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Acoustical Analysis Report for Corydon Group

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1.0 Executive Summary

The proposed project, known as Corydon Group, consists of the construction of two new warehouse buildings on a 2.3-acre lot. The project site is located at 32291 Corydon Road in the City of Lake Elsinore, California.

The current and future noise environment includes automobile and truck traffic noise from Corydon Road, with minor aircraft noise impacts from Skylark Airport. Future combined noise levels at the building facades are expected to range from 50 dBA at the west facade of the first floor of Building 2 to 67 dBA at the east facade of the second floor of Building 2.

The State of California requires that occupied nonresidential spaces demonstrate compliance with the requirements of the California Green Building Standards Code (known as CALGreen). CALGreen requires that where occupied nonresidential spaces are exposed to peak-hour exterior noise levels of greater than 65 dBA, the project must demonstrate building features necessary to reduce interior noise levels to 50 dBA or less in occupied areas during any hour of operation. Occupied nonresidential spaces are expected to comply with CALGreen Building Code regulations using exterior glazing with a minimum rating of STC 25.

Noise from the HVAC equipment and operational activity on site has been calculated to determine noise levels at off-site receivers. Calculations show that noise levels from operations will be in compliance with the City of Lake Elsinore daytime noise regulations found within the Municipal Code. As the applicant does not intend to operate during nighttime hours and is willing to have the project conditioned to be limited to operation during the daytime hours of 7 a.m. to 10 p.m., no project design features are deemed necessary to control project-generated noise levels from mechanical equipment or operational activity. Project-generated traffic noise is also expected to be less than significant.

Noise levels from temporary construction activities associated with this project are expected to comply with the applicable City of Lake Elsinore construction noise limits at all surrounding property lines, with activity limited to the daytime hours of 7 a.m. to 7 p.m. during all phases of construction. Construction is prohibited between the hours of 7 p.m. and 7 a.m. and on weekends or legal holidays. Though it is not required by regulations, the general good practice construction noise control methods listed herein should be followed, as a courtesy to surrounding properties.

2.0 Introduction

This acoustical analysis report is submitted to satisfy the noise requirements of the City of Lake Elsinore and the State of California. Its purpose is to assess noise levels from nearby roadway traffic and aircraft overflight to identify project features or requirements necessary to achieve exterior noise levels of 50 dBA or less in occupied nonresidential space. In addition, this report assesses noise levels from potential project-related noise sources, such as mechanical equipment, operational 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 noise levels to comply with the applicable noise regulations of the City of Lake Elsinore Municipal Code and the California Green Building Standards Code (CALGreen).

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting, abbreviated "dBA," to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol "L_{EQ}." Unless a different time period is specified, "L_{EQ}" implies a period of one hour.

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 Corydon Group, consists of the construction of two new warehouse buildings on a 2.3-acre lot. Each warehouse is 24,296 square feet. The hours of operation of the facility are anticipated to be 7 a.m. to 1 p.m. The applicant does not intend to operate during nighttime hours and is willing to have the project conditioned to be limited to operation during the daytime hours of 7 a.m. to 10 p.m. Project plans are provided as Appendix A.

2.2 Project Location

The project site is located at 32291 Corydon Road in the City of Lake Elsinore, California. The Assessor's Parcel Numbers (APN) are 370-080-002 and 370-080-003. The site is currently vacant. The project site is surrounded by single-family residential uses to the east, and commercial uses to the north, south, and west.

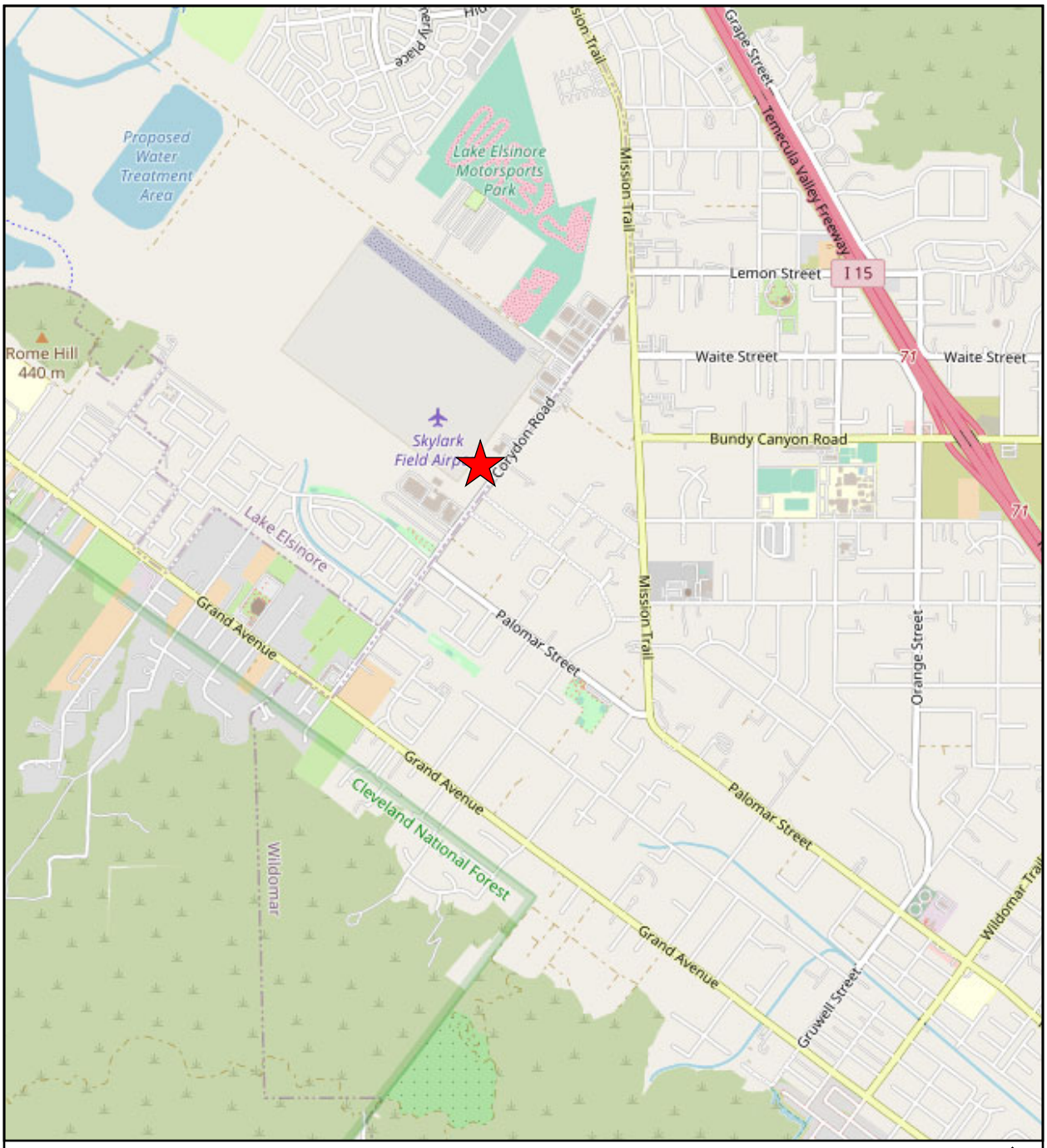
For a graphical representation of the site, please refer to the Vicinity Map, Assessor's Parcel Map, and Satellite Aerial Photograph, provided as Figures 1 through 3, respectively.

2.3 Applicable Noise Regulations

This acoustical report is submitted to satisfy the acoustical requirements of the City of Lake Elsinore and the State of California. The State of California requires that occupied nonresidential spaces demonstrate compliance with the requirements of the California Green Building Standards Code (known as CALGreen). CALGreen states that, if noise level readings of 65 dBA L_{EQ} or greater are documented at the proposed project site, the project must either (a) incorporate wall and roof/ceiling assemblies with an STC rating of at least 45 and exterior windows with an STC rating of at least 40, or (b) provide an acoustical analysis documenting interior noise levels do not exceed 50 dBA in occupied areas during any hour of operation. This report provides the performance/analysis method detailed in Item (b).

The City of Lake Elsinore Municipal Code, Section 17.176.060, specifies noise limits based on the land use of the properties in question. Noise levels have been evaluated at the nearest noise-sensitive receivers beyond adjacent roadways, sidewalks, or vacant area. The Municipal Code states that noise standards for single-family residential properties are 40 dBA between the hours of 10 p.m. and 7 a.m. and 50 dBA between the hours of 7 a.m. and 10 p.m. Noise standards for general commercial properties are 60 dBA and 65 dBA for nighttime and daytime hours, respectively. As the site will only be operational between 7 a.m. and 1 p.m., and as the applicant is willing to have the project conditioned to be limited to operation during the daytime hours of 7 a.m. to 10 p.m., daytime noise limits would apply.

The code states that the noise standard would be the noise limit for noise sources present for a cumulative period of 30 minutes in any hour. As all noise sources are assumed to be intermittent with an assumed maximum operation of about 30 minutes in an hour, this noise standard has been applied. Additionally, the code states that, on the boundary between two different zones, the noise level limit applicable to the lower noise zone plus six decibels shall apply. With this in mind, operational noise limits were applied as 56 dBA at single-family residential properties and 65 dBA at commercial properties.



Source: Open Street Map, 2023

Project Location

Figure 1.

Vicinity Map

Source: RCIT, Riverside County, 2023

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Project Location

Figure 2.

Assessor's Parcel Map

Source: Google Earth Pro, 2023.

Project Location

Figure 3.

Satellite Aerial Photograph

Additionally, Section 17.176.080 of the City of Lake Elsinore Municipal Code states that construction activity is prohibited between the hours of 7 p.m. and 7 a.m. and on weekends or legal holidays. As much as feasible, during permissible hours of operation, noise levels from mobile construction equipment for non-scheduled, intermittent, short-term operation (less than ten days) should be limited to 75 dBA at residential properties and 85 dBA at commercial properties. Noise levels from stationary construction equipment for repetitively scheduled and relatively long-term operation (period of ten days or more) should be limited to 60 dBA at residential properties and 75 dBA at commercial properties. The majority of equipment anticipated to be used in the construction of the site will be mobile.

Pertinent sections of CALGreen and the City of Lake Elsinore 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 Corydon Road, with minor aircraft noise impacts from Skylark Airport. No other noise source is considered significant.

3.1.1 Aircraft Overflight Noise Sources

Skylark Airport is located to the northeast of the proposed project site. According to the Skylark Airport aircraft noise contours, found within the EIR for the East Lake Specific Plan Amendment (see reference), the project site lies outside of the 60 CNEL contours. Based on the project site's location relative to the noise contour, the aircraft noise impact at the project site is estimated to be approximately 50 CNEL. For purposes of this analysis, this CNEL impact is considered to be representative of hourly aircraft noise levels during peak hour operations. Please refer to Figure 4 for a graphical representation of these contours.

3.1.2 Roadway Noise Sources

Current traffic volumes are given based on information provided in the East Lake Specific Plan Amendment EIR. Corydon Road is a two-lane roadway running generally north-south along the east boundary of the project site. The posted speed limit is 45 mph. In the vicinity of the project site, Corydon Road currently carries a traffic volume of approximately 15,630 Average Daily Trips (ADT) as of the year 2017.

No current or future truck percentages were available for Corydon Road in the vicinity of the project site. However, based on neighboring and surrounding land use, roadway classification, and professional experience, a truck percentage mix of 2.0% medium and 1.0% heavy trucks was used for Corydon Road. Please refer to Appendix C for additional information.

3.2 Future Noise Environment

3.2.1 Future Transportation Noise

The future on-site noise environment will be the result of the same noise sources. Future aircraft noise exposure from Skylark Airport is expected to remain at approximately the same level as in the current noise environment, and therefore was evaluated as described above. The future (year 2040) traffic volume for Corydon Road was provided in the East Lake Specific Plan Amendment EIR. By the year 2040, the traffic volume of Corydon Road is expected to increase to approximately 32,174 ADT. The same truck percentages from the current traffic volumes were used for future traffic volume modeling.

Source: East Lake Specific Plan EIR, 2017.

⊗ Project Location

Figure 4.

Skylark Airport Noise Contours

3.2.2 Mechanical Equipment and Operational Activity

The primary sources of noise generated by the proposed project are anticipated to be truck deliveries to the site, forklift operation in the rear loading area, and proposed HVAC equipment.

The project is expected to receive 29 truck deliveries per day and will also include the operation of forklifts in the rear loading area. Truck deliveries have been evaluated using noise levels for flatbed trucks provided by the Federal Highway Administration (FHWA), which show noise levels of 74 dBA at 50 feet from the truck. Forklifts have been evaluated using data provided by Caterpillar for Engine Powered Lift Trucks, which show a maximum noise level of 78.5 dBA at the operator's ear, approximately five feet from the engine of the machine.

HVAC equipment will be roof-mounted on the buildings. Typical HVAC units were selected for the buildings for purposes of this analysis. It was assumed that a unit equivalent to the Carrier 48HCD08 (7.5-ton capacity) would be used for each building, with six units roof-mounted on each building. Sound power levels have been provided by the manufacturer in octave band values and a sound rating value, which are shown below in Table 1. Manufacturer data sheets have been provided as Appendix D.

Table 1. Sound Power Levels of Carrier 48HCD08 (Typical 7.5-ton Unit)

Source	Sound Power at Octave Band Frequency (dB)								Total (dBA)
	63	125	250	500	1000	2000	4000	8000	
Carrier 48HCD08	90.6	84.3	80.2	79.3	77.1	72.2	67.4	63.7	82

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.

3.2.3 Project-Generated Traffic

Project-generated traffic volumes have been estimated using the Institute of Transportation Engineers Trip Generation Manual (see reference). The project site's anticipated trip generation would be 83 ADT. An analysis of project-generated traffic noise is provided in Section 5.3.2.

3.2.4 Temporary Construction Equipment

In order to evaluate anticipated temporary construction noise levels, general information from the project applicant and typical assumptions have been made regarding stages of construction and equipment to be used. The equipment listed in Table 2 is typical of what is expected to be used on site based on information provided and professional experience. Unless otherwise noted, all noise levels and duty cycles have been provided by the Federal Highway Administration (FHWA) (see reference). Although FHWA noise levels are considered extremely conservative for this type of project, as they are typically based on older, larger equipment used on large transportation projects, these reference noise levels have been used for a worst-case analysis of construction noise impacts.

Table 2. Anticipated Construction Stages and Equipment Noise Levels				
Construction Stage	**Equipment**	**Quantity**	**Duty Cycle (%)**	**Noise Level, at 50 feet (dBA)**
Site Preparation	Grader	2	40	85
	Scraper	2	40	84
	Backhoe	2	40	78
	Dump Truck	1	40	76
Grading	Grader	2	40	85
	Dozer	2	40	82
	Backhoe	2	40	78
	Dump Truck	1	40	76
Building Construction	Crane	2	16	81
	Telescopic Forklift[1]	2	40	74
	Backhoe	2	40	78
	Welder	2	40	73
	Generator	2	50	70
	Dump Truck	1	40	76
Paving	Cement Mixer	2	40	79
	Paver	2	50	77
	Roller	2	20	80
	Backhoe	2	40	78
	Dump Truck	1	40	76
Architectural Coating	Compressor	2	40	78

[1]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 5.4.

4.0 Methodology

4.1 Roadway Noise Calculation

The Traffic Noise Model (TNM) calculation protocol in CadnaA Version 2025 MR 1 (based on the methodology used in TNM Version 2.5, released in February 2004 by the U.S. Department of Transportation) was used to determine the peak hour noise level (dBA L_{EQ}) during hours of operation. In order to determine this value, the Average Daily Trips (ADT) value is divided into percentages for each hour of the day to establish maximum noise impacts that the project site may experience during a 24-hour period. These percentages were established in a study performed by Katz-Okitsu and Associates, Traffic Engineers (see reference). According to this study, the peak traffic volume expected during the day is approximately 8.6% of the ADT value (between the hours of 4 p.m. and 5 p.m.). Although this falls outside of operational hours of the facility, the peak volume percentage of traffic volumes was used for a worst-case assessment.

4.2 CadnaA Noise Modeling Software

Modeling of the outdoor noise environment is accomplished using CadnaA Version 2025 MR 1, which is a model-based computer program developed by DataKustik for predicting noise levels in a wide variety of conditions. CadnaA (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 levels. Noise standards used by CadnaA that are particularly relevant to this analysis include ISO 9613 (Attenuation of sound during propagation outdoors). CadnaA provides results that are in line with basic acoustical calculations for distance attenuation and barrier insertion loss.

4.3 Exterior-to-Interior Noise Analysis

CALGreen requires non-residential buildings to be designed in order to attenuate, control, and maintain average interior noise levels not greater than 50 dBA. Contemporary exterior building construction is expected to achieve at least 15 decibels of exterior-to-interior noise attenuation with windows opened, according to the U.S. EPA (see reference). As a result, exterior noise levels of more than 65 dBA often result in interior conditions that fail to meet the 50 dBA requirements for occupied space.

Analysis for the interior noise levels requires consideration of:

- Number of unique assemblies in the wall (doors, window/wall mount air conditioners, sliding glass doors, and windows)
- Size, number of units, and sound transmission data for each assembly type
- Length of sound impacted wall(s)
- Depth of sound impacted room
- Height of exterior wall of sound impacted room
- Exterior noise level at wall assembly or assemblies of sound impacted room

The Composite Sound Transmission data is developed for the exterior wall(s) and the calculated noise exposure is converted to octave band sound pressure levels (SPL) for a typical traffic type noise. The reduction in room noise due to absorption is calculated and subtracted from the interior octave noise levels, and the octave band noise levels are logarithmically summed to yield the overall interior room noise level. When interior noise levels exceed 50 dBA, the noise reduction achieved by each element is reviewed to determine which changes will achieve the most cost-effective compliance. Windows are usually the first to be reviewed, followed by exterior doors, and then exterior walls.

Modeling of wall assemblies is accomplished using INSUL Version 9.0, which is a model-based computer program, developed by Marshall Day Acoustics for predicting the sound insulation of walls, floors, ceilings, and windows. It is acoustically based on theoretical models that require only minimal material information that can make reasonable estimates of the sound transmission loss (TL) and STC for use in sound insulation calculations; such as the design of common party walls and multiple family floor-ceiling assemblies, etc. INSUL can be used to quickly evaluate new materials or systems or investigate the effects of changes to existing designs. It models individual materials using the simple mass law and coincidence frequency approach and can model more complex assembly partitions. It has evolved over several versions into an easy to use tool and has refined the theoretical models by continued comparison with laboratory tests to provide acceptable accuracy for a wide range of constructions. INSUL model performance comparisons with laboratory test data show that the model generally predicts the performance of a given assembly within 3 STC points.

4.4 Project-Generated Traffic Noise

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: Δ= Change in sound energy,
V1 = original or existing traffic volume, and
V2 = future or cumulative traffic volume.

5.0 Noise Levels

5.1 Exterior

Future combined traffic and aircraft noise levels were calculated for use in interior noise calculations at the site. Future noise levels at the building facades are expected to range from 50 dBA at the west facade of the first floor of Building 2 to 67 dBA at the east facade of the second floor of Building 2. Future traffic and aircraft noise levels at building facades are shown in Table 3, and receiver locations are shown in Figure 5. Please refer to Appendix C for additional information.

Source: Empire Design Group, Google Earth Pro, 2025

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⊗ Facade Receiver Location

Figure 5.

Facade Receiver Locations

Table 3. Future Combined Noise Levels at Building Facades								
Building	Receiver	Facade	Exterior Noise Level (dBA)					
			Floor 1			Floor 2		
			Traffic	Aircraft	Combined	Traffic	Aircraft	Combined
1	F1	South	54.8	50	56.0	56.7	50	57.5
	F2	East	64.6	50	64.7	66.5	50	66.6
	F3	North	57.1	50	57.9	58.9	50	59.4
	F4	West	28.7	50	50.0	32.4	50	50.1
2	F5	South	56.4	50	57.3	58.2	50	58.8
	F6	East	64.6	50	64.7	66.5	50	66.6
	F7	North	54.5	50	55.8	56.4	50	57.3
	F8	West	29.5	50	50.0	33.1	50	50.1

5.2 Interior

CALGreen requires that nonresidential structures that are exposed to greater than 65 dBA during any hour of operation must control interior noise levels to be 50 dBA or less in occupied nonresidential spaces. Current exterior building construction is generally expected to achieve at least 15 decibels of exterior-to-interior noise attenuation with windows opened, according to the U.S. EPA (see reference). Therefore, proposed project building structures exposed to exterior noise levels greater than 65 dBA could be subject to interior noise levels exceeding the 50 dBA noise limit in nonresidential space.

The exterior wall assembly is assumed to be 10-inch thick CMU wall. The CMU exterior wall assembly was evaluated using INSUL and was shown to achieve an STC rating of 58. As aircraft noise is expected to have a minor impact on the roof, the roof/ceiling assembly was evaluated. The worst-case roof/ceiling assembly in occupied areas is assumed to be constructed as a waterproof membrane over rigid insulation on a metal roof deck, with a dropped ACT ceiling. The roof/ceiling assembly was evaluated using INSUL and was shown to achieve a minimum STC rating of 29. These exterior wall and roof/ceiling assemblies were incorporated into exterior-to-interior noise calculations.

An exterior-to-interior noise analysis was conducted for a typical mezzanine area. The typical exterior wall and roof assemblies detailed above were used for exterior-to-interior noise calculations. Please refer to Table 4, which shows calculated interior noise levels, and refer to Appendix E for additional information.

Table 4. Interior Noise Levels in Occupied Nonresidential Spaces		
Room	**Maximum Exterior Noise Impact (dBA)**	**Interior Noise Level (dBA)**
Building 1 Mezzanine (Worst-Case)	66.6	36.3

As shown above, worst-case representative spaces are expected to have peak hour interior noise levels of less than 50 dBA L_{EQ} with exterior glazing with a minimum STC rating of 25. An STC rating of 25 is fairly easily achievable with standard single or dual pane glazing; however, sound ratings should be confirmed with the manufacturer prior to final product selection.

Exterior door installation should include all-around weather-tight door stop seals and an improved threshold closure system. The additional hardware will improve the doors' overall sound reduction properties. The transmission loss (TL) of an exterior door without weather-tight seals is largely a factor of sound leakage, particularly at the bottom of the door if excessive clearance is allowed for air transfer. By equipping exterior doors with all-around weather-tight seals and an airtight threshold closure at the bottom, a loss of up to 10 STC points can be prevented.

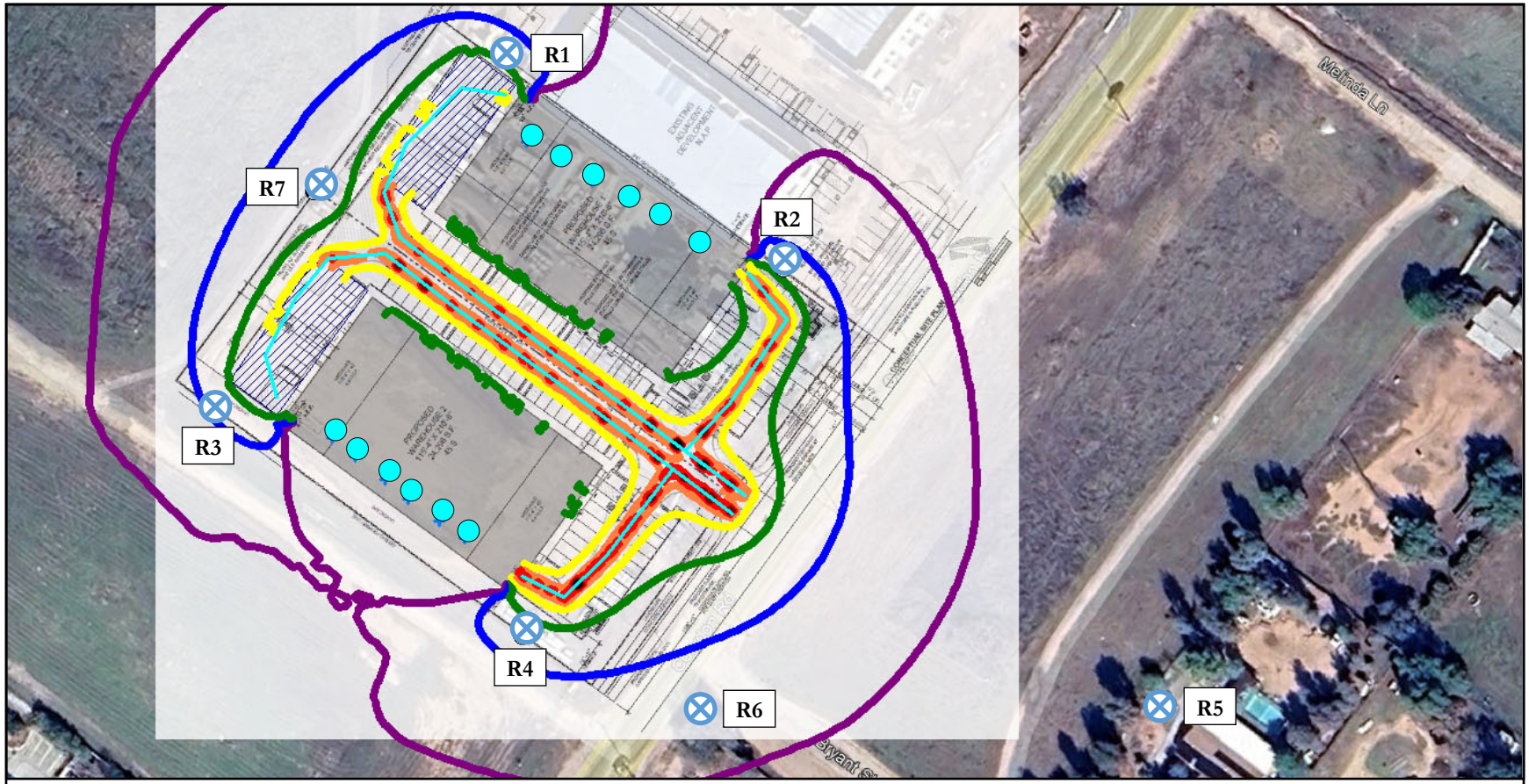
Additionally, it is imperative to seal and caulk between the rough opening and the finished door frame for all doors by applying an acoustically resilient, non-skinning, butyl caulking compound. Sealant application should be as generous as needed to ensure effective sound barrier isolation. The same recommendation applies to any other penetrations, cracks, or gaps through the assembly. The OSI SC175 Draft & Acoustical Sound Sealant and the Pecora AC-20 FTR acoustic sound sealants are products specifically designed for this purpose. For additional information on these products, please refer to Appendix F: Recommended Products.

The assumed interior spaces were analyzed for future exterior noise impacts from roadway traffic and aircraft overflight. With the assumed exterior wall assembly and exterior windows and glass doors meeting the minimum STC 25 rating, all occupied nonresidential space is expected to comply with CALGreen noise requirements.

5.3 Permanent Project-Related Noise Levels

5.3.1 Operational Noise

Noise levels from the assumed HVAC units, forklift activity, and truck deliveries were calculated in CadnaA at the nearest properties using data presented in Section 3.2.2. Noise limits have been applied as detailed in Section 2.3. Calculations consider the shielding that would be provided by the proposed on-site structures, with the exception of any parapet walls. The analysis also assumes one forklift will be operating behind each building, with five truck deliveries in an hour (accounting for activity at each of the four loading areas and an average of five trucks per hour, based on the anticipated 29 truck trips per day between 7 a.m. and 1 p.m.), as shown in Figure 6. For these reasons, the analysis is considered to represent a conservative estimate of noise levels at off-site receivers. All receivers have been calculated at a height of five feet above their respective grade. Please refer to Table 5 for calculated receiver results. For a graphic showing operational noise source and receiver locations, please refer to Figure 6. Please refer to Appendix C for additional information.



Source: Empire Design Group, Inc./Google Earth Pro, 2025

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≥ 45 dB
≥ 50 dB
≥ 55 dB
≥ 60 dB
≥ 65 dB
≥ 70 dB
≥ 75 dB
≥ 80 dB

Receiver Location
Forklift Area
HVAC Equipment
Delivery Truck Route

Figure 6.

Operational Noise Contours

Table 5. Operational Noise Levels at Surrounding Receivers			
Receiver	**Description**	**Noise Limit (dBA)**	**Noise Level (dBA)**
R1	North Property Line 1	65	54.0
R2	North Property Line 2	65	53.1
R3	South Property Line 1	65	50.1
R4	South Property Line 2	65	52.3
R5	East Residential Property Line 1	56	40.5
R6	East Residential Property Line 2	56	47.1
R7	West Property Line	65	52.7

As shown above, noise levels at adjacent property lines are anticipated to comply with the applicable daytime noise limits of the City of Lake Elsinore with the project as currently designed. As the applicant does not intend to operate during nighttime hours and is willing to have the project conditioned to be limited to operation during the daytime hours of 7 a.m. to 10 p.m., no additional project design features are deemed necessary to reduce noise levels from on-site operations or mechanical equipment.

5.3.2 Project-Generated Traffic Noise

An analysis of the potential change in traffic noise levels to the surrounding area has been evaluated based on traffic detailed in Section 3.2.3. The project's impacts have been evaluated to determine whether a direct 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 4.4.

The existing traffic volume of Corydon Road was shown to be 15,630 ADT in the East Lake Specific Plan Amendment EIR. According to the approximate calculations detailed in Section 3.2.3, the project is expected to add 83 ADT to the roadway. Using the calculation methodology of Section 4.4, the change in noise levels on Corydon Road as a result of project-generated traffic is anticipated to be 0 dB. For this reason, project-generated traffic noise levels are considered less than significant.

5.4 Temporary Construction Noise Levels

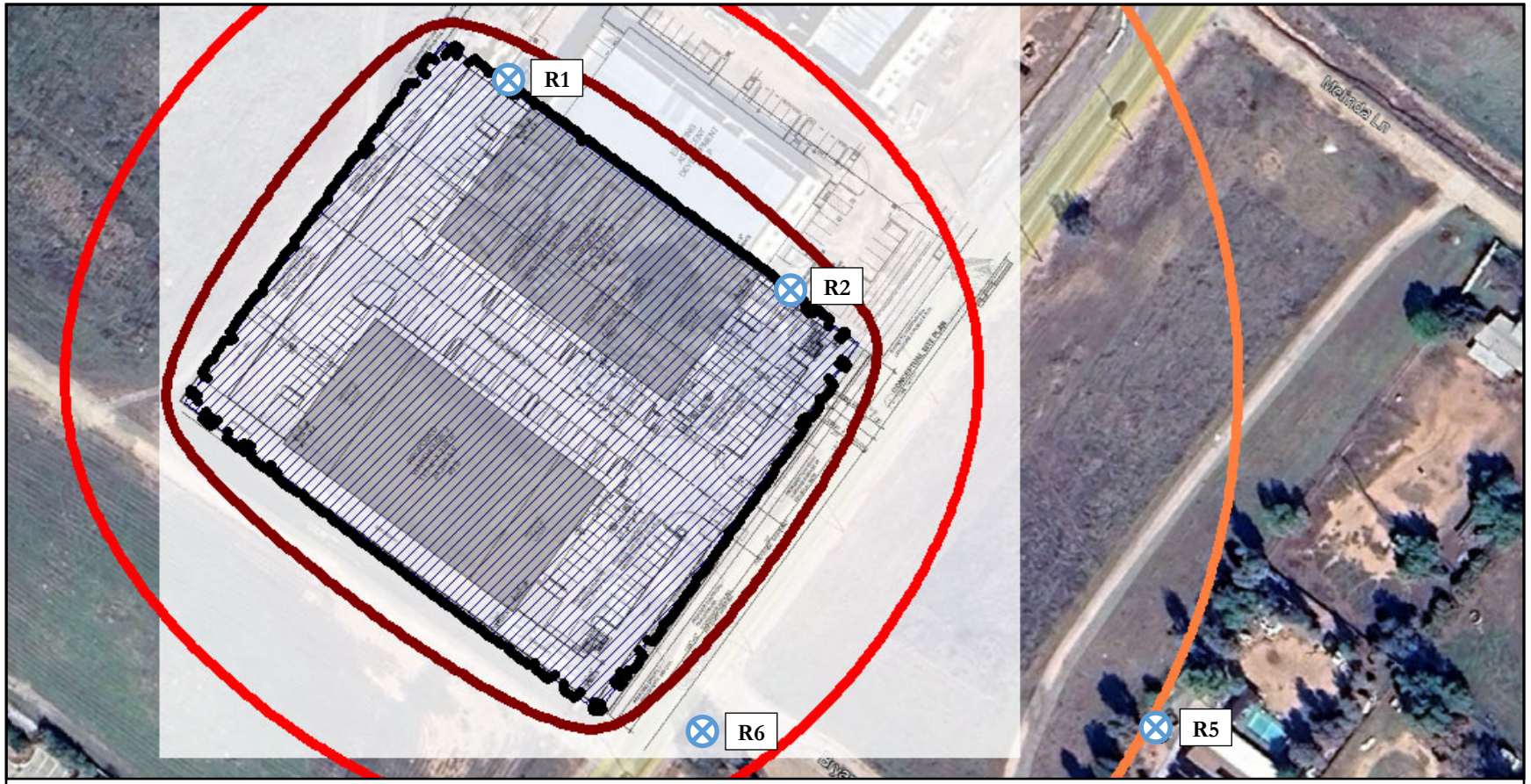
According to the City of Lake Elsinore Municipal Code, construction activity is prohibited between the hours of 7 p.m. and 7 a.m. and on weekends or legal holidays. During permissible hours of operation, short-term (less than ten days) noise levels from mobile construction equipment should be limited to no greater than 75 dBA at residential properties and 85 dBA at commercial properties, where feasible. Although mobile equipment will operate on site for a duration exceeding the ten-day threshold, equipment is not expected to be focused near residential receivers for extended durations, considering the large area of the project site, and for this reason, the mobile construction equipment noise limit has been applied for on-site mobile construction activity. Noise levels from stationary construction equipment should be limited to 60 dBA at residential properties and 75 dBA at commercial properties; in phases where stationary sources are used, these limits have been considered for this equipment separately.

Noise levels were calculated at commercial receivers to the north and residential receivers to the east. Mobile construction noise sources were evaluated as point sources moving within an area to approximate noise impacts to off-site receivers as equipment moves around the project site. Stationary equipment sources were evaluated as point sources in the center of the construction site. All equipment noise calculations also consider typical duty cycles of equipment to account for periods of activity and inactivity on the site.

Calculated construction noise levels for construction equipment are shown in Table 6. Graphical representations of noise contour and receiver locations are shown in Figures 7 through 11. Please refer to Appendix C for additional information.

Table 6. Temporary Construction Noise Levels at Neighboring Properties

Stage	Receiver Location	Average Noise Level (dBA)
Site Preparation	R1 (North Property Line 1)	79.5 (All Mobile Sources)
	R2 (North Property Line 2)	81.2 (All Mobile Sources)
	R5 (East Residential Property Line)	64.8 (All Mobile Sources)
	R6 (East Residential Property Line)	71.9 (All Mobile Sources)
Grading	R1 (North Property Line 1)	79.0 (All Mobile Sources)
	R2 (North Property Line 2)	80.7 (All Mobile Sources)
	R5 (East Residential Property Line)	64.3 (All Mobile Sources)
	R6 (East Residential Property Line)	71.4 (All Mobile Sources)
Building Construction	R1 (North Property Line 1)	74.2 (All Sources) / 55.6 (Stationary Only)
	R2 (North Property Line 2)	75.9 (All Sources) / 56.4 (Stationary Only)
	R5 (East Residential Property Line)	59.8 (All Sources) / 47.8 (Stationary Only)
	R6 (East Residential Property Line)	66.8 (All Sources) / 52.7 (Stationary Only)
Paving	R1 (North Property Line 1)	76.1 (All Mobile Sources)
	R2 (North Property Line 2)	77.8 (All Mobile Sources)
	R5 (East Residential Property Line)	61.6 (All Mobile Sources)
	R6 (East Residential Property Line)	68.7 (All Mobile Sources)
Architectural Coating	R1 (North Property Line 1)	63.0 (Stationary Only)
	R2 (North Property Line 2)	63.8(Stationary Only)
	R5 (East Residential Property Line)	55.3 (Stationary Only)
	R6 (East Residential Property Line)	60.0 (Stationary Only)



Source: Empire Design Group, Inc./Google Earth Pro, 2025

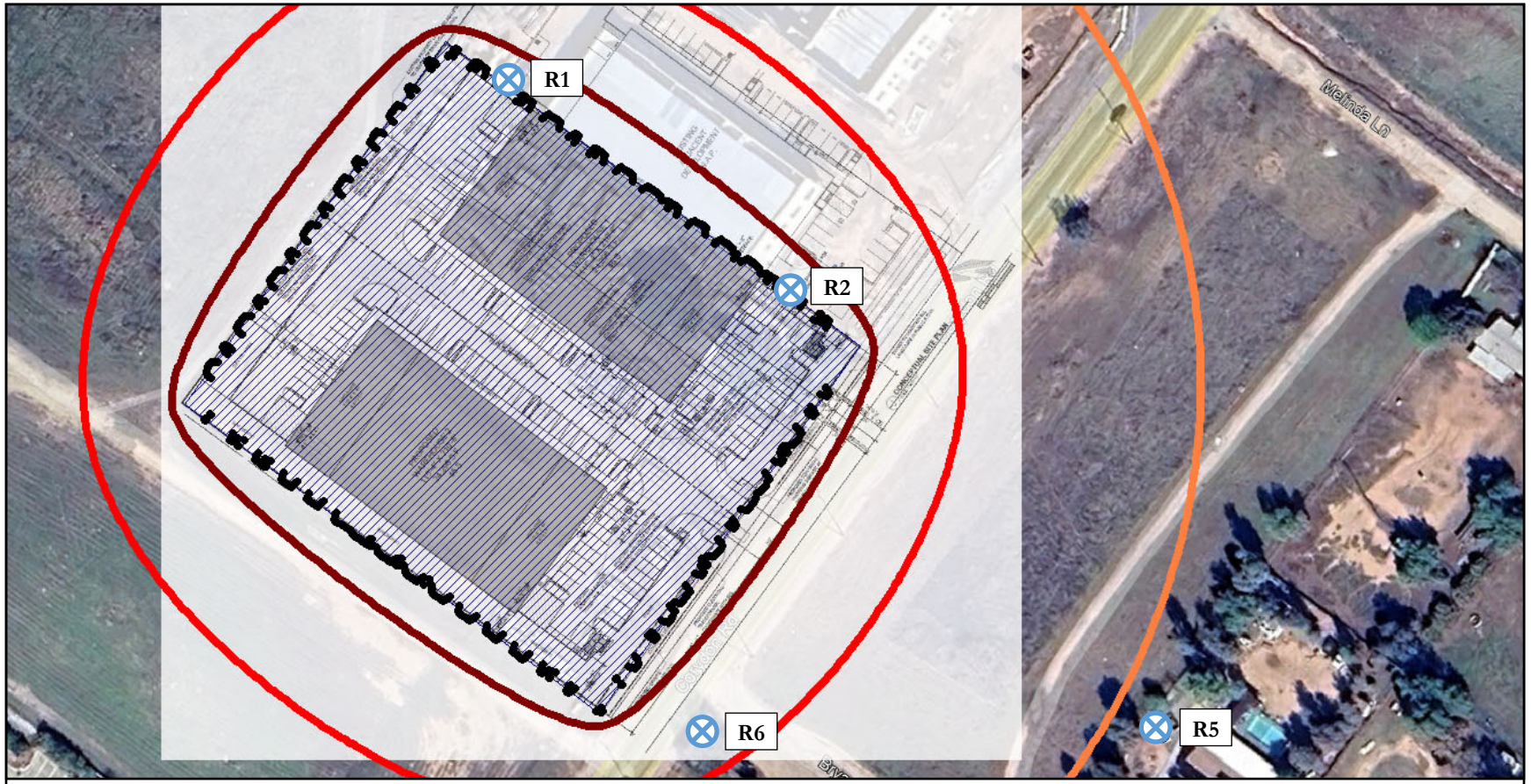
N

≥ 45 dB
≥ 50 dB
≥ 55 dB
≥ 60 dB
≥ 65 dB
≥ 70 dB
≥ 75 dB
≥ 80 dB

Receiver Location
Area of Work

Figure 7.

Construction Noise Contours—Site Preparation



Source: Empire Design Group, Inc./Google Earth Pro, 2025

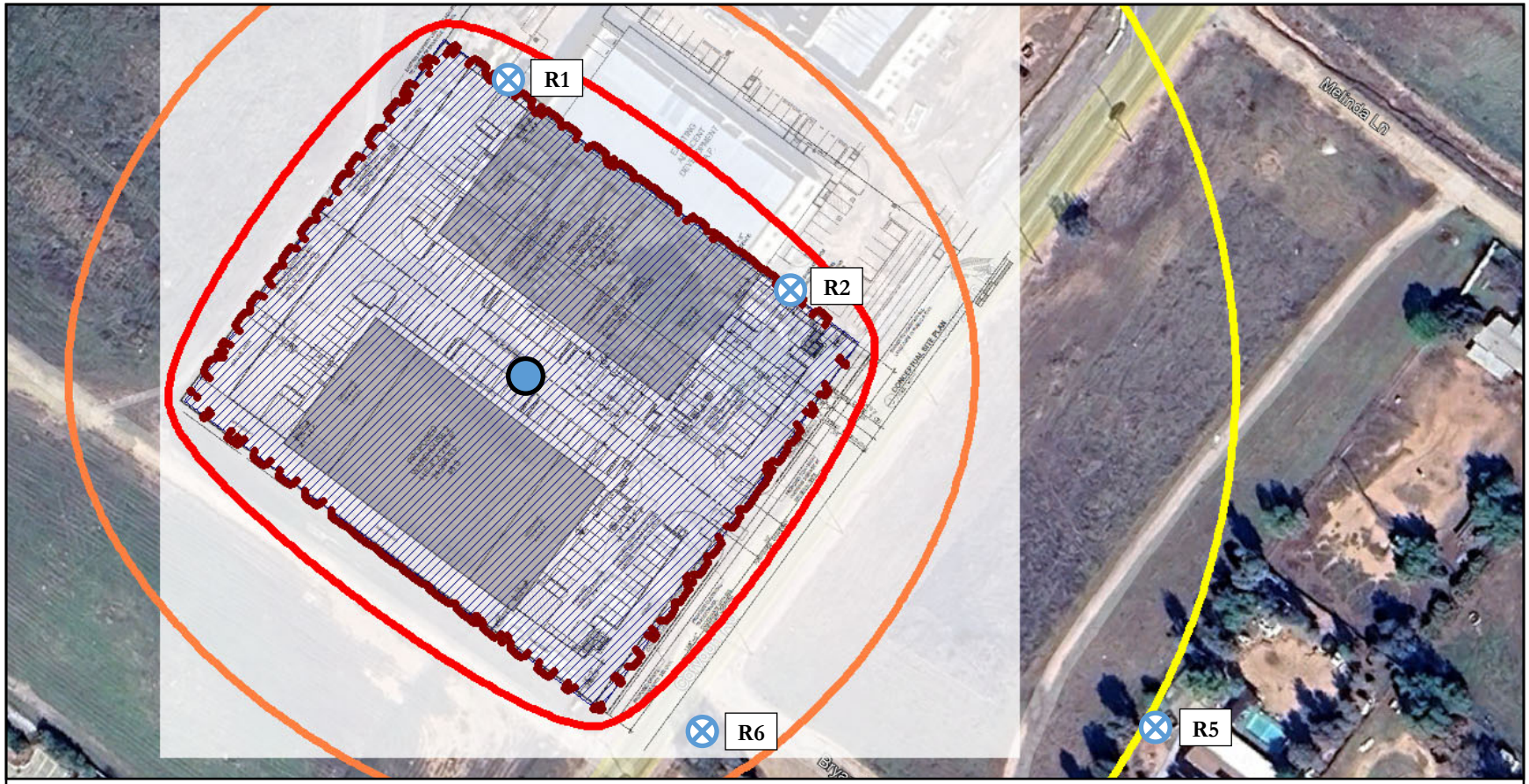
N

≥ 45 dB
≥ 50 dB
≥ 55 dB
≥ 60 dB
≥ 65 dB
≥ 70 dB
≥ 75 dB
≥ 80 dB

Receiver Location
Area of Work

Figure 8.

Construction Noise Contours—Grading



Source: Empire Design Group, Inc./Google Earth Pro, 2025

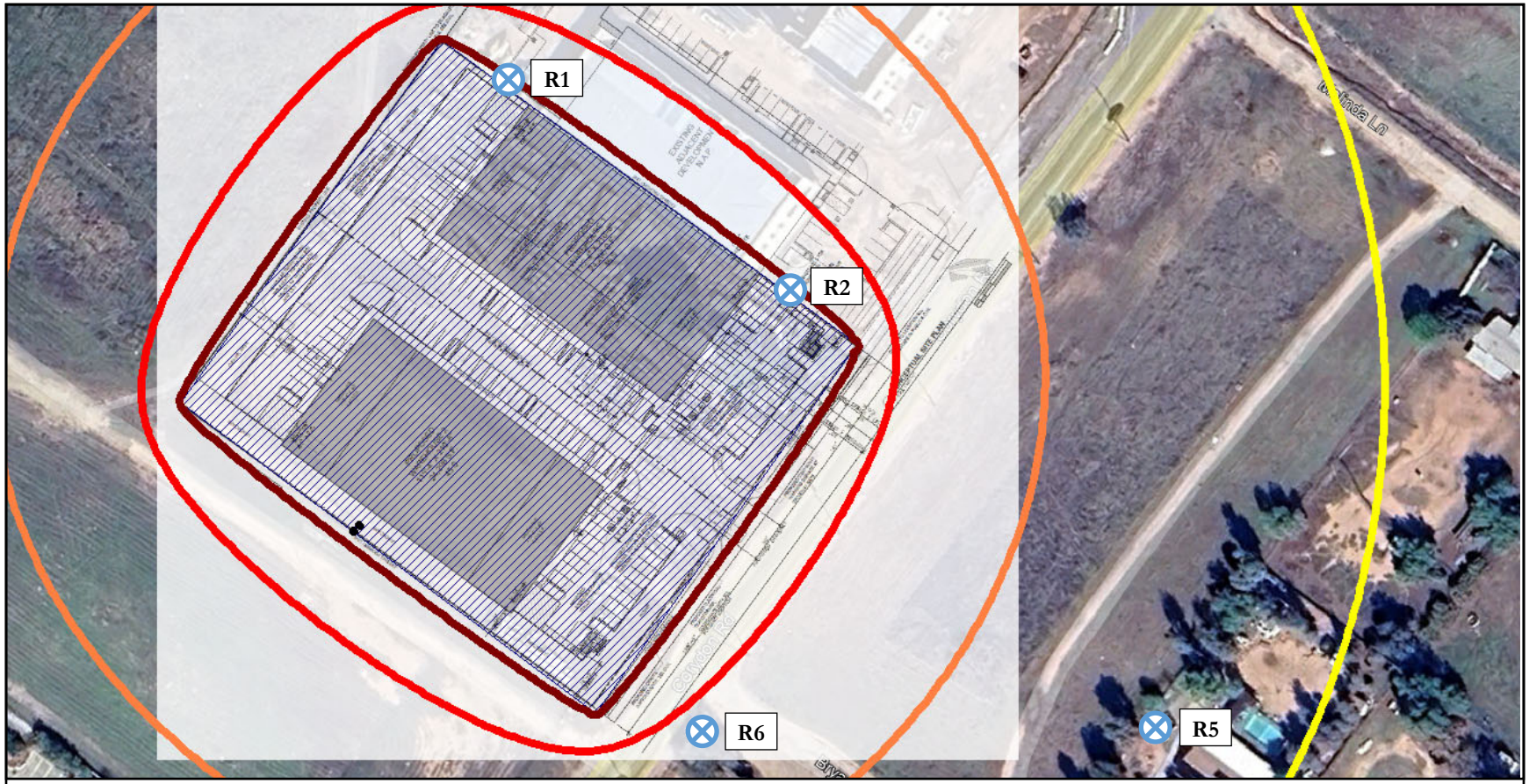
N

≥ 45 dB
≥ 50 dB
≥ 55 dB
≥ 60 dB
≥ 65 dB
≥ 70 dB
≥ 75 dB
≥ 80 dB

Receiver Location
Area of Work
Stationary Source Location

Figure 9.

Construction Noise Contours—Building Construction



Source: Empire Design Group, Inc./Google Earth Pro, 2025

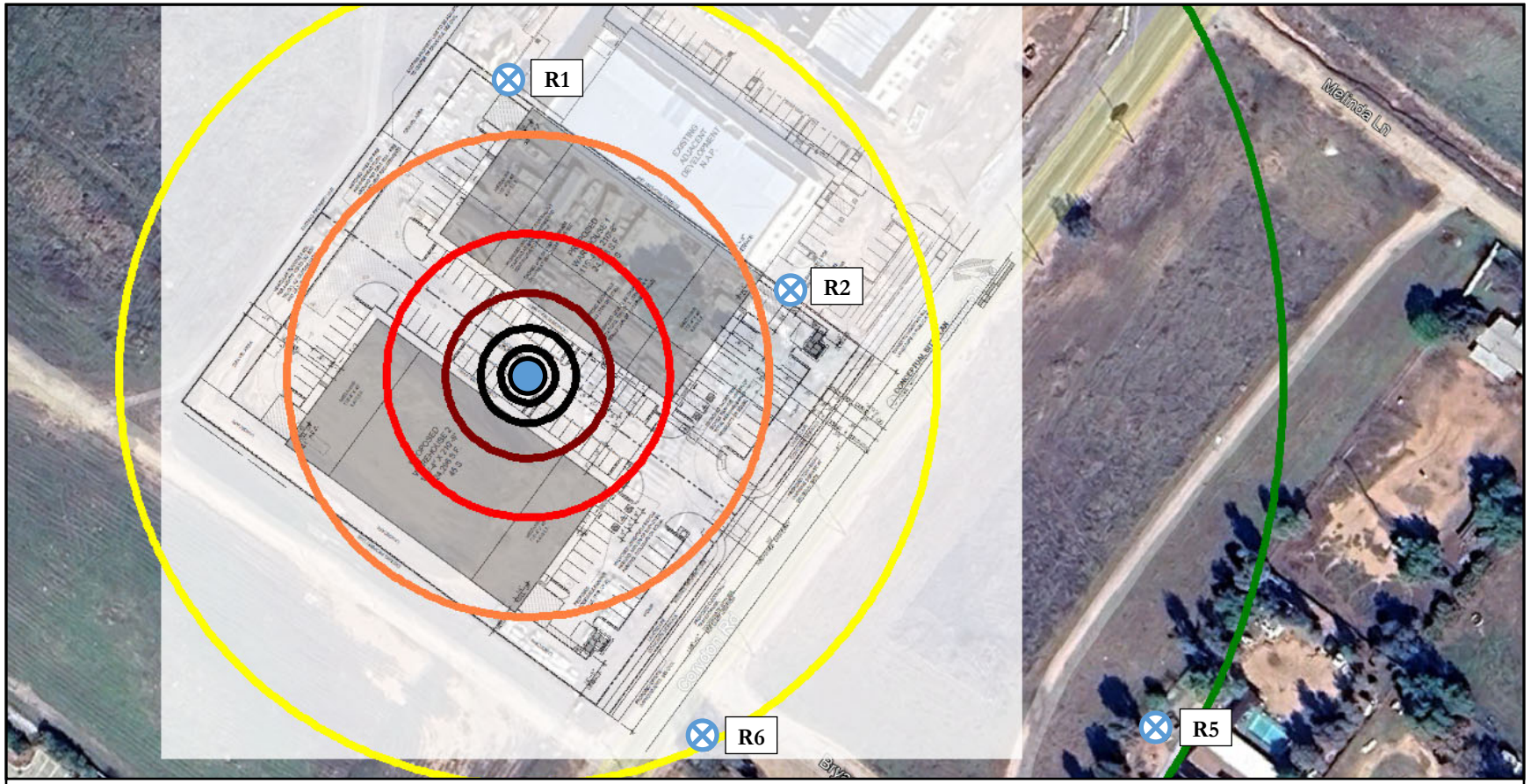
N

≥ 45 dB
≥ 50 dB
≥ 55 dB
≥ 60 dB
≥ 65 dB
≥ 70 dB
≥ 75 dB
≥ 80 dB

Receiver Location
Area of Work

Figure 10.

Construction Noise Contours—Paving



Source: Empire Design Group, Inc./Google Earth Pro, 2025

N

≥ 45 dB
≥ 50 dB
≥ 55 dB
≥ 60 dB
≥ 65 dB
≥ 70 dB
≥ 75 dB
≥ 80 dB

Receiver Location

Stationary Source Location

Figure 11.

Construction Noise Contours—Architectural Coating

As shown in Table 6, based on the typical noise levels and duty cycles of construction equipment, average noise levels of mobile construction equipment are anticipated to remain below 75 dBA at the nearest residential property lines and below 85 dBA at commercial property lines. Average noise levels of stationary equipment are also expected to remain at or below 60 dBA at the nearest residential properties and 75 dBA at commercial property lines. Any other residential or commercial properties are located at a greater distance from on-site activity and therefore would be exposed to lesser noise levels.

Despite the fact that noise levels are expected to remain in compliance with the construction noise limits of the City of Lake Elsinore, the following "good practice" measures should still be practiced as a courtesy to residential neighbors, wherever feasible:

1. Staging areas should be placed as far as possible from residential receivers.

2. Turn off equipment when not in use.

3. Limit the use of enunciators or public address systems, except for emergency notifications.

4. Equipment used in construction should be maintained in proper operating condition, and all loads should be properly secured, to prevent rattling and banging.

5. Schedule work to avoid simultaneous construction activities that both generate high noise levels.

6. Use equipment with effective mufflers.

7. Minimize the use of backup alarms.

With operating hours limited to those permitted by the City of Lake Elsinore, temporary construction noise levels are expected to comply with applicable noise limits at surrounding properties.

6.0 Conclusion

The State of California requires that occupied nonresidential spaces demonstrate compliance with the requirements of the California Green Building Standards Code (known as CALGreen). CALGreen requires that where occupied nonresidential spaces are exposed to peak-hour exterior noise levels of greater than 65 dBA, the project must demonstrate building features necessary to reduce interior noise levels to 50 dBA or less in occupied areas during any hour of operation. Occupied nonresidential spaces are expected to comply with CALGreen Building Code regulations using exterior glazing with a minimum rating of STC 25.

Noise from the HVAC equipment and operational activity on site has been calculated to determine noise levels at off-site receivers. Calculations show that noise levels from operations will be in compliance with the City of Lake Elsinore daytime noise regulations found within the Municipal Code. As the applicant does not intend to operate during nighttime hours and is willing to have the project conditioned to be limited to operation during the daytime hours of 7 a.m. to 10 p.m., no project design features are deemed necessary to control project-generated noise levels from mechanical equipment or operational activity. Project-generated traffic noise is also expected to be less than significant.

Noise levels from temporary construction activities associated with this project are expected to comply with the applicable City of Lake Elsinore construction noise limits at all surrounding property lines, with activity limited to the daytime hours of 7 a.m. to 7 p.m. during all phases of construction. Construction is prohibited between the hours of 7 p.m. and 7 a.m. and on weekends or legal holidays. Though it is not required by regulations, the general good practice construction noise control methods listed herein should be followed, as a courtesy to surrounding properties.

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 measured noise levels and represents a true and factual analysis of the acoustical impact issues associated with the Corydon Group project, to be located at 32291 Corydon Road in the City of Lake Elsinore, California. This report was prepared by Amy Hool and Jonathan Brothers.

Amy Hool, INCE
President/CEO

Jonathan Brothers, INCE
Principal Acoustical Consultant

8.0 References

City of Lake Elsinore Municipal Code, Chapter 17.176: Noise Control.

California Green Building Code, Nonresidential Mandatory Measures.

East Lake Specific Plan Amendment (ELSPA) No. 11 Project, EIR and DEIR.

Institute of Transportation Engineers, Trip Generation Manual, 10th Edition.

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Department for Environment Food and Rural Affairs (DEFRA), Update of Noise Database for Prediction of Noise on Construction and Open Sites, 2005.

DataKustik, CadnaA (Computer Aided Noise Abatement), Version 2025 MR 1.

Katz-Okitsu and Associates Traffic Engineers, Traffic Distribution Study, 1986.

Marshall Day Acoustics, INSUL Version 9.0.

U.S. Environmental Protection Agency Office of Noise Abatement and Control, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With an Adequate Margin of Safety, March 1974.

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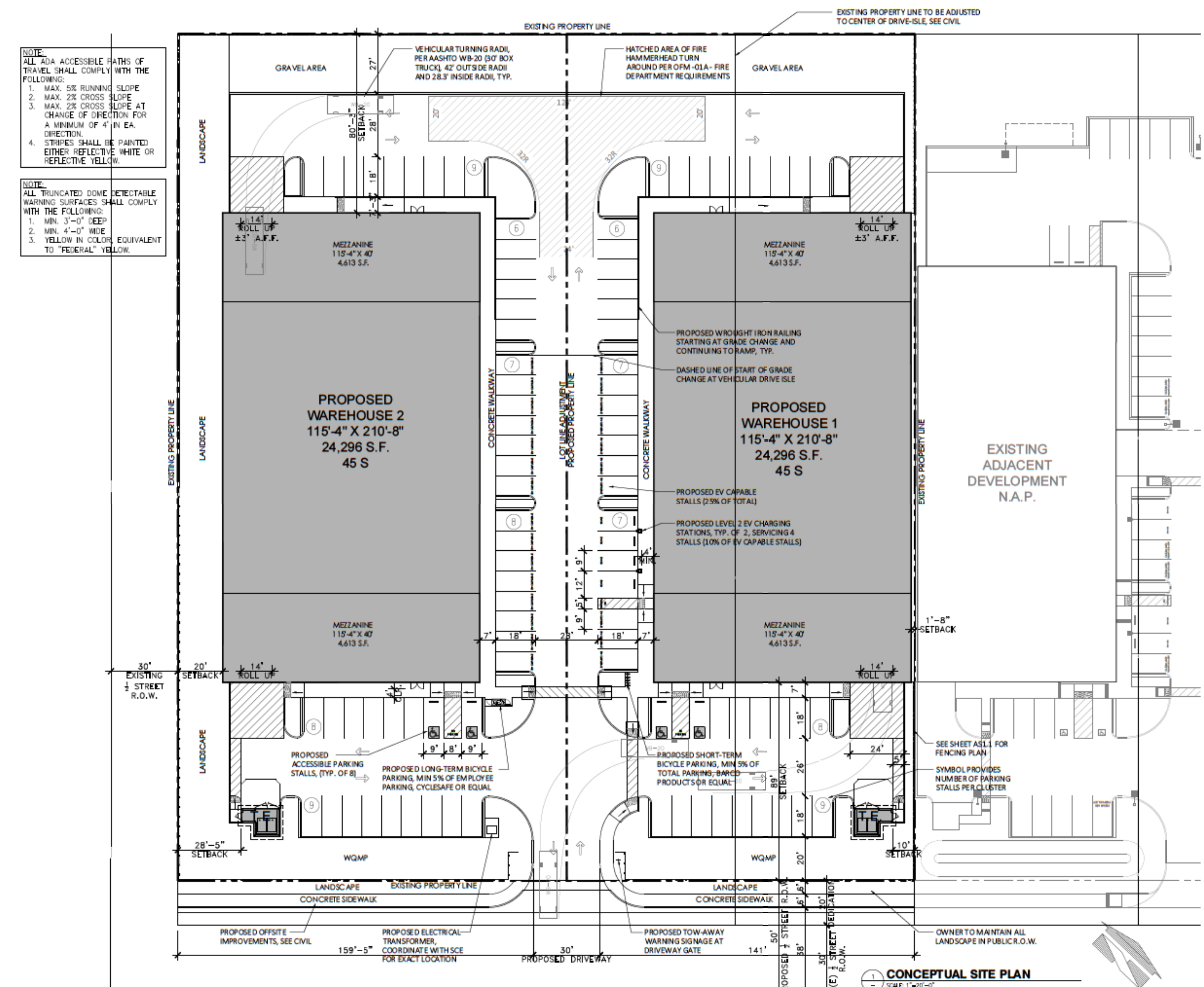
Appendix A
Project Plans



SITE DATA

ADDRESS:	CORYDON RD. LAKE ELSINORE, CA 92530
PERMIT NUMBER:	TBD
APN:	370-080-002, 370-080-003
LOT SIZE:	370-080-002 EXISTING NET: 2.30 ACRES (99,981 S.F.) PROPOSED NET: 1.52 ACRES (66,250 S.F.) 370-080-003 EXISTING NET: 0.74 ACRES (32,155 S.F.) PROPOSED NET: 1.36 ACRES (59,281 S.F.)
BUILDING AREAS:	WAREHOUSE 1: 24,296 S.F. WAREHOUSE 2: 24,296 S.F. TRASH ENCLOSURE: 180S.F. (TYP. OF 2)
FLOOR AREA RATIO:	.38
BUILDING HEIGHT:	WAREHOUSE 1 & 2: 28'-0" HIGH
COUNTY:	RIVERSIDE
CONSTRUCTION TYPE:	III-B/SPRINKLERED
OCCUPANCYS:	B & S1
SPECIFIC PLAN:	PLANNING AREA 3 OF THE EAST LAKE SPECIFIC PLAN
LAND USE:	ACTION SPORTS, TOURISM AND COMMERCIAL, AND RECREATIONAL
SURROUNDING LAND USE AND ZONING:	NORTH: EAST LAKE SPECIFIC PLAN SOUTH: CITY OF WILDOMAR EAST: EAST LAKE SPECIFIC PLAN WEST: EAST LAKE SPECIFIC PLAN
PARKING REQUIREMENTS:	IN MANUFACTURING DISTRICT: 1 PARKING SPACE PER 500 SF OF UNIT AREA FOR UP TO 20,000 S.F. + PARKING SPACE PER 1,000 SF TOTAL STALLS REQUIRED: 90 PER WAREHOUSE TOTAL STALLS PROVIDED: 93 TOTAL (INCLUDING 4 ADA & 4 EVCS)
LOT COVERAGE:	BUILDING: 48,952 S.F. (39%) LANDSCAPING: 25,226 S.F. (20%) IMPERVIOUS: 51,353 S.F. (41%) TOTAL: 125,531 S.F. (100%)

APPLICANT / OWNER

PETER DELATORRE
RD CONSTRUCTION
38850 CALLE DE COMPANERO
MURRIETA, CA 92562
PHONE: (818) 625-1011
E-MAIL: peter@rdconstructioncorp.com

ARCHITECT / EXHIBIT PREPARER

EMPIRE DESIGN GROUP, INC.
511 N MAIN STREET
LAKE ELSINORE, CA 92530
PHONE: (951) 696-1490
CELL PHONE: (951) 809-7601
E-MAIL: ghann@empiregr.biz
CONTACT: GREGORY HANN, ARCHITECT

PLANNING NOTES

1. PROJECTS SHOULD DEMONSTRATE A RESPECT FOR A NEIGHBORING PROPERTY'S PRIVACY, QUIET, FUNCTION, OR VIEWS, AND ELEMENTS OF THE DESIGN INCLUDING, BUT NOT LIMITED TO, OPENINGS, DOCKS, AND EQUIPMENT PLACEMENT SHOULD NOT BE LOCATED IN SUCH A WAY AS TO CREATE A NUISANCE FOR AN ADJOINING PROPERTY. (LAKE ELSINORE MUNICIPAL CODE (LEMC) SECTION 17.415.050.F.6)

DEFERRED SUBMITTALS

1. AUTOMATIC FIRE SPRINKLER SYSTEM

VICINITY MAP

EMPIRE DESIGN GROUP Inc.
511 N Main St.
Lake Elsinore, CA 92530
951-696-1490
EmpireDesignGroup.biz

CLIENT:
RD CONSTRUCTION

CORYDON GROUP
APN'S: 370-080-002, 370-080-003
CORYDON RD.
LAKE ELSINORE, CA 92530

ARCHITECT OF RECORD:
GREGORY S. HANN, AIA
511 N MAIN STREET
LAKE ELSINORE, CA 92530
TEL: 951-696-1490
CELL: 951-809-7601
E-MAIL: ghann@empiregr.biz

SEAL: STATE OF CALIFORNIA · GREGORY SCOTT HANN · C-23663 · REN. 8/30/25 · LICENSED ARCHITECT

Date: FEBRUARY 23, 2024
Project Number: EDG#04793

NO.	DATE	REVISION DESCRIPTION
1	3-19-24	1ST CUP CORRECTIONS
2	1-24-25	2ND CUP CORRECTIONS
3	6-2-25	ADDITIONAL PARCEL ADDED TO PROJECT SCOPE

DESIGNED BY: GH
CHECKED BY: GH
DRAWN BY: AH

DRAWING TITLE: CONCEPTUAL SITE PLAN

SHEET NO: AS 1.0

Eilar Associates, Inc.
Acoustical and Environmental Consulting Services

Appendix B

Applicable Noise Regulations

5.507.4 Acoustical Control

Employ building assemblies and components with Sound Transmission Class (STC) values determined in accordance with ASTM E90 and ASTM E413 or Outdoor-Indoor Sound Transmission Class (OITC) determined in accordance with ASTM E1332, using either the prescriptive or performance method in Section 5.507.4.1 or 5.507.4.2.

Exception: Buildings with few or no occupants or where occupants are not likely to be affected by exterior noise, as determined by the enforcement authority, such as factories, stadiums, storage, enclosed parking structures and utility buildings.

Exception: [DSA-SS] For public schools and community colleges, the requirements of this section and all subsections apply only to new construction.

5.507.4.1 Exterior Noise Transmission, Prescriptive Method

Wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall meet a composite STC rating of at least 50 or a composite OITC rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 in the following locations:

1. Within the 65 CNEL noise contour of an airport.

   Exceptions:

   1. L_{dn} or CNEL for military airports shall be determined by the facility Air Installation Compatible Land Use Zone (AICUZ) plan.

   2. L_{dn} or CNEL for other airports and heliports for which a land use plan has not been developed shall be determined by the local general plan noise element.

2. Within the 65 CNEL or L_{dn} noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway source as determined by the Noise Element of the General Plan.

5.507.4.1.1 Noise Exposure Where Noise Contours Are Not Readily Available

Buildings exposed to a noise level of 65 dB L_{eq}-1-hr during any hour of operation shall have building, addition or alteration exterior wall and roof-ceiling assemblies exposed to the noise source meeting a composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum STC of 40 (or OITC 30).

5.507.4.2 Performance Method

For buildings located as defined in Section 5.507.4.1 or 5.507.4.1.1, wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level (L_{eq}-1Hr) of 50 dBA in occupied areas during any hour of operation.

5.507.4.2.1 Site Features

Exterior features such as sound walls or earth berms may be utilized as appropriate to the building, addition or alteration project to mitigate sound migration to the interior.

5.507.4.2.2 Documentation of Compliance

An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.

5.507.4.3 Interior Sound Transmission

Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40.

Note: Examples of assemblies and their various STC ratings may be found at the California Office of Noise Control: http://www.toolbase.org/PDF/CaseStudies/stc_icc_ratings.pdf.

F. The time of day or night the noise occurs.

G. The duration of the noise and its tonal, informational or musical content.

H. Whether the noise is continuous, recurrent, or intermittent.

I. Whether the noise is produced by a commercial or noncommercial activity. [Ord. 772 § 17.78.040, 1986. Code 1987 § 17.78.040].

17.176.050 Noise measurement procedure.

A. Upon receipt of a complaint from a citizen, the Noise Control Office(r) or his agent, equipped with sound level measurement equipment satisfying the requirements specified in LEMC 17.176.020, shall investigate the complaint. The investigation shall consist of a measurement and the gathering of data to adequately define the noise problem and shall include the following:

1. Nonacoustic Data.

a. Type of noise source.

b. Location of noise source relative to complainant's property.

c. Time period during which noise source is considered by complainant to be intrusive.

d. Total duration of noise produced by noise source.

e. Date and time of noise measurement survey.

B. Noise Measurement Procedure. Utilizing the A-weighting scale of the sound level meter and the "slow" meter response (use "fast" response for impulsive type sounds), the noise level shall be measured at a position or positions at any point on the receiver's property.

In general, the microphone shall be located four to five feet above the ground; 10 feet or more from the nearest reflective surface where possible. However, in those cases where another elevation is deemed appropriate, the latter shall be utilized. If the noise complaint is related to interior noise levels, interior noise measurements shall be made within the affected residential unit. The measurements shall be made at a point at least four feet from the wall, ceiling, or floor nearest the noise source, with windows in the normal seasonal configuration. Calibration of the measurement equipment, utilizing an acoustic calibration, shall be performed immediately prior to recording any noise data. [Ord. 772 § 17.78.050, 1986. Code 1987 § 17.78.050].

17.176.060 Exterior noise limits.

A. Maximum Permissible Sound Levels by Receiving Land Use.

1. The noise standards for the various categories of land use identified by the Noise Control Office(r) as presented in Table 1 shall, unless otherwise specifically indicated, apply to all such property within a designated zone.

2. No person shall operate, or cause to be operated, any source of sound at any location within the incorporated City or allow the creation of any noise on property owned, leased,

occupied or otherwise controlled by such person, which causes the noise level when measured on any other property, either incorporated or unincorporated, to exceed:

a. The noise standard for that land use as specified in Table 1 for a cumulative period of more than 30 minutes in any hour; or

b. The noise standard plus five dB for a cumulative period of more than 15 minutes in any hour; or

c. The noise standard plus 10 dB for a cumulative period of more than five minutes in any hour; or

d. The noise standard plus 15 dB for a cumulative period of more than one minute in any hour; or

e. The noise standard plus 20 dB or the maximum measured ambient level, for any period of time.

3. If the measured ambient level differs from that permissible within any of the fast four noise limit categories above, the allowable noise exposure standard shall be adjusted in five dB increments in each category as appropriate to encompass or reflect said ambient noise level.

In the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level

4. If the measurement location is on a boundary between two different zones, the noise level limit applicable to the lower noise zone plus six dB shall apply.

5. If possible, the ambient noise shall be measured at the same location along the property line utilized in subsection (A)(2) of this section with the alleged offending noise source inoperative. If, for any reason, the alleged offending noise source cannot be shut down, the ambient noise must be estimated by performing a measurement in the same general area of the source but at a sufficient distance such that the noise from the source is at least 10 dB below the ambient in order that only the ambient level be measured. If the difference between the ambient and the noise source is five to 10 dB, then the level of the ambient itself can be reasonably determined by subtracting a one-decibel correction to account for the contribution of the source.

B. Correction for Character of Sound. In the event the alleged offensive noise, as judged by the Noise Control Officer, contains a steady, audible tone such as a whine, screech, or hum, or is a repetitive noise such as hammering or riveting, or contains music or speech conveying informational content, the standard limits set forth in Table 1 shall be reduced by five dB.

TABLE 1
EXTERIOR NOISE LIMITS

(Levels Not to Be Exceeded More Than 30 Minutes in Any Hour)

Receiving Land Use Category	Time Period	Noise Level (dBA)
Single-Family Residential	10:00 p.m. – 7:00 a.m.	40
	7:00 a.m. – 10:00 p.m.	50
Multiple Dwelling Residential	10:00 p.m. – 7:00 a.m.	45
	7:00 a.m. – 10:00 p.m.	50
Public Space		
Limited Commercial and Office	10:00 p.m. – 7:00 a.m.	55
	7:00 a.m. – 10:00 p.m.	60
General Commercial	10:00 p.m. – 7:00 a.m.	60
	7:00 a.m. – 10:00 p.m.	65
Light Industrial	Anytime	70
Heavy Industrial	Anytime	75

[Ord. 772 § 17.78.060, 1986. Code 1987 § 17.78.060].

17.176.070 Interior noise standards.

A. Maximum Permissible Dwelling Interior Sound Levels.

1. The interior noise standards for multifamily residential dwellings as presented in Table 2 shall apply, unless otherwise specifically indicated, within all such dwellings with windows in their normal seasonal configuration.

TABLE 2

Noise Zone	Type of Land Use	Time Internal	Allowable Interior Noise Level (dBA)
All	Multifamily Residential	10:00 p.m. – 7:00 a.m.	35
		7:00 a.m. – 10:00 p.m.	45

2. No person shall operate or cause to be operated within a dwelling unit, any source of sound or allow the creation of any noise which causes the noise level when measured inside a neighboring receiving dwelling unit to exceed:

a. The noise standard as specified in Table 2 for a cumulative period of more than five minutes in any hour; or

b. The noise standard plus five dB for a cumulative period of more than one minute in any hour; or

c. The noise standard plus 10 dB or the maximum measured ambient, for any period of time.

3. If the measured ambient level differs from that permissible within any of the noise limit categories above, the allowable noise exposure standard shall be adjusted in five dB

increments in each category as appropriate to reflect said ambient noise level.

B. Correction for Character of Sound. In the event the alleged offensive noise, as judged by the Noise Control Officer, contains a steady, audible tone such as a whine, screech, or hum, or is a repetitive noise such as hammering or riveting, or contains music or speech conveying informational content, the standard limits set forth in Table 2 shall be reduced by five dB. [Ord. 772 § 17.78.070, 1986. Code 1987 § 17.78.070].

17.176.080 Prohibited acts.

No person shall unnecessarily make, continue, or cause to be made or continued, any noise disturbance. The following acts, and the causing or permitting thereof, are declared to be in violation of this chapter:

A. Operating, playing or permitting the operation or playing of any radio, television set, phonograph, drum, musical instrument, or similar device which produces or reproduces sound:

1. Between the hours of 10:00 p.m. and 7:00 a.m. in such a manner as to create a noise disturbance across a residential or commercial real property line or at any time to violate the provisions of LEMC 17.176.060(A), except for which a variance has been issued by the City.

2. In such a manner as to exceed the levels set forth for public space in Table 1, measured at a distance of at least 50 feet (15 meters) from such device operating on a public right-of-way or public space.

B. Using or operating for any purpose any loudspeaker, loudspeaker system, or similar device between the hours of 10:00 p.m. and 7:00 a.m., such that the sound therefrom creates a noise disturbance across a residential real property line, or at any time violates the provisions of LEMC 17.176.060(A), except for any noncommercial public speaking, public assembly or other activity for which a variance has been issued by the City.

C. Offering for sale, selling anything, or advertising by shouting or outcry within any residential or commercial area or noise sensitive zone of the City except by variance issued by the City. The provisions of this section shall not be construed to prohibit the selling by outcry of merchandise, food, and beverages at licensed sporting events, parades, fairs, circuses, or other similar licensed public entertainment events.

D. Owning, possessing or harboring any animal or bird which frequently or for long duration, howls, barks, meows, squawks, or makes other sounds which create a noise disturbance across a residential or commercial real property line or within a noise sensitive zone. This provision shall not apply to public zoos.

E. Loading, unloading, opening, closing or other handling of boxes, crates, containers, building materials, garbage cans, or similar objects between the hours of 10:00 p.m. and 7:00 a.m. in such a manner as to cause a noise disturbance across a residential real property line or at any time to violate the provisions of LEMC 17.176.060(A).

F. Construction/Demolition.

1. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work between weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on weekends or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance issued by the City.

2. Noise Restrictions at Affected Properties. Where technically and economically feasible, construction activities shall be conducted in such a manner that the maximum noise levels at affected properties will not exceed those listed in the following schedule:

AT RESIDENTIAL PROPERTIES:

Mobile Equipment

Maximum noise levels for nonscheduled, intermittent, short-term operation (less than 10 days) of mobile equipment:

	Type I Areas Single-Family Residential	Type II Areas Multifamily Residential	Type III Areas Semi-Residential/Commercial
Daily, except Sundays and Legal Holidays 7:00 a.m. to 7:00 p.m.	75 dBA	80 dBA	85 dBA
Daily, 7:00 p.m. to 7:00 a.m. and all day Sunday and Legal Holidays	60 dBA	65 dBA	70 dBA

Stationary Equipment

Maximum noise levels for repetitively scheduled and relatively long-term operation (period of 10 days or more) of stationary equipment:

	Type I Areas Single-Family Residential	Type II Areas Multifamily Residential	Type III Areas Semi-Residential/Commercial
Daily, except Sundays and Legal Holidays 7:00 a.m. to 7:00 p.m.	60 dBA	65 dBA	70 dBA
Daily, 7:00 p.m. to 7:00 a.m. and all day Sunday and Legal Holidays	50 dBA	55 dBA	60 dBA

AT BUSINESS PROPERTIES:

Mobile Equipment

Maximum noise levels for nonscheduled, intermittent, short-term operation of mobile equipment:

Daily, including Sundays and Legal Holidays, all hours: maximum of 85 dBA.

Stationary Equipment

Maximum noise levels for repetitively scheduled and relatively long-term operation of stationary equipment:

Daily, including Sundays and Legal Holidays, all hours: maximum of 75 dBA.

3. All mobile or stationary internal combustion engine powered equipment or machinery shall be equipped with suitable exhaust and air intake silencers in proper working order.

G. Operating or permitting the operation of any device that creates a vibration which is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property or at 150 feet (46 meters) from the source if on a public space or public right-of-way.

H. Powered Model Vehicles. Operating or permitting the operation of powered model vehicles:

1. Between the hours of 7:00 p.m. and 7:00 a.m. so as to create a noise disturbance across a residential or commercial real property line or at any time to violate the provisions of LEMC 17.176.060(A).

2. In such a manner as to exceed the levels set forth for public space land use in Table 1, measured at a distance not less than 100 feet (30 meters) from any point on the path of a vehicle operating on public space or public right-of-way.

I. Stationary Nonemergency Signaling Devices.

1. Sounding or permitting the sounding of any electronically amplified signal from any stationary bell, chime, siren, whistle, or similar device, intended primarily for nonemergency purposes, from any place, for more than 10 seconds in any hourly period.

2. Houses of religious worship shall be exempt from the operation of this provision.

3. Sound sources covered by this provision and not exempted under subsection (I)(2) of this section shall be exempted by a variance issued by the City.

J. Emergency Signaling Devices.

1. The intentional sounding or permitting the sounding outdoors of any fire, burglar, or civil defense alarm, siren, whistle, or similar stationary emergency signaling device, except for emergency purposes or for testing, as provided in subsection (J)(2) of this section.

2. a. Testing of a stationary emergency signaling system shall not occur before 7:00 a.m. or after 7:00 p.m. Any such testing shall use only the minimum cycle test time. In no case shall such test time exceed 60 seconds.

b. Testing of the complete emergency signaling system, including the functioning of the signaling device and the personnel response to the signaling device, shall not occur more than once in each calendar month. Such testing shall not occur before 7:00 a.m., or after 10:00 p.m. The time limit specified in subsection (J)(2)(a) of this section shall not apply to such complete system testing.

3. Sounding or permitting the sounding of any exterior burglar or fire alarm or any motor vehicle burglar alarm unless such alarm is terminated within 15 minutes of activation.

K. Noise Sensitive Zones.

Eilar Associates, Inc.
Acoustical and Environmental Consulting Services

Appendix C

CadnaA Analysis Data and Results

Eilar Associates, Inc.
210 South Juniper Street, Suite 100
Escondido, California 92025-4230
Phone: (760) 738-5570
Date: 10 Jun 2025

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.68
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.84
Min. Length of Section (ft)	3.28
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
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	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rvcr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
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 (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.40
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receivers

Name	Sel.	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)				(ft)		(ft)	(ft)	(ft)
F1			1	54.8	-77.7	0.0	0.0		x	Total	5.00	r	452.40	519.20	5.00
F1-2			1	56.7	-77.6	0.0	0.0		x	Total	17.00	r	452.40	519.20	17.00
F2			3	64.6	-71.5	0.0	0.0		x	Total	5.00	r	576.79	493.52	5.00
F2-2			3	66.5	-71.1	0.0	0.0		x	Total	17.00	r	576.79	493.52	17.00
F3			5	57.1	-76.4	0.0	0.0		x	Total	5.00	r	529.52	621.15	5.00
F3-2			5	58.9	-76.2	0.0	0.0		x	Total	17.00	r	529.52	621.15	17.00
F4			7	28.7	-80.2	0.0	0.0		x	Total	5.00	r	399.75	625.36	5.00
F4-2			7	32.4	-80.2	0.0	0.0		x	Total	17.00	r	399.75	625.36	17.00
F5			9	56.4	-76.8	0.0	0.0		x	Total	5.00	r	329.64	366.81	5.00
F5-2			9	58.2	-76.6	0.0	0.0		x	Total	17.00	r	329.64	366.81	17.00
F6			11	64.6	-71.5	0.0	0.0		x	Total	5.00	r	463.70	339.60	5.00
F6-2			11	66.5	-71.1	0.0	0.0		x	Total	17.00	r	463.70	339.60	17.00
F7			13	54.5	-77.8	0.0	0.0		x	Total	5.00	r	406.55	462.98	5.00
F7-2			13	56.4	-77.7	0.0	0.0		x	Total	17.00	r	406.55	462.98	17.00
F8			15	29.5	-80.2	0.0	0.0		x	Total	5.00	r	285.27	471.28	5.00
F8-2			15	33.1	-80.2	0.0	0.0		x	Total	17.00	r	285.27	471.28	17.00

Roads

Name	Sel.	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	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)
Corydon Road				70.3	0.0	0.0			2767.0	0.0	0.0	3.0	0.0	0.0	45		4.36	0.0	1	0.0	0.0		

Geometry - Roads

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
Corydon Road	0.00	r			1079.83	952.20	0.00	0.00		
					568.47	257.73	0.00	0.00		
					271.25	-148.21	0.00	0.00		

Buildings

Name	Sel.	M.	ID	RB	Residents	Absorption	Height	
							Begin	
							(ft)	
Warehouse 1				x	0		30.00	r
Warehouse 2				x	0		30.00	r

Geometry - Buildings

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(ft)		(ft)	(ft)	(ft)	(ft)
Warehouse 1				x	0		30.00	r	372.35	584.69	30.00	0.00
									443.10	678.83	30.00	0.00
									616.30	551.67	30.00	0.00
									546.01	456.92	30.00	0.00
Warehouse 2				x	0		30.00	r	254.76	425.35	30.00	0.00
									325.30	519.32	30.00	0.00
									497.84	392.80	30.00	0.00
									428.54	297.95	30.00	0.00

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Date: 14 Nov 2025

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.68
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.84
Min. Length of Section (ft)	3.28
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
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	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rvcr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
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 (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.40
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receivers

Name	Sel.	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)				(ft)		(ft)	(ft)	(ft)
North1			R1	54.0	34.9	0.0	0.0		x	Total	5.00	r	422.88	701.71	5.00
North2			R2	53.1	32.5	0.0	0.0		x	Total	5.00	r	635.08	542.82	5.00
South1			R3	50.1	37.9	0.0	0.0		x	Total	5.00	r	202.45	434.96	5.00
South2			R4	52.3	37.6	0.0	0.0		x	Total	5.00	r	437.72	265.67	5.00
East1			R5	40.5	31.0	0.0	0.0		x	Total	5.00	r	917.76	207.75	5.00
East2			R6	47.1	34.8	0.0	0.0		x	Total	5.00	r	569.88	206.25	5.00
West			R7	52.7	35.5	0.0	0.0		x	Total	5.00	r	281.04	600.93	5.00

Point Sources

Name	Sel.	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
				Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
				(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft²)		(min)	(min)	(min)	(dB)	(Hz)		(ft)		(ft)	(ft)	(ft)
HVAC 1			1	81.7	81.7	81.7	Lw	L1		0.0	0.0	0.0							0.0		(none)	4.00	g	441.47	638.41	34.00
HVAC 1			2	81.7	81.7	81.7	Lw	L1		0.0	0.0	0.0							0.0		(none)	4.00	g	467.19	623.98	34.00
HVAC 1			3	81.7	81.7	81.7	Lw	L1		0.0	0.0	0.0							0.0		(none)	4.00	g	490.63	608.79	34.00
HVAC 1			4	81.7	81.7	81.7	Lw	L1		0.0	0.0	0.0							0.0		(none)	4.00	g	517.76	594.25	34.00
HVAC 1			5	81.7	81.7	81.7	Lw	L1		0.0	0.0	0.0							0.0		(none)	4.00	g	540.12	581.44	34.00
HVAC 1			6	81.7	81.7	81.7	Lw	L1		0.0	0.0	0.0							0.0		(none)	4.00	g	570.07	561.47	34.00
HVAC 1			7	81.7	81.7	81.7	Lw	L1		0.0	0.0	0.0							0.0		(none)	4.00	g	294.44	414.76	34.00
HVAC 1			8	81.7	81.7	81.7	Lw	L1		0.0	0.0	0.0							0.0		(none)	4.00	g	311.80	401.31	34.00
HVAC 1			9	81.7	81.7	81.7	Lw	L1		0.0	0.0	0.0							0.0		(none)	4.00	g	335.02	383.94	34.00
HVAC 1			10	81.7	81.7	81.7	Lw	L1		0.0	0.0	0.0							0.0		(none)	4.00	g	352.39	368.97	34.00
HVAC 1			11	81.7	81.7	81.7	Lw	L1		0.0	0.0	0.0							0.0		(none)	4.00	g	375.39	352.69	34.00
HVAC 1			12	81.7	81.7	81.7	Lw	L1		0.0	0.0	0.0							0.0		(none)	4.00	g	394.49	339.45	34.00

Line Sources

Name	Sel.	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			Speed
				(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night	(mph)
Trucks-Bldg 1				89.1	-10.9	-10.9	67.3	-32.7	-32.7	PWL-Pt	S15		0.0	0.0	0.0							0.0		(none)	1.0	0.0	0.0	6.2
Trucks-Bldg 1				85.7	-14.3	-14.3	67.3	-32.7	-32.7	PWL-Pt	S15		0.0	0.0	0.0							0.0		(none)	1.0	0.0	0.0	6.2
Trucks-Bldg 2				89.1	-10.9	-10.9	67.3	-32.7	-32.7	PWL-Pt	S15		0.0	0.0	0.0							0.0		(none)	1.0	0.0	0.0	6.2
Trucks-Bldg 2				85.6	-14.4	-14.4	67.3	-32.7	-32.7	PWL-Pt	S15		0.0	0.0	0.0							0.0		(none)	1.0	0.0	0.0	6.2
Trucks-Bldg 2				85.6	-14.4	-14.4	67.3	-32.7	-32.7	PWL-Pt	S15		0.0	0.0	0.0							0.0		(none)	1.0	0.0	0.0	6.2

Geometry - Line Sources

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
Trucks-Bldg 1		5.00	r			606.69	371.81	5.00	0.00
						409.63	517.54	5.00	0.00
						345.55	565.77	5.00	0.00
						333.86	599.50	5.00	0.00
						350.53	635.16	5.00	0.00
						391.91	679.13	5.00	0.00
						425.89	673.47	5.00	0.00
Trucks-Bldg 1		5.00	r			606.80	371.90	5.00	0.00
						561.40	405.62	5.00	0.00
						595.47	441.37	5.00	0.00
						637.85	503.95	5.00	0.00
						608.62	539.29	5.00	0.00
Trucks-Bldg 2		5.00	r			596.52	357.83	5.00	0.00
						474.68	449.35	5.00	0.00
						387.53	512.64	5.00	0.00
						334.53	553.42	5.00	0.00
						291.97	550.43	5.00	0.00
						267.06	519.93	5.00	0.00
						244.33	477.44	5.00	0.00
						252.91	445.60	5.00	0.00
Trucks-Bldg 2		5.00	r			596.85	358.02	5.00	0.00
						551.44	391.74	5.00	0.00
						500.44	324.18	5.00	0.00
						469.62	294.73	5.00	0.00
						438.39	310.99	5.00	0.00
Trucks-Bldg 2		5.00	r			596.85	358.02	5.00	0.00
						551.44	391.74	5.00	0.00
						500.44	324.18	5.00	0.00
						469.62	294.73	5.00	0.00
						438.39	310.99	5.00	0.00

Area Sources

Name	Sel.	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		
				(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
Forklift 1				82.9	-17.1	-17.1	56.0	-44.0	-44.0	PWL-Pt	S22		0.0	0.0	0.0							0.0		(none)	1.0	0.0	0.0
Forklift 2				82.9	-17.1	-17.1	56.0	-44.0	-44.0	PWL-Pt	S22		0.0	0.0	0.0							0.0		(none)	1.0	0.0	0.0

Geometry - Area Sources

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
Forklift 1		5.00	r			217.26	458.09	5.00	0.00
						252.63	432.22	5.00	0.00
						321.45	525.90	5.00	0.00
						285.19	553.57	5.00	0.00
Forklift 2		5.00	r			328.37	612.61	5.00	0.00
						363.75	586.73	5.00	0.00
						432.56	680.42	5.00	0.00
						396.31	708.08	5.00	0.00

Buildings

Name	Sel.	M.	ID	RB	Residents	Absorption	Height	
							Begin	
							(ft)	
Warehouse 1				x	0		30.00	r
Warehouse 2				x	0		30.00	r

Geometry - Buildings

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(ft)		(ft)	(ft)	(ft)	(ft)
Warehouse 1				x	0		30.00	r	372.35	584.69	30.00	0.00
									443.10	678.83	30.00	0.00
									616.30	551.67	30.00	0.00
									546.01	456.92	30.00	0.00
Warehouse 2				x	0		30.00	r	254.76	425.35	30.00	0.00
									325.30	519.32	30.00	0.00
									497.84	392.80	30.00	0.00
									428.54	297.95	30.00	0.00

Sound Level Spectra

Name	ID	Type	1/3 Octave Spectrum (dB)											Source
			Weight.	63	125	250	500	1000	2000	4000	8000	A	lin	
Delivery Truck	S15	Lw		113.8	113.8	102.8	104.8	100.8	98.8	97.8	89.8	107.3	117.4	RCNM/Typ Spectrum
Forklift	S22	Lw (c)		97.3	91.3	81.3	79.3	76.3	74.3	68.3	59.3	82.9	98.5	Caterpillar data
Carrier 48HCD08	L1	Lw		90.6	84.3	80.2	79.3	77.1	72.2	67.4	63.7	81.7	92.3	Mfr

Eilar Associates, Inc.
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Phone: (760) 738-5570

Date: 14 Nov 2025

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.68
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.84
Min. Length of Section (ft)	3.28
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
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	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rvcr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
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 (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receivers

Name	Sel.	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)				(ft)		(ft)	(ft)	(ft)
North1			R1	79.5	-80.2	0.0	0.0		x	Total	5.00	r	422.88	701.71	5.00
North2			R2	81.2	-80.2	0.0	0.0		x	Total	5.00	r	635.08	542.82	5.00
East1			R5	64.8	-80.2	0.0	0.0		x	Total	5.00	r	917.76	207.75	5.00
East2			R6	71.9	-80.2	0.0	0.0		x	Total	5.00	r	569.88	206.25	5.00

Area Sources

Name	Sel.	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		
				(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
Grader		+		121.4	18.4	18.4	80.5	-22.5	-22.5	PWL-Pt	S1		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Scraper		+		120.4	17.4	17.4	79.5	-23.5	-23.5	PWL-Pt	S2		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Backhoe		+		114.4	11.4	11.4	73.5	-29.5	-29.5	PWL-Pt	S3		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Dump Truck		+		109.4	9.4	9.4	68.5	-31.5	-31.5	PWL-Pt	S4		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	1.0	0.0	0.0

Geometry - Area Sources

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
Grader		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00
Scraper		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00
Backhoe		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00
Dump Truck		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00

Sound Level Spectra

Name	ID	Type	1/3 Octave Spectrum (dB)											Source
			Weight.	63	125	250	500	1000	2000	4000	8000	A	lin	
Grader	S1	Lw (c)		99.4	116.6	118.9	114.2	113.9	110.5	105.6	101.6	118.4	122.8	FHWA
Scraper	S2	Lw (c)		98.4	115.6	117.9	113.2	112.9	109.5	104.6	100.6	117.4	121.8	FHWA
Backhoe	S3	Lw (c)		101.9	111.8	104.3	110.0	106.6	103.1	98.9	93.7	111.4	115.6	FHWA
Dump Truck	S4	Lw (c)		110.3	110.3	109.3	105.3	104.3	102.3	97.3	87.3	109.4	115.8	FHWA
Dozer	S5	Lw (c)		121.8	121.8	110.8	113.8	109.8	106.8	105.8	97.8	115.8	125.5	FHWA
Crane	S6	Lw (c)		126.0	122.0	114.0	112.0	107.0	105.0	106.0	96.0	114.8	127.8	FHWA
Telescopic Forklift	S7	Lw (c)		107.3	103.6	103.8	101.1	103.7	101.3	96.1	90.1	107.6	112.0	Brutoco Measurements
Welder	S8	Lw (c)		106.3	102.6	102.8	100.1	102.7	100.3	95.1	89.1	106.5	110.9	FHWA
Generator	S9	Lw (c)		117.9	112.9	105.9	102.9	93.9	89.9	83.9	78.9	103.9	119.4	FHWA
Concrete Mixer	S10	Lw (c)		117.0	118.0	111.0	110.0	107.0	106.0	97.0	91.0	112.8	121.6	FHWA
Paver	S11	Lw (c)		113.1	112.1	107.1	107.1	106.1	104.1	97.1	91.1	110.7	117.3	FHWA
Roller	S12	Lw (c)		128.6	120.6	111.6	110.6	108.6	103.6	97.6	92.6	113.6	129.4	FHWA
Compressor	S13	Lw (c)		130.4	109.4	110.4	105.4	103.4	101.4	104.4	93.4	111.3	130.5	FHWA

Eilar Associates, Inc.
210 South Juniper Street, Suite 100
Escondido, California 92025-4230
Phone: (760) 738-5570

Date: 14 Nov 2025

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.68
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.84
Min. Length of Section (ft)	3.28
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
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	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rvcr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
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 (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receivers

Name	Sel.	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)				(ft)		(ft)	(ft)	(ft)
North1			R1	79.0	-80.2	0.0	0.0		x	Total	5.00	r	422.88	701.71	5.00
North2			R2	80.7	-80.2	0.0	0.0		x	Total	5.00	r	635.08	542.82	5.00
East1			R5	64.3	-80.2	0.0	0.0		x	Total	5.00	r	917.76	207.75	5.00
East2			R6	71.4	-80.2	0.0	0.0		x	Total	5.00	r	569.88	206.25	5.00

Area Sources

Name	Sel.	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		
				(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
Grader		+		121.4	18.4	18.4	80.5	-22.5	-22.5	PWL-Pt	S1		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Dozer		+		118.8	15.8	15.8	77.9	-25.1	-25.1	PWL-Pt	S5		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Backhoe		+		114.4	11.4	11.4	73.5	-29.5	-29.5	PWL-Pt	S3		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Dump Truck		+		109.4	9.4	9.4	68.5	-31.5	-31.5	PWL-Pt	S4		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	1.0	0.0	0.0

Geometry - Area Sources

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
Grader		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00
Dozer		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00
Backhoe		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00
Dump Truck		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00

Sound Level Spectra

Name	ID	Type	1/3 Octave Spectrum (dB)											Source
			Weight.	63	125	250	500	1000	2000	4000	8000	A	lin	
Grader	S1	Lw (c)		99.4	116.6	118.9	114.2	113.9	110.5	105.6	101.6	118.4	122.8	FHWA
Scraper	S2	Lw (c)		98.4	115.6	117.9	113.2	112.9	109.5	104.6	100.6	117.4	121.8	FHWA
Backhoe	S3	Lw (c)		101.9	111.8	104.3	110.0	106.6	103.1	98.9	93.7	111.4	115.6	FHWA
Dump Truck	S4	Lw (c)		110.3	110.3	109.3	105.3	104.3	102.3	97.3	87.3	109.4	115.8	FHWA
Dozer	S5	Lw (c)		121.8	121.8	110.8	113.8	109.8	106.8	105.8	97.8	115.8	125.5	FHWA
Crane	S6	Lw (c)		126.0	122.0	114.0	112.0	107.0	105.0	106.0	96.0	114.8	127.8	FHWA
Telescopic Forklift	S7	Lw (c)		107.3	103.6	103.8	101.1	103.7	101.3	96.1	90.1	107.6	112.0	Brutoco Measurements
Welder	S8	Lw (c)		106.3	102.6	102.8	100.1	102.7	100.3	95.1	89.1	106.5	110.9	FHWA
Generator	S9	Lw (c)		117.9	112.9	105.9	102.9	93.9	89.9	83.9	78.9	103.9	119.4	FHWA
Concrete Mixer	S10	Lw (c)		117.0	118.0	111.0	110.0	107.0	106.0	97.0	91.0	112.8	121.6	FHWA
Paver	S11	Lw (c)		113.1	112.1	107.1	107.1	106.1	104.1	97.1	91.1	110.7	117.3	FHWA
Roller	S12	Lw (c)		128.6	120.6	111.6	110.6	108.6	103.6	97.6	92.6	113.6	129.4	FHWA
Compressor	S13	Lw (c)		130.4	109.4	110.4	105.4	103.4	101.4	104.4	93.4	111.3	130.5	FHWA

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Date: 14 Nov 2025

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.68
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.84
Min. Length of Section (ft)	3.28
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
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	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rvcr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
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 (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receivers

Name	Sel.	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)				(ft)		(ft)	(ft)	(ft)
North1			R1	74.2	-80.2	0.0	0.0		x	Total	5.00	r	422.88	701.71	5.00
North2			R2	75.9	-80.2	0.0	0.0		x	Total	5.00	r	635.08	542.82	5.00
East1			R5	59.8	-80.2	0.0	0.0		x	Total	5.00	r	917.76	207.75	5.00
East2			R6	66.8	-80.2	0.0	0.0		x	Total	5.00	r	569.88	206.25	5.00

Point Sources

Name	Sel.	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
				Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
				(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft²)		(min)	(min)	(min)	(dB)	(Hz)		(ft)		(ft)	(ft)	(ft)
Generator				103.9	103.9	103.9	Lw	S9		0.0	0.0	0.0				30.00	0.00	0.00	0.0		(none)	5.00	r	438.68	477.65	5.00
Generator				103.9	103.9	103.9	Lw	S9		0.0	0.0	0.0				30.00	0.00	0.00	0.0		(none)	5.00	r	438.68	477.65	5.00

Area Sources

Name	Sel.	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		
				(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
Crane		+		117.8	14.8	14.8	76.9	-26.1	-26.1	PWL-Pt	S6		0.0	0.0	0.0				9.60	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Forklift		+		110.6	7.6	7.6	69.7	-33.3	-33.3	PWL-Pt	S7		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Backhoe		+		114.4	11.4	11.4	73.5	-29.5	-29.5	PWL-Pt	S3		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Welder		+		109.5	6.5	6.5	68.7	-34.4	-34.4	PWL-Pt	S8		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Dump Truck		+		109.4	9.4	9.4	68.5	-31.5	-31.5	PWL-Pt	S4		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	1.0	0.0	0.0

Geometry - Area Sources

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
Crane		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00
Forklift		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00
Backhoe		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00
Welder		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00
Dump Truck		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00

Sound Level Spectra

Name	ID	Type	1/3 Octave Spectrum (dB)											Source
			Weight.	63	125	250	500	1000	2000	4000	8000	A	lin	
Grader	S1	Lw (c)		99.4	116.6	118.9	114.2	113.9	110.5	105.6	101.6	118.4	122.8	FHWA
Scraper	S2	Lw (c)		98.4	115.6	117.9	113.2	112.9	109.5	104.6	100.6	117.4	121.8	FHWA
Backhoe	S3	Lw (c)		101.9	111.8	104.3	110.0	106.6	103.1	98.9	93.7	111.4	115.6	FHWA
Dump Truck	S4	Lw (c)		110.3	110.3	109.3	105.3	104.3	102.3	97.3	87.3	109.4	115.8	FHWA
Dozer	S5	Lw (c)		121.8	121.8	110.8	113.8	109.8	106.8	105.8	97.8	115.8	125.5	FHWA
Crane	S6	Lw (c)		126.0	122.0	114.0	112.0	107.0	105.0	106.0	96.0	114.8	127.8	FHWA
Telescopic Forklift	S7	Lw (c)		107.3	103.6	103.8	101.1	103.7	101.3	96.1	90.1	107.6	112.0	Brutoco Measurements
Welder	S8	Lw (c)		106.3	102.6	102.8	100.1	102.7	100.3	95.1	89.1	106.5	110.9	FHWA
Generator	S9	Lw (c)		117.9	112.9	105.9	102.9	93.9	89.9	83.9	78.9	103.9	119.4	FHWA
Concrete Mixer	S10	Lw (c)		117.0	118.0	111.0	110.0	107.0	106.0	97.0	91.0	112.8	121.6	FHWA
Paver	S11	Lw (c)		113.1	112.1	107.1	107.1	106.1	104.1	97.1	91.1	110.7	117.3	FHWA
Roller	S12	Lw (c)		128.6	120.6	111.6	110.6	108.6	103.6	97.6	92.6	113.6	129.4	FHWA
Compressor	S13	Lw (c)		130.4	109.4	110.4	105.4	103.4	101.4	104.4	93.4	111.3	130.5	FHWA

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Date: 14 Nov 2025

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.68
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.84
Min. Length of Section (ft)	3.28
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
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	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rvcr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
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 (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receivers

Name	Sel.	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)				(ft)		(ft)	(ft)	(ft)
North1			R1	76.1	-80.2	0.0	0.0		x	Total	5.00	r	422.88	701.71	5.00
North2			R2	77.8	-80.2	0.0	0.0		x	Total	5.00	r	635.08	542.82	5.00
East1			R5	61.6	-80.2	0.0	0.0		x	Total	5.00	r	917.76	207.75	5.00
East2			R6	68.7	-80.2	0.0	0.0		x	Total	5.00	r	569.88	206.25	5.00

Area Sources

Name	Sel.	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		
				(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
Cement Mixer		+		115.8	12.8	12.8	74.9	-28.1	-28.1	PWL-Pt	S10		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Paver		+		113.7	10.7	10.7	72.8	-30.2	-30.2	PWL-Pt	S11		0.0	0.0	0.0				30.00	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Roller		+		116.6	13.6	13.6	75.7	-27.3	-27.3	PWL-Pt	S12		0.0	0.0	0.0				12.00	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Backhoe		+		114.4	11.4	11.4	73.5	-29.5	-29.5	PWL-Pt	S3		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Dump Truck		+		109.4	9.4	9.4	68.5	-31.5	-31.5	PWL-Pt	S4		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	1.0	0.0	0.0

Geometry - Area Sources

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
Cement Mixer		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00
Paver		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00
Roller		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00
Backhoe		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00
Dump Truck		5.00	r			180.03	456.99	5.00	0.00
						493.45	223.13	5.00	0.00
						690.11	501.31	5.00	0.00
						376.53	730.81	5.00	0.00

Sound Level Spectra

Name	ID	Type	1/3 Octave Spectrum (dB)											Source
			Weight.	63	125	250	500	1000	2000	4000	8000	A	lin	
Grader	S1	Lw (c)		99.4	116.6	118.9	114.2	113.9	110.5	105.6	101.6	118.4	122.8	FHWA
Scraper	S2	Lw (c)		98.4	115.6	117.9	113.2	112.9	109.5	104.6	100.6	117.4	121.8	FHWA
Backhoe	S3	Lw (c)		101.9	111.8	104.3	110.0	106.6	103.1	98.9	93.7	111.4	115.6	FHWA
Dump Truck	S4	Lw (c)		110.3	110.3	109.3	105.3	104.3	102.3	97.3	87.3	109.4	115.8	FHWA
Dozer	S5	Lw (c)		121.8	121.8	110.8	113.8	109.8	106.8	105.8	97.8	115.8	125.5	FHWA
Crane	S6	Lw (c)		126.0	122.0	114.0	112.0	107.0	105.0	106.0	96.0	114.8	127.8	FHWA
Telescopic Forklift	S7	Lw (c)		107.3	103.6	103.8	101.1	103.7	101.3	96.1	90.1	107.6	112.0	Brutoco Measurements
Welder	S8	Lw (c)		106.3	102.6	102.8	100.1	102.7	100.3	95.1	89.1	106.5	110.9	FHWA
Generator	S9	Lw (c)		117.9	112.9	105.9	102.9	93.9	89.9	83.9	78.9	103.9	119.4	FHWA
Concrete Mixer	S10	Lw (c)		117.0	118.0	111.0	110.0	107.0	106.0	97.0	91.0	112.8	121.6	FHWA
Paver	S11	Lw (c)		113.1	112.1	107.1	107.1	106.1	104.1	97.1	91.1	110.7	117.3	FHWA
Roller	S12	Lw (c)		128.6	120.6	111.6	110.6	108.6	103.6	97.6	92.6	113.6	129.4	FHWA
Compressor	S13	Lw (c)		130.4	109.4	110.4	105.4	103.4	101.4	104.4	93.4	111.3	130.5	FHWA

Eilar Associates, Inc.
210 South Juniper Street, Suite 100
Escondido, California 92025-4230
Phone: (760) 738-5570

Date: 14 Nov 2025

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.68
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.84
Min. Length of Section (ft)	3.28
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
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	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rvcr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
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 (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receivers

Name	Sel.	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)				(ft)		(ft)	(ft)	(ft)
North1			R1	63.0	-80.2	0.0	0.0		x	Total	5.00	r	422.88	701.71	5.00
North2			R2	63.8	-80.2	0.0	0.0		x	Total	5.00	r	635.08	542.82	5.00
East1			R5	55.3	-80.2	0.0	0.0		x	Total	5.00	r	917.76	207.75	5.00
East2			R6	60.0	-80.2	0.0	0.0		x	Total	5.00	r	573.16	200.78	5.00

Point Sources

Name	Sel.	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
				Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
				(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft²)		(min)	(min)	(min)	(dB)	(Hz)		(ft)		(ft)	(ft)	(ft)
Compressor				111.3	111.3	111.3	Lw	S13		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	5.00	r	438.68	477.65	5.00
Compressor				111.3	111.3	111.3	Lw	S13		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	5.00	r	438.68	477.65	5.00

Sound Level Spectra

Name	ID	Type	1/3 Octave Spectrum (dB)											Source
			Weight.	63	125	250	500	1000	2000	4000	8000	A	lin	
Grader	S1	Lw (c)		99.4	116.6	118.9	114.2	113.9	110.5	105.6	101.6	118.4	122.8	FHWA
Scraper	S2	Lw (c)		98.4	115.6	117.9	113.2	112.9	109.5	104.6	100.6	117.4	121.8	FHWA
Backhoe	S3	Lw (c)		101.9	111.8	104.3	110.0	106.6	103.1	98.9	93.7	111.4	115.6	FHWA
Dump Truck	S4	Lw (c)		110.3	110.3	109.3	105.3	104.3	102.3	97.3	87.3	109.4	115.8	FHWA
Dozer	S5	Lw (c)		121.8	121.8	110.8	113.8	109.8	106.8	105.8	97.8	115.8	125.5	FHWA
Crane	S6	Lw (c)		126.0	122.0	114.0	112.0	107.0	105.0	106.0	96.0	114.8	127.8	FHWA
Telescopic Forklift	S7	Lw (c)		107.3	103.6	103.8	101.1	103.7	101.3	96.1	90.1	107.6	112.0	Brutoco Measurements
Welder	S8	Lw (c)		106.3	102.6	102.8	100.1	102.7	100.3	95.1	89.1	106.5	110.9	FHWA
Generator	S9	Lw (c)		117.9	112.9	105.9	102.9	93.9	89.9	83.9	78.9	103.9	119.4	FHWA
Concrete Mixer	S10	Lw (c)		117.0	118.0	111.0	110.0	107.0	106.0	97.0	91.0	112.8	121.6	FHWA
Paver	S11	Lw (c)		113.1	112.1	107.1	107.1	106.1	104.1	97.1	91.1	110.7	117.3	FHWA
Roller	S12	Lw (c)		128.6	120.6	111.6	110.6	108.6	103.6	97.6	92.6	113.6	129.4	FHWA
Compressor	S13	Lw (c)		130.4	109.4	110.4	105.4	103.4	101.4	104.4	93.4	111.3	130.5	FHWA

Eilar Associates, Inc.
Acoustical and Environmental Consulting Services

Appendix D

Manufacturer Data Sheets

48HC
High Efficiency
Gas Heat/Electric Cooling Packaged Rooftop
3 to 12.5 Nominal Tons

Carrier
turn to the experts

Product Data

WeatherMaster®

ENERGY STAR

AHRI CERTIFIED
www.ahridirectory.org

Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program For verification of certification for individual products, go to www.ahridirectory.org.

Puron™
the environmentally sound refrigerant

c UL US

ASHRAE 90.1 COMPLIANT

C10222

Table 5 – HEATING RATING TABLE - LOW NO_X[1]

UNIT		GAS HEAT	LOW NOx HEAT EXCHANGER		TEMP RISE (DEG F)	THERMAL EFFICIENCY (%)	AFUE (%)
			INPUT / OUTPUT STAGE 1 (MBH)	INPUT / OUTPUT STAGE 2 (MBH)			
Single Phase	04	LOW	–	60 / 47	20 – 50	81%	80.6%
		MED	–	90 / 72	30 – 60	81%	80.6%
		HIGH	–	–	–	–	–
	05	LOW	–	60 / 47	20 – 50	81%	80.6%
		MED	–	90 / 72	30 – 60	81%	80.6%
		HIGH	–	120 / 97	40 – 70	81%	81.5%
	06	LOW	–	60 / 47	15 – 50	81%	80.6%
		MED	–	90 / 72	25 – 60	80%	80.6%
		HIGH	–	120 / 97	35 – 70	80%	81.5%
Three Phase	04	LOW	–	60 / 47	20 – 50	81%	–
		MED	–	90 / 72	30 – 60	81%	–
		HIGH	–	–	–	–	–
	05	LOW	–	60 / 47	20 – 50	81%	–
		MED	–	90 / 72	30 – 60	81%	–
		HIGH	–	120 / 97	40 – 70	81%	–
	06	LOW	–	60 / 47	15 – 50	81%	–
		MED	–	90 / 72	25 – 60	80%	–
		HIGH	–	120 / 97	35 – 70	80%	–

– Not Applicable

NOTE:

1. Units meet California's South Coast Air Quality Management District (SCAQMD) Low–NO_x emissions requirement of 40 nanograms per joule or less.

Table 6 – SOUND PERFORMANCE TABLE

UNIT	COOLING STAGES	OUTDOOR SOUND (dB) AT 60								
		A–WEIGHTED	63	125	250	500	1000	2000	4000	8000
A04	1	76	78.2	78.0	74.2	73.3	70.6	66.0	62.4	56.9
A05	1	78	84.7	83.6	77.1	74.6	72.3	68.3	64.7	60.9
A06	1	77	87.5	82.5	76.1	73.6	71.3	67.1	64.1	60.0
A07	1	82	90.1	82.6	81.0	79.4	77.0	73.0	70.4	66.7
D08	2	82	90.6	84.3	80.2	79.3	77.1	72.2	67.4	63.7
D09	2	82	88.6	85.0	81.6	79.5	77.4	74.1	71.0	66.3
D12	2	87	85.9	87.9	85.6	84.4	82.8	78.5	74.9	72.5
D14	2	83	89.3	86.0	82.9	80.7	78.5	73.6	69.6	64.5

LEGEND

dB – Decibel

NOTES:

1. Outdoor sound data is measure in accordance with AHRI.
2. Measurements are expressed in terms of sound power. Do not compare these values to sound pressure values because sound pressure depends on specific environmental factors which normally do not match individual applications. Sound power values are independent of the environment and therefore more accurate.
3. A–weighted sound ratings filter out very high and very low frequencies, to better approximate the response of "average" human ear. A–weighted measurements for Carrier units are taken in accordance with AHRI.

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Appendix E

Exterior-to-Interior Noise Analysis

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: RD Construction Corydon Group
Project #: S230209.2
Room Name: Mezzanine

Wall 1 of 3

Room Type : **Medium Hard**

	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Reverberation Time (sec) :	1.2	1.2	1.2	1.2	1.0	1.0	: Moderately Reflective Room
Room Absorption (Sabins) :	1290	1290	1290	1290	1612	1612	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**66.5**	**dBA**	49.8	55.3	57.8	61.8	61.8	55.8	: Traffic Spectrum
Source 2:	**Aircraft**	**50.0**	**dBA**	34.7	43.2	45.7	43.7	40.7	34.7	: Aircraft Spectrum
Source 3:	**<N/A>**	**0.0**	**dBA**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**dBA**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**66.6**	**dBA**	49.9	55.6	58.1	61.9	61.8	55.8	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
10-inch CMU Wall	N	62	13	1	627.9	42	46	54	60	65	70
Window, Insulated Dual-Glazed (STC 25)	N	3.25	5.25	2	34.1	14	21	24	22	30	29
Window, Insulated Dual-Glazed (STC 25)	N	10	8	1	80.0	14	21	24	22	30	29
Window, Insulated Dual-Glazed (STC 25)	N	8	8	1	64.0	14	21	24	22	30	29
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Room Depth: **40** ft **Overall Area:** **806** ft²
Volume: **32240** ft³

Number of Impacted Walls: **3**

Windows Open Interior Noise Level:	**36.3**	**dBA**
Windows Closed Interior Noise Level:	**36.3**	**dBA**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
49.9	55.6	58.1	61.9	61.8	55.8	: Exterior Wall Noise Exposure
20.5	27.5	30.5	28.6	36.6	35.6	: Transmission Loss
29.1	29.1	29.1	29.1	29.1	29.1	: Wall Surface Area Factor
31.1	31.1	31.1	31.1	32.1	32.1	: Absorption
27.4	26.0	25.5	31.3	22.3	17.3	: Noise Level
34.6	**dBA**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
49.9	55.6	58.1	61.9	61.8	55.8	: Exterior Wall Noise Exposure
20.5	27.5	30.5	28.6	36.6	35.6	: Transmission Loss
29.1	29.1	29.1	29.1	29.1	29.1	: Wall Surface Area Factor
31.1	31.1	31.1	31.1	32.1	32.1	: Absorption
27.4	26.0	25.5	31.3	22.3	17.3	: Noise Level
34.6	**dBA**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: RD Construction Corydon Group
Project #: S230209.2
Room Name: Mezzanine

Wall 2 of 3

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**57.1**	**dBA**	40.4	45.9	48.4	52.4	52.4	46.4	: Traffic Spectrum
Source 2:	**Aircraft**	**50.0**	**dBA**	34.7	43.2	45.7	43.7	40.7	34.7	: Aircraft Spectrum
Source 3:	**<N/A>**	**0.0**	**dBA**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**dBA**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**57.9**	**dBA**	41.4	47.8	50.3	53.0	52.7	46.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
10-inch CMU Wall	N	40	13	1	416.0	42	46	54	60	65	70
Window, Insulated Dual-Glazed (STC 25)	N	13	8	1	104.0	14	21	24	22	30	29
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Overall Area: 520 ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
41.4	47.8	50.3	53.0	52.7	46.7	: Exterior Wall Noise Exposure
21.0	27.9	31.0	29.0	37.0	36.0	: Transmission Loss
27.2	27.2	27.2	27.2	27.2	27.2	: Wall Surface Area Factor
31.1	31.1	31.1	31.1	32.1	32.1	: Absorption
16.5	15.9	15.4	20.0	10.8	5.8	: Noise Level

23.7 **dBA** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
41.4	47.8	50.3	53.0	52.7	46.7	: Exterior Wall Noise Exposure
21.0	27.9	31.0	29.0	37.0	36.0	: Transmission Loss
27.2	27.2	27.2	27.2	27.2	27.2	: Wall Surface Area Factor
31.1	31.1	31.1	31.1	32.1	32.1	: Absorption
16.5	15.9	15.4	20.0	10.8	5.8	: Noise Level

23.7 **dBA** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: RD Construction Corydon Group **Wall 3 of 3**
Project #: S230209.2
Room Name: Mezzanine

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**0.0**	**dBA**	0.0	0.0	0.0	0.0	0.0	0.0	: Traffic Spectrum
Source 2:	**Aircraft**	**50.0**	**dBA**	34.7	43.2	45.7	43.7	40.7	34.7	: Aircraft Spectrum
Source 3:	**<N/A>**	**0.0**	**dBA**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**dBA**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**50.0**	**dBA**	34.7	43.2	45.7	43.7	40.7	34.7	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
Worst-Case Roof	N	62	40	1	2480.0	12	20	23	29	37	45
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Overall Area: **2480** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
34.7	43.2	45.7	43.7	40.7	34.7	: Exterior Wall Noise Exposure
12.0	20.0	23.0	29.0	37.0	45.0	: Transmission Loss
33.9	33.9	33.9	33.9	33.9	33.9	: Wall Surface Area Factor
31.1	31.1	31.1	31.1	32.1	32.1	: Absorption
25.6	26.1	25.6	17.6	5.6	-8.4	: Noise Level
30.7	**dBA**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
34.7	43.2	45.7	43.7	40.7	34.7	: Exterior Wall Noise Exposure
12.0	20.0	23.0	29.0	37.0	45.0	: Transmission Loss
33.9	33.9	33.9	33.9	33.9	33.9	: Wall Surface Area Factor
31.1	31.1	31.1	31.1	32.1	32.1	: Absorption
25.6	26.1	25.6	17.6	5.6	-8.4	: Noise Level
30.7	**dBA**	WINDOWS CLOSED				

Eilar Associates, Inc.
Acoustical and Environmental Consulting Services

Appendix F
Recommended Products

TECHNICAL DATA SHEET

Revision: August 7, 2018
Supersedes: November 13, 2015
Ref. #: 518327

DRAFT & ACOUSTICAL SOUND SEALANT

SC175

DESIGNED FOR USE ON SOUND-RATED WALL SYSTEMS

OSI SC175 Draft & Acoustical Sound Sealant is a non-flammable, latex-based sealant specially designed to reduce sound transmissions and drafts in all types of wall systems where a sound-rated assembly is required. Its primary function is to achieve and maintain the specific STC (Sound Transmission Class) value of the system designed. This paintable sealant remains flexible and adheres firmly to wood, metal studs, concrete, gypsum board and most other building materials. It is easy-to-use and cleans up easily with soap and water.

Available As:

Item #	Size	Color
1496542	28 fl oz (828 ml) cartridge	White

FEATURES & BENEFITS

- Designed for Use on Sound-Rated Wall Systems
- Reduces Draft & Sound Transmission
- Tested to UL 1479 and UL 2079 *****
- Tested to ASTM E84
- Stays Permanently Flexible
- VOC Compliant

RECOMMENDED FOR

- Developed primarily for commercial construction utilizing light weight cavity walls and floor systems
- Used for exposed and unexposed applications at perimeter joints, floor and ceiling runners, cutouts in gypsum board, veneer plaster systems and other areas where a sound rated assembly is required
- Sealant can also be applied or buttered around all electrical boxes and outlets, cold air returns, heating and air conditioning ducts and other utility equipment penetrating wall surfaces for increased acoustical performance
- Works well for sealing sill and base plates in residential construction and non-fire rated systems

LIMITATIONS

- SC175 must be applied in accordance with ASTM C919 (Standard Practice for Use of Sealants in Acoustical Applications
- Non-fire rated and fire rated systems. Refer to UL Fire Resistance Directory for testing details *****
- Not for use in underwater applications or permanent water immersion
- Do not use in applications requiring temperature resistance greater than 170°F
- Do not use on metals that will corrode
- Consult with manufacturer of adjoining materials for compatibility, including CPVC materials
- Not recommended for bonding two non-porous surfaces
- Not recommended for use with polyethylene, polypropylene, polytetrafluoroethylene (PTFE)/Teflon® or nylon

COVERAGE

For a 28 fl. oz. (825 ml) cartridge:	
▪ A 1/4” (6 mm) bead extrudes approximately 86 ft. (26 m)	▪ A 3/8” (9.5 mm) bead extrudes approximately 38 ft. (12 m)

TECHNICAL DATA

Typical Uncured Physical Properties:

Color:	White	**VOC Content:**	<1.0% by weight CARB 45 g/l SCAQMD rule 1168
Appearance:	Non-slumping paste		
Base:	Synthetic latex rubber	**Shelf Life:**	24 months from date of manufacture (unopened)
Odor:	Mild acrylic odor	**Lot Code Explanation**	**YYDDD** **YY=** Last two digits of year of manufacture **DDD=** Day of manufacture based on 365 days in a year
Specific Gravity:	1.59		
Flashpoint:	800.6° F (427°C)		
Freeze/Thaw Stability	3 Freeze/Thaw Cycles Unaffected by freezing once cured	**Example:**	18061 = 61st day of 2018 = March 2, 2018

Typical Application Properties:

Application Temperature:	Above 40°F (4°C)	
Open/Tooling Time	15 minutes*	
Tack-free Time:	30 minutes	
Cure Time:	2-7 days or longer*	* Cure time is dependent on temperature, humidity and depth of sealant applied
Sag or Slump:	0.10 inches	ASTM D2202

Typical Cured Performance Properties:

Color:	White	
Service Temperature:	-5°F (-21°C) to 170°F (77°C)	
Water Resistant:	Yes	
Paintable:	Yes, after 24 hours	
Surface Burning Characteristics:	Flame Spread Index: 0 Smoke Development: 0	ASTM E 84 Inorganic reinforced cement board
Sound Transmission Class:	Unsealed partition: STC = 15 Single bead of sealant used at top and bottom runners only – both sides of partition system: STC = 24 Single bead of sealant used at top, bottom and perimeter joints – both sides of system: STC = 45 Double Bead of Sealant used at top, bottom, and all perimeter edges - both sides of partition system: STC = 55	ASTM E 90
Low Temperature Flexibility After Artificial Weathering:	Pass with no cracking or adhesion loss	ASTM C734
Consistency Test:	300	ASTM D217
180° Peel Adhesion:		ASTM C794
Aluminum:	10.0 pli	7day cure @ 73°F & day cure @ 122°F
Wood:	8.0 pli	

TECHNICAL DATA SHEET

Revision: August 7, 2018
Supersedes: November 13, 2015
Ref. #: 518327

TECHNICAL DATA

Specifications:

UL File Number R39256

FILL, VOID OR CAVITY MATERIAL
FOR USE IN THROUGH-PENETRATION FIRESTOP
SYSTEMS & JOINT SYSTEMS
SEE UL FIRE RESISTANCE DIRECTORY
Control No. # R39256

Tested to or conforms to:

- **ASTM C834** – Standard Specification for Latex Sealants
- **ASTM E84, Class A** – Standard Test Method for Surface Burning Characteristics of Building Materials (Tested at UL under research project)
- **ASTM E90** – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- **ASTM C919** – Standard Practice for Use of Sealants in Acoustical Applications
- **ASTM D217** – Standard Test Methods for Cone Penetration of Lubricating Grease
- *** UL 1479** (ASTM E814) – Standard for Fire Tests of Penetration Firestops
- *** UL 2079** (ASTM E1966) – Standard for Tests for Fire Resistance of Building Joint Systems
- GreenGuard® Certified

*** Refer to UL Fire Resistance Directory for design systems**

DIRECTIONS

Tools Typically Required:
Utility knife, caulking gun and tool to puncture inside seal of cartridge.

Safety Precautions:
Wear gloves.

Preparation:
The temperature of the product, the surfaces and the working area must be above 40°F (4°C). For best performance, apply sealant at 70°F (21°C). Ensure surfaces to be sealed are clean, dry, structurally sound and free of dust, grease, oil, and other foreign contaminants. Cut off tip of cartridge at a 45° angle to desired bead size (3/8" recommended). Puncture inside seal of cartridge.

Application:
Sealant should be applied as specified in the sound-rated system being installed (either wood or metal studs). Sealant must be applied in accordance with ASTM C 919. Maximum joint size should not exceed 5/8" (15.9 mm) width x ½" (12.7 mm) depth. If necessary, sealant can be painted as applicable to meet project requirements after 24 hours.

Bottom and Top Runners:
Apply a continuous 3/8" (9.5 mm) round bead of sealant on runners before setting gypsum board. Press gypsum board firmly into sealant, ensuring complete contact with adjacent materials. Fill joint on top runners to complete the seal. Repeat procedure for double-layer applications.

Cut-Outs and Perimeter Joints:
Backs of electrical boxes, pipes, duct systems and other types of utility equipment penetrating wall surfaces shall be buttered with sealant. Seal all joints at perimeter edges including abutting surfaces and corner joints.

For further application information, refer to ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications.

Clean-up:
Clean tools and uncured adhesive residue immediately with warm water and soap. Cured sealant may be carefully cut away with a sharp-edged tool.

STORAGE & DISPOSAL

DAMAGED BY FREEZING. Store in a cool, dry location at room temperature. For maximum shelf life store at 75°F (24°C). Take unwanted product to an approved household hazardous waste transfer facility. Hardened material may be disposed of with

LABEL PRECAUTIONS

CAUTION! Contains ethylene glycol, mineral spirits, and crystalline silica. May cause skin, eye and respiratory irritation. Avoid contact with eyes and skin. Avoid breathing vapors. Use with adequate ventilation. Do not swallow. FIRST AID: If swallowed do not induce vomiting, call a physician or Poison Control center immediately. For eye contact, flush with water for 15 minutes, call a physician. For skin contact, wash thoroughly with soap and water. **KEEP OUT OF REACH OF CHILDREN.**

WARNING: Cancer and Reproductive Harm – www.P65Warnings.ca.gov.

Refer to the Safety Data Sheet (SDS) for further information.

LIMITED WARRANTY

This product is warranted to be free from defects in materials when used as directed. Henkel's sole obligation shall be, at its option, to replace or refund the purchase price of product proven to be defective. Henkel makes no other warranty, express or implied, including warranties of MERCHANTABILITY and FITNESS FOR A PARTICULAR PURPOSE and will not be liable for consequential or incidental damages. This limited warranty gives you specific legal rights, which vary from state to state

DISCLAIMER

The information and recommendations contained herein are based on our research and are believed to be accurate, but no warranty, express or implied, is made or should be inferred. Henkel recommends purchasers/users should test the products to determine acceptable quality and suitability for the intended use. All adhesive/sealant applications should be tested under simulated or actual end use conditions to ensure the adhesive/sealant meets or exceeds all required project specifications. Since assembly conditions may be critical to adhesive/sealant performance, it is also recommended that testing be performed on specimens assembled under simulated or actual production conditions. Nothing contained herein shall be construed to imply the nonexistence of any relevant patents or to constitute a permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of the patent.

OSI Tougher than the Elements. For Professional Use Only. The Battle will be Fierce.
OSI works side by side with residential builders, contractors and remodeling professionals who use our products every day on their jobsites. OSI combines this deep understanding with the sophisticated global innovation and manufacturing excellence of Henkel to make the world's best professional-grade caulks, sealants and adhesives.

For Technical Assistance call: 1-800-624-7767 – Mon-Fri - 9:00a – 4:00p ET
www.ositough.com

OSI Brand is part of the Henkel family of brands. Founded in 1876, Henkel is a global leader in the consumer and industrial businesses. Henkel operates worldwide with leading brands and technologies in three business areas: Laundry & Home Care, Beauty Care and Adhesive Technologies.

Henkel Corporation - Professional & Consumer Adhesives Headquarters - Rocky Hill, CT 06067
www.henkelna.com

AC-20® FTR

(Fire & Temperature Rated) Acoustical & Insulation Sealant

PECORA CORPORATION

SPECIFICATION DATA SHEET

BASIC USES

- AC-20® FTR fire-rated systems are suitable for applications in schools, hospitals, churches, high-rise office buildings and hotels, prisons, sports arenas, and other public-use buildings to ensure a safe and orderly evacuation in the event of a fire

MANUFACTURER

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PRODUCT DESCRIPTION

AC-20® FTR is a unique acrylic latex sealant that is UL® Classified in firestopping systems for expansion joints and through penetrations. When properly installed, these systems effectively contain fire, smoke, toxic fumes, and water within a given area surrounded by firewalls for a two, three, or four hour period, depending on the design specifications.

Other Uses: Excellent adhesive, flexibility and durability qualities make AC-20® FTR ideal for insulating and weatherproofing around windows, doors, panels, siding, duct work, base plates, etc. It is compatible with all common building materials including specialties such as polystyrene, polyurethane, cork, vinyl (not for use on cpvc), foamed and fibrous glass.

Used as an acoustical sealant, AC-20® FTR reduces sound transmission in partition systems to maintain specific STC values by sealing spaces around cut-outs and at perimeters of partitions. The sealant cures to a tough rubber to form a long-lasting acoustical seal.

TECHNICAL DATA

Applicable Standards: ASTM C-834-00 specification for latex sealing compounds. USDA acceptance for use in meat and poultry processing plants, ASTM C-919 standard practice per use of sealants in acoustical applications, and ASTM E-90-09.

Fire Rated System: Two-hour Fire and Temperature Rated wall and floor joint systems up to 7" (178mm) wide and four-hour systems up to 4" wide can be designed with AC-20® FTR in conjunction with Ultra Block fire blocking material in fire-rated walls and floors. Reference: ANSI/UL 263, ASTM E-119, NFPA No. 251.

UL CLASSIFIED

UNDERWRITERS LABORATORIES INC.® CLASSIFIED JOINT TREATMENT MATERIALS FIRE RESISTANCE CLASSIFICATION DESIGNS FFS 0006, WWS 0010, FFS 2002, WWS 2008, FFS 1010, WWS 1012

AC-20® FTR in conjunction with Ultra Block® achieves a 2-hour fire rating when sealing around steel or copper pipe and electrical metallic tubing or steel conduit in through penetration systems. Reference: ANSI/UL 1479, ASTM E-814.

FILL, VOID OR CAVITY MATERIALS CLASSIFIED BY UNDERWRITERS LABORATORIES INC. FOR USE IN THROUGH-PENETRATION FIRESTOP SYSTEM NO. CAJ 1093

PACKAGING

- 29 fl. oz. (.858 liter) plastic cartridges
- 5-gallon (18.9 liter) pails

COLOR

- White, Beige-Gray
- Special colors available in 250-gallon (946 liter) batches.

In addition to its fire-blocking value, Ultra Block® is very efficient acoustically, having a noise reduction coefficient of .75 and sound transmission coefficient of .5 (Ultra Block® is a registered trademark of Backer Rod Mfg. and Supply Co., Denver, CO, USA.)

INSTALLATION

Surface Preparation: Surfaces must be free of all contamination. Sealant may be applied to damp, porous surfaces. No priming is required.

Application: Refer to Pecora Technical Bulletin #85J and UL Fire Resistance Directory for installation details on fire-rated joint and through penetration systems. For insulating and weatherproofing purposes, fill all window, door, and panel perimeter joints using a resilient backer rod to control sealant depth to 1/2" (13mm) maximum. For best results, protect sealant from excessive low temperatures and apply above 40˚F (4˚C). For acoustical purposes, apply continuous beads of sealant to seal perimeters of all sound-rated partitions. Apply sealant in the angles formed by metal components or base-layer panels and abutting surfaces.

TABLE 1: TYPICAL PHYSICAL PROPERTIES

TEST PROPERTY	VALUE	TEST PROCEDURE
Modulus @ 100% (psi)	60-65	ASTM D412
Ultimate Tensile (psi)	80-90	ASTM D412
Ultimate Elongation (%)	200	ASTM D412
Movement Capability (%)	±7 1/2	ASTM D412
VOC Content	31 g/L	ASTM D3960
VOC Emissions (TVOC)	<2 ug (0.002 mg)/cu m	CDPH v1.1-2010

Since Pecora Architectural Sealants are applied to varied substrates under diverse environmental conditions and construction situations it is recommended that substrate testing be conducted prior to application.

AC-20® FTR

SPECIFICATION DATA SHEET

Apply sealant around all openings formed for outlets; electrical, telephone, light fixtures, etc.

Tooling: Tool material flush with surfaces to allow for expected shrinkage and insure good contact and adhesion to the substrate.

Cleaning: Remove excess material with water or a damp cloth before it cures. Sealant may be painted within 30 minutes after application with a good grade of latex paint.

Shelf Life: One year when stored in unopened containers in dry areas below 80˚ F (26˚C).

Precautions: AC-20® FTR is non-flammable, non-toxic, non-irritating and environmentally safe. However, do not take internally.

Ultra Block® is a non-carcinogenic processed continuous filament textile glass fiber that may cause skin, eye and respiratory irritation. When applying, wear long sleeves, gloves, cap, goggles or safety glasses and NIOSH/MSHA-approved dust respirator. After use bathe with soap and warm water. Wash clothes separately and rinse after use. Refer to our Safety Data Sheet (SDS) for additional information.

FOR PROFESSIONAL USE ONLY.
KEEP OUT OF THE REACH
OF CHILDREN.

AVAILABILITY AND COST

Pecora products are available from stocking distributors nationwide. For the name and telephone number of your nearest representative, call the number below or visit our website at www.pecora.com.

WARRANTY

Pecora Corporation warrants its products to be free of defects. Under this warranty, we will provide, at no charge, replacement materials for, or refund the purchase price of, any product proven to be defective when used in strict accordance with our published recommendations and in applications considered by us as suitable for this product. The determination of eligibility for this warranty, or the choice of remedy available under this warranty, shall be made in our sole discretion and any decisions made by Pecora Corporation shall be final. This warranty is in lieu of any and all other warranties, expressed or implied, including but not limited to a warranty of merchantability or fitness for a particular purpose and in no case will Pecora be liable for damages other than those expressly stated in this warranty, including but not limited to incidental or consequential damages.

MAINTENANCE

If the sealant is damaged and the bond is intact, cut out the damaged area and recaulk. No primer is required. If the bond has been affected, remove the sealant, clean and prepare the joint in accordance with instructions under "Installation".

TECHNICAL SERVICES

Pecora representatives are available to assist you in selecting an appropriate product and to provide on-site application instructions or to conduct jobsite inspections. For further assistance call our Technical Service Department at 215-723-6051 or 800-523-6688.

FILING SYSTEMS

- CSI Master Format Designation
  -07 10 00 Waterproofing
  -07 92 00 Sealants