Appendix I

Revised Noise Impact Analysis

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Revised Noise Impact Analysis for Bamiyan Marketplace

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August 10, 2021

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1.0 Executive Summary

The proposed project, known as Bamiyan Marketplace consists of the construction of a mixed use development on an 11.85-acre lot. The project site is located at the southwest corner of Grand Avenue and Ortega Highway in the City of Lake Elsinore, California.

The current and future noise environment primarily consists of traffic noise from Grand Avenue and Ortega Highway. Future noise levels at residential building facades are expected to range from 40 CNEL at a south-facing facade of the multifamily portion of the property, to approximately 70 CNEL at a north-facing facade of the multifamily portion of the property.

The City of Lake Elsinore Public Safety and Welfare Element to the General Plan requires that residential outdoor use areas be protected from noise levels greater than 60 CNEL. As designed, future traffic noise levels are expected to exceed 60 CNEL at the pool area, such that a six-foot high sound barrier wall would be required to attenuate noise levels. As balcony and patio locations are currently not indicated on project plans, an evaluation of noise levels at building facades was performed to determine where balconies or patios would require a barrier wall as a noise-attenuating project design feature. The evaluation demonstrated that barriers would be needed at patios or balconies on the north side of the property with a direct line-of-sight to Grand Avenue. Required barrier heights range from four to five feet and are detailed in Section 5.1.1 of this report. With a six-foot high barrier at the pool area and solid balcony barriers incorporated into the design where indicated herein, future traffic noise levels are expected to be reduced to be 60 CNEL or less at all outdoor use areas, and therefore would be in compliance with the City of Elsinore exterior noise standards.

The City of Lake Elsinore and State of California require interior noise levels of 45 CNEL or less in residential units. Calculations show that future noise levels on site exceed 60 CNEL at many facades, and therefore interior noise levels may exceed 45 CNEL within units. Due to high noise levels on-site, an exterior-to-interior analysis should be performed when building plans become available, prior to the issuance of building permits. The required interior noise levels are feasible and can be achieved with readily available building materials and construction methods. It is anticipated that a typical exterior wall, windows and glass doors with an STC rating of 28, and mechanical ventilation in units will be sufficient for achieving compliant interior noise levels; however, this should be confirmed when construction documents become available.

Noise from the anticipated car wash, vacuum, and HVAC equipment on site has been calculated to determine noise levels at off-site receivers. Calculations show that noise levels from the mechanical equipment will be in compliance with the City of Lake Elsinore noise regulations for both daytime and nighttime hours found within the Municipal Code. No project design features are deemed necessary to control project-generated noise levels from mechanical equipment. 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.

The proposed project is not expected to result in any potentially significant noise impacts by the standards of the California Environmental Quality Act (CEQA). Noise impacts are summarized in Section 5.5.

2.0 Introduction

This acoustical analysis report is submitted to satisfy the noise requirements of the City of Lake Elsinore. Its purpose is to assess noise levels from nearby roadway traffic to identify project features or requirements necessary to achieve exterior noise levels of 60 CNEL or less at outdoor use areas, and interior noise levels of 45 CNEL or less in habitable residential spaces. In addition, this report assesses noise levels from potential project-related noise sources, such as mechanical equipment 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 Public Safety and Welfare Element to the General Plan and Municipal Code. Potential noise impacts will also be assessed for significance per the California Environmental Quality Act (CEQA).

All noise level or sound level values presented herein are expressed in terms of decibels, with A-weighting to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}, for a specified duration. The Community Noise Equivalent Level (CNEL) is a calculated 24-hour weighted average, where sound levels during evening hours of 7 p.m. to 10 p.m. have an added 5 dB weighting, and sound levels during nighttime hours of 10 p.m. to 7 a.m. have an added 10 dB weighting. This is similar to the Day-Night sound level, L_{DN}, which is a 24-hour average with an added 10 dB weighting on the same nighttime hours but no added weighting on the evening hours. According to the California Department of Transportation's Technical Noise Supplement to the Traffic Noise Analysis Protocol (see reference), peak hour traffic noise levels are typically found to be close to predicted CNEL values. Sound levels expressed in CNEL are always based on A-weighted decibels. These metrics are used to express noise levels for both measurement and municipal regulations, for land use guidelines, and for enforcement of noise ordinances. Further explanation can be provided upon request.

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 Bamiyan Marketplace, consists of the construction of a mixed use development on a 12.56-acre lot. The net area for the project is 11.85 acres. The project will be constructed in three phases. Phase 1 consists of the construction of a 6,321-square-foot convenience store plus restaurant, a 2,000-square foot office on the second story above the convenience store, a gas station, an automatic car wash, and two fast food restaurants (each with an area of 2,400 square feet). Car wash and vacuum equipment are currently anticipated to be operational between the hours of 8 a.m. and 5 p.m. during Pacific Standard Time and 8 a.m. to 7 p.m. during Pacific Daylight Time. The car wash will be staffed during operating hours. The convenience store and associated restaurant will be open from 5 a.m. to 10 p.m. daily, with the gas station operational 24 hours a day. Each of the two fast food restaurants will each have operational lobbies from 5 a.m. to 10 p.m. daily with the drive-through service 24 hours a day.

Phase 2 consists of the construction of a mixed use building to include 23,000 square feet of retail space and 20,000 square feet of residential space (14 units). Phase 3 consists of the construction of a 60-unit multifamily residential development in five buildings, each three stories in height, plus a 2,800-square-foot clubhouse. For additional project details, please refer to the project plans provided in Appendix A.

The project site is surrounded by vacant or commercial uses to the north and east (across Grand Avenue and Ortega Highway, respectively), and single-family residential uses to the south and west (across Macy Street).

2.2 Project Location

The project site is located at the southwest corner of Grand Avenue and Ortega Highway in the City of Lake Elsinore, California. The Assessor's Parcel Numbers (APNs) are 381320023 and 381320020. The site is currently vacant. For a graphical representation of the site, please refer to the Vicinity Map, Assessor's Parcel Map, Satellite Aerial Photograph, and Topographic Map, provided as Figures 1 through 4, respectively.

2.3 Applicable Noise Regulations

This acoustical report is submitted to satisfy the acoustical requirements of the City of Lake Elsinore Public Safety and Welfare Element to the General Plan and Municipal Code. The General Plan regulates noise exposure of new uses (i.e., the project), and the Municipal Code regulates noise generated by the project/properties in question to the receiving land uses.

The City of Lake Elsinore Public Safety and Welfare Element to the General Plan and California Building Code require interior noise levels not exceeding 45 CNEL in habitable residential space. The City of Lake Elsinore requires that noise levels at residential outdoor use areas do not exceed 60 CNEL. This exterior noise standard applies to common outdoor use areas and private patios or balconies.

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 and sidewalks. 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.

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; and that, for noise sources present for a cumulative period of 15 minutes in any hour, the noise limit would be the noise standard plus five decibels. 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. These considerations were taken into account for the application of noise limits for various sources on the property, and noise limits were applied as follows:

- HVAC operation: Assumed to be operational for 30 minutes out of an hour and potentially during nighttime hours. Noise limits: 46 dBA at single-family and multifamily residential properties (40 dBA noise standard + 6 dBA for commercial adjacency) and 60 dBA at commercial properties
- Car wash and vacuum operation: Assumed to be operational for 15 minutes out of an hour and only during daytime hours. Noise limits: 61 dBA at single-family and multifamily residential properties (50 dBA noise standard + 5 dBA for 15-minute operation + 6 dBA for commercial adjacency) and 70 dBA at commercial properties

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 used in the construction of the site is anticipated to be mobile, with the only stationary pieces of equipment anticipated to be air compressors during framing activity.

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

3.0 Environmental Setting

3.1 Existing Noise Environment

The primary noise sources in the vicinity of the project site includes automobile and truck traffic noise from Grand Avenue and Ortega Highway. No other noise source is considered significant.

3.1.1 Roadway Traffic Noise

Current traffic volumes are given based on traffic assumptions developed by Urban Crossroads for the traffic analysis for the project.

Grand Avenue is a two-lane Urban Arterial running generally east-west along the north boundary of the project site. The posted speed limit is 45 mph. In the vicinity of the project site, Grand Avenue currently carries a traffic volume of approximately 23,800 Average Daily Trips (ADT) and 27,200 ADT east and west of Ortega Highway, respectively.

Ortega Highway is a two-lane Urban Arterial running generally north-south along the east boundary of the project site. The posted speed limit is 50 mph. In the vicinity of the project site, Ortega Highway currently carries a traffic volume of approximately 20,800 ADT.

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

Without existing or proposed on-site structures, the current traffic noise contours calculated at ground level showed that traffic noise levels at the project site are between 57 and 71 CNEL. For a graphical representation of these contours, please refer to Figure 5: Satellite Aerial Photograph Showing Current Traffic CNEL Contours and Noise Measurement Location.

3.1.2 Measured Noise Level

An on-site inspection and traffic noise measurement were made on the afternoon of May 15, 2019. The noise measurement was made using the methodology described in Section 4.1 at a location approximately 35 feet from the Grand Avenue centerline and 500 feet from the Ortega Highway centerline. The microphone was placed at approximately five feet above the road grade. Traffic volumes for Grand Avenue were recorded for automobiles, medium-size trucks, and large trucks during the measurement period. After a continuous 15-minute sound level measurement, no changes in the L_{EQ} were observable and results were recorded. The measured noise level and related weather conditions are found in Table 1.

Table 1. On-Site Noise Measurement Conditions and Results	
Date	Wednesday, May 15, 2019
Time	2:11 p.m. – 2:27 p.m.
Conditions	Clear skies, 7 mph wind, temperature in the low 70s with moderate humidity
Measured Noise Level	70.8 dBA L_{EQ}

3.1.3 Calculated Noise Level

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

The measured noise level of 70.8 dBA L_{EQ} at 35 feet from the Grand Avenue centerline and 500 feet from the Ortega Highway centerline was compared to the calculated (modeled) noise level of 69.2 dBA L_{EQ}, for the same weather conditions and traffic flow. According to the Federal Highway Administration's Highway Traffic Noise: Analysis and Abatement Guide (see reference), a traffic noise model is considered validated if the measured and calculated noise levels differ by three decibels or fewer. No adjustment was deemed necessary to model future noise levels for this noise model as the difference between the measured and calculated levels was found to be less than three decibels. The traffic noise model is assumed to be representative of actual traffic noise that is experienced on site. This information is presented in Table 2.

Table 2. Calculated versus Measured Traffic Noise Data				
Location	**Calculated**	**Measured**	**Difference**	**Correction**
35 feet from Grand Ave centerline, 500 feet from Ortega Hwy centerline	69.2 dBA L_{EQ}	70.8 dBA L_{EQ}	1.6 dB	None Applied

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. The future (year 2040) traffic volumes for surrounding roadways were predicted using a two percent annual growth percentage, which is recommended by the City of Lake Elsinore traffic department. By the year 2040, the traffic volume of Grand Avenue is expected to increase to approximately 35,366 ADT and 40,418 ADT east and west of Ortega Highway, respectively. The traffic volume of Ortega Highway is expected to increase to approximately 30,908 ADT by the year 2040.

The same truck percentages from the current traffic volumes were used for future traffic volume modeling.

Future traffic noise contours were calculated at ground level and showed that traffic noise levels at the project site will increase slightly to be between 59 and 74 CNEL. For a graphical representation of these contours,

please refer to Figure 6: Satellite Aerial Photograph Showing Future Traffic CNEL Contours and Noise Measurement Location.

3.2.2 Mechanical Equipment On-Site

The primary sources of noise generated by the proposed project are anticipated to be the proposed car wash and HVAC equipment. Although vacuum equipment will be located on the site, the proposed system is a central vacuum system. The central vacuum unit contains the motor and blower for all of the individual vacuum/suction units on site. Since the motor and blower are the main sources of noise typically associated with a vacuum, the central unit would be the primary source of noise during vacuuming activity, and individual suction units would generate significantly less noise within the user's vehicle when in use. Conservative projections of noise from vacuums have been included in this analysis, based on the proximity of vacuum stalls to the proposed mixed use development. Sound power levels based on measurements of vacuum equipment at a similar car wash site are shown in Table 3 below. A five decibel reduction has been applied as the vacuum hose measurement was performed in a free field, and additional sound reduction would be expected when the vacuum is used within a vehicle.

Table 3. Sound Power Level of Proposed Vacuum Stall

Source	Sound Power Level at Octave Band Frequency (dB)								Sound Power Total (dBA)
	63	125	250	500	1K	2K	4K	8K	
Individual Vacuum Station – Single Hose, with In-Vehicle Reduction Applied	64.4	60.1	58.3	60.1	65.2	69.0	71.3	74.4	77.3

The automated car wash on site will incorporate a Proto-Vest "Stripper" dryer package. The dryer is the focus of this analysis. Noise levels for this equipment were provided by the manufacturer as broadband, A-weighted noise levels of 82.9 dBA at 10 feet from the equipment in a free-field (outside of a tunnel). No octave band data has been given for the dryer, and therefore, octave band noise levels of a similar carwash have been used to estimate the spectral content of the Proto-Vest Stripper dryer. Noise levels are shown in Table 4, and manufacturer data sheets are provided in Appendix C.

Table 4. Sound Pressure Level and Estimated Spectrum of Proposed Car Wash Equipment

Source	Sound Pressure Level at Octave Band Frequency (dB)								Total (dBA)
	63	125	250	500	1K	2K	4K	8K	
Proto-Vest "Stripper" at 10 feet	75.7	79.7	76.6	77.1	78.2	76.3	73.8	70.6	82.9

It is anticipated that HVAC equipment will be roof-mounted on the buildings. Typical HVAC units were selected for both commercial and residential properties. The typical unit selected for each individual residential unit is manufactured by Carrier, and is model number CA13NA030 (2.5-ton capacity). Sound power levels have been provided by the manufacturer in octave band values and a sound rating value. As the sum of octave band noise levels given was found to be slightly less than the given sound rating, the octave band noise levels were increased accordingly such that the total sum was equal to the sound rating. The resultant estimated spectrum for the unit is shown below in Table 5. Manufacturer data sheets have been provided as Appendix C.

Table 5. Sound Power Levels of Carrier CA13NA030 (Typical 2.5-ton Unit)								
Source	Sound Power at Octave Band Frequency (dBA)							Total (dBA)
	125	250	500	1K	2K	4K	8K	
Carrier CA13NA030 (2.5-ton unit)	52.7	62.2	66.2	67.2	65.2	60.2	55.2	72

Commercial HVAC units were selected based on anticipated square footage. The units used in calculations were package rooftop units, also manufactured by Carrier, with sizes ranging from 5-ton to 12.5-ton. It was assumed that HVAC units would be placed on buildings as follows:

- Convenience store/restaurant/second-story offices: one 10-ton unit and two 5-ton units
- Retail portion of mixed use building: one 12.5-ton unit and four 7.5-ton units
- Fast food restaurants: one 5-ton unit at each
- Multifamily residential club house: one 5-ton unit

Sound data was provided by Carrier for these units and is shown in Table 6. Manufacturer data sheets have been provided as Appendix C.

Table 5. Sound Power Levels of Carrier 48HC Packaged Rooftop Units (Typical Commercial)									
Source	Sound Pressure Level at Octave Band Frequency (dB)								Total (dBA)
	63	125	250	500	1K	2K	4K	8K	
48HC06 (5-ton unit)	87.5	82.5	76.1	73.6	71.3	67.1	64.1	60.0	77
48HC08 (7.5-ton unit)	90.6	84.3	80.2	79.3	77.1	72.2	67.4	63.7	82
48HC11(10-ton unit)	85.9	87.9	85.6	84.4	82.8	78.5	74.9	72.5	87
48HC14 (12.5-ton unit)	89.3	86.0	82.9	80.7	78.5	73.6	69.6	64.5	83

Operational mechanical 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

A traffic impact study conducted by Urban Crossroads shows traffic volumes generated by the proposed project and the distribution of these trips on surrounding roadways. The impacts of project-generated traffic noise have been assessed using these trip generation values and the existing traffic volumes for surrounding roadways. Cumulative traffic volumes for other anticipated projects to be constructed in the vicinity of the project site have also been provided in the traffic study and allow for the evaluation of cumulative traffic noise impacts. Project traffic volumes and the analysis of project-generated traffic noise is provided in Section 5.3.2.

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 7 is typical of what is expected to be used on site based on information provided

and professional experience. Unless otherwise noted, all noise levels have been provided by the UK Department for Environment, Food and Rural Affairs (DEFRA) (see reference). Duty cycle information was taken from the Federal Highway Administration.

Table 7. Anticipated Construction Stages and Equipment Noise Levels

Construction Stage	Equipment	Duty Cycle (%)	Noise Level, at 50 feet (dBA)
Utilities and Grading	Excavator[1]	40	75
	Backhoe[1]	40	74
	Water Truck[1]	40	77
	Grader[1]	40	70
Foundation	Concrete Mixer Truck	40	76
	Concrete Pump Truck	20	74
Paving	Paver	50	71
	Roller[1]	20	74
	Dump Truck	40	75
Framing	Air Compressor	40	61
	Telescopic Forklift[1]	40	74

[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 and Equipment

4.1 Methodology

4.1.1 Field Measurement

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

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

4.1.2 Roadway Noise Calculation

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

In order to determine the estimated traffic volumes of roadways during the traffic noise measurement made on site for model calibration, the approximate percentage of the Average Daily Trips (ADT) value for the time period in which the measurement is made is incorporated into the traffic model. These percentages have been established in a study performed by Katz-Okitsu and Associates, Traffic Engineers (see reference). For purposes of calibrating the Cadna TNM, 8.6% of the ADT values for the current environment were used in calculations (for roadways that were not manually counted) to account for traffic between the hours of 4 p.m. and 5 p.m. in the vicinity of the project site.

4.1.3 Cadna Noise Modeling Software

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

4.1.4 Formulas and Calculations

Decibel Addition

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

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

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

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

Distance Attenuation

Attenuation due to distance is calculated by the equation:

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

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

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

Hourly L_{EQ} Summation

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

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

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

Project-Generated Traffic Noise Impacts

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

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

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

Construction Vibration Calculations

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

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

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

4.2 Measurement Equipment

Some or all of the following equipment was used at the site to measure existing noise levels:

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

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

5.0 Noise Levels

5.1 Exterior

5.1.1 Noise Levels at Outdoor Use Areas

As per the City of Lake Elsinore Public Safety and Welfare Element to the General Plan, outdoor use areas of residential land uses should not exceed 60 CNEL. Common outdoor use areas are provided on the north side of the multifamily residential portion of the project (a pool area), and presumably a small area to the south of the clubhouse. The City of Lake Elsinore requires compliance with this noise standard at common outdoor use areas as well as private patios and balconies.

Future traffic noise levels for the common outdoor use areas are shown in Table 8, and take the shielding provided by the proposed buildings into account. Receiver locations are shown in Figure 7.

Table 8. Future Traffic Noise Levels at Common Outdoor Use Areas

Receiver	Description	Exterior Noise Level (CNEL)
OU1	Pool Area	**65**
OU2	Open Space	57

As shown in Table 8, exterior traffic noise levels at the pool area are expected to exceed the 60 CNEL noise limit set by the City of Lake Elsinore. For this reason, a six-foot high sound barrier was incorporated into the noise model to determine the attenuation that would be provided by a three-sided wall surrounding the pool. With a six-foot high sound barrier in place, noise levels would be reduced to 60 CNEL, thus meeting the applicable exterior noise standard of the City of Lake Elsinore. The sound barrier location is shown in Figure 7.

It is anticipated that private balconies and patios will be provided for residential units at both the mixed use building and the multifamily development on the project site; however, current locations of proposed balconies and patios are unknown. For this reason, receivers have been placed around the perimeter of each building that will include residential space to determine where balconies may have noise levels that exceed the 60 CNEL noise threshold. Future traffic noise levels at building facades are shown in Table 9. As all buildings in the multifamily development are coded "170" on project plans, building have been arbitrarily assigned letters for ease of reference. Receiver locations are shown in Figure 7.

Table 9. Future Traffic Noise Levels at Residential Building Facades (Potential Patios/Balconies)					
Building	**Receiver**	**Location**	**Exterior Noise Level (CNEL)[1]**		
			First Floor	**Second Floor**	**Third Floor**
Multifamily 170 - Building A	A1	North	**68**	**70**	**70**
	A2	East	**63**	**65**	**66**
	A3	East	59	60	**62**
	A4	East	56	57	58
	A5	South	40	42	45
	A6	West	59	59	60
	A7	West	**61**	**61**	**62**
	A8	West	**64**	**64**	**65**
Multifamily 170 – Building B	B1	North	**66**	**68**	**68**
	B2	East	59	**61**	**62**
	B3	East	55	56	57
	B4	East	51	52	54
	B5	South	42	43	46
	B6	West	54	55	56
	B7	West	57	58	59
	B8	West	**61**	**62**	**63**
Multifamily 170 – Building C	C1	North	**66**	**67**	**68**
	C2	East	**61**	**62**	**64**
	C3	East	58	59	60
	C4	East	55	56	57
	C5	South	43	46	48
	C6	West	51	52	53
	C7	West	55	56	57
	C8	West	60	**61**	**63**
Multifamily 170 – Building D	D1	North	**66**	**68**	**69**
	D2	East	60	**61**	**62**
	D3	East	54	55	57
	D4	East	50	51	52
	D5	South	44	48	51
	D6	West	55	56	57
	D7	West	58	59	60
	D8	West	**62**	**63**	**64**
Multifamily 170 – Building E	E1	North	**66**	**68**	**69**
	E2	East	**62**	**63**	**64**
	E3	East	59	60	**62**
	E4	East	56	57	59
	E5	South	43	46	50
	E6	West	50	51	52
	E7	West	54	55	57
	E8	West	60	**62**	**63**
Mixed Use 140 – Building F	F1	North	N/A	**62**	N/A
	F2	North	N/A	**61**	N/A
	F3	North	N/A	**62**	N/A
	F4	East	N/A	59	N/A
	F5	South	N/A	49	N/A
	F6	South	N/A	48	N/A
	F7	South	N/A	43	N/A
	F8	West	N/A	58	N/A

[1]Numbers shown in **bold text** indicate receivers where noise levels exceed 60 CNEL.

As shown above, private patios or balconies that are placed on the north side of the project site with a direct line-of-sight to Grand Avenue are expected to have future noise levels that exceed 60 CNEL in the future noise environment. For this reason, if patios or balconies are proposed in these locations, additional project design features would be required.

Potential patio or balcony receivers were evaluated with a solid balcony barrier wall with a height of four feet above deck height at all locations where noise levels were found to exceed 60 CNEL. This project design feature was found to be capable of effectively reducing noise levels to be 60 CNEL or less at all locations with the exception of locations A1, B1, C1, D1, and E1 (directly facing Grand Avenue). If a patio or balcony is proposed along either of these facades, the patio or balcony must incorporate a solid five-foot high wall in order to reduce noise levels to be 60 CNEL or less. In addition, balconies at receivers A2 and A8 are expected to achieve compliance with a four-foot high barrier at the second and third floors, but will require a five-foot high barrier at the ground floor. With these project design features in place, all private outdoor use areas would be expected to comply with the City of Lake Elsinore Public Safety and Welfare Element to the General Plan. Locations at which these project design features would be required are indicated in Figure 7.

The required sound attenuation barrier at the pool should be a minimum of six feet above ground height, and balcony barriers should meet the minimum height requirements detailed above, relative to the deck floor height. A sound wall should be solid and constructed of masonry, wood, plastic, fiberglass, steel, or a combination of those materials, with no cracks or gaps, through or below the wall. Any seams or cracks must be filled or caulked as much as possible. If wood is used, it can be tongue and groove and must be at least 7/8-inch thick or have a surface density of at least 3½ pounds per square foot. Where architectural or aesthetic factors allow, glass or clear plastic may be used, if it is desirable to preserve a view. A glass or plexiglass railing wall should be sufficient for sound attenuation in balcony locations.

5.1.2 Noise Levels at Building Facades

Future traffic noise levels at residential building facades were calculated and show that noise levels are expected to range from approximately 40 CNEL at a south-facing facade of the multifamily portion of the property, to approximately 70 CNEL at a north-facing facade of the multifamily portion of the property. Noise levels are shown in Table 9 in Section 5.1.2, and receiver locations are shown in Figure 7.

5.2 Interior

The State of California and the City of Lake Elsinore require buildings to be designed in order to attenuate, control, and maintain interior noise levels to 45 CNEL or less in habitable residential space. 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 60 CNEL could be subject to interior noise levels exceeding the 45 CNEL noise limit for residential habitable space.

As shown in Table 9, the maximum future noise level anticipated at project building facades is above 60 CNEL. As building facade noise levels are expected to exceed 60 CNEL, interior noise levels may exceed 45 CNEL with standard building construction. Therefore, a detailed interior noise analysis should be performed for this project prior to the issuance of building permits, to determine design elements necessary to maintain compliant interior noise levels. However, the required interior noise levels are feasible and can be achieved with readily available building materials and construction methods. From a preliminary review, it is anticipated that a typical exterior wall, windows and glass doors with an STC rating of 28, and mechanical ventilation in units will be sufficient for achieving compliant interior noise levels; however, this can be confirmed when construction documents become available.

5.3 Permanent Project-Related Noise Levels

5.3.1 Mechanical Equipment Noise

Noise levels from the proposed car wash dryer, vacuum, and HVAC units were calculated in Cadna at the nearest properties using data presented in Section 3.2.2. Car wash, vacuum, and HVAC equipment were evaluated for the daytime scenario, and HVAC equipment only was calculated for the nighttime scenario. Noise limits have been applied as detailed in Section 2.3. Calculations consider the topography of the surrounding area as well as shielding that would be provided by the proposed on-site structure, with the exception of any parapet walls. For this reason, the analysis is considered to represent a conservative estimate of noise levels at off-site receivers.

Tables 10 and 11 show the project-related mechanical noise levels at surrounding receivers during daytime and nighttime hours, respectively. Calculated noise levels at the properties to the south are shown at both the property line and at the nearest useable area on the property, beyond the immediately adjacent slope. All receivers have been calculated at a height of five feet above their respective grade with the exception of receivers R8, R9, and R10, which were calculated at a height of 15 feet above grade to account for receivers at the second stories of the adjacent residential properties. For a graphic showing mechanical equipment noise source and receiver locations, please refer to Figures 8 and 9.

Table 10. Project-Related Mechanical Noise Levels – Daytime (Car Wash/Vacuums + HVAC)

Receiver	Description	Noise Limit (dBA)	Noise Level (dBA)
R1	North Property Line	70	41
R2	South Property Line 1	61	47
R3	South Property Line 2	61	43
R4	South Property Line 3	61	40
R5	South Useable Area 1	61	47
R6	South Useable Area 2	61	44
R7	South Useable Area 3	61	41
R8	South 2nd Story 1	61	48
R9	South 2nd Story 2	61	46
R10	South 2nd Story 3	61	43
R11	East Property Line	70	51
R12	West Property Line	61	37
R13	North Property Line, Residential	61	37
R14	Residential On-Site Building	61	38

Table 11. Project-Related Mechanical Noise Levels – Nighttime (HVAC Only)			
Receiver	**Description**	**Noise Limit (dBA)**	**Noise Level (dBA)**
R1	North Property Line	60	37
R2	South Property Line 1	46	36
R3	South Property Line 2	46	40
R4	South Property Line 3	46	37
R5	South Useable Area 1	46	37
R6	South Useable Area 2	46	41
R7	South Useable Area 3	46	39
R8	South 2nd Story 1	46	40
R9	South 2nd Story 2	46	44
R10	South 2nd Story 3	46	42
R11	East Property Line	60	37
R12	West Property Line	46	35
R13	North Property Line, Residential	46	35
R14	Residential On-Site Building	46	37

As shown above, noise levels at adjacent property lines are anticipated to comply with the applicable daytime and nighttime noise limits of the City of Lake Elsinore with the project as currently designed. For these reasons, no additional project design features are deemed necessary to reduce noise levels from on-site 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 projections in the Urban Crossroads traffic study. The project's impacts have been evaluated to determine whether a direct or cumulative impact will result. A significant direct impact occurs when project traffic combines with existing traffic and causes a doubling of sound energy, which is an increase of 3 dB. Direct impacts are assessed by comparing existing traffic volumes to existing plus project traffic volumes using the calculation methodology shown in Section 4.1.4. A cumulative impact may occur when project traffic combines with traffic generated by other proposed projects in the area and causes an increase of 3 dB. Cumulative impacts are assessed by comparing existing traffic volumes to existing plus project plus cumulative traffic volumes using the methodology detailed herein.

As project and cumulative ADT values have not been given for all roadways studied in the traffic analysis, noise calculations focus on representative receivers that would potentially be subjected to the highest impact, which would be those including project driveways. Macy Street, in particular, currently has the lowest daily traffic volumes of nearly all studied roadways and is also subject to a comparatively higher share of project traffic due to the presence of a project driveway on this roadway. Receivers along Grand Avenue and Ortega Highway

have also been considered. The CadnaA model has been calculated assuming existing and worst-case anticipated traffic volumes for the project and cumulative scenarios for these three roadways. Evaluated traffic volumes are shown in Table 12 with project-generated traffic noise levels and associated increases are shown in Table 13. Receiver locations are shown in Figure 10.

Table 12. Evaluated Traffic Volumes for Project-Generated Traffic Noise Calculations

Roadway	Traffic Volume (ADT)		
	Existing	Project[1]	Cumulative[2]
Macy Street	1,800	1,000	950
Grand Avenue, East of Ortega Highway	23,800	2,672	950
Grand Avenue, West of Ortega Highway	27,200	2,672	950
Ortega Highway	20,800	2,672	950

[1]Daily project traffic volumes required for computing impacts in terms of CNEL have not been given for sections of roadway at the intersection of Grand Avenue and Ortega Highway. For this reason, for a conservative analysis, these segments have been evaluated assuming all total project trips will use these roadway segments.
[2]Cumulative traffic volumes required for computing impacts in terms of CNEL have not been given for sections of roadway at the intersection of Grand Avenue and Ortega Highway. For this reason, for a conservative analysis, these segments have been evaluated assuming the maximum anticipated cumulative traffic volume for a single roadway segment of 950 cumulative trips will use these roadway segments.

Table 13. Anticipated Traffic Noise Increases with Project-Generated Traffic

Receiver (Nearest Roadway)	Noise Level (CNEL)				
	Existing	Direct Impacts		Cumulative Impacts	
		Existing plus Project	Increase over Existing	Existing plus Cumulative plus Project	Increase over Existing
TR1 (Macy Street)	63.5	64.8	1.3	65.8	2.3
TR2 (Grand, West of Ortega)	69.7	70.2	0.5	70.3	0.6
TR3 (Grand, West of Ortega)	61.2	61.6	0.4	61.8	0.6
TR4 (Ortega Highway)	70.8	71.4	0.6	71.5	0.7
TR5 (Grand, East of Ortega)	68.8	69.2	0.4	69.4	0.6

As shown in Table 13, no direct or cumulative impacts are anticipated to result from project traffic as any increases on the most affected roadways shown above would be less than 3 dB. For this reason, project-generated traffic noise levels are therefore 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. In addition, operational noise from stationary equipment should be limited to 60 dBA at residential properties and 75 dBA at commercial properties, where feasible.

Noise levels were calculated at residential receivers to the south, as any other off-site receivers are located at a greater distance from the project site and therefore would be exposed to lesser noise levels. Mobile construction noise sources were placed near the center of the various work areas to evaluate typical noise levels at this receiver as equipment moves around the property. The approximate center of work is located roughly 200 feet from the nearest sensitive receiver location during Phases 1 and 3, and 130 feet during Phase 2. Mobile equipment noise calculations consider typical duty cycles of equipment to account for periods of activity and inactivity on the site.

Calculated construction noise levels for mobile equipment are shown in Table 14. A graphical representation of evaluated source and receiver locations is shown in Figure 11. Please refer to Appendix D for additional information.

Table 14. Temporary Construction Noise Levels at Nearest Residential Receivers (Mobile)

Stage	Equipment	Average Noise Level (dBA)	
		Phases 1 & 3 (Receivers C1 & C3)	Phase 2 (Receiver C2)
Utilities and Grading	Excavator, Backhoe, Water Truck, Grader	65	67
Foundation	Concrete Mixer Truck, Concrete Pump Truck	61	65
Paving	Paver, Roller, Dump Truck	62	64
Framing	Telescopic Forklift	66	70

As shown in Table 14, 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. 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.

Stationary equipment anticipated at the project site is limited to air compressors during the framing stage of construction. An air compressor generates a noise level of approximately 61 dBA at 50 feet from the equipment. As the air compressors will be used for building construction, they will be located in close proximity to the building pads. The nearest building pad to the residential property line to the south is the southernmost residential building to be constructed in Phase 3, which is located at approximately 85 feet from the south property line. At a distance of 85 feet, an air compressor would generate a noise level of approximately 56 dBA. As this noise level does not exceed the 60 dBA threshold for stationary construction equipment operation, and as any other potential compressor location would be placed at a further distance from the

property line, thereby resulting in lower noise levels at the property line, stationary equipment operation would remain in compliance with the City of Lake Elsinore noise limit for stationary construction equipment noise.

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. Locate stationary equipment in locations as far as feasible from nearby sensitive receivers.

3. Turn off equipment when not in use.

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

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

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

7. Use equipment with effective mufflers.

8. Minimize the use of backup alarms.

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

5.5 CEQA Significance Determination

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

XII. NOISE—Would the project result in:

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

Less Than Significant Impact. Operational noise impacts calculated in Section 5.3.1 are not expected to generate a substantial permanent increase in ambient noise levels in the vicinity of the project site and would comply with the noise limits of the City of Lake Elsinore Municipal Code, as shown in Section 5.3.1. The impact of permanent project-related noise sources would therefore be less than significant.

Additionally, as demonstrated in Section 5.3.2 of this report, noise impacts from project-generated traffic are not expected to cause a significant direct increase or a cumulative increase on any surrounding roadway. This impact is also considered to be less than significant.

As shown in Section 5.4 of this report, noise from temporary construction is expected to be less than significant considering a typical construction schedule. Noise impacts from anticipated construction activity are expected to remain below the applicable construction noise limits set by the City of Lake Elsinore. Additionally, no

construction activity will take place during the more sensitive nighttime hours when ambient noise levels tend to be lower, as per City of Lake Elsinore requirements. For these reasons, this impact is deemed to be less than significant.

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

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

Less Than Significant Impact. The paving stage of construction has the potential to generate the highest vibration levels of the four phases, as paving activities would take place closest to residential receivers and may consist of the use of a vibratory roller. According to the Federal Transit Administration Transit Noise and Vibration Assessment Manual (see reference), a vibratory roller generates a peak particle velocity (PPV) of approximately 0.210 inches/second at a distance of 25 feet from equipment. The evaluation of an impact's significance can be determined by reviewing both the likelihood of annoyance to individuals as well as the potential for damage to existing structures. According to the Caltrans Transportation and Construction Vibration Guidance Manual (see reference), the appropriate threshold for damage to modern residential structures is a PPV of 0.5 inches/second. Annoyance is assessed based on levels of perception, with a PPV of 0.01 being considered "barely perceptible," 0.04 inches/second as "distinctly perceptible," 0.1 inches/second as "strongly perceptible," and 0.4 inches/second as "severe."

It is estimated that the nearest location to sensitive receptors would be approximately 50 feet from the nearest residential structure, when the roller is used at the southern boundary of the site. At this distance, the PPV would be approximately 0.074 inches/second. This level of vibration falls well below the building damage PPV criteria of 0.5 inches/second. The impact falls between the "distinctly perceptible" and "strongly perceptible" PPV criteria for annoyance; however, vibration would be reduced to "distinctly perceptible" levels by the time the roller is located at a distance of 75 feet from receivers, and "barely perceptible" at 195 feet from receivers. As construction vibration is not anticipated to cause damage to off-site buildings and will only approach the threshold of "strongly perceptible" vibration for a short period of time when work is performed near the southern boundary of the property, it is the opinion of the undersigned that temporary construction vibration impacts would not be "excessive" and therefore are less than significant. Please refer to Appendix D for additional information.

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

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

6.0 Conclusion

The City of Lake Elsinore Public Safety and Welfare Element to the General Plan requires that residential outdoor use areas be protected from noise levels greater than 60 CNEL. As designed, future traffic noise levels are expected to exceed 60 CNEL at the pool area, such that a six-foot high sound barrier wall would be required to attenuate noise levels. As balcony and patio locations are currently not indicated on project plans, an evaluation of noise levels at building facades was performed to determine where balconies or patios would require a barrier wall as a noise-attenuating project design feature. The evaluation demonstrated that barriers would be needed at patios or balconies on the north side of the property with a direct line-of-sight to Grand Avenue. Required barrier heights range from four to five feet and are detailed in Section 5.1.1 of this report. With a six-foot high barrier at the pool area and solid balcony barriers incorporated into the design where indicated herein, future traffic noise levels are expected to be reduced to be 60 CNEL or less at all outdoor use areas, and therefore would be in compliance with the City of Elsinore exterior noise standards.

The City of Lake Elsinore and State of California require interior noise levels of 45 CNEL or less in residential units. Calculations show that future noise levels on site exceed 60 CNEL at many facades, and therefore interior noise levels may exceed 45 CNEL within units. Due to high noise levels on-site, an exterior-to-interior analysis should be performed when building plans become available, prior to the issuance of building permits. The required interior noise levels are feasible and can be achieved with readily available building materials and construction methods. It is anticipated that a typical exterior wall, windows and glass doors with an STC rating of 28, and mechanical ventilation in units will be sufficient for achieving compliant interior noise levels; however, this should be confirmed when construction documents become available.

Noise from the anticipated car wash, vacuum, and HVAC equipment on site has been calculated to determine noise levels at off-site receivers. Calculations show that noise levels from the mechanical equipment will be in compliance with the City of Lake Elsinore noise regulations for both daytime and nighttime hours found within the Municipal Code. No project design features are deemed necessary to control project-generated noise levels from mechanical equipment. 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.

The proposed project is not expected to result in any potentially significant noise impacts by the standards of the California Environmental Quality Act (CEQA). Noise impacts are summarized in Section 5.5.

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 Bamiyan Marketplace project, to be located in the City of Lake Elsinore, California. This report was prepared by Amy Hool, Rachael Cowell, and Jonathan Brothers.

Amy Hool, INCE
President/CEO

Jonathan Brothers, INCE
Principal Acoustical Consultant

8.0 References

City of Lake Elsinore Public Safety and Welfare Element to the General Plan, Adopted December 13, 2011.

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

California Environmental Quality Act (CEQA), Statute and Guidelines, 2018.

Urban Crossroads, Bamiyan Marketplace Traffic Analysis, June 22, 2021.

Federal Highway Administration, Highway Traffic Noise: Analysis and Abatement Guide, December 2011.

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 2019.

Wyle Laboratories, Development of Ground Transportation Systems Noise Contours for the San Diego Region, December 1973.

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

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.

Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment, May 2006.

California Department of Transportation (Caltrans), Transportation and Construction Vibration Guidance Manual, September 2013.

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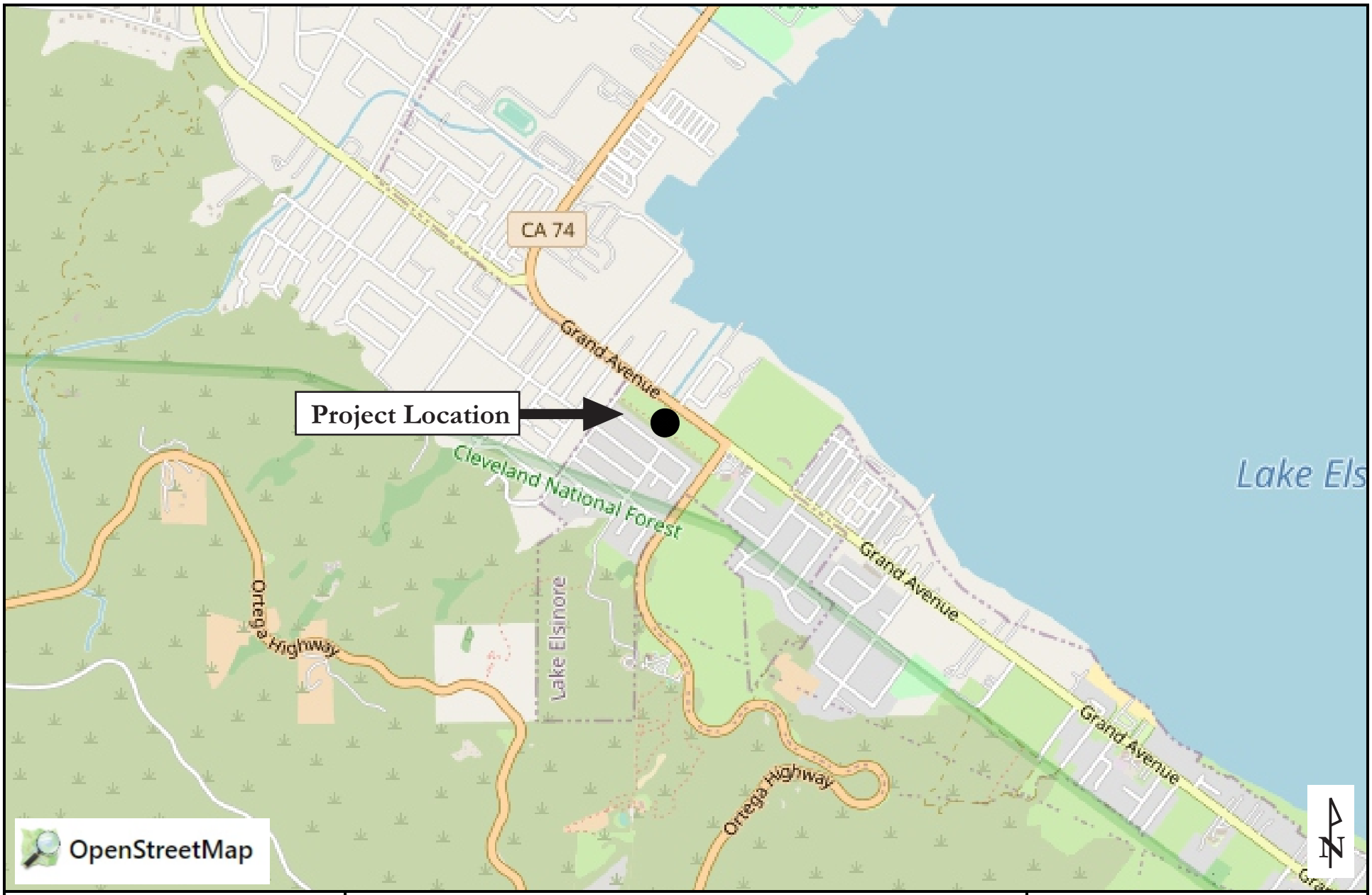
Figures



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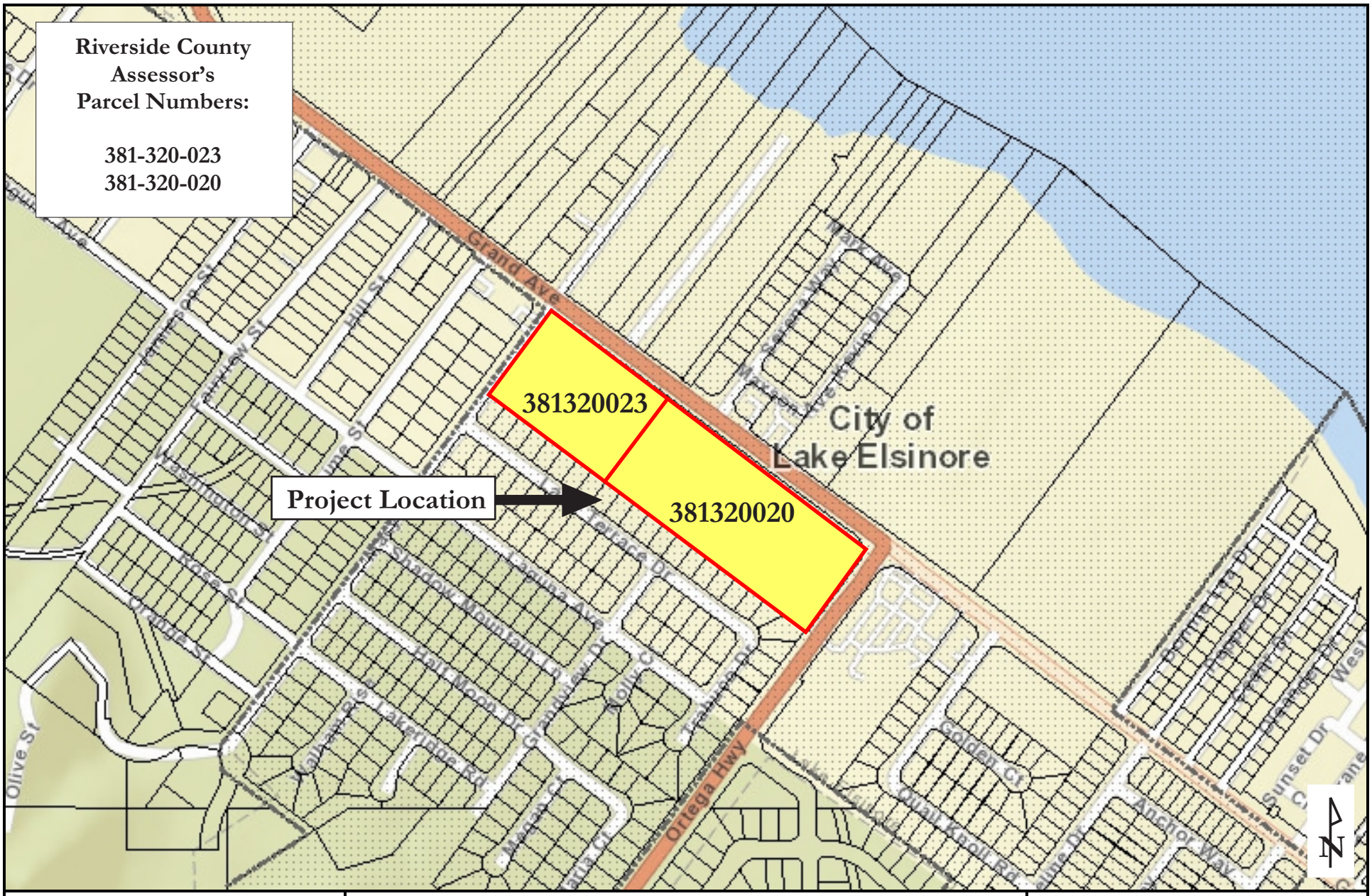
Vicinity Map
Job #S210707

Figure 1



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Assessor's Parcel Map
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Figure 2

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Satellite Aerial Photograph
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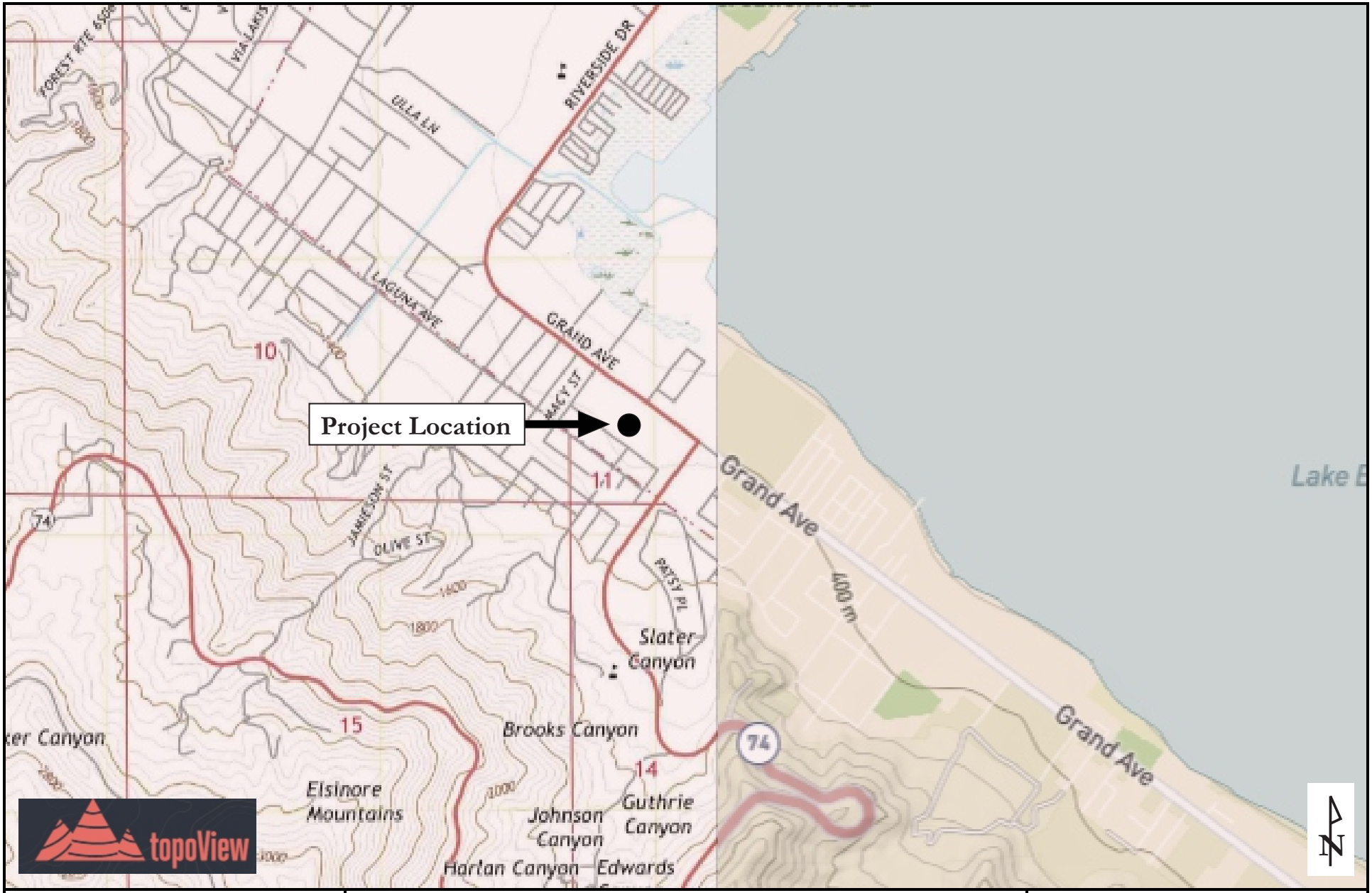
Figure 3



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Topographic Map
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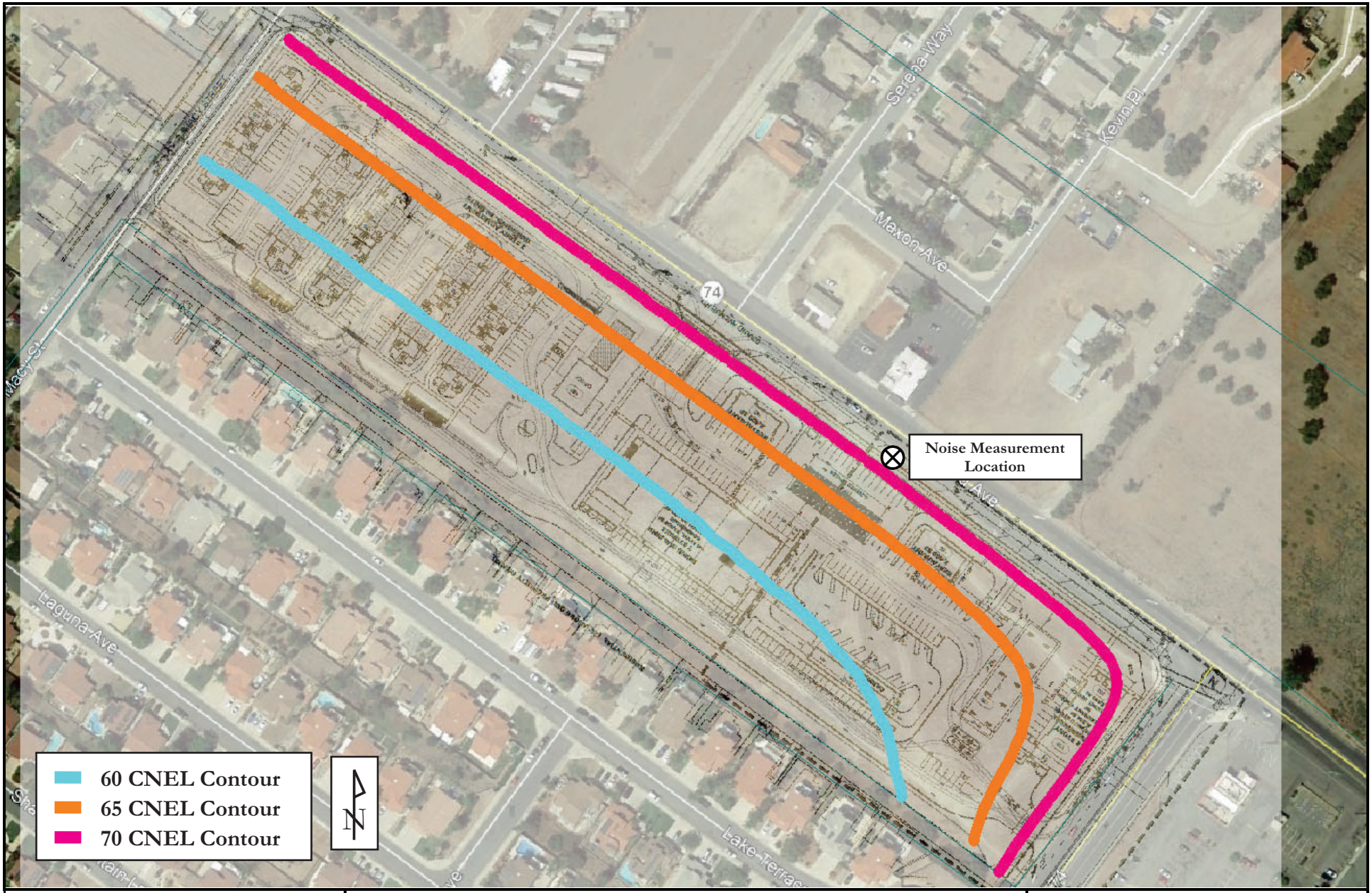
Figure 4



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Satellite Aerial Photograph Showing Current Traffic CNEL Contours and Noise Measurement Location
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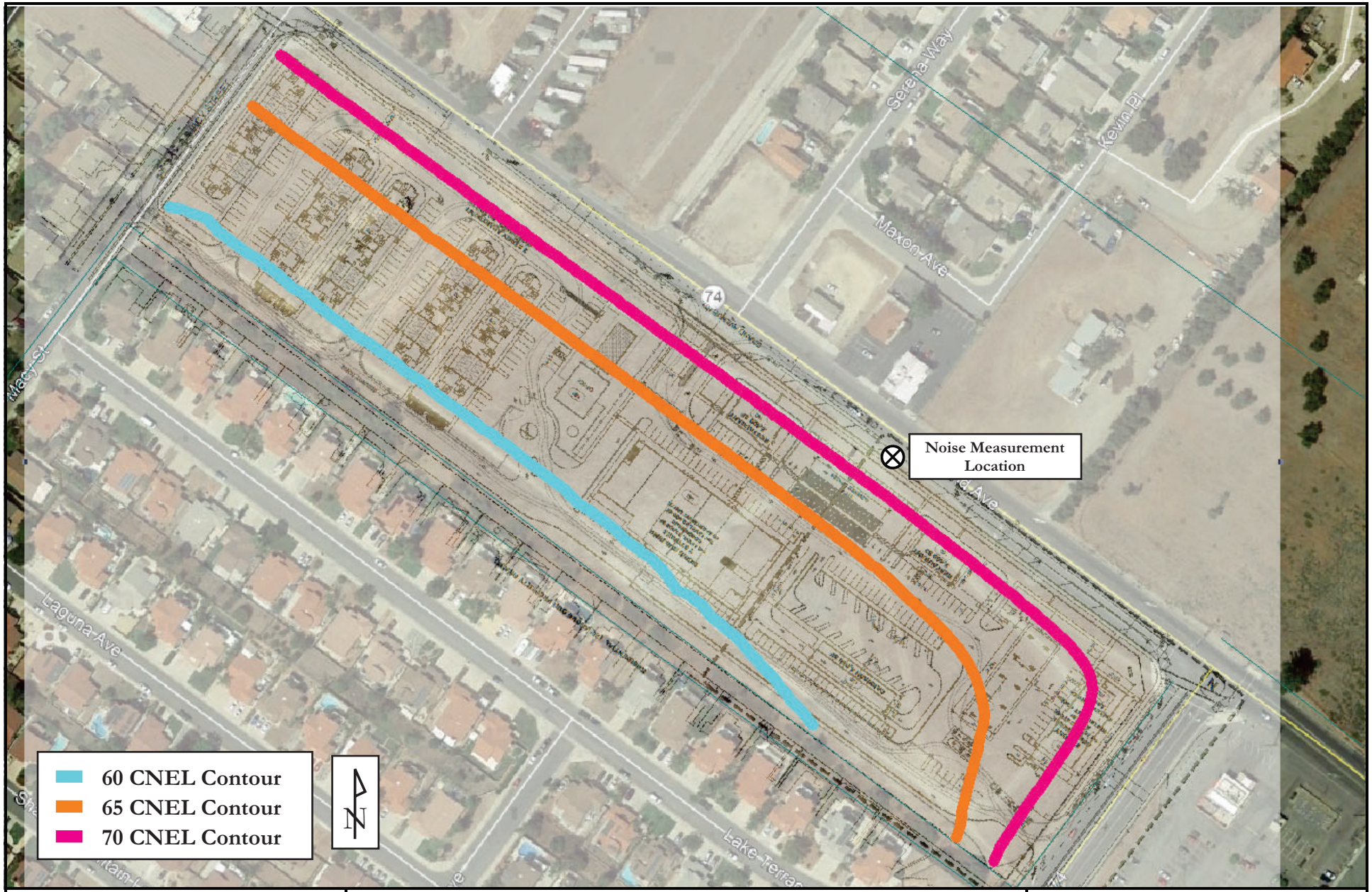
Figure 5



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Satellite Aerial Photograph Showing Future Traffic CNEL Contours and Noise Measurement Location
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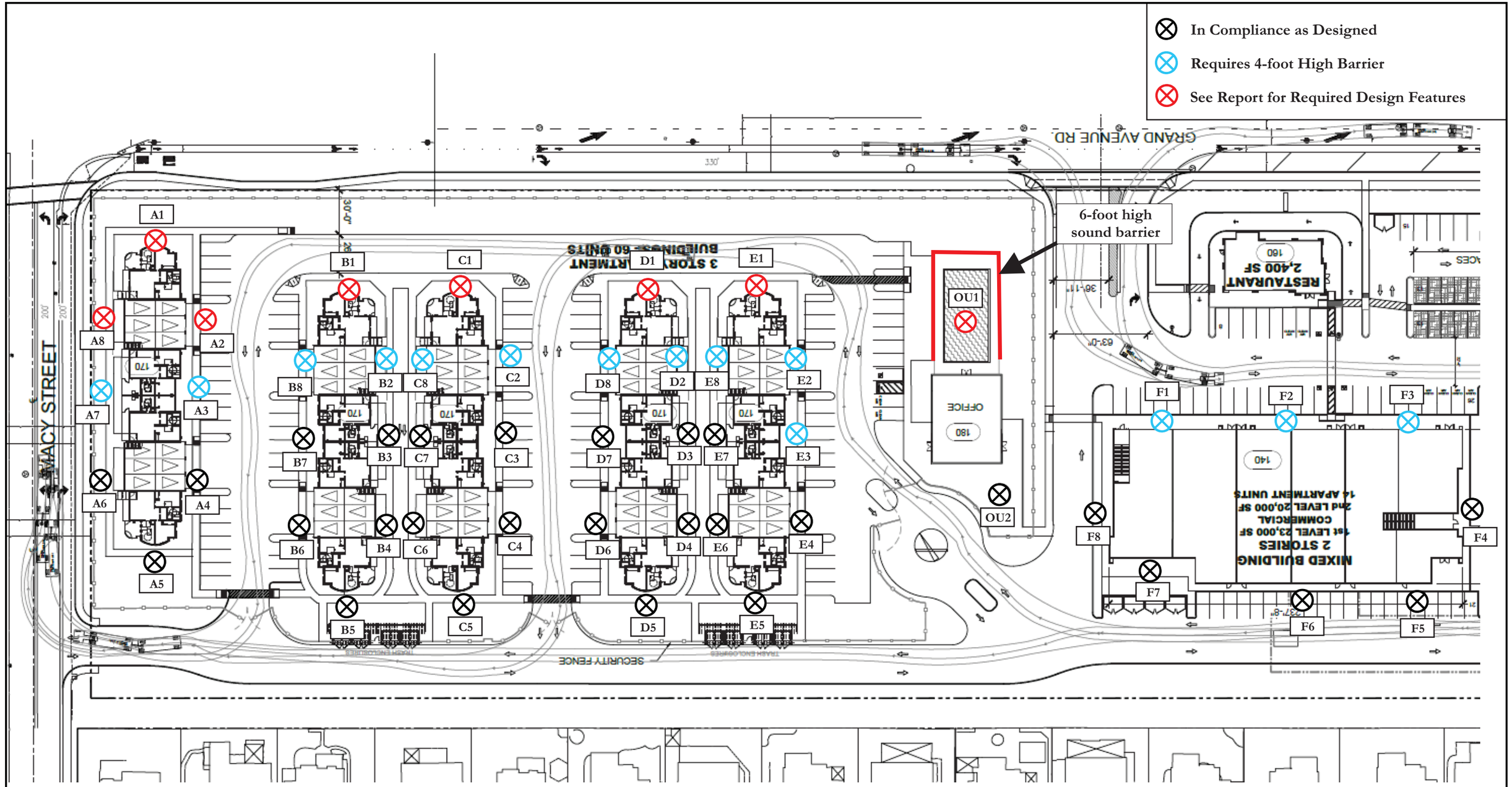
Figure 6



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Site Plan Showing Outdoor Use Area and Building Facade Receiver and Balcony Barrier Locations
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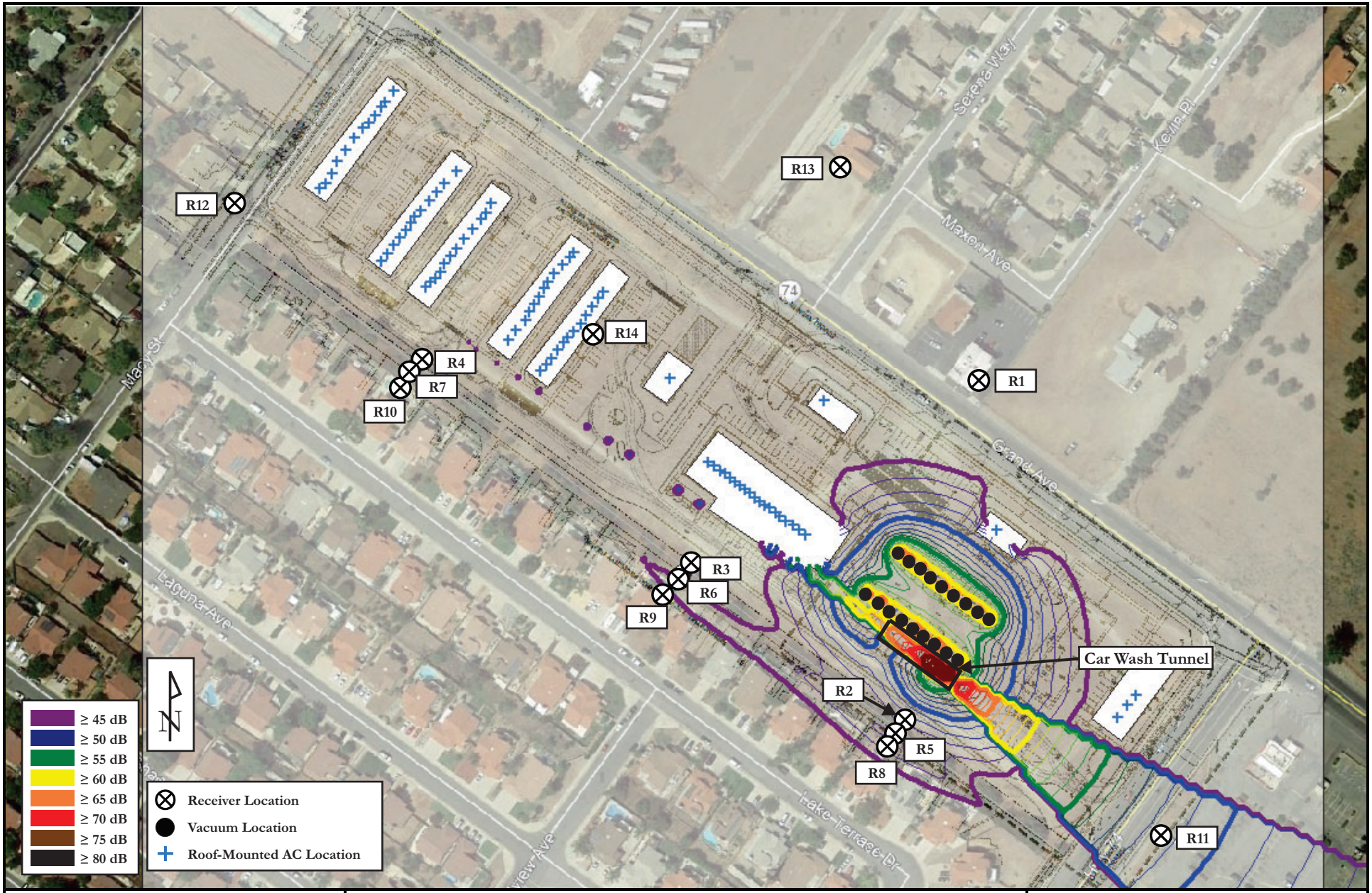
Figure 7



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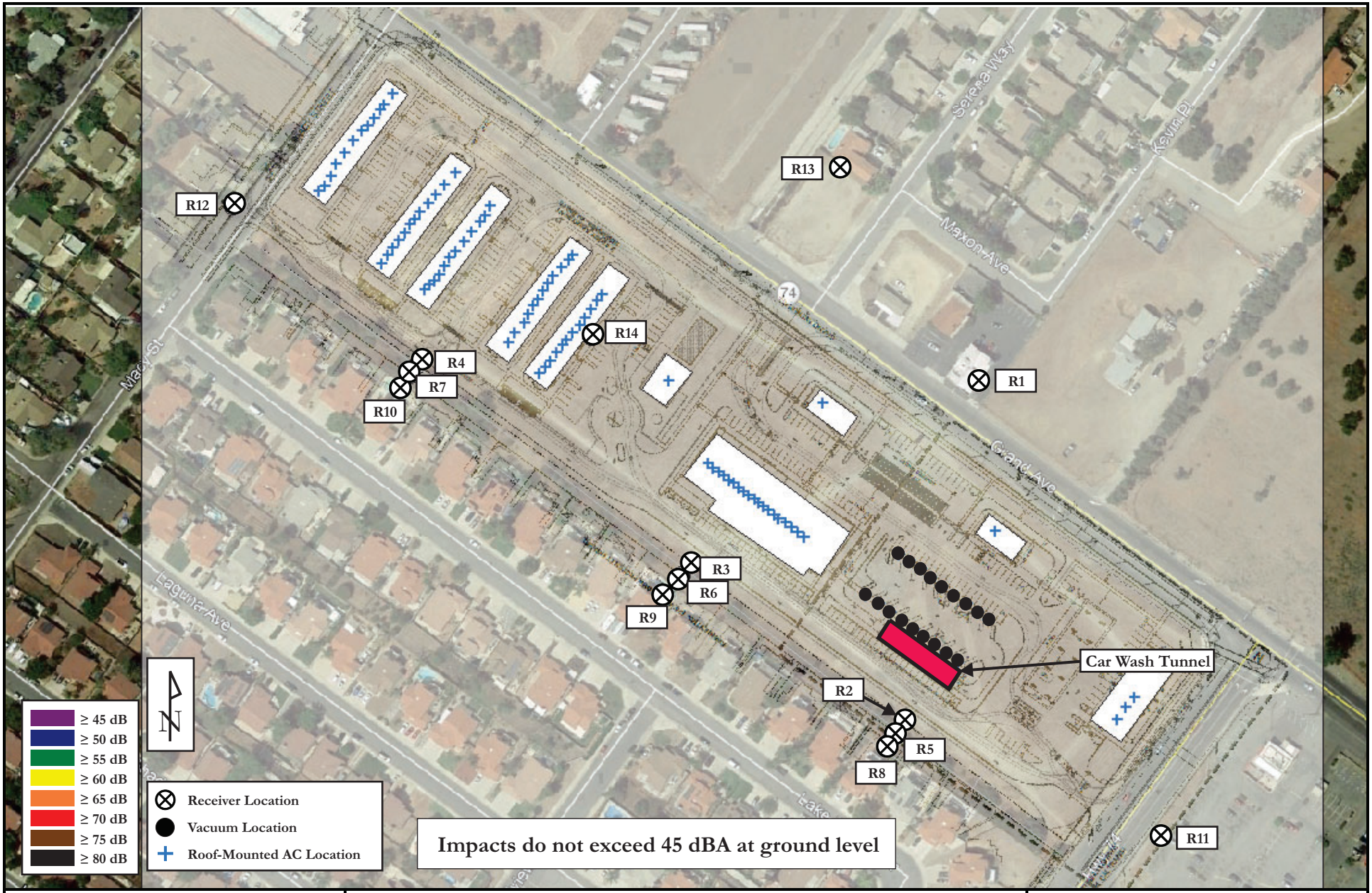
Satellite Aerial Photograph Mechanical Equipment Noise Contours and Receiver Locations - Daytime Scenario
Job # S210707

Figure 8



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Satellite Aerial Photograph Mechanical Equipment Noise Contours and Receiver Locations - Nighttime Scenario
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Figure 9

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Satellite Aerial Photograph Showing
Project-Generated Traffic Noise Receiver Locations
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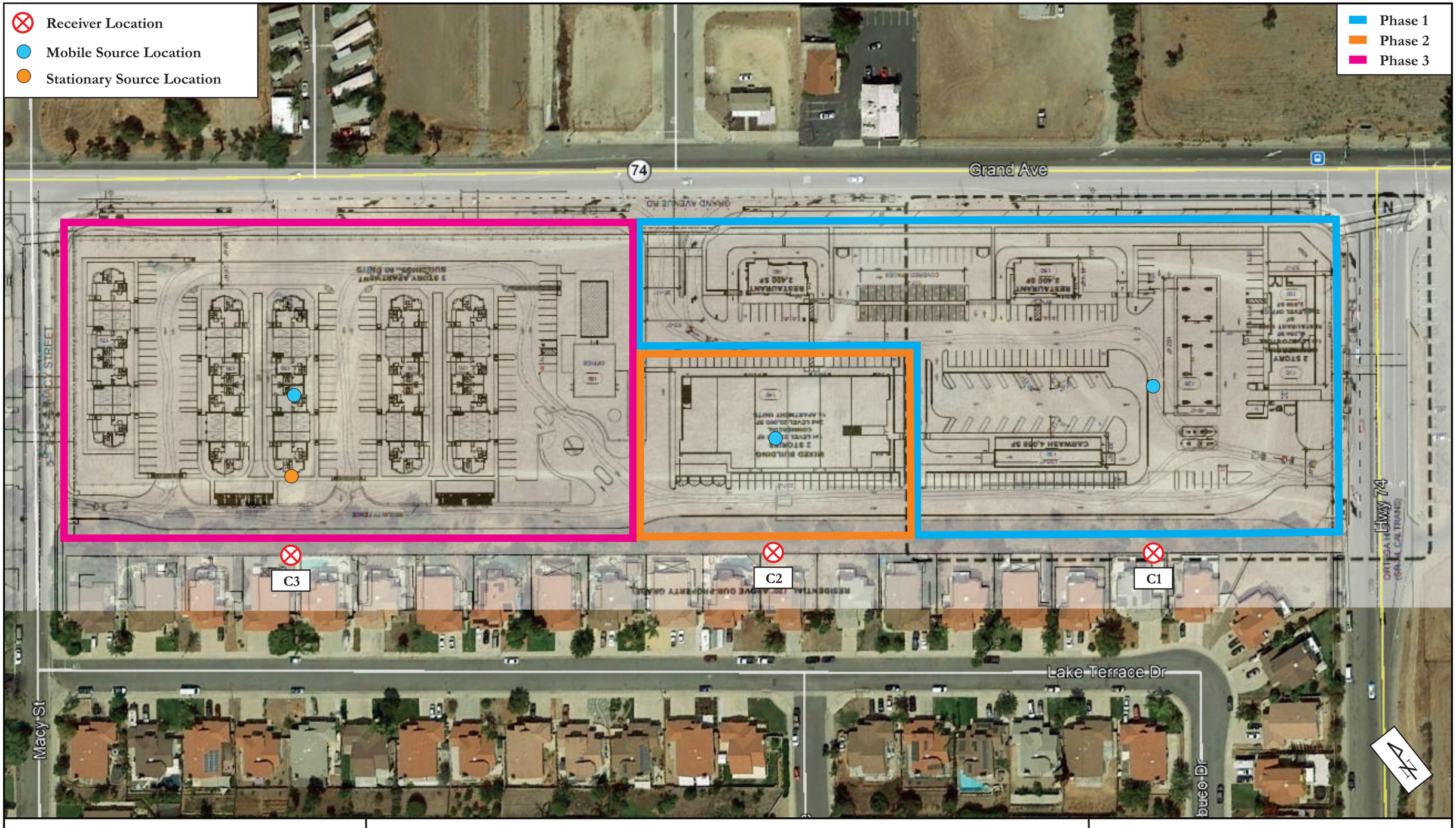
Figure 10



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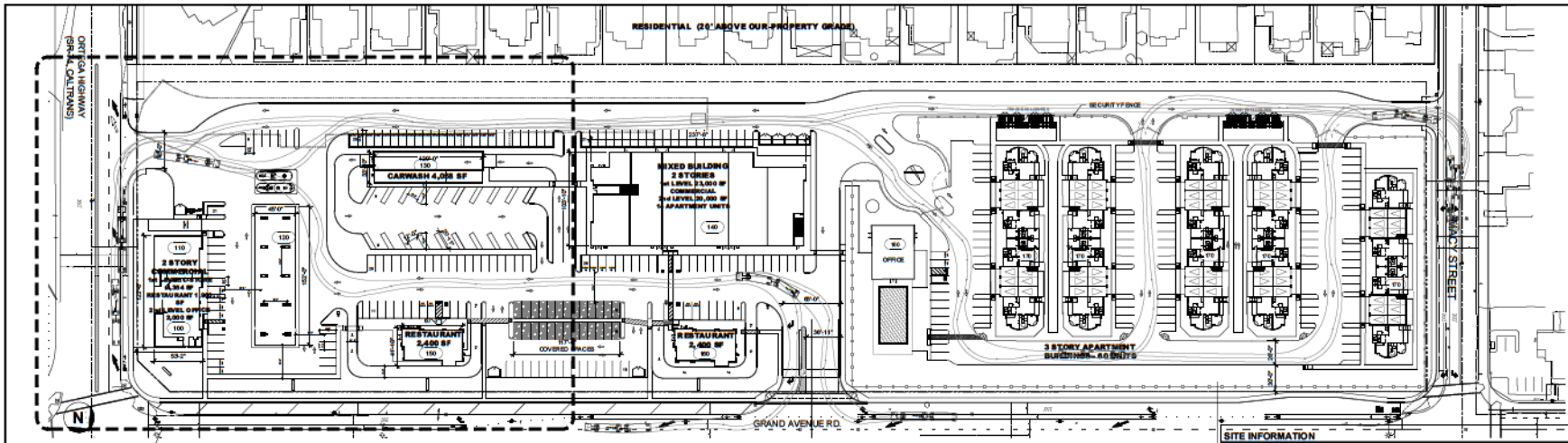
Satellite Aerial Photograph Showing Construction Noise Source and Receiver Locations
Job # S210707

Figure 11

Eilar Associates, Inc.
Acoustical and Environmental Consulting Services

Appendix A
Project Plans



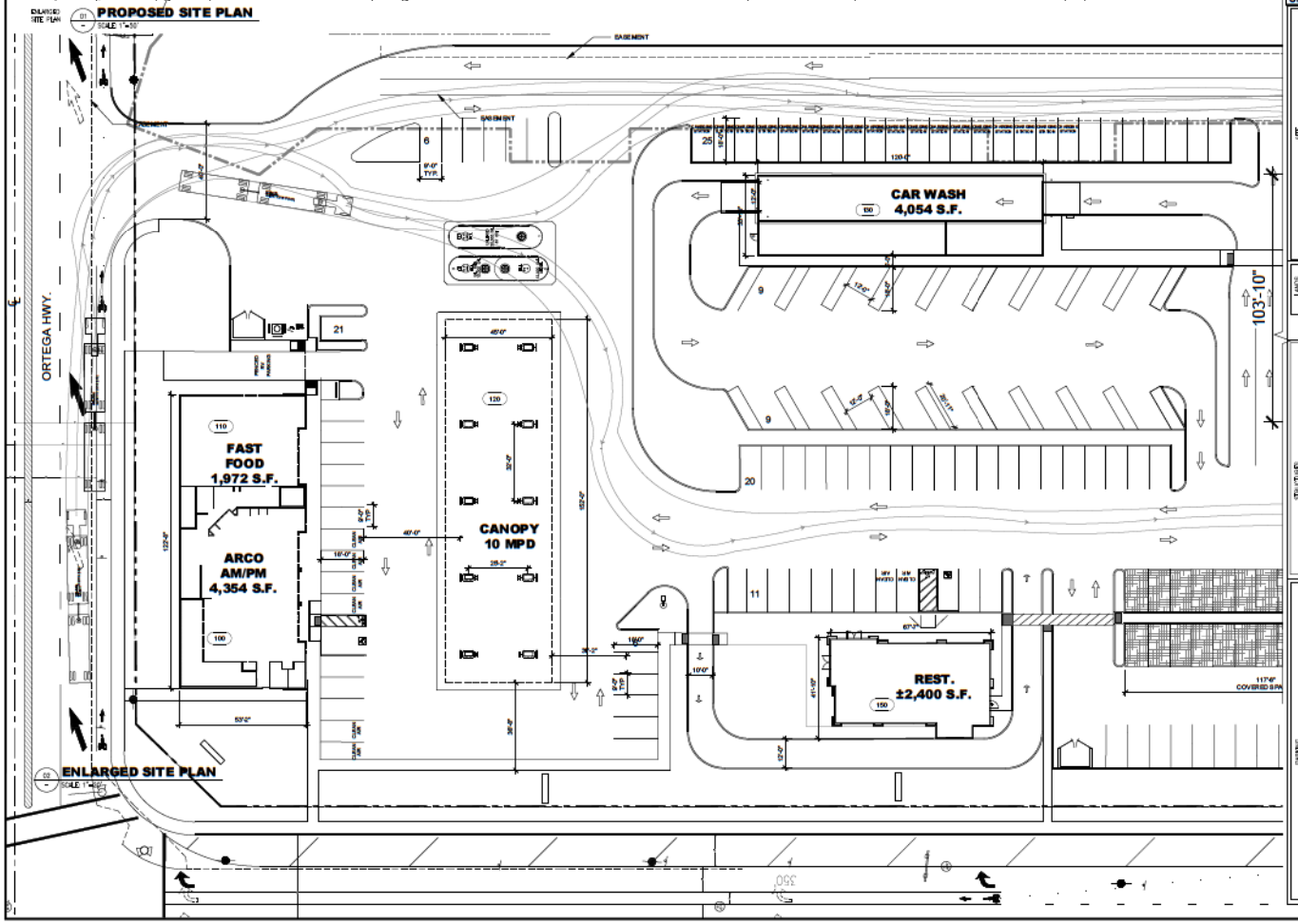
INDEX

BUILDINGS

100	ARCO AM/PM 4,354 S.F. OFFICE 2,000 S.F.
110	RESTAURANT 1,900 S.F.
120	CANOPY 10 MPD
130	CAR WASH 4,008 S.F.
140	MIXED BUILDING 2 STORIES 65,000 SF.
150	RESTAURANT 2,400 SF
160	RESTAURANT 2,400 SF
170	12 UNITS BLDG 2 STORIES
180	CLUB HOUSE 2,000 S.F.

PROPOSED SITE PLAN

SCALE: 1"=50'



ENLARGED SITE PLAN

SCALE: 1"=30'

SITE INFORMATION

AREA OF PROPERTY

	AREA SQUARE FEET	ACRES
GROSS AREA	515,612 SQ.FT.	11.83 A
DEDICATIONS (GRAND, ORTEGA AND MACY)	28,041 SQ.FT.	0.64 A
NET BUILDABLE AREA	487,571 SQ.FT.	11.19 A

ZONING	ZONE
EXISTING	CMU (COMMERCIAL MIXED USE)
PROPOSED	CMU (COMMERCIAL MIXED USE)
ASSESSORS PARCEL NUMBER	APN 381-330-020/023

DEVELOPMENT STANDARD	REQUIRED	PROPOSED
STANDARD (CMU) SITE AREA IN COMMERCIAL USE	>50% NET LOT SIZE	51% = 284,847 SQ.FT.
FAR	0.8:1	0.32:1
NET DENSITY LOT 7 ONLY 66/4.32 AC	7-18 D.U. / AC.	15.7 D.U. / AC.
NET DENSITY LOT 5 ONLY 14/4.32 AC	7-18 D.U. / AC.	9.9 D.U. / AC.
MIN. FRONT SET BACK: LOT 3, BLDG 160	10'-0"	27'-0"
INTERIOR SET BACK: LOT 5, BUILDING 140	20'-0"	77'-0"
MAX. BUILDING HEIGHT LOT 5, BLDG 140		39'-0"
MAX. BUILDING HEIGHT LOT 7		34'-10"
	VARIED ROOF LINES	

LANDS

DESCRIPTION	PERCENT	AREA
LANDSCAPE REQUIRED		
LANDSCAPING PROVIDED PHASE I + II	10.6%	54,697 SQ. FT.
PHASE 3 (MULTIFAMILY RESIDENTIAL)	10.5%	54,376 SQ. FT.
TOTAL LANDSCAPE PROVIDED COMPLETE PROJECT	21.15%	109,073 SQ. FT.

STRUCTURES

	DESCRIPTION	OVERALL SIZE	OCC.	CONS. TYPE	STATUS	AREA
PHASE I + II	C-STORE + RESTAURANT	122'-6" x 53'-0"	M	V-B	PROPOSED	6,312 SQ. FT.
	OFFICE ON TOP OF C-STORE (2ND LEVEL)	36'-0" x 49'-7"	M	V-B	PROPOSED	2,000 SQ. FT.
	CANOPY	193'-0" x 45'-0"	M	II-B	PROPOSED	6,840 SQ. FT.
	CARWASH	120'-0" x 33'-10"	B	V-B	PROPOSED	4,054 SQ. FT.
	RESTAURANT (x2)	87'-7" x 41'-10"	B	V-B	PROPOSED	(2,400 sq) 4,800 SQ. FT.
	MIXED BUILDING RETAIL (1ST FLOOR 6 SPACES)	237'-6" x 103'-10"	M	V-B	PROPOSED	23,000 SQ. FT.
	MIXED BUILDING RESIDENTIAL (2ND FLOOR) 14 UNITS	237'-6" x 103'-10"	R	V-B	PROPOSED	20,000 SQ. FT.
PHASE III	MULTIFAMILY RESIDENTIAL (1ST FLOOR) 20 UNITS 5 BUILDINGS	201' x 41'-6"	R	V-B	PROPOSED	6,714 SQ. EA. X 5 33,570 SQ.FT.
	MULTIFAMILY RESIDENTIAL (2ND AND 3RD FLOOR) 20 UNITS/ FLOOR= 40 UNITS 5 BUILDINGS	201' x 41'-6"	R	V-B	PROPOSED	3,930 SQ. EA. X 5 19,650 SQ.FT.
	CLUB HOUSE	59'-4" x 47'-3"	M	V-B	PROPOSED	2,800 SQ. FT.
					TOTAL BUILDING AREA:	123,026 SQ.FT.

% OF LOT COVERAGE (EXCLUDING CANOPY) — BUILDING COVERED AREA (1ST FLOOR ONLY) 76,536 SQ. FT. / NET LOT AREA 487,571 SQ. FT. = (15.69%)

PARKING

DESCRIPTION (REQUIRED PARKING)	RATIO	REQD. #
C-STORE + RESTAURANT/ OFFICE	PER 250 G.F.	34 SPACES
RESTAURANT (x2)	PER 250 G.F.	20 SPACES
RETAIL ON MIXED OCCUPANCY (1ST FLOOR)	PER 250 G.F.	92 SPACES
RESIDENTIAL ON MIXED OCC (20) 1 COVERED /UNIT + 1.3/ UNIT		33 SPACES
TOTAL PARKING SPACES REQUIRED PHASE 1 & 2		179 SPACES
RESIDENTIAL MULTIFAMILY (60=280 units) 1 COVERED /UNIT + 1.3/ UNIT		138 SPACES
TOTAL PARKING SPACES REQUIRED PHASE 1 & 2		317 SPACES

DESCRIPTION (PROVIDED PARKING)	SIZE	PROVIDED
PHASE I + II — STANDARD (VEHICLE)	9'-0"x18'-0"	94
PHASE I + II — ACCESSIBLE VAN SPACES	11'-0"x20'-0"	3
PHASE I + II — VACUUM SPACES	9'-0"x20'-0"	18
PHASE I + II — COVERED SPACES	10'-0"x20'-0"	26
PHASE I + II — CUBAN AIR VEHICLE (5% OF REQD.)	9'-0"x18'-0"	16
PHASE I + II — ELECTRIC VEHICLE CHARGING STATION (5% OF REQD.)	9'-0"x18'-0"	12
PHASE I + II — H.V. PARKING	10'-0"x20'-0"	1
TOTAL PARKING SPACES PROVIDED:		173
PHASE III — STANDARD (VEHICLE)	9'-0"x18'-0"	50
PHASE III — ACCESSIBLE VAN SPACES	11'-0"x20'-0"	5
PHASE III — COVERED GARAGES	9'-0"x20'-0"	60
PHASE III — CUBAN AIR VEHICLE (5% OF REQD.)	9'-0"x20'-0"	12
TOTAL PARKING SPACES PROVIDED:		137 = SPACES

AGC DESIGN CONCEPT, INC.
agcdesignconcept.com
3500 Concordia Rd
Yucaipa, CA 92399
Phone: 909.366.1111

BY | REVISIONS | DATE | NO.

PROPOSED SHOPPING CENTER
BAMIYAN MARKET PLACE
SWC. GRAND AVENUE @ ORTEGA HWY.
LAKE ELSINORE, CA

PROPOSED SITE PLAN

consultant job#
master release date
project area date
master drawn by
Filename AGC
Facility/Project
sheet name

CUP-1

Eilar Associates, Inc.
Acoustical and Environmental Consulting Services

Appendix B

Pertinent Sections of the City of Lake Elsinore Public Safety and Welfare Element to the General Plan and Municipal Code

Table 3-2. Interior and Exterior Noise Standards

Land Use Categories		Energy Average LDN	
Categories	**Uses**	**Interior**	**Exterior**
Residential	Single Family, Duplex, Multiple Family	45 [3, 5]	60
	Mobile Homes	–	60 [4]
Commercial, Institutional	Hotel, Motel, Transient Lodging	45 [5]	–
	Hospital, School's classroom	45	–
	Church, Library	45	–

Interpretation

1. Indoor environment excluding: Bathrooms, toilets, closets, corridors.

2. Outdoor environment limited to: Private yard of single family, multi-family private patio or balcony which is served by a means of exit from inside, Mobile Home Park.

3. Noise level requirement with closed windows. Mechanical ventilating system or other means of natural ventilation shall be provided as of Chapter 12, Section 1205 of UBC.

4. Exterior noise level should be such that interior noise level will not exceed 45 CNEL.

5. As per California Administrative Code, Title 24, Part 6, Division T25, Chapter 1, Subchapter 1, Article 4, Section T25-28.

Topography and Climate

Noise amplitude and attenuation characteristics are key factors in the establishment of noise conditions and vary considerably according to natural climate and topographical features. Meteorological factors affecting noise characteristics within the Lake Elsinore planning area include temperature changes, Santa Ana winds, and the amount and duration of rainfall. Topographical features in the planning area include the steep Santa Ana Mountains and Elsinore Mountains to the south and west; the large centrally located, low-lying Lake Elsinore and surrounding local valley; and the rolling hills throughout much of the area. Man-made features within the planning area, such as buildings and structures, agricultural fields, and roadways, also affect noise amplitude and attenuation.

Vehicular Traffic

Because two highly utilized transportation corridors, I-15 and SR 74, traverse the City, roadway traffic is one of the more prevalent sources of noise within the area. Traffic noise varies in how it affects land uses depending upon the type of roadway, distance of the land use from that roadway, topographical setting, and other physical land features such as landscaping, walls, buildings, and other structures. Some variables that affect the amount of noise emitted from a

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.

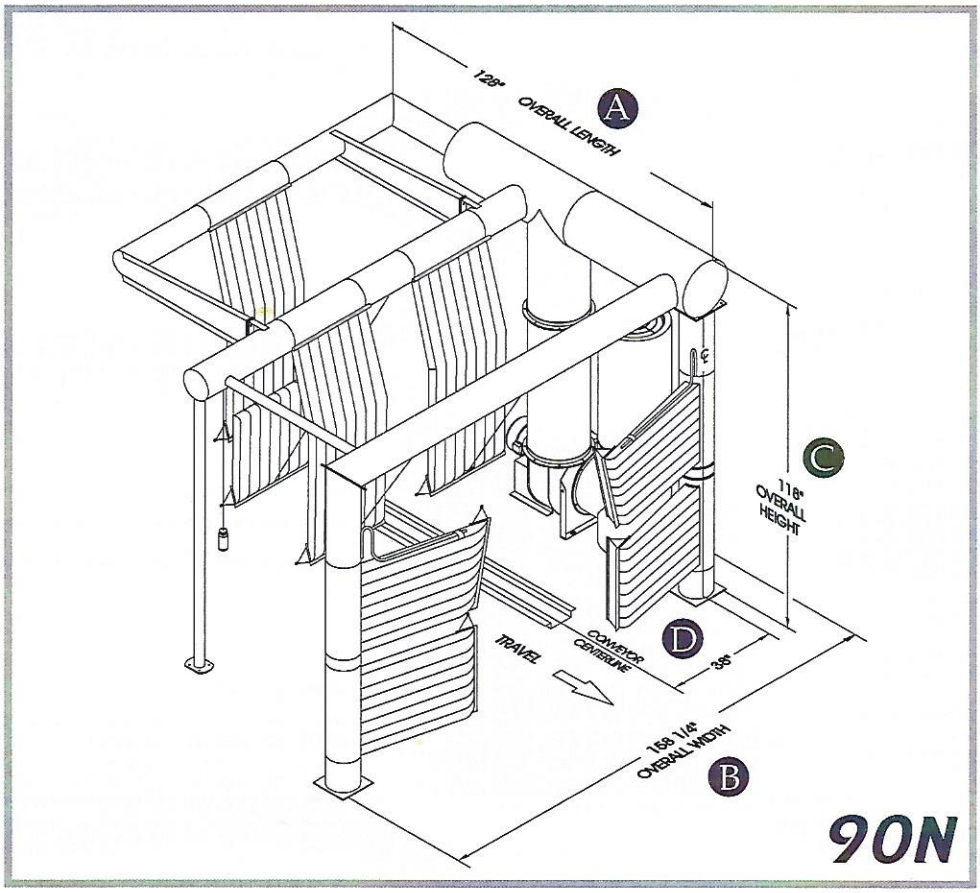
3. Sounding or permitting the sounding of any exterior burglar or fire alarm or any motor vehicle burglar alarm unless such alarm is terminated within 15 minutes of activation.

K. Noise Sensitive Zones.

Eilar Associates, Inc.
Acoustical and Environmental Consulting Services

Appendix C

Manufacturer Data Sheets



EQUIPMENT

- A OVERALL LENGTH 128 in.
- B OVERALL WIDTH 158 1/4 in.
- C OVERALL HEIGHT 118 in.
- D CONVEYOR CENTERLINE 38 in.

MOTORS

- 15-hp, 3600 RPM's
- 208-230 / 460 volts
- 1.25 service factor
- Frame: 254T
- 3 Phase
- Fan-cooled, totally enclosed

NOTE: Wiring and controls to be provided by the purchaser: Additional motor specifications available upon request. Additional voltages available on special order.

EQUIPMENT OPTIONS

- Colors: Blue or Red bags
- The Silencer Package™
- Vehicle Recognition System™ (VRS)
- Mist Eliminator™
- Tunnel Heater

Weight: 1280 lbs. (approximate)

GENERAL DESCRIPTION

The Proto-Vest "Stripper®" was developed to perform as the carwash industry's most efficient and effective drying system. The Stripper's incomparable performance is ideal for carwash centers in need of a reliable dryer that can handle high volume and fast line speeds without sacrificing performance or quality. This system's seven Proto-Duck™ air delivery bags are specifically designed to gently follow a vehicle's contour with a feather light touch, to strip water from its surface.

Proto-Vest's blower/motor assembly is engineered for both maximum efficiency and cost effectiveness. As a result of the Stripper's patented nozzle air delivery systems and the bags close proximity to the vehicle surface, a 15-hp blower is all that is required to dry a vehicle.

Proto-Vest's stringent standards in material selection for our dryers results in extended equipment life and reduced maintenance. The 90N's blower assembly is manufactured from powder coated steel and is AMCA certified. Its plenum is made from 5052-H32 aluminum and its bags are produced from durable Proto-Duck™ material to resist corrosion and tearing.

FEATURES / BENEFITS

Patented Design:
Pressurized air flows through seven patented air delivery bags which strip water from the vehicle's horizontal and vertical surfaces. It dries the hood, roof, deck, windows and sides of the vehicle

Low Maintenance:
Light maintenance and periodic cleaning is recommended to ensure peak performance.

Line Speed Efficiency:
The Stripper dryer has proven to be the most efficient drying system made. With a 15-hp blower, the Stripper will give you approximately a 95% dry car at any line speed.

Efficient design:
Designed to provide the driest car possible with an automatic drying system. The Stripper's patented nozzles gently glide over the vehicle's surfaces, literally stripping away the water.

DECIBEL READINGS

- With Silencer / Without Silencer

	(WS)	(WOS)
90N - (1) 15-hp dryer:		
WS: 10 ft=74.5 dBa;		WOS: 10 ft=82.9 dBa
WS: 20 ft=68.5 dBa;		WOS: 20 ft=76.9 dBa
WS: 30 ft=64.9 dBa;		WOS: 30 ft=73.4 dBa
WS: 40 ft=62.4 dBa;		WOS: 40 ft=70.9 dBa
WS: 50 ft=60.5 dBa;		WOS: 50 ft=69 dBa

(The above decibel readings are interpolated.)

SERVICE / SUPPORT

Proto-Vest recognizes that support after the sale of equipment is critical to the success of our customers. Our company offers its customers access to a wide range of services including: field service technicians, factory direct aftermarket parts, and an engineering staff for custom designed applications.

Proto-Vest Patents:
U.S.: 3,942,430; 4,161,801; 4,409,035; 4,418,442; 4,433,450; 4,445,251; 4,446,592; 4,589,160; 4,700,426; 5,027,714; 5,184,369; 5,187,881; 5,195,207; 5,280,665; 5,421,102; 5,553,346; 5,886,648; 5,901,461; 5,950,324; 5,960,564; 6,038,781; 6,176,024; 6,519,872; others pending.
Canada: 1,021,996; 1,111,328; 1,190,453; 1,201,040; 1,197,439; 1,219,195; 1,219,192; 1,219,194; 1,258,026; 1,219,193; 2,013,749; 2,071,568; 2,071,239; 2,071,388; others pending.

*Specifications subject to change without notice.
**If starting motor over 10-12 times an hour it may be more efficient to leave blower on.

Proto-Vest, Inc., 7400 N. Glen Harbor Blvd., Glendale, AZ 85307 • 800-521-8218 • 623-872-8300 • Fax 623-872-6150
www.proto-vest.com

CA13NA 018–060
Base Series Air Conditioner with Puron® Refrigerant

Carrier
turn to the experts

Product Data

Carrier's CA13 has been designed utilizing Carrier's Puron refrigerant. The environmentally sound refrigerant allows you to make a responsible decision in the protection of the earth's ozone layer.

This product has been designed and manufactured to meet Energy Star® criteria for energy efficiency when matched with appropriate coil components. Refer to the combination ratings in the Product Data for system combinations that meet Energy Star® guidelines.

INDUSTRY LEADING FEATURES / BENEFITS

Efficiency

- 13.0 SEER / 10.9 – 11 EER (based on tested combination)
- Microtube Technology™ refrigeration system
- Energy Star® combinations

Reliability

- Puron® refrigerant – environmentally sound, won't deplete the ozone layer and low lifetime servce cost.
- Scroll compressor
- Internal pressure relief valve
- Internal thermal overload
- Filter drier

Durability

WeatherArmor™ protection package:

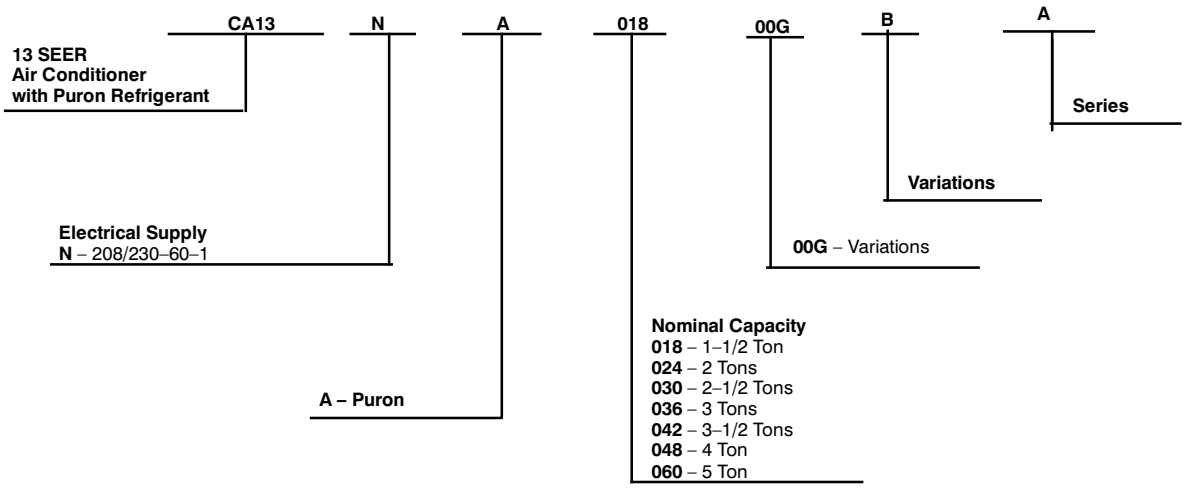
- Solid, durable sheet metal construction
- Dense wire coil guard

Applications

- Long–line – up to 250 feet (76.20 m) total equivalent length, up to 200 feet (60.96 m) condenser above evaporator, or up to 80 ft. (24.38 m) evaporator above condenser (See Longline Guide for more information.)
- Low ambient (down to –20°F/–28.9°C)) with accessory kit

NOTE: **Ratings contained in this document are subject to change at any time. Always refer to the AHRI directory (www.ahridirectory.org) for the most up–to–date ratings information.**

PRODUCT NUMBER NOMENCLATURE



Puron™
the environmentally sound refrigerant

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.

c UL us

ENERGY STAR

This product has been designed and manufactured to meet Energy Star® criteria for energy efficiency when matched with appropriate coil components. However, proper refrigerant charge and proper air flow are critical to achieve rated capacity and efficiency. Installation of this product should follow all manufacturing refrigerant charging and air flow instructions. **Failure to confirm proper charge and air flow may reduce energy efficiency and shorten equipment life.**

A–WEIGHTED SOUND POWER (dBA)

UNIT SIZE – SERIES	Standard Rating (dBA)	TYPICAL OCTAVE BAND SPECTRUM (dBA without tone adjustment)						
		125	250	500	1000	2000	4000	8000
018–A	71	49.5	59.0	63.0	66.5	62.5	58.5	54.0
024–A	73	50.5	61.0	67.0	68.0	65.0	60.0	55.5
030–A	72	52.0	61.5	65.5	66.5	64.5	59.5	54.5
036–C	74	53.5	63.5	68.5	69.5	67.0	65.0	58.5
042–A	75	56.0	64.5	69.5	71.0	66.0	64.0	59.0
048–C	76	54.0	63.0	69.5	71.5	70.0	66.0	58.5
060–C	79	57.5	67.0	72.0	75.0	72.5	68.0	61.0

NOTE: Tested in compliance with AHRI 270–2008 (not listed with AHRI)

A–WEIGHTED SOUND POWER (dBA) WITH SOUND SHIELD

UNIT SIZE – SERIES	Standard Rating (dBA)	TYPICAL OCTAVE BAND SPECTRUM (dBA without tone adjustment)						
		125	250	500	1000	2000	4000	8000
018–A	70	53.5	60.0	62.0	65.5	62.0	57.5	52.5
024–A	73	53.0	62.0	67.5	68.0	65.0	60.0	53.5
030–A	71	54.0	61.5	65.5	66.0	63.5	58.5	52.0
036–C	74	54.0	63.5	68.0	69.0	66.5	64.0	58.5
042–A	74	55.5	64.0	69.0	69.5	65.5	63.5	57.5
048–C	76	55.0	63.0	69.5	71.0	68.5	65.0	58.0
060–C	79	57.5	68.0	72.5	74.5	72.5	68.0	60.5

NOTE: Tested in compliance with AHRI 270–2008 (not listed with AHRI)

METERING DEVICE

UNIT SIZE – SERIES	INDOOOR	REQUIRED SUBCOOLING °F (°C)
18–A	TXV*	10 (5.6)
24–A		10 (5.6)
30–A		10 (5.6)
36–C		12 (6.7)
42–A		10 (5.6)
48–C		15 (8.3)
60–C		15 (8.3)

* TXV must be ordered separately when indoor coil is not equipped with a TXV. TXV must be hard–shutoff type.

Carrier

United Technologies

Product Data

WeatherMaster®
Packaged Rooftop Units
3 to 12.5 Nominal Tons

WeatherMaster®

48HC Sizes 04 to 14
Packaged Rooftop Units with Gas Heat and Optional EnergyX® Energy Recovery Ventilator

Model number nomenclature

48HC MODEL NUMBER NOMENCLATURE

48 HC D E 09 A 2 A 6 A 0 A 3 B 0

Unit Heat Type
48 - Gas Heat Packaged Rooftop

Model Series - WeatherMaster®
HC - High Efficiency

Heat Options
D = Low Gas Heat
E = Medium Gas Heat
F = High Gas Heat
L = Low NOx - Low Gas Heat
M = Low NOx - Medium Gas Heat
N = Low NOx - High Gas Heat
S = Low Heat w/ Stainless Steel Exchanger
R = Medium Heat w/ Stainless Steel Exchanger
T = High Heat w/ Stainless Steel Exchanger
(Low NOx models include – Stainless Steel HX)

Refrig. Systems Options
A = Single stage cooling models
B = Single stage cooling models with Humidi-MiZer®
D = Two stage cooling models
E = Two stage cooling models with Humidi-MiZer
F = Single stage cooling models with Motormaster® Low Ambient Controller
G = Two stage cooling models with Motormaster Low Ambient Controller

Cooling Tons
04 - 3 ton
05 - 4 ton
06 - 5 ton
07 - 6 ton
08 - 7.5 ton
09 - 8.5 ton
11 - 10 ton (12.0 EER)*
12 - 10 ton (11.5 EER)*
14 - 12.5 ton

Sensor Options
A = None
B = RA Smoke Detector
C = SA Smoke Detector
D = RA + SA Smoke Detector
E = CO_2
F = RA Smoke Detector and CO_2
G = SA Smoke Detector and CO_2
H = RA + SA Smoke Detector and CO_2
J = Condensate Overflow Switch
K = Condensate Overflow Switch and RA Smoke Detectors
L = Condensate Overflow Switch and RA + SA Smoke Detectors

Indoor Fan Options 3, 4, 5 Ton Models Only
0 = Electric (Direct) Drive x13 Motor
2 = Medium Static Option - Belt Drive
3 = High Static Option - Belt Drive
Indoor Fan Options 6-12.5 Ton Models Only
1 = Standard Static Option - Belt Drive
2 = Medium Static Option - Belt Drive
3 = High Static Option - Belt Drive
C = High Static Option with High-Efficiency Motor, Belt Drive (Size 14 only)

Coil Options (RTPF) (Outdoor - Indoor - Hail Guard)
A = Al/Cu - Al/Cu
B = Precoat Al/Cu - Al/Cu
C = E-coat Al/Cu - Al/Cu
D = E-coat Al/Cu - E-coat Al/Cu
E = Cu/Cu - Al/Cu
F = Cu/Cu - Cu/Cu
M = Al/Cu -Al/Cu — Louvered Hail Guard
N = Precoat Al/Cu - Al/Cu — Louvered Hail Guard
P = E-coat Al/Cu - Al/Cu — Louvered Hail Guard
Q = E-coat Al/Cu - E-coat Al/Cu — Louvered Hail Guard
R = Cu/Cu - Al/Cu — Louvered Hail Guard
S = Cu/Cu - Cu/Cu — Louvered Hail Guard

Factory Assigned
0 = Standard
1 = LTL

Electrical Options†
A = None
B = HACR Breaker
C = Non-Fused Disconnect
D = Thru-The-Base Connections
E = HACR and Thru-The Base Connections
F = Non-Fused Disconnect and Thru-The-Base Connections
G = 2-Speed Indoor Fan (VFD) Controller
H = 2-Speed Fan Controller (VFD) and HACR Breaker
J = 2-Speed Fan Controller (VFD) and Non-Fused Disconnect
K = 2-Speed Fan Controller (VFD) and Thru-The-Base Connections
L = 2-Speed Fan Controller (VFD) w/ HACR Breaker and Thru-The Base Connections
M = 2-Speed Fan Controller (VFD) with Non-Fused Disconnect and Thru-The-Base Connections

Service Options
0 = None
1 = Unpowered Convenience Outlet
2 = Powered Convenience Outlet
3 = Hinged Panels
4 = Hinged Panels and Unpowered Convenience Outlet
5 = Hinged Panels and Powered Convenience Outlet
C = Foil Faced Insulation
D = Foil Faced Insulation with Unpowered Convenience Outlet
E = Foil Faced Insulation with Powered Convenience Outlet
F = Foil Faced Insulation & Hinged Panels
G = Foil Faced Insulation & Hinged Panels with Unpowered Convenience Outlet
H = Foil Faced Insulation & Hinged Panels with Powered Convenience Outlet

Intake / Exhaust Options
A = None
B = Temperature Economizer w/ Barometric Relief
F = Enthalpy Economizer w/ Barometric Relief
K = 2-Position Damper
Q = EnergyX only
R = EnergyX + Economizer only**
S = EnergyX + Frost Protection only**
T = EnergyX + Economizer + Frost Protection**
U = Low Leak Temperature Economizer w/ Barometric Relief
W = Low Leak Enthalpy Economizer w/ Barometric Relief

Base Unit Controls
0 = Electromechanical Controls can be used with W7212 Controller (Non-Fault Detection and Diagnostic)
1 = PremierLink™ Controller
2 = RTU Open Multi-Protocol Controller
6 = Electro-mechanical w/ 2-speed fan and W7220 controller (w/ Fault Detection & Diagnostic). Can be used with EconoMi$erX
D = ComfortLink Controls (Not available on 2-stage cooling 07 size models or size 11 with Humidi-Mizer®)

Design Revision
A = Factory Design Revision

Voltage††
1 = 575/3/60
3 = 208-230/1/60
5 = 208-230/3/60
6 = 460/3/60

* Staged Air Volume (SAV) is required on sizes 11 and 12 units to meet DOE-2018 minimum efficiency requirements.

† Units sold in the US require a 2-speed fan.

** Includes ComfortLink controls.

†† On single phase models (-3 voltage code), the following are not available as factory-installed options:

- Humidi-MiZer System
- Coated Coils or Cu Fin Coils
- Louvered Hail Guards
- Economizer or 2-Position Damper
- Powered 115 v Convenience Outlet

Puron

ASHRAE 90.1 COMPLIANT

Capacity ratings (cont)

SOUND RATINGS TABLE

48HC UNIT	COOLING STAGES	OUTDOOR SOUND (dB) AT 60 HZ								
		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
D07	2	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
D11	2	87	85.9	87.9	85.6	84.4	82.8	78.5	74.9	72.5
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 measured 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.

Eilar Associates, Inc.
Acoustical and Environmental Consulting Services

Appendix D

Construction Noise and Vibration Calculations

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Excavator
Receiver: C1, C3 Phases 1 & 3, Stage 1 Utilities/Grading

Noise Source

Noise Level (dBA) 82.6 at 20 feet

Distances

Source Elevation 0 feet at 5 feet above grade
Receiver Elevation: 0 feet at 5 feet above grade
Source to Receiver Distance: 200 feet

Path Calculation

Source to Receiver Direct Path Distance: **200** feet

Sound Pressure Level **62.6** at 200 feet
Hours of Use: **12**
Duty Cycle (%): **40**
Level During 12 Hour day: **58.6**

Summation

Number of Sources: 4

Level during 12 hour day: **64.6**

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Backhoe
Receiver: C1, C3

Noise Source

Noise Level (dBA)	81.5	at	20	feet

Distances

Source Elevation	0	feet	at	5	feet above grade
Receiver Elevation:	0	feet	at	5	feet above grade
Source to Receiver Distance:	200	feet			

Path Calculation

Source to Receiver Direct Path Distance:	**200**	feet

Sound Pressure Level	**61.5**	at	200	feet
Hours of Use:	**12**			
Duty Cycle (%):	**40**			
Level During 12 Hour day:	**57.5**			

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Water Truck
Receiver: C1, C3

Noise Source

Noise Level (dBA)	85.2	at	20	feet

Distances

Source Elevation	0	feet	at	5	feet above grade
Receiver Elevation:	0	feet	at	5	feet above grade
Source to Receiver Distance:	200	feet			

Path Calculation

Source to Receiver Direct Path Distance:	**200**	feet

Sound Pressure Level	**65.2**	at	200	feet
Hours of Use:	**12**			
Duty Cycle (%):	**40**			
Level During 12 Hour day:	**61.2**			

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Grader
Receiver: C1, C3

Noise Source

Noise Level (dBA)	76.1	at	25	feet

Distances

Source Elevation	0	feet	at	5	feet above grade
Receiver Elevation:	0	feet	at	5	feet above grade
Source to Receiver Distance:	200	feet			

Path Calculation

Source to Receiver Direct Path Distance:	**200**	feet

Sound Pressure Level	**58.0**	at	200	feet
Hours of Use:	**12**			
Duty Cycle (%):	**40**			
Level During 12 Hour day:	**54.1**			

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Excavator
Receiver: C2 Phase 2, Stage 1 Utilities/Grading

Noise Source

Noise Level (dBA) 82.6 at 20 feet

Distances

Source Elevation 0 feet at 5 feet above grade
Receiver Elevation: 0 feet at 5 feet above grade
Source to Receiver Distance: 130 feet

Path Calculation

Source to Receiver Direct Path Distance: **130** feet

Sound Pressure Level **66.3** at 130 feet
Hours of Use: **12**
Duty Cycle (%): **40**
Level During 12 Hour day: **62.4**

Summation

Number of Sources: 4

Level during 12 hour day: **66.7**

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Backhoe
Receiver: C2

Noise Source

Noise Level (dBA) 81.5 at 20 feet

Distances

Source Elevation 0 feet at 5 feet above grade
Receiver Elevation: 0 feet at 5 feet above grade
Source to Receiver Distance: 130 feet

Path Calculation

Source to Receiver Direct Path Distance: **130** feet

Sound Pressure Level **65.2** at 130 feet
Hours of Use: **12**
Duty Cycle (%): **40**
Level During 12 Hour day: **61.3**

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Water Truck
Receiver: C2

Noise Source

Noise Level (dBA)	85.2	at	20	feet

Distances

Source Elevation	0	feet	at	5	feet above grade
Receiver Elevation:	0	feet	at	5	feet above grade
Source to Receiver Distance:	200	feet			

Path Calculation

Source to Receiver Direct Path Distance:	**200**	feet

Sound Pressure Level	**65.2**	at	200	feet
Hours of Use:	**12**			
Duty Cycle (%):	**40**			
Level During 12 Hour day:	**61.2**			

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Grader
Receiver: C2

Noise Source

Noise Level (dBA)	76.1	at	25	feet

Distances

Source Elevation	0	feet	at	5	feet above grade
Receiver Elevation:	0	feet	at	5	feet above grade
Source to Receiver Distance:	200	feet			

Path Calculation

Source to Receiver Direct Path Distance:	**200**	feet

Sound Pressure Level	**58.0**	at	200	feet
Hours of Use:	**12**			
Duty Cycle (%):	**40**			
Level During 12 Hour day:	**54.1**			

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Concrete Mixer Truck
Receiver: C1, C3, Phases 1 & 3, Stage 2 Foundations

Noise Source

Noise Level (dBA) 76 at 50 feet

Distances

Source Elevation 0 feet at 5 feet above grade
Receiver Elevation: 0 feet at 5 feet above grade
Source to Receiver Distance: 200 feet

Path Calculation

Source to Receiver Direct Path Distance: **200** feet

Sound Pressure Level **64.0** at 200 feet
Hours of Use: **12**
Duty Cycle (%): **40**
Level During 12 Hour day: **60.0**

Summation

Number of Sources: 2

Level during 12 hour day: **61.2**

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Concrete Pump Truck
Receiver: C1, C3,

Noise Source

Noise Level (dBA) 74 at 50 feet

Distances

Source Elevation 0 feet at 5 feet above grade
Receiver Elevation: 0 feet at 5 feet above grade
Source to Receiver Distance: 200 feet

Path Calculation

Source to Receiver Direct Path Distance: **200** feet

Sound Pressure Level **62.0** at 200 feet
Hours of Use: **12**
Duty Cycle (%): **20**
Level During 12 Hour day: **55.0**

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Concrete Mixer Truck
Receiver: C2 Phase 2, Stage 2 Foundations

Noise Source

Noise Level (dBA) 76 at 50 feet

Distances

Source Elevation 0 feet at 5 feet above grade
Receiver Elevation: 0 feet at 5 feet above grade
Source to Receiver Distance: 130 feet

Path Calculation

Source to Receiver Direct Path Distance: **130** feet

Sound Pressure Level **67.7** at 130 feet
Hours of Use: **12**
Duty Cycle (%): **40**
Level During 12 Hour day: **63.7**

Summation

Number of Sources: 2

Level during 12 hour day: **64.9**

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Concrete Pump Truck
Receiver: C2

Noise Source

Noise Level (dBA) 74 at 50 feet

Distances

Source Elevation	0	feet	at	5	feet above grade
Receiver Elevation:	0	feet	at	5	feet above grade
Source to Receiver Distance:	130	feet			

Path Calculation

Source to Receiver Direct Path Distance: **130** feet

Sound Pressure Level	**65.7**	at	130	feet
Hours of Use:	**12**			
Duty Cycle (%):	**20**			
Level During 12 Hour day:	**58.7**			

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Paver
Receiver: C1, C3, Phases 1 & 3, Stage 3 Paving

Noise Source

Noise Level (dBA) 71 at 50 feet

Distances

Source Elevation 0 feet at 5 feet above grade
Receiver Elevation: 0 feet at 5 feet above grade
Source to Receiver Distance: 200 feet

Path Calculation

Source to Receiver Direct Path Distance: **200** feet

Sound Pressure Level **59.0** at 200 feet
Hours of Use: **12**
Duty Cycle (%): **50**
Level During 12 Hour day: **55.9**

Summation

Number of Sources: 3

Level during 12 hour day: **61.7**

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Roller
Receiver: C1, C3,

Noise Source

Noise Level (dBA)	81.6	at	20	feet

Distances

Source Elevation	0	feet	at	5	feet above grade
Receiver Elevation:	0	feet	at	5	feet above grade
Source to Receiver Distance:	200	feet			

Path Calculation

Source to Receiver Direct Path Distance:	**200**	feet

Sound Pressure Level	**61.6**	at	200	feet
Hours of Use:	**12**			
Duty Cycle (%):	**20**			
Level During 12 Hour day:	**54.6**			

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Dump Truck
Receiver: C1, C3,

Noise Source

Noise Level (dBA)	75	at	50	feet

Distances

Source Elevation	0	feet	at	5	feet above grade
Receiver Elevation:	0	feet	at	5	feet above grade
Source to Receiver Distance:	200	feet			

Path Calculation

Source to Receiver Direct Path Distance:	**200**	feet

Sound Pressure Level	**63.0**	at	200	feet
Hours of Use:	**12**			
Duty Cycle (%):	**40**			
Level During 12 Hour day:	**59.0**			

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Paver
Receiver: C2 Phase 2, Stage 3 Paving

Noise Source

Noise Level (dBA) 71 at 50 feet

Distances

Source Elevation 0 feet at 5 feet above grade
Receiver Elevation: 0 feet at 5 feet above grade
Source to Receiver Distance: 130 feet

Path Calculation

Source to Receiver Direct Path Distance: **130** feet

Sound Pressure Level **62.7** at 130 feet
Hours of Use: **12**
Duty Cycle (%): **50**
Level During 12 Hour day: **59.7**

Summation

Number of Sources: 3

Level during 12 hour day: **63.8**

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Roller
Receiver: C2

Noise Source

Noise Level (dBA) 81.6 at 20 feet

Distances

Source Elevation 0 feet at 5 feet above grade
Receiver Elevation: 0 feet at 5 feet above grade
Source to Receiver Distance: 130 feet

Path Calculation

Source to Receiver Direct Path Distance: **130** feet

Sound Pressure Level **65.3** at 130 feet
Hours of Use: **12**
Duty Cycle (%): **20**
Level During 12 Hour day: **58.4**

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Dump Truck
Receiver: C2

Noise Source

Noise Level (dBA)	75	at	50	feet

Distances

Source Elevation	0	feet	at	5	feet above grade
Receiver Elevation:	0	feet	at	5	feet above grade
Source to Receiver Distance:	200	feet			

Path Calculation

Source to Receiver Direct Path Distance:	**200**	feet

Sound Pressure Level	**63.0**	at	200	feet
Hours of Use:	**12**			
Duty Cycle (%):	**40**			
Level During 12 Hour day:	**59.0**			

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412.3
Date: 12/30/2019
Source: Forklift
Receiver: C1, C3, Phases 1 & 3, Stage 4 Framing

Noise Source

Noise Level (dBA) 82.4 at 50 feet

Distances

Source Elevation 0 feet at 5 feet above grade
Receiver Elevation: 0 feet at 5 feet above grade
Source to Receiver Distance: 200 feet

Path Calculation

Source to Receiver Direct Path Distance: **200** feet

Sound Pressure Level **70.4** at 200 feet
Hours of Use: **12**
Duty Cycle (%): **40**
Level During 12 Hour day: **66.4**

Summation

Number of Sources: 1

Level during 12 hour day: **66.4**

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412.3
Date: 12/30/2019
Source: Forklift
Receiver: C2 Phase 2, Stage 4 Framing

Noise Source

Noise Level (dBA) 82.4 at 50 feet

Distances

Source Elevation 0 feet at 5 feet above grade
Receiver Elevation: 0 feet at 5 feet above grade
Source to Receiver Distance: 130 feet

Path Calculation

Source to Receiver Direct Path Distance: **130** feet

Sound Pressure Level **74.1** at 130 feet
Hours of Use: **12**
Duty Cycle (%): **40**
Level During 12 Hour day: **70.1**

Summation

Number of Sources: 1

Level during 12 hour day: **70.1**

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Noise Attenuation by Distance Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 12/30/2019
Source: Compressor
Receiver: C3

Noise Source

Noise Level (dBA) 61 at 50 feet

Distances

Source Elevation 0 feet at 5 feet above grade
Receiver Elevation: 0 feet at 5 feet above grade
Source to Receiver Distance: 85 feet

Path Calculation

Source to Receiver Direct Path Distance: **85** feet

Sound Pressure Level **56.4** at 85 feet
Hours of Use: **12**
Duty Cycle (%): **100**
Level During 12 Hour day: **56.4**

Summation

Number of Sources: 1

Level during 12 hour day: **56.4**

Construction Vibration Calculation

Job: Bamiyan Marketplace
Job #: S190412
Date: 6/18/2019
Source 1: Vibratory Roller (Worst-Case)
Receiver: Southwest PL

Vibration Source

Vibration Level (PPV, in/sec) 0.21 at 25 feet

Path Calculation

Source to Receiver Direct Path Distance: **50** feet

Vibration Level (PPV, in/sec) **0.074** at 50 feet

Path Calculation

Source to Receiver Direct Path Distance: **75** feet

Vibration Level (PPV, in/sec) **0.040** at 75 feet

Path Calculation

Source to Receiver Direct Path Distance: **195** feet

Vibration Level (PPV, in/sec) **0.010** at 195 feet