Appendix I

Noise Analysis Letter Report

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October 2, 2020 Project # CUC-01

Mr. Binh Nguyen
City of Union City
34009 Alvarado-Niles Road
Union City, CA 95487

Subject: Noise Analysis for the 1998 Whipple Road Gasoline Dispensing Facility and Convenience Store Project, Union City, California

Dear Mr. Nguyen:

HELIX Environmental Planning, Inc. (HELIX) has assessed the noise and vibration impacts associated with the construction and operation of the proposed 1998 Whipple Road Gasoline Dispensing Facility and Convenience Store Project (project). The analysis has been prepared to support environmental review under the California Environmental Quality Act (CEQA).

PROJECT LOCATION

The project site is located at 1998 Whipple Road, Union City, CA (City), at the southeast corner of the Whipple Road and Amaral Street intersection. The site coordinates are 37°36'20.74"N latitude and 122°3'30.38"W longitude (WGS84 coordinate reference system). The 0.55-acre site is currently vacant and is surrounded by industrial park and light industrial development to the north and west, respectively, and residential development to the south and east. An existing approximately 8-foot-high concrete masonry wall follows the east and south boundaries of the site, and separates the project site from the adjacent residential development. See Figure 1, *Vicinity Map* and Figure 2, *Location Map* in Attachment A.

Project Construction

Project construction is assumed to begin January 2021 and be completed in October 2021, for a total construction period of 10 months. Construction activities include site preparation, grading, installation of underground utilities and fuel tanks, construction of structures, paving, and architectural coating (e.g., painting). Project construction would also include utility work within the public right of way (ROW) for Whipple Road and Amaral Street.

PROJECT DESCRIPTION

The proposed project would consist of an approximately 2,800 square-foot (SF) 7-Eleven convenience store and a gas station with 3 multi-product dispensers (pumps), 6 dispensing stations, and three underground storage tanks (USTs; two for gasoline and one for diesel). The gasoline dispensers/refueling stations would be covered by a 1,646 SF canopy. 10 parking spaces would be provided in front of the convenience store, including 1 ADA/van accessible parking space. Landscaping and bioretention areas would comprise approximately 6,252 sf (27 percent) of the site. The remaining areas of the project site would be impervious surfaces (pavement or concrete). See Figure 3, *Proposed Site Plan* in Attachment A. The facility would operate 24-hours, 7-days a week with 2 to 3 employees per 8-hour shift. It is anticipated that 2.7 million gallons of fuel would be dispensed annually.

A three-foot wide median island would be constructed on Whipple Road to control turning movements to/from Whipple Road.

The existing overhead utility lines along Amaral Street adjacent to the project site, and crossing Whipple Road, would be terminated at new and existing utility vaults and/or relocated to new underground utility conduits which would extend across Whipple Road to an existing pole on the north side of the street.

EXISTING NOISE SETTING

The project site is located on a vacant lot at the southeast corner of Whipple Road and Amaral Street. Surrounding land uses include single family residential neighborhoods to the south and east; commercial businesses across Amaral Street to the west and across Whipple Road to the northwest; and an industrial/warehouse building across Whipple Road to the north. Noise sources in the project vicinity include traffic noise from Whipple Road and Amaral Street; commercial and residential heating, ventilation and air conditions (HVAC) systems; commercial aircraft approaching Oakland International Airport; and typical urban noises such as landscape maintenance equipment, emergency vehicles, solid waste collection trucks, and pets.

Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise, such as residential dwellings, schools, hospitals, educational facilities, and libraries. Industrial and commercial land uses are generally not considered sensitive to noise. The closest NSLUs to the project site are five single-family residential properties adjacent to the project site to the south and east. An existing, approximately 8-feet high, solid-masonry wall along the project's south and east property line separates the project site from the single-family residences.

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

NOISE TERMINOLOGY AND METRICS

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ} and represent a period of one hour unless otherwise specified. The

Community Noise Equivalent Level (CNEL) is a 24-hour weighted average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dBA weighting, and sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dBA weighting. This is similar to the Day Night sound level (L_{DN}), which is a 24-hour average with an added 10 dBA weighting on the same nighttime hours but no added weighting on the evening hours.

Because decibels are logarithmic units, sound pressure level (SPL) cannot be added or subtracted through standard arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dBA increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than from one source under the same conditions. For example, if one automobile produces an SPL of 70 dBA when it passes an observer, two cars passing simultaneously would not produce 140 dBA—rather, they would combine to produce 73 dBA. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dBA louder than one source.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dBA changes in sound levels, when exposed to steady, single-frequency (“pure-tone”) signals in the mid-frequency (1,000 Hz to 8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dBA are generally not perceptible. It is widely accepted, however, that people begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dBA increase is generally perceived as a distinctly noticeable increase, and a 10-dBA increase is generally perceived as a doubling of loudness.

To place noise levels measured in dBA in context, typical noise levels for common outdoor and indoor noise sources are shown in Table 1, *Typical Noise Levels*.

Table 1
TYPICAL NOISE LEVELS

Common Outdoor Noise	Noise Level (dBA)	Common Indoor Noise
	110	Rock band
Jet flyover at 1000 feet		
	100	
Gas lawn mower at 3 feet		
Diesel truck at 50 feet at 50 mph	90	
		Food blender at 3 feet
Noisy urban area, daytime	80	Garbage disposal at 3 feet
Gas lawn mower at 100 feet	70	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60	
		Large business office
Quiet urban area, daytime	50	Dishwasher in next room
Quiet urban area, nighttime	40	Theater, large conference room (background)
Quiet suburban area, nighttime		

Table 1 (cont.)
TYPICAL NOISE LEVELS

Common Outdoor Noise	Noise Level (dBA)	Common Indoor Noise
	30	Library
Quiet rural area, nighttime		Bedroom at night, concert hall (background)
	20	
		Broadcast/recording studio
	10	
	0	

Source: Caltrans 2009

GROUNDBORNE VIBRATION TERMINOLOGY AND METRICS

Groundborne vibration consists of rapidly fluctuating motions or waves transmitted through the ground with an average motion of zero. Sources of groundborne vibrations include natural phenomena and anthropogenic causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions). Several different methods are typically used to quantify vibration amplitude. One is the peak particle velocity (PPV); another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. For the purposes of this analysis, a PPV descriptor with units of inches per second (in/sec) is used to evaluate construction-generated vibration for building damage and human complaints. Generally, a PPV of less than 0.08 in/sec does not produce perceptible vibration. At 0.10 PPV in/sec, continuous vibrations may begin to annoy people, and it is the level at which there is a risk of architectural damage (e.g., cracking of plaster) to historical buildings and other vibration-sensitive structures. A level of 0.30 PPV in/sec is commonly used as a threshold for risk of architectural damage to standard dwellings (Caltrans 2013a).

REGULATORY FRAMEWORK

The City 2040 General Plan Safety Element includes policies related to noise that would be applicable to the project (City 2019a): Policy S-8.2 requires review of new development to determine whether noise levels on site are consistent with the noise exposure standards. For commercial uses, Table S-8.1 from the General Plan Safety Element defines “normally acceptable” as less than 70 dBA CNEL or L_{DN}; “conditionally acceptable” as 70 to 75 dBA CNEL or L_{DN}; and “normally unacceptable” as greater than 75 dBA CNEL or $L_{DN;}$ Policy S-8.8 limits construction activities to between the hours of 8:00 a.m. and 8:00 p.m. on Monday through Friday, 9:00 a.m. and 8:00 p.m. on Saturdays, and 10:00 a.m. and 6:00 p.m. on Sundays and holidays; Policy S-8.9 requires the implementation of construction noise control measures as standard conditions of approval; Policy S-8.9 requires the implementation of construction vibrations control measures as standard conditions of approval, including avoiding the use of vibratory rollers within 50 feet of buildings that are susceptible to damage from vibration.

The City Municipal Code, Chapter 9.40 – Community Noise contains the following ordinances that would be applicable to noise generated by the project (City 2019b):

9.40.042 Commercial and industrial property noise limits. No person shall produce, suffer or allow to be produced by any machine or device, or any combination of same, on commercial or industrial property, a noise level more than 12 dBA above the local ambient at any point outside of the property line.

"Local ambient" is defined in Section 9.40.030 as: The lowest sound level repeating itself at a certain location during a six-minute period as measured with a precision sound level meter, using slow response and "A" weighting. The local ambient noise level shall be determined with the noise source at issue silent, and in the same location as the measurement of the noise level of the source or sources at issue. In no case shall the local ambient be considered to be less than 40 dBA.

9.40.050 Daytime exceptions. Any noise source which does not produce a noise level exceeding 70 dBA at a distance of 25 feet from the noise source under its most noisy condition of use shall be exempt from the provisions of Article 4 [Prohibited Acts; 9.40.040 through 9.40.044] between the hours of eight a.m. and eight p.m. daily except Sundays and holidays, when the exemption herein shall apply between ten a.m. and six p.m.

9.40.053 Construction. Notwithstanding any other provision of this chapter, between the hours of eight a.m. and eight p.m. daily except Saturday, when the exemption herein shall apply between nine a.m. and eight p.m. and Sundays and holidays, when the exemption herein shall apply between ten a.m. and six p.m., construction, alteration, or repair activities which are authorized by valid City permit shall be allowed if they meet at least one of the following noise limitations:

A. No individual piece of equipment shall produce a noise level exceeding 83 dBA at a distance of 25 feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to twenty-five feet from the equipment as possible.

B. The noise level at any point outside the property plane of the project shall not exceed 86 dBA.

METHODOLOGY

Modeling of the exterior noise emitted on the project site was accomplished using the noise modeling software Computer Aided Noise Abatement (CadnaA) version 2019. CadnaA is a model-based computer program developed by DataKustik for predicting noise impacts in a wide variety of conditions. CadnaA assists in the calculation, presentation, assessment, and mitigation of noise exposure. It allows for the input of project related information, such as noise source data, barriers, structures, and topography to create a detailed digital environmental noise model to predict outdoor noise impacts. The following assumptions were used in modeling the project's on-site operational noise:

Heating, Ventilation, and Air Conditioning Units

Standard HVAC planning assumes one ton of HVAC for every 350 SF of habitable space (American Society of Heating, Refrigeration, and Air Conditioning Engineers [ASHRAE] 2012). Based on the 2,800 SF building size, one 10-ton unit would be required for the Project. Specific HVAC information for the project, including unit types and locations, was not available at the time of the analysis. This analysis assumes a 10-ton Carrier Centurion Model 50 PG03-12 with a sound rating of 80 dBA sound power. This unit produces noise levels of 45 dBA L_{EQ} at 50 feet, which would be reduced by at least 5 dBA by standard parapet walls installed on a building's roofline. The manufacturer's data sheets are included in Attachment B to this report.

Commercial Refrigeration

Specific information for the convenience store's planned refrigeration condensers was not available at the time of the analysis. This analysis assumes the use of two Hussman Proto-Air 3280 units. The units would use 0.5-horsepower (HP), 1140 revolutions per minute (RPM) motors and variable speed drives (fan speed controllers). The fan was assumed to operate ate 1140 RPM for daytime operations and 850 RPM for nighttime operations. The modeled noise levels from the refrigeration unit fans is shown in Table 2, *Typical Refrigeration Condenser Unit Fan Noise*. The manufacturer's data sheets are included in Attachment B to this report.

Table 2
TYPICAL REFRIGERATION CONDENSER UNIT FAN NOISE

Noise Levels in Decibels[1] (dBA) Measured at Octave Frequencies in Hertz (Hz)								Overall Noise Level
Fan Type	**63 Hz**	**125 Hz**	**250 Hz**	**500 Hz**	**1 KHz**	**2 KHz**	**4 KHz**	**(dBA)**
Single Fan 1,140 RPM	90.6	93.6	89.6	86.6	84.6	79.6	75.6	86.3
Single Fan 850 RPM	80.6	83.6	79.6	76.6	74.6	69.6	65.5	79.3

[1] Sound Power Levels (S_{WL})
dBA= A-weighted decibels; Hz = hertz; kHz = kilohertz; RPM = revolutions per minute

Air Compressor

Gasoline stations are required by California law to provide air compressors and water for vehicles. The air is typically provided by a small compressor near the gas pumps. Field measurements of typical small air compressor units used at California gas stations showed operating noise ranging from a 65 dBA to 85 dBA measured at 5 feet from the unit. Air compressors are assumed to be used once per hour, with a two-minute cycle time. This analysis conservatively assumes the air compressor generates 85 dBA at 5 feet.

Parking Lot Noise

The project would include ten at-grade parking spaces around the proposed convenience store, which could be a source of nuisance noise. Typical parking lots noise events include vehicle movement, engines starting and stopping, doors slamming, car alarms and horns, and conversations. In addition, the 6 fuel dispensing stations would generate similar noise events to parking areas. The project's parking spaces, and fuel dispensing stations were modeled as parking areas in CadnaA. Based on the project trip generation analysis in the Traffic Impact Analysis (TIA), an average of 1,935 vehicles per day are anticipated to enter and exit the project driveways, or an average of 81 vehicles per hour (KD Anderson 2020). Based on the trip generation, the following conservative (high) estimate of events per hour per space was used in the model: 6 per hour daytime and 2 per hour nighttime for gasoline dispensing stations; 5 per hour daytime and 2 per hour nighttime for the five parking spaces in front of the store entrance; and 3 per hour daytime and 1 per hour nighttime for the five parking spaces at the south of the parking lot.

Delivery Truck Noise

Truck deliveries could result in the occasional use of backup alarms for periods of approximately 30 seconds. Because the noise events related to truck deliveries would be infrequent and of short duration, it is not anticipated that these events would substantially increase the project's hourly average on-site noise generation (L_{EQ}). Therefore, these noise events are not included in the project's operational noise modeling and analysis.

The off-site traffic noise was modeled using the United States Department of Transportation (USDOT) Traffic Noise Model (TNM) version 2.5. The TNM calculates the daytime average hourly L_{EQ} from three-dimensional model inputs and traffic data (USDOT 2004). The one-hour L_{EQ} noise level is calculated utilizing peak-hour traffic. The model-calculated one-hour L_{EQ} noise output is approximately equivalent to the L_{DN} (Caltrans 2013b).

Construction Equipment Noise

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

PROJECT ANALYSIS

a) *Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies*?

Construction (Temporary) Noise

Construction of the project would generate noise from the use of heavy construction equipment. Based on the construction modeling from the air quality emissions analysis for the project, the most intense use of heavy construction equipment would be during the site-preparation and grading/excavation phases and could include graders, backhoes, concrete saws, excavators, and rubber-tired dozers. The site-preparation and grading/excavation phases are anticipated to last a total of approximately 20 workdays. According to the air quality analysis completed for the project, the site-preparation and grading/excavation phases are anticipated to last a total of approximately 20 workdays (HELIX 2020). Construction equipment could be used sporadically throughout the project site but would be concentrated primarily in areas requiring substantial improvements (such as excavation for the underground fuel tanks and the building foundations). Multiple pieces of construction equipment would rarely be used simultaneously in close proximity to each other.

The loudest piece of construction equipment anticipated to be used on the project site would be a concrete saw. According to the RCNM, a concrete saw generates noise levels of approximately 88.6 dBA L_{EQ} at a distance of 25 feet. A concrete saw could be used approximately 20 feet from the residential property line to the south. According to the Federal Highway Administration's (FHWA) *Noise Barrier Handbook*, noise reductions from sound walls in the range from 5 to 10 dBA are attainable (FHWA

2020). Therefore, 8 dBA of estimated shielding from the existing approximately 8-foot high solid-masonry wall was used in the modeling. The predicted noise from the concrete saw measured on the residential properties adjacent to the project site would be approximately 82.5 dBA L_{EQ}. The RCNM modeling output is included as Attachment C to this report. Therefore, this noise level would not exceed the City Community Noise Ordinance standard for construction of 86 dBA. In addition, the project's construction activities would be required to comply with the construction noise control measures specified in the City General Plan Policy S-8.9, which includes requirements for: maintenance; prohibition of certain activities; placement of noise-generating equipment to reduce noise levels; and notification to neighbors of construction activities.

Utility work performed within the public ROW along Amaral Street would include the installation of a new utility pole approximately 5 feet from the residential property line south of the project site. The loudest construction equipment required installation of the utility pole would be a truck mounted auger drill. The engine of truck would be the primary noise source and would be located approximately 15 feet from the property line. According to the RCNM, a drill rig truck generates noise levels of approximately 79.1 dBA L_{EQ} at a distance of 25 feet. At 15 feet, a drill rig truck would result in approximately 82.6 dBA L_{EQ} (see Attachment B to this report). The equipment required for installation of utility vaults and trenchless boring under Whipple Road would operate further from NSLUs and would result in lower noise levels measured at the closest NSLU property line, compared to the utility pole drill rig truck. Therefore, the noise level from utility work in the public ROW would not exceed the City Community Noise Ordinance standard for construction of 86 dBA.

Therefore, the project's construction activity performed on-site, and utility work performed in the public ROW, would not result in a temporary increase in ambient noise in excess of the City Community Noise Ordinance standard of 86 dBA (identified in Sections 9.40.053 of the City Municipal Code, discussed above) and the impact would be less than significant.

Operational (Permanent) Noise

On-Site Noise

The proposed operational noise sources for the project include HVAC systems, refrigeration condensers for the convenience store; an air compressor for customer tire inflation; parking lot noise; delivery truck noise; and off-site traffic noise from vehicles traveling to and from the project site. Modeling assumed one hour of continuous operation of all equipment except for the compressor which was modeled as operating for two minutes per hour. The existing 8-foot high solid masonry wall along the project's south and east property line is included in the modeling as an acoustic barrier. Modeled noise levels were analyzed at receivers at a height of five feet above the ground, placed at distances of 10, 15, and 20 feet from the property line of the five closest single-family residences. The modeled 1-hour (L_{EQ}) noise level at these receivers is compared with the City Community Noise Ordinance standard of 52 dBA L_{EQ} for noise produced on a commercial property (defined in Sections 9.40.030 and 9.40.042 of the City Municipal Code ,12 dBA above the minimum local ambient noise level of 40 dBA L_{EQ}). The highest modeled noise level from the combined operational noise sources, measured on the adjacent residential properties would be 44.1 dBA L_{EQ}. This location is approximately 15 feet from the property line south of the proposed air compressor (see Figure 3). Operational noise levels would not exceed the City standard of 52 dBA L_{EQ} at nearby residences. The highest operational noise level measured at the surrounding commercial properties would be 48.7 dBA L_{EQ}, measured across Amaral Street to the west of the proposed gas pumps location, and would not exceed the City standard of 52 dBA L_{EQ}. Therefore, the project's non-transportation operational noise would not result in a permanent increase in ambient noise in excess of the City standards and the impact would be less than significant.

Off-Site Traffic Noise

Off-site traffic noise modeling is based on data in the TIS (KD Anderson 2020). Traffic data includes traffic estimates for surrounding street segments for the Existing, Existing plus Project; Cumulative; and Cumulative plus Project conditions. Table 3, Project Traffic Volumes, shows the traffic volumes on surrounding streets. Anticipated future traffic noise levels are based on the forecasted peak hour traffic volumes. All traffic was modeled using the posted speed limits: 40 miles per hour (mph) for Whipple Road, and 25 mph for Amaral Street and Almaden Boulevard. A typical vehicle mix of 96 percent cars and light trucks, 3 percent medium trucks, and 1 percent heavy trucks was used for modeling existing and future noise conditions in the vicinity of the Project for all road segments.

Table 3
PROJECT TRAFFIC VOLUMES

Roadway Segment	Peak Hour Existing (2020)	Peak Hour Existing + Project	Peak Hour Cumulative (2040)	Peak Hour Cumulative+ Project
Whipple Road				
Amaral Street to Huntwood Avenue	1,924	1,939	3,767	3,782
Amaral Street				
Whipple Road to Almaden Boulevard	278	308	579	596
Almaden Boulevard				
Amaral Street to Ascot Way	326	329	602	604

Source: KD Anderson 2020

The project-generated traffic noise roadway modeling represents a conservative analysis that does not take into account topography or attenuation provided by existing structures. The results of this analysis for the L_{DN} at the nearest NSLU to the roadway segments are shown below in Table 4, Project-Generated Traffic Noise Levels.

Table 4
PROJECT-GENERATED TRAFFIC NOISE LEVELS

Roadway Segment	Distance to Nearest NSLU (feet)[1]	NSLU Type	L_{DN} at Nearest NSLU					
			Existing (2020)			Cumulative (2040)		
			2020	2020 + Project	Change in L_{DN}	2040	2040 + Project	Change in L_{DN}
Whipple Road								
Amaral Street to Huntwood Avenue	55	SF	69.0	69.0	<0.1	71.9	72.0	0.1
Amaral Street								
Whipple Road to Almaden Boulevard	35	SF	57.8	58.4	0.6	61.0	61.4	0.4
Almaden Boulevard								
Amaral Street to Ascot Way	35	SF	58.7	58.7	<0.1	61.4	61.4	<0.1

[1] Distance measured from roadway centerline.
NSLU = Noise Sensitive Land Use; SF = Single-Family Residential

As shown in Table 4, exterior traffic noise levels on surrounding roadways would increase by less than one decibel in existing and future conditions as a result of the project. The maximum increase in noise levels from project-added traffic would be 0.6 dBA $L_{DN.}$ In typical noisy environments, changes in sound levels of 1 to 2 dBA are generally not perceptible. A sound level change of 3 dBA is considered a barely perceptible increase and a sound level change of 5 dBA is considered a readily perceptible increase (Caltrans 2009). Therefore, project-generated transportation noise would not result in the generation of a substantial permanent increase in ambient noise levels in the vicinity of the project and the impact would be less than significant.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Construction activities known to generate excessive ground-borne vibration, such as pile driving, would not be conducted by the project. A possible source of vibration during general project construction activities would be a vibratory roller, which may be used within 60 feet of the nearest off-site residences, south and east of the project site. A large vibratory roller would create approximately 0.210 inch per second PPV at a distance of 25 feet (Caltrans 2013a). A 0.210 inch per second PPV vibration level would equal 0.08 inch per second PPV at a distance of 60 feet[1]. This would be less than what is considered a "strongly perceptible" impact for humans of 0.1 inches per second PPV, and less than the structural damage impact to older residential structures of 0.3 inch per second PPV. In addition, the project's construction activities would be required to comply with the construction vibration control measures specified in the City General Plan Policy S-8.10, which includes a prohibition from using vibratory rollers within 50 feet of structures susceptible to damage. Therefore, although vibrations from a vibratory roller may be perceptible to nearby human receptors, temporary impacts associated with the roller (and other potential equipment) would be less than significant.

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

c) *For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?*

The closest airport or private airstrip to the project site is the Hayward Executive Airport, approximately 4.5 miles northwest of the project. The project site is not within the airport influence area, or the 65 dBA CNEL noise contour for Hayward Executive Airport (Alameda County 2012). Commercial aircraft overfly the project site while approaching or departing the Oakland International Airport, approximately 11 miles northwest. According to noise exposure maps for the Oakland International Airport, the project site in not within the 65 dBA CNEL contour for the Oakland International Airport (Port of Oakland 2006). Therefore, the project would not expose people residing or working in the project area to excessive noise levels from airports and there would be no impact.

SUMMARY

Temporary construction would be limited to the hours specified in the City Noise Ordinance and noise levels would not exceed the City standards. Long term operation of the project would not result in machinery and equipment noise in exceedance of the City standards, measured at nearby commercial and residential property lines. Off-site traffic noise increases from project-generated traffic would not result in a noticeable increase in ambient noise levels. Noise impacts from short-term temporary construction activities and long-term operational activities would be less than significant. Ground-borne vibrations generated by the project during short-term construction activities and during long-term operation would be less than significant. The project would not expose persons working in the project area to excessive noise from airports and there would be no impact associated with airports.

Sincerely,

Martin D. Rolph

Martin Rolph
Noise Specialist

Joanne M. Dramko, AICP
Senior Noise Specialist

Attachments:

Attachment A: Figures
Attachment B: Equipment Specifications
Attachment C: RCNM Output

REFERENCES

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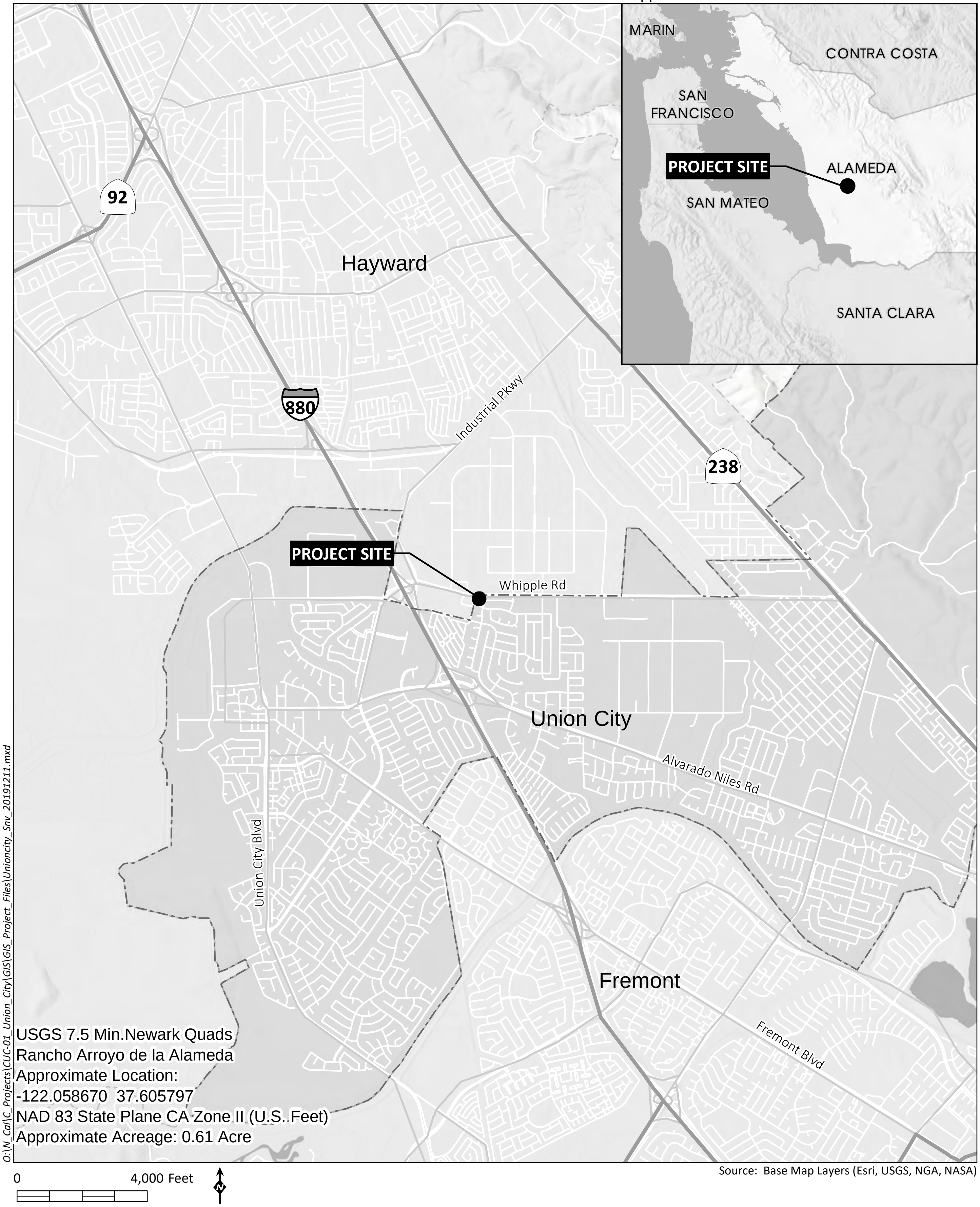
Attachment A

Figures



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

HELIX Environmental Planning

Vicinity Map

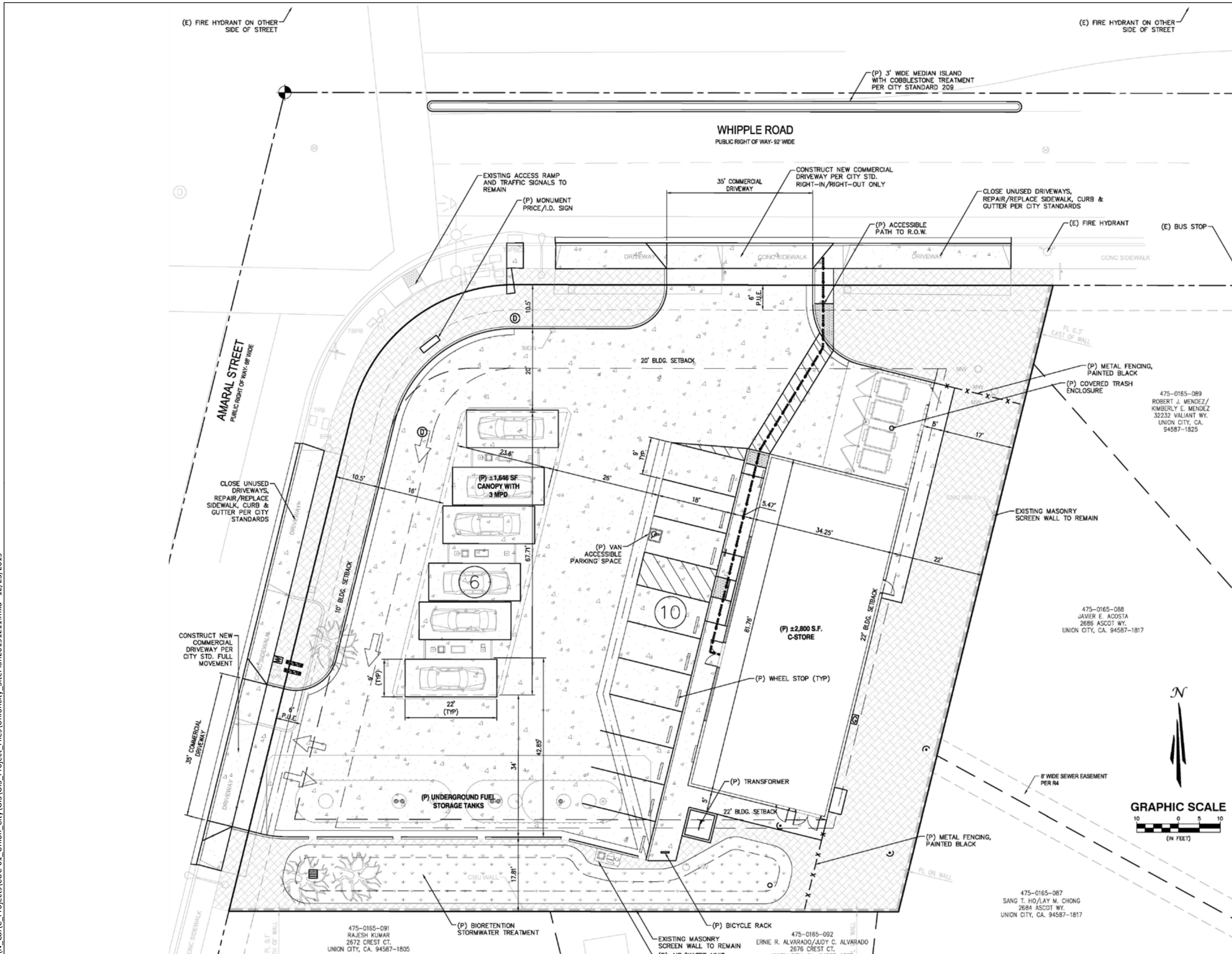
Figure 1

Source: ESRI Base Maps

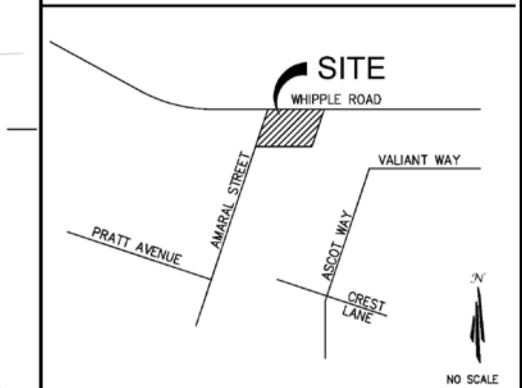
HELIX Environmental Planning

Location Map

Figure 2



VICINITY MAP



PROJECT DATA

PROJECT INFORMATION:	
APPLICANT:	TAIT & ASSOCIATES, INC. ATTN: KIM BARNETT 11280 TRADE CENTER DRIVE RANCHO CORDOVA, CA 95742 TEL: (916) 669-1822 kbarnett@tait.com
ASSESSOR'S PARCEL NUMBER(S):	475-0165-090
ADDRESS:	7-ELEVEN 1998 WHIPPLE ROAD UNION CITY, CA 94587
PROJECT DESCRIPTION:	NEW CONSTRUCTION- GROUND UP 7-11 CONVENIENCE STORE AND FUEL STATION
ADJACENT ZONING:	NORTH: INDUSTRIAL SOUTH; SINGLE FAMILY RESIDENTIAL EAST; SINGLE FAMILY RESIDENTIAL WEST: COMMERCIAL ZONING
EXISTING ZONING:	NC - NEIGHBORHOOD COMMERCIAL
EXISTING LAND USE:	EMPTY LOT
PROPOSED ZONING:	NC - NEIGHBORHOOD COMMERCIAL
PROPOSED LAND USE:	CONVENIENCE STORE & AUTO FUELING STATION
BUILDING INFORMATION:	
PROPOSED SITE AREA:	±22,833 (±0.55 ACRES)
PROPOSED BUILDING AREA:	±2,800 SF
PROPOSED BUILDING COVERAGE:	±12%
PROPOSED PAVED AREA::	±13,139 SF (58%)
PROPOSED LANDSCAPE AREA::	±6,894 SF (30%)
BUILDING HEIGHT:	55 FEET MAXIMUM
REQUIRED BUILDING SETBACKS	
FRONT	10 FT
REAR	10 FT
SIDE (STREET)	20 FT
SIDE (INTERIOR)	20 FT
PARKING REQUIREMENTS:	
PARKING REQUIRED:	16 STALLS (1 STALL PER 175 SF)
PARKING PROVIDED:	16 STALLS (INCLUDES 6 SPACES AT FUEL ISLANDS)
ACCESSIBLE PARKING REQUIRED:	1 STALL
ACCESSIBLE PARKING PROVIDED:	1 STALL
BICYCLE PARKING REQUIRED:	2 SPACES
BICYCLE PARKING PROVIDED:	3 SPACES
UTILITY INFORMATION:	
ELECTRICAL:	PG&E
GAS:	PG&E
WATER:	ALAMEDA COUNTY WATER DISTRICT
STORM SEWER:	UNION SANITARY DISTRICT
SEWER:	CITY OF UNION CITY

LEGEND

Source: TAIT & Associates, 2019

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Proposed Site Plan

Figure 3

Attachment B

Equipment Specifications

50PG03–28
Ultra High Efficiency Single Package Electric Cooling with Optional Electric Heat Commercial Rooftop Units with PURON® (R–410A) Refrigerant, Optional EnergyX™ (Energy Recovery Ventilator)

Carrier®
Turn to the Experts.℠

Product Data

CENTURION

EnergyX model shown

DEALER DESIGN AWARDS
the NEWS | GOLD

BUILDINGS magazine
Editors' Choice
TOP 100 PRODUCTS
2005

Puron®
the environmentally sound refrigerant

Operation Air Quantity Limits

50PG03-16 Units

UNIT 50PG	COOLING (cfm)		HEATING (cfm) ELECTRIC HEAT	
	Min	Max	Min	Max
03	600	1000	600	1000
04	900	1500	900	1500
05	1200	2000	1200	2000
06	1500	2500	1500	2500
07	1800	3000	1800	3000
08	2250	3750	2250	3750
09	2550	4250	2550	4250
12	3000	5000	3000	5000
14	3750	6250	3750	6250
16	4500	7500	4500	7500

50PG

50PG20-28 Units

50PG	COOLING		ELECTRIC HEAT	ELECTRIC HEAT (Vertical)	ELECTRIC HEAT (Horizontal)
	Minimum Cfm	Maximum Cfm		Minimum Cfm	Minimum Cfm
20	5000	9,000	High Heat (75 kW)	4,500	5,400
			Medium Heat (50 kW)	3,750	4,800
			Low Heat (25 kW)	3,750	3,750
24	5500	10,000	High Heat (75 kW)	4,500	5,400
			Medium Heat (50 kW)	3,750	4,800
			Low Heat (25 kW)	3,750	3,750
28	6500	12,000	High Heat (75 kW)	4,500	5,400
			Medium Heat (50 kW)	3,750	4,800
			Low Heat (25 kW)	3,750	3,750

Outdoor Sound Power (Total Unit)

UNIT 50PG	A-WEIGHTED* (dB)	OCTAVE BAND LEVELS dB							
		63	125	250	500	1000	2000	4000	8000
03	75.0	82.6	79.9	75.7	73.3	70.0	64.3	58.4	50.5
04	73.2	79.8	77.2	74.1	70.1	68.0	63.6	58.4	51.9
05	71.9	79.7	79.6	72.6	69.6	66.0	61.4	56.4	48.5
06	78.5	82.2	82.6	79.5	75.7	73.9	68.6	64.0	56.3
07	78.5	87.5	83.0	78.5	76.3	73.8	68.4	63.8	56.5
08	80.0	91.7	83.6	81.0	77.9	75.0	69.9	66.0	59.3
09	79.9	89.1	82.7	80.0	77.7	75.0	70.2	66.3	57.8
12	80.0	90.4	83.1	80.9	77.8	75.2	70.0	66.1	57.6
14	83.3	86.4	85.9	85.3	81.8	78.2	72.2	67.9	59.9
16	84.0	90.3	85.2	83.5	81.1	79.0	73.7	70.5	65.4
20	81.7	90.2	84.8	80.7	79.0	77.6	71.4	66.7	60.7
24	84.9	90.0	86.3	83.6	82.9	80.3	74.9	71.4	66.5
28	84.9	90.0	86.3	83.6	82.9	80.3	74.9	71.4	66.5

LEGEND
db – Decibel
*Sound Rating ARI or Tone Adjusted, A–Weighted Sound Power Level in dB. For sizes 03–12, the sound rating is in accordance with ARI Standard 270–1995. For sizes 14–28, the sound rating is in accordance with ARI 370–2001.

Outdoor Sound Power (Total Unit) with High CFM EnergyX

UNIT 50PG w/ERV	A−WEIGHTED* (dB)	OCTAVE BAND LEVELS dB							
		63	125	250	500	1000	2000	4000	8000
03	83.0	82.8	81.4	79.7	78.1	77.9	76.5	72.5	70.1
04	82.7	80.2	79.6	79.1	77.3	77.6	76.5	72.5	70.1
05	82.6	80.1	81.1	78.8	77.2	77.4	76.4	72.4	70.0
06	83.8	82.4	83.4	81.6	79.1	78.8	76.9	72.9	70.2
07	83.8	87.6	83.8	81.1	79.3	78.8	76.9	72.9	70.2
08	87.3	92.0	86.8	84.5	82.4	81.8	80.5	78.0	74.2
09	87.2	89.6	86.4	84.1	82.4	81.8	80.5	78.1	74.2
12	87.3	90.8	86.5	84.5	82.4	81.8	80.5	78.0	74.2
14	88.2	87.2	88.0	87.0	84.2	82.7	80.8	78.2	74.3
16	91.4	93.2	92.8	88.2	86.3	85.5	84.4	83.4	78.4
20	91.2	93.1	92.7	87.4	85.8	85.2	84.2	83.3	78.3
24	91.7	93.0	93.0	88.2	86.9	85.8	84.5	83.5	78.5
28	91.7	93.0	93.0	88.2	86.9	85.8	84.5	83.5	78.5

LEGEND
dB − Decibel
* Sound Rating ARI or tone Adjusted, A−Weighted Sound Power Level in dB. For sizes 03−12, the sound rating is in accordance with ARI Standard 270−1995. For sizes 14−28, the sound rating is in accordance with ARI 370−2001.

PHYSICAL DATA

50PG03-07

BASE UNIT 50PG		03	04	05	06	07
NOMINAL CAPACITY (Tons)		2	3	4	5	6
OPERATING WEIGHT (lb)						
Unit*		704	704	775	829	874
Economizer						
Vertical		40	40	40	40	40
Horizontal		50	50	50	50	50
Humidi-MiZer™ Adaptive Dehumidification System		22	22	31	27	26
Roof Curb						
14-in.		122	122	122	122	122
24-in.		184	184	184	184	184
COMPRESSOR				Fully Hermetic Scroll		
Quantity		1	1	1	1	1
Oil Type				Copeland 3MA		
Number of Refrigerant Circuits		1	1	1	1	1
Oil (oz)		38	42	42	66	56
REFRIGERANT TYPE				R-410A (Puron® Refrigerant)		
Expansion Device		TXV	TXV	TXV	TXV	TXV
Operating Charge (lb) — Standard Unit		7.3	9.0	15.7	16.6	19.0
Operating Charge (lb) — Unit with Humidi-MiZer System		11.75	13.50	25.00	22.00	22.70
CONDENSER COIL				Enhanced Copper Tubes, Aluminum Lanced Fins		
Condenser A (Outer)						
Rows...Fins/in.		1…17	1…17	2…17	2…17	2…17
Face Area (sq ft)		12.6	12.6	12.6	12.6	12.6
Condenser B (Inner)						
Rows...Fins/in.		—	1…17	2…17	2…17	2…17
Face Area (sq ft)		—	12.6	12.6	12.6	12.6
HUMIDI-MIZER COIL				Enhanced Copper Tubes, Aluminum Lanced Fins		
Rows...Fins/in.		1...17	1...17	1...17	1...17	1...17
Face Area (sq ft)		6.4	6.4	9.3	9.3	9.3
CONDENSER FAN				Propeller		
Quantity…Diameter (in.)		1…24	1…24	1…24	1…24	1…24
Nominal Cfm (Total, all fans)		3500	3500	3500	4500	4500
Motor Hp		1/8	1/8	1/8	1/4	1/4
Nominal Rpm — High Speed		825	825	825	1100	1100
Nominal Rpm — Low Speed		300	300	300	300	300
EVAPORATOR COIL				Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Face Split		
Rows…Fins/in.		2…15	2…15	2…15	3…15	4…15
Face Area (sq ft)		9.3	9.3	9.3	9.3	9.3
EVAPORATOR FAN				Centrifugal Type, Belt Drive		
Quantity…Size (in.)	Low	1...12 x 9	1...12 x 9	1...12 x 9	1...12 x 9	1...12 x 9
	High	1...12 x 9	1...12 x 9	1...12 x 9	1...12 x 9	1...12 x 9
Type Drive	Low	Belt	Belt	Belt	Belt	Belt
	High	Belt	Belt	Belt	Belt	Belt
Nominal Cfm		800	1200	1600	2000	2400
Maximum Continuous Bhp	Low	0.85	0.85	0.85	0.85/2.40†	2.40
	High	0.85	0.85	1.60/2.40†	1.60/2.40†	3.10
Motor Nominal Rpm		1620	1620	1620	1725	1725
Motor Frame Size	Low	48Y	48Y	48Y	56Y	56Y
	High	48Y	48Y	56Y	56Y	56Y
Fan Rpm Range	Low	482-736	482-736	596-910	690-978	796-1128
	High	656-1001	796-1128	828-1173	929-1261	1150-1438
Motor Bearing Type		Ball	Ball	Ball	Ball	Ball
Maximum Fan Rpm		2000	2000	2000	2000	2000
Motor Pulley Pitch Diameter Range (in.)	Low	1.9-2.9	1.9-2.9	1.9-2.9	2.4-3.4	2.4-3.4
	High	1.9-2.9	2.4-3.4	2.4-3.4	2.8-3.8	4.0-5.0
Fan Pulley Pitch Diameter (in.)	Low	6.8	6.8	5.5	6.0	5.2
	High	5.0	5.2	5.0	5.2	6.0
Nominal Motor Shaft Diameter (in.)	Low	1/2	1/2	1/2	5/8	5/8
	High	1/2	1/2	5/8	5/8	7/8
Belt…Pitch Length (in.)	Low	49.3	49.3	49.3	49.3	49.3
	High	49.3	49.3	49.3	49.3	52.3
Belt…Type	Low	AX	AX	AX	AX	AX
	High	AX	AX	AX	AX	AX
Pulley Center Line Distance Min. (in.)	Low	16.2	16.2	16.2	16.2	16.2
	High	16.2	16.2	16.2	16.2	16.2
Pulley Center Line Distance Max. (in.)	Low	20.2	20.2	20.2	20.2	20.2
	High	20.2	20.2	20.2	20.2	20.2
Speed Change per Full Turn of Movable Pulley Flange (rpm)	Low	48	48	59	58	66
	High	65	62	69	66	58
Movable Pulley Maximum Full Turns from Closed Position	Low	5	5	5	5	5
	High	5	5	5	5	5
Factory Pulley Setting (rpm)	Low	482	482	596	690	796
	High	656	796	828	929	1150
Fan Shaft Diameter at Pulley (in.)		3/4	3/4	3/4	3/4	3/4
HIGH-PRESSURE SWITCH (psig)						
Cutout		660 ± 10	660 ± 10	660 ± 10	660 ± 10	660 ± 10
Reset (Auto.)		505 ± 20	505 ± 20	505 ± 20	505 ± 20	505 ± 20
RETURN-AIR FILTERS				Throwaway		
Quantity…Size (in.)		4…16 x 20 x 2	4…16 x 20 x 2	4…16 x 20 x 2	4…16 x 20 x 2	4…16 x 20 x 2

LEGEND

TXV – Thermostatic Expansion Valve

*Aluminum evaporator coil/aluminum condenser coil.

† Single phase/three phase

HUSSMANN®

Proto-Aire Outdoor Protocol

Environmental Benefits Compared to Traditional Rack Systems.

- Better energy efficiency reduces use of fossil fuels, reduces air pollution.
- Significantly smaller refrigerant charge reduces use of HFCs.
- Significantly lower refrigerant leak rate.

PROTO-AIRE

Outdoor Small Footprint Protocol Solution.

Proto-Aire is a compact footprint outdoor Protocol unit with an integrated air-cooled condenser and weatherproof skins. Units can be installed outside next to the store or on the roof. This allows for more flexibility with Protocol store designs and reduces space requirements for equipment inside the store.

Sustainable Solutions.

Protocol is the most widely used refrigeration system directly addressing today's environmental concerns. We are using the phrase "Sustainable Solutions" to underscore Protocol's important role in helping address environmental issues.

Hussmann is committed to developing advanced technologies that reduce the use of HFCs and improve energy efficiency. Protocol is just one of many alternatives we offer to promote sustainable solutions.

Several condenser sizes.

Proto-Aire is sized based on the compressor load and the heat of rejection requirements for the compressors. The largest condenser can support up to 450 MBH at a 20˚F TD.

Features and options.

- Weatherproof outdoor enclosure.
- Factory installed suction filters and liquid driers.
- Optional factory-installed gas defrost valves and winter control.
- Optional Polyfin and Electrofin coil coating.
- Optional oversized receiver with heat tape and insulation.
- Optional hail guards and rain doors.

All standard Protocol options.

Since the Proto-Aire builds upon the Protocol frame, all standard Protocol mechanical and electrical options are available with Proto-Aire.

Proto-Aire environmental advantages.

- Significant reduction in refrigerant charge.
- Significant reduction in greenhouse gas emissions.
- Better energy efficiency in virtually all applications.
- Less copper refrigerant piping.
- Fewer braze joints for fewer leaks.

Other advantages.

- Easy to install.
- No machine room needed.
- Lower installation costs.
- Decreases or eliminates the need for EPRs.
- Compact footprint.

Proto-Aire dimensions.

	L	H	D	Weight
Nomenclature	(in)	(in)	(in)	(lb)
3 and 4 Fan	128	56.5	42	2800
6 Fan (Super)	185	56.5	42	3700

NOTE: We reserve the right to change or revise specifications and product design in connection with any feature of our products. Such changes do not entitle the buyer to corresponding changes, improvements, additions, or replacements for equipment previously sold or shipped.

For additional resources, contact your representative or visit www.hussmann.com.

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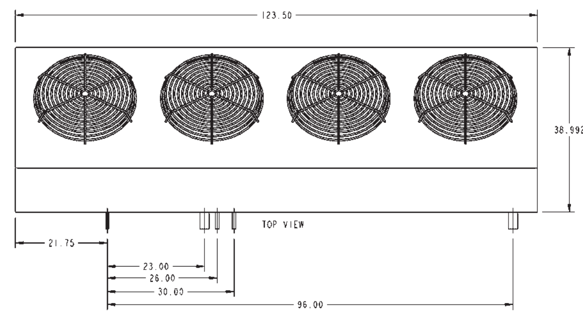

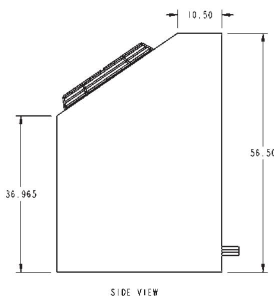

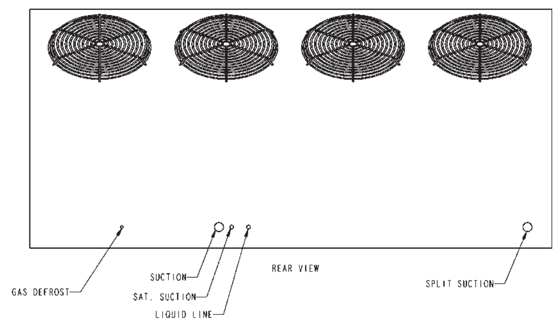

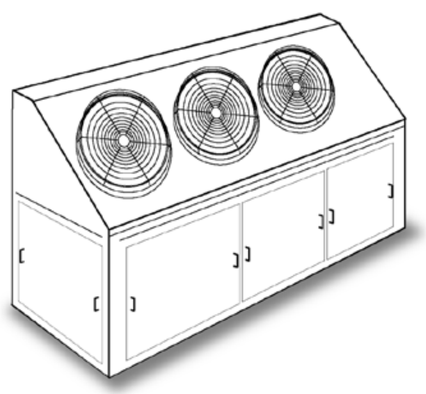

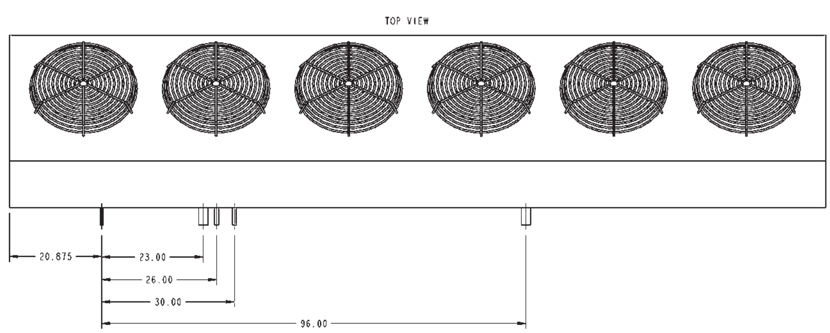

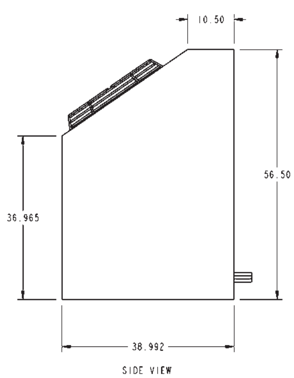

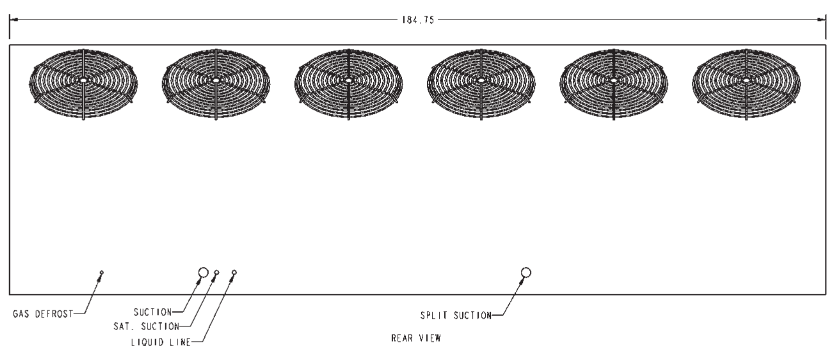

Hussmann Corporation
12999 St. Charles Rock Rd.
Bridgeton, MO 63044-2483
Ph: 314.291.2000

www.hussmann.com

Attachment C

RCNM Output

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/18/2020
Case Description: Grading/Exscavation Phase

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
SF Residential	Residential	60	60	60

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		25	8
Dozer	No	40		81.7	25	8
Backhoe	No	40		77.6	25	8
Excavator	No	40		80.7	25	8
Crane	No	16		80.6	25	8
Concrete Saw	No	20		89.6	20	8

Results

Equipment		Calculated (dBA) *Lmax	Leq
Grader		83	79
Dozer		79.7	75.7
Backhoe		75.6	71.6
Excavator		78.7	74.8
Crane		78.6	70.6
Concrete Saw		89.5	82.5
	Total	89.5	85.5

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/18/2020
Case Description: CUC-01 Utility Work

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Single-family residence	Residential	60	60	60

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	15	0
Drill Rig Truck	No	20		79.1	15	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Day Lmax
Crane		91	83	N/A
Drill Rig Truck		89.6	82.6	N/A
	Total	91	85.8	N/A

*Calculated Lmax is the Loudest value.