total	1.52	r	633649	4277709.01	1.52

CadnaA Receiver Table: Existing Traffic

Name	M.	ID	Level Lr		Limit. Value		Land Use		Height			Coordinates		
			Day (dBA)	Night (dBA)	Day (dBA)	Night (dBA)	Type	Auto	Noise Type	(m)		X (m)	Y (m)	Z (m)
R1			66.5	-63.6	0	0	x	Total	1.52	r		633423.46	4277711.56	1.52
R2			66.5	-63.7	0	0	x	Total	1.52	r		633471.66	4277710.49	1.52
R3			66.6	-63.4	0	0	x	Total	1.52	r		633487.75	4277711.23	1.52
R4			66.7	-63	0	0	x	Total	1.52	r		633508.85	4277711.52	1.52
R5			66.7	-63.1	0	0	x	Total	1.52	r		633535.11	4277710.99	1.52
R6			66.7	-63	0	0	x	Total	1.52	r		633558	4277710.74	1.52
R7			66.7	-63.2	0	0	x	Total	1.52	r		633597.15	4277709.94	1.52
R8			66.8	-63	0	0	x	Total	1.52	r		633619.46	4277709.94	1.52
R9			66.8	-63.1	0	0	x	Total	1.52	r		633649	4277709.01	1.52
C Harris			68.9	-64.1	0	0	x	Total	1.52	r		633546.25	4277822.53	1.52
C Norwood			71.3	-65.1	0	0	x	Total	1.52	r		634258.04	4277877.56	1.52

CadnaA Receiver Table: Existing + Project Traffic

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day (dBA)	Night (dBA)	Day (dBA)	Night (dBA)	Type	Auto	Noise Type	(m)		X (m)	Y (m)	Z (m)
R1			66.5	-63.6	0	0	x	Total		1.52	r	633423.46	4277711.56	1.52
R2			66.5	-63.7	0	0	x	Total		1.52	r	633471.66	4277710.49	1.52
R3			66.6	-63.4	0	0	x	Total		1.52	r	633487.75	4277711.23	1.52
R4			66.7	-63	0	0	x	Total		1.52	r	633508.85	4277711.52	1.52
R5			66.7	-63.1	0	0	x	Total		1.52	r	633535.11	4277710.99	1.52
R6			66.7	-63	0	0	x	Total		1.52	r	633558	4277710.74	1.52
R7			66.7	-63.2	0	0	x	Total		1.52	r	633597.15	4277709.94	1.52
R8			66.8	-63	0	0	x	Total		1.52	r	633619.46	4277709.94	1.52
R9			66.8	-63.1	0	0	x	Total		1.52	r	633649	4277709.01	1.52
C Harris			68.9	-64.1	0	0	x	Total		1.52	r	633546.25	4277822.53	1.52
C Norwood			71.4	-65.1	0	0	x	Total		1.52	r	634258.04	4277877.56	1.52