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MEMORANDUM

DATE: May 25, 2022

TO: Joseph W. Cross, P.E., Cross Engineering Services, LLC

FROM: Jason Lui, Associate, Senior Noise Specialist

SUBJECT: Noise and Vibration Impact Analysis Memorandum for the French Valley Commercial Retail Project at Benton Road and Penfield Lane in French Valley, unincorporated Riverside County, California

INTRODUCTION

This memorandum has been prepared to evaluate potential noise and vibration impacts associated with the proposed Commercial Retail Project at Benton Road and Penfield Lane in French Valley, California (project). This report provides a project-specific noise and vibration impact analysis by examining the impacts of the proposed project on nearby sensitive uses.

PROJECT LOCATION

The project site is located on the southwest corner of Penfield Lane and Benton Road within the Borel Airpark Specific Plan in the community of French Valley in an unincorporated portion of Riverside County, California, as shown on Figure 1 (all figures are provided in Attachment A).

PROJECT DESCRIPTION

The undeveloped 2.24-acre site would be developed with a 5,215-square-foot (sf) express car wash with a 130-foot (ft) wash tunnel and approximately 18 customer parking spaces with vacuums, one handicap parking space, and one employee parking space. The project would also include a 729 sf drive-through only Wienerschnitzel restaurant and a 2,535 sf Arby's restaurant with a drive-through. The car wash would operate during daytime hours only, which would be between the hours of 7:00 a.m. and 10:00 p.m. The two fast-food restaurants would operate during both daytime and nighttime hours. The tentative construction schedule would begin in June 2022 and be completed in February 2023, a duration of approximately 8 months. Figure 2 shows the project's site plan.

CHARACTERISTICS OF SOUND

Sound is increasing to such disagreeable levels in the environment that it can threaten quality of life. Noise is usually defined as unwanted sound. Noise consists of any sound that may produce

physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect the ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a wave resulting in the tone's range from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment and is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves combined with the reception characteristics of the human ear. Sound intensity is the average rate of sound energy transmitted through a unit of area perpendicular to the direction in which the sound waves are traveling. This characteristic of sound can be precisely measured with instruments. The analysis of a project defines the noise environment of the project area in terms of sound intensity and its effect on adjacent sensitive land uses.

Measurement of Sound

Sound intensity is measured through the A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Unlike the linear scale (e.g., inches or pounds), decibels are measured on a logarithmic scale representing points on a sharply rising curve.

For example, 10 decibels (dB) is 10 times more intense than 0 dB, 20 dB is 100 times more intense than 0 dB, and 30 dB is 1,000 times more intense than 0 dB. Thirty decibels (30 dB) represents 1,000 times as much acoustic energy as 0 dB. The decibel scale increases on a logarithmic scale, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the loudness of the sound. Ambient sounds generally range from 30 dB (very quiet) to 100 dB (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with increasing distance from the noise source. For a single point source, sound levels decrease approximately 6 dB for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source (e.g., highway traffic or railroad operations) the sound decreases 3 dB for each doubling of distance in a hard site environment. Line source (noise in a relatively flat environment with absorptive vegetation) decreases 4.5 dB for each doubling of distance.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. The equivalent continuous sound level (L_{eq}) is the total sound energy of time-weighted average noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq} and Community Noise Equivalent Level (CNEL) or the day-night average noise level (L_{dn}) based on

A-weighted decibels (dBA). CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noises occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally interchangeable.

Other noise rating scales of importance when assessing the annoyance factor include the maximum instantaneous noise level (L_{max}), which is the highest sound level that occurs during a stated time period. The noise environments discussed in this analysis for short-term noise impacts are specified in terms of maximum levels denoted by L_{max}, which reflects peak operating conditions and addresses the annoying aspects of intermittent noise. It is often used together with another noise scale, or noise standards in terms of percentile noise levels, in noise ordinances for enforcement purposes. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half the time the noise level exceeds this level, and half the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first category includes audible impacts that refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3 dB or greater because this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1 dB and 3 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category includes changes in noise levels of less than 1 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. In comparison, extended periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear, even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear (the threshold of pain). A sound level of 160–165 dBA will result in dizziness or loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying, less developed areas. Table A lists the definitions of acoustical terms, and Table B shows common sound levels and their sources.

Table A: Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit of measurement that denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in 1 second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter deemphasizes the very low- and very high-frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. (All sound levels in this report are A-weighted, unless reported otherwise.)
L_{01}, L_{10}, L_{50}, L_{90}	The fast A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 1%, 10%, 50%, and 90% of a stated time period.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dBA to sound levels occurring in the evening from 7:00 PM to 10:00 PM and after the addition of 10 dBA to sound levels occurring in the night between 10:00 PM and 7:00 AM.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dBA to sound levels occurring in the night between 10:00 PM and 7:00 AM.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time; usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content, as well as the prevailing ambient noise level.

Source: *Handbook of Acoustical Measurements and Noise Control* (Harris 1991).

Table B: Common Sound Levels and Their Noise Sources

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle at a Few Feet Away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	—
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	—
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	—
Near Freeway Auto Traffic	70	Moderately Loud	—
Average Office	60	Quiet	One-half as loud
Suburban Street	55	Quiet	—
Light Traffic; Soft Radio Music in Apartment	50	Quiet	One-quarter as loud
Large Transformer	45	Quiet	—
Average Residence without Stereo Playing	40	Faint	One-eighth as loud
Soft Whisper	30	Faint	—
Rustling Leaves	20	Very Faint	—
Human Breathing	10	Very Faint	Threshold of Hearing
—	0	Very Faint	—

Source: Compiled by LSA Associates, Inc. (2015).

FUNDAMENTALS OF VIBRATION

Vibration refers to ground-borne noise and perceptible motion. Ground-borne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors, where the motion may be discernible, but without the effects associated with the shaking of a building there is less adverse reaction. Vibration energy propagates from a source through intervening soil and rock layers to the foundations of nearby buildings. The vibration then propagates from the foundation throughout the remainder of the structure. Building vibration may be perceived by occupants as the motion of building surfaces, the rattling of items sitting on shelves or hanging on walls, or a low-frequency rumbling noise. The rumbling noise is caused by the vibration of walls, floors, and ceilings that radiate sound waves. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by 10 dB or less. This is an order of magnitude below the damage threshold for normal buildings.

Typical sources of ground-borne vibration are construction activities (e.g., blasting, pile-driving, and operating heavy-duty earthmoving equipment), steel-wheeled trains, and occasional traffic on rough roads. Problems with both ground-borne vibration and noise from these sources are usually localized to areas within approximately 100 ft from the vibration source, although there are examples of ground-borne vibration causing interference out to distances greater than 200 ft (FTA 2018). When roadways are smooth, vibration from traffic, even heavy trucks, is rarely perceptible. It is assumed for most projects that the roadway surface will be smooth enough that ground-borne vibration from street traffic will not exceed the impact criteria; however, both construction of the project and the freight train operations could result in ground-borne vibration that may be perceptible and annoying.

Ground-borne noise is not likely to be a problem because noise arriving via the normal airborne path will usually be greater than ground-borne noise. Ground-borne vibration has the potential to disturb people and damage buildings. Although it is very rare for train-induced ground-borne vibration to cause even cosmetic building damage, it is not uncommon for construction processes such as blasting and pile-driving to cause vibration of sufficient amplitudes to damage nearby buildings (FTA 2018). Ground-borne vibration is usually measured in terms of vibration velocity, either the root-mean-square (RMS) velocity or peak particle velocity (PPV). The RMS is best for characterizing human response to building vibration, and PPV is used to characterize potential for damage. Decibel notation acts to compress the range of numbers required to describe vibration. Vibration velocity level in decibels is defined as:

$$L_v = 20 \log_{10} [V/V_{ref}]$$

where "L_v" is the vibration velocity in decibels (VdB), "V" is the RMS velocity amplitude, and "V_{ref}" is the reference velocity amplitude, or 1 x 10-6 inches/second (in/sec) used in the United States.

REGULATORY SETTING

Federal Regulations

Federal Transit Administration

Vibration standards included in the Federal Transit Authority's [FTA] *Transit Noise and Vibration Impact Assessment Manual* (2018) are used in this analysis for ground-borne vibration impacts on human annoyance, as shown in Table C. Table C provides the criteria for assessing the potential for interference or annoyance from vibration levels in a building.

Table D lists the potential vibration building damage criteria associated with construction activities, as suggested in the FTA's *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018). FTA guidelines show that a vibration level of up to 0.50 PPV (in/sec) is considered safe for buildings consisting of reinforced concrete, steel, or timber (no plaster) and would not result in any construction vibration damage. For non-engineered timber and masonry buildings, the construction building vibration damage criterion is 0.20 PPV (in/sec).

Table C: Interpretation of Vibration Criteria for Detailed Analysis

Land Use	Max L_v (VdB)[1]	Description of Use
Workshop	90	Vibration that is distinctly felt. Appropriate for workshops and similar areas not as sensitive to vibration.
Office	84	Vibration that can be felt. Appropriate for offices and similar areas not as sensitive to vibration.
Residential Day	78	Vibration that is barely felt. Adequate for computer equipment and low-power optical microscopes (up to 20X).
Residential Night and Operating Rooms	72	Vibration is not felt, but ground-borne noise may be audible inside quiet rooms. Suitable for medium-power microscopes (100X) and other equipment of low sensitivity.

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
[1] As measured in 1/3-Octave bands of frequency over the frequency range 8 to 80 Hertz.
FTA = Federal Transit Administration
L_V = velocity in decibels
VdB = vibration velocity decibels
Hz = hertz
Max = maximum

Table D: Construction Vibration Damage Criteria

Building Category	PPV (in/sec)	Approximate L_V (VdB)[1]
Reinforced concrete, steel, or timber (no plaster)	0.50	102
Engineered concrete and masonry (no plaster)	0.30	98
Non-engineered timber and masonry buildings	0.20	94
Buildings extremely susceptible to vibration damage	0.12	90

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
[1] RMS vibration velocity in decibels (VdB) re 1 µin/sec.
µin/sec = microinches per second
L_V = velocity in decibels
RMS = root-mean-square
FTA = Federal Transit Administration
PPV = peak particle velocity
VdB = vibration velocity decibels
in/sec = inch/inches per second

Local Regulations

County of Riverside

General Plan Noise Element. The County of Riverside addresses noise in the County of Riverside's (County) General Plan. The goals, objectives, and policies in the County's General Plan are designed to provide noise-compatible land use relationships by establishing noise standards utilized for design and siting purposes and minimizing noise impacts from significant noise generators. The following policies are applicable to the proposed project:**Policy N 2.3:** Mitigate exterior and interior noises to the levels listed in Table E to the extent feasible, for stationary sources.

- **Policy N 4.1:** Prohibit facility-related noise received by any sensitive use from exceeding the following worst-case noise levels:
    - 45 dBA—10-minute L_{eq} between 10:00 p.m. and 7:00 a.m.
    - 65 dBA—10-minute L_{eq} between 7:00 a.m. and 10:00 p.m.

Table E: Stationary Source Land Use Noise Standards

Land Use	Land Use	Interior Standards	Exterior Standards
Residential	10:00 p.m. to 7:00 a.m.	40 dBA L_{eq} (10 minute)	45 dBA L_{eq} (10 minute)
	7:00 a.m. to 10:00 p.m.	55 dBA L_{eq} (10 minute)	65 dBA L_{eq} (10 minute)

Source: County of Riverside General Plan Noise Element, Table N-2 (December 2015).
Note: These are only preferred standards; final decision will be made by the Riverside County Planning Department and Office of Public Health.
dBA = A-weighted decibels
L_{eq} = equivalent continuous sound level

- **Policy N 4.2:** Develop measures to control non-transportation noise impacts.

- **Policy N 4.3:** Ensure any use determined to be a potential generator of significant stationary noise impacts be properly analyzed and ensure that the recommended mitigation measures are implemented.

- **Policy N 4.4:** Require that detailed and independent acoustical studies be conducted for any new or renovated land uses or structures determined to be potential major stationary noise sources.

- **Policy N 7.1:** New land use development within Airport Influence Areas shall comply with airport land use noise compatibility criteria contained in the corresponding airport land use compatibility plan for the area. Each Area Plan affected by a public-use airport includes one or more Airport Influence Areas, one for each airport. The applicable noise compatibility criteria are fully set forth in Appendix I-1 of the General Plan and summarized in the Policy Area section of the affected Area Plan.

- **Policy N 9.3:** Require development that generates increase traffic and subsequent increases in the ambient noise level adjacent to noise-sensitive land uses to provide for appropriate mitigation measures.

- **Policy N 13.1:** Minimize the impacts of construction on adjacent uses within acceptable practices.

- **Policy N 13.2:** Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse noise impacts on surrounding areas.

- **Policy N 13.3:** Condition subdivision approval adjacent to developed/occupied noise-sensitive land uses (see Policy N 1.3) by requiring the developer to submit a construction-related noise mitigation plan to the County for review and approval prior to issuance of a grading permit. The plan must depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of this project, through the use of such methods as:

a. Temporary noise attenuation fences;
b. Preferential location of equipment; and
c. Use of current noise suppression technology and equipment.

- **Policy N 13.3:** Require that all construction equipment utilize noise reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

Municipal Code. Section 9.52.020(H) of the County's Code of Ordinances exempts sound emanating from private construction projects located 0.25 mile or more from an inhabited dwelling. In addition, Section 9.52.020(I) limits the hours of private construction projects located within 0.25 mile from an inhabited dwelling. Construction shall not occur between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September, or between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May.

Section 9.52.020(L) of the County's Code of Ordinances exempts sound emanating from heating and air conditioning equipment.

EXISTING SETTING

Overview of the Existing Noise Environment

The primary existing noise sources in the project area are transportation facilities. Traffic on Benton Road is a steady source of ambient noise. Aircraft associated with French Valley Airport can also be heard regularly in the project area. Other noise sources include noise associated with commercial and light industrial operations in the project area.

Existing Sensitive Land Uses in the Project Vicinity

The project site is surrounded by single-family residences, vacant land, and commercial and light industrial uses. Single-family residences are located across Penfield Lane to the east of the project site. Commercial uses are located to the north across Benton Road, south, and west across Temeku Street. Light industrial uses are located southeast across Penfield Lane, immediately south, and west of the project site. Vacant land is located immediately west of the project site.

Ambient Noise Measurements

Short-Term Noise Level Measurements

Three short-term (20-minute) noise level measurements were conducted using a Larson Davis Model 831 Type 1 sound level meter to document the existing noise environment in the project area. Table F shows the results of the short-term noise level measurements along with a description of the measurement location and noise that occurred during the measurement. As shown in Table F, the measured average noise levels range from 57.7 to 62.6 dBA L_{eq} and the maximum instantaneous noise levels range from 66.8 to 87.7 dBA L_{max}. Figure 3 shows the short-term monitoring locations.

Table F: Short-Term Ambient Noise Level Measurements

Monitor No.	Location	Date	Start Time	Noise Level (dBA)			Noise Source(s)
				L_{eq}	L_{max}	L_{min}	
ST-1	36580 Penfield Lane. In parking lot near northwest corner of the Crunch Fitness building.	6/2/21	11:39 am	57.7	71.3	47.2	Light traffic on Penfield Lane and faint traffic on Barton Street. Some parking lot noise, aircraft noise, and bird noise.
ST-2	36520 Temeku Street. Near El Burro Taco Shop drive-through. Approximately 30 ft from the Temeku Street centerline.	6/2/21	12:16 pm	62.6	76.8	51.6	Traffic on Benton Road and Temeku Street. Some parking lot noise, drive-through noise, and aircraft noise.
ST-3	30736 Temeku Street. In parking lot of CVS Pharmacy. Approximately 20 ft south of the building.	6/2/21	12:48 pm	60.3	72.7	52.3	Traffic on Benton Road. Some construction activity to the southeast along Benton Road. Some parking lot noise, drive-through noise, and aircraft noise.

Source: Compiled by LSA Associates, Inc. (2022).
dBA = A-weighted decibels
ft = foot/feet
L_{eq} = equivalent continuous sound level
L_{max} = maximum measured sound level
L_{min} = minimum measured sound level

Long-Term Noise Level Measurements

Two long-term (24-hour) noise level measurements were conducted from June 2, 2021, to June 3, 2021, using a Larson Davis Spark dosimeter (Model 706RC). Tables G and H show hourly L_{eq} results from the long-term noise level measurements, and Table I shows the daytime and nighttime noise level range (L_{eq} and L_{max}) along with the calculated CNEL from the long-term noise level measurements at LT-1 and LT-2. As shown in Table I, the daytime noise levels ranged from 56.0 to 61.5 dBA L_{eq} at monitoring location LT-1 and from 51.8 to 60.3 dBA L_{eq} at monitoring location LT-2. The daytime maximum instantaneous noise level ranged from 72.2 to 87.7 dBA L_{max} at LT-1 and from 66.8 to 81.7 dBA L_{max} at LT-2. The calculated daily noise levels were 60.3 dBA CNEL at LT-1 and 58.3 dBA CNEL at LT-2. Figure 3 shows the long-term monitoring locations.

Existing Aircraft Noise

Airport-related noise levels are primarily associated with aircraft engine noise made while aircraft are taking off, landing, or running their engines while still on the ground. French Valley Airport is the closest airport to the proposed project site and is located approximately 0.56 mile southwest of the project site. Based on the Riverside County Airport Land Use Compatibility Plan (RCALUC 2004), the project is located outside the 60 dBA CNEL noise contour of the airport. Additionally, there are no private airstrips or heliports within 2 miles of the project site.

Table G: Long-Term (24-Hour) Noise Level Measurement Results at LT-1

No.	Start Time	Date	Noise Level (dBA)		
			L_{eq}	L_{max}	L_{min}
1	10:00 AM	6/2/21	61.5	87.7	47.2
2	11:00 AM	6/2/21	57.4	73.3	46.7
3	12:00 PM	6/2/21	56.9	72.2	47.4
4	1:00 PM	6/2/21	58.2	76.6	48.8
5	2:00 PM	6/2/21	58.0	78.4	47.5
6	3:00 PM	6/2/21	58.9	76.9	48.3
7	4:00 PM	6/2/21	58.1	81.1	47.0
8	5:00 PM	6/2/21	56.4	78.4	45.5
9	6:00 PM	6/2/21	56.2	74.3	45.7
10	7:00 PM	6/2/21	56.0	73.0	43.9
11	8:00 PM	6/2/21	51.4	71.0	41.4
12	9:00 PM	6/2/21	50.8	70.2	40.4
13	10:00 PM	6/2/21	47.0	69.4	38.6
14	11:00 PM	6/2/21	46.2	65.0	37.9
15	12:00 AM	6/3/21	47.9	70.7	38.5
16	1:00 AM	6/3/21	49.8	69.4	38.5
17	2:00 AM	6/3/21	51.8	73.5	40.3
18	3:00 AM	6/3/21	53.3	66.6	43.2
19	4:00 AM	6/3/21	55.9	74.1	45.0
20	5:00 AM	6/3/21	57.9	78.2	47.6
21	6:00 AM	6/3/21	58.5	79.7	45.4
22	7:00 AM	6/3/21	58.8	84.1	46.3
23	8:00 AM	6/3/21	58.4	75.9	47.2
24	9:00 AM	6/3/21	59.5	82.1	47.4

Source: Compiled by LSA Associates, Inc. (2022).
dBA = A-weighted decibels L_{max} = maximum instantaneous noise level L_{min} = minimum instantaneous noise level
L_{eq} = equivalent continuous sound level

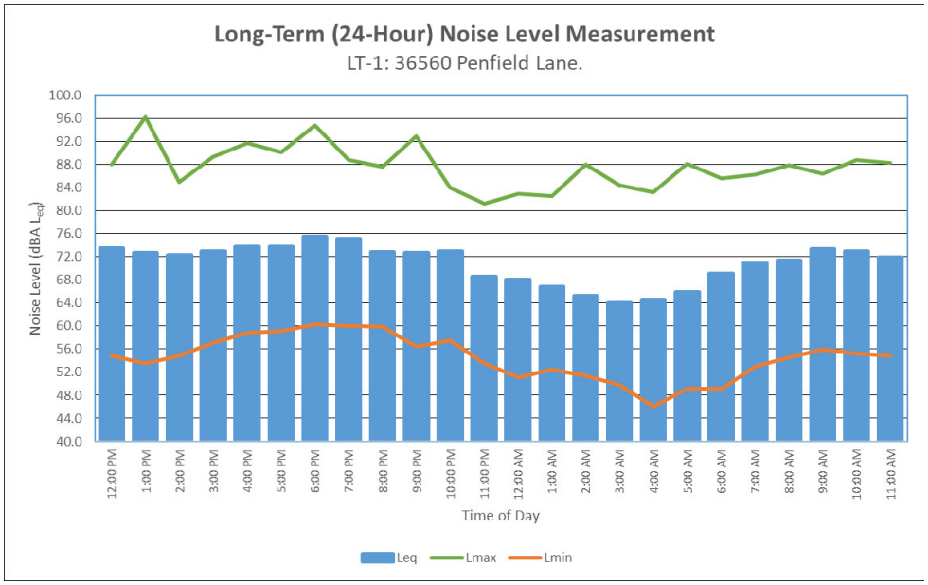

Table H: Long-Term (24-Hour) Noise Level Measurement Results at LT-2

No.	Start Time	Date	Noise Level (dBA)		
			L_{eq}	L_{max}	L_{min}
1	10:00 AM	8/17/21	57.8	74.2	51.8
2	11:00 AM	8/17/21	57.9	70.4	52.1
3	12:00 PM	8/17/21	59.7	72.7	53.1
4	1:00 PM	8/17/21	58.7	69.4	53.1
5	2:00 PM	8/17/21	60.5	72.5	54.3
6	3:00 PM	8/17/21	62.5	73.0	56.1
7	4:00 PM	8/17/21	63.5	74.5	56.4
8	5:00 PM	8/17/21	63.4	77.7	56.7
9	6:00 PM	8/17/21	62.5	72.8	55.9
10	7:00 PM	8/17/21	60.2	71.4	54.3
11	8:00 PM	8/17/21	59.0	77.4	54.0
12	9:00 PM	8/17/21	55.5	63.4	50.0
13	10:00 PM	8/17/21	56.2	68.3	50.4
14	11:00 PM	8/17/21	56.7	70.1	51.3
15	12:00 AM	8/18/21	55.6	61.9	48.5
16	1:00 AM	8/18/21	53.8	71.1	47.1
17	2:00 AM	8/18/21	51.5	59.2	44.4
18	3:00 AM	8/18/21	50.9	64.7	45.2
19	4:00 AM	8/18/21	51.6	65.8	44.9
20	5:00 AM	8/18/21	54.6	66.4	46.4
21	6:00 AM	8/18/21	56.8	71.9	52.7
22	7:00 AM	8/18/21	54.9	71.1	47.7
23	8:00 AM	8/18/21	55.3	78.9	49.2
24	9:00 AM	8/18/21	57.3	67.7	51.0

Source: Compiled by LSA Associates, Inc. (2022).
dBA = A-weighted decibels L_{max} = maximum instantaneous noise level L_{min} = minimum instantaneous noise level
L_{eq} = equivalent continuous sound level

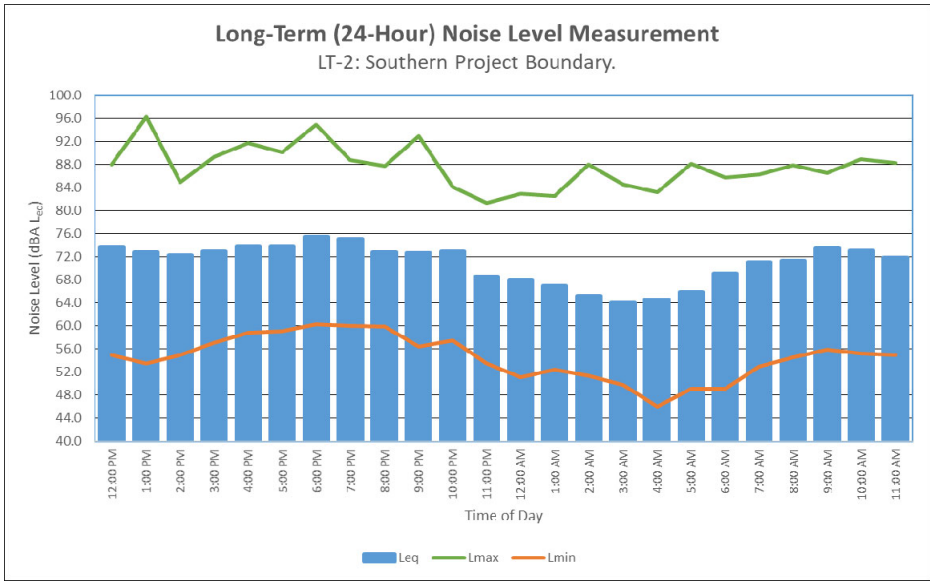

Table I: Long-Term Ambient Noise Monitoring Results

Monitor No.	Location	Noise Level (dBA)				CNEL	Noise Sources
		Daytime		Nighttime			
		L_{eq}	L_{max}	L_{eq}	L_{max}		
LT-1	36560 Penfield Lane, on a tree in the front yard of the residence	56.0–61.5	72.2–87.7	46.2–55.9	65.0–74.1	60.2	Traffic on Valley Boulevard, children playing at the schoolyard, and activity at the adjacent car lot
LT-2	Southern project boundary of the project site	51.8–60.3	66.8–81.7	44.8–53.0	60.9–71.7	58.3	Traffic on Valley Boulevard

Source: Compiled by LSA Associates, Inc. (2022).
Note: Long-term (24-hour) noise level measurements were conducted from June 2, 2021, to June 3, 2021.
dBA = A-weighted decibels
CNEL = Community Noise Equivalent Level
ft = foot/feet
L_{eq} = equivalent continuous sound level
L_{max} = maximum instantaneous noise level

Existing Traffic Noise

The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) was used to evaluate traffic-related noise conditions along roadway segments in the project vicinity. This model requires various parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24-hour periods to determine the CNEL values. The existing average daily traffic (ADT) volumes were calculated based on existing ADT volumes obtained from the *Traffic Impact Analysis Report for the French Valley Tommy's Express Wash Project* (LLG 2022). The standard vehicle mix for Southern California roadways was used for traffic on these roadway segments. Table J provides the existing traffic noise levels in the project vicinity. These traffic noise levels are representative of a worst-case scenario that assumes a flat terrain and no shielding between the traffic and the noise contours. Attachment B provides the specific assumptions used in developing these noise levels and model printouts.

Table J: Existing Without Project Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 dBA CNEL (ft)	Centerline to 65 dBA CNEL (ft)	Centerline to 60 dBA CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane
Winchester Road North of Benton Road	30,640	77	158	338	70.2
Winchester Road South of Benton Road	27,420	72	147	314	69.8
Benton Road Between Winchester Road and Temeku Street	13,505	< 50	94	197	66.7
Benton Road Between Temeku Street and Penfield Lane	11,110	< 50	83	173	65.8
Benton Road Between Penfield Lane and Leon Road	11,435	< 50	85	176	66.0

Source: Compiled by LSA Associates, Inc. (2022).
Notes: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = foot/feet

Table J shows that traffic noise levels along Winchester Road are moderately high, with the 70, 65, and 60 dBA CNEL impact zones extending up to 77 ft, 158 ft, and 338 ft, respectively, from the roadway centerline. Also, Table J shows that traffic noise levels along Benton Road are moderate, with the 70 dBA CNEL impact zone located less than 50 ft from the roadway centerline and the 65 and 60 dBA CNEL impact zones extending up to 94 ft and 197 ft, respectively, from the roadway centerline.

IMPACTS

Short-Term Construction Noise Impacts

Two types of short-term noise impacts could occur during construction on the project site. First, construction crew commutes and the transport of construction equipment and materials to the site for the project would incrementally increase noise levels on roadways leading to the site. The pieces of construction equipment for construction activities would move on site, would remain for the duration of each construction phase, and would not add to the daily traffic volume in the project vicinity.

The building construction phase would generate the most trips out of all of the construction phases, at 112 trips per day based on the California Emissions Estimator Model (CalEEMod) (Version 2020.4.0). Roadways that would be used to access the project site are Benton Road and Winchester Road. Based on Table J, Benton Road and Winchester Road have estimated existing daily traffic volumes of 11,110 and 27,420, respectively, near the project site. Although there would be a relatively high single-event noise exposure potential causing intermittent noise nuisance (passing trucks at 50 ft would generate up to a maximum of 84 dBA), the effect on longer-term ambient noise levels would be small because the number of daily construction-related vehicle trips is small compared to existing daily traffic volumes in the project area. Based on the information above, construction-related traffic would not increase noise. Therefore, no short-term construction-related impacts associated with worker commutes and transport of construction equipment and materials to the project site would occur, and no noise reduction measures would be required.

The second type of short-term noise impact is related to noise generated from construction activities. Construction is performed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. The project anticipates demolition, site preparation, and grading; building construction; paving; and architectural coating phases of construction. These various sequential phases change the character of the noise generated on a project site. Therefore, the noise levels vary as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table K lists the L_{max} recommended for noise impact assessments for typical construction equipment included in the FHWA Highway Construction Noise Handbook (FHWA 2006), based on a distance of 50 ft between the equipment and a noise receptor.

Table K: Typical Construction Equipment Noise Levels

Equipment Description	Acoustical Usage Factor[1]	Maximum Noise Level (L_{max}) at 50 ft[2]
Backhoe	40	80
Compactor (ground)	20	80
Compressor	40	80
Crane	16	85
Dozer	40	85
Dump Truck	40	84
Excavator	40	85
Flatbed Truck	40	84
Forklift	20	85
Front-End Loader	40	80
Grader	40	85
Impact Pile Driver	20	95
Jackhammer	20	85
Pickup Truck	40	55
Pneumatic Tools	50	85
Pump	50	77
Rock Drill	20	85
Roller	20	85
Scraper	40	85
Tractor	40	84
Welder	40	73

Source: *FHWA Highway Construction Noise Handbook,* Table 9.1 (FHWA 2006).
Note: The noise levels reported in this table are rounded to the nearest whole number.
[1] The usage factor is the percentage of time during a construction noise operation that a piece of construction equipment is operating at full power.
[2] The maximum noise levels were developed based on Specification 721.560 from the CA/T program to be consistent with the City of Boston, Massachusetts, Noise Code for the "Big Dig" project.
CA/T = Central Artery/Tunnel
FHWA = Federal Highway Administration
ft = foot/feet
L_{max} = maximum instantaneous noise level

Typical noise levels range up to 88 dBA L_{max} at 50 ft during the noisiest construction phases. The site preparation phase, which includes excavation and grading of the site, tends to generate the highest noise levels because the noisiest construction equipment is earthmoving equipment. Earthmoving equipment includes excavating machinery such as backfillers, bulldozers, draglines, and front-end loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders.

Project construction is expected to require the use of graders, bulldozers, and water trucks/pickup trucks. Noise associated with the use of each type of construction equipment for the site preparation and grading phase is estimated to be between 55 dBA L_{max} and 85 dBA L_{max} at a distance of 50 ft from the active construction area. As shown in Table K, the maximum noise level generated by each grader is assumed to be approximately 85 dBA L_{max} at 50 ft. Each bulldozer would generate approximately 85 dBA L_{max} at 50 ft. The maximum noise level generated by water trucks/pickup trucks is approximately 55 dBA L_{max} at 50 ft from these vehicles. Each doubling of the sound sources with equal strength increases the noise level by 3 dBA. Assuming that each piece of construction equipment operates at some distance from the other equipment, the worst-case combined noise level during this phase of construction would be 88 dBA L_{max} at a distance of 50 ft from the active construction area. Based on a usage factor of 40 percent, the worst-case combined noise level

during this phase of construction would be 84 dBA L_{eq} at a distance of 50 ft from the active construction area.

The closest residential property line is located approximately 60 ft from the project construction boundary and would be subject to short-term construction noise levels of 86.4 dBA L_{max} (82.4 dBA L_{eq}) when construction occurs at the project construction boundary. Ambient noise levels in the project vicinity range between 51.8 to 62.6 dBA L_{eq} and 66.8 to 87.7 dBA L_{max} based on short-term and long-term noise level measurements shown in Tables F and I. Although the noise generated by project construction activities would be higher than the ambient noise levels and may result in a temporary increase in the ambient noise levels, construction noise would stop once project construction is completed. Additionally, the project would be required to comply with the construction hours allowed under the County's Code of Ordinances, and the best construction practices listed below would minimize construction noise:

- The construction contractor shall limit construction activities to between the hours of 6:00 a.m. and 6:00 p.m. during the months of June through September and between the hours of 6:00 a.m. and 7:00 p.m. during the months of October through May, pursuant to Sections 9.52.020(H) and 9.52.020(I) of the County's Code of Ordinances. Construction is prohibited outside these hours.

- During all project site excavation and grading, the project contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards.

- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and the noise-sensitive receptors nearest the project site during all project construction.

- The construction contractor shall place all stationary construction equipment so that the emitted noise is directed away from the sensitive receptors nearest the project site.

Therefore, no noise impacts from construction activities would occur. No noise reduction measures are required.

Short-Term Construction Vibration Impacts

This construction vibration impact analysis discusses the level of human annoyance using vibration levels in VdB and will assess the potential for building damage using vibration levels in PPV (in/sec). As shown in Table D, the FTA guidelines indicate that a vibration level up to 102 VdB (equivalent to 0.5 PPV [in/sec]) is considered safe for buildings consisting of reinforced concrete, steel, or timber (no plaster), and would not result in any construction vibration damage (FTA 2018). For a non-engineered timber and masonry building, the construction vibration damage criterion is 94 VdB (0.2 PPV [in/sec]). For a fragile building, the construction vibration damage criterion is 90 VdB (0.12 PPV [in/sec]).

Table L shows the PPV and VdB values at a distance of 25 ft from the construction vibration source. As shown in Table L, large bulldozers and other heavy-tracked construction equipment (except for pile drivers and vibratory rollers) generate approximately 87 VdB of ground-borne vibration when measured at a distance of 25 ft, based on the *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018). Project construction is expected to use a large bulldozer and a loaded truck, which would generate 87 VdB (0.089 PPV [in/sec]) and 86 VdB (0.076 PPV [in/sec] at 25 ft, respectively. The greatest levels of vibration are anticipated to occur during the site preparation and grading phase. All other phases are expected to result in lower vibration levels. The distance to the nearest buildings for vibration impact analysis is measured between the nearest off-site buildings and the project boundary (assuming the construction equipment would be used at or near the project boundary).

Table L: Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV/L_V at 25 ft	
	PPV (in/sec)	L_V (VdB)[1]
Hoe Ram	0.089	87
Large Bulldozer	0.089	87
Caisson Drilling	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).

1. RMS VdB re 1 µin/sec.

µin/sec = microinches per second
ft = foot/feet
FTA = Federal Transit Administration
in/sec = inches per second
L_V = velocity in decibels
PPV = peak particle velocity
RMS = root-mean-square
VdB = vibration velocity in decibels

The formula for vibration transmission is provided below.

$$L_vdB\ (D) = L_vdB\ (25\ feet) - 30\ Log\ (D/25)$$

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

Table M lists the projected vibration levels from various construction equipment expected to be used on the project site to the nearest buildings in the project vicinity. As shown in Table M, the closest residential, commercial, and industrial structures are located east, south, and west, respectively, of the project site and would experience vibration levels of up to 77 VdB (0.027 PPV [in/sec]). This vibration level would not have the potential to result in community annoyance because vibration levels would not exceed the FTA's community annoyance threshold of 78 VdB for daytime residential uses and 84 VdB for commercial and industrial uses. In addition, this vibration level would not have the potential to cause damage because residential and commercial building structures were observed to be constructed equivalent to non-engineered timber and masonry and the vibration level would not exceed the FTA's damage threshold of 0.2 PPV (in/sec). For the industrial building structure, this vibration level would not have the potential to cause damage

Table M: Summary of Construction Vibration Levels

Land Use	Direction	Equipment/Activity	Reference Vibration Level (VdB) at 25 ft	Reference Vibration Level (PPV) at 25 ft	Distance[1] (ft)	Maximum Vibration Level (VdB)	Maximum Vibration Level (PPV)
Commercial	North	Large Bulldozer	87	0.089	195	60	0.004
		Loaded Trucks	86	0.076		59	0.003
Barn	East	Large Bulldozer	87	0.089	80	72	0.016
		Loaded Trucks	86	0.076		71	0.013
Residential	East	Large Bulldozer	87	0.089	110	68	0.010
		Loaded Trucks	86	0.076		67	0.008
Commercial	Southeast	Large Bulldozer	87	0.089	130	66	0.008
		Loaded Trucks	86	0.076		65	0.006
Commercial	South	Large Bulldozer	87	0.089	55	77	0.027
		Loaded Trucks	86	0.076		76	0.023
Industrial	West	Large Bulldozer	87	0.089	290	55	0.002
		Loaded Trucks	86	0.076		54	0.002
Commercial	West	Large Bulldozer	87	0.089	275	56	0.002
		Loaded Trucks	86	0.076		55	0.002

Source: Compiled by LSA Associates, Inc. (2022).
[1] Distance from the project construction boundary to the building structure.
ft = foot/feet
PPV = peak particle velocity
VdB = vibration velocity decibels

because the structure was observed to be constructed equivalent to engineered concrete and masonry and the vibration level would not exceed the FTA's damage threshold of 0.3 PPV (in/sec).

Other building structures are farther away and would experience a lower vibration level than 77 VdB (0.027 PPV [in/sec]), which would not exceed the FTA's community annoyance thresholds and damage thresholds based on the use of the building and type of building construction. Therefore, no construction vibration impacts would occur during project construction. No vibration reduction measures are required.

Long-Term Aircraft Noise Impacts

As discussed above, French Valley Airport is the closest airport to the proposed project site and is located approximately 0.56 mile southwest of the project site. Based on the Riverside County Airport Land Use Compatibility Plan (RCALUC 2004), the project is located outside of the 60 dBA CNEL noise contour of the airport. Additionally, there are no private airstrips or heliports within 2 miles of the project site. Therefore, the project would not expose people working in the project area to excessive noise levels.

Long Term Traffic Noise Impacts

The FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77 108) was used to evaluate traffic-related noise conditions along roadway segments in the project vicinity. This model requires various

parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry, to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24-hour periods to determine the CNEL values. The existing without and with project ADT volumes were obtained from the *Traffic Impact Analysis Report for the French Valley Tommy's Express Wash Project* (LLG 2022). The standard vehicle mix for Southern California roadways was used for traffic on these roadway segments. Table N provides the traffic noise levels for the existing without and with project scenarios. These noise levels represent the worst-case scenario, which assumes that no shielding is provided between traffic and the location where the noise contours are drawn. Attachment B provides the specific assumptions used in developing these noise levels and model printouts.

Table N shows that the project-related traffic noise increase would be up to 0.4 dBA. Noise level increases less than 3 dBA would not be perceptible to the human ear in an outdoor environment. Therefore, no traffic noise impacts from project-related traffic on off-site sensitive receptors would occur. No noise reduction measures are required.

Long-Term Off-Site Stationary Noise Impacts

The car wash operations; vacuum stations; truck delivery and truck unloading operations; heating, ventilation, and air conditioning (HVAC) equipment; drive-through speakerphones; and parking lot activities associated with the project could affect the existing off-site sensitive land uses. The following provides a detailed noise analysis and discussion of each stationary noise source at the closest residence to the east.

Car Wash Operations

The proposed car wash project would include a 130 ft wash tunnel that would operate during daytime hours (7:00 a.m. and 10:00 p.m.) only. Noise from the blowers near the exit of the wash tunnel would generate a noise level of 95 dBA L_{eq} at a distance of 7 ft based on a recent Tommy's Express Car Wash noise study (ABD Engineering & Design 2020). At a distance of 50 ft, the noise level would be 77.9 dBA L_{eq}. The noise level at the entrance of the wash tunnel was estimated to be approximately 7 dBA lower than the exit of the wash tunnel, which would be 70.9 dBA L_{eq}.

Vacuum Stations

The project would include a total of 18 vacuum stations that would operate during daytime hours (7:00 a.m. and 10:00 p.m.) only. As shown on Figure 2, there are 9 vacuum stations east of the wash tunnel and 9 vacuum stations near the southern project boundary. Noise generated at each vacuum station would consist of the turbine vacuum motor and the vacuum stanchion, which would generate a sound power level of 73 dBA and 65 dBA, which would be 41.4 dBA and 33.4 dBA, respectively, at a distance of 50 ft. The combined noise level would be 42.0 dBA at 50 ft from the turbine vacuum motor and the vacuum stanchion. The turbine vacuum motor and the vacuum stanchion specifications are provided in Attachment C.

Table N: Existing Without and With Project Traffic Noise Levels

Roadway Segment	Without Project Traffic Conditions					With Project Traffic Conditions					
	ADT	Centerline to 70 dBA CNEL (ft)	Centerline to 65 dBA CNEL (ft)	Centerline to 60 dBA CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane	ADT	Centerline to 70 dBA CNEL (ft)	Centerline to 65 dBA CNEL (ft)	Centerline to 60 dBA CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane	Increase from Baseline Conditions
Winchester Road North of Benton Road	30,640	77	158	338	70.2	32,090	79	163	348	70.4	0.2
Winchester Road South of Benton Road	27,420	72	147	314	69.8	28,630	73	151	323	69.9	0.1
Benton Road Between Winchester Road and Temeku Street	13,505	< 50	94	197	66.7	14,380	< 50	98	205	67.0	0.3
Benton Road Between Temeku Street and Penfield Lane	11,110	< 50	83	173	65.8	11,965	< 50	87	182	66.2	0.4
Benton Road Between Penfield Lane and Leon Road	11,435	< 50	85	176	66.0	12,545	< 50	90	187	66.4	0.4

Source: Compiled by LSA Associates, Inc. (2022).
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = foot/feet

Truck Delivery and Truck Unloading Activities

Truck delivery and truck unloading activities for the project would occur near the two fast-food restaurants during daytime hours only. Noise levels generated from these activities include truck movement, backup alarms, air brakes, idling, and unloading activities. The maximum noise level generated from these activities is 75 dBA L_{max} at 50 ft. Although a typical truck unloading process takes an average of 15 to 20 minutes, this maximum noise level occurs in a much shorter period of time (less than 5 minutes). Also, it is estimated that there would be a maximum of one delivery truck per hour, which would result in a cumulative period of 5 minutes in any hour. Based on the assumptions above, truck delivery and truck unloading activities would generate a noise level of 64.2 dBA L_{eq} at 50 ft.

HVAC Equipment

Potential noise impacts from the project's HVAC equipment were evaluated even though noise generated from HVAC equipment is exempted from the County's noise standards. The project would include a rooftop HVAC unit on each of the two fast-food restaurant buildings. The HVAC equipment could potentially operate 24 hours per day. One piece of rooftop HVAC equipment would generate noise levels of 66.6 dBA L_{eq} at 5 ft.

Speakerphone Noise

The proposed project would include two fast-food restaurants, each with a drive-through speakerphone that is part of the menu board. It is assumed that the two fast-food restaurants would operate during both daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) hours. Noise generated from each speakerphone is approximately 84 dBA at 1 ft. The speakerphone reference noise levels are provided in Attachment D.

Parking Activities

The project would include parking areas on the project site. Noise generated from parking activities includes vehicles traveling at slow speeds, engine start-up noise, car door slams, car horns, car alarms, and tire squeals. Parking activities associated with the project would occur during the hours of operations. As discussed above, the two fast-food restaurants would operate during both daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) hours, while the car wash would operate during daytime hours. Representative parking activities would generate approximately 60 to 70 dBA L_{max} at 50 ft.

Table O shows the daytime and nighttime parking activity noise levels generated at the vacuum stalls of the car wash, the Arby's fast-food restaurant, the Wienerschnitzel fast-food restaurant, and the area south of the two fast-food restaurants. Parking activity noise levels were estimated based on the estimated number of cumulative minutes generating the maximum noise level of 70 dBA L_{max} at 50 ft in any hour.

Table O: Parking Activity Noise Levels

Project Component	Daytime[1]		Nighttime[2]	
	Minutes[3]	Noise Level at 50 ft (dBA L_{eq})	Minutes[3]	Noise Level at 50 ft (dBA L_{eq})
Car Wash	4	58.2	--[4]	--
Arby's Fast-Food Restaurant	7	60.7	2	55.2
Wienerschnitzel Fast-Food Restaurant	2	55.2	1	52.2
Parking South of the Two Fast-Food Restaurants	1	52.2	1	52.2

Source: Compiled by LSA Associates, Inc. (2022).
[1] Daytime hours are defined as the hours between 7:00 a.m. and 10:00 p.m.
[2] Nighttime hours are defined as the hours between 10:00 pm. and 7:00 a.m.
[3] Cumulative minutes in any hour.
[4] The car wash would not operate during nighttime hours.
dBA = A-weighted decibels
L_{eq} = equivalent continuous sound level

Stationary-Source Noise Impacts Summary

Table P shows the combined calculated daytime and nighttime noise levels at the closest residential property line east of the project site using SoundPLAN from the individual stationary noise sources discussed above, which include the car wash tunnel, vacuum stations, truck delivery and truck unloading activities, rooftop HVAC equipment, speakerphones, and parking activities. The SoundPLAN printouts are provided in Attachment E. As shown in Table P, the combined daytime and nighttime stationary-source noise level is 50.4 dBA L_{eq} and 45.0 dBA L_{eq}, respectively, at the closest residential property line east of the project site. As shown in Table P, the combined calculated daytime and nighttime noise levels would not exceed the County's exterior daytime and nighttime 10-minute noise standards of 65 dBA L_{eq} and 45 dBA L_{eq}, respectively. Therefore, no noise impacts from project operations would occur. No noise reduction measures are required.

Table P: Operational Noise Levels

Receptor	Land Use	Direction	Noise Level[1] (dBA L_{eq})		Noise Standard (10-minute L_{eq})		Exceed Noise Standard?	
			Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
R-1	Residence	East	50.4	45.0	65	45	No	No

Source: Compiled by LSA Associates, Inc. (2022).
[1] Noise level at the residential property line.
dBA = A-weighted decibels
L_{eq} = equivalent continuous sound level

Long-Term Vibration Impacts

The proposed project would not generate vibration. In addition, vibration levels generated from project-related traffic on the adjacent roadways (Benton Road, Winchester Road, and local roadways within the project area) are unusual for on-road vehicles because the rubber tires and suspension systems of on-road vehicles provide vibration isolation. Vibration generated from

project-related traffic on the adjacent roadways would be less than significant. No vibration reduction measures are required.

BEST CONSTRUCTION PRACTICES

The following best construction practices would minimize construction noise:

- The construction contractor shall limit construction activities to between the hours of 6:00 a.m. and 6:00 p.m. during the months of June through September and between the hours of 6:00 a.m. and 7:00 p.m. during the months of October through May, pursuant to Sections 9.52.020(H) and 9.52.020(I) of the County's Code of Ordinances. Construction is prohibited outside these hours.

- During all project site excavation and grading, the project contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.

- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and the noise-sensitive receptors nearest the project site during all project construction.

- The construction contractor shall place all stationary construction equipment so that the emitted noise is directed away from the sensitive receptors nearest the project site.

REDUCTION MEASURES

Short-Term Construction Noise Impacts

No noise reduction measures are required.

Short-Term Construction Vibration Impacts

No vibration reduction measures are required.

Long-Term Aircraft Noise Impacts

No noise reduction measures are required.

Long-Term Traffic Noise Impacts

No noise reduction measures are required.

Long-Term Stationary Noise Impacts

No noise reduction measures are required.

Long-Term Vibration Impacts

No vibration reduction measures are required.

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Attachments:
A: Figures
B: FHWA Highway Traffic Noise Model Printouts
C: Turbine Vacuum Motor and Vacuum Stanchion Specifications
D: Speakerphone Specifications
E: SoundPLAN Printouts

ATTACHMENT A

FIGURES

LSA

LEGEND

Project Site Boundary

FIGURE 1

N

0 150 300

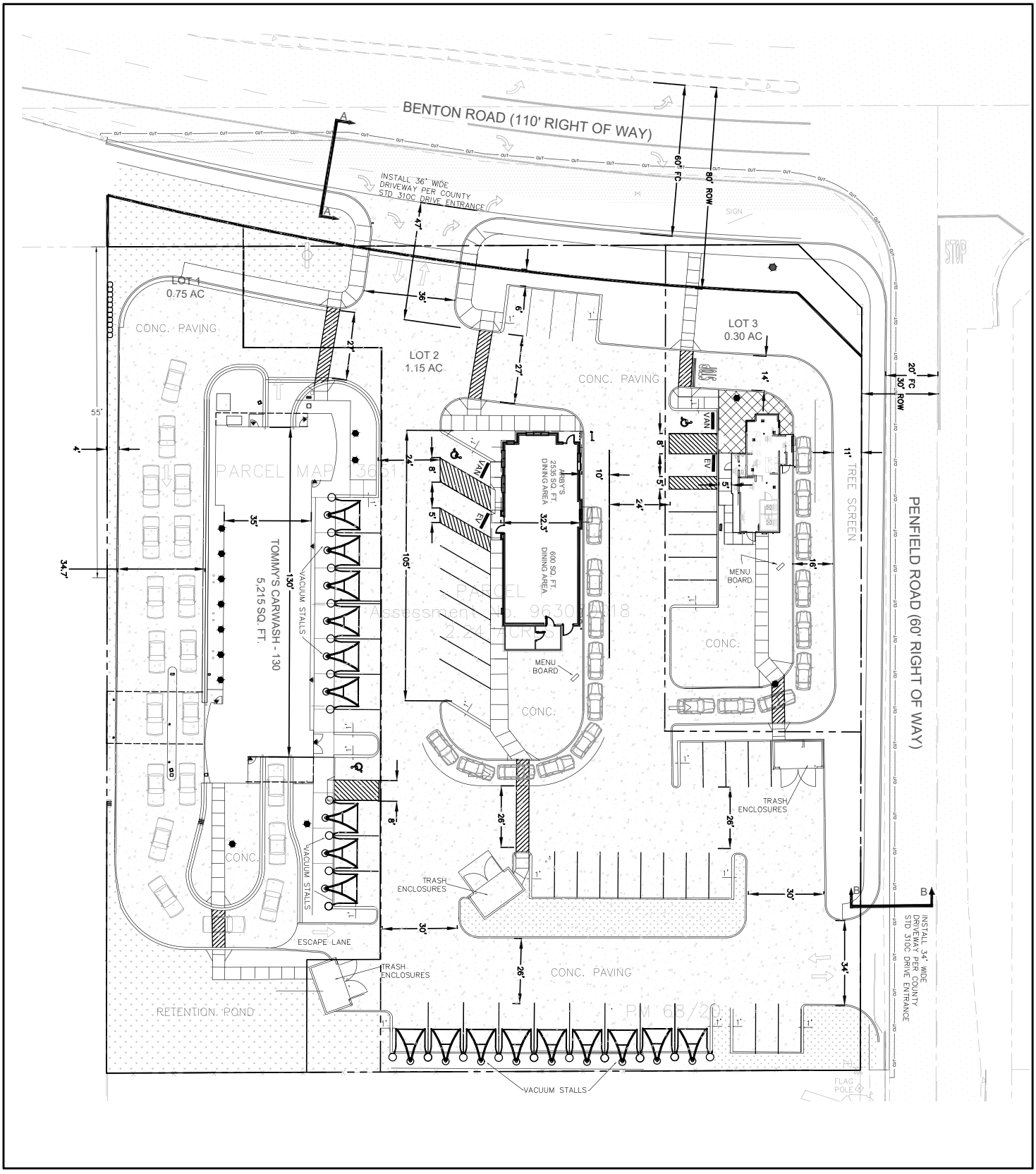
FEET

SOURCE: Google Earth (2021)

French Valley Commercial Retail Project

Project Location

I:\EGR2101\G\Project_Location.ai (4/27/2022)



LSA

FIGURE 2

N

0 10 20
FEET

SOURCE: Cross Engineering Services

I:\EGR2102\G\Site Plan.ai (4/27/2022))

French Valley Commercial Retail Project

Site Plan

LSA

LEGEND

- Project Site Boundary
- ST-1 - Short-term Noise Monitoring Location
- LT-1 - Long-term Noise Monitoring Location

0 150 300

FEET

SOURCE: Google Earth (2021)

I:\EGR2101\G\Noise_Monitor_Locs_FV.ai (6/17/2021)

FIGURE 3

French Valley Commercial Retail Project

Noise Monitoring Locations

ATTACHMENT B

FHWA HIGHWAY TRAFFIC NOISE MODEL PRINTOUTS

TABLE Existing -01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 04/15/2022
ROADWAY SEGMENT: Winchester Road North of Benton Road
NOTES: French Valley Commercial Retail - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 30640 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.24

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
76.5	158.3	337.9	726.4

TABLE Existing -02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 04/15/2022
ROADWAY SEGMENT: Winchester Road South of Benton Road
NOTES: French Valley Commercial Retail - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 27420 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.76

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
71.6	147.3	313.9	674.7

TABLE Existing -03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 04/15/2022
ROADWAY SEGMENT: Benton Road Between Winchester Road and Temeku Street
NOTES: French Valley Commercial Retail - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13505 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.69

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	93.8	196.7	421.3

TABLE Existing -04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 04/15/2022
ROADWAY SEGMENT: Benton Road Between Temeku Street and Penfield Lane
NOTES: French Valley Commercial Retail - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11110 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.84

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	83.1	173.1	370.0

TABLE Existing -05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 04/15/2022
ROADWAY SEGMENT: Benton Road Between Penfield Lane and Leon Road
NOTES: French Valley Commercial Retail - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11435 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.96

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	84.6	176.4	377.2

TABLE Existing Plus Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 04/15/2022
ROADWAY SEGMENT: Winchester Road North of Benton Road
NOTES: French Valley Commercial Retail - Existing Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 32090 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.44

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
78.7	163.2	348.4	749.1

TABLE Existing Plus Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 04/15/2022
ROADWAY SEGMENT: Winchester Road South of Benton Road
NOTES: French Valley Commercial Retail - Existing Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 28630 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.95

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
73.5	151.5	323.0	694.3

TABLE Existing Plus Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 04/15/2022
ROADWAY SEGMENT: Benton Road Between Winchester Road and Temeku Street
NOTES: French Valley Commercial Retail - Existing Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14380 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.96

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL	70 CNEL	65 CNEL	60 CNEL	55 CNEL
	0.0	97.5	205.0	439.2

TABLE Existing Plus Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 04/15/2022
ROADWAY SEGMENT: Benton Road Between Temeku Street and Penfield Lane
NOTES: French Valley Commercial Retail - Existing Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11965 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.16

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	87.0	181.7	388.7

TABLE Existing Plus Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 04/15/2022
ROADWAY SEGMENT: Benton Road Between Penfield Lane and Leon Road
NOTES: French Valley Commercial Retail - Existing Plus Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12545 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.37

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	89.6	187.4	401.1

ATTACHMENT C

TURBINE VACUUM MOTOR AND VACUUM STANCHION SPECIFICATIONS

TOMMY CAR WASH SYSTEMS
Clean. Shiny. Dry.

Tommy Car Wash Systems
581 Ottawa Ave, Ste. 300
Holland, Michigan 49423 • USA
Sales: (616) 494-0411 • Support: (616) 795-4892
sales@tommycarwash.com | www.tommycarwash.com
* Prices subject to change without notice and do not include tax, shipping, or insallation

4.6HP Turbine Vacuum Motor

Part Number: P-VAC-2047
Description: 4.6HP Turbine Vacuum Motor
Site Map:
Price: $1,800.00

Detailed Description

4.6HP Vacuum/Pressure Regenerative Blower

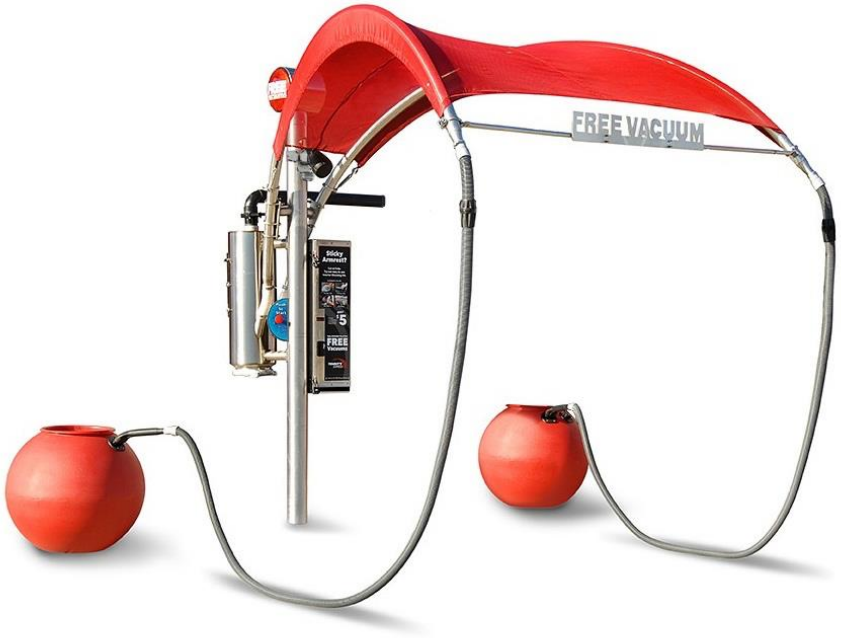
Specifications

- Hz : 50
- HP : 4.62
- Input Voltage (V) : 220D… 250D / 415Y…460Y
- Input Current (A) : 12.6D / 7.3Y
- Permissible total differential Pressure : -96 (Vacuum Inch H20) / 92(Compressor Inch H20)
- dB(A) : 73
- Weight lbs. : 75

Features

- Cooler running, outboard bearing provides maintenance-free operation
- Environmentally friendly oil-free technology
- Extremely quiet operation
- All motors are standard TEFC with Class F insulation, UL recognized, CE Compliant
- Explosion-Proof motors available
- Custom construction blowers are available
- Rugged die cast aluminum construction

Tommy Car Wash Systems
Vacuum Stations



Part No: **"Tommy Vacuum" (Various Configurations)**
Description: **Dual Drop Vacuum Systems**
Updated: **10.2.18**

General Warning

It is important that you read this manual in its entirety attempting to install, operate, or service the corresponding Tommy Car Wash Systems equipment. Observe all safety information and any additional instructions included with this equipment. Failure to observe these instructions may result in personal injury and / or property damage.

Product Description & Specification

System Description:

Each Tommy Car Wash Systems' dual drop vacuum station offers two full-size vacuum hoses, allowing customers to vacuum out both sides of their vehicle without dragging a single hose back and forth, reducing effort, wear, and tear. The stainless steel stanchion design is 100% weatherproof for all-climate use. Likewise, the custom-fitted canopy system is built for durability and offers partial shade for visiting customers. The top light can be fitted with decals and is available in a number of different colors upon request. System fits 13" Tommy Dual Motor Vacuum or Central Vacuum Producer Kit.

Technical Data - Stanchion

- Construction: Stainless Steel
- Dimensions: 13' - 15' stalls / 10' 6" tip to tip / hoses hang approx. 11' apart
- Shipping Weight: 209 lbs.
- Function: Self Service Vacuum Stanchion
- Noise Level: 65dB (approximate, all systems)

Technical Data – 13" Dual Motor Vacuum

- Construction: Stainless Steel
- Power Requirements: 220V / 13.4 amps (peak demand)
- Shipping Weight: 40 lbs.
- Function: Producer / Canister for Self Service Car Wash Vacuums

Technical Data – Semi-Central Vacuum

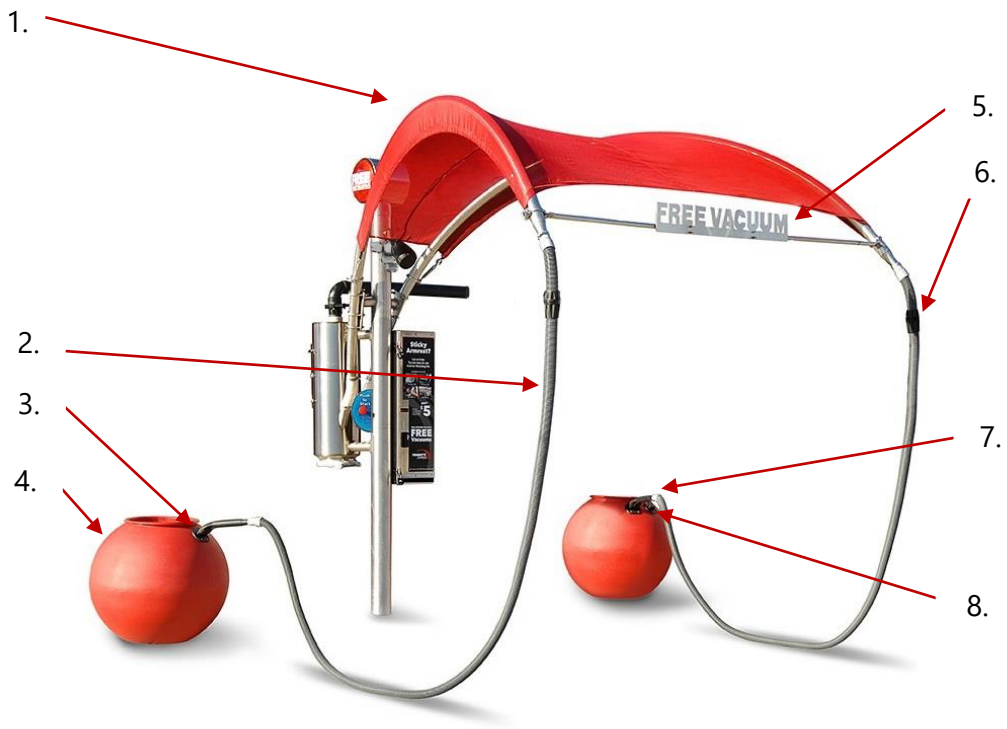
- Construction: Stainless Steel (Canister), ABS Plastic
- Power Requirements: 220V / 13.4 amps (peak demand)
- Shipping Weight: 40 lbs.
- Function: Producer / Canister / Piping for Self Service Car Wash Vacuums

General Safety Information

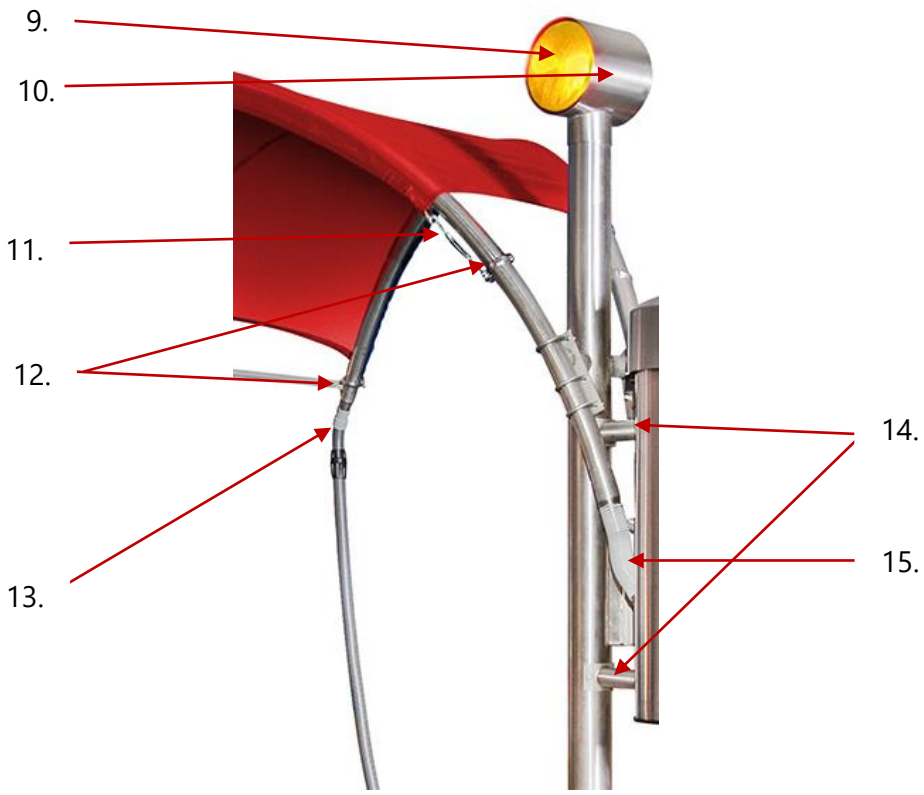
All WARNINGS, CAUTIONS, AND ADVISEMENTS below concern the safe installation, operation, and service of your Tommy Car Wash Systems equipment. This safety information is included for your protection and should be reviewed thoroughly prior to working with or near this equipment.

- Never service equipment while it is running.
- All personnel must be trained on relevant equipment and corresponding safety procedures before conducting service.
- All employees should have ready access to emergency stop buttons and should be trained on their location and operation.
- All moving and/or electrical equipment involves certain hazards. At least two qualified personnel must be on-hand during service or normal operation.
- Do not wear loose fitting clothing when working on or around moving equipment.
- All car washes must implement an audible warning system to alert employees prior to wash activation.
- Do not attempt to operate any malfunctioning equipment.
- Unauthorized personnel or foreign objects are not permitted near functioning equipment.
- Never attempt to clean or service any area near operational equipment. Keep area clear until equipment has been fully deactivated.
- Disconnect all equipment prior to servicing.
- Do not attempt to use any equipment for any function it was not intended for.

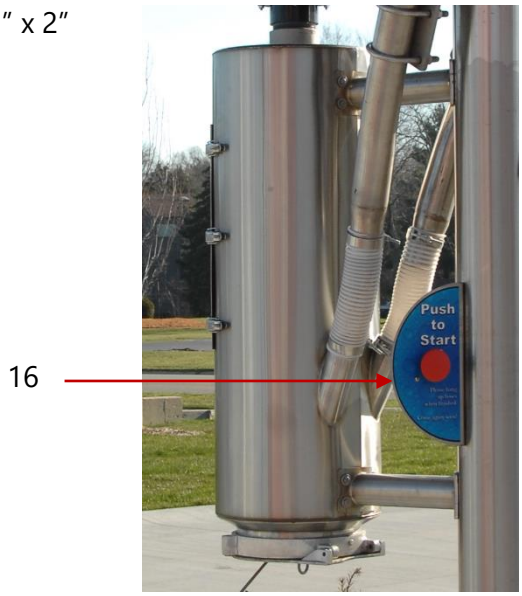
Equipment Components



1.	P-VAC-CPY	Canopy
2.	P-VAC-208	Tapered Hose
	• P-VAC-208-K	Hose Assembly (includes fittings)
3.	P-VAC-105HLSR	Crevice Tool Holster
4.	A-Ball-TX	Tommy Ball
5.	P-VAC-201	"Free Vacuum" Letters
6.	P-VAC-220	Swivel Cuff
7.	P-VAC-224	Vacuum Adapter Cuff - 1.5" x 1.5
8.	P-VAC-105NZL	Crevice Tool

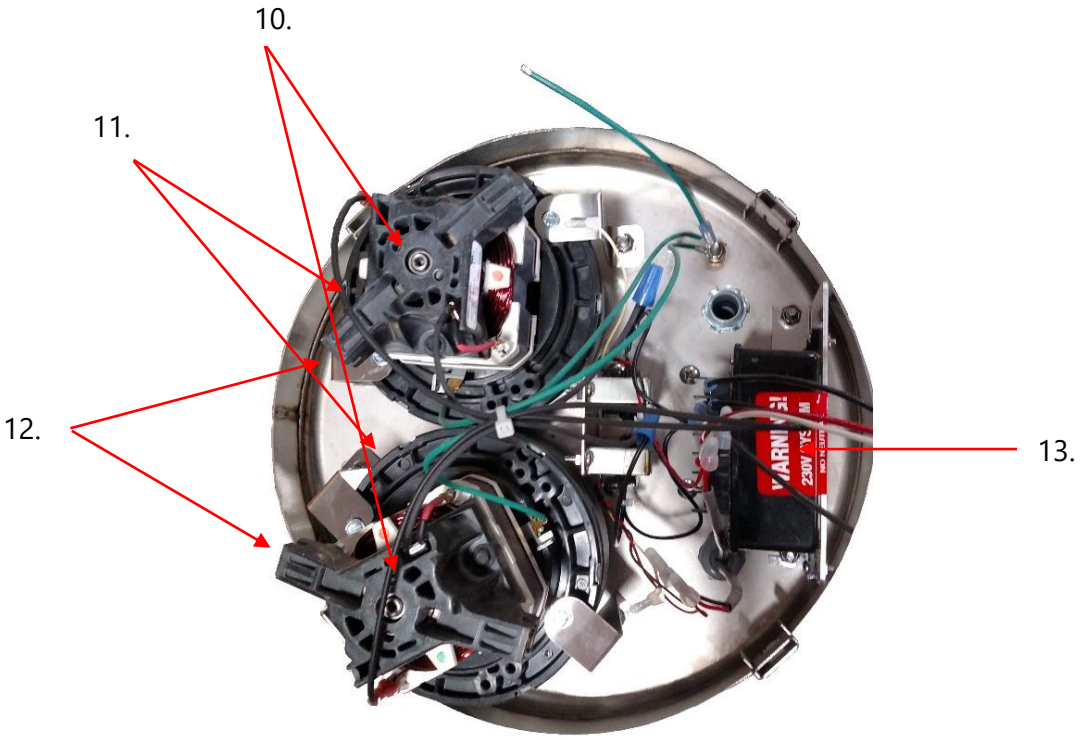


9.	P-LED-RND	12″ Round LED Indicator
10.	P-VAC-215	Light Can
11.	P-VAC-2019	Turnbuckle
12.	P-SE-2006	Hinge Clamp
13.	P-VAC-209	Vacuum Arch to Hose Adapter Cuff 2″ x 2″
14.	P-VAC-2035	Standoff Brackets
15.	P-VAC-2030	Suction Hose
16.	E-VAC-209	Push Button Kit



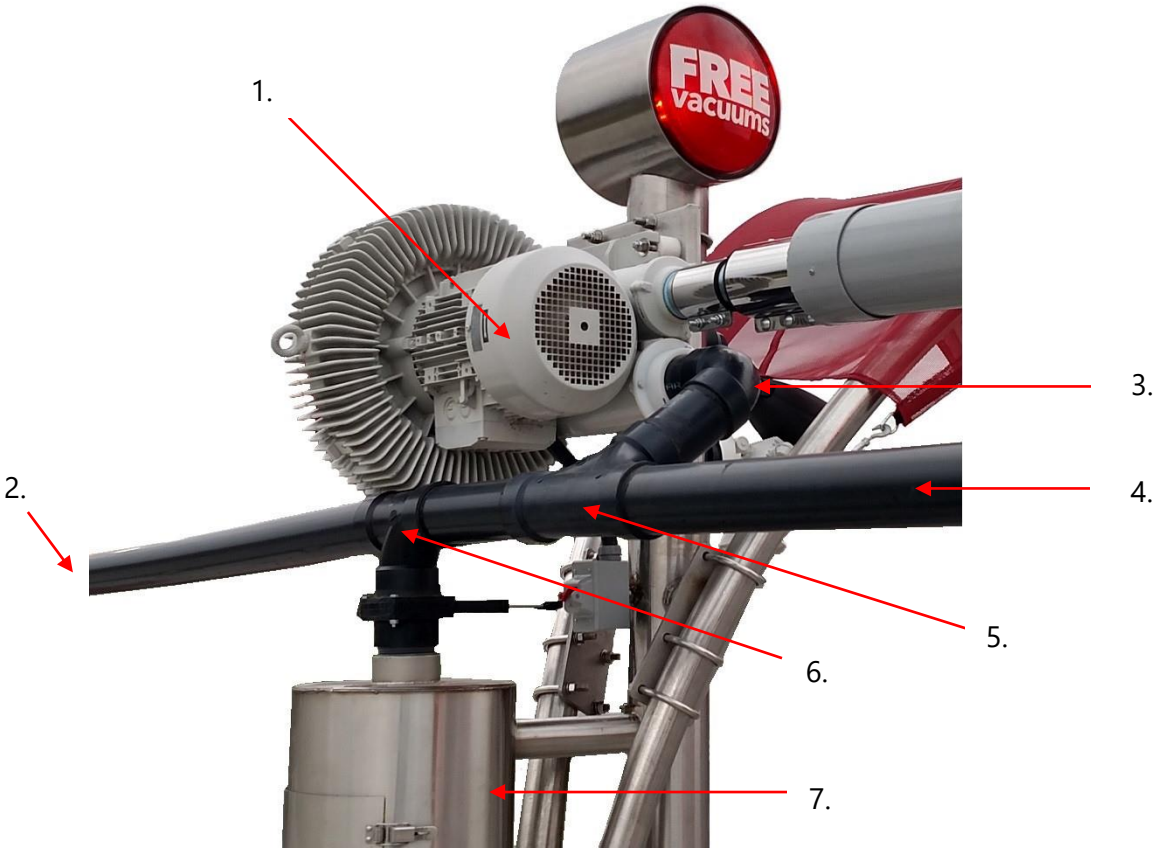
13" Dual Motor Vacuum (Onboard Producer)

1.	P-VAC-245	Dome 13"
2.	P-VAC-247	Indicator Lights
3.	P-VAC-236	Door Gasket Set
4.	P-VAC-230	Pleated Filter
5.	P-VAC-255	Pleated Filter Protector
6.	P-VAC-256	Dirtbag Vacuum Pre-Filter
7.	P-VAC-2035	Standoff Brackets
8.	P-VAC-2032	Neoprene Foam Rubber Disk
9.	P-VAC-246	Dump Door



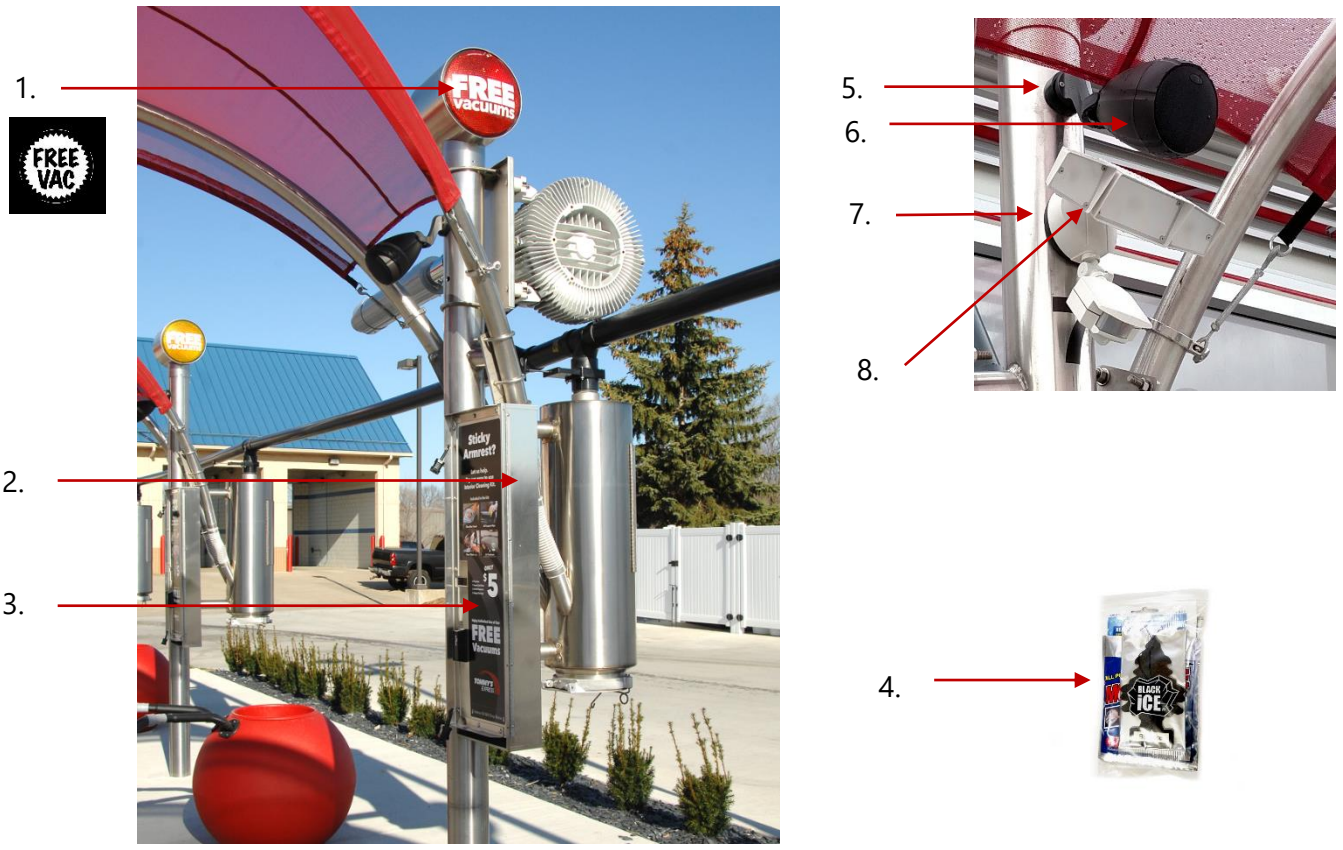
10.	P-VAC-106	(OLD) Extreme Power Vacuum Motor
	P-VAC-283	(NEW) Extreme Power Vacuum Motor
11.	P-VAC-225	Foam Gasket
12.	P-VAC-234	Brush Kit for Motor (110 or 220V)
13.	E-VAC-107/8/9/10	Timer

Semi-Central Vacuum



1.	E-VAC-SC-204-K	Central Vacuum Producer Kit with Mount
2.	P-VAC-SC-250-K	Complete Semi-Central Vac Piping Kit
3.	P-VAC-253	90 Degree Pipe Elbow 3”
4.	P-VAC-254	3” 20ft Pipe (cut to lengths)
5.	P-VAC-252	3” Pipe Sweep Tee
6.	P-VAC-251	3” Pipe Tee
7.	E-VAC-222-CV	Separator Assembly for Semi-Central Vacuum

Optional Components



**Shown with Central Vacuum Producer Kit E-VAC-SC-204-K*

1.	P-VAC-246	"Free Vac" Light Decal
2.	E-VAC-399X	Vacuum-Mount Detail Kit Vending Machine
3.	N/A	Vending Machine Decal – Call to custom order
4.	P-DET-KIT	Interior Cleaning Vending Kits
5.	P-VAC-261	Polk Speaker Mounting Adapter
6.	P-VAC-240	Waterproof Speaker
7.	P-VAC-258	Motion Light Mounting Adapter
8.	P-VAC-2033	Motion Activated Flood Light

Installation

Electrical

Junction box with disconnect switch provided and installed by contractor.

Push to start button and junction box provided by Tommy Car Wash Systems. Connections by contractor.

Flex conduit containing conductors from breaker panel and control wire from motors to start / stop button by contractor.

Conductors fed from underground and through vacuum stanchion into flex by contractor that terminates into box. Box by Tommy Car Wash Systems. **

Speaker fed from IT cabinet in Flight Deck. **

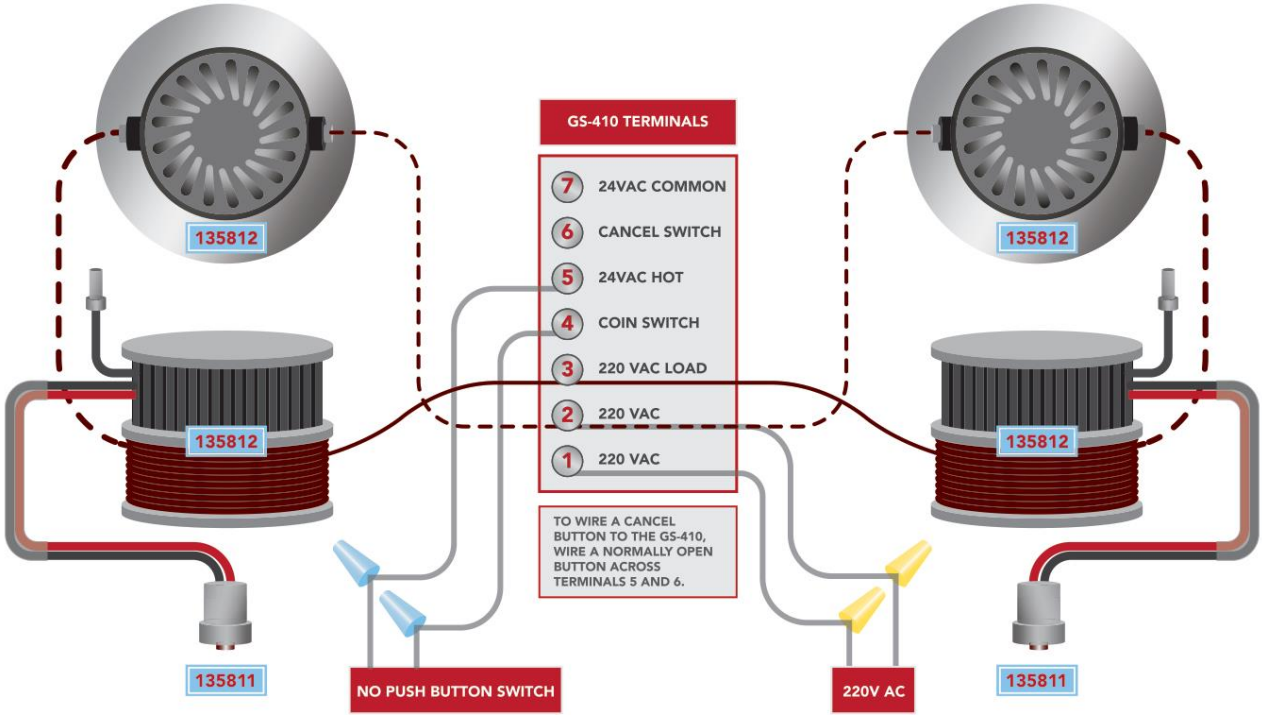
Globe light fed from breaker panel. **

Motion sensor light fed from breaker panel. **

Optional Wiring Access Point -Updated Style

***Connections by General Contractor*

Push to Start Wiring & Programing

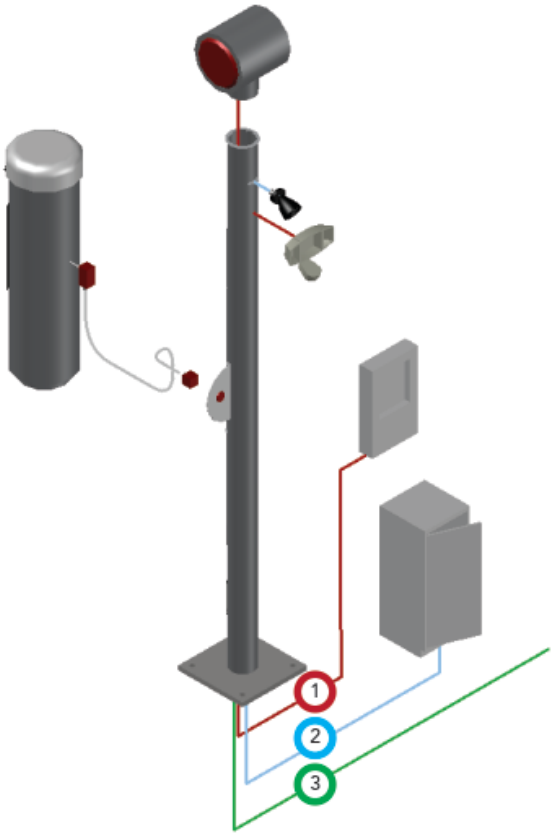


Vacuum Stanchion Wiring

CIRCUIT 1 220V/110V SINGLE PHASE PRODCUER FROM BREAKER PANEL TO LED INDICATOR LIGHT AND MOTION SENSOR LIGHT.

CIRCUIT 2 POWER FROM IT CABINET TO SPEAKER.

CIRCUIT 3 SPARE FOR FUTURE USE. *RUN POST TO POST OR HOME RUN TO DRY BACKROOM.*

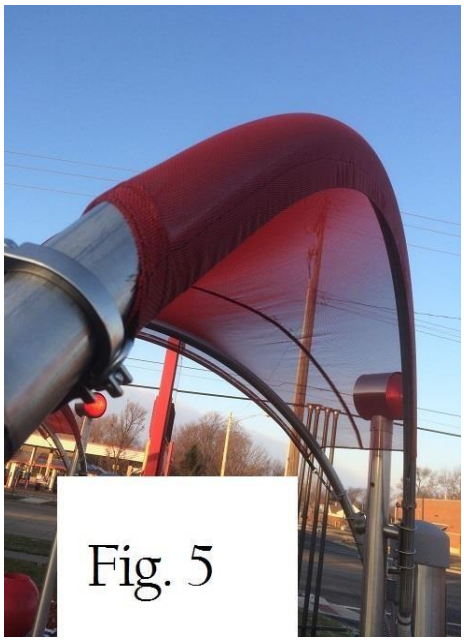


Canopy Installation Procedure

1. Place one collar clamp (Fig 1, above) on each side of the arch cylinders 1-2 inches above the spreader bar on the wide side of the vacuum assembly. At this point the clamps should be positioned so the opening faces AWAY from the spreader bar and vacuum interior (I.E. 90 degrees counterclockwise from example shown Fig 1).

Place the wide-end canopy ring through the forward-most clamp opening projection (Fig. 2), around the threaded part of the clamp. Then thread the wing nut through, closing the clamp and securing the canopy ring to the clamp as shown (Fig. 2) (both sides). Do not over-tighten.

On the narrow end of the vacuum assembly, place remaining collar clamps about 8 inches above the metal plates securing the outer arches to the center tube, as shown (Fig. 3). Put the turnbuckle eye through the threaded bolt openings on the clamp and place the wing nut through the bolts and eye, securing the turnbuckle to the clamp (Fig. 4). Tighten clamps securely.



Hook the turnbuckle hooks to the narrow-side canopy rings (Fig. 4). Make sure turnbuckles are fully extended.

Work the canopy up and over the arches on both sides (Fig 5). This process may require several individuals working together.

6. Rotate wide-side camps inwards and tighten securely, as shown (Fig 1.) Snug them with hammer if necessary. Also use turnbuckles to tighten the narrow-side until all wrinkles are out of the canopy.

Tip: Once the arches are wrapped tension will hold the canopy in place like a covered wagon, as shown. The metal rings, fabric, and clamps are all built for incredible tension. You cannot break them, so be prepared to use force and "Work" the canopy around the arches until the wrinkles are out and the canopy lays smoothly.

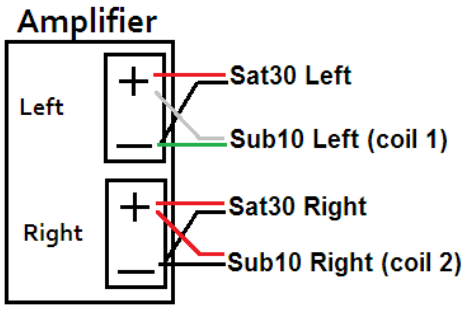
7. The canopies will stretch after about 3 weeks. Retighten the turnbuckles at that point.

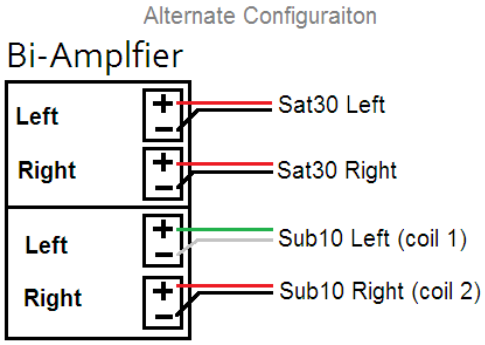
Atrium Sat30 Loudspeakers Installation Procedures

Connect only two Sat30 loudspeakers per stereo channel.

The atrium Sat30 and Atrium Sub10 each come with 3 feet of CL# speaker wire, which is rated for underground burial. The Sat30 has two conductors—one red that is labeled "+" and one that is labeled "-". The Sub10 has four conductors, (white, green, red, and black) because it has dual voice coil. Follow the correct polarity during hookup to avoid performance issues and/or damage to your amplifier.

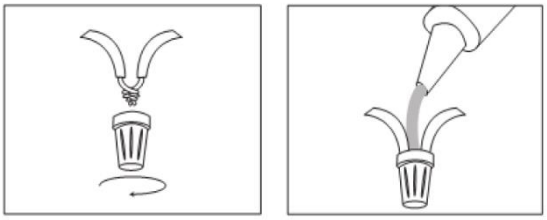
A standard configuration for outdoor listening includes two Sat30 loudspeakers and a single Sub10 subwoofer.





* You must connect the left and right channels to achieve maximum output. Observe positive and negative polarity. Reversing polarity of a dual voice coil subwoofer will result in diminished bass output and possible damage.

* Use provided wire nuts for all speaker connections. We recommend filling each wire nut with a small amount of silicone sealant to guarantee weatherproof connection.



Any number of Sat30 loudspeakers can be used in an installation. For applications requiring more than two Sat30 loudspeakers, use a separate amplifier channel for each additional pair of Sat30 loudspeakers. Do not use the A and B channels on your receiver to hook up two pairs of Sat30 loudspeakers, as this may overload and damage your receiver/amplifier circuitry.

Motion Sensor Light Assembly Procedures

⚠ SAFETY INFORMATION

Please read and understand this entire manual before attempting to assemble, operate or install the product.

WARNING

• This light fixture is designed to fit standard junction boxes as defined by the National Electrical Code. Consult a qualified electrician if you are not certain about the installation process. Always install wiring connections in accordance with local code, ordinances and the National Electric Code.

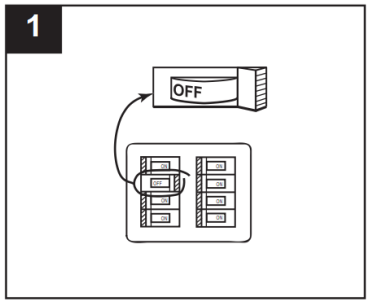
PREPARATION

Before beginning to assemble or install lighting fixture, make sure all parts are present. Compare parts with package contents listed and shown above. If any part is missing or damaged, do not attempt to assemble, install or operate the fixture. Contact customer service for replacement parts.

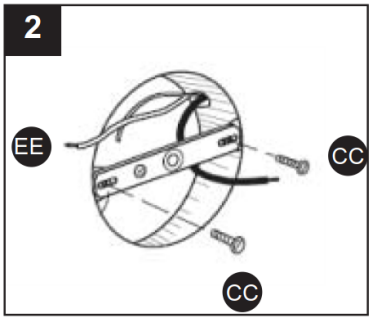
- **Estimated Assembly Time: 30-60 minutes** (Installation time will vary depending on skill level and existing wiring conditions. Estimated installation time assumes standard wall junction box and supply wiring are already installed).
- Tools Required for Assembly (not included): Phillips screwdriver, slotted screwdriver, wrench or pliers, silicone caulking adhesive and gun.
- NOTE: This fixture can be installed on a wall OR under a soffit where applicable.
- Helpful Items (not included): Wire cutters and/or wire strippers, step ladder.

ASSEMBLY INSTRUCTIONS

1. Turn OFF power to work area at main circuit breaker or fuse box. CAUTION: Do not rely on wall switch alone to turn off power. See Fig. 1.



2. Attach crossbar (EE) to junction box (not included) with the two crossbar screws (CC). See Fig. 2.



Hardware Used

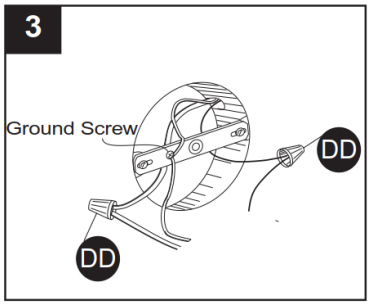
CC Crossbar Screw  x 2

EE Crossbar  x 1

ASSEMBLY INSTRUCTIONS

3. Connect bare ground wire from the fixture to the ground screw on the crossbar (EE). (The ground screw is painted green.) Connect the white wire from the outlet box to the white wire from the light (A) by twisting a wire nut (DD) onto bare ends of the wires. Connect the black wire from the outlet box to the black wire from the light (A) by twisting a second wire nut (DD) onto the bare ends of the wires.

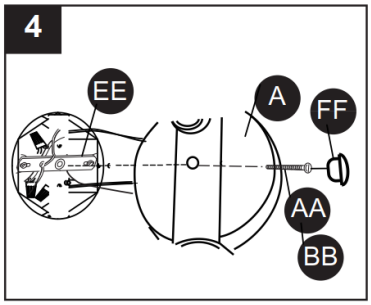
Note: The ground wire may be red and/or have a copper conductor. The white outlet box wire may be square and/or have a silver conductor.



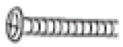
Hardware Used

DD Wire Nut  x 3

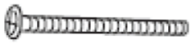
4. Make sure wire connections are secure. Carefully place wires into junction box. Position the light (A) cover plate over the crossbar (EE). Note: Long mounting screw (AA) and short mounting screw (BB) are provided for differences in screw hole depth. Put either long mounting screw (AA) or short mounting screw (BB) through the center hole and into the crossbar (EE) and tighten the screw until secure. Insert mounting screw cap (FF) into mounting screw hole. DO NOT overtighten.



Hardware Used

AA Long mounting screw  x 1

(or)

BB Short mounting screw  x 1

FF Mounting screw cap  x 1

⚠ **IMPORTANT:** After mounting the motion-activated light, apply silicone caulking compound completely around the perimeter of the cover plate where the back of the cover plate meets the mounting surface. Silicone caulking prevents water from seeping into the junction box.

⚠ **CAUTION:** Make sure motion detector head is not UPSIDE DOWN! Turn the head so the controls face the ground. If the head is turned upside down, the motion detector can be damaged by rain!

Your installation is now complete. Turn on power at circuit breaker and flip wall switch to ON position. Wall switch must remain in the ON position for the motion detector to work properly.

Maintenance Schedule – 13” Dual Motor Vacuum

Separators: Dust collection chambers should be emptied daily. Open the side door of the separator tank. Squeeze filter bags to check for paper or large liter that may have been trapped inside bags. Tap or shake bags to remove dirt and dust. Inspect bags by sight and touch for signs of wear, and replace if holes are found. Wipe gasket and edge of door opening to ensure proper seal. Close door securely and check for proper gasket seal.

Open bottom door on separator tank. Remove dirt and trash to an appropriate trash container. Check intake tube for clogs. Wipe down gasket and door opening edges to ensure proper seal. Close door securely and check for proper gasket seal.

Hoses: Activate vacuum and check suction. If hoses are clogged, clear by detaching hoses and reversing end for end. Check cuffs and nozzle for wear, and then cover hose end with hand to listen and check for leaks on the hose, doors, and gaskets.

Locks: All locks should be lubricated monthly with graphite or another suitable lubricant.

Surfaces: In order to maintain shine and prevent rust, the stainless steel separator surface and other surfaces should be cleaned and polished monthly with a stainless steel cleaner and a soft cloth.

Canister Rear Light: If light deactivates then there is a problem with the vacuum motor.

Steel Arch Blockages: Use a PVC pipe as a ramrod to clear.

Maintenance Performed	Hourly	Daily	Weekly	Monthly	4 Months
Empty Trash /Wipe Down Filter	x				
Check Gasket On Vacuum Access Door		x			
Remove Filter And Dirt Bag To Clean			x		
Clean Out Stainless Steel Arch			x		
Lubricate Locks				x	
Polish Stainless Steel Surfaces				x	
Check Hose Suction			x		

Maintenance Schedule – Central Vacuum

Producers: The Tommy Car Wash Systems Semi Central Vacuum system is virtually maintenance free. Interior filters are cleaned automatically with a reverse pulse jet, no oil is used for the motor function, and there are no brushes to replace during the life of the system.

Separators: Dust collection chambers should be emptied daily. Open the side door of the separator tank. Squeeze filter bags to check for paper or large liter that may have been trapped inside bags. Tap or shake bags to remove dirt and dust. Inspect bags by sight and touch for signs of wear, and replace if holes are found. Wipe gasket and edge of door opening to ensure proper seal. Close door securely and check for proper gasket seal.

Open bottom door on separator tank. Remove dirt and trash to an appropriate trash container. Check intake tube for clogs. Wipe down gasket and door opening edges to ensure proper seal. Close door securely and check for proper gasket seal.

Hoses: Activate vacuum and check suction. If hoses are clogged, clear by detaching hoses and reversing end for end. Check cuffs and nozzle for wear, and then cover hose end with hand to listen and check for leaks on the hose, doors, and gaskets.

Locks: All locks should be lubricated monthly with graphite or another suitable lubricant.

Surfaces: In order to maintain shine and prevent rust, the stainless steel separator surface and other surfaces should be cleaned and polished monthly with a stainless steel cleaner and a soft cloth.

Steel Arch Blockages: Use a PVC pipe as a ramrod to clear.

Grease Turbine and Motor Bearings: You must use Shell Gadus S2 V100 2 / Shell Alvania RL 2 (lithium base). Do not exceed 3 pumps per bearing, once per 120 days only.

Maintenance Performed	Daily	Weekly	Monthly	4 Months	Yearly
Inspect Lip Seal Gaskets	x				
Inspect Filter and Separator-Shake Bags	x				
Wash Filter Bags		x			
Replace Filter Bags					x
Empty separator dust collection chambers	x				
Lubricate Locks			x		
Polish Stainless Steel Surfaces			x		
Check Hose Suction		x			
Grease Turbine and Motor Bearings				x	

Recommended Replacement Parts

To search products or place orders online please visit:

- shop.tommycarwash.com/Tommy-Store/Vacuum-and-Vending (Main Components)
- shop.tommycarwash.com/Tommy-Store/Vacs-and-Vending-Parts (Parts Selection)

Part Number	Description	Comments
P-VAC-105NZL	Crevice Tool	
P-VAC-208-K	Tapered Hose Assembly	Includes Hose, Cuffs, and Fittings
P-VAC-208	Hose	
P-VAC-209	Arch to Hose Adapter Cuff	
P-VAC-220	2" Swivel Cuff	
P-VAC-224	Hose to Crevice Tool Adapter Cuff	
P-VAC-2037	2.38" to 2.69" SS T-Bolt Clamp	
E-VAC-209	Push Button Start Kit	
P-VAC-236	Door Gasket Set	
For 13" Dual Motor Vacuums		
P-VAC-2013	Vacuum Bags – Pack of 4	
P-VAC-255	Pleated Filter Protector	
P-VAC-256	Dirtbag Vacuum Pre-Filter	
P-VAC-230	Pleated Filter	
P-VAC-283	Extreme Power Vacuum Motor-New Style	Brushes non-replaceable
P-VAC-234	Brush Kit for Vacuum Motor	OLD STYLE ONLY
E-VAC-10(7/8/9/10)	Push Button Timer	Select Voltage
For Optional Vending Unit		
P-DET-KIT	Interior Cleaning Vending Kits	

ATTACHMENT D

SPEAKERPHONE SPECIFICATIONS

HME

Customer Driven

Memo

Re: Drive-Thru Sound Pressure Levels From the Menu Board or Speaker Post

The sound pressure levels from the menu board or speaker post are as follows:

1. Sound pressure level (SPL) contours (A weighted) were measured on a typical HME SPP2 speaker post. The test condition was for pink noise set to 84 dBA at 1 foot in front of the speaker. All measurements were conducted outside with the speaker post placed 8 feet from a non-absorbing building wall and at an oblique angle to the wall. These measurements should not be construed to guarantee performance with any particular speaker post in any particular environment. They are typical results obtained under the conditions described above.

2. The SPL levels are presented for different distances from the speaker post:

Distance from the Speaker (Feet)	SPL (dBA)
1 foot	84 dBA
2 feet	78 dBA
4 feet	72 dBA
8 feet	66 dBA
16 feet	60 dBA
32 feet	54 dBA

3. The above levels are based on factory recommended operating levels, which are preset for HME components and represent the optimum level for drive-thru operations in the majority of the installations.

Also, HME incorporates automatic volume control (AVC) into many of our Systems. AVC will adjust the outbound volume based on the outdoor, ambient noise level. When ambient noise levels naturally decrease at night, AVC will reduce the outbound volume on the system. See below for example:

Distance from Outside Speaker	Decibel Level of standard system with 45 dB of outside noise without AVC	Decibel level of standard system with 45 dB of outside noise with AVC active
1 foot	84 dBA	60 dBA
2 feet	78 dBA	54 dBA
4 feet	72 dBA	48 dBA
8 feet	66 dBA	42 dBA
16 feet	60 dBA	36 dBA

If there are any further questions regarding this issue please contact HME customer service at 1-800-848-4468.

Thank you for your interest in HME's products.

HM Electronics, Inc. | 14110 Stowe Drive | Poway, CA 92064
phone: 800.848.4468 | fax: 858.452.7207 | www.hme.com

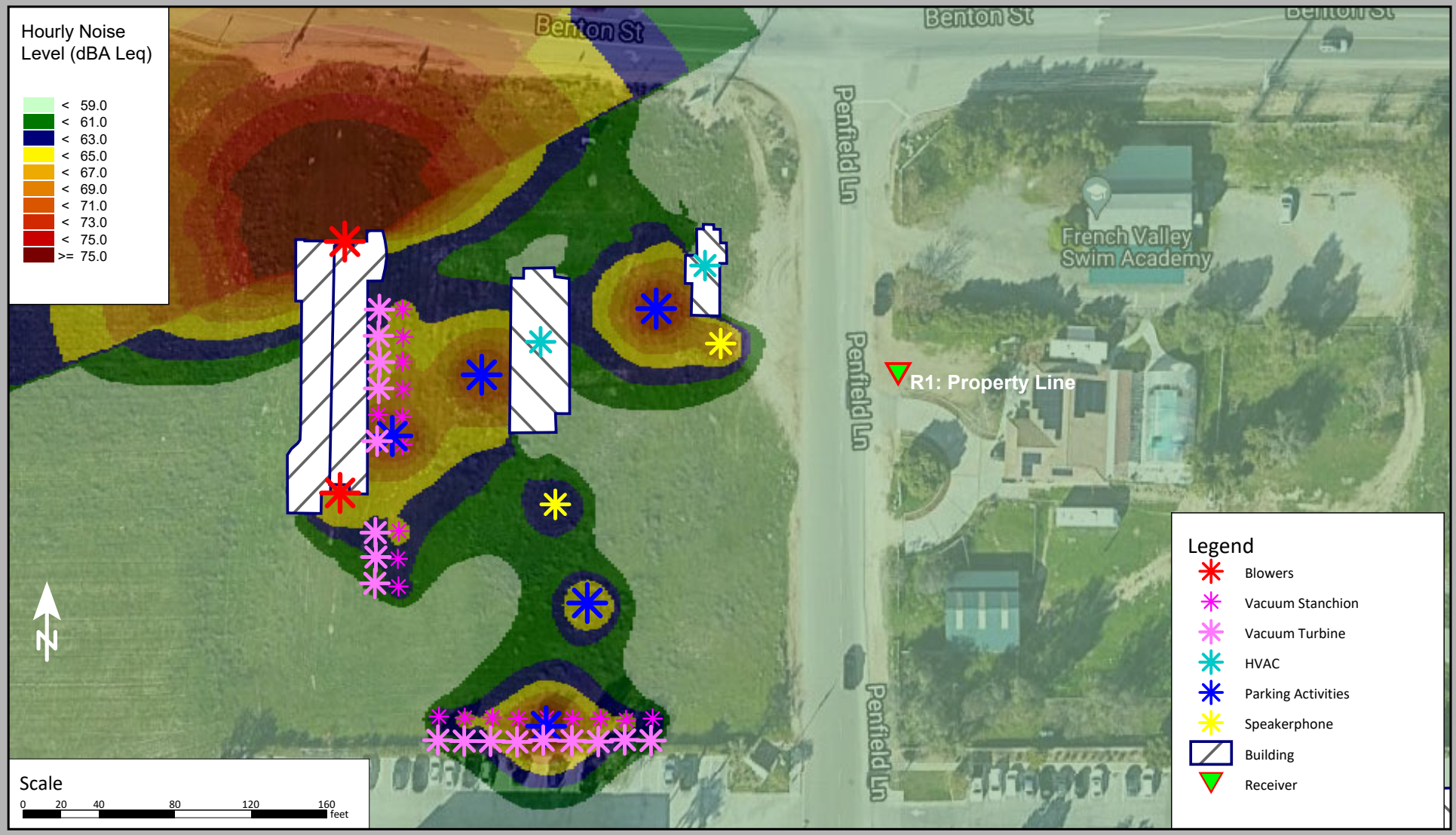
ATTACHMENT E

SOUNDPLAN PRINTOUTS

French Valley Commercial Retail Project

Project No. EGR2101

Project Operational Noise Levels - Daytime



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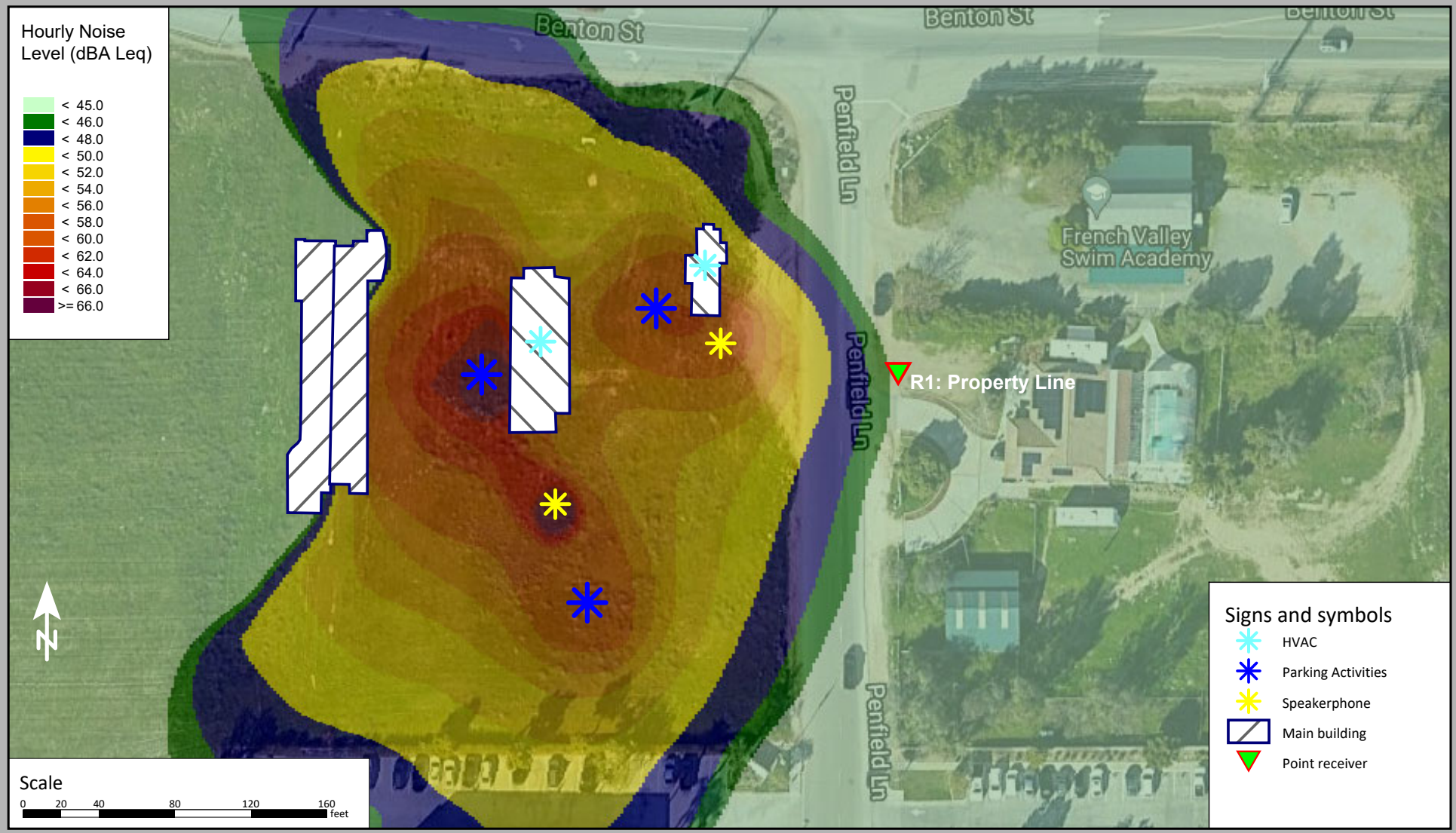
French Valley Commercial Retail Project

Project No. EGR2101

Project Operational Noise Levels - Nighttime



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