

# NOISE IMPACT ANALYSIS

**S2A Modular Factory  
State Street & Crows Nest Place  
Hemet, California 92543**

## **Prepared For**

### **S2A Modular**

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## 1.0 EXECUTIVE SUMMARY

The proposed project, known as S2A Modular Factory, consists of the construction of a modular home factory on a 32.1-acre lot. The project site is located at the northwest corner of State Street and Crows Nest Place in the City of Hemet, California.

Noise from the anticipated operational equipment and activities on site has been calculated to determine impacts at off-site receivers. Calculations show that noise levels from project operation will be in compliance with the City of Hemet noise regulations for daytime hours found within the General Plan. No factory operations are proposed to occur outside of daytime hours. No project design features are deemed necessary to control project-generated noise impacts from project operation. Project-generated traffic noise is also expected to be less than significant at off-site receivers.

Noise levels from temporary construction activities associated with this project are expected to comply with the applicable City of Hemet construction noise limits at all surrounding property lines, with activity limited to the hours of 6 a.m. and 6 p.m. from June 1 through September 30 and the hours of 7 a.m. and 6 p.m. from October 1 to May 31 on Monday through Friday. Grading is prohibited on Saturdays between the hours of 6 p.m. and 7 a.m. and Sundays, year-round. The general good practice construction noise control methods listed herein should be followed, as a courtesy to surrounding properties.

The proposed project is not expected to result in any potentially significant noise impacts by the standards of the California Environmental Quality Act (CEQA). Noise impacts are summarized in Section 5.3.

## 2.0 INTRODUCTION

This acoustical analysis report is submitted to satisfy the noise requirements of the City of Hemet. Its purpose is to assess noise impacts from potential project-related noise sources, such as mechanical equipment, site activity, and project-generated traffic, as well as temporary construction noise. This analysis aims to determine if additional project design features are necessary and feasible to reduce these impacts to comply with the applicable noise regulations of the City of Hemet Public Safety Element to the General Plan and Municipal Code. Potential impacts will also be assessed for significance per the California Environmental Quality Act (CEQA).

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

Sound pressure is the actual noise experienced by a human or registered by a sound level instrument. When sound pressure is used to describe a noise source, the distance from the noise source must be specified in order to provide complete information. Sound power, on the other hand, is a specialized analytical metric to provide information without the distance requirement, but it may be used to calculate the sound pressure at any desired distance.

## **2.1 Project Description**

The proposed project, known as S2A Modular Factory, consists of the construction of a modular home factory on a 32.1-acre lot. The project will be constructed in two phases. Phase 1 consists of the construction of an approximately 100,000-square-foot factory building. Phase 2 consists of the construction of a second factory building, an office building, and two storage buildings. Operational hours for all buildings are proposed to be 7 a.m. to 5 p.m., Monday through Friday. For additional project details, please refer to the project plans provided in Appendix A.

The project site is surrounded by commercial uses to the north and single-family residential uses to the south and west.

## **2.2 Project Location**

The project site is located at the northeast corner of State Street and Crows Nest Place in the City of Hemet, California. The Assessor's Parcel Numbers (APNs) are 439-030-009, 439-030-010, and 439-040-023. The site is currently vacant. For a graphical representation of the site, please refer to the Vicinity Map, Assessor's Parcel Map, Satellite Aerial Photograph, and Topographic Map, provided as Figures 1 through 4, respectively.

## **2.3 Applicable Noise Regulations**

This acoustical report is submitted to satisfy the acoustical requirements of the City of Hemet Public Safety Element to the General Plan and Municipal Code.

The City of Hemet Public Safety Element to the General Plan, specifies noise level limits to nearby noise-sensitive receivers. Noise levels have been evaluated at the nearest noise-sensitive receivers beyond adjacent roadways and sidewalks. The General Plan states that noise impacts to off-site noise-sensitive receivers should not exceed 60 dBA  $L_{EQ}$  between the hours of 7 a.m. and 10 p.m. and 45 dBA  $L_{EQ}$  between the hours of 10 p.m. and 7 a.m. Additionally, maximum noise impacts should not exceed 75 dBA  $L_{MAX}$  during daytime hours, and 65 dBA  $L_{MAX}$  during nighttime hours. The General Plan also incorporates a five decibel penalty for simple tone noises, such as backup alarms.

Additionally, Section 67-10 of the City of Hemet Municipal Code states that grading activity is limited to between the hours of 6 a.m. and 6 p.m. from June 1 through September 30 and between the hours of 7 a.m. and 6 p.m. from October 1 to May 31 on Monday through Friday. Grading is prohibited on Saturdays between the hours of 6 p.m. and 7 a.m. and Sundays, year-round. The Code does not include specific noise limits for construction activity; however, 75 dBA is a commonly used construction noise threshold that has been applied to this project.

Pertinent sections of the City of Hemet Public Safety Element to the General Plan and Municipal Code are provided as Appendix B.

## **3.0 ENVIRONMENTAL SETTING**

### **3.1 Existing Noise Environment**

The primary noise sources in the vicinity of the project site includes automobile and truck traffic noise from State Street. No other noise source is considered significant.

#### **3.1.1 Roadway Traffic Noise**

Current traffic volumes are given based on traffic counts by Ganddini Group, Inc., for the traffic impact study for the project.

State Street is a four-lane Divided Secondary Roadway running north-south along the east boundary of the project site. The posted speed limit is 45 mph to the north of the project site and 40 mph to the south of the site. The observed speed was 55 mph. In the vicinity of the project site, State Street currently carries a traffic volume of approximately 20,000 Average Daily Trips (ADT) and 19,600 ADT north and south of Crows Nest Place, respectively.

Crows Nest Place is a two-lane, unpaved roadway running east-west along the south boundary of the project site. There is no posted speed limit for Crows Nest Place; however, cars were observed to be traveling at approximately 20 mph. In the vicinity of the project site, Crows Nest Place currently carries a traffic volume of approximately 200 ADT.

No current or future truck percentages were available for roadways in the vicinity of the project site. However, based on neighboring and surrounding land use, roadway classification, professional experience, and on-site observations, a truck percentage mix of 2.0% medium and 3.0% heavy trucks was used for State Street, and a truck percentage mix of 2.0% medium and 1.0% heavy trucks was used for Crows Nest Place.

#### **3.1.2 Measured Noise Level**

An on-site inspection and traffic noise measurement were made on the morning of Tuesday, October 22, 2019. The noise measurement was made using the methodology described in Section 4.1 at a location approximately 35 feet from the State Street centerline and 43 feet from the Crows Nest Place centerline. The microphone was placed at approximately five feet above the road grade. Traffic volumes for State Street were recorded for automobiles, medium-size trucks, and large trucks during the measurement period. After a continuous 15-minute sound level measurement, no changes in the  $L_{EQ}$  were observable and results were recorded. The measured noise level and related weather conditions are found in Table 1 and the measurement location is shown in Figure 3.

<b>Table 1. On-Site Noise Measurement Conditions and Results</b>	
<b>Date</b>	Tuesday, October 22, 2019
<b>Time</b>	11:49 a.m. – 12:05 p.m.
<b>Conditions</b>	Sunny skies, light wind at 4 mph, temperature in the high 80s with low humidity
<b>Measured Noise Level</b>	76.5 dBA L <sub>EQ</sub>

### 3.1.3 Calculated Noise Level

Noise levels were calculated for the site using the methodology described in Section 4.1 for the location, conditions, and traffic volumes counted during the noise measurements. The calculated noise levels (L<sub>EQ</sub>) were compared with the measured on-site noise level to determine if adjustments or corrections (calibration) should be applied to the traffic noise prediction model. Adjustments are intended to account for site-specific variances in overall reflectivity or absorption, which may not be accurately represented by the default settings in the model.

The measured noise level of 76.5 dBA L<sub>EQ</sub> at 35 feet from the State Street centerline and 43 feet from the Crows Nest Place centerline was compared to the calculated (modeled) noise level of 75.9 dBA L<sub>EQ</sub> for the same weather conditions and traffic flow. According to the Federal Highway Administration's Highway Traffic Noise: Analysis and Abatement Guide (see reference), a traffic noise model is considered validated if the measured and calculated noise impacts differ by three decibels or fewer. No adjustment was deemed necessary to model future noise levels for this noise model as the difference between the measured and calculated levels was found to be less than three decibels. The traffic noise model is assumed to be representative of actual traffic noise that is experienced on site. This information is presented in Table 2.

<b>Table 2. Calculated versus Measured Traffic Noise Data</b>				
<b>Calibration Receiver Position</b>	<b>Calculated</b>	<b>Measured</b>	<b>Difference</b>	<b>Correction</b>
35 feet from State St CL, 43 feet from Crows Nest PI CL	75.9 dBA L <sub>EQ</sub>	76.5 dBA L <sub>EQ</sub>	0.6 dB	None applied

## 3.2 Future Noise Environment

### 3.2.1 Operational Noise Impacts

The primary sources of noise generated by the proposed project are anticipated to be the proposed vehicular and HVAC equipment.

The factory will incorporate multiple vehicles on site. Noise levels for typical equipment were provided by DEFRA as octave band noise levels. Noise levels are shown in Table 3.

Table 3. Sound Power Level of Proposed Vehicular Equipment									
Source	Sound Power Level at Octave Band Frequency (dB)								Total (dBA)
	63	125	250	500	1K	2K	4K	8K	
Forklift	114.6	108.6	98.6	96.6	93.6	91.6	85.6	76.6	100.1
Delivery Truck	111.8	111.8	100.8	102.8	98.8	96.8	95.8	87.8	105.3

Additionally, noise measurements made by Eilar Associates of a truck backup alarm were incorporated into calculations (76.0 dBA at 50 feet).

HVAC units for the office spaces are proposed to be split-system units manufactured by Mitsubishi. Noise levels for this equipment were provided by the manufacturer as broadband, A-weighted noise levels of 58 dBA at one meter from the outdoor unit. No octave band data has been given for the HVAC unit, and therefore, octave band noise levels of a similar HVAC unit have been used to estimate the spectral content of the Mitsubishi MXZ-5C42NA2. Noise levels are shown in Table 4, and manufacturer data sheets are provided in Appendix D.

Table 4. Sound Power Levels of Mitsubishi MXZ-5C42NA2 (Split-System Unit)									
Source	Sound Power at Octave Band Frequency (dBA)								Total (dBA)
	63	125	250	500	1K	2K	4K	8K	
Mitsubishi MXZ-5C42NA2	47.9	56.5	61.5	60.4	60.6	57.3	50.6	45.5	77.6

HVAC units for the factory and storage buildings are proposed to be supply fans manufactured by Canarm. Noise levels for this equipment were not provided by the manufacturer, and therefore, octave band noise levels of a similar supply fan unit have been used to estimate the spectral content of the Canarm P24-1RS9M115. Noise levels are shown in Table 5, and manufacturer data sheets are provided in Appendix D.

Table 5. Sound Power Levels of Canarm P24-1RS9M115 Supply Fan									
Source	Sound Power at Octave Band Frequency (dB)								Total (dBA)
	63	125	250	500	1K	2K	4K	8K	
Canarm P24-1RS9M115	79	82	79	76	72	69	65	60	78

Operational noise levels have been calculated for the project site using the above information. Results of this analysis are provided in Section 5.3.1.

### 3.2.2 Project-Generated Traffic

A traffic impact study conducted by Ganddini Group, Inc. shows traffic volumes generated by the proposed project and the distribution of these trips on surrounding roadways. The impacts of project-generated traffic noise have been assessed using these trip generation values and the existing traffic volumes for surrounding roadways. Cumulative traffic volumes for other anticipated

projects to be constructed in the vicinity of the project site have also been provided in the traffic study and allow for the evaluation of cumulative traffic noise impacts. Project traffic volumes and the analysis of project-generated traffic noise is provided in Section 5.1.2.

### 3.2.3 Temporary Construction Equipment

In order to evaluate anticipated temporary construction noise impacts, information from the project applicant regarding stages of construction and equipment is to be used. The equipment listed in Table 6 is typical of what is expected to be used on site based on professional experience and the information provided. Unless otherwise noted, all noise levels have been provided by the UK Department for Environment, Food and Rural Affairs (DEFRA) (see reference). Duty cycle information was taken from the Federal Highway Administration.

<b>Table 6. Anticipated Construction Stages and Equipment Noise Levels</b>			
<b>Construction Stage</b>	<b>Equipment</b>	<b>Duty Cycle (%)</b>	<b>Noise Level, at 50 feet (dBA)</b>
Utilities and Grading	Small Dozer	40	74
	Dozer	40	76
	Backhoe <sup>1</sup>	40	74
	Water Truck <sup>1</sup>	40	77
Foundation	Concrete Pump Truck	20	74
Installation of Buildings	Pickup Trucks	40	76
	Crane	16	66
Paving	Asphalt Paver	50	71
	Roller <sup>1</sup>	20	74
	Pickup Trucks	40	76

<sup>1</sup>Source: Noise measurements made by Eilar Associates on 3/25/2010 for Brutoco Engineering & Construction, Inc. for the Orange Line Extension Project, Metro Contract #C0943, City of Los Angeles.

These noise levels have been incorporated into the temporary construction noise analysis for the site, provided in Section 5.2.

## 4.0 METHODOLOGY AND EQUIPMENT

### 4.1 Methodology

#### 4.1.1 Field Measurement

Typically, a “one-hour” equivalent sound level measurement ( $L_{EQ}$ , A-Weighted) is recorded for at least one noise-sensitive location on the site. During the on-site noise measurement, start and end times are recorded, vehicle counts are made for cars, medium trucks (double-tires/two axles), and heavy trucks (three or more axles) for the corresponding road segment(s). Supplemental sound

measurements of one hour or less in duration are often made to further describe the noise environment of the site.

For measurements of less than one hour in duration, the measurement time is long enough for a representative traffic volume to occur and the noise level ( $L_{EQ}$ ) to stabilize. The vehicle counts are then converted to one-hour equivalent volumes by applying an appropriate factor. Other field data gathered include measuring or estimating distances, angles-of-view, slopes, elevations, roadway grades, and vehicle speeds. This information is subsequently verified using available maps and records.

#### 4.1.2 Roadway Noise Calculation

The Traffic Noise Model (TNM) calculation protocol in Cadna Version 2019 (based on the methodology used in TNM Version 2.5, released in February 2004 by the U.S. Department of Transportation) was used for all traffic modeling in the preparation of this report. Using the TNM protocol, the CNEL is calculated as 0.092 times the ADT for surrounding roadways, based on the studies made by Wyle Laboratories (see reference). CNEL is calculated for desired receptor locations using road alignment, elevations, lane configurations, projected traffic volumes, estimated truck mixes, and vehicle speeds. Noise attenuation methods may be analyzed, tested, and planned with Cadna, as required.

In order to determine the estimated traffic volumes of roadways during the traffic noise measurement made on site for model calibration, the approximate percentage of the Average Daily Trips (ADT) value for the time period in which the measurement is made is incorporated into the traffic model. These percentages have been established in a study performed by Katz-Okitsu and Associates, Traffic Engineers (see reference). For purposes of calibrating the Cadna TNM, 6.2% of the ADT values for the current environment were used in calculations (for roadways that were not manually counted) to account for traffic between the hours of 11 a.m. and 12 p.m. in the vicinity of the project site.

#### 4.1.3 Cadna Noise Modeling Software

Modeling of the outdoor noise environment is accomplished using Cadna Version 2019, which is a model-based computer program developed by DataKustik for predicting noise impacts in a wide variety of conditions. Cadna (Computer Aided Noise Abatement) assists in the calculation, presentation, assessment, and alleviation of noise exposure. It allows for the input of project information such as noise source data, barriers, structures, and topography to create a detailed model and uses the most up-to-date calculation standards to predict outdoor noise impacts. Noise standards used by Cadna that are particularly relevant to this analysis include ISO 9613 (Attenuation of sound during propagation outdoors). Cadna provides results that are in line with basic acoustical calculations for distance attenuation and barrier insertion loss.

#### 4.1.4 Formulas and Calculations

##### *Decibel Addition*

To determine the combined logarithmic noise level of two known noise source levels, the values are converted to the base values, added together, and then converted back to the final logarithmic value, using the following formula:

$$L_C = 10\log(10^{L1/10} + 10^{L2/10} + 10^{LN/10})$$

where  $L_C$  = the combined noise level (dB), and  
 $L_N$  = the individual noise sources (dB).

This procedure is also valid when used successively for each added noise source beyond the first two. The reverse procedure can be used to estimate the contribution of one source when the contribution of another concurrent source is known and the combined noise level is known. These methods can be used for  $L_{EQ}$  or other metrics (such as  $L_{DN}$  or  $CNEL$ ), as long as the same metric is used for all components.

#### *Sound Power to Sound Pressure*

To convert sound power levels to sound pressure levels, the following formula is used:

$$SPL = SWL - 20\log(D) - 0.5$$

where:  $SPL$  = Calculated sound pressure level at distance, and  
 $D$  = Distance from source to location of calculated sound pressure level, measured in feet.

#### *Distance Attenuation*

Attenuation due to distance is calculated by the equation:

$$SPL_2 = SPL_1 - 20\log\left(\frac{D_2}{D_1}\right)$$

where  $SPL_1$  = Known sound pressure level at known distance,  
 $SPL_2$  = Calculated sound pressure level at distance,  
 $D_1$  = Distance from source to location of known sound pressure level, and  
 $D_2$  = Distance from source to location of calculated sound pressure level.

This is identical to the more commonly used reference of 6 dB reduction for every doubling of distance. This equation does not take into account reduction in noise due to atmospheric absorption.

#### *Hourly $L_{EQ}$ Summation*

To determine the hourly average noise levels ( $L_{EQ}$ ) when the noise is created for less than the full hour, convert the logarithm values to the base energy value, multiply by the percentage of the hour that the noise occurs, and then convert the sum back to a logarithmic value. This is done with the following formula:

$$L_{EQ} = 10\log(P_H \times 10^{L_P/10})$$

where  $P_H$  = the percent or fraction of the hour noise is created, and  
 $L_P$  = the partial hour noise level (dB).

### *Project-Generated Traffic Noise Impacts*

Changes in traffic noise levels can be predicted by inputting the ratio of the two scenarios into the following logarithmic equation:

$$\Delta = 10\log(V2/V1)$$

where:  $\Delta$  = Change in sound energy,  
V1 = original or existing traffic volume, and  
V2 = future or cumulative traffic volume.

### *Construction Vibration Calculations*

The construction vibration assessment contained herein is evaluated using calculations of peak particle velocity (PPV). PPV at receivers is calculated as follows:

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

where  $PPV_{equip}$  is the peak particle velocity (in inches per second) of the equipment, adjusted for distance,  
 $PPV_{ref}$  is the reference vibration level (in inches per second) at a distance of 25 feet from the equipment, and  
D is the distance from the equipment to the receiver.

### *Project-Generated Traffic Noise Impacts*

Changes in traffic noise levels can be predicted by inputting the ratio of the two scenarios into the following logarithmic equation:

$$\Delta = 10\log(V2/V1)$$

where:  $\Delta$  = Change in sound energy,  
V1 = original or existing traffic volume, and  
V2 = future or cumulative traffic volume.

## **4.2 Measurement Equipment**

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

- Larson Davis Model LxT Type 1 Integrating Sound Level Meter, Serial #4084
- Larson Davis Model CA250 Type 1 Calibrator, Serial #2106

The sound level meter was field-calibrated immediately prior to the noise measurement and checked afterward to ensure accuracy. All sound level measurements conducted and presented in this report, in accordance with the regulations, were made with a sound level meter that conforms to the American National Standards Institute specifications for sound level meters (ANSI S1.4). All instruments are maintained with National Bureau of Standards traceable calibration, per the manufacturers' standards.

## 5.0 NOISE IMPACTS

### 5.1 Permanent Project-Related Noise Impacts

#### 5.1.1 Operational Noise

Noise levels from the proposed vehicles and HVAC units were calculated in Cadna for both Phase 1 and the completed project at the nearest properties using data presented in Section 3.2.1. As hours of operation are limited to the daytime period, nighttime noise limits have not been considered herein. Daytime noise limits have been applied as detailed in Section 2.3. Calculations consider shielding that would be provided by the proposed on-site structures. Hourly average noise level calculations also assume backup alarms would operate for one minute per hour, three on-site truck movements per hour, two on-site forklift movements per hour, and continuous HVAC equipment operation during hours of operation. For this reason, the analysis is considered to represent a conservative estimate of noise impacts at off-site receivers.

Tables 7 and 8 show the project-related operational noise impacts at surrounding receivers for Phase 1 and the completed project, respectively. Calculated noise impacts at the properties to the west and south are shown at the nearest noise-sensitive property lines. All receivers have been calculated at a height of five feet above grade. Additional information is provided in Appendix C: Cadna Analysis Data and Results. For a graphic showing noise source and receiver locations, please refer to Figures 5 and 6.

<b>Table 7. Project-Related Operational Noise Impacts – Phase 1</b>					
Receiver	Description	Noise Limit (dBA)	Average Hourly Noise Level (dBA)	Max Noise Level Limit (dBA L <sub>MAX</sub> )*	Max Noise Level (L <sub>MAX</sub> )
R1	West Property Line	60	37.0	70	51.5
R2	South Property Line	60	49.6	70	65.1

\*Max noise level limit evaluated as 70 dBA to account for simple tone noise of backup alarms.

<b>Table 8. Project-Related Operational Noise Impacts – Completed Project</b>					
Receiver	Description	Noise Limit (dBA)	Average Hourly Noise Level (dBA)	Max Noise Level Limit (dBA L <sub>MAX</sub> )*	Max Noise Level (L <sub>MAX</sub> )
R1	West Property Line	60	50.2	70	65.9
R2	South Property Line	60	52.4	70	66.4

\*Max noise level limit evaluated as 70 dBA to account for simple tone noise of backup alarms.

As shown above, noise levels at adjacent property lines are anticipated to comply with the applicable daytime noise limits of the City of Hemet for both Phase 1 and the completed project, as currently designed. For these reasons, no additional project design features are deemed necessary to reduce noise impacts from on-site operational activity.

## 5.1.2 Project-Generated Traffic Noise

An analysis of the potential change in traffic noise levels to the surrounding area has been evaluated based on traffic projections in the Ganddini Group, Inc., traffic study. The project's impacts have been evaluated to determine whether a direct or cumulative impact will result. A significant direct impact occurs when project traffic combines with existing traffic and causes a doubling of sound energy, which is an increase of 3 dB. Direct impacts are assessed by comparing existing traffic volumes to existing plus project traffic volumes using the calculation methodology shown in Section 4.1.4. A cumulative impact may occur when project traffic combines with traffic generated by other proposed projects in the area and causes an increase of 3 dB. Cumulative impacts are assessed by comparing existing traffic volumes to existing plus project plus cumulative traffic volumes using the methodology detailed herein. In cases where a cumulative impact is identified, the project's contribution can be considered "cumulatively considerable" if the proposed project accounts for more than a one decibel increase to cumulative noise levels. A cumulatively considerable impact can be identified by comparing existing plus cumulative traffic volumes to existing plus cumulative plus project traffic volumes using the methodology detailed herein. Project-generated traffic noise increases are shown in Table 9.

<b>Table 9. Anticipated Traffic Noise Increases with Project-Generated Traffic</b>						
<b>Road</b>	<b>Segment</b>	<b>Traffic Volume (ADT)</b>			<b>Noise Level Increase (dB)</b>	
		<b>Existing</b>	<b>Project</b>	<b>Cumulative</b>	<b>Direct</b>	<b>Cumulative</b>
State Street	North of Esplanade	21,200	290	3,200	0.1	0.7
	Between Esplanade and Crows Nest	20,000	840	4,300	0.2	1.0
	Between Le Crows Nest and Fruitvale	19,600	990	4,200	0.2	1.0
	Between Fruitvale and Menlo	20,500	930	4,200	0.2	1.0
	Between Menlo and Devonshire	18,000	660	6,500	0.2	1.5
	Between Devonshire and Florida	16,800	540	6,900	0.1	1.6
	South of Florida	11,500	290	5,200	0.1	1.7
Esplanade Avenue	West of State Street	16,500	300	1,600	0.1	0.5
	East of State Street	19,700	240	1,600	0.1	0.4
Crows Nest Place	West of State Street	200	1,200	0	<b>8.8</b>	<b>8.8</b>
Fruitvale Avenue	West of State Street	2,600	60	700	0.1	1.1
	East of State Street	1,600	0	200	0.0	0.5

Table 9. Anticipated Traffic Noise Increases with Project-Generated Traffic						
Road	Segment	Traffic Volume (ADT)			Noise Level Increase (dB)	
		Existing	Project	Cumulative	Direct	Cumulative
Menlo Avenue	West of State Street	8,300	110	2,300	0.1	1.1
	East of State Street	10,000	170	1,400	0.1	0.6
Devonshire Avenue	West of State Street	5,200	60	300	0.0	0.3
	East of State Street	3,100	60	200	0.1	0.3
Florida Avenue	West of State Street	30,100	160	5,900	0.0	0.8
	East of State Street	29,900	90	3,900	0.0	0.5

As shown in Table 9, no direct or cumulative impacts are anticipated to cause theoretical increases of three decibels or greater, with the exception of Crows Nest Place. In order to determine actual increases in noise impacts, existing traffic noise levels were evaluated at off-site receivers and compared to traffic noise levels anticipated with the increase in traffic volumes on surrounding roadways. Table 10 below shows the results of these calculations.

Table 10. Anticipated Traffic Noise Increases with Project-Generated Traffic at Nearby Receivers				
Receiver	Description	Existing Noise Level (CNEL)	Existing + Project Noise Level (CNEL)	Noise Level Increase (dB)
R1	West Property Line	45.6	45.9	0.3
R2	South Property Line	51.7	52.7	1.0

As shown in Table 10, no direct impacts are anticipated to result from project traffic at nearby sensitive receivers resulting from the increase in traffic volumes on Crows Nest Place. For this reason, project-generated traffic noise levels are considered to be less than significant.

## 5.2 Temporary Construction Noise Impacts

According to the City of Hemet Municipal Code, grading activity is permitted from June 1 through September 30 on Monday through Friday between the hours of 6 a.m. and 6 p.m. and between the hours of 7 a.m. and 6 p.m. from October 1 to May 31. Grading is prohibited on Saturdays between the hours of 6 p.m. and 7 a.m. and Sundays, year-round. Although the City of Hemet does not have specific noise limits for temporary construction activity, a typically applied threshold for construction noise is 75 dBA. This noise limit has been applied to activity on the proposed project site to assess the significance of construction noise impacts.

Noise levels were calculated at residential receivers to the south, as any other off-site receivers are located at a greater distance from the project site, and therefore, would be exposed to lesser noise impacts. Construction noise sources were placed near the center of various work areas on the

western portion of the site to evaluate typical impacts to these receivers as equipment moves around the property during the worst-case phases of construction. Depending on the stage of construction, the approximate center of work is expected to be located roughly 115 to 300 feet from the nearest sensitive receiver location. Noise calculations consider typical duty cycles of equipment to account for periods of activity and inactivity on the site.

Calculated construction noise impacts during worst-case phases of construction are shown in Table 11. A graphical representation of evaluated source and receiver locations is shown in Figure 7. Please refer to Appendix E for additional information.

<b>Table 11. Temporary Construction Noise Levels at Nearest Residential Receivers (South)</b>			
<b>Stage (Source Location)</b>	<b>Receiver</b>	<b>Equipment</b>	<b>Average Noise Level (dBA)</b>
Utilities and Grading (S1)	C1	Small Dozer, Dozer, Backhoe, Water Truck	67.9
Foundation (S2)	C2	Concrete Pump Truck	59.8
Building Installation (S2)	C2	Pickup Trucks, Crane	72.6
Paving (S3)	C2	Asphalt Paver, Roller, Pickup Trucks	62.3

As shown in Table 11, based on the typical noise levels and duty cycles of construction equipment, average noise levels are anticipated to remain below 75 dBA at the nearest residential property lines during the worst-case phases of construction. Any other noise-sensitive receivers are located at a greater distance from on-site activity, and therefore, would be exposed to lesser noise levels.

Despite the fact that noise impacts are expected to remain in compliance with typically accepted construction noise limits, the following “good practice” measures should still be practiced as a courtesy to residential neighbors:

1. Staging areas should be placed as far as possible from residential receivers.
2. Place stationary equipment in locations that will have a lesser noise impact on nearby sensitive receivers.
3. Turn off equipment when not in use.
4. Limit the use of enunciators or public address systems, except for emergency notifications.
5. Equipment used in construction should be maintained in proper operating condition, and all loads should be properly secured to prevent rattling and banging.
6. Schedule work to avoid simultaneous construction activities that both generate high noise levels.
7. Use equipment with effective mufflers.
8. Minimize the use of backup alarms.

With operating hours limited to those permitted by the City of Hemet and adherence to the general good practice construction noise control techniques, temporary construction noise impacts are expected to be less than significant at surrounding properties.

### 5.3 CEQA Significance Determination

Noise impacts from the project site are summarized below and classified per the noise portion of the CEQA Environmental Checklist form. This list summarizes conclusions made within the report and classifies the level of significance as: Potentially Significant Impact, Less than Significant with Mitigation Incorporated, Less than Significant Impact, or No Impact. *Italics* are used to denote language from the CEQA Environmental Checklist form.

XII. *NOISE—Would the project result in:*

- 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?*

**Less Than Significant Impact.** Operational noise impacts calculated in Section 5.1.1 are not expected to generate a substantial permanent increase in ambient noise levels in the vicinity of the project site, and would comply with the noise limits of the City of Hemet Public Safety Element to the General Plan, as designed. The impact of permanent project-related noise sources would therefore be less than significant.

Additionally, as demonstrated in Section 5.1.2 of this report, noise impacts from project-generated traffic are not expected to cause a significant direct increase or a cumulatively considerable increase on any surrounding roadway. This impact is also considered to be less than significant.

As shown in Section 5.2 of this report, noise from temporary construction is expected to be less than significant considering a typical construction schedule. Noise impacts from anticipated construction activity are expected to remain below the applicable construction noise limits set by the City of Hemet. Additionally, no construction activity will take place during the more sensitive nighttime hours when ambient noise levels tend to be lower, as per City of Hemet Municipal Code requirements. For these reasons, this impact is deemed to be less than significant.

As demonstrated above, the project is not expected to cause a substantial permanent or temporary increase in ambient noise levels, and therefore, this impact can be classified as less than significant.

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

**Less Than Significant Impact.** The grading stage of construction has the potential to generate the highest vibration levels of the four phases, as grading activities would take place closest to residential receivers and would consist of the use of loaded trucks. According to the Federal Transit Administration Transit Noise and Vibration Assessment Manual (see reference), a loaded truck generates a peak particle velocity (PPV) of approximately 0.076 inches/second at a distance of 25 feet from equipment. The evaluation of an impact's significance can be determined by reviewing both the likelihood of annoyance to individuals as well as the potential for damage to existing structures. According to the Caltrans Transportation and Construction Vibration Guidance Manual (see reference), the appropriate threshold for damage to modern residential structures is a

PPV of 0.5 inches/second. Annoyance is assessed based on levels of perception, with a PPV of 0.01 being considered “barely perceptible,” 0.04 inches/second as “distinctly perceptible,” 0.1 inches/second as “strongly perceptible,” and 0.4 inches/second as “severe.”

It is estimated that the nearest location to sensitive receptors would be approximately 25 feet from the nearest residential structure, when trucks are used near the southern boundary of the site. At this distance, the PPV would be 0.076 inches/second. This level of vibration falls well below the building damage PPV criteria of 0.5 inches/second. The impact falls between the “barely perceptible” and “distinctly perceptible” PPV criteria for annoyance; however, vibration would be reduced to “barely perceptible” levels by the time the trucks are located at a distance of 100 feet from receivers. As construction vibration is not anticipated to cause damage to off-site buildings and will be less than the “barely perceptible” vibration threshold for the majority of construction, it is the opinion of the undersigned that temporary construction vibration impacts would not be “excessive,” and therefore, are less than significant. Please refer to Appendix E for additional information.

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?*

**No Impact.** The project site is not located within an airport land use plan nor is it located within two miles of a private airstrip, public airport, or public use airport. Therefore, the proposed project would not expose people working in the project area to excessive noise levels from such uses.

## 6.0 CONCLUSION

Noise from the anticipated operational equipment and activities on site has been calculated to determine impacts at off-site receivers. Calculations show that noise levels from project operation will be in compliance with the City of Hemet noise regulations for daytime hours found within the General Plan. No factory operations are proposed to occur outside of daytime hours. No project design features are deemed necessary to control project-generated noise impacts from project operation. Project-generated traffic noise is also expected to be less than significant at off-site receivers.

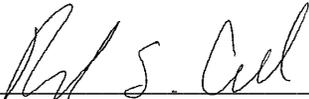
Noise levels from temporary construction activities associated with this project are expected to comply with the applicable City of Hemet construction noise limits at all surrounding property lines, with activity limited to the hours of 6 a.m. and 6 p.m. from June 1 through September 30 and the hours of 7 a.m. and 6 p.m. from October 1 to May 31 on Monday through Friday. Grading is prohibited on Saturdays between the hours of 6 p.m. and 7 a.m. and Sundays, year-round. The general good practice construction noise control methods listed herein should be followed, as a courtesy to surrounding properties.

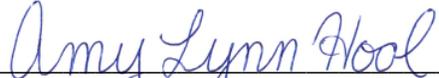
The proposed project is not expected to result in any potentially significant noise impacts by the standards of the California Environmental Quality Act (CEQA). Noise impacts are summarized in Section 5.3.

## 7.0 CERTIFICATION

All recommendations for noise control are based on the best information available at the time our consulting services are provided. However, as there are many factors involved in sound transmission, and Eilar Associates has no control over the construction, workmanship, or materials, Eilar Associates is specifically not liable for final results of any recommendations or implementation of the recommendations.

This report is based on the related project information received and on measured noise levels, and represents a true and factual analysis of the acoustical impact issues associated with the S2A Modular Factory project, to be located in the City of Hemet, California. This report was prepared by Rachael Cowell and Amy Hool.

  
\_\_\_\_\_  
Rachael Cowell, Acoustical Consultant

  
\_\_\_\_\_  
Amy Hool, President/CEO

## 8.0 REFERENCES

1. City of Hemet Public Safety Element to the General Plan, Adopted January 24, 2012.
2. City of Hemet Municipal Code, Chapter 67-10: Time of grading operations.
3. California Environmental Quality Act (CEQA), Statute and Guidelines, 2018.
4. Ganddini Group, Inc., S2A Modular Manufacturing Traffic Impact Analysis, August 2019.
5. Federal Highway Administration, Highway Traffic Noise: Analysis and Abatement Guide, December 2011.
6. Department for Environment Food and Rural Affairs (DEFRA), Update of Noise Database for Prediction of Noise on Construction and Open Sites, 2005.
7. U.S. Department of Transportation Federal Highway Administration, Construction Noise Handbook, Construction Equipment Noise Levels and Ranges.
8. DataKustik, CadnaA (Computer Aided Noise Abatement), Version 2020.
9. Wyle Laboratories, Development of Ground Transportation Systems Noise Contours for the San Diego Region, December 1973.
10. Katz-Okitsu and Associates Traffic Engineers, Traffic Distribution Study, 1986.
11. Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment, May 2006.
12. California Department of Transportation (Caltrans), Transportation and Construction Vibration Guidance Manual, September 2013.

## FIGURES

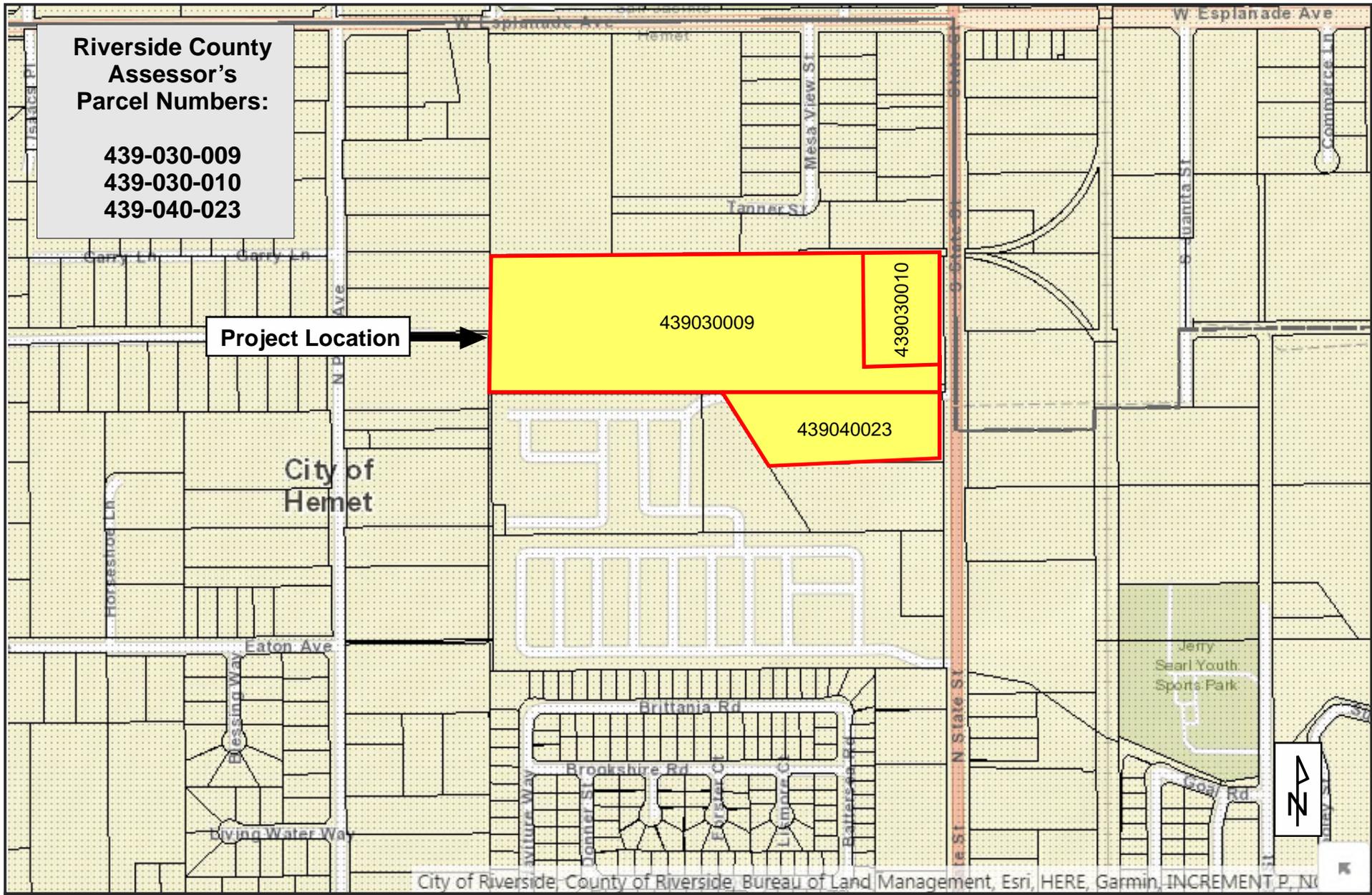


mapquest

**Eilar Associates, Inc.**  
 210 South Juniper Street, Suite 100  
 Escondido, California 92025  
 760-738-5570

**Vicinity Map**  
**Job # S190701**

**Figure 1**



**Eilar Associates, Inc.**  
210 South Juniper Street, Suite 100  
Escondido, California 92025  
760-738-5570

**Assessor's Parcel Map**  
**Job # S190701**

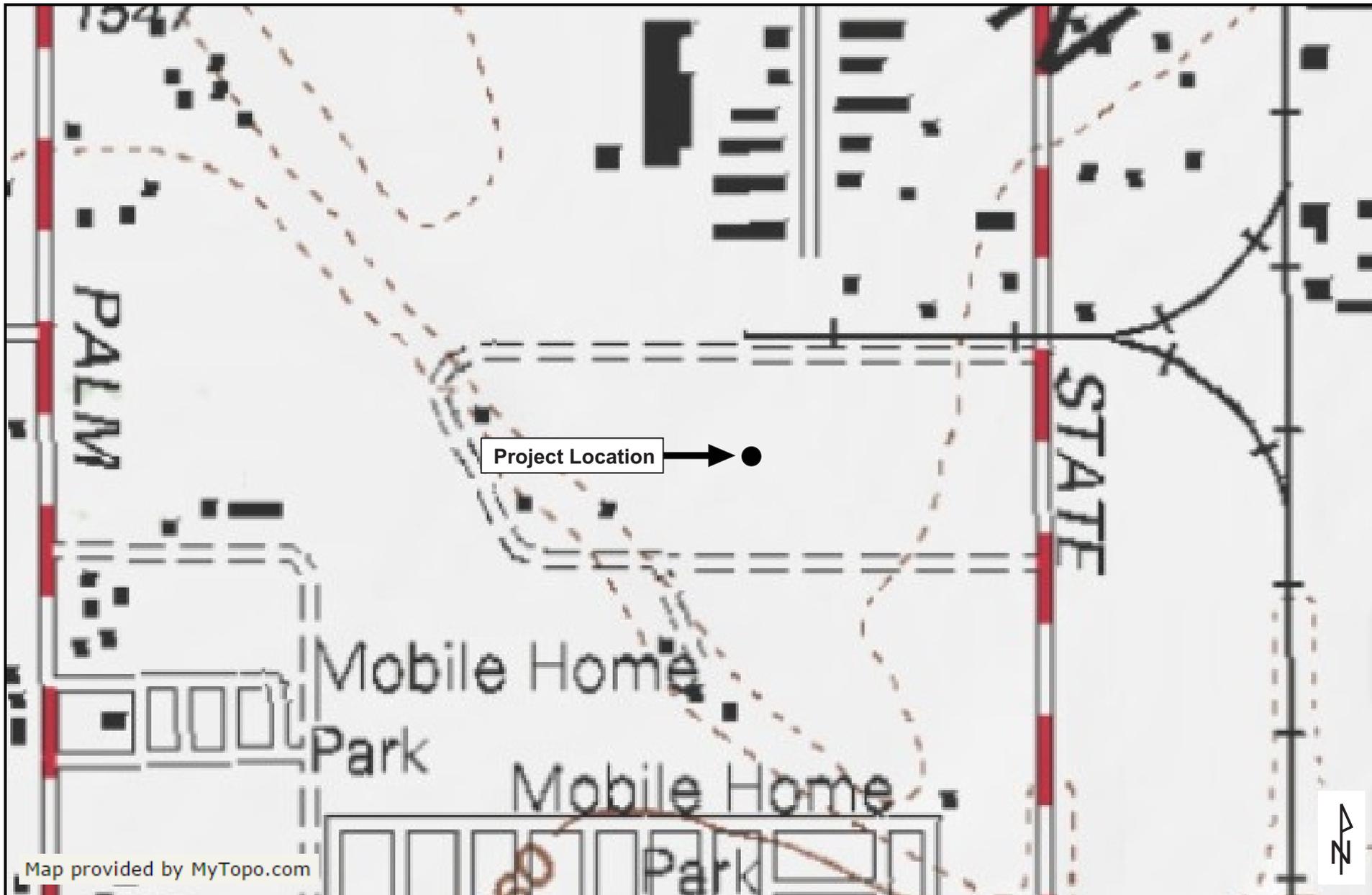
**Figure 2**



**Eilar Associates, Inc.**  
210 South Juniper Street, Suite 100  
Escondido, California 92025  
760-738-5570

**Satellite Aerial Photograph Showing Noise Measurement Location  
Job # S190701**

**Figure 3**

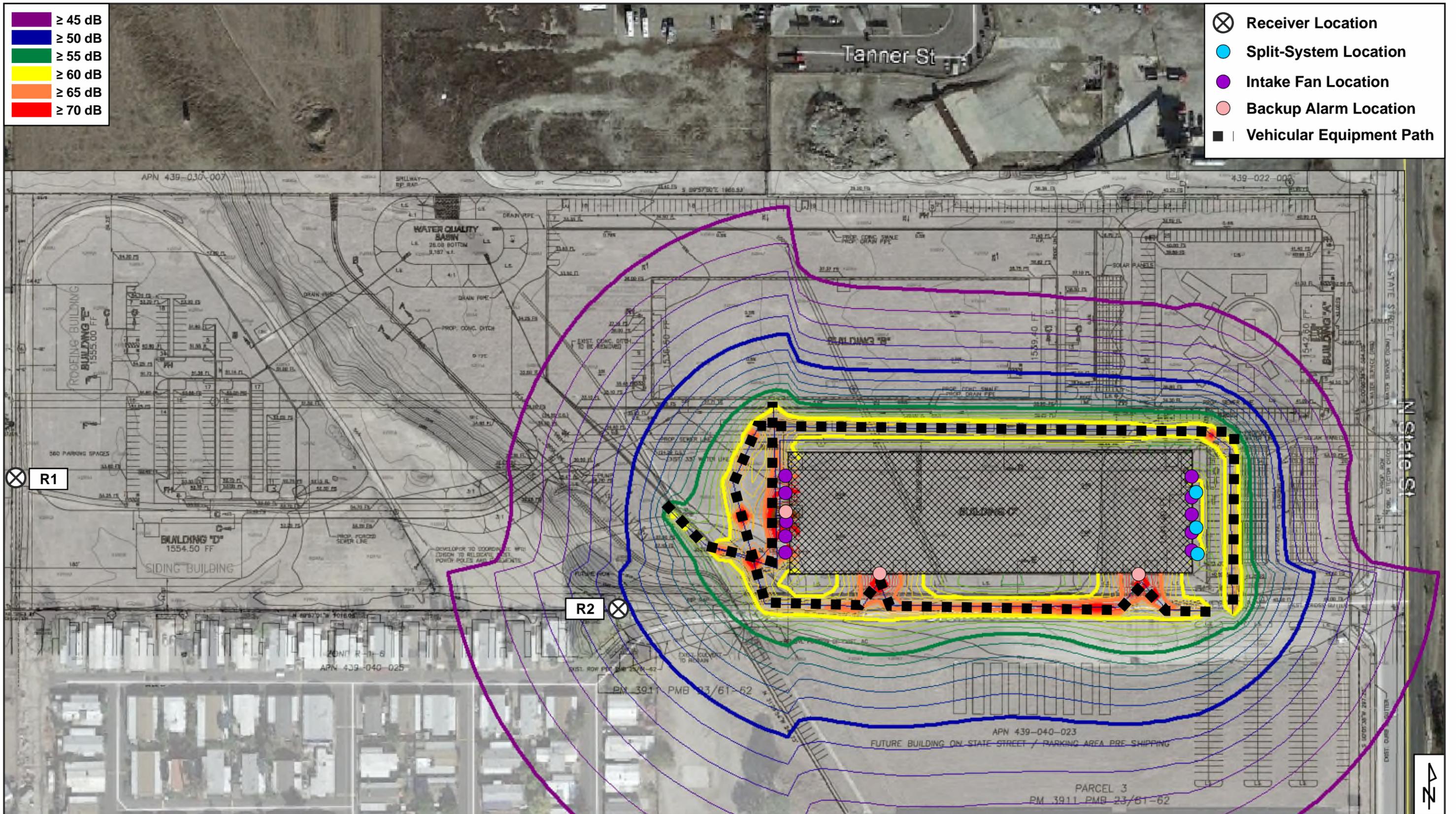


Map provided by MyTopo.com

**Eilar Associates, Inc.**  
210 South Juniper Street, Suite 100  
Escondido, California 92025  
760-738-5570

**Topographic Map**  
**Job # S190701**

**Figure 4**



**Eilar Associates, Inc.**  
 210 South Juniper Street, Suite 100  
 Escondido, California 92025  
 760-738-5570

**Satellite Aerial Photograph Showing Mechanical Equipment Noise Contours and Receiver Locations - Phase 1**  
 Job # S190701

**Figure 5**





Eilar Associates, Inc.  
 210 South Juniper Street, Suite 100  
 Escondido, California 92025  
 760-738-5570

Satellite Aerial Photograph Showing Construction Noise Source and Receiver Locations  
 Job # S190701

Figure 7

## **APPENDIX A**

### **Project Plans**

# CITY OF HEMET PLOT PLAN

LOT 5 AND PORTION OF LOT 4 OF MESA TERRACE TRACT, IN THE CITY OF HEMET, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 8 PAGE 46 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

SAKE ENGINEERS, INC.

AUGUST 2019

### ZONING AND LAND USE:

EXIST. ZONING \_\_\_\_\_ COMMERCIAL-MANUFACTURING  
 PROP. ZONING \_\_\_\_\_ COMMERCIAL-MANUFACTURING  
 EXIST. LAND USE \_\_\_\_\_ VACANT  
 PROP. LAND USE \_\_\_\_\_ COMMERCIAL-MANUFACTURING

### ASSESSORS PARCEL NO.:

439-030-009, 439-030-010, 439-040-023

### TOTAL ACREAGE:

TOTAL ACREAGE (GROSS) \_\_\_\_\_ 32.1 AC.  
 DISTURBED AREA \_\_\_\_\_ 21 AC.  
 IMPERVIOUS AREA \_\_\_\_\_ 16.42 AC.  
 PERVIOUS AREA \_\_\_\_\_ 15.68 AC.  
 TOTAL NO. OF PARKING \_\_\_\_\_ 700

### EASEMENT NOTES:

- DECLARATION OF DEDICATION PER INST. NO. 136701 REC. 12/06/1965 O.R.
- CL OF 10' WIDE EASEMENT IN FAVOR OF SO. CAL EDISON CO. PER INST. NO. 106260 REC. 10/28/1966. O.R.
- EASEMENT IN FAVOR OF SO. CAL EDISON CO. PER INST. NO. 44421 REC. 05/29/1967. O.R.
- 5' WIDE EASEMENT FOR WATER PIPE LINE AND UTILITIES
- AN EASEMENT IN FAVOR OF CALIFORNIA WATER AND TELEPHONE CO. PER BK. 1604 PG 231 IS NOT PLOTTABLE FROM THE RECORD.
- EASEMENT IN FAVOR OF EASTERN MUNICIPAL WATER DISTRICT PER BK. 3726 PG 565-568. O.R.
- EASEMENT IN FAVOR OF EASTERN MUNICIPAL WATER DISTRICT PER INST. 108484 REC. 06/11/1981.

### BUILDING SQUARE FOOTAGE

BUILDING "A" \_\_\_\_\_ 4,959 S.F.  
 BUILDING "B" \_\_\_\_\_ 101,355 S.F.  
 BUILDING "C" \_\_\_\_\_ 101,355 S.F.  
 BUILDING "D" \_\_\_\_\_ 12,000 S.F.  
 BUILDING "E" \_\_\_\_\_ 12,000 S.F.  
 TOTAL SQUARE FOOTAGE \_\_\_\_\_ 231,669 S.F.

### BUILDING USE

BUILDING "A" \_\_\_\_\_ OFFICES/SHOWROOM  
 BUILDING "B" \_\_\_\_\_ OFFICES/SHOWROOM  
 BUILDING "C" \_\_\_\_\_ OFFICES  
 BUILDING "D" \_\_\_\_\_ HEMP R & D STUCCO/PANELS  
 BUILDING "E" \_\_\_\_\_ HEMP R & D DRY WALL MUD

### BASIS OF ELEVATION:

B.M. H 8 3 RESET AT THE SW CORNER OF SEVENTH ST. AND STATE ST.  
 ELEV = 467.17'

### EMERGENCY PHONE NUMBERS:

CITY OF HEMET  
 FIRE DEPARTMENT (951) 765-2464  
 CITY OF HEMET POLICE DISPATCH (951) 765-2400  
 CITY OF HEMET TRAFFIC SIGNALS (951) 675-3710  
 HEMET UNIFIED SCHOOL DISTRICT (951) 765-5100  
 UNDERGROUND ALERT SERVICE \_\_\_\_\_ 811

MISSION AMBULANCE (951) 654-2746  
 FRONTIER TELEPHONE (800) 921-8101  
 SOUTHERN CALIFORNIA EDISON COMPANY (800) 655-4555  
 SOUTHERN CALIFORNIA GAS COMPANY (800) 427-2200

### BASIS OF BEARING:

CALIFORNIA STATE PLANE COORDINATE SYSTEM  
 ZONE 6

### FLOOD ZONE:

ZONE X, 06065C1488H  
 EFFECTIVE 4-19-2017

### UTILITIES:

ELECTRIC \_\_\_\_\_ SO. CAL. EDISON COMPANY (800) 655-4555 PH.  
 GAS \_\_\_\_\_ THE GAS COMPANY (800) 427-2200 PH.  
 WATER \_\_\_\_\_ EMWD (951) 928-3777 PH.  
 SEWER \_\_\_\_\_ EMWD (951) 928-3777 PH.  
 TELEPHONE \_\_\_\_\_ FRONTIER (800) 921-8101 PH.  
 CABLE \_\_\_\_\_ SPECTRUM CABLE (855) 427-0190 PH.

### LEGAL DESCRIPTION:

LOT 5 AND PORTION OF LOT 4 OF MESA TERRACE TRACT, IN THE CITY OF HEMET, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA AS PER MAP RECORDED IN BOOK 8 PAGE 46 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

### EARTHWORK:

CUT \_\_\_\_\_ 0± C.Y.  
 FILL \_\_\_\_\_ 0± C.Y.  
 IMPORT \_\_\_\_\_ 0± C.Y.

### NOTE:

EARTH QUANTITIES SHOWN HERE ARE FOR RAW ESTIMATING PLAN CHECK FEES ONLY. GRADING CONTRACTOR IS RESPONSIBLE TO PERFORM THEIR OWN CALCULATIONS FOR EARTH VOLUME WITH THE SOILS ENGINEER'S RECOMMENDATION.

### OWNER/DEVELOPER:

SSS GROUP, A CALIFORNIA PARTNERSHIP  
 MICHAEL A. GUERINO AND  
 SUZANNE E. GUERINO  
 MURRIETA, CA 92562  
 CONTACT: JOHN ROWLAND  
 (951) 279-4041 PH.  
 JMVPOPTICS@AOL.COM

### ENGINEER:

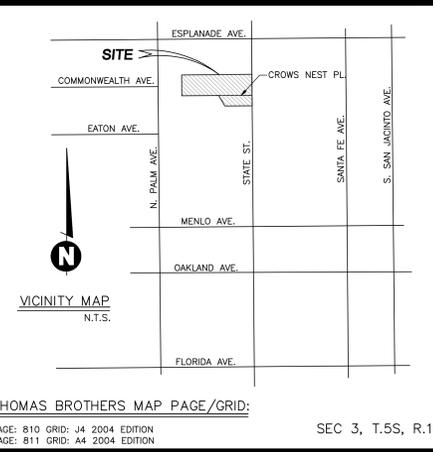
SAKE ENGINEERS INC.  
 400 S. RAMONA AVE. STE. 202  
 CORONA, CA 92879  
 (951) 279-4041 PH.  
 (951) 279-2830 FAX

### SOIL ENGINEER:

SOIL EXPLORATION COMPANY, INC.  
 7535 JURUPA AVE. UNIT C  
 RIVERSIDE, CA 92504  
 (951) 688-7200 PH.  
 (951) 688-7100 FAX

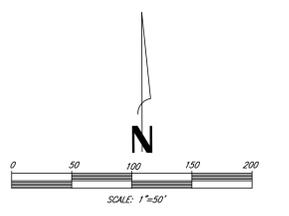
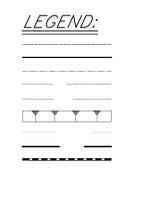
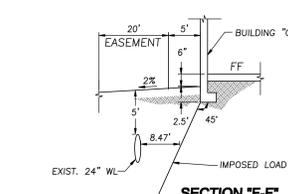
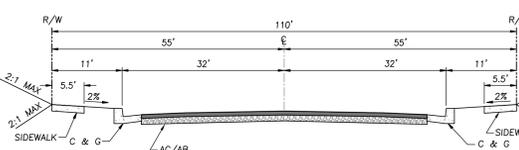
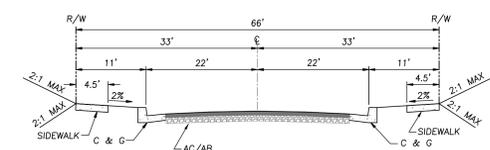
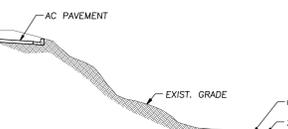
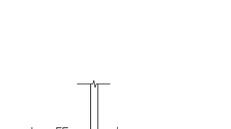
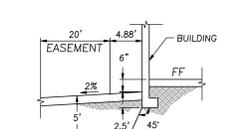
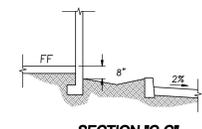
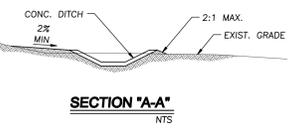
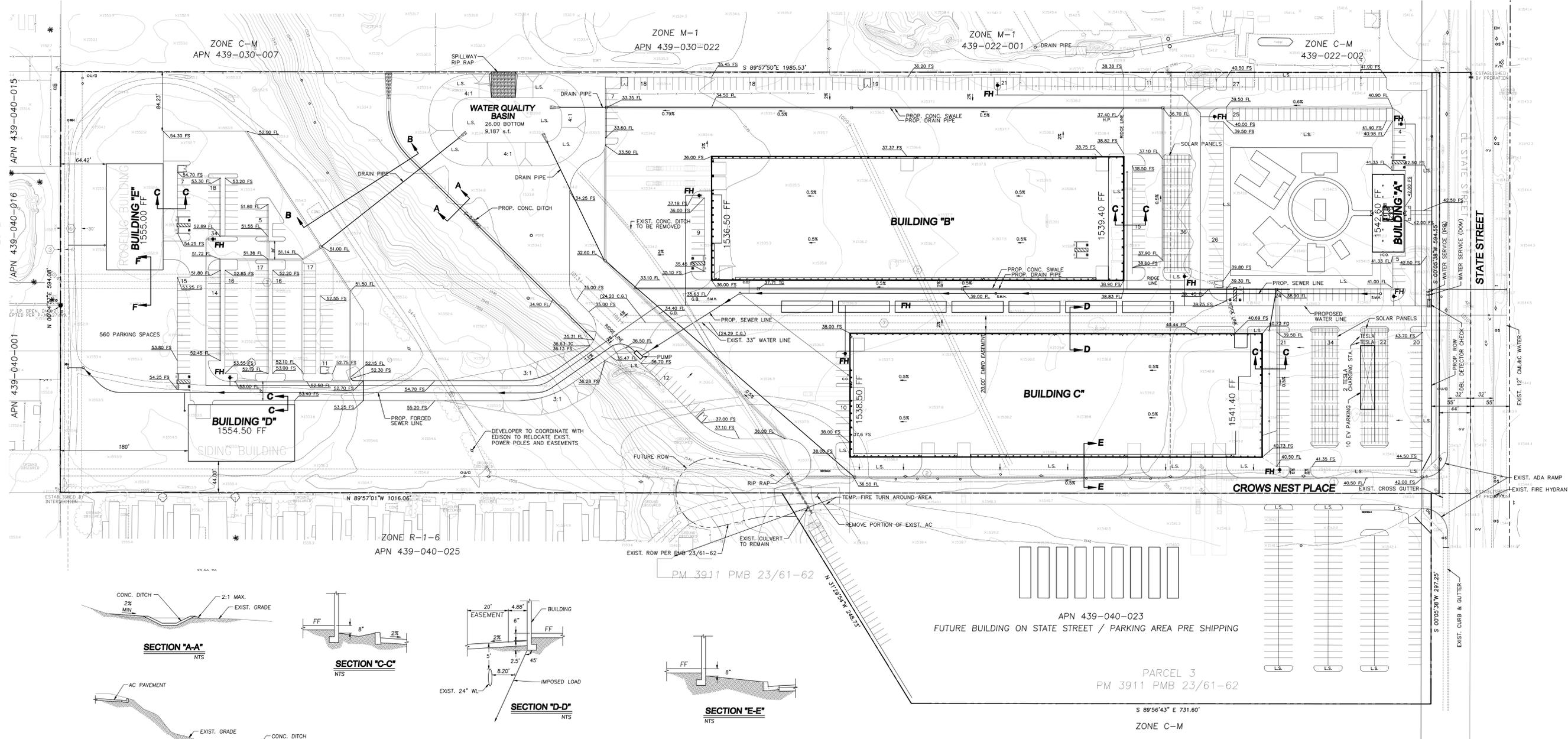
### TOPOGRAPHY:

LANDMARK SURVEYING  
 14888 CHOKO CHERRY DRIVE  
 VICTORVILLE, CA 92392  
 (760) 955-4141 PH.



THOMAS BROTHERS MAP PAGE/GRID:  
 PAGE: 810 GRID: J4 2004 EDITION  
 PAGE: 811 GRID: A4 2004 EDITION

SEC 3, T.5S, R.1W

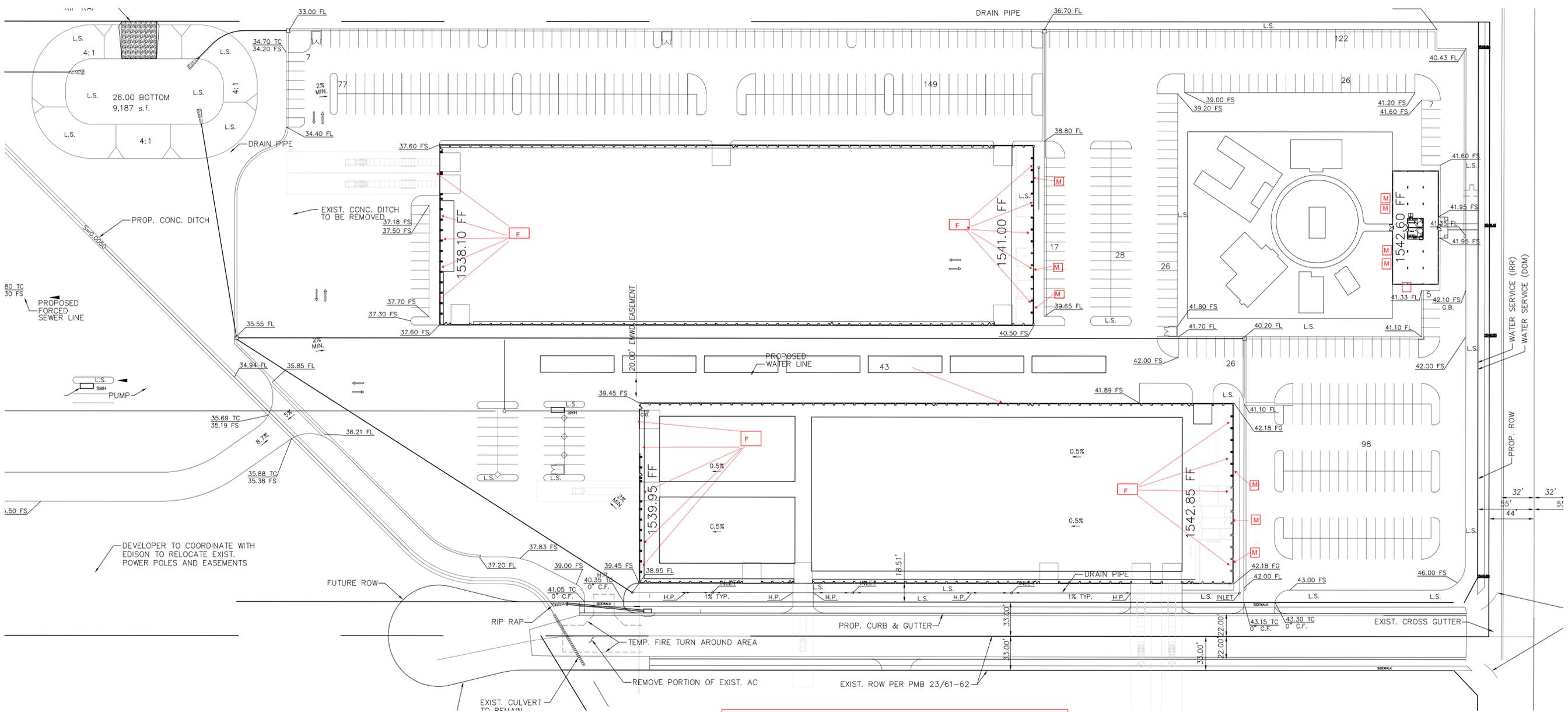


REVISIONS		DATE	BY

<b>PLOT PLAN</b>		<b>CITY OF HEMET</b>	
SCALE: 1" = 50'	DATE: 4/29/2020	J.N. 3210	SHEET 1
DRAWN: JAC	DESIGNED: SA	CHECKED: SA	PLN CK REF:
<b>SAKE ENGINEERS, INC.</b> ENGINEERING SURVEYING & LAND DEVELOPMENT 400 S. RAMONA AVE. STE. 202 CORONA, CALIFORNIA 92879 (951) 279-4041 FAX (951) 279-2830		OF 1 SHEETS	DWG. NO.

PREPARED UNDER THE DIRECTION OF:  
**SAM AKBARPOUR P.E. RCE 053038**



Item	Description	Location Symbol
Fan	Intake Fan	F
HVAC	Mini split System	M

FRONT



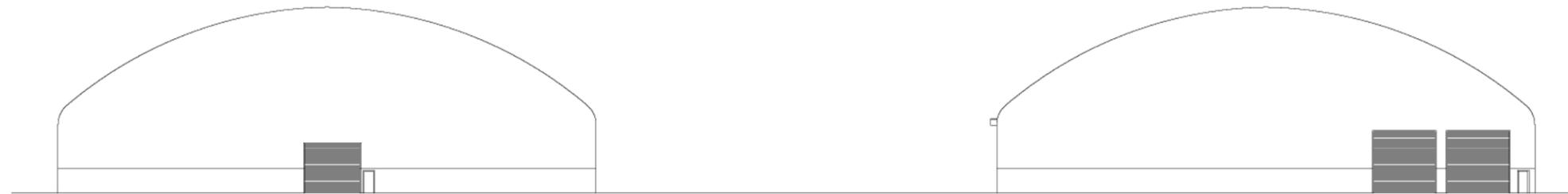
LEFT



RIGHT



REAR



MANUFACTURER:

CUSTOMER:



PROJECT NAME:  
 S²A MODULAR  
 MANUFACTURING PLANT  
 & OFFICES  
 CONCEPT DESIGN FOR  
 1321 & 1255  
 NORTH STATE STREET  
 APN #S  
 439-030-009  
 439-030-010

APPROVAL STAMPS:

DRAWN BY: LCL

DATE: 4.30.19

SCALE: AS SHOWN

REVISIONS:

NO:	DATE:	DESCRIPTION:
1.		

DRAWING DESCRIPTION

ELEVATIONS

SHEET TITLE

E1



FRONT  
STATE STREET OFFICES ONLY



FRONT  
STATE STREET OFFICES WITH PLANT INCLUDED IN BACKGROUND

MANUFACTURER:

CUSTOMER:



PROJECT NAME:  
S2A MODULAR  
MANUFACTURING PLANT  
& OFFICES  
CONCEPT DESIGN FOR  
1321 & 1255  
NORTH STATE STREET  
APN #S  
439-030-009  
439-030-010

APPROVAL STAMPS:

DRAWN BY: LCL  
DATE: 5.1.19  
SCALE: AS SHOWN

REVISIONS:

NO:	DATE:	DESCRIPTION:
1.		

DRAWING DESCRIPTION  
ELEVATIONS

SHEET TITLE  
E2

## **APPENDIX B**

### **Pertinent Sections of the City of Hemet Public Safety Element to the General Plan and Municipal Code**



#### 6.10.4 NOISE AND LAND USE COMPATIBILITY

##### Noise Standards

The City has developed the following noise and land use compatibility designations: normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable. Using these designations, the City has established both interior and exterior noise standards.

Community noise is commonly described in terms of the ambient, or all-encompassing, noise level associated with a given environment. Numerous metrics have been developed to account for the way people perceive sound. The most common of these descriptors are the average equivalent noise level ( $L_{eq}$ ), the maximum noise level ( $L_{max}$ ), and the community noise equivalent level (CNEL).  $L_{eq}$  represents a measure of the average noise level at a given location over a specified period of time. CNEL is based on a 24-hour  $L_{eq}$ , which weights evening and nighttime noise levels to account for increased sensitivity of people to noise occurring during these periods.

Hemet's Land Use Compatibility Standards are presented in Table 6.3. These standards, which use the CNEL noise descriptor, apply to land uses exposed to noise levels generated by transportation-related sources. Residential uses and hotels or overnight lodgings are most sensitive to their noise environment and thus have the lowest range of normally acceptable noise exposure levels. Other uses, such as fairgrounds, are less sensitive and can occur in areas with higher existing noise levels.

Land use compatibility standards for exterior and interior noise are shown in Table 6.4. These standards are maximum interior noise levels for new residential development. Insulation and design features must be employed to reduce interior ambient noise levels to these levels.

The City applies a second set of standards when planning and making development decisions to ensure that stationary noise sources (e.g., HVAC units, industrial operations) do not adversely affect noise-sensitive land uses. These hourly and maximum levels (expressed in  $L_{eq}$  and  $L_{max}$ ) for stationary noise sources are designed to protect noise-sensitive land uses adjacent to stationary sources from excessive and continuous noise. Table 6.5 summarizes stationary source noise standards. These standards represent the acceptable exterior noise levels at the sensitive receptor's property line.



**Table 6.4**  
**Land Use Compatibility Standards for**  
**Exterior and Interior Noise**

Land Use	Maximum Allowable Noise (CNEL)	
	Exterior (dBA)	Interior (dBA)
Residential and mixed use with residential component	65	45
School classrooms	65	45
School playgrounds	70	--
Libraries	–	50
Hospitals, convalescent homes—sleeping areas	–	40
Hospitals, convalescent homes—living areas	–	50
Passive recreation areas	65	–
Active recreation areas	70	–
Commercial and industrial areas	70	–
Office areas	–	50

Notes: CNEL = community noise equivalent level; dBA = A-weighted decibel; – = not applicable/not available.  
The acceptable interior noise level for other uses depends upon the specific nature of the indoor activity.

**Table 6.5**  
**Noise Level Performance Standards for**  
**Nontransportation Noise Sources**

Noise Level Descriptor	Daytime (7 a.m.–10 p.m.)	Nighttime (10 p.m.–7 a.m.)
Hourly average level ( $L_{eq}$ )	60 dBA	45 dBA
Maximum equivalent levels ( $L_{max}$ )	75 dBA	65 dBA

Notes: Each of the noise levels specified shall be lowered by 5 decibels for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings). The noise standard is to be applied at the property lines of the affected land use.

Sec. 67-10. - Time of grading operations.

Grading is allowed Monday through Friday between the hours of 6:00 a.m. and 6:00 p.m. from June 1 through September 30, and between the hours of 7:00 a.m. and 6:00 p.m. from October 1 through May 31. Grading is allowed on Saturdays between the hours of 7:00 a.m. and 6:00 p.m. yearround. Grading on Sundays is prohibited.

The city engineer may extend the hours allowed for grading if he or she determines that such operations are not detrimental to the health, safety or welfare of the occupants of nearby structures, or the quiet enjoyment of nearby residential property.

(Ord. No. 1862, § 1(Exh. A), 6-25-13)

## **APPENDIX C**

### **Cadna Analysis Data and Results**

**Eilar Associates, Inc.**

210 South Juniper Street, Suite 100

Escondido, California 92025-4230

Phone: (760) 738-5570

Date: 18 Jun 2020

**Calculation Configuration**

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rcvr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.30
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

**Receivers**

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height	Coordinates			
			Day	Night	Day	Night	Type	Auto	Noise Type		X	Y	Z	
			(dBA)	(dBA)	(dBA)	(dBA)				(m)	(m)	(m)	(m)	
R1			31.4	-80.1	60.0	45.0				1.52	r	292.01	396.89	1.52
R2			47.1	-75.8	60.0	45.0				1.52	r	557.07	340.07	1.52
NML			75.9	-60.3	60.0	45.0				1.52	r	882.48	352.12	1.52

**Roads**

Name	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
			Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type	Drefl	Hbuild	Dist.	
			(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(km/h)	(km/h)		(dB)		(%)	(dB)	(m)	(m)
State Street (North of Crows Nest)		R_1	68.5	0.0	0.0			1260.0	0.0	0.0	4.8	0.0	0.0	89		19.81	0.0	1	0.0	0.0		
State Street (South of Crows Nest)		R_2	68.5	0.0	0.0			1260.0	0.0	0.0	4.8	0.0	0.0	89		19.81	0.0	1	0.0	0.0		
Crows Nest		R_3	34.2	0.0	0.0			12.0	0.0	0.0	0.0	0.0	0.0	32		6.71	0.0	1	0.0	0.0		

**Geometry - Roads**

Name	Height		Coordinates				Dist (m)	LSlope (%)
	Begin	End	x	y	z	Ground		
	(m)	(m)	(m)	(m)	(m)	(m)		
State Street (North of Crows Nest)	0.00	r	895.14	340.68	0.00	0.00		
			897.80	666.85	0.00	0.00		
State Street (South of Crows Nest)	0.00	r	894.47	341.35	0.00	0.00		
			902.47	100.55	0.00	0.00		
Crows Nest	0.00	r	893.80	340.01	0.00	0.00		
			596.98	340.01	0.00	0.00		

**Eilar Associates, Inc.**

210 South Juniper Street, Suite 100

Escondido, California 92025-4230

Phone: (760) 738-5570

Date: 18 Jun 2020

**Calculation Configuration**

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rcvr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.30
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

**Receivers**

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height	Coordinates			
			Day	Night	Day	Night	Type	Auto	Noise Type		X	Y	Z	
			(dBA)	(dBA)	(dBA)	(dBA)				(m)	(m)	(m)	(m)	
R1			45.6	-79.3	60.0	45.0				1.52	r	292.01	396.89	1.52
R2			51.7	-75.5	60.0	45.0				1.52	r	557.07	340.07	1.52
NML			77.6	-60.3	60.0	45.0				1.52	r	882.48	352.12	1.52

**Roads**

Name	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
			Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type	Drefl	Hbuild	Dist.	
			(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(km/h)	(km/h)		(dB)		(%)	(dB)	(m)	(m)
State Street (North of Crows Nest)		R_1	70.2	0.0	0.0			1840.0	0.0	0.0	5.0	0.0	0.0	89		19.81	0.0	1	0.0	0.0		
State Street (South of Crows Nest)		R_2	70.1	0.0	0.0			1803.0	0.0	0.0	5.0	0.0	0.0	89		19.81	0.0	1	0.0	0.0		
Crows Nest		R_3	36.0	0.0	0.0			18.0	0.0	0.0	0.0	0.0	0.0	32		6.71	0.0	1	0.0	0.0		

**Geometry - Roads**

Name	Height		Coordinates				Dist (m)	LSlope (%)
	Begin	End	x	y	z	Ground		
	(m)	(m)	(m)	(m)	(m)	(m)		
State Street (North of Crows Nest)	0.00	r	895.14	340.68	0.00	0.00		
			897.80	666.85	0.00	0.00		
State Street (South of Crows Nest)	0.00	r	894.47	341.35	0.00	0.00		
			902.47	100.55	0.00	0.00		
Crows Nest	0.00	r	893.80	340.01	0.00	0.00		
			596.98	340.01	0.00	0.00		

**Eilar Associates, Inc.**

210 South Juniper Street, Suite 100  
 Escondido, California 92025-4230  
 Phone: (760) 738-5570  
 Date: 18 Jun 2020

**Calculation Configuration**

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rcvr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	
	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.30
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

**Receivers**

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height	Coordinates			
			Day	Night	Day	Night	Type	Auto	Noise Type		X	Y	Z	
			(dBA)	(dBA)	(dBA)	(dBA)				(m)	(m)	(m)	(m)	
R1			45.9	-79.2	60.0	45.0				1.52	r	292.01	396.89	1.52
R2			52.7	-74.4	60.0	45.0				1.52	r	557.07	340.07	1.52
NML			77.8	-59.9	60.0	45.0				1.52	r	882.48	352.12	1.52

**Roads**

Name	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
			Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type	Drefl	Hbuild	Dist.	
			(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(km/h)	(km/h)		(dB)		(%)	(dB)	(m)	(m)
State Street (North of Crows Nest)		R_1	70.4	0.0	0.0			1917.0	0.0	0.0	5.0	0.0	0.0	89		19.81	0.0	1	0.0	0.0		
State Street (South of Crows Nest)		R_2	70.3	0.0	0.0			1894.0	0.0	0.0	5.0	0.0	0.0	89		19.81	0.0	1	0.0	0.0		
Crows Nest		R_3	53.2	0.0	0.0			138.0	0.0	0.0	4.0	0.0	0.0	56		7.32	0.0	1	0.0	0.0		

**Geometry - Roads**

Name	Height		Coordinates				Dist (m)	LSlope (%)
	Begin	End	x	y	z	Ground		
	(m)	(m)	(m)	(m)	(m)	(m)		
State Street (North of Crows Nest)	0.00	r	895.14	340.68	0.00	0.00		
			897.80	666.85	0.00	0.00		
State Street (South of Crows Nest)	0.00	r	894.47	341.35	0.00	0.00		
			902.47	100.55	0.00	0.00		
Crows Nest	0.00	r	893.80	340.01	0.00	0.00		
			596.98	340.01	0.00	0.00		

# S190701 - S2A Factory - Equipment Leq - Phase 1

## Eilar Associates, Inc.

210 South Juniper Street, Suite 100

Escondido, California 92025-4230

Phone: (760) 738-5570

Date: 18 Jun 2020

## Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rcvr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.30
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

**Receivers**

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height	Coordinates			
			Day	Night	Day	Night	Type	Auto	Noise Type		X	Y	Z	
			(dBA)	(dBA)	(dBA)	(dBA)				(m)	(m)	(m)	(m)	
R1			37.0	24.3	60.0	45.0				1.52	r	292.01	396.89	1.52
R2			49.6	36.4	60.0	45.0				1.52	r	557.07	340.07	1.52

**Point Sources**

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day (dBA)	Evening (dBA)	Night (dBA)	Type	Value dB(A)	norm. dB(A)	Day dB(A)	Evening dB(A)	Night dB(A)	R	Area (m²)		Day (min)	Special (min)	Night (min)				(dB)	(Hz)	(m)		X (m)
Condenser		AC4	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0						0.0		(none)	1.00	r	808.27	388.86	1.00	
Condenser		AC5	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0						0.0		(none)	1.00	r	808.07	373.54	1.00	
Condenser		AC6	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0						0.0		(none)	1.00	r	808.34	363.76	1.00	
Backup Alarm		BU2	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0						0.0		(none)	2.44	r	629.92	381.61	2.44	
Backup Alarm		BU3	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0						0.0		(none)	2.44	r	670.54	354.25	2.44	
Backup Alarm		BU4	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0						0.0		(none)	2.44	r	783.93	354.58	2.44	
Intake		IF11	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	629.50	396.89	2.44	
Intake		IF12	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	629.90	389.74	2.44	
Intake		IF13	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	630.16	380.21	2.44	
Intake		IF14	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	630.03	372.14	2.44	
Intake		IF15	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	630.29	365.25	2.44	
Intake		IF16	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	807.10	396.76	2.44	
Intake		IF17	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	807.26	388.01	2.44	
Intake		IF18	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	807.00	381.13	2.44	
Intake		IF19	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	807.13	373.06	2.44	
Intake		IF20	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	807.26	364.85	2.44	

**Line Sources**

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src			
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number			Spee
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				dB(A)	dB(A)	dB(A)		(m²)	(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night	(km/h)	
Forklifts	+		87.3	-15.7	-15.7	63.2	-39.9	-39.9	PWL-Pt	S8		2.0	0.0	0.0						0.0		(none)	2.0	0.0	0.0	10.0	
On-Site Transport Truck	+		85.3	-14.7	-14.7	65.3	-34.7	-34.7	PWL-Pt	S15		2.0	0.0	0.0						0.0		(none)	1.0	0.0	0.0	10.0	
Delivery Truck	+		95.9	-7.1	-7.1	68.3	-34.7	-34.7	PWL-Pt	S15		2.0	0.0	0.0						0.0		(none)	2.0	0.0	0.0	10.0	

**Geometry - Line Sources**

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(m)	(m)	(m)	(m)	(m)	(m)
Forklifts	1.52	r	577.54	383.50	1.52	0.00
			594.22	367.09	1.52	0.00
			617.77	361.01	1.52	0.00
			626.50	370.80	1.52	0.00
			626.50	412.88	1.52	0.00
			784.50	412.88	1.52	0.00
On-Site Transport Truck	1.52	r	599.20	365.53	1.52	0.00
			625.53	357.17	1.52	0.00
			623.78	429.13	1.52	0.00
Delivery Truck	1.52	r	824.12	337.55	1.52	0.00
			823.18	409.57	1.52	0.00
			812.12	417.44	1.52	0.00
			790.35	417.19	1.52	0.00
			617.26	418.81	1.52	0.00
			606.05	394.43	1.52	0.00
			619.87	341.61	1.52	0.00
			662.74	340.56	1.52	0.00
			669.89	351.07	1.52	0.00
			674.09	340.98	1.52	0.00
			774.77	340.14	1.52	0.00
			784.65	351.28	1.52	0.00
			795.37	338.88	1.52	0.00
			813.26	338.59	1.52	0.00

**Buildings**

Name	M.	ID	RB	Residents	Absorption	Height
						Begin
						(m)
C				0	0.37	

**Geometry - Buildings**

Name	M.	ID	RB	Residents	Absorption	Height	Coordinates			
						Begin	x	y	z	Ground
						(m)	(m)	(m)	(m)	(m)
C				0	0.37		630.07	407.88	7.92	0.00
							806.69	408.41	7.92	0.00
							806.66	381.87	18.14	0.00
							806.56	354.96	7.92	0.00
							630.99	354.83	7.92	0.00
							630.90	381.29	18.14	0.00

**Sound Level Spectra**

Name	ID	Type	Oktave Spectrum (dB)												Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Forklift	S8	Lw			114.6	108.6	98.6	96.6	93.6	91.6	85.6	76.6	100.1	115.8	DEFRA
MXZ-5C42NA2	CON1	Lw (c)	A		47.9	56.5	61.5	60.4	60.6	57.3	50.6	45.5	66.9	77.6	Manufacturer
Delivery Truck	S15	Lw			111.8	111.8	100.8	102.8	98.8	96.8	95.8	87.8	105.3	115.4	DEFRA
Backup Alarm	L1	Lw (c)		0.0	0.0	0.0	0.0	0.0	110.7	0.0	0.0	0.0	110.7	110.7	Measurement
P24-1RS9M115	IN1	Lw			79.0	82.0	79.0	76.0	72.0	69.0	65.0	60.0	78.1	85.9	Similar - Cook Manufacturer

**Eilar Associates, Inc.**

210 South Juniper Street, Suite 100  
 Escondido, California 92025-4230  
 Phone: (760) 738-5570  
 Date: 18 Jun 2020

**Calculation Configuration**

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rcvr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.30
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

**Receivers**

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height	Coordinates			
			Day	Night	Day	Night	Type	Auto	Noise Type		X	Y	Z	
			(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
R1			51.5	51.4	70.0	45.0				1.52	r	292.01	396.89	1.52
R2			65.1	65.1	70.0	45.0				1.52	r	557.07	340.07	1.52

**Point Sources**

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day (dBA)	Evening (dBA)	Night (dBA)	Type	Value dB(A)	norm. dB(A)	Day dB(A)	Evening dB(A)	Night dB(A)	R	Area (m²)		Day (min)	Special (min)	Night (min)				(dB)	(Hz)	(m)		X (m)
Condenser		AC4	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0						0.0		(none)	1.00	r	808.27	388.86	1.00	
Condenser		AC5	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0						0.0		(none)	1.00	r	808.07	373.54	1.00	
Condenser		AC6	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0						0.0		(none)	1.00	r	808.34	363.76	1.00	
Backup Alarm		BU2	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0						0.0		(none)	2.44	r	629.92	381.61	2.44	
Backup Alarm		BU3	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0						0.0		(none)	2.44	r	670.54	354.25	2.44	
Backup Alarm		BU4	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0						0.0		(none)	2.44	r	783.93	354.58	2.44	
Intake		IF11	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	629.50	396.89	2.44	
Intake		IF12	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	629.90	389.74	2.44	
Intake		IF13	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	630.16	380.21	2.44	
Intake		IF14	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	630.03	372.14	2.44	
Intake		IF15	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	630.29	365.25	2.44	
Intake		IF16	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	807.10	396.76	2.44	
Intake		IF17	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	807.26	388.01	2.44	
Intake		IF18	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	807.00	381.13	2.44	
Intake		IF19	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	807.13	373.06	2.44	
Intake		IF20	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0						0.0		(none)	2.44	r	807.26	364.85	2.44	

**Line Sources**

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src			
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number			Spee
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)				dB	(Hz)		Day
Forklifts	+		87.3	-15.7	-15.7	63.2	-39.9	-39.9	PWL-Pt	S8		2.0	0.0	0.0							0.0		(none)	2.0	0.0	0.0	10.0
On-Site Transport Truck	+		85.3	-14.7	-14.7	65.3	-34.7	-34.7	PWL-Pt	S15		2.0	0.0	0.0							0.0		(none)	1.0	0.0	0.0	10.0
Delivery Truck	+		95.9	-7.1	-7.1	68.3	-34.7	-34.7	PWL-Pt	S15		2.0	0.0	0.0							0.0		(none)	2.0	0.0	0.0	10.0

**Geometry - Line Sources**

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(m)	(m)	(m)	(m)	(m)	(m)
Forklifts	1.52	r	577.54	383.50	1.52	0.00
			594.22	367.09	1.52	0.00
			617.77	361.01	1.52	0.00
			626.50	370.80	1.52	0.00
			626.50	412.88	1.52	0.00
			784.50	412.88	1.52	0.00
On-Site Transport Truck	1.52	r	599.20	365.53	1.52	0.00
			625.53	357.17	1.52	0.00
			623.78	429.13	1.52	0.00
Delivery Truck	1.52	r	824.12	337.55	1.52	0.00
			823.18	409.57	1.52	0.00
			812.12	417.44	1.52	0.00
			790.35	417.19	1.52	0.00
			617.26	418.81	1.52	0.00
			606.05	394.43	1.52	0.00
			619.87	341.61	1.52	0.00
			662.74	340.56	1.52	0.00
			669.89	351.07	1.52	0.00
			674.09	340.98	1.52	0.00
			774.77	340.14	1.52	0.00
			784.65	351.28	1.52	0.00
			795.37	338.88	1.52	0.00
			813.26	338.59	1.52	0.00

**Buildings**

Name	M.	ID	RB	Residents	Absorption	Height
						Begin
						(m)
C				0	0.37	

**Geometry - Buildings**

Name	M.	ID	RB	Residents	Absorption	Height	Coordinates			
						Begin	x	y	z	Ground
						(m)	(m)	(m)	(m)	(m)
C				0	0.37		630.07	407.88	7.92	0.00
							806.69	408.41	7.92	0.00
							806.66	381.87	18.14	0.00
							806.56	354.96	7.92	0.00
							630.99	354.83	7.92	0.00
							630.90	381.29	18.14	0.00

**Sound Level Spectra**

Name	ID	Type	Oktave Spectrum (dB)												Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Forklift	S8	Lw			114.6	108.6	98.6	96.6	93.6	91.6	85.6	76.6	100.1	115.8	DEFRA
MXZ-5C42NA2	CON1	Lw (c)	A		47.9	56.5	61.5	60.4	60.6	57.3	50.6	45.5	66.9	77.6	Manufacturer
Delivery Truck	S15	Lw			111.8	111.8	100.8	102.8	98.8	96.8	95.8	87.8	105.3	115.4	DEFRA
Backup Alarm	L1	Lw (c)		0.0	0.0	0.0	0.0	0.0	110.7	0.0	0.0	0.0	110.7	110.7	Measurement
P24-1RS9M115	IN1	Lw			79.0	82.0	79.0	76.0	72.0	69.0	65.0	60.0	78.1	85.9	Similar - Cook Manufacturer

# S190701 - S2A Factory - Equipment Lmax - Completed Project

## Eilar Associates, Inc.

210 South Juniper Street, Suite 100

Escondido, California 92025-4230

Phone: (760) 738-5570

Date: 18 Jun 2020

## Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rcvr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	
	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.30
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

**Receivers**

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height	Coordinates			
			Day	Night	Day	Night	Type	Auto	Noise Type		X	Y	Z	
			(dBA)	(dBA)	(dBA)	(dBA)				(m)	(m)	(m)	(m)	
R1			50.2	37.2	60.0	45.0				1.52	r	292.01	396.89	1.52
R2			52.4	38.4	60.0	45.0				1.52	r	557.07	340.07	1.52

**Point Sources**

Name	M.	ID	Result. PWL			Lw / Li		Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height	Coordinates			
			Day (dBA)	Evening (dBA)	Night (dBA)	Type	Value	norm.	Day dB(A)	Evening dB(A)	Night dB(A)	R		Area (m²)	Day (min)	Special (min)					Night (min)	(dB)	(Hz)	(m)
Condenser		AC1	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	749.09	473.08	1.00		
Condenser		AC2	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	748.82	443.52	1.00		
Condenser		AC3	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	748.56	434.21	1.00		
Condenser		AC4	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	808.27	388.86	1.00		
Condenser		AC5	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	808.07	373.54	1.00		
Condenser		AC6	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	808.34	363.76	1.00		
Condenser		AC7	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	853.37	470.18	1.00		
Condenser		AC8	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	853.40	466.29	1.00		
Condenser		AC9	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	852.95	453.04	1.00		
Condenser		AC10	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	853.51	449.19	1.00		
Backup Alarm		BU1	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0				1.00	0.00	0.00	0.0	(none)	2.44	r	569.43	474.69	2.44
Backup Alarm		BU2	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0				1.00	0.00	0.00	0.0	(none)	2.44	r	629.92	381.61	2.44
Backup Alarm		BU3	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0				1.00	0.00	0.00	0.0	(none)	2.44	r	670.54	354.25	2.44
Backup Alarm		BU4	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0				1.00	0.00	0.00	0.0	(none)	2.44	r	783.93	354.58	2.44
Backup Alarm		BU5	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0				1.00	0.00	0.00	0.0	(none)	2.44	r	335.51	442.76	2.44
Backup Alarm		BU6	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0				1.00	0.00	0.00	0.0	(none)	2.44	r	352.41	377.16	2.44
Intake		IF1	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	569.37	473.82	2.44		
Intake		IF2	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	569.58	466.26	2.44		
Intake		IF3	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	569.54	456.17	2.44		
Intake		IF4	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	569.37	448.40	2.44		
Intake		IF5	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	569.16	440.20	2.44		
Intake		IF6	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	748.31	474.17	2.44		
Intake		IF7	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	747.98	468.20	2.44		
Intake		IF8	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	747.87	458.86	2.44		
Intake		IF9	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	747.77	450.03	2.44		
Intake		IF10	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	748.08	441.84	2.44		
Intake		IF11	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	629.50	396.89	2.44		
Intake		IF12	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	629.90	389.74	2.44		
Intake		IF13	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	630.16	380.21	2.44		
Intake		IF14	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	630.03	372.14	2.44		
Intake		IF15	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	630.29	365.25	2.44		
Intake		IF16	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	807.10	396.76	2.44		
Intake		IF17	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	807.26	388.01	2.44		
Intake		IF18	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	807.00	381.13	2.44		
Intake		IF19	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	807.13	373.06	2.44		
Intake		IF20	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	807.26	364.85	2.44		
Intake Fan		IF21	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	392.39	363.95	2.44		
Intake Fan		IF22	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	344.70	364.37	2.44		
Intake Fan		IF23	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	321.68	434.30	2.44		
Intake Fan		IF24	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	322.18	481.82	2.44		

**Line Sources**

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src			
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number			Spee
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(dB(A)	(dB(A)	(dB(A)		(m²)		(min)	(min)	(min)				(dB)	(Hz)		Day
Forklifts	+		93.4	-9.6	-9.6	63.2	-39.9	-39.9	PWL-Pt	S8		2.0	0.0	0.0							0.0		(none)	2.0	0.0	0.0	10.0
On-Site Transport Truck	+		91.2	-8.8	-8.8	65.3	-34.7	-34.7	PWL-Pt	S15		2.0	0.0	0.0							0.0		(none)	1.0	0.0	0.0	10.0
Delivery Truck	+		97.9	-5.1	-5.1	68.3	-34.7	-34.7	PWL-Pt	S15		2.0	0.0	0.0							0.0		(none)	2.0	0.0	0.0	10.0
Delivery Truck	+		94.0	-9.0	-9.0	68.3	-34.7	-34.7	PWL-Pt	S15		2.0	0.0	0.0							0.0		(none)	2.0	0.0	0.0	10.0

**Geometry - Line Sources**

Name	Height		Coordinates				
	Begin	End	x	y	z	Ground	
	(m)	(m)	(m)	(m)	(m)	(m)	
Forklifts	1.52	r	336.91	444.26	1.52	0.00	
			363.73	445.43	1.52	0.00	
			364.94	411.53	1.52	0.00	
			368.35	385.18	1.52	0.00	
			414.85	384.41	1.52	0.00	
			468.06	384.07	1.52	0.00	
			499.74	385.94	1.52	0.00	
			526.95	404.71	1.52	0.00	
			532.12	417.38	1.52	0.00	
			538.29	427.38	1.52	0.00	
			537.45	503.74	1.52	0.00	
			557.46	503.74	1.52	0.00	
			557.96	412.88	1.52	0.00	
			577.54	383.50	1.52	0.00	
			594.22	367.09	1.52	0.00	
	On-Site Transport Truck	1.52	r	617.77	361.01	1.52	0.00
			626.50	370.80	1.52	0.00	
			626.50	412.88	1.52	0.00	
			784.50	412.88	1.52	0.00	
			781.57	492.98	1.52	0.00	
			566.48	492.98	1.52	0.00	
			567.19	475.50	1.52	0.00	
			568.32	502.91	1.52	0.00	
			537.23	503.12	1.52	0.00	
			539.12	413.64	1.52	0.00	
Delivery Truck	1.52	r	599.20	365.53	1.52	0.00	
			625.53	357.17	1.52	0.00	
			623.78	429.13	1.52	0.00	
			559.36	428.59	1.52	0.00	
			824.24	341.18	1.52	0.00	
			824.49	417.32	1.52	0.00	
			790.35	417.19	1.52	0.00	
		562.53	425.80	1.52	0.00		
		561.19	492.84	1.52	0.00		
		538.01	500.18	1.52	0.00		

S190701 - S2A Factory - Equipment Lmax - Completed Project

Name	Height		Coordinates			
	Begin (m)	End (m)	x (m)	y (m)	z (m)	Ground (m)
			534.90	428.52	1.52	0.00
			529.07	408.68	1.52	0.00
			497.05	384.84	1.52	0.00
			371.02	384.41	1.52	0.00
			365.29	481.18	1.52	0.00
			336.81	476.88	1.52	0.00
			348.98	380.94	1.52	0.00
Delivery Truck	1.52	r	532.32	415.03	1.52	0.00
			572.25	387.84	1.52	0.00
			613.56	392.51	1.52	0.00
			622.19	337.63	1.52	0.00
			664.80	340.28	1.52	0.00
			671.42	351.93	1.52	0.00
			679.89	339.49	1.52	0.00
			776.76	341.60	1.52	0.00
			783.91	350.07	1.52	0.00
			792.38	341.60	1.52	0.00
			824.52	340.73	1.52	0.00

**Buildings**

Name	M.	ID	RB	Residents	Absorption	Height	
						Begin	
						(m)	
A				0	0.37	3.66	r
C				0	0.37		
B				0	0.37		
D				0	0.37	7.32	r
E				0	0.37	7.32	r

**Geometry - Buildings**

Name	M.	ID	RB	Residents	Absorption	Height	Coordinates				
						Begin	x	y	z	Ground	
						(m)	(m)	(m)	(m)	(m)	
A				0	0.37	3.66	r	854.00	475.93	3.66	0.00
								867.81	476.02	3.66	0.00
								867.74	442.63	3.66	0.00
								853.90	442.55	3.66	0.00
C				0	0.37			630.07	407.88	7.92	0.00
								806.69	408.41	7.92	0.00
								806.66	381.87	18.14	0.00
								806.56	354.96	7.92	0.00
								630.99	354.83	7.92	0.00
								630.90	381.29	18.14	0.00
B				0	0.37			570.29	482.89	7.92	0.00
								747.43	483.63	7.92	0.00
								746.80	455.08	18.14	0.00
								747.22	430.39	7.92	0.00
								570.27	430.34	7.92	0.00
								570.27	456.23	18.14	0.00
D				0	0.37	7.32	r	345.54	376.71	7.32	0.00
								391.72	376.84	7.32	0.00
								391.59	352.49	7.32	0.00
								345.40	352.62	7.32	0.00
E				0	0.37	7.32	r	310.60	480.47	7.32	0.00
								334.15	480.73	7.32	0.00
								334.15	434.94	7.32	0.00
								310.07	434.94	7.32	0.00

**Sound Level Spectra**

Name	ID	Type	Oktave Spectrum (dB)												Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Forklift	S8	Lw			114.6	108.6	98.6	96.6	93.6	91.6	85.6	76.6	100.1	115.8	DEFRA
MXZ-5C42NA2	CON1	Lw (c)	A		47.9	56.5	61.5	60.4	60.6	57.3	50.6	45.5	66.9	77.6	Manufacturer
Delivery Truck	S15	Lw			111.8	111.8	100.8	102.8	98.8	96.8	95.8	87.8	105.3	115.4	DEFRA
Backup Alarm	L1	Lw (c)		0.0	0.0	0.0	0.0	0.0	110.7	0.0	0.0	0.0	110.7	110.7	Measurement
P24-1RS9M115	IN1	Lw			79.0	82.0	79.0	76.0	72.0	69.0	65.0	60.0	78.1	85.9	Similar - Cook Manufacturer

# S190701 S2A Factory - Equipment Lmax - Completed Project

## Eilar Associates, Inc.

210 South Juniper Street, Suite 100

Escondido, California 92025-4230

Phone: (760) 738-5570

Date: 18 Jun 2020

## Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rcvr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	
	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.30
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

**Receivers**

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height	Coordinates			
			Day	Night	Day	Night	Type	Auto	Noise Type		X	Y	Z	
			(dBA)	(dBA)	(dBA)	(dBA)				(m)	(m)	(m)	(m)	
R1			65.9	65.8	70.0	45.0				1.52	r	292.01	396.89	1.52
R2			66.4	66.3	70.0	45.0				1.52	r	557.07	340.07	1.52

## Point Sources

Name	M.	ID	Result. PWL			Lw / Li		Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height	Coordinates		
			Day (dBA)	Evening (dBA)	Night (dBA)	Type	Value norm.	Day dB(A)	Evening dB(A)	Night dB(A)	R	Area (m²)		Day (min)	Special (min)	Night (min)					(dB)	(Hz)	(m)
Condenser		AC1	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	749.09	473.08	1.00	
Condenser		AC2	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	748.82	443.52	1.00	
Condenser		AC3	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	748.56	434.21	1.00	
Condenser		AC4	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	808.27	388.86	1.00	
Condenser		AC5	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	808.07	373.54	1.00	
Condenser		AC6	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	808.34	363.76	1.00	
Condenser		AC7	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	853.37	470.18	1.00	
Condenser		AC8	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	853.40	466.29	1.00	
Condenser		AC9	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	852.95	453.04	1.00	
Condenser		AC10	66.9	66.9	66.9	Lw	CON1		0.0	0.0	0.0					0.0	(none)	1.00	r	853.51	449.19	1.00	
Backup Alarm		BU1	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0					0.0	(none)	2.44	r	569.43	474.69	2.44	
Backup Alarm		BU2	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0					0.0	(none)	2.44	r	629.92	381.61	2.44	
Backup Alarm		BU3	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0					0.0	(none)	2.44	r	670.54	354.25	2.44	
Backup Alarm		BU4	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0					0.0	(none)	2.44	r	783.93	354.58	2.44	
Backup Alarm		BU5	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0					0.0	(none)	2.44	r	335.51	442.76	2.44	
Backup Alarm		BU6	110.7	110.7	110.7	Lw	L1		0.0	0.0	0.0					0.0	(none)	2.44	r	352.41	377.16	2.44	
Intake		IF1	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	569.37	473.82	2.44	
Intake		IF2	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	569.58	466.26	2.44	
Intake		IF3	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	569.54	456.17	2.44	
Intake		IF4	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	569.37	448.40	2.44	
Intake		IF5	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	569.16	440.20	2.44	
Intake		IF6	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	748.31	474.17	2.44	
Intake		IF7	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	747.98	468.20	2.44	
Intake		IF8	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	747.87	458.86	2.44	
Intake		IF9	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	747.77	450.03	2.44	
Intake		IF10	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	748.08	441.84	2.44	
Intake		IF11	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	629.50	396.89	2.44	
Intake		IF12	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	629.90	389.74	2.44	
Intake		IF13	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	630.16	380.21	2.44	
Intake		IF14	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	630.03	372.14	2.44	
Intake		IF15	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	630.29	365.25	2.44	
Intake		IF16	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	807.10	396.76	2.44	
Intake		IF17	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	807.26	388.01	2.44	
Intake		IF18	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	807.00	381.13	2.44	
Intake		IF19	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	807.13	373.06	2.44	
Intake		IF20	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	807.26	364.85	2.44	
Intake Fan		IF21	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	392.39	363.95	2.44	
Intake Fan		IF22	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	344.70	364.37	2.44	
Intake Fan		IF23	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	321.68	434.30	2.44	
Intake Fan		IF24	78.1	78.1	78.1	Lw	IN1		0.0	0.0	0.0					0.0	(none)	2.44	r	322.18	481.82	2.44	

**Line Sources**

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src			
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number			Spee
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(dB(A)	(dB(A)	(dB(A)		(m²)		(min)	(min)	(min)				(dB)	(Hz)		Day
Forklifts	+		93.4	-9.6	-9.6	63.2	-39.9	-39.9	PWL-Pt	S8		2.0	0.0	0.0							0.0		(none)	2.0	0.0	0.0	10.0
On-Site Transport Truck	+		91.2	-8.8	-8.8	65.3	-34.7	-34.7	PWL-Pt	S15		2.0	0.0	0.0							0.0		(none)	1.0	0.0	0.0	10.0
Delivery Truck	+		97.9	-5.1	-5.1	68.3	-34.7	-34.7	PWL-Pt	S15		2.0	0.0	0.0							0.0		(none)	2.0	0.0	0.0	10.0
Delivery Truck	+		94.0	-9.0	-9.0	68.3	-34.7	-34.7	PWL-Pt	S15		2.0	0.0	0.0							0.0		(none)	2.0	0.0	0.0	10.0

**Geometry - Line Sources**

Name	Height		Coordinates				
	Begin	End	x	y	z	Ground	
	(m)	(m)	(m)	(m)	(m)	(m)	
Forklifts	1.52	r	336.91	444.26	1.52	0.00	
			363.73	445.43	1.52	0.00	
			364.94	411.53	1.52	0.00	
			368.35	385.18	1.52	0.00	
			414.85	384.41	1.52	0.00	
			468.06	384.07	1.52	0.00	
			499.74	385.94	1.52	0.00	
			526.95	404.71	1.52	0.00	
			532.12	417.38	1.52	0.00	
			538.29	427.38	1.52	0.00	
			537.45	503.74	1.52	0.00	
			557.46	503.74	1.52	0.00	
			557.96	412.88	1.52	0.00	
			577.54	383.50	1.52	0.00	
			594.22	367.09	1.52	0.00	
			617.77	361.01	1.52	0.00	
			626.50	370.80	1.52	0.00	
		626.50	412.88	1.52	0.00		
		784.50	412.88	1.52	0.00		
		781.57	492.98	1.52	0.00		
		566.48	492.98	1.52	0.00		
On-Site Transport Truck	1.52	r	567.19	475.50	1.52	0.00	
			568.32	502.91	1.52	0.00	
			537.23	503.12	1.52	0.00	
			539.12	413.64	1.52	0.00	
			599.20	365.53	1.52	0.00	
			625.53	357.17	1.52	0.00	
			623.78	429.13	1.52	0.00	
		559.36	428.59	1.52	0.00		
Delivery Truck	1.52	r	824.24	341.18	1.52	0.00	
			824.49	417.32	1.52	0.00	
			790.35	417.19	1.52	0.00	
			562.53	425.80	1.52	0.00	
			561.19	492.84	1.52	0.00	
		538.01	500.18	1.52	0.00		

S190701 S2A Factory - Equipment Lmax - Completed Project

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(m)	(m)	(m)	(m)	(m)	(m)
			534.90	428.52	1.52	0.00
			529.07	408.68	1.52	0.00
			497.05	384.84	1.52	0.00
			371.02	384.41	1.52	0.00
			365.29	481.18	1.52	0.00
			336.81	476.88	1.52	0.00
			348.98	380.94	1.52	0.00
Delivery Truck	1.52	r	532.32	415.03	1.52	0.00
			572.25	387.84	1.52	0.00
			613.56	392.51	1.52	0.00
			622.19	337.63	1.52	0.00
			664.80	340.28	1.52	0.00
			671.42	351.93	1.52	0.00
			679.89	339.49	1.52	0.00
			776.76	341.60	1.52	0.00
			783.91	350.07	1.52	0.00
			792.38	341.60	1.52	0.00
			824.52	340.73	1.52	0.00

**Buildings**

Name	M.	ID	RB	Residents	Absorption	Height
						Begin
						(m)
A				0	0.37	3.66 r
C				0	0.37	
B				0	0.37	
D				0	0.37	7.32 r
E				0	0.37	7.32 r

**Geometry - Buildings**

Name	M.	ID	RB	Residents	Absorption	Height	Coordinates			
						Begin	x	y	z	Ground
						(m)	(m)	(m)	(m)	(m)
A				0	0.37	3.66 r	854.00	475.93	3.66	0.00
							867.81	476.02	3.66	0.00
							867.74	442.63	3.66	0.00
							853.90	442.55	3.66	0.00
C				0	0.37		630.07	407.88	7.92	0.00
							806.69	408.41	7.92	0.00
							806.66	381.87	18.14	0.00
							806.56	354.96	7.92	0.00
							630.99	354.83	7.92	0.00
							630.90	381.29	18.14	0.00
B				0	0.37		570.29	482.89	7.92	0.00
							747.43	483.63	7.92	0.00
							746.80	455.08	18.14	0.00
							747.22	430.39	7.92	0.00
							570.27	430.34	7.92	0.00
							570.27	456.23	18.14	0.00
D				0	0.37	7.32 r	345.54	376.71	7.32	0.00
							391.72	376.84	7.32	0.00
							391.59	352.49	7.32	0.00
							345.40	352.62	7.32	0.00
E				0	0.37	7.32 r	310.60	480.47	7.32	0.00
							334.15	480.73	7.32	0.00
							334.15	434.94	7.32	0.00
							310.07	434.94	7.32	0.00

**Sound Level Spectra**

Name	ID	Type	Oktave Spectrum (dB)												Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Forklift	S8	Lw			114.6	108.6	98.6	96.6	93.6	91.6	85.6	76.6	100.1	115.8	DEFRA
MXZ-5C42NA2	CON1	Lw (c)	A		47.9	56.5	61.5	60.4	60.6	57.3	50.6	45.5	66.9	77.6	Manufacturer
Delivery Truck	S15	Lw			111.8	111.8	100.8	102.8	98.8	96.8	95.8	87.8	105.3	115.4	DEFRA
Backup Alarm	L1	Lw (c)		0.0	0.0	0.0	0.0	0.0	110.7	0.0	0.0	0.0	110.7	110.7	Measurement
P24-1RS9M115	IN1	Lw			79.0	82.0	79.0	76.0	72.0	69.0	65.0	60.0	78.1	85.9	Similar - Cook Manufacturer

## **APPENDIX D**

### **Manufacturer Data Sheets**

Job Name:

System Reference:

Date:



Outdoor Unit: MXZ-5C42NA2

### ACCESSORIES

- 3/8" x 1/2" Port Adapter (MAC-A454JP-E)
- 1/2" x 3/8" Port Adapter (MAC-A455JP-E)
- 1/2" x 5/8" Port Adapter (MAC-A456JP-E)
- 1/4" x 3/8" Port Adapter (PAC-493PI)
- 3/8" x 5/8" Port Adapter (PAC-SG76RJ-E)
- M-NET Adapter (PAC-IF01MNT-E)
- Base Heater (PAC-645BH-E)

(For data on specific indoor units, see the MXZ-C Technical and Service Manual.)

Specifications			Model Name
Unit Type			MXZ-5C42NA2
Cooling* (Non-ducted / Ducted)	Rated Capacity	Btu/h	40,500 / 37,400
	Capacity Range	Btu/h	12,600 - 43,000
	Rated Total Input	W	4,403 / 4,112
Heating at 47°F* (Non-ducted / Ducted)	Rated Capacity	Btu/h	45,000 / 41,000
	Capacity Range	Btu/h	11,400 - 53,600
	Rated Total Input	W	3,575 / 3,463
Heating at 17°F* (Non-ducted/Ducted)	Rated Capacity	Btu/h	24,400 / 23,000
	Rated Total Input	W	2,943 / 2,869
Connectable Capacity		Btu/h	12,000 - 51,000
Electrical Requirements	Power Supply	Voltage, Phase, Hertz	208 / 230V, 1-Phase, 60 Hz
	Recommended Fuse/Breaker Size	A	40
	MCA	A	32.5
Voltage	Indoor - Outdoor S1-S2	V	AC 208 / 230
	Indoor - Outdoor S2-S3	V	DC ±24
Compressor			INVERTER-driven Scroll Hermetic
Fan Motor (ECM)		F.L.A.	2.43
Sound Pressure Level	Cooling	dB(A)	56
	Heating	dB(A)	58
External Dimensions (H x W x D)		In mm	41-9/32 x 37-13/32 x 13 (1048 x 950 x 330)
Net Weight		Lbs / kg	189 (86)
External Finish			Munsell No. 3Y 7.8/11
Refrigerant Pipe Size O.D.	Liquid (High Pressure)	In / mm	1/4 (6.35)
	Gas (Low Pressure)	In / mm	A:1/2 (12.7) ; B,C,D,E: 3/8 (9.52)
Max. Refrigerant Line Length		Ft / m	262 (80)
Max. Piping Length for Each Indoor Unit		Ft / m	82 (25)
Max. Refrigerant Pipe Height Difference	If IDU is Above ODU	Ft / m	49 (15)
	If IDU is Below ODU	Ft / m	49 (15)
Connection Method			Flared/Flared
Refrigerant			R410A

\* Rating Conditions per AHRI Standard:

Cooling | Indoor: 80° F (27° C) DB / 67° F (19° C) WB

Cooling | Outdoor: 95° F (35° C) DB / 23.9° C (75° F) WB

Heating at 47°F | Indoor: 70° F (21° C) DB / 60° F (16° C) WB

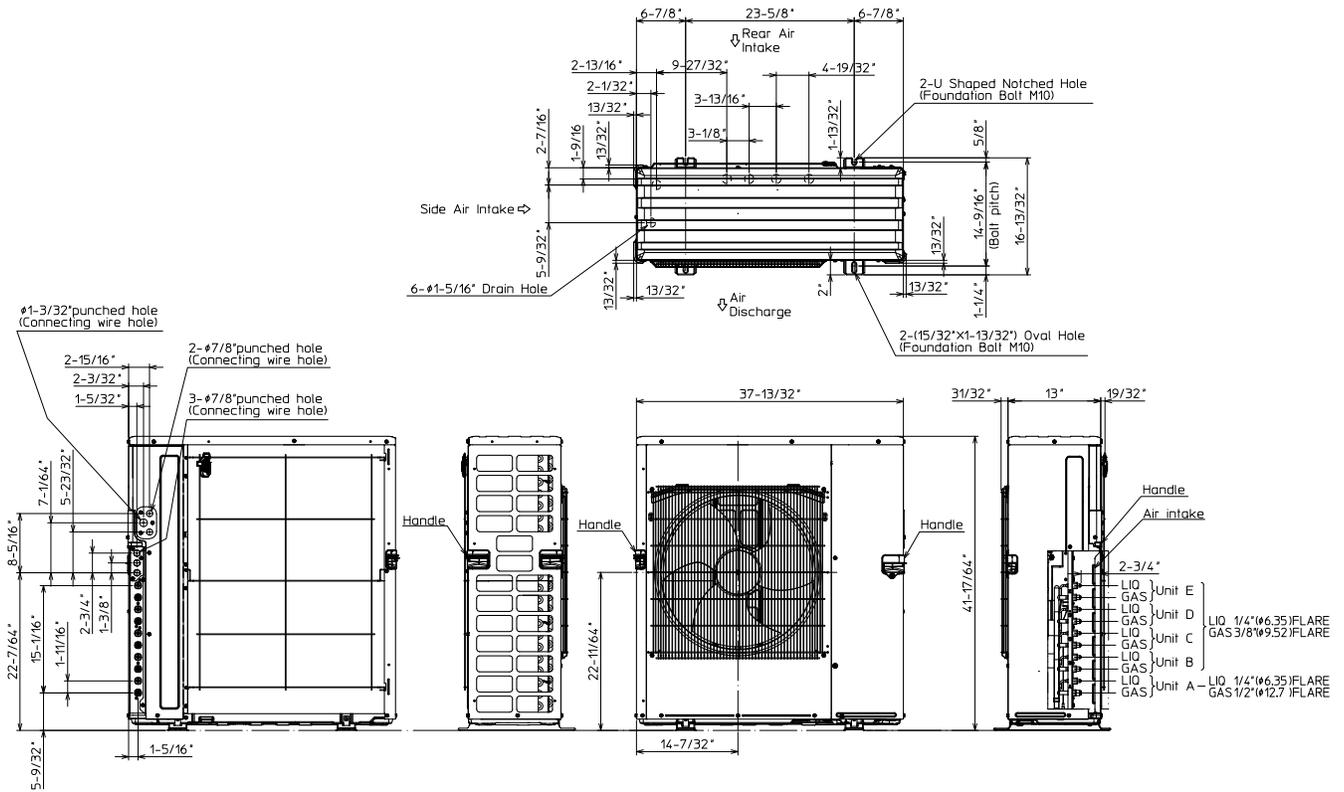
Heating at 47°F | Outdoor: 47° F (8° C) DB / 43° F (6° C) WB

Heating at 17° F | Indoor: 70° F (21° C) DB

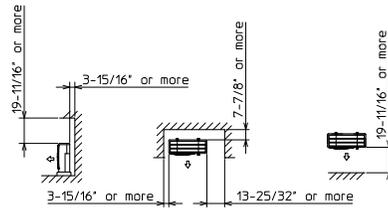
Heating at 17° F | Outdoor: 17° F (-8° C) DB / 15° F (-9° C) WB

# DIMENSIONS: MXZ-5C42NA2

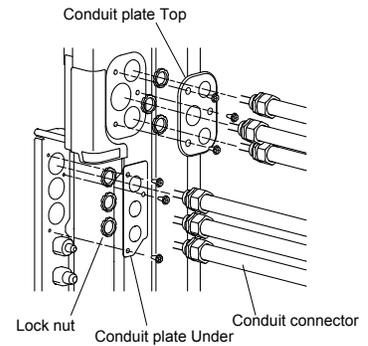
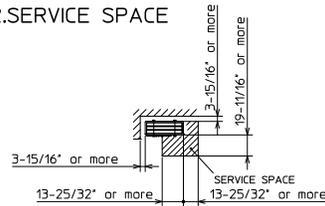
Unit: inch



### 1. FREE SPACE



### 2. SERVICE SPACE



COOLING & HEATING

1340 Satellite Boulevard, Suwanee, GA 30024  
 Toll Free: 800-433-4822 www.mehvac.com





P12-1R FAN SHOWN

# P - SERIES SUPPLY FANS

Designed for Industrial &amp; Commercial Supply applications.



P12-1RS9M1115 FAN SHOWN COMPLETE WITH SLEEVE AND MOTORIZED DAMPER.

## FEATURES

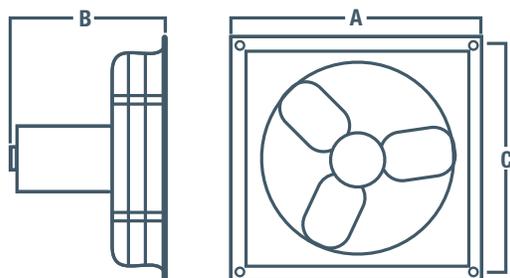
- Fully assembled.
- Sturdily constructed direct drive, horizontal fan.
- Durable powder coated finish.
- Heavy duty OSHA motor mount/guard is standard.
- Totally enclosed air over motor with overload protection.



Non-stock, made-to-order products are non-returnable and cannot be cancelled.

## DIMENSIONS

MODEL	A X A SQUARE	B	C c/c
P12-1R	17 1/4"	11"	16"
P14-1R	19 1/4"	11"	18"
P16-1R	21 1/4"	11"	20"
P18-1R	23 1/4"	12"	22"
P20-1R	25 1/4"	12"	24"
P24-1R	29 1/4"	12"	28"



## SPECIFICATIONS

MODEL	BLADE DIAMETER	RPM	HP	VOLTAGE	AMPS (FLA)	WEIGHT (LBS)	CFM @ STATIC PRESSURE			
							0.00"	0.10"	0.125"	0.25"
<b>P SERIES SUPPLY FAN</b>										
P12-1R	12"	1700	1/3	115/230	5.0/2.5	26	1450	1400	1370	1260
P14-1R	14"	1700	1/3	115/230	5.0/2.5	29	1950	1825	1750	1700
P16-1R	16"	1700	1/3	115/230	5.0/2.5	30	2310	2200	2150	2030
P18-1R	18"	1700	1/3	115/230	3.8/1.9	36	2835	2700	2600	2315
P20-1R	20"	1700	1/3	115/230	3.8/1.9	39	3250	3075	3000	2800
P24-1R	24"	1100	1/3	115/230	6.4/3.2	43	4040	3928	3848	3520

### P SERIES SUPPLY FAN

Complete with 9" sleeve and 120 Volt motorized damper (specs are for fan motor only and not damper motor)  
For exhaust models, replace "1R" in the model name with "1V".

P12-1RS9M1115	12"	1700	1/3	115/230	5.0/2.5	45	1450	1400	1370	1260
P14-1RS9M1115	14"	1700	1/3	115/230	5.0/2.5	50	1950	1825	1750	1700
P16-1RS9M1115	16"	1700	1/3	115/230	5.0/2.5	54	2310	2200	2150	2030
P18-1RS9M1115	18"	1700	1/3	115/230	3.8/1.9	60	2835	2700	2600	2315
P20-1RS9M1115	20"	1700	1/3	115/230	3.8/1.9	66	3250	3075	3000	2800
P24-1RS9M1115	24"	1100	1/3	115/230	4.4/2.2	73	4040	3928	3848	3520

## ACCESSORIES

- Thermostats
- Front guard
- Weather hoods

For a complete listing on all available accessories, see page D16.  
For a complete listing of all available hoods, see page D11.  
For all available control options, see Controls & Thermostats tab.

## **APPENDIX E**

### **Construction Noise and Vibration Calculations**

**EILAR ASSOCIATES, INC.**  
**Acoustical and Environmental Consulting**

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**Noise Attenuation by Distance Calculation**

Job: S2A Modular Factory  
Job #: S190701  
Date: 11/11/2019  
Source: Small Dozer  
Receiver: C1 - Grading/Utilities S1

<b>Noise Source</b>
Noise Level (dBA) <u>74</u> at <u>50</u> feet

<b>Distances</b>
Source Elevation <u>0</u> feet at <u>5</u> feet above grade
Receiver Elevation: <u>0</u> feet at <u>5</u> feet above grade
Source to Receiver Distance: <u>150</u> feet

<b>Path Calculation</b>
Source to Receiver Direct Path Distance: <u>150</u> feet

<b>Sound Pressure Level</b>	<u>64.5</u>	at	<u>150</u>	feet
Hours of Use:	<u>12</u>			
Duty Cycle (%):	<u>40</u>			
Level During 12 Hour day:	<u>60.5</u>			

<b>Summation</b>
Number of Sources: <u>4</u>
Level during 12 hour day: <u>67.9</u>

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**Noise Attenuation by Distance Calculation**

Job: S2A Modular Factory  
Job #: S190701  
Date: 11/11/2019  
Source: Dozer  
Receiver: C1 - Grading/Utilities S

<b>Noise Source</b>
Noise Level (dBA) <u>76</u> at <u>50</u> feet

<b>Distances</b>
Source Elevation <u>0</u> feet at <u>5</u> feet above grade
Receiver Elevation: <u>0</u> feet at <u>5</u> feet above grade
Source to Receiver Distance: <u>150</u> feet

<b>Path Calculation</b>
Source to Receiver Direct Path Distance: <u>150</u> feet

<b>Sound Pressure Level</b>	<u>66.5</u>	at	<u>150</u>	feet
Hours of Use:	<u>12</u>			
Duty Cycle (%):	<u>40</u>			
Level During 12 Hour day:	<u>62.5</u>			

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**Noise Attenuation by Distance Calculation**

Job: S2A Modular Factory  
Job #: S190701  
Date: 11/11/2019  
Source: Backhoe  
Receiver: C1 - Grading/Utilities S

<b>Noise Source</b>			
Noise Level (dBA)	<u>74</u>	at	<u>50</u> feet

<b>Distances</b>			
Source Elevation	<u>0</u>	feet	at <u>5</u> feet above grade
Receiver Elevation:	<u>0</u>	feet	at <u>5</u> feet above grade
Source to Receiver Distance:	<u>150</u>	feet	

<b>Path Calculation</b>	
Source to Receiver Direct Path Distance:	<u>150</u> feet

<b>Sound Pressure Level</b>	<u>64.5</u>	at	<u>150</u> feet
Hours of Use:	<u>12</u>		
Duty Cycle (%):	<u>40</u>		
Level During 12 Hour day:	<u>60.5</u>		

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**Noise Attenuation by Distance Calculation**

Job: S2A Modular Factory  
Job #: S190701  
Date: 11/11/2019  
Source: Water Truck  
Receiver: C1 - Grading/Utilities S

<b>Noise Source</b>
Noise Level (dBA) <u>77</u> at <u>50</u> feet

<b>Distances</b>
Source Elevation <u>0</u> feet at <u>5</u> feet above grade
Receiver Elevation: <u>0</u> feet at <u>5</u> feet above grade
Source to Receiver Distance: <u>150</u> feet

<b>Path Calculation</b>
Source to Receiver Direct Path Distance: <u>150</u> feet

<b>Sound Pressure Level</b>	<u>67.5</u>	at	<u>150</u>	feet
Hours of Use:	<u>12</u>			
Duty Cycle (%):	<u>40</u>			
Level During 12 Hour day:	<u>63.5</u>			

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**Noise Attenuation by Distance Calculation**

Job: S2A Modular Factory  
Job #: S190701  
Date: 11/11/2019  
Source: Concrete Pump Truck  
Receiver: C2 - Foundation S2

<b>Noise Source</b>
Noise Level (dBA) <u>74</u> at <u>50</u> feet

<b>Distances</b>
Source Elevation <u>0</u> feet at <u>5</u> feet above grade
Receiver Elevation: <u>0</u> feet at <u>5</u> feet above grade
Source to Receiver Distance: <u>115</u> feet

<b>Path Calculation</b>
Source to Receiver Direct Path Distance: <u>115</u> feet

<b>Sound Pressure Level</b>	<u>66.8</u>	at	<u>115</u>	feet
Hours of Use:	<u>12</u>			
Duty Cycle (%):	<u>20</u>			
Level During 12 Hour day:	<u>59.8</u>			

<b>Summation</b>
Number of Sources: <u>1</u>
Level during 12 hour day: <u>59.8</u>

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**Noise Attenuation by Distance Calculation**

Job: S2A Modular Factory  
Job #: S190701  
Date: 11/11/2019  
Source: 6 Pickup Trucks  
Receiver: C2 - Building Installation S2

<b>Noise Source</b>
Noise Level (dBA) <u>83.8</u> at <u>50</u> feet

<b>Distances</b>
Source Elevation <u>0</u> feet at <u>5</u> feet above grade
Receiver Elevation: <u>0</u> feet at <u>5</u> feet above grade
Source to Receiver Distance: <u>115</u> feet

<b>Path Calculation</b>
Source to Receiver Direct Path Distance: <u>115</u> feet

<b>Sound Pressure Level</b>	<u>76.6</u>	at	<u>115</u>	feet
Hours of Use:	<u>12</u>			
Duty Cycle (%):	<u>40</u>			
Level During 12 Hour day:	<u>72.6</u>			

<b>Summation</b>
Number of Sources: <u>2</u>
Level during 12 hour day: <u>72.6</u>

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**Noise Attenuation by Distance Calculation**

Job: S2A Modular Factory  
Job #: S190701  
Date: 11/11/2019  
Source: Crane  
Receiver: C2 - Building Installation S2

<b>Noise Source</b>
Noise Level (dBA) <u>66</u> at <u>50</u> feet

<b>Distances</b>
Source Elevation <u>0</u> feet at <u>5</u> feet above grade
Receiver Elevation: <u>0</u> feet at <u>5</u> feet above grade
Source to Receiver Distance: <u>115</u> feet

<b>Path Calculation</b>
Source to Receiver Direct Path Distance: <u>115</u> feet

<b>Sound Pressure Level</b>
<u>58.8</u> at <u>115</u> feet
Hours of Use: <u>12</u>
Duty Cycle (%): <u>16</u>
Level During 12 Hour day: <u>50.8</u>

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**Noise Attenuation by Distance Calculation**

Job: S2A Modular Factory  
Job #: S190701  
Date: 11/11/2019  
Source: Asphalt Paver  
Receiver: C2 - Paving S3

<b>Noise Source</b>
Noise Level (dBA) <u>71</u> at <u>50</u> feet

<b>Distances</b>
Source Elevation <u>0</u> feet at <u>5</u> feet above grade Receiver Elevation: <u>0</u> feet at <u>5</u> feet above grade Source to Receiver Distance: <u>300</u> feet

<b>Path Calculation</b>
Source to Receiver Direct Path Distance: <u>300</u> feet

<b>Sound Pressure Level</b>
<u>55.4</u> at <u>300</u> feet Hours of Use: <u>12</u> Duty Cycle (%): <u>50</u> Level During 12 Hour day: <u>52.4</u>

<b>Summation</b>
Number of Sources: <u>3</u> Level during 12 hour day: <u>62.3</u>

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**Noise Attenuation by Distance Calculation**

Job: S2A Modular Factory  
Job #: S190701  
Date: 11/11/2019  
Source: Roller  
Receiver: C2 - Paving S3

<b>Noise Source</b>
Noise Level (dBA) <u>74</u> at <u>50</u> feet

<b>Distances</b>
Source Elevation <u>0</u> feet at <u>5</u> feet above grade Receiver Elevation: <u>0</u> feet at <u>5</u> feet above grade Source to Receiver Distance: <u>300</u> feet

<b>Path Calculation</b>
Source to Receiver Direct Path Distance: <u>300</u> feet

<b>Sound Pressure Level</b>
Hours of Use: <u>12</u> Duty Cycle (%): <u>20</u> Level During 12 Hour day: <u>51.4</u>
at <u>300</u> feet

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**Noise Attenuation by Distance Calculation**

Job: S2A Modular Factory  
Job #: S190701  
Date: 11/11/2019  
Source: 3 Pickup Trucks  
Receiver: C2 - Paving S3

<b>Noise Source</b>
Noise Level (dBA) <u>81</u> at <u>50</u> feet

<b>Distances</b>
Source Elevation <u>0</u> feet at <u>5</u> feet above grade
Receiver Elevation: <u>0</u> feet at <u>5</u> feet above grade
Source to Receiver Distance: <u>300</u> feet

<b>Path Calculation</b>
Source to Receiver Direct Path Distance: <u>300</u> feet

<b>Sound Pressure Level</b>	<u>65.4</u>	at	<u>300</u>	feet
Hours of Use:	<u>12</u>			
Duty Cycle (%):	<u>40</u>			
Level During 12 Hour day:	<u>61.5</u>			

---

## Construction Vibration Calculation

Job: S2A Factory  
Job #: S190701  
Date: 11/8/2019  
Source 1: Loaded Trucks  
Receiver: Southwest PL

<b>Vibration Source</b>
Vibration Level (PPV, in/sec) <u>0.076</u> at <u>25</u> feet

<b>Path Calculation</b>
Source to Receiver Direct Path Distance: <u>25</u> feet

<b>Vibration Level (PPV, in/sec)</b> <u>0.076</u> at <u>25</u> feet
---

---

<b>Path Calculation</b>
Source to Receiver Direct Path Distance: <u>50</u> feet

<b>Vibration Level (PPV, in/sec)</b> <u>0.027</u> at <u>50</u> feet
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---

<b>Path Calculation</b>
Source to Receiver Direct Path Distance: <u>100</u> feet

<b>Vibration Level (PPV, in/sec)</b> <u>0.010</u> at <u>100</u> feet
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