NOISE IMPACT ANALYSIS

Westmont of La Mesa
Murray Drive
La Mesa, California

Prepared For

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1.0 EXECUTIVE SUMMARY

The proposed project, known as Westmont of La Mesa, consists of the development of a currently vacant site to contain a new assisted living and memory care facility. The project site is located on Murray Drive, adjacent to the State Route 125 overpass, in the City of La Mesa, California.

As per City of La Mesa requirements, noise levels at outdoor use areas of the project site should be 65 CNEL or less. Future traffic noise impacts were calculated for common outdoor use areas on the site to determine compliance with this requirement. As future traffic noise level impacts were calculated to be less than 65 CNEL at all outdoor use areas, no project design features are deemed necessary for attenuating exterior noise impacts. Additional details are provided in Section 5.1.1 of this report.

The City of La Mesa and State of California require interior noise levels of 45 CNEL or less in residential units. Calculations show that future noise levels on site are expected to exceed 60 CNEL at many locations at the proposed building, and therefore, the developer shall have an exterior-to-interior noise analysis performed by an acoustical consultant when building plans become available, prior to the issuance of building permits, in order to demonstrate that the project will have interior noise levels that meet the noise standards of the City of La Mesa and State of California. The required interior noise levels are feasible and can be achieved with readily available building materials and construction methods. Mitigation typically includes fresh air ventilation and enhanced glazing.

Calculations show that noise levels from project-generated traffic are expected to be less than significant. Additionally, anticipated HVAC units are expected to meet the applicable noise limits set within the City of La Mesa Municipal Code at surrounding property lines, without considering potential shielding that would be provided by parapet walls. The noise impacts caused by project deliveries, landscaping, and trash removal are also expected to be less than significant. No mitigation is deemed necessary for attenuating these noise impacts aside from adhering to the appropriate hours of operation for landscaping equipment.

The City of La Mesa Municipal Code does not provide noise limits for temporary construction activity at surrounding noise-sensitive property lines; however, construction activities within CN or residential zones are prohibited between the hours of 10 p.m. and 7 a.m. and on Sundays. Calculations demonstrate that brief noise impacts are expected to be adequately controlled by the standard construction noise control mitigation measures listed in the Mitigation Monitoring Reporting Program (MMRP), as documented herein, and that no sound attenuation barriers would be necessary for controlling construction noise impacts.

2.0 INTRODUCTION

This acoustical analysis report is submitted to satisfy the noise evaluation requirement of the City of La Mesa. This analysis will demonstrate project compliance with noise regulations found within the City of La Mesa Noise Element to the General Plan and Municipal Code. Its purpose is to assess noise impacts from nearby roadway traffic noise and to identify project features or requirements necessary to achieve exterior noise levels of 65 CNEL or less in outdoor activity areas and interior noise levels of 45 CNEL or less in interior habitable space. This analysis will also address the potential noise impacts caused by the project at surrounding noise sensitive receivers, and, if needed, recommend mitigation to reduce impacts to be compliant with applicable noise limits.

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting, abbreviated "dBA," to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol "L_{EQ}." Unless a different time period is specified, "L_{EQ}" is implied to mean a period of one hour. Some of the data may also be presented as octave-band-filtered and/or A-octave-band-filtered data, which are a series of sound spectra centered about each stated frequency, with half of the bandwidth above and half of the bandwidth below each stated frequency. This data is typically used for machinery noise analysis and barrier calculations.

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 10 dB added weighting on the same nighttime hours but no added weighting on the evening hours. Sound levels expressed in CNEL are always based on A-weighted decibels. These data unit metrics are used to express noise levels for both measurement and municipal noise ordinances and regulations, for land use guidelines, and 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 method 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 Westmont of La Mesa, consists of the development of a currently vacant site to contain a new assisted living and memory care facility. There will be 109 assisted living suites and 31 memory care suites for a total of 140 units. The proposed project will also include public outdoor use areas for residents, including two courtyards, two ground floor patio areas, four second floor patio areas, and two third floor patio areas. The surrounding parcels to the north are occupied by the Grossmont Health Care Center and Briercrest Park to the northeast. The area immediately adjacent to the east is used as a staging area for the Grossmont Medical Center. Existing single-family residential properties are located to the northeast and east, beyond the aforementioned land uses and across Wakarusa Street. There are no noise-receiving properties located immediately to the south or west of the site, as the project is immediately adjacent to Murray Drive and Interstate 8 to the south and State Route 125 to the west. For additional project details, please refer to the project plans provided in Appendix A.

2.2 Project Location

The project site is located on the north side of Murray Drive, immediately to the east of the State Route 125 overpass, in the City of La Mesa, California. The Assessor's Parcel Numbers (APNs) are 490-390-17-00 and 490-390-23-00. 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 Standards

This acoustical analysis report is submitted to satisfy the acoustical requirements of the City of La Mesa Noise Element to the General Plan. The City of La Mesa Noise Element to the General Plan requires that at a multifamily residential or nursing home property, indoor noise levels are attenuated to 45 CNEL for habitable space and noise levels at outdoor use areas do not exceed 65 CNEL. Exterior noise levels of up to 70 CNEL are considered conditionally acceptable in the City of La Mesa, such that new construction is only undertaken after a detailed analysis of noise reduction requirements is made and interior noise levels are adequately controlled to be beneath the appropriate threshold.

In addition, project-generated noise impacts must meet the noise regulations contained within the City of La Mesa Municipal Code which specifies noise limits based on the zoning of the properties in question. The project site is proposed to be an assisted living land use, which is currently zoned R-1S (Suburban Residential). Surrounding properties to the north and east are also zoned R-1S. Any noise-sensitive properties to the south or west of the proposed project site are located at a considerable distance, as they are located beyond the immediately adjacent Murray Drive, Interstate 8, or State Route 125, at which point noise impacts from the project are not expected to be audible. The City of La Mesa Municipal Code, Section 10.80.090, states that noise generated by mechanical equipment cannot cause noise levels to exceed the presumed ambient base noise level for the zone in question by more than five (5) decibels. Ambient base noise levels are shown in Section 10.80.040 of the Municipal Code and are 60 dBA between the hours of 7 a.m. and 7 p.m., 55 dBA between the hours of 7 p.m. and 10 p.m., and 50 dBA between the hours of 10 p.m. and 7 a.m. for properties zoned R-1. In order to remain in compliance with the noise regulations of the City of La Mesa Municipal Code, noise levels from project operation should not exceed 65 dBA, 60 dBA, or 55 dBA at surrounding property lines during daytime, evening, or nighttime hours, respectively. Specific noise limits are not defined in the Municipal Code for other project-generated noise sources, such as landscaping equipment, deliveries, or trash removal, and for this reason, it is assumed that the same noise limits applicable to machinery would apply for these noise sources.

The Municipal Code also contains general requirements for temporary construction noise impacts. According to Section 10.80.100 of the code, construction activities within CN or residential zones are prohibited between the hours of 10 p.m. and 7 a.m. and on Sundays. During permissible hours of operation, the City does not have a noise limit with which construction noise must comply.

Pertinent sections of the City of La Mesa Noise Element to the General Plan and Municipal Code are provided in Appendix B.

3.0 ENVIRONMENTAL SETTING

3.1 Existing Noise Environment

3.1.1 Vehicle Traffic Information

The primary noise sources in the vicinity of the project site include automobile and truck traffic noise from State Route 125, Interstate 8, Murray Drive, and Wakarusa Street. No other noise sources are considered significant.

Current and future traffic volumes are given based on information from the San Diego Association of Governments (SanDAG) Series 12 Transportation Forecast Information Center (located on the SanDAG website at http://tfic.sandag.org/), the California Department of Transportation (Caltrans), or the City of La Mesa.

State Route 125 is a six-lane, two-way Freeway running north-south immediately to the west of the project site. The posted speed limit is 65 mph. According to traffic information in the Caltrans publication "State Route 125 Transportation Concept Summary," the current traffic volume is estimated to be approximately 98,200 Average Daily Trips (ADT) as of the year 2007. According to SanDAG traffic volume estimates, State Route 125 currently carries approximately 43,100 ADT traveling northbound and 46,200 ADT traveling southbound as of the year 2008, for a total traffic volume of 89,300 ADT. Although Caltrans estimates exceed that provided by SanDAG, in attempting to calibrate the Traffic Noise Model (see Section 3.1.3), it was observed that the lower of the two traffic volumes produced a result that more closely reflected the measured traffic noise levels on the site. For this reason, SanDAG figures were considered in the evaluation of current traffic noise levels to the site.

Interstate 8 is an eight-lane, two-way Freeway running east-west to the south of the project site. The posted speed limit is 65 mph. According to traffic counts provided by Caltrans, Interstate 8 currently carries approximately 221,000 ADT for eastbound and westbound traffic combined as of the year 2014.

Murray Drive is a four-lane, two-way Light Collector running east-west along the south boundary of the project site. The posted speed limit is 40 mph. According to Chris Gonzales, Community Development Program Coordinator with the City of La Mesa, the current traffic volume of Murray Drive is assumed to be approximately 8,210 ADT.

Wakarusa Street is a two-lane, two-way Local Roadway running generally north-south to the northeast of the project site. The posted speed limit is 25 mph. According to SanDAG, the current traffic volume of Wakarusa Street is approximately 4,200 ADT as of the year 2008.

No current or future truck percentages were available for roadways other than freeways 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 1.0% medium and 0.5% heavy trucks was used for Murray Drive, and a mix of 0.5% medium trucks and 0.5% heavy trucks was used for Wakarusa Street. Truck percentage mixes for State Route 125 and Interstate 8 were provided by Caltrans. State Route 125 is currently expected to carry approximately 2.6% medium and 1.8% heavy trucks, while Interstate 8 is expected to carry 2.5% medium and 1.9% heavy trucks.

Current and future traffic volumes for the roadway sections near the project site are shown below in Table 1. For further roadway details and ADT traffic volumes, please refer to Appendix C: Traffic Noise Model (TNM) Data and Results.

Table 1. Overall Traffic Information					
Roadway Name	**Speed Limit (mph)**	**Vehicle Mix (%)**		**Current ADT (Year)**	**Future ADT (Year)**
		Medium	**Heavy**		
NB State Route 125	65	2.6	1.8	43,100 (2008)	78,550 (2030)
SB State Route 125	65	2.6	1.8	46,200 (2008)	78,550 (2030)
EB Interstate 8	65	2.5	1.9	110,500 (2014)	121,300 (2035)
WB Interstate 8	65	2.5	1.9	110,500 (2014)	123,000 (2035)
Murray Drive	40	1.0	0.5	8,210 (2016)	25,000 (Capacity)
Wakarusa Street	25	0.5	0.5	4,200 (2008)	4,600 (2035)

Noise contours were calculated for the project site using Traffic Noise Model without considering project structures in the current noise environment. Noise contours are irregularly shaped due to the presence and topography of many surrounding roadways. The site is exposed to noise levels ranging from approximately 63 CNEL to 73 CNEL in the current noise environment. For a graphical representation of contours, please refer to Figure 5: Site Plan Showing Current Traffic CNEL Contours and Noise Measurement Location.

3.1.2 Ambient Noise Environment

An on-site inspection was conducted at 1:45 p.m. on Thursday, March 10, 2016. The weather conditions were as follows: winds at 8 to 12 mph, moderate humidity, and temperatures in the mid 70s. A noise measurement was taken near the south boundary of the project site, approximately 125 feet north of the Murray Drive centerline. The microphone position was approximately five feet above the existing grade. The dominant source of noise during the measurement was traffic noise from surrounding roadways, with most of the traffic noise coming from State Route 125. The measured noise level can be seen in Table 2, and the measurement location is shown graphically on Figures 5 and 6.

Table 2. On-Site Noise Measurement Conditions and Results	
Date	Thursday, March 10, 2016
Time	1:48 p.m. – 2:05 p.m.
Conditions	Partly cloudy skies, winds at 8-12 mph, temperature in the mid 70s with moderate humidity
Measured Noise Level	64.1 dBA L_{EQ}

3.1.3 Calculated Noise Level

Noise levels were calculated for the site using the methodology described in Section 4.1.2 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 differences, such as reflection and absorption, which may be greater or lesser than accounted for in the model.

The measured noise level of 64.1 dBA L_{EQ} at the 125 feet from the Murray Drive centerline was compared to the calculated (modeled) noise level of 66.1 dBA L_{EQ} for the same conditions and traffic flow. According to the Federal Highway Administration's Highway Traffic Noise: Analysis and Abatement Guide (see reference), a traffic noise model is considered validated if the measured and calculated noise impacts differ by three decibels or less. No adjustment was deemed necessary to model future noise levels for this location 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 3.

Table 3. Calculated versus Measured Traffic Noise Data

Location	Calculated	Measured	Difference	Correction
125 feet from Murray Drive centerline	66.1 dBA L_{EQ}	64.1 dBA L_{EQ}	2.0 dB	None Applied

3.2 Future Noise Environment

The future noise environment in the vicinity of the project site will be primarily a result of the same ambient noise sources, as well as the noise generated by the proposed uses at the project site.

3.2.1 Future Traffic Volumes and Project-Generated Traffic

Future traffic volumes of surrounding roadways have been provided by the same data sources as current traffic volumes. According to the Caltrans report on State Route 125, the traffic volume of this freeway is expected to increase to 157,100 ADT by the year 2030. Traffic volumes on Interstate 8 are expected to increase to 121,300 ADT traveling eastbound and 123,000 ADT traveling westbound by the year 2035, according to SanDAG data. Mr. Gonzales with the City of La Mesa stated that, at full capacity, Murray Drive would carry up to 25,000 ADT, and therefore, this maximum value was used in future traffic noise calculations. According to SanDAG, the traffic volume of Wakarusa Street is expected to increase to 4,600 ADT by the year 2035.

Future noise contours were calculated for the project site using Traffic Noise Model without considering project structures. Noise contours will remain irregularly shaped in the future. In the future noise environment, the site is expected to be exposed to noise levels ranging from approximately 65 CNEL to 76 CNEL. For a graphical representation of contours, please refer to Figure 6: Site Plan Showing Future Traffic CNEL Contours and Noise Measurement Location.

The City of La Mesa has not requested that a traffic study be prepared for the project site. For this reason, typical trip generation data has been provided to the architect by the City of La Mesa. The expected breakdown of project-generated traffic volumes is as follows:

2.5 trips per dwelling unit for Assisted Living = 2.5 trips x 109 units = Approx. 273 ADT

3 trips per bed for Memory Care = 3 trips x 31 beds = 93 ADT

Total Project-Generated Traffic = 366 ADT

As project-generated traffic is expected to be added to Murray Drive, the expected current traffic volume with the project would be 8,576 ADT (increased from 8,210 ADT). These figures will be used in the evaluation of project-generated traffic noise, found in Section 5.1.3.

3.2.2 Project-Generated Noise Sources

The following section lists some of the project-generated noise sources anticipated to be associated with the proposed development. Further discussion and analysis is found in Section 5.2.

Air Conditioning Units

Air conditioning units will be roof-mounted on the proposed building. The manufacturer/model of air conditioning units on site is currently unknown; however, according to the project architect, the York ZH product line could potentially be used at the project site. The estimated capacities of units required are nine 10-ton units throughout the building and one 12.5-ton unit to serve the kitchen. Sound power levels for the units were provided by the manufacturer, and are shown in Table 4 below. Manufacturer data sheets are provided in Appendix D.

Table 4. Sound Power Levels of York Predator ZH Series Air Conditioning Units

Source	Sound Power at Octave Band Frequency (dB)								Total (dBA)
	63	125	250	500	1K	2K	4K	8K	
York ZH120 (10-ton)	80	82	82	80	78	74	74	69	83
York ZH150 (12.5-ton)	84	86	86	84	82	78	78	73	87

Deliveries/Service Vehicles

Deliveries and maintenance at the project site are expected to be standard for this type of facility. The project architect provided the following list of expected deliveries and service vehicles that would regularly visit the site, as well as the anticipated frequency:

- Operational Deliveries (trucks with trailers)
  - U.S. Foods – twice each week
  - Dairy – twice each week
  - Bread – two to three time each week

- Service Vehicles (van-type vehicles)
  - Landscaping – once each week
  - Carpet cleaning – once each quarter
  - Pest control – once each month
  - Housekeeping and chemicals – once each month
  - Activity supplies – once each month
  - Office supplies – once each month

- Medical supplies – once each month
- Fire sprinklers – once each quarter and one annual certification
- Elevators – once each quarter

The impact of service vehicles is expected to be insignificant, due to the relative infrequency of trips to the site required and the fact that these vans would not be expected to generate any more noise than a standard vehicle entering and exiting the parking lot.

Deliveries would have the potential to create a more significant impact, as they would consist of a truck entering the project site, driving up to the northwest corner of the site to turn the truck around, backing into the loading area near the southwest corner of the building while sounding a backup alarm, unloading, and then exiting the site. Delivery noise is evaluated in more depth in this report to ensure impacts to surrounding properties will be limited. Due to the number of total deliveries in a week and the fact that trucks will require time to unload material, it is assumed that no more than one delivery would take place in an hour. The loudest noise levels would be generated by the dairy delivery, which would be expected to arrive in a refrigerated truck. In order to approximate noise from this source, noise levels measured for a previous study conducted by Eilar Associates were implemented into the Cadna noise model (see Section 4.1.3). The previous noise measurement was performed at an existing Henry's grocery store. The noise measurement was performed at a distance of 15 feet from an operational refrigerated truck (both engine and refrigeration unit running) and was one minute in duration. In order to determine worst-case noise levels at surrounding property lines, the L_{MAX} of this noise measurement was input into the noise model (rather than the average noise level, or L_{EQ}) in order to evaluate operational noise levels of the refrigerated truck maneuvering in the parking lot with its refrigeration unit running. Noise measurement data is shown in Table 5.

Table 5. Sound Pressure Level of Operational Refrigerated Truck, at 15 feet

Source	Sound Pressure Level at Octave Band Frequency (dB)								Total L_{MAX} (dBA)
	63	125	250	500	1K	2K	4K	8K	
Refrigerated Truck	90.8	84.8	79.9	81.3	80.0	76.8	71.6	66.0	84.1

Additionally, noise measurements made by Eilar Associates of a truck backup alarm were incorporated into calculations (76.0 dBA at 50 feet). Both of these noise sources have been incorporated into the operational noise model for the project site.

Landscape Maintenance

As mentioned above, landscaping maintenance crews would be expected to visit the site once weekly. Typical landscaping equipment would be expected to be present, including lawn mowers, hedge trimmers, weed-whackers, leaf blowers, and other similar equipment. Per the City of La Mesa Municipal Code, Section 10.80.101, landscaping equipment may only be operational between the hours of 7 a.m. and 7 p.m. during Pacific Standard Time and between 7 a.m. and 8 p.m. during Pacific Daylight Savings Time.

Trash Removal

Trash removal is expected to occur on a weekly basis. The trash enclosure is indicated on project plans around the southwest corner of the building, near the service and delivery area.

3.2.3 Temporary Construction Equipment

Construction information was provided by the project architect. The entire process is expected to take approximately 14 to 18 months from groundbreaking. The architect provided equipment information for the grading and utilities phase of construction, which is when the most heavy equipment would be operational on site and therefore, noise levels at neighboring properties would be at their highest. Unless otherwise noted, construction equipment noise levels were obtained from the DEFRA Construction Equipment Noise Database (see reference). Noise levels are shown in Table 6.

Table 6. Typical Construction Equipment Noise Levels

Equipment Description	Duty Cycle (%)	Noise Level at 50 feet (dBA)
Backhoe	40	64
Skip Loader	40	64
Dozer	40	71
Dump Truck	40	76
Water Truck[1]	40	77
Excavator with Jackhammer Attachment	20	86

[1] Source: Noise measurements performed by Eilar Associates on March 25, 2010 for Brutoco Engineering & Construction, Inc. for the Orange Line Extension Project, Metro Contract #C0943, City of Los Angeles, California.

These noise levels will be incorporated into the temporary construction noise analysis for the site, provided in Section 5.3.

4.0 METHODOLOGY AND EQUIPMENT

4.1 Methodology

4.1.1 Field Measurement

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

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

4.1.2 Roadway Noise Calculation

The Traffic Noise Model software, 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. TNM calculates the daytime average Hourly Noise Level (HNL) from traffic data including road alignment, elevation, lane configuration, projected traffic volumes, estimated truck composition percentages and vehicle speeds. The HNL is equivalent to the L_{EQ}.

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 TNM, 6.5% 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 1 p.m. and 2 p.m. in the vicinity of the project site. Further explanation can be supplied on request.

4.1.3 Cadna Noise Modeling

Modeling of the outdoor noise environment is accomplished using Cadna Version 4.6, which is a model-based computer program developed by DataKustik for predicting noise impacts in a wide variety of conditions. Cadna (Computer Aided Noise Abatement) assists in the calculation, presentation, assessment, and alleviation of noise exposure. It allows for the input of project information such as noise source data, barriers, structures, and topography to create a detailed model and uses the most up-to-date calculation standards to predict outdoor noise impacts. Noise standards used by Cadna that are particularly relevant to this analysis include ISO 9613 (Attenuation of sound during propagation outdoors). Cadna provides results that are in line with basic acoustical calculations for distance attenuation and barrier insertion loss. Further explanation may be provided upon request.

4.1.4 Formulas and Calculations

<u>Decibel Addition</u>

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:

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

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.

Attenuation Due To Distance

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.

Sound Power to Sound Pressure

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

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

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

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.

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).

4.2 Measurement Equipment

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

- Larson Davis Sound Expert LxT Type 1 Sound Level Meter, Serial #4084, with microphone & windscreen
- Larson Davis Model CA250 Calibrator, Serial #2625
- Tripod

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

5.0 IMPACTS AND MITIGATION

5.1 Traffic Noise Impacts

5.1.1 Exterior Traffic Noise Impacts

As per the City of La Mesa Noise Element to the General Plan, noise levels impacting outdoor use areas of multifamily residential or nursing home land uses should be limited to 65 CNEL or less. Exterior noise levels of up to 70 CNEL are considered conditionally acceptable in the City of La Mesa, such that new construction is only undertaken after a detailed analysis of noise reduction requirements is made and interior noise levels are adequately controlled to be beneath the appropriate threshold.

Common outdoor use areas on site include two courtyards, two ground floor patio areas, four second floor patio areas, and two third floor patio areas. Future traffic noise levels for common outdoor use areas have been evaluated in Traffic Noise Model and are shown in Table 7. Calculations take the shielding provided by the proposed building into account. Receiver locations are shown in Figure 7, and additional information is provided in Appendix C: Traffic Noise Model (TNM) Data and Results.

Table 7. Future Traffic Noise Levels at Outdoor Use Areas		
Receiver	**Location**	**Exterior Traffic Noise Level (CNEL)**
OU1	Outdoor Courtyard (Rear)	46.8
OU2	Memory Care Courtyard	46.3
OU3	Memory Care Ground Floor Patio 1	51.8
OU4	Memory Care Ground Floor Patio 2	51.7
OU5	Memory Care Second Floor Patio 1	48.4
OU6	Assisted Living Second Floor Patio 1	59.9
OU7	Assisted Living Second Floor Patio 2	48.6
OU8	Memory Care Second Floor Patio 2	48.1
OU9	Memory Care Third Floor Patio 1	54.8
OU10	Memory Care Third Floor Patio 2	55.2

As shown above, noise levels at the proposed common outdoor use areas are not expected to exceed 65 CNEL in the future noise environment, as adequate noise shielding is provided by the proposed building structures. These noise levels meet City of La Mesa noise regulations as currently designed, and therefore, no additional project design features are deemed necessary to attenuate exterior noise impacts.

In addition to the assessment of future traffic noise levels at outdoor use areas, future noise levels at building facades have also been calculated. Results of this analysis are shown in Table 8, and receiver locations are shown graphically in Figure 8.

Table 8. Future Traffic Noise Levels at Building Facades				
Receiver	**Facade Location**	**Exterior Traffic Noise Level (CNEL)**		
		First Floor	**Second Floor**	**Third Floor**
R1	South Facade	68.8	71.8	73.9
R2	South Facade	70.2	72.0	73.5
R3	South Facade	71.3	72.8	74.9
R4	West Facade	69.2	73.9	76.5
R5	West Facade	65.6	73.5	76.4
R6	North Facade	56.6	61.4	68.5
R7	East Facade (At Courtyard)	52.3	54.9	57.4
R8	North Facade (At Courtyard)	46.7	50.3	53.8
R9	East Facade	58.7	62.0	66.7
R10	East Facade	61.4	65.1	70.0

5.1.2 Interior Traffic Noise Impacts

The State of California and the City of La Mesa 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. 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.

Calculations show that future noise levels on site are expected to exceed 60 CNEL at many locations at the proposed building, and therefore, the developer shall have an exterior-to-interior noise analysis performed by an acoustical consultant when building plans become available, prior to the issuance of building permits, in order to demonstrate that the project will have interior noise levels that meet the noise standards of the City of La Mesa and State of California.

The required interior noise levels are feasible and can be achieved with readily available building materials and construction methods. Specific recommendations for interior noise control would be provided in a supplemental noise study. Mitigation typically includes fresh air ventilation and enhanced glazing.

5.1.3 Project-Generated Traffic Noise Impacts

As a traffic study was not required by the City of La Mesa, the City has used the SanDAG formula for estimating the average daily trips generated by the project site. As detailed in Section 3.2.1, the project is expected to add 366 ADT to the current traffic volume of Murray Drive, increasing the traffic volume from 8,210 ADT to 8,576 ADT. Using the calculation methodology detailed in Section 4.1.4, it is determined that the change in sound energy along Murray Drive would be approximately 0.2 dB. As an increase of 3 dB is widely accepted as “barely perceptible,” this change in traffic noise is expected to be less than significant. For this reason, it can be determined that project-generated traffic noise will have a less than significant impact on surrounding noise-sensitive properties in the vicinity of the project site. No mitigation is deemed necessary for the attenuation of these noise impacts.

5.2 Operational Noise Sources

The operational noise sources detailed in Section 3.2.2 are evaluated in this section in further depth to ensure that noise impacts from these sources will be less than significant.

<u>Air Conditioning Units</u>

Noise levels from air conditioning units were calculated at the nearest surrounding property lines to the north and northeast using Cadna. Calculations consider shielding that would be provided by the proposed building but do not include any parapet walls that may be present at the roof. All other receivers are located at a greater distance and therefore will experience lower noise levels than those predicted herein as they will receive additional noise attenuation due to distance and shielding from intervening structures. It is assumed that air conditioning units will be roof-mounted. As air conditioning equipment may operate during nighttime hours, noise impacts will be compared to the most restrictive nighttime noise limits to determine compliance. Results are shown in Table 9 and calculation sheets are provided in Appendix E. For a graphical representation of modeled AC locations and receiver locations, please refer to Figure 9.

Table 9. Air Conditioning Unit Noise Levels			
Receiver	**Description**	**Nighttime Noise Limit (dBA)**	**Estimated Noise Level (dBA)**
PL1	North Property Line 1	55	35.2
PL2	Northeast Property Line 1	55	42.2

As shown above, noise levels from typical mechanical equipment on site are expected to meet the applicable nighttime noise limits set by the City of La Mesa without the implementation of mitigation measures. As daytime and evening noise limits exceed those specified for nighttime hours, daytime and evening noise limits will also be met during equipment operation.

Deliveries

Noise from truck deliveries on site was calculated using the noise information provided in Section 3.2.2 in order to determine average hourly noise impacts. Given the total number of deliveries per week, it is assumed that there will be no more than one delivery in an hour.

Deliveries would consist of a truck entering the project site, driving up to the northwest corner of the site to turn the truck around, backing into the loading area near the southwest corner of the building, unloading, and then exiting the site. Backup alarms would be operational for a brief period of time near the northwest of the project site and again near the southwest corner of the building. When backup alarms are operational, it was assumed that this noise source would be present for one minute out of the hour, as the source is intermittent in nature and will only operate for a very short period of time. As hours of deliveries have not been specified, it is assumed for purposes of this analysis that deliveries could potentially take place during the nighttime hours of 10 p.m. to 7 a.m., during which the most restrictive nighttime noise limits would apply.

Receivers have been calculated at a height of five feet above grade at the two nearest property lines to the north and northeast. All other receivers are located at a greater distance and therefore will experience lower noise levels than those predicted herein as they will receive additional noise attenuation due to distance and shielding from intervening structures. Calculated delivery noise impacts are shown in Table 10, and also include noise impacts from air conditioning unit operation. Additional information is provided in Appendix E. Receiver locations and noise contours are shown graphically in Figure 9.

Table 10. Operational Delivery Noise Levels			
Receiver	**Description**	**Nighttime Noise Limit (dBA)**	**Estimated Noise Level (dBA)**
PL3	North Property Line 2	55	54.7
PL4	Northeast Property Line 2	55	46.9

As shown above, noise levels from truck loading activity are expected to remain below the applicable nighttime noise limit of 55 dBA at all surrounding property lines. As daytime and evening noise limits exceed those specified for nighttime hours, daytime and evening noise limits will also be met during deliveries. Any other neighboring properties are located at a greater distance from the

project site and will therefore be exposed to lesser noise levels as a result of additional distance attenuation and shielding provided by on-site structures. For these reasons, this noise source would be considered less than significant and no mitigation is deemed necessary for attenuating noise impacts from on-site deliveries at the proposed project site.

Landscape Maintenance

Landscaping maintenance crews would be expected to visit the site once weekly. Typical landscaping equipment would be expected to be present, including lawn mowers, weed-whackers, hedge trimmers, leaf blowers, and other similar equipment. Per the City of La Mesa Municipal Code, Section 10.80.101, landscaping equipment may only be operational between the hours of 7 a.m. and 7 p.m. during Pacific Standard Time and between 7 a.m. and 8 p.m. during Pacific Daylight Savings Time. During these hours of operation, noise levels should comply with the applicable daytime or evening noise limits of 65 dBA or 60 dBA, respectively. As landscaping equipment will only be operational for a brief period of time once weekly, and as equipment will not idle in one location for long periods of time, but rather, will consistently move along around the property, noise impacts to neighboring property lines would be expected to be brief in duration and would not be expected to exceed the applicable noise limits of 65 dBA during daytime operation or 60 dBA during evening operation, when allowable. For these reasons, provided the acceptable hours of operation for landscaping are followed on the project site, noise impacts from landscaping activity would be expected to be less than significant at surrounding properties.

Trash Removal

Trash removal is expected to occur on a weekly basis. The trash enclosure is indicated on project plans around the southwest corner of the building, near the service and delivery area. The City of La Mesa does not indicate any exceptions in their noise ordinance for trash removal vehicles, and therefore, it is assumed that these vehicles must meet the noise limits defined within the Municipal Code as well.

Trash removal vehicles are expected to drive along the same route shown for delivery trucks, as detailed above. These trucks are also expected to use backup alarms in the same locations as the delivery trucks and will load refuse into the vehicles from the trash enclosure, located near the southwest corner of the proposed building. As the calculated delivery truck noise impacts considered a refrigerated truck, which is expected to have noise levels which exceed those generated by a typical trash removal truck due to the added compressor at the front of the cab, trash removal vehicles are expected to generate similar or lesser noise levels as what is shown for delivery vehicles. Since delivery truck noise impacts are shown to be less than the most restrictive nighttime noise limit, noise from trash removal trucks is also assumed to be in compliance with these noise limits. For this reason, noise impacts from trash removal trucks are expected to be less than significant, and no mitigation would be deemed necessary to attenuate these noise impacts.

5.3 Temporary Construction Noise

According to the City of La Mesa Municipal Code, Section 10.80.100, construction activities within CN or residential zones are prohibited between the hours of 10 p.m. and 7 a.m. and on Sundays. During permissible hours of operation, the City does not have a noise limit with which construction noise must comply; however, the County of San Diego Municipal Code was used as a guide to determine whether any significant noise impacts will be temporarily experienced during project construction. The County of San Diego requires that construction noise is limited to an average of

75 dBA for an eight-hour period. Typical noise levels of construction equipment that may be used on site is listed in Section 3.2.3, Table 6.

Noise from grading activity was evaluated to determine potential temporary noise impacts to the surrounding noise sensitive receivers to the northeast (Briercrest Park). Any other potentially noise-sensitive receivers are located at a greater distance from construction activity and therefore, would be exposed to lesser noise impacts due to distance attenuation and shielding provided by intervening structures. The noise source was calculated from the approximate center of the construction area to the northeast property line (approximately 120 feet) to evaluate typical impacts to the receiver as equipment moves around the property. Considering the noise levels of equipment shown in Table 6, the maximum noise impact at the northeast property line is expected to be approximately 73 dBA, falling below the 75 dBA noise limit of the County of San Diego. Detailed calculations can be found in Appendix F: Temporary Construction Noise Calculations.

As grading represents the noisiest activity that will take place on site, and as the evaluated receiver to the northeast is the nearest affected receiver, it can be determined that no significant impact will be caused by brief construction activity taking place on site. No sound attenuation barriers are therefore deemed necessary to reduce temporary noise impacts; however, the Mitigation Monitoring and Report Program (MMRP) does require that the following general mitigation measures be followed on the project site to assist in the reduction of construction noise impacts to surrounding receivers:

1. Construction equipment shall be properly maintained per manufacturers' specifications and fitted with the best available noise suppression devices (e.g. mufflers, silencers, wraps).

2. Construction operations and related activities shall comply with the operational hours outlined in the City Noise Ordinance.

3. Construction equipment shall not be idled for extended periods of time in the vicinity of noise-sensitive receivers.

4. Fixed and/or stationary construction equipment (e.g. generators, compressors, rock crushers, cement mixers) shall be located as far as possible from noise-sensitive receivers.

5. All impact tools shall be shrouded or shielded, and all intake and exhaust ports on powered constructed equipment shall be muffled or shielded.

With the aforementioned general construction noise control methods in place, temporary construction noise is not expected to have a significant impact on surrounding properties.

5.4 Additional Considerations

Another source of noise that may affect residential units in multifamily buildings is unit-to-unit noise transmission. The California State Building Code requires that the Sound Transmission Class (STC) rating of common wall assemblies separating residential units from one another and residential units from common areas (such as corridors, stairways, storage rooms, and the like) have a minimum laboratory rating of STC 50. The same STC requirement applies for floor/ceiling assemblies, and an added requirement dictates that the Impact Insulation Class (IIC) rating of the floor/ceiling assembly is a minimum laboratory rating of IIC 50.

This level of evaluation is not possible at this time, as the project is in the preliminary design stages and assemblies have not yet been specified. For this reason, the developer shall have an evaluation of wall and floor/ceiling assemblies performed by an acoustical consultant when building plans become available, prior to the issuance of building permits, in order to demonstrate that the project will meet the requirements for acoustical separation found within the California Building Code. Minimum sound ratings of STC 50 for walls and STC 50 and IIC 50 for floor/ceiling assemblies must be met at the proposed development.

5.5 Summary of Mitigation

The following list summarizes the mitigation measures required at the project site to ensure that noise impacts to the project site and generated by uses at the project site will be less than significant:

NOI-1. The developer shall have an exterior-to-interior noise analysis performed by an acoustical consultant when building plans become available, prior to the issuance of building permits, in order to demonstrate that the project will have interior noise levels that meet the noise standards of the City of La Mesa and State of California. Specific recommendations for interior noise control would be provided in a supplemental noise study. Mitigation typically includes fresh air ventilation and enhanced glazing.

NOI-2. Landscaping activity must be limited to the acceptable hours of operation outlined in the City of La Mesa Municipal Code (activity prohibited between 7 p.m. and 7 a.m. during Pacific Standard Time and between 8 p.m. and 7 a.m. during Pacific Daylight Savings Time).

NOI-3. Construction equipment shall be properly maintained per manufacturers' specifications and fitted with the best available noise suppression devices (e.g. mufflers, silencers, wraps).

NOI-4. Construction operations and related activities shall comply with the operational hours outlined in the City Noise Ordinance (activity prohibited between 10 p.m. and 7 a.m. and on Sundays).

NOI-5. Construction equipment shall not be idled for extended periods of time in the vicinity of noise-sensitive receivers.

NOI-6. Fixed and/or stationary construction equipment (e.g. generators, compressors, rock crushers, cement mixers) shall be located as far as possible from noise-sensitive receivers.

NOI-7. All impact tools shall be shrouded or shielded, and all intake and exhaust ports on powered constructed equipment shall be muffled or shielded.

NOI-8. The developer shall have an evaluation of common wall and floor/ceiling assemblies performed by an acoustical consultant when building plans become available, prior to the issuance of building permits, in order to demonstrate that the project will meet the requirements for acoustical separation found within the California Building Code, which pertain to all walls and floor/ceiling assemblies separating residential units from one another or residential units from common space. Minimum sound ratings of STC 50

for walls and STC 50 and IIC 50 for floor/ceiling assemblies must be met at the proposed development.

With the aforementioned mitigation measures in place, noise impacts to residents on the project site and to off-site receivers are expected to be controlled such that they will remain in compliance with City of La Mesa noise regulations and will be less than significant.

6.0 CONCLUSION

As per City of La Mesa requirements, noise levels at outdoor use areas of the project site should be 65 CNEL or less. Future traffic noise impacts were calculated for common outdoor use areas on the site to determine compliance with this requirement. As traffic noise levels at common outdoor use areas are expected to remain below 65 CNEL in the future noise environment, they are expected to meet City of La Mesa noise regulations as currently designed. Calculations show that future noise levels on site are expected to exceed 60 CNEL at many locations at the proposed building, and therefore, the developer shall have an exterior-to-interior noise analysis performed by an acoustical consultant when building plans become available, prior to the issuance of building permits, in order to demonstrate that the project will have interior noise levels that meet the noise standards of the City of La Mesa and State of California. The required interior noise levels are feasible and can be achieved with readily available building materials and construction methods. Mitigation typically includes fresh air ventilation and enhanced glazing.

Calculations show that noise levels from project-generated traffic are expected to be less than significant. Additionally, anticipated HVAC units are expected to meet the applicable noise limits set within the City of La Mesa Municipal Code at surrounding property lines, without considering potential shielding that would be provided by parapet walls. The noise impacts caused by project deliveries, landscaping, and trash removal are also expected to be less than significant. No mitigation is deemed necessary for attenuating these noise impacts aside from adhering to the appropriate hours of operation for landscaping equipment.

The City of La Mesa Municipal Code does not provide noise limits for temporary construction activity at surrounding noise-sensitive property lines; however, construction activities within CN or residential zones are prohibited between the hours of 10 p.m. and 7 a.m. and on Sundays. Calculations demonstrate that brief noise impacts are expected to be adequately controlled by the standard construction noise control mitigation measures listed in the Mitigation Monitoring Reporting Program (MMRP), as documented herein, and that no sound attenuation barriers would be necessary for controlling construction noise impacts.

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 issues associated with Westmont of La Mesa, to be located on Murray Drive in the City of La Mesa, California. This report was prepared by Amy Hool and Jonathan Brothers.

Amy Lynn Hool

Amy Hool, Principal Acoustical Consultant

Jonathan Brothers, Senior Acoustical Consultant

8.0 REFERENCES

1. Beranek, Leo L., *Acoustical Measurements*, Published for the Acoustical Society of America by the American Institute of Physics, Revised Edition, 1988.

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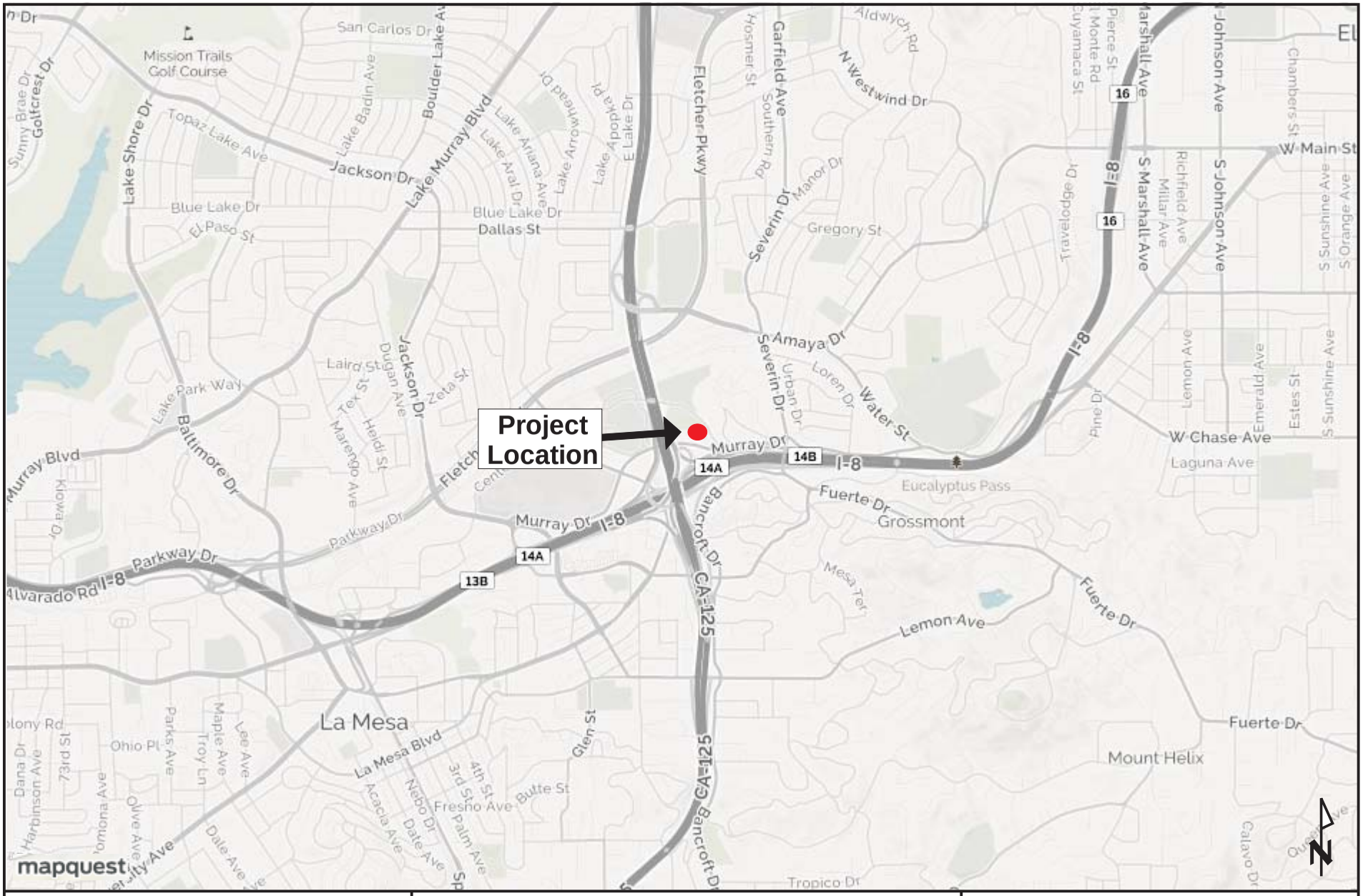
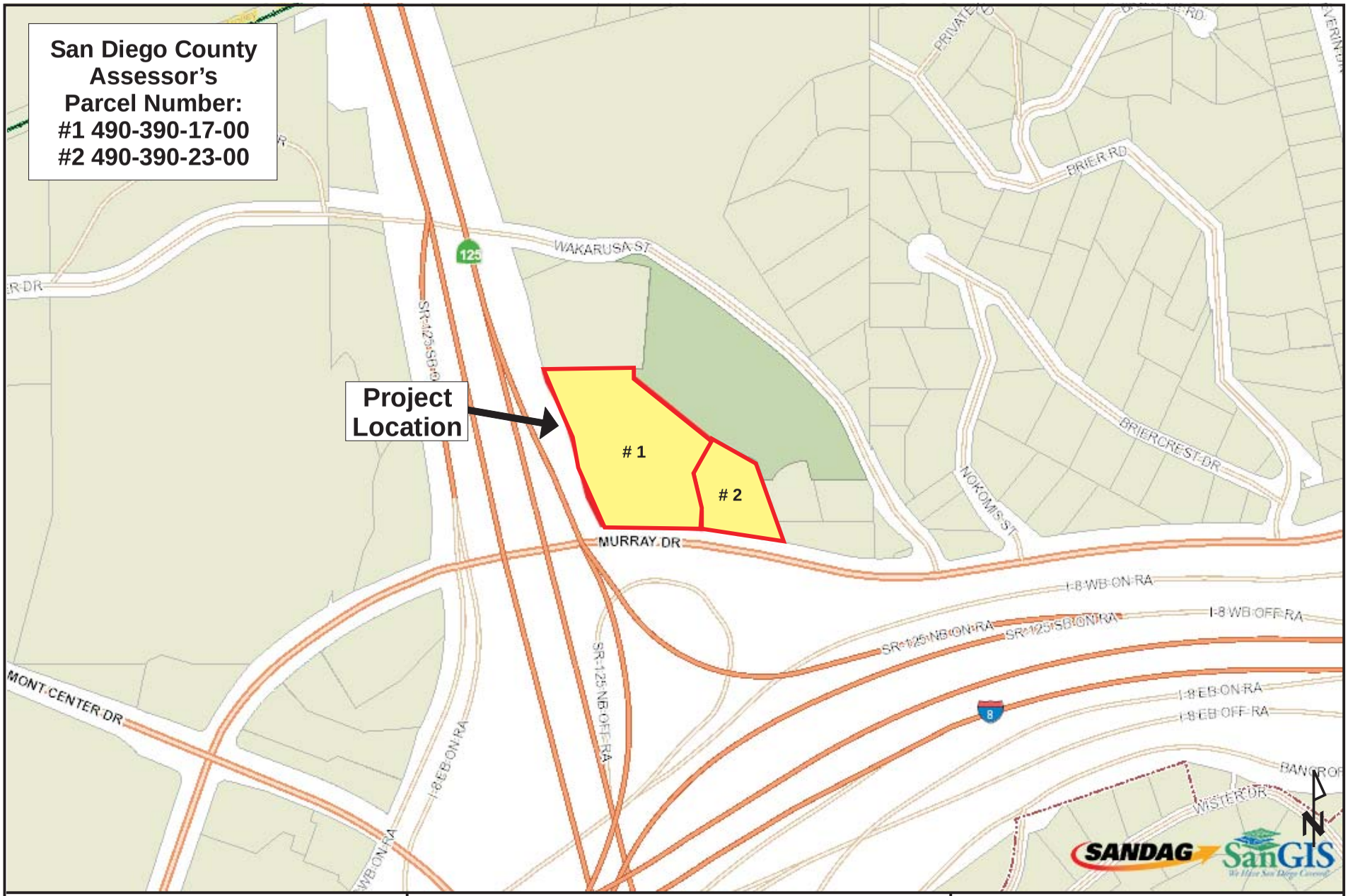
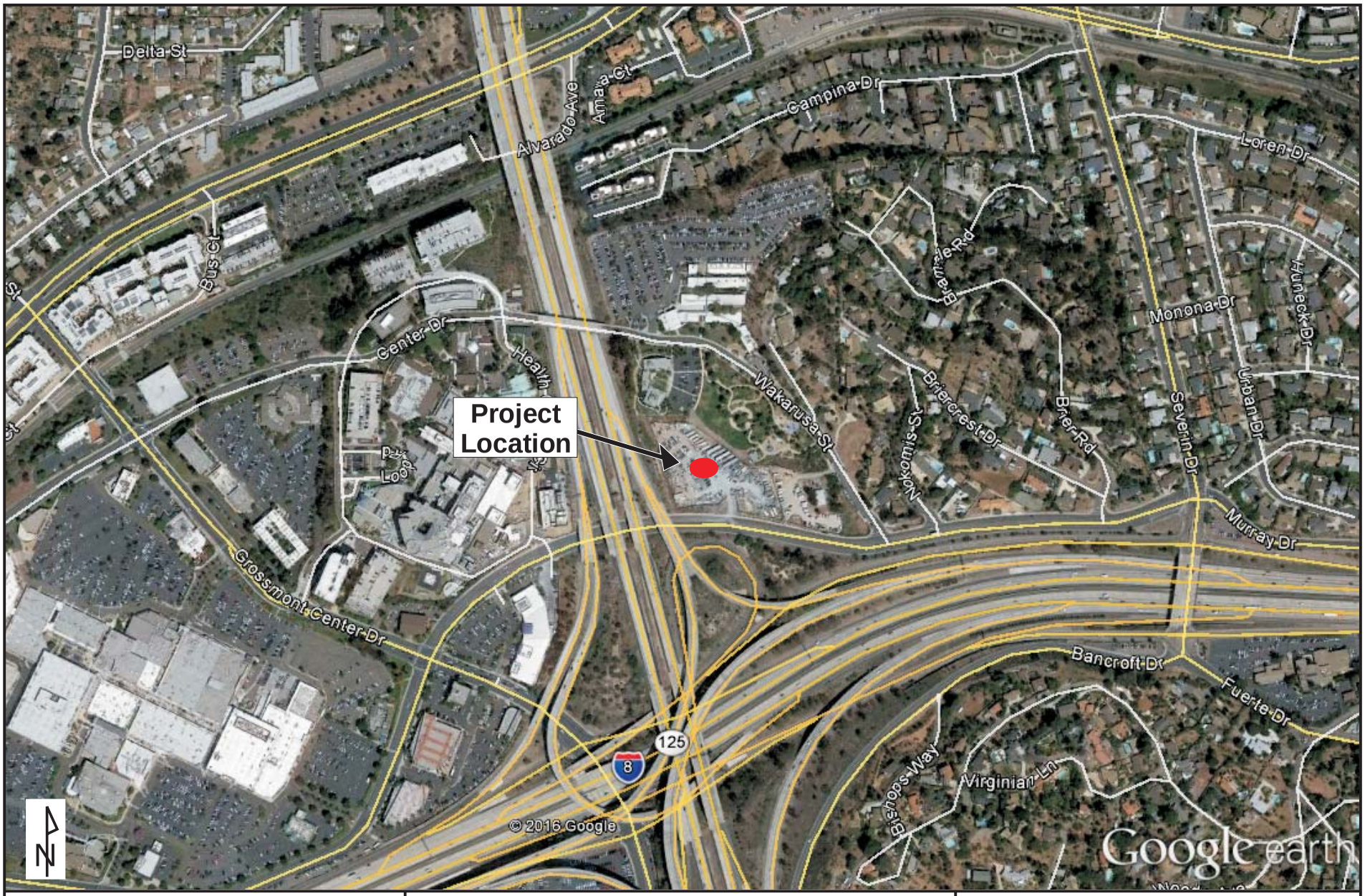
FIGURES



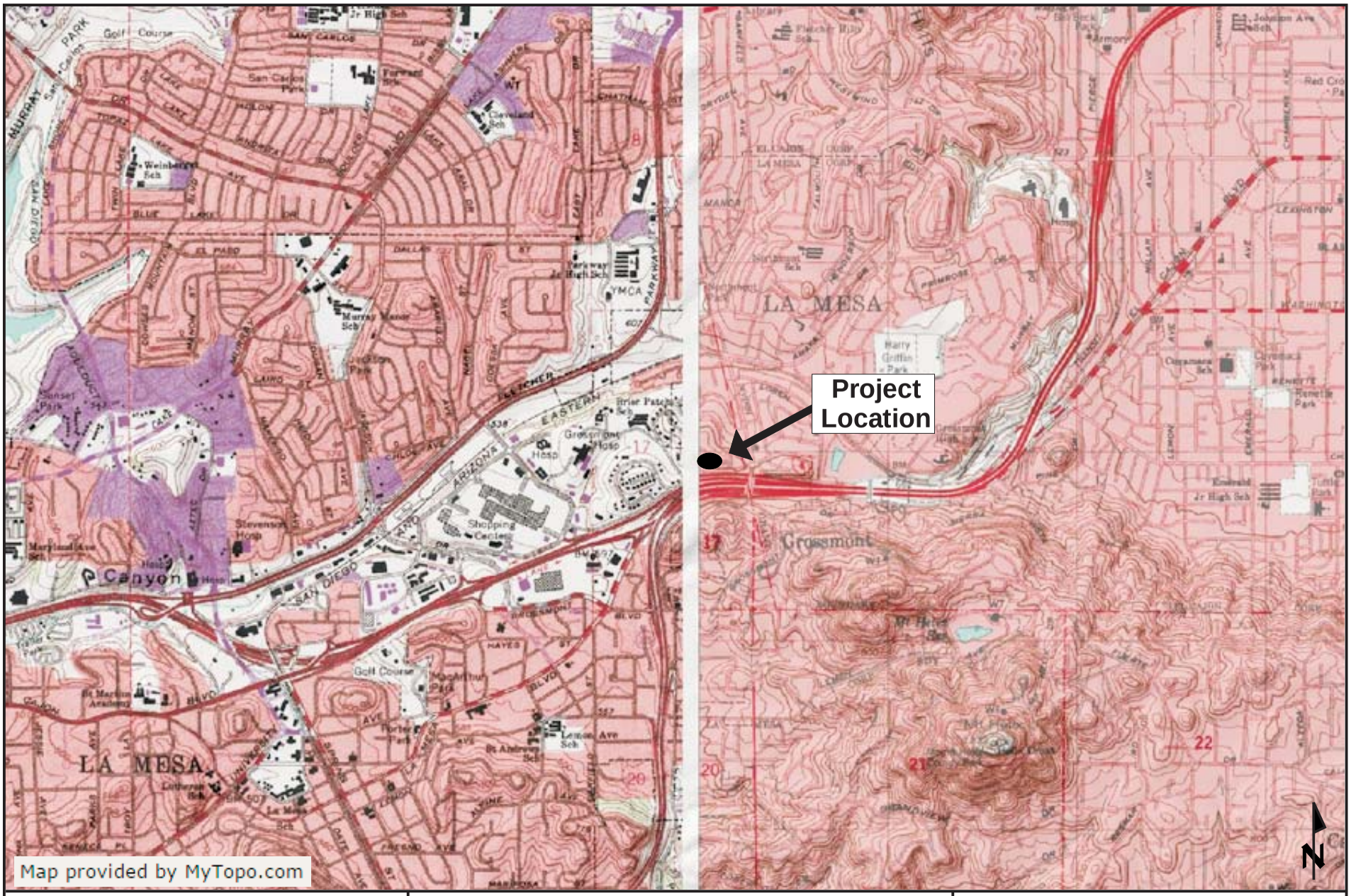
Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Vicinity Map** **Job # B60301N1**	**Figure 1**



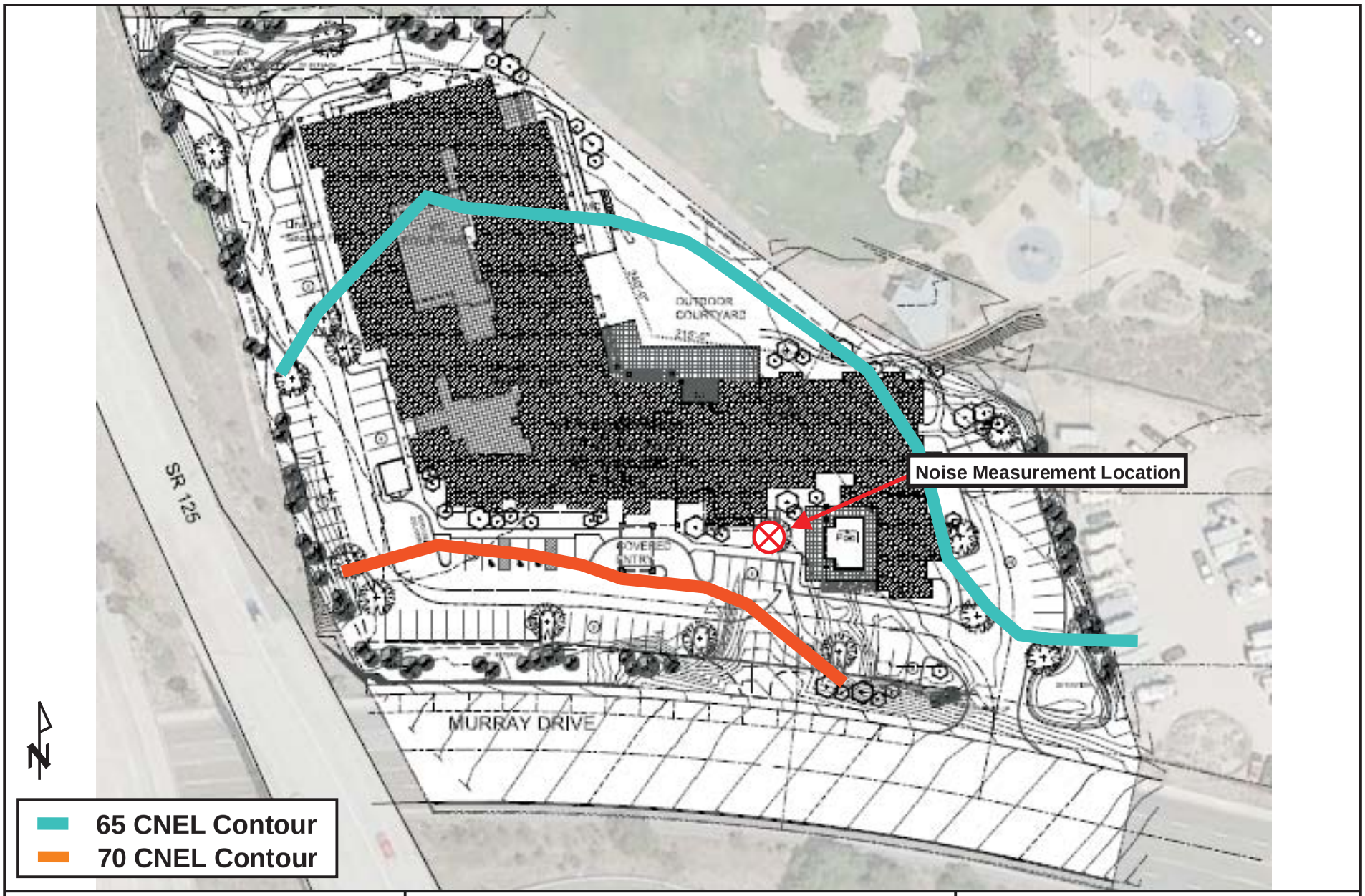
Eilar Associates, Inc. 210 South Juniper Street, Suite 100 Escondido, California 92025 760-738-5570	Assessor's Parcel Map Job # B60301N1	Figure 2



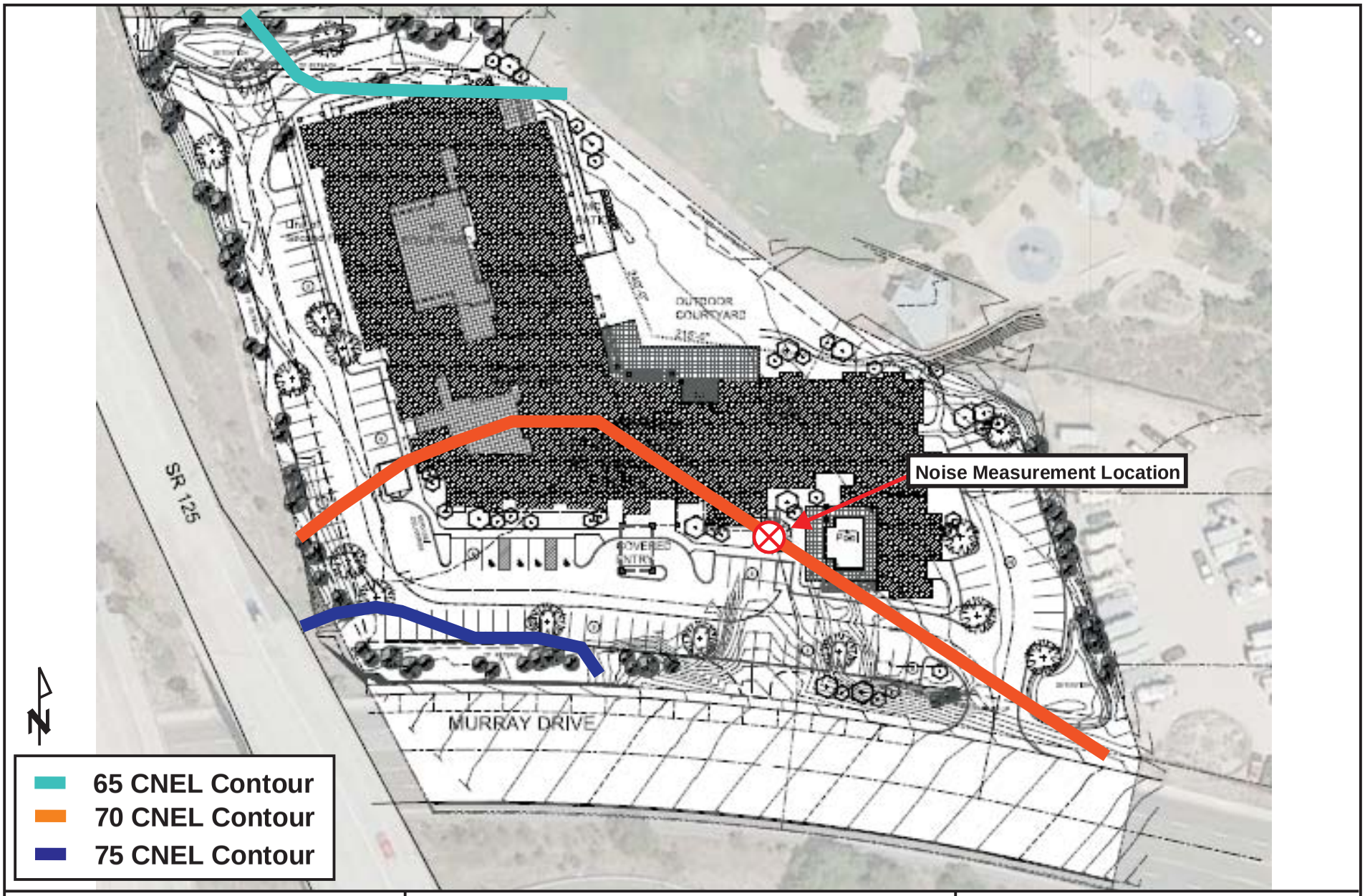
Eilar Associates, Inc. 210 South Juniper Street, Suite 100 Escondido, California 92025 760-738-5570	Satellite Aerial Photograph Job # B60301N1	Figure 3



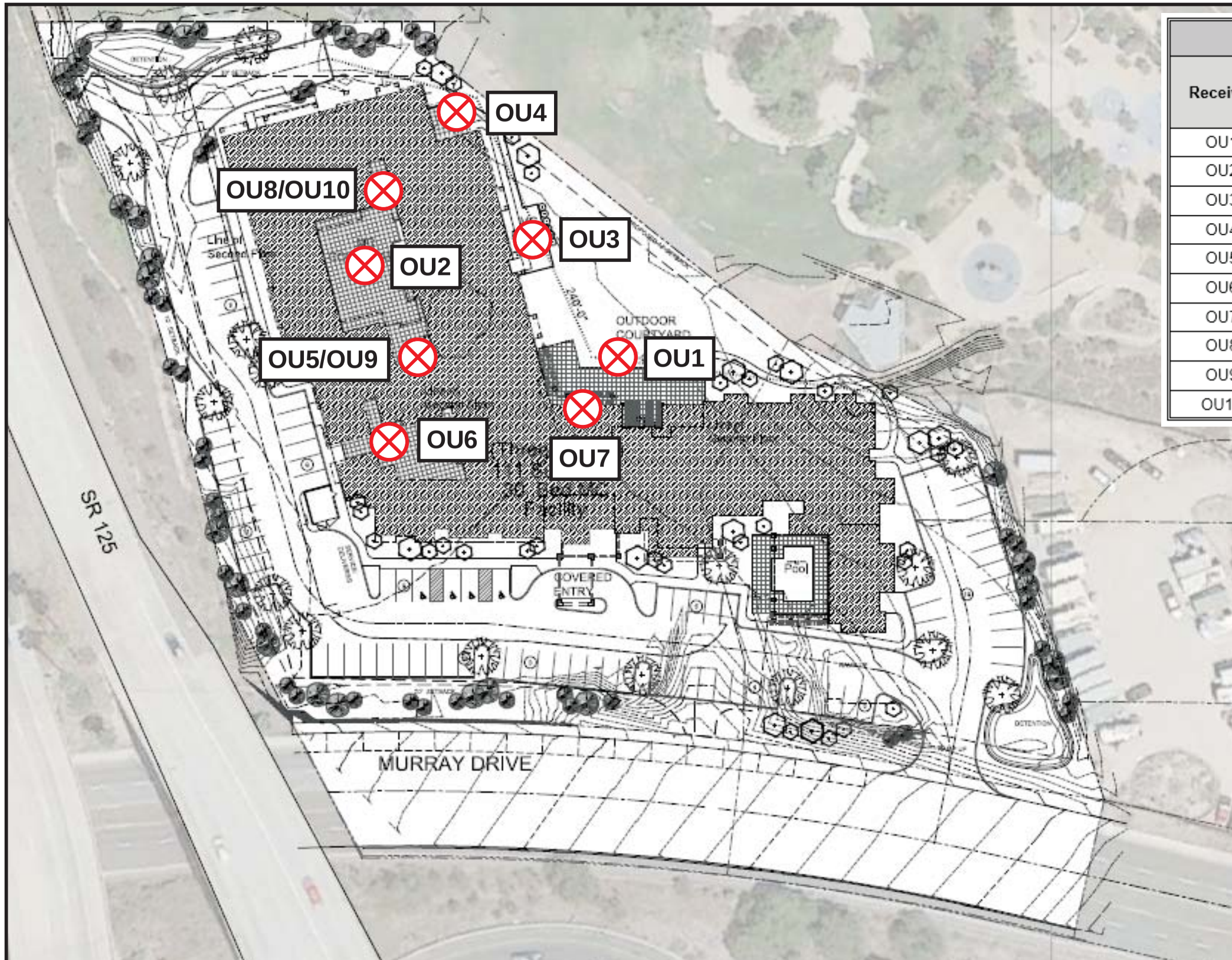
Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Topographic Map** **Job # B60301N1**	**Figure 4**



Eilar Associates, Inc. 210 South Juniper Street, Suite 100 Escondido, California 92025 760-738-5570	Site Plan Showing Current Traffic CNEL Contours and Noise Measurement Location Job # B60301N1	Figure 5



Eilar Associates, Inc. 210 South Juniper Street, Suite 100 Escondido, California 92025 760-738-5570	Site Plan Showing Future Traffic CNEL Contours and Noise Measurement Location Job # B60301N1	Figure 6



Future Traffic Noise Levels at Outdoor Use Areas		
Receiver	**Location**	**Exterior Traffic Noise Level (CNEL)**
OU1	Outdoor Courtyard (Rear)	46.8
OU2	Memory Care Courtyard	46.3
OU3	Memory Care Ground Floor Patio 1	51.8
OU4	Memory Care Ground Floor Patio 2	51.7
OU5	Memory Care Second Floor Patio 1	48.4
OU6	Assisted Living Second Floor Patio 1	59.9
OU7	Assisted Living Second Floor Patio 2	48.6
OU8	Memory Care Second Floor Patio 2	48.1
OU9	Memory Care Third Floor Patio 1	54.8
OU10	Memory Care Third Floor Patio 2	55.2

N

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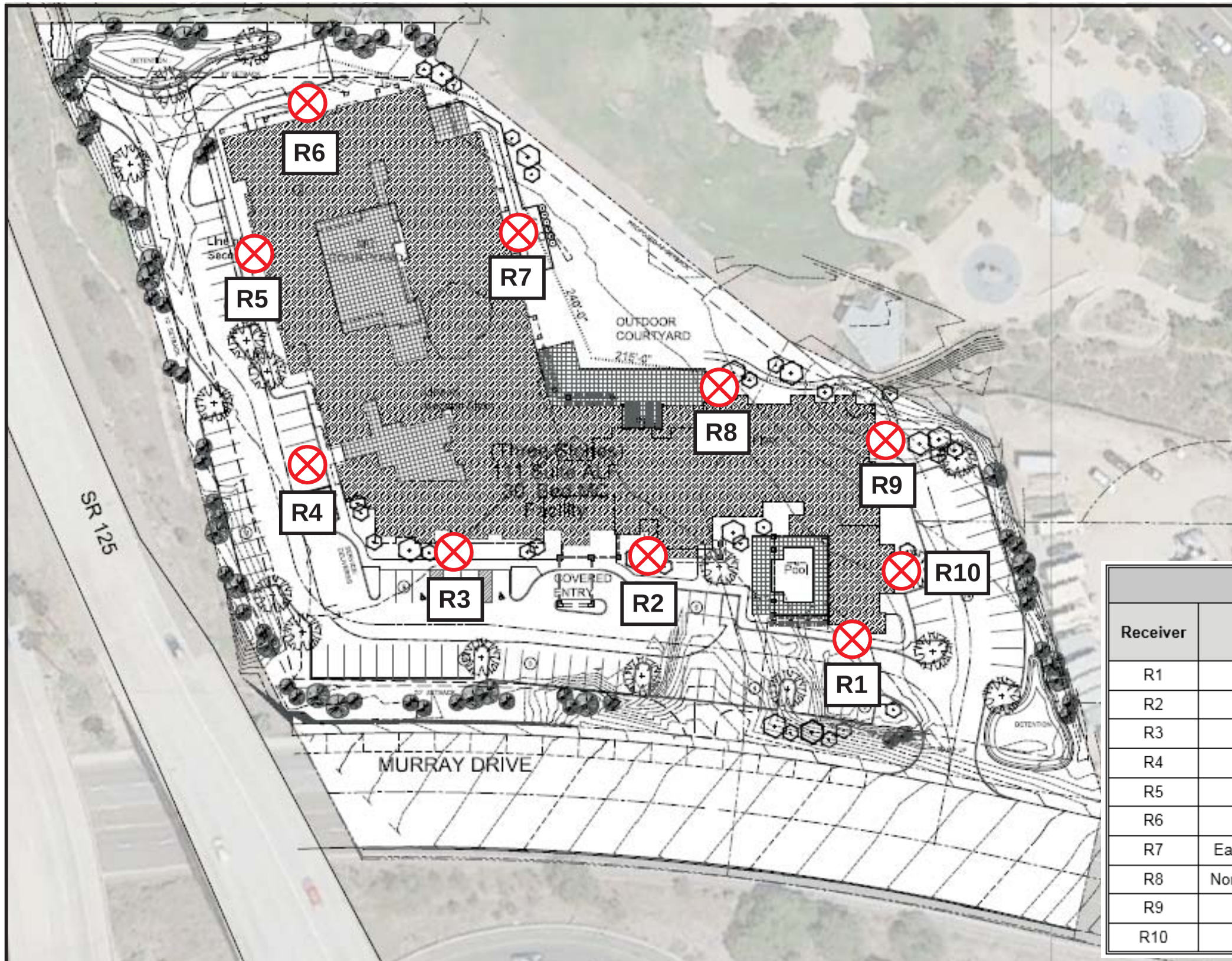
Site Plan Showing Future Traffic CNEL Impacts at Outdoor Use Areas
Job #B60301N1

Figure 7



Future Traffic Noise Levels at Building Facades				
Receiver	Facade Location	Exterior Traffic Noise Level (CNEL)		
		First Floor	Second Floor	Third Floor
R1	South Facade	68.8	71.8	73.9
R2	South Facade	70.2	72.0	73.5
R3	South Facade	71.3	72.8	74.9
R4	West Facade	69.2	73.9	76.5
R5	West Facade	65.6	73.5	76.4
R6	North Facade	56.6	61.4	68.5
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R8	North Facade (At Courtyard)	46.7	50.3	53.8
R9	East Facade	58.7	62.0	66.7
R10	East Facade	61.4	65.1	70.0

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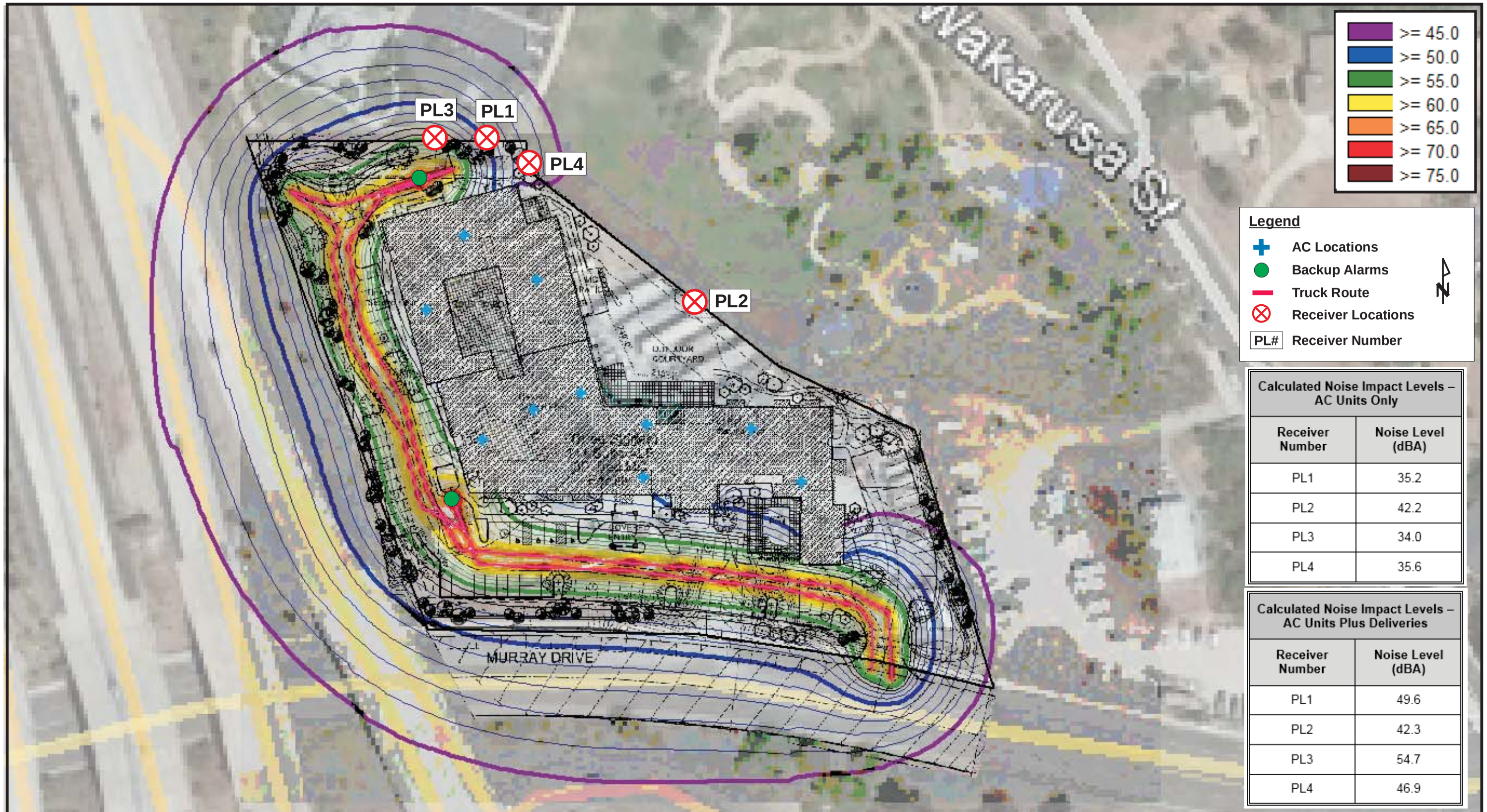
Site Plan Showing Future Traffic CNEL Impacts at Building Facades
Job #B60301N1

Figure 8



Calculated Noise Impact Levels – AC Units Only	
Receiver Number	Noise Level (dBA)
PL1	35.2
PL2	42.2
PL3	34.0
PL4	35.6

Calculated Noise Impact Levels – AC Units Plus Deliveries	
Receiver Number	Noise Level (dBA)
PL1	49.6
PL2	42.3
PL3	54.7
PL4	46.9

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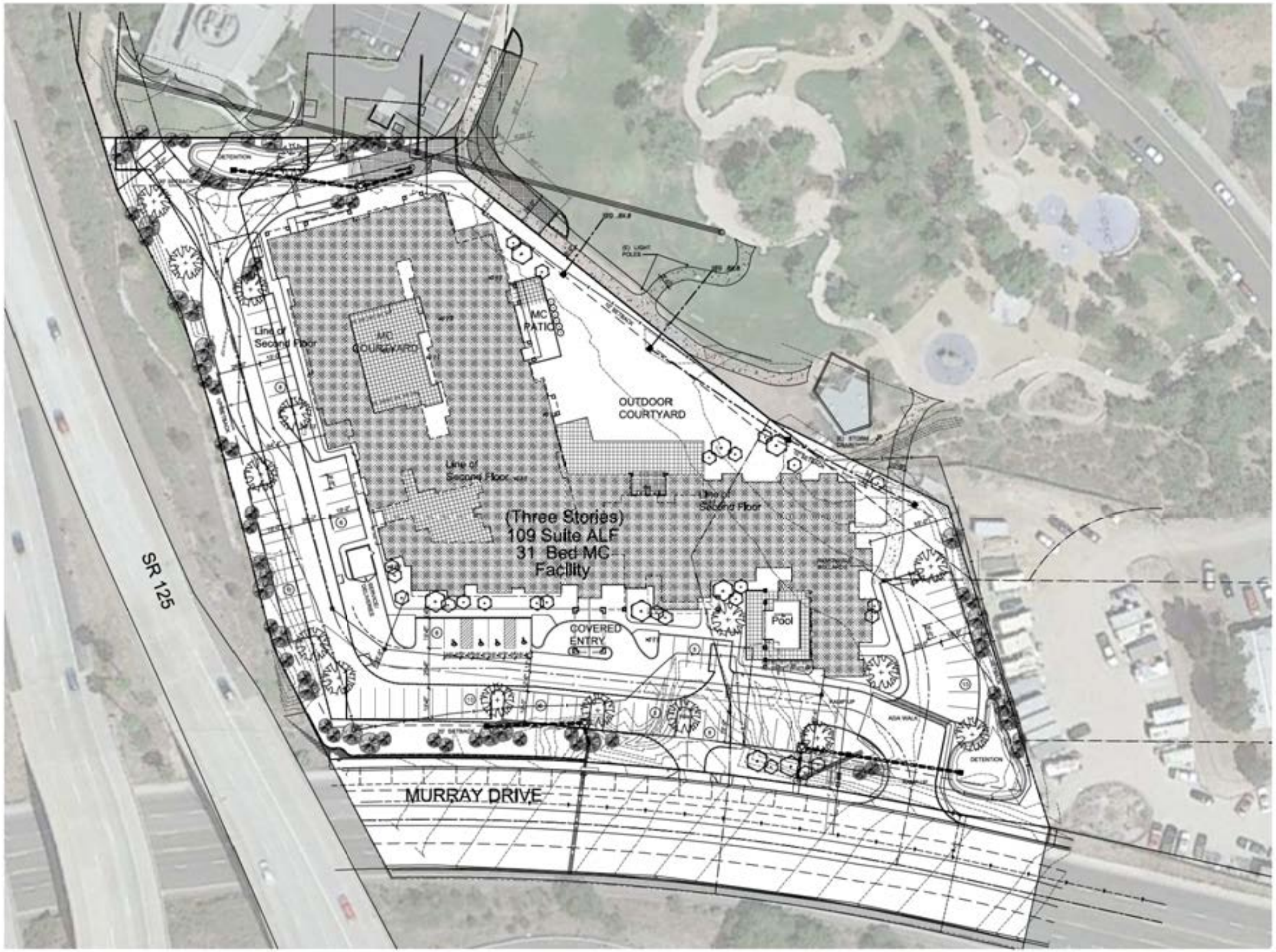
Satellite Aerial Photograph Showing AC Unit and Delivery Noise Contours and Receiver Locations
Job # B60301N1

Figure 9

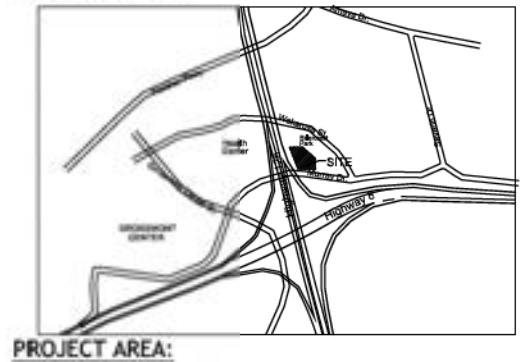
APPENDIX A

Project Plans



La Mesa Vicinity Map

SCALE: N.T.S.



PROJECT AREA:

TOTAL AREA 3.3383 AC
(APPROX. 145,424 SQ. FT.)

BUILDING AREA:

FIRST FLOOR:	43,797 SQ. FT.
SECOND FLOOR:	38,797 SQ FT.
THIRD FLOOR:	38,797 SQ FT.
TOTAL:	121,391 SQ. FT.

UNIT COUNT:

ASSISTED LIVING SUITES:

STUDIO SUITES	36	(448 SF TYPICAL)
ONE BEDROOM SUITES	57	(604 SF TYPICAL)
TWO BEDROOM SUITES	16	(970 SF TYPICAL)
TOTAL	109	

MEMORY CARE SUITES:

PRIVATE SUITES	25	(357 SF AVERAGE)
SEMI-PRIVATE BEDS	6	(255 SF AVERAGE)
TOTAL BEDS	31	

121,391/ 140 = 867 sf/bed

AREA CALCULATIONS:

BUILDING FOOTPRINT:	43,797 SQ. FT.	30.1%
PATIOS / WALKS:	10,358 SQ. FT.	7.1%
DRIVES / PARKING:	39,567 SQ. FT.	27.2%
OPEN SPACE:	51,702 SQ. FT.	35.6%

PARKING PROVIDED:

4 ACCESSIBLE SPACES
57 OPEN SPACES
18 PARK SPACES
75 TOTAL SPACES

REQUIRED PARKING:

1 SPACE / 5 RESIDENTS = 28 SPACES
1 SPACE / 300 SF OFFICES = 2,100/300 = 7 SPACES
15 PARK SPACES
50 REQUIRED SPACES

Site Plan

DATE: 03/21/2016
SCALE: 1" = 30'-0"

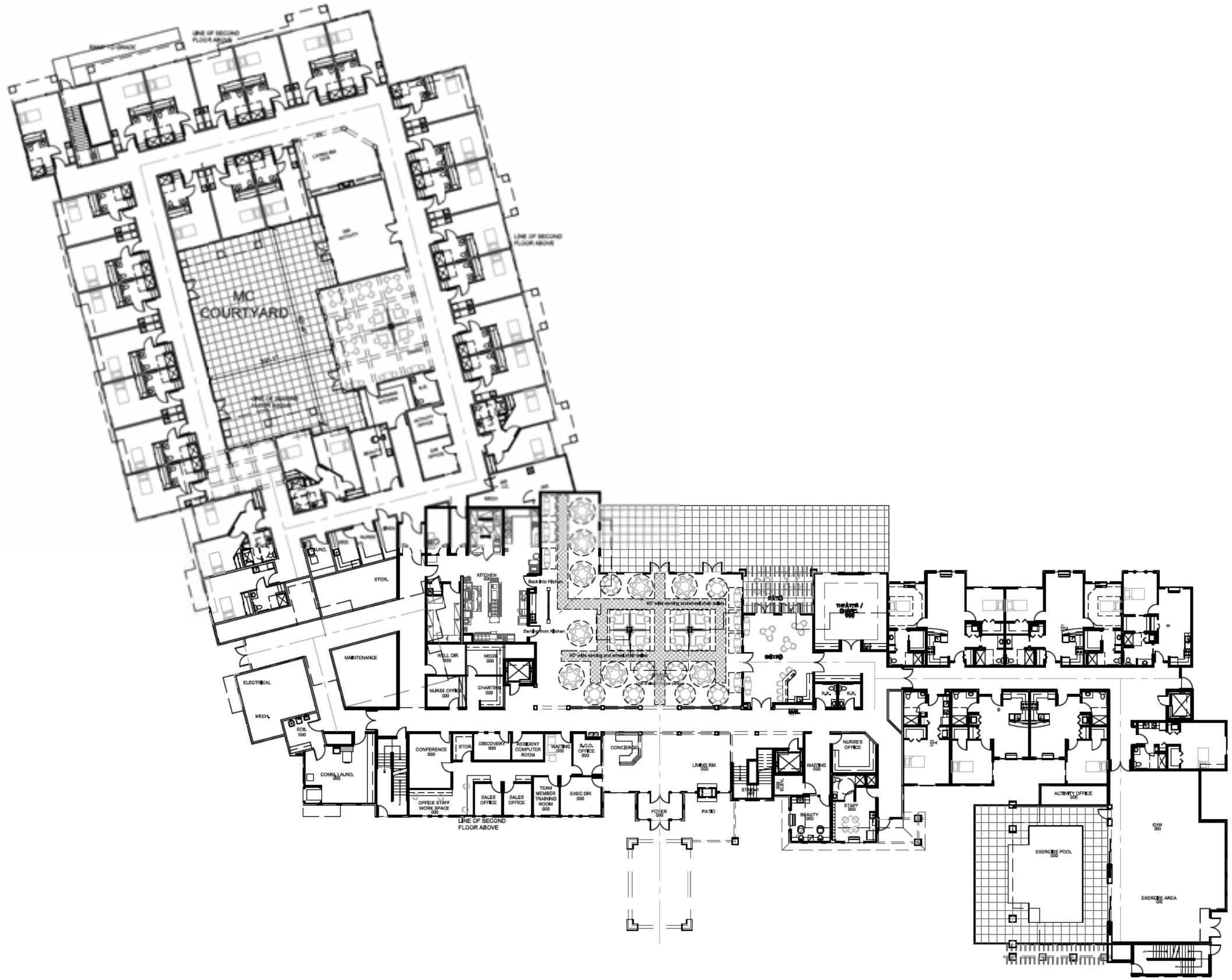
0 10 30 60 90

lenity architecture
3150 Kettle Court SE, Salem, Oregon 97301
P 503 399 1090 F 503 399 0565 W lenityarchitecture.com

Westmont of La Mesa

La Mesa, California

WESTMONT LIVING
inspired retirement living



First Floor Plan

DATE: 03/22/2016
SCALE: 1" = 16'-0"

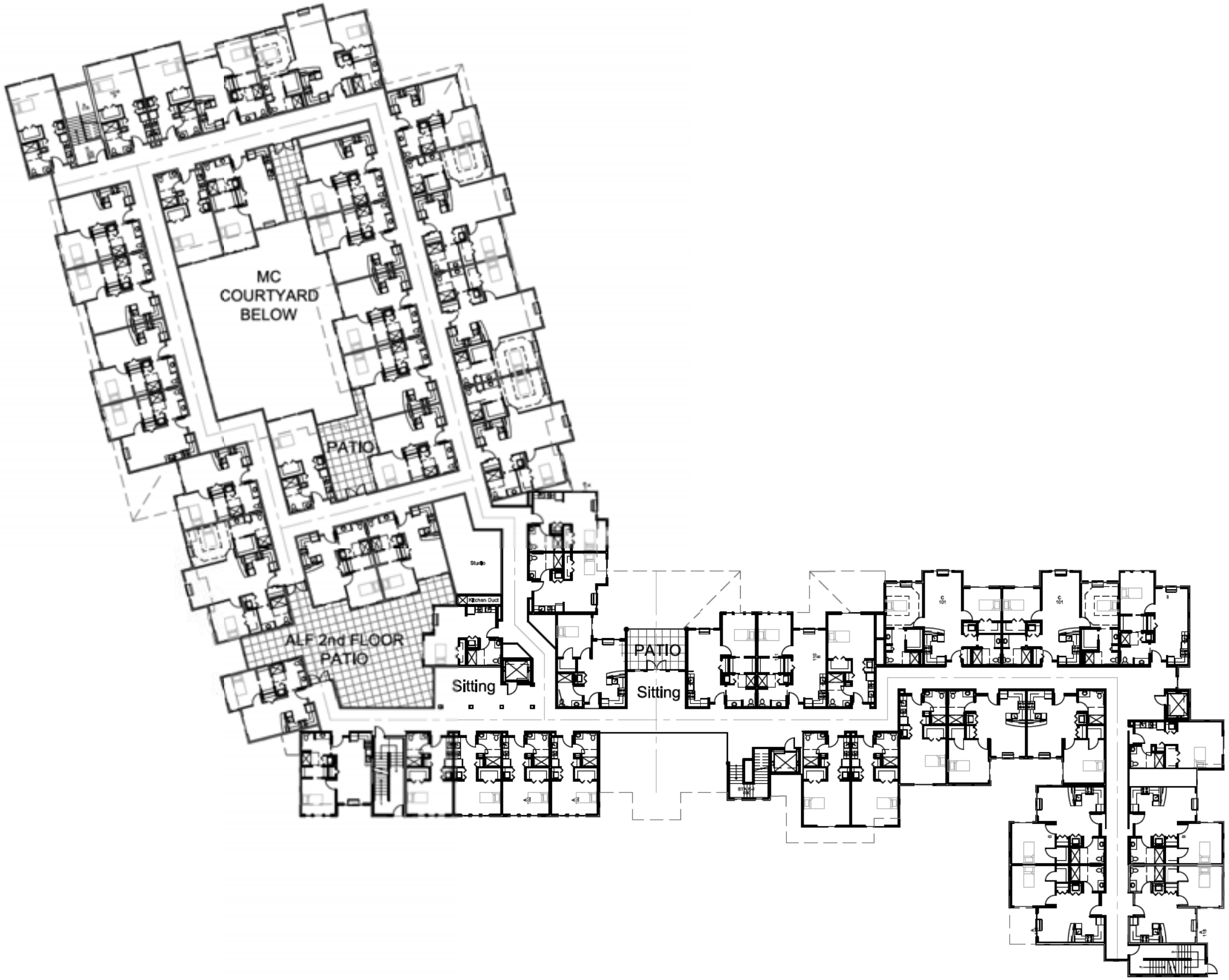
0 8 16 32 48

lenity architecture
3150 Kettle Court SE, Salem, Oregon 97301
p 503 399 1090 f 503 399 0565 w lenityarchitecture.com

Westmont of La Mesa

La Mesa, California

WESTMONT LIVING
inspired retirement living



2nd Floor Plan

DATE: 03/22/2016
SCALE: 1" = 16'-0"

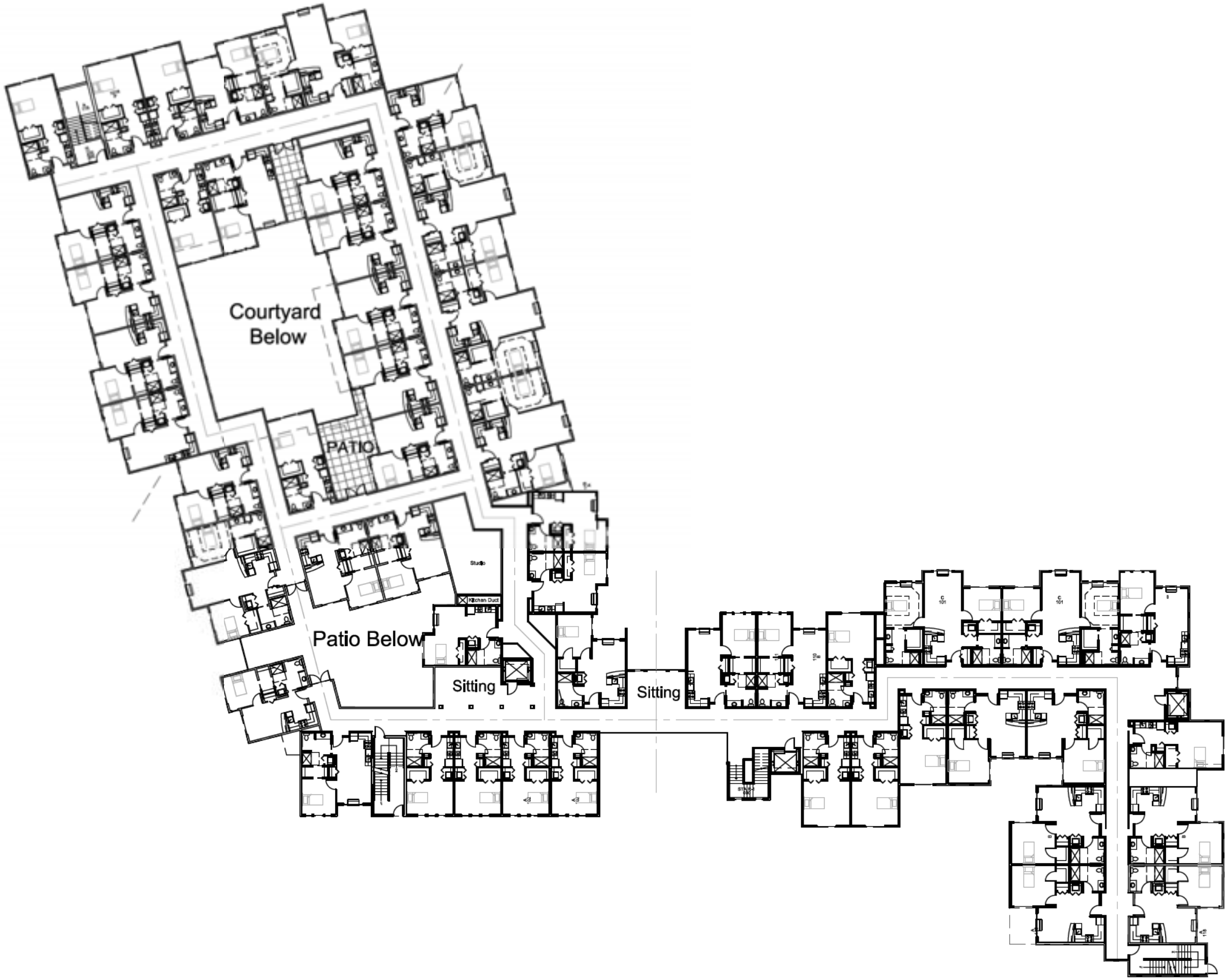
0 8 16 32 48

lenity architecture
3150 Kettle Court SE, Salem, Oregon 97301
p 503 399 1090 f 503 399 0565 w lenityarchitecture.com

Westmont of La Mesa

La Mesa, California

WESTMONT LIVING
inspired retirement living



3rd Floor Plan

DATE: 03/22/2016
SCALE: 1" = 16'-0"

0 16 32 48

lenity architecture
3150 Kettle Court SE, Salem, Oregon 97301
p 503 399 1090 f 503 399 0565 w lenityarchitecture.com

Westmont of La Mesa

La Mesa, California

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APPENDIX B

Pertinent Sections of the City of La Mesa Noise Element to the General Plan and Municipal Code

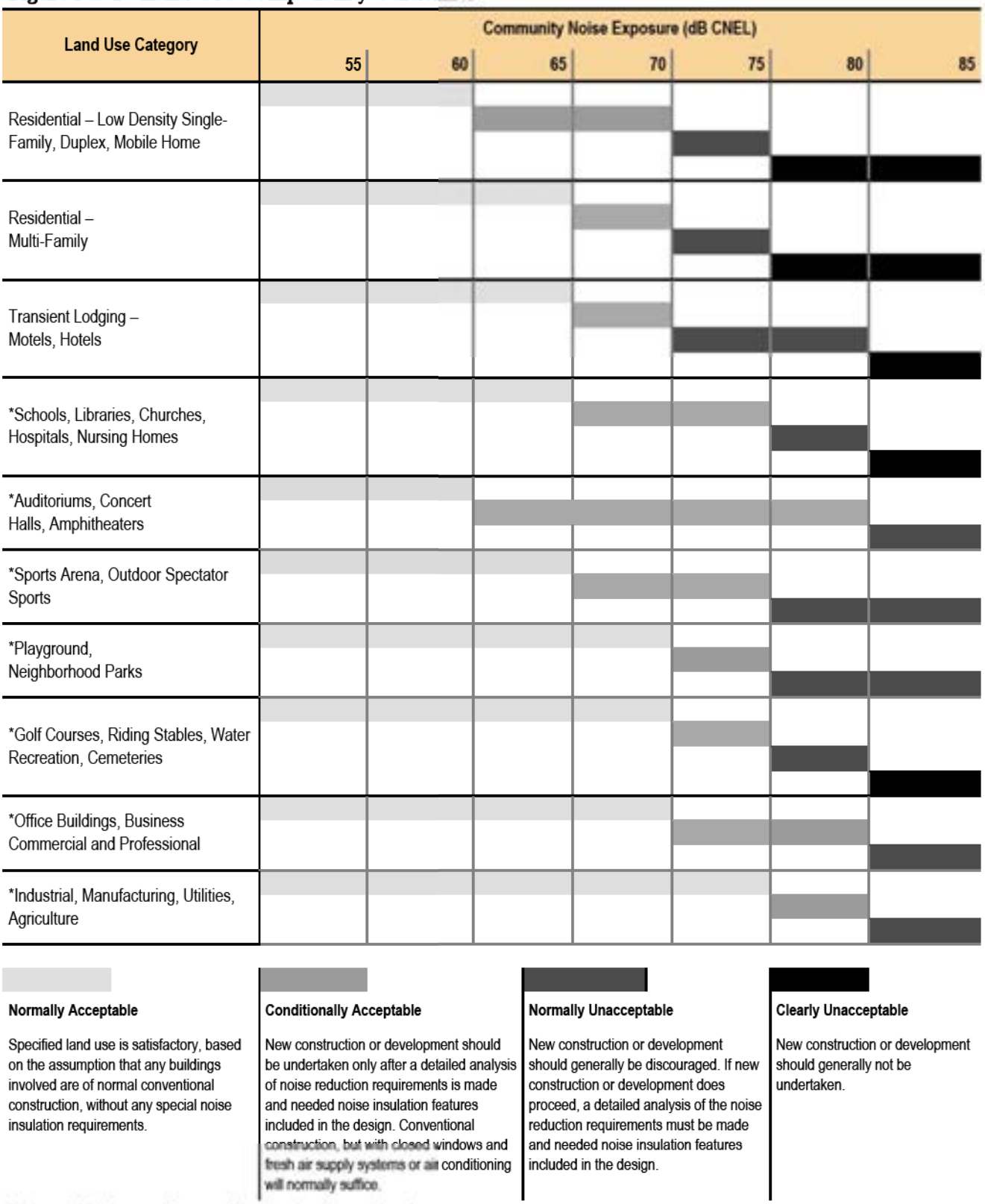
Table NS-2. Federal and California State Traffic Noise Abatement Criteria

Activity Category	Noise Abatement Criteria (Leq(h), dBA)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: FHWA 2006

The table on the following page provides a guideline for land use compatibility at various noise levels **(Figure NS-1)**. The compatibility guidelines are used in conjunction with the future noise exposure contours to identify projects or activities which may require special treatment to minimize noise exposure. This exhibit references generic land use categories identified by the State of California and; as such, these categories should be interpreted as to their applicability to City of La Mesa land use categories identified in the General Plan.

Figure NS-1. Land Use Compatibility Guidelines



* Denotes facilities used for part of the day; therefore, an hourly standard (L_{eq}) would be used rather than CNEL.

Source: State of California General Plan Guidelines (2003)

Existing Noise Conditions

The City of La Mesa utilizes the State of California Land Use Compatibility Guidelines (Figure NS-1) to identify land uses or activities that may require special treatment to minimize noise exposure. The Guidelines are the primary tool that allows the City to ensure integrated planning compatibility between land uses and indoor and outdoor noise.

Noise Monitoring Equipment

The goal for maximum outdoor noise levels in residential areas is a CNEL of 60 dBA. This level is a requirement for the design and location of future development and a goal for the reduction of noise in existing development. However, 60 dBA CNEL is a goal that cannot necessarily be reached in all residential areas within the realm of economic or aesthetic feasibility. The goal is applied where outdoor use is a major consideration (e.g., backyards in single-family housing developments, recreation areas in multi-family housing projects).

The indoor noise level, as required by the State of California Noise Insulation Standards, must not exceed 45 dBA CNEL in multi-family dwellings. This indoor standard may also be applied as the maximum acceptable indoor noise level in single-family homes.

The La Mesa Municipal Code (Chapter 10.80) identifies acceptable criteria for various noise sources. Noise levels are typically regulated across property boundaries. The noise level to be observed is based on the zone applicable to the property adjoining that on which the noise is generated. Noise sources regulated by the Municipal Code include outdoor construction or repair activity, machinery, pumps, fans, air conditioning systems, radios, musical instruments and phonographs.

Issues

The primary source of noise in the City is vehicular traffic, including automobiles, trucks, buses and motorcycles. Most of this traffic is concentrated on the freeways that cross through the City. **Figure NS-2**, the 2030 Projected Noise Contour Map, demonstrates the extent to which freeway noise affects surrounding areas. Other sources of noise include the San Diego & Imperial Valley (SDIV) Railroad freight line, the MTS San Diego Trolley light rail line, periodic aircraft overflights from Gillespie Field and the Sharp Grossmont Hospital heliport, industrial manufacturing , commercial activity, and construction.

Goals, Objectives, and Policies

The following goals, objectives and policies emphasize the minimization of noise through standards, site planning, and noise mitigation.

Goal NS-1: A community where noise and the effects of noise are minimized.

Objective NS-1.1: Require new projects to meet acceptable exterior noise level standards.

Policy NS-1.1.1: Review all development proposals, public and private, for consistency with the policies of this Element.

Policy NS-1.1.2: Discourage development of noise-sensitive land uses in areas exposed to existing or future noise levels exceeding 65 dBA CNEL.

Policy NS-1.1.3: Incorporate noise reduction features during site planning to ensure that areas intended for frequent outdoor use are subjected to 60 dBA CNEL or less for single-family land uses and 65 dBA CNEL or less for multi-family residential land uses and multi-family residential land uses within mixed-use developments.

Policy NS-1.1.4: Control and abate undesirable sounds through the use of the land use compatibility criteria shown in Exhibit NS-1 and the requirements of Municipal Code Chapter 10.80.

Policy NS-1.1.5: Provide developers and builders with development noise policy guidelines. The guidelines shall provide specific design criteria, minimum standards for submittal of acoustical studies and descriptions of acceptable noise mitigation measures.

Objective NS-1.2: Ensure that interior noise levels do not exceed 45 dBA CNEL for single-family and multi-family residential land uses.

Policy NS-1.2.1: Enforce the California Noise Insulation Standards (California Code of Regulations, Title 24). Title 24 requires that an acoustical analysis be performed for all new multi-family residences in areas where the exterior sound level exceeds 60 dBA CNEL. The analysis shall ensure that the building design limits the interior noise environment to 45 dBA CNEL or below.

Policy NS-1.2.2: Ensure that an acoustical analysis be performed for all new single-family residences in areas where the exterior sound level exceeds 60 dBA CNEL. The analysis shall ensure that the building design limits the interior noise environment to 45 dBA CNEL or below.

Chapter 10.80 - NOISE REGULATION

Sections:

10.80.010 - Declaration of policy.

It is hereby declared to be the policy of the city to prohibit unnecessary, excessive, and annoying noises from all sources subject to its police power. At certain levels noises are detrimental to the health and welfare of the citizenry and in the public interests shall be systematically prescribed.

(Ord. 2175; December 28, 1978)

10.80.020 - Definitions.

As used in this chapter, unless the context otherwise clearly indicates, the words and phrases used in this chapter are defined as follows:

(a) Ambient Noise. "Ambient noise" is the all-encompassing noise associated with a given environment, being usually a composite of sounds from many sources near and far. For the purpose of this ordinance, ambient noise level is the level obtained when the noise level is averaged over a period of 15 minutes without inclusion of noise from isolated identifiable sources, at the location and time of day near that at which a comparison is to be made.

(b) Decibel. "Decibel" shall mean a unit of level when the base of the logarithm is the tenth root of ten and the quantities concerned are proportional to power.

(c) Emergency Work. "Emergency work" shall mean work made necessary to restore property to a safe condition following a public calamity or work required to protect persons or property from an imminent exposure to danger or work by private or public utilities when restoring utility service. 10.80.020

(d) Frequency. "Frequency" of a function periodic in time shall mean the reciprocal of the primitive period. The unit is the hertz and shall be specified.

(e) Hertz. "Hertz" shall mean the complete sequence of values of a periodic quantity which occurs during a period.

(f) Microbar. "Microbar" shall mean a unit of pressure commonly used in acoustics and is equal to one (1) dyne per square centimeter.

(g) Period. "Period" of a periodic quantity shall mean the smallest increment of time for which the function repeats itself.

(h) Periodic Quantity. "Periodic quantity" shall mean oscillating quantity, the values of which recur for equal increments of time.

(i) Person. "Person" shall mean a person, firm, association, co-partnership, joint venture, corporation, or any entity, public or private in nature.

(j) Sound Level. "Sound level" (noise level) in decibels (dB) is the sound measured with the "A" weighting and slow response by a sound level meter.

(k) Sound Level Meter. "Sound level meter" shall mean an instrument including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement of sound levels which satisfies the pertinent requirements in American Standard Specifications for sound

level meters S1.4-1971 or the most recent revision thereof.

(l) Motor Vehicles. "Motor vehicles" shall include, but not be limited to, mini-bikes and go-carts.

(m) Sound Amplifying Equipment. "Sound amplifying equipment" shall mean any machine or device for the amplification of the human voice, music, or any other sound. "Sound amplifying equipment" shall not include standard automobile radios when used and heard only by the occupants of the vehicle in which the automobile radio is installed. "Sound amplifying equipment", as used in this chapter, shall not include warning devices on authorized emergency vehicles or horns or other warning devices on any vehicle used only for traffic safety purposes.

(n) Sound Truck. "Sound truck" shall mean any motor vehicle, or any other vehicle regardless of motive power, whether in motion or stationary, having mounted thereon, or attached thereto, any sound amplifying equipment.

(o) Commercial Purpose. "Commercial purpose" shall mean and include the use, operation, or maintenance of any sound amplifying equipment for the purpose of advertising any business, or any goods, or any services, or for the purpose of attracting the attention of the public to, or advertising for, or soliciting patronage or customers to or for any performance, show, entertainment, exhibition, or event, or for the purpose of demonstrating such sound equipment.

(p) Noncommercial Purpose. "Noncommercial purpose" shall mean the use, operation, or maintenance of any sound equipment for other than a "commercial purpose." "Noncommercial purpose" shall mean and include, but shall not be limited to, philanthropic, political, patriotic, and charitable purposes.

(q) "Landscaping" means work performed on private or public property to modify or ornament a natural landscape by altering the plant cover.

(r) "Landscaping power equipment" means any leaf blower, wood chipper, lawn mower, electric trimmer, chain saw, lawn edger, weed whacker, pressure washer or other similar type equipment used for maintenance of landscapes or hardscape areas.

(s) "Maintenance power equipment" means any pressure washer, power drill, power sander, nail gun, wet/dry vaccum or other similar type equipment used in home improvements or non-construction activity.

(Ord. 2175; December 28, 1978: Ord. 2740 § 1 (part); November 12, 2003)

10.80.030 - Sound level measurement criteria.

Any sound level measurement made pursuant to the provisions of this chapter shall be measured with a sound level meter using the "A" weighting.

(Ord. 2175; December 28, 1978)

10.80.040 - Ambient base noise level.

Where the ambient noise level is less than designated in this section, the respective noise level in this section shall govern. The noise level to be observed in all measurements shall be that specified for the zone applicable to the property adjoining that on which the noise is generated and closest to the noise source.

Sound Level A, Decibels

Zone	Time	Level

R1 & R2	10:00 p.m. to 7:00 a.m.	50
R1 & R2	7:00 p.m. to 10:00 p.m.	55
R1 & R2	7:00 a.m. to 7:00 p.m.	60
R3 & RB	10:00 p.m. to 7:00 a.m.	55
R3 & RB	7:00 a.m. to 10:00 p.m.	60
C, CN, CD & CM	10:00 p.m. to 7:00 a.m.	60
C, CN, CD & CM	7:00 a.m. to 10:00 p.m.	65
M	Anytime	70

(Ord. 2207; November 30, 1979)

10.80.050 - Penalty.

It shall be unlawful for any person to violate any provision of this chapter. A violation of any of the provisions or failing to comply with any mandatory requirements of this chapter shall constitute an infraction and shall be subject to the provisions of the general penalty clause as set out in Section 1.01.080 of the code of the city of La Mesa.

(Ord. 2175; December 28, 1978: Ord. 2638 § 2; November 23, 1993)

10.80.060 - Violations: additional remedies: injunctions.

As an additional remedy, the operation or maintenance of any device, instrument, vehicle, or machinery in violation of any provision of this chapter, which operation or maintenance causes discomfort or annoyance to reasonable persons of normal sensitiveness or which endangers the comfort, repose,

health, or peace of residents in the area, shall be deemed and is declared to be, a public nuisance and may be subject to abatement summarily by a restraining order or injunction by a court of competent jurisdiction.

(Ord. 2175; December 28, 1978)

10.80.070 - Severability.

If any provision, clause, sentence, or paragraph of this chapter or the application thereof to any person or circumstances, shall be held invalid, such invalidity shall not effect the other provisions or applications of the provisions of this chapter which can be given effect without the invalid provisions or application and, to this end, the provisions of this chapter are hereby declared to be severable.

(Ord. 2175; December 28, 1978)

10.80.080 - Radios, television sets, and similar devices.

(a) Use restricted. It shall be unlawful for any person within any residential zone of the City to use or operate any radio receiving set, musical instrument, phonograph, television set, or other machine or device for the producing or reproducing of sound (between the hours of 10:00 p.m. of one day and 7:00 a.m. of the following day) in such a manner as to disturb the peace, quiet, and comfort of neighboring residents or any reasonable person of normal sensitiveness residing in the area.

(b) Prima facie violation. Any noise level exceeding the ambient base level (i) within any living unit in a multiple family dwelling, (ii) within a non-residential principal building where people are present on a regular basis, or (iii) removed at least 50 feet or more from a single family dwelling shall be deemed to be prima facie evidence of a violation of the provisions of this section.

(Ord. 2207; November 30, 1979)

10.80.090 - Machinery, equipment, fans, and air conditioning.

It shall be unlawful for any person to install or operate any machinery, equipment, pump, fan, air conditioning apparatus, or similar mechanical device which can be or is operated in any manner so as to create noise which will cause the noise level at the property line of any property to exceed the ambient base noise level by more than five (5) decibels.

(a) Certificate of Compliance: Required. The installer of any such mechanical devices shall furnish to the Department of Building Inspection and Housing a certificate that the equipment installed as proposed can, without the addition of any baffling or construction, be operated within the sound limits specified above.

(b) Prima facie violation: The installation of any such mechanical device without permit or without furnishing the certificate referred to above shall be deemed to be prima facie evidence of violation of the provisions of this section and such device installed shall not be operated at any time unless the required permits are obtained and the certificate of compliance is furnished to the Department of Building Inspection and Housing.

(Ord. 2207; November 30, 1979)

10.80.100 - Construction of buildings and projects.

It shall be unlawful for any person within a residential zone or CN zone, or within a radius of five hundred feet therefrom, to operate equipment or perform any outside construction or repair work on buildings, structures, or projects or to operate any pile driver, power shovel, pneumatic hammer, derrick,

power hoist, or any other construction-type device between the hours of 10:00 p.m. of one day and 7:00 a.m. of the next day or on Sundays unless a special permit authorizing the activity has been duly obtained from the chief building official. No permit shall be required to perform emergency work as defined in this chapter. This section shall not apply to any work of improvement performed by a single-family residential occupant which is performed on the occupant's said premises.

(Ord. 2175; December 28, 1978: Ord. 2402 § 1; November 12, 1985)

10.80.101 - Landscaping power equipment—Hours of use.

It shall be unlawful for any person to operate landscaping power equipment between the hours of 7:00 p.m. and 7:00 a.m. during Pacific Standard Time and between 8:00 p.m. and 7:00 a.m. during Pacific Daylight Savings Time. All landscaping power equipment shall conform to the city's noise limitations established in Section 10.80.040. No permit shall be required to perform emergency work as defined in this chapter.

(Ord. 2740 § 1 (part); November 12, 2003)

10.80.102 - Maintenance power equipment.

Within a residential use, or within a radius of five hundred feet therefrom, the operation of maintenance power equipment shall conform to the city's noise limitations established in Section 10.80.040. No permit shall be required to perform emergency work as defined in this chapter.

(Ord. 2740 § 1 (part); November 12, 2003)

10.80.103 - Landscaping—Disposal.

Any person landscaping an outdoor area shall be required to legally dispose of accumulated dirt, debris, leaves, and grass clippings generated by landscaping activities.

(Ord. 2740 § 1 (part); November 12, 2003)

10.80.110 - Vehicle repairs.

It shall be unlawful for any person within any residential area of the city to repair, rebuild, or test any motor vehicle between the hours of 10:00 p.m. of one day and 7:00 a.m. of the next day.

(Ord. 2175; December 28, 1978)

10.80.120 - Purpose.

The council enacts this legislation for the sole purpose of securing and promoting the public health, comfort, safety and welfare of its citizenry. While recognizing that the use of sound amplifying equipment is protected by the constitutional rights of freedom of speech and assembly, the council nevertheless feels obligated to reasonably regulate the use of sound amplifying equipment in order to protect the correlative constitutional rights of the citizens of this community to privacy and freedom from public nuisance of loud and unnecessary noise.

(Ord. 2175; December 28, 1978)

10.80.130 - Registration: required.

It shall be unlawful for any person, other than personnel of law enforcement or governmental agencies, to install, use, or operate within the city a loudspeaker or sound amplifying equipment in a fixed or movable position or mounted upon any sound truck for the purposes of giving instructions, directions, talks, addresses, lectures, or transmitting music to any persons or assemblages of persons in or upon any street, alley, sidewalk, park, place, or public property without first filing a registration statement and obtaining approval thereof as set forth in this section.

(Ord. 2175; December 28, 1978)

10.80.140 - Registration: requirements and duties.

(a) Registration statements: filing. Every user of sound amplifying equipment shall file a registration statement with the Police Department ten days prior to the date which the sound amplifying equipment is intended to be used, which statement shall contain the following information:
   (1) The name, address and telephone number of both the owner and user of the sound amplifying equipment;
   (2) The maximum sound producing power of the sound amplifying equipment which shall include the wattage to be used, the volume in decibels of sound which will be produced, and the approximate distance for which sound will be audible from the sound amplifying equipment;
   (3) The license and motor number if a sound truck is to be used;
   (4) A general description of the sound amplifying equipment which is to be used; and
   (5) Whether the sound amplifying equipment will be used for commercial or non-commercial purposes.

(b) Registration statements: approval. The Police Department shall return to the applicant an approved certified copy of the registration statement unless it is found that:
   (1) The conditions of the motor vehicle movement are such that in the opinion of the Police Department, use of the equipment would constitute a detriment to traffic safety; or
   (2) The conditions of pedestrian movement are such that use of the equipment would constitute a detriment to traffic safety; or
   (3) The registration statement required reveals that the applicant would violate the provisions set forth in this Code.

(c) Disapproval. In the event the registration statement is disapproved, the Police Chief shall endorse upon the statement his reasons for disapproval and return it forthwith to applicant.

(Ord. 2175; December 28, 1978)

10.80.150 - Appeals.

Any person aggrieved by disapproval of a registration statement may appeal to the City Council.

(Ord. 2175; December 28, 1978)

10.80.160 - Fees.

Prior to the issuance of the registration statement, a fee in the amount of $25.00 per year, or any portion thereof, shall be paid to the City, if the loudspeaker or sound amplifying equipment is to be used for commercial purposes. No fee shall be required for the operation of a loudspeaker or sound amplifying equipment for non-commercial purposes.

(Ord. 2175; December 28, 1978)

10.80.170 - Regulations.

The commercial and non-commercial use of sound amplifying equipment shall be subject to the following regulations:

(a) The only sounds permitted shall be either music or human speech, or both.

(b) Outdoor operation of sound amplifying equipment shall only occur between the hours of 7:00 a.m. and 10:00 p.m. each day unless otherwise authorized by the city council in conjunction with a validly issued special event permit.

(c) Sound level emanating from sound amplifying equipment shall not exceed fifteen (15) decibels above the ambient base noise level.

(d) Notwithstanding the provisions of subsection (c) of this section, outdoor operation of sound amplifying equipment shall not be within two hundred feet of churches, schools, hospitals, or city or county buildings unless otherwise authorized by the city council in conjunction with a validly issued special event permit.

(e) In any event, the volume of sound shall be so controlled that it will not be unreasonably loud, raucous, jarring, disturbing, or a nuisance to reasonable persons of normal sensitiveness within the area of audibility.

(Ord. 2175; December 28, 1978: Ord. 2010-2809, §§ 1, 2; July 27, 2010)

10.80.180 - General noise regulations.

Notwithstanding any other provision of this chapter, and in addition thereto, it shall be unlawful for any person to wilfully make or continue, or cause to be made or continued, any loud, unnecessary, or unusual noise which disturbs the peace or quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area.

The standards which shall be considered in determining whether a violation of the provisions of this section exists shall include, but not be limited to, the following:

(a) the level of the noise;

(b) the intensity of the noise;

(c) whether the nature of the noise is usual or unusual;

(d) whether the origin of the noise is natural or unnatural;

(e) the level and intensity of the background noise, if any;

(f) the proximity of the noise to residential sleeping facilities;

(g) the nature and zoning of the area within which the noise emanates;

(h) the density of the inhabitation of the area within which the noise emanates;

(i) the time of the day or night the noise occurs;

(j) the duration of the noise;

(k) whether the noise is recurrent, intermittent, or constant; and

(l) whether the noise is produced by a commercial or non-commercial activity.

(Ord. 2175; December 28, 1978)

APPENDIX C

Traffic Noise Model (TNM) Data and Results

Eilar Associates 22 March 2016
AH TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: B60301N1 Westmont La Mesa
RUN: Calibration

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	m			m	m	m		km/h	%		
EB I-8	14.6	point1	1	51.8	-30.6	180.00				Average	Y
		point2	2	466.5	149.4	197.00				Average	Y
		point3	3	626.5	248.0	204.00				Average	
		point4	4	753.2	297.4	208.00				Average	
		point5	5	886.6	317.4	210.00				Average	
		point6	6	1,015.9	313.4	212.00				Average	
		point7	7	1,366.6	302.7	207.00				Average	
		point8	8	1,613.3	290.7	199.00					
WB I-8	14.6	point9	9	1,604.0	317.4	199.00				Average	
		point10	10	1,297.3	325.4	209.00				Average	
		point11	11	1,111.9	334.7	206.00				Average	
		point12	12	1,018.6	337.4	211.00				Average	
		point13	13	878.6	342.7	210.00				Average	
		point14	14	717.2	308.1	207.00				Average	
		point15	15	593.2	258.7	204.00				Average	Y
		point16	16	371.9	128.0	190.00				Average	Y
		point17	17	-4.2	-33.3	180.00					
NB SR-125	11.0	point18	18	477.2	-40.8	201.00				Average	
		point19	19	402.5	252.5	199.00				Average	Y
		point64	64	356.1	419.6	199.00				Average	Y
		point20	20	319.9	551.2	194.00				Average	Y
		point21	21	242.5	865.9	178.00					
SB SR-125	11.0	point22	22	206.5	872.6	178.00				Average	
		point23	23	289.8	539.1	194.00				Average	
		point65	65	324.1	412.2	199.00				Average	Y

		point24	24	369.9	242.4	199.00				Average	Y
		point25	25	449.2	-48.8	201.00					
EB Murray	7.3	point26	26	112.8	256.2	182.00				Average	
		point27	27	143.1	301.5	185.00				Average	
		point28	28	196.8	345.2	186.00				Average	
		point29	29	255.6	375.5	188.00				Average	
		point30	30	282.5	385.5	190.00				Average	
		point31	31	369.9	407.4	194.00				Average	
		point32	32	422.8	409.1	194.00				Average	
		point33	33	484.1	404.9	196.00				Average	
		point34	34	616.8	378.0	201.00				Average	
		point35	35	644.5	378.0	204.00				Average	
		point36	36	668.1	383.0	205.00				Average	
		point37	37	728.5	397.3	207.00				Average	
		point38	38	939.4	411.6	215.00					
WB Murray	7.3	point39	39	941.9	420.0	215.00				Average	
		point40	40	727.7	404.9	207.00				Average	
		point41	41	659.7	392.3	205.00				Average	
		point42	42	632.8	388.1	201.00				Average	
		point43	43	495.0	410.7	196.00				Average	
		point44	44	448.8	416.6	194.00				Average	
		point45	45	368.2	414.1	194.00				Average	
		point46	46	280.8	396.5	190.00				Average	
		point47	47	190.1	354.5	186.00				Average	
		point48	48	133.8	310.8	185.00				Average	
		point49	49	102.7	258.7	182.00					
Wakarusa	7.3	point59	59	336.7	649.9	199.00				Average	
		point60	60	446.8	631.4	197.00				Average	
		point61	61	518.2	581.0	198.00				Average	
		point62	62	577.8	530.6	198.00				Average	
		point63	63	658.5	399.5	205.00					

Eilar Associates 22 March 2016
AH TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: B60301N1 Westmont La Mesa
RUN: Calibration

Roadway Name	Points Name	No.	Segment Autos V veh/hr	Autos S km/h	MTrucks V veh/hr	MTrucks S km/h	HTrucks V veh/hr	HTrucks S km/h	Buses V veh/hr	Buses S km/h	Motorcycles V veh/hr	Motorcycles S km/h
EB I-8	point1	1	6866	105	180	105	136	105	0	0	0	0
	point2	2	6866	105	180	105	136	105	0	0	0	0
	point3	3	6866	105	180	105	136	105	0	0	0	0
	point4	4	6866	105	180	105	136	105	0	0	0	0
	point5	5	6866	105	180	105	136	105	0	0	0	0
	point6	6	6866	105	180	105	136	105	0	0	0	0
	point7	7	6866	105	180	105	136	105	0	0	0	0
	point8	8										
WB I-8	point9	9	6866	105	180	105	136	105	0	0	0	0
	point10	10	6866	105	180	105	136	105	0	0	0	0
	point11	11	6866	105	180	105	136	105	0	0	0	0
	point12	12	6866	105	180	105	136	105	0	0	0	0
	point13	13	6866	105	180	105	136	105	0	0	0	0
	point14	14	6866	105	180	105	136	105	0	0	0	0
	point15	15	6866	105	180	105	136	105	0	0	0	0
	point16	16	6866	105	180	105	136	105	0	0	0	0
	point17	17										
NB SR-125	point18	18	2678	105	73	105	50	105	0	0	0	0
	point19	19	2678	105	73	105	50	105	0	0	0	0
	point64	64	2678	105	73	105	50	105	0	0	0	0
	point20	20	2678	105	73	105	50	105	0	0	0	0
	point21	21										
SB SR-125	point22	22	2871	105	78	105	54	105	0	0	0	0

	point23	23	2871	105	78	105	54	105	0	0	0	0
	point65	65	2871	105	78	105	54	105	0	0	0	0
	point24	24	2871	105	78	105	54	105	0	0	0	0
	point25	25										
EB Murray	point26	26	178	64	0	0	0	0	0	0	0	0
	point27	27	178	64	0	0	0	0	0	0	0	0
	point28	28	178	64	0	0	0	0	0	0	0	0
	point29	29	178	64	0	0	0	0	0	0	0	0
	point30	30	178	64	0	0	0	0	0	0	0	0
	point31	31	178	64	0	0	0	0	0	0	0	0
	point32	32	178	64	0	0	0	0	0	0	0	0
	point33	33	178	64	0	0	0	0	0	0	0	0
	point34	34	178	64	0	0	0	0	0	0	0	0
	point35	35	178	64	0	0	0	0	0	0	0	0
	point36	36	178	64	0	0	0	0	0	0	0	0
	point37	37	178	64	0	0	0	0	0	0	0	0
	point38	38										
WB Murray	point39	39	178	64	0	0	0	0	0	0	0	0
	point40	40	178	64	0	0	0	0	0	0	0	0
	point41	41	178	64	0	0	0	0	0	0	0	0
	point42	42	178	64	0	0	0	0	0	0	0	0
	point43	43	178	64	0	0	0	0	0	0	0	0
	point44	44	178	64	0	0	0	0	0	0	0	0
	point45	45	178	64	0	0	0	0	0	0	0	0
	point46	46	178	64	0	0	0	0	0	0	0	0
	point47	47	178	64	0	0	0	0	0	0	0	0
	point48	48	178	64	0	0	0	0	0	0	0	0
	point49	49										
Wakarusa	point59	59	270	40	1	40	1	40	0	0	0	0
	point60	60	270	40	1	40	1	40	0	0	0	0
	point61	61	270	40	1	40	1	40	0	0	0	0
	point62	62	270	40	1	40	1	40	0	0	0	0
	point63	63										

Eilar Associates			**22 March 2016**	
AH			**TNM 2.5**	
INPUT: TERRAIN LINES				
PROJECT/CONTRACT:	**B60301N1 Westmont La Mesa**			
RUN:	**Calibration**			
Terrain Line	**Points**			
Name	**No.**	**Coordinates (ground)**		
		X	**Y**	**Z**
		m	m	m
Terrain Line1	1	413.5	398.9	196.00
	2	447.5	399.5	197.00
	3	484.1	395.5	199.00
	4	555.5	380.9	203.00
	5	605.1	369.5	205.00
	6	637.5	368.2	206.00
	7	723.8	385.2	209.00
	8	765.8	392.9	211.00
Terrain Line2	9	382.4	356.8	200.00
	10	423.7	370.1	198.00
	11	500.4	366.8	205.00
	12	613.7	341.4	206.00
	13	697.1	363.4	210.00
	14	870.4	386.8	213.00
	15	1,007.8	386.1	215.00
Terrain Line3	16	463.6	441.9	200.00
	17	456.7	434.2	200.00
	18	404.8	429.4	200.00
	19	382.6	491.6	200.00
	20	382.3	509.3	200.00
	21	371.7	533.4	200.00
	22	379.2	536.3	200.00
	23	423.6	535.8	200.00
	24	495.8	483.1	200.00
	25	519.4	481.5	200.00
	26	537.6	415.1	200.00
	27	481.0	426.0	200.00
	28	478.9	445.0	200.00
Terrain Line4	29	392.3	430.5	203.00
	30	351.5	534.5	201.00
	31	318.2	643.1	196.00
	32	297.5	725.1	195.00
Terrain Line5	33	410.9	272.4	201.00
	34	566.9	282.4	202.00
	35	686.2	326.4	208.00
	36	797.6	347.1	209.00
	37	884.3	355.1	210.00

	38	1,002.9	352.4	211.00
Terrain Line6	39	401.0	425.1	198.70
	40	440.7	424.7	197.20
	41	449.8	424.7	194.00

Eilar Associates **22 March 2016**
AH **TNM 2.5**

INPUT: BARRIERS
PROJECT/CONTRACT: **B60301N1 Westmont La Mesa**
RUN: **Calibration**

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per	$ per	Top	Run:Rise	$ per			X	Y	Z	at	Seg Ht Perturbs			On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
				Area	Vol.			Length							ment				tions?
		m	m	$/sq m	$/cu m	m	m:m	$/m			m	m	m	m	m				
Barrier1	W	0.00	30.48	0.00				0.00	point1	1	401.0	424.6	194.00	4.69	0.00	0	0		
									point2	2	440.7	424.2	194.00	3.20	0.00	0	0		
									point3	3	449.8	424.2	194.00	0.00					

Eilar Associates **22 March 2016**
AH **TNM 2.5**

INPUT: RECEIVERS
PROJECT/CONTRACT: **B60301N1 Westmont La Mesa**
RUN: **Calibration**

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			m	m	m	m	dBA	dBA	dB	dB	
Calibration	1	1	472.9	448.2	200.00	1.50	0.00	66	10.0	8.0	Y

Eilar Associates							22 March 2016					
AH							TNM 2.5					
							Calculated with TNM 2.5					
RESULTS: SOUND LEVELS												
PROJECT/CONTRACT:		B60301N1 Westmont La Mesa										
RUN:		Calibration										
BARRIER DESIGN:		INPUT HEIGHTS						Average pavement type shall be used unless				
								a State highway agency substantiates the use				
ATMOSPHERICS:		20 deg C, 50% RH						of a different type with approval of FHWA.				
Receiver												
Name	No.	#DUs	Existing	No Barrier					With Barrier			
			LAeq1h	LAeq1h		Increase over existing		Type	Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n	Impact	LAeq1h	Calculated	Goal	Calculated
							Sub'l Inc					minus
												Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Calibration	1	1	0.0	66.1	66	66.1	10	Snd Lvl	66.1	0.0	8	-8.0
Dwelling Units		# DUs	Noise Reduction									
			Min	Avg	Max							
			dB	dB	dB							
All Selected		1	0.0	0.0	0.0							
All Impacted		1	0.0	0.0	0.0							
All that meet NR Goal		0	0.0	0.0	0.0							

Eilar Associates **22 March 2016**
AH **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **B60301N1 Westmont La Mesa**
RUN: **Current Contours**

Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h
EB I-8	point1	1	6127	105	160	105	122	105	0	0	0	0
	point2	2	6127	105	160	105	122	105	0	0	0	0
	point3	3	6127	105	160	105	122	105	0	0	0	0
	point4	4	6127	105	160	105	122	105	0	0	0	0
	point5	5	6127	105	160	105	122	105	0	0	0	0
	point6	6	6127	105	160	105	122	105	0	0	0	0
	point7	7	6127	105	160	105	122	105	0	0	0	0
	point8	8										
WB I-8	point9	9	6127	105	160	105	122	105	0	0	0	0
	point10	10	6127	105	160	105	122	105	0	0	0	0
	point11	11	6127	105	160	105	122	105	0	0	0	0
	point12	12	6127	105	160	105	122	105	0	0	0	0
	point13	13	6127	105	160	105	122	105	0	0	0	0
	point14	14	6127	105	160	105	122	105	0	0	0	0
	point15	15	6127	105	160	105	122	105	0	0	0	0
	point16	16	6127	105	160	105	122	105	0	0	0	0
	point17	17										
NB SR-125	point18	18	2390	105	65	105	45	105	0	0	0	0
	point19	19	2390	105	65	105	45	105	0	0	0	0
	point64	64	2390	105	65	105	45	105	0	0	0	0
	point20	20	2390	105	65	105	45	105	0	0	0	0
	point21	21										
SB SR-125	point22	22	2562	105	70	105	48	105	0	0	0	0

	point23	23	2562	105	70	105	48	105	0	0	0	0
	point65	65	2562	105	70	105	48	105	0	0	0	0
	point24	24	2562	105	70	105	48	105	0	0	0	0
	point25	25										
EB Murray	point26	26	228	64	6	64	4	64	0	0	0	0
	point27	27	228	64	6	64	4	64	0	0	0	0
	point28	28	228	64	6	64	4	64	0	0	0	0
	point29	29	228	64	6	64	4	64	0	0	0	0
	point30	30	228	64	6	64	4	64	0	0	0	0
	point31	31	228	64	6	64	4	64	0	0	0	0
	point32	32	228	64	6	64	4	64	0	0	0	0
	point33	33	228	64	6	64	4	64	0	0	0	0
	point34	34	228	64	6	64	4	64	0	0	0	0
	point35	35	228	64	6	64	4	64	0	0	0	0
	point36	36	228	64	6	64	4	64	0	0	0	0
	point37	37	228	64	6	64	4	64	0	0	0	0
	point38	38										
WB Murray	point39	39	228	64	6	64	4	64	0	0	0	0
	point40	40	228	64	6	64	4	64	0	0	0	0
	point41	41	228	64	6	64	4	64	0	0	0	0
	point42	42	228	64	6	64	4	64	0	0	0	0
	point43	43	228	64	6	64	4	64	0	0	0	0
	point44	44	228	64	6	64	4	64	0	0	0	0
	point45	45	228	64	6	64	4	64	0	0	0	0
	point46	46	228	64	6	64	4	64	0	0	0	0
	point47	47	228	64	6	64	4	64	0	0	0	0
	point48	48	228	64	6	64	4	64	0	0	0	0
	point49	49										
Wakarusa	point59	59	241	40	1	40	1	40	0	0	0	0
	point60	60	241	40	1	40	1	40	0	0	0	0
	point61	61	241	40	1	40	1	40	0	0	0	0
	point62	62	241	40	1	40	1	40	0	0	0	0
	point63	63										

Eilar Associates			**22 March 2016**	
AH			**TNM 2.5**	
INPUT: TERRAIN LINES				
PROJECT/CONTRACT:	**B60301N1 Westmont La Mesa**			
RUN:	**Current Contours**			
Terrain Line	**Points**			
Name	**No.**	**Coordinates (ground)**		
		X	**Y**	**Z**
		m	m	m
Terrain Line1	1	413.5	398.9	196.00
	2	447.5	399.5	197.00
	3	484.1	395.5	199.00
	4	555.5	380.9	203.00
	5	605.1	369.5	205.00
	6	637.5	368.2	206.00
	7	723.8	385.2	209.00
	8	765.8	392.9	211.00
Terrain Line2	9	382.4	356.8	200.00
	10	423.7	370.1	198.00
	11	500.4	366.8	205.00
	12	613.7	341.4	206.00
	13	697.1	363.4	210.00
	14	870.4	386.8	213.00
	15	1,007.8	386.1	215.00
Terrain Line3	16	465.6	432.9	200.00
	17	460.4	425.9	200.00
	18	404.2	429.0	200.00
	19	382.0	491.2	200.00
	20	376.9	509.3	200.00
	21	363.3	543.7	200.00
	22	369.5	543.0	200.00
	23	418.4	541.5	200.00
	24	495.2	482.7	200.00
	25	518.8	481.1	200.00
	26	537.0	414.7	200.00
	27	480.4	424.2	200.00
	28	478.6	432.3	200.00
Terrain Line4	29	392.3	430.5	203.00
	30	351.5	534.5	201.00
	31	318.2	643.1	196.00
	32	297.5	725.1	195.00
Terrain Line5	33	410.9	272.4	201.00
	34	566.9	282.4	202.00
	35	686.2	326.4	208.00
	36	797.6	347.1	209.00
	37	884.3	355.1	210.00

	38	1,002.9	352.4	211.00
Terrain Line6	39	401.0	425.1	198.70
	40	440.7	424.7	197.20
	41	449.8	424.7	194.00

Eilar Associates 22 March 2016
AH TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: B60301N1 Westmont La Mesa
RUN: Current Contours

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Sub'l	NR Goal	Active in Calc.
			m	m	m	m	dBA	dBA	dB	dB	
Calibration	1	1	472.9	448.2	200.00	1.52	0.00	66	10.0	8.0	Y
1	3	1	401.6	432.0	200.00	1.52	0.00	66	10.0	8.0	Y
2	4	1	397.9	447.4	200.00	1.52	0.00	66	10.0	8.0	Y
3	5	1	393.1	463.2	200.00	1.52	0.00	66	10.0	8.0	Y
4	6	1	388.4	479.1	200.00	1.52	0.00	66	10.0	8.0	Y
5	7	1	383.9	494.5	200.00	1.52	0.00	66	10.0	8.0	Y
6	8	1	379.9	509.8	200.00	1.52	0.00	66	10.0	8.0	Y
7	9	1	375.9	525.4	200.00	1.52	0.00	66	10.0	8.0	Y
8	10	1	370.6	541.8	200.00	1.52	0.00	66	10.0	8.0	Y
9	11	1	417.5	431.0	200.00	1.52	0.00	66	10.0	8.0	Y
10	12	1	412.7	447.1	200.00	1.52	0.00	66	10.0	8.0	Y
11	13	1	408.2	462.2	200.00	1.52	0.00	66	10.0	8.0	Y
12	14	1	404.2	478.1	200.00	1.50	0.00	66	10.0	8.0	Y
13	15	1	398.9	493.4	200.00	1.52	0.00	66	10.0	8.0	Y
14	16	1	395.0	509.0	200.00	1.52	0.00	66	10.0	8.0	Y
15	17	1	390.5	524.1	200.00	1.52	0.00	66	10.0	8.0	Y
16	18	1	386.0	540.8	200.00	1.52	0.00	66	10.0	8.0	Y
17	19	1	433.1	429.9	200.00	1.52	0.00	66	10.0	8.0	Y
18	20	1	428.6	445.8	200.00	1.52	0.00	66	10.0	8.0	Y
19	21	1	424.1	461.1	200.00	1.52	0.00	66	10.0	8.0	Y
20	22	1	420.1	477.0	200.00	1.52	0.00	66	10.0	8.0	Y
21	23	1	416.1	492.1	200.00	1.52	0.00	66	10.0	8.0	Y

22	24	1	410.3	508.0	200.00	1.52	0.00	66	10.0	8.0	Y
23	25	1	405.8	523.3	200.00	1.52	0.00	66	10.0	8.0	Y
24	26	1	402.4	539.5	200.00	1.52	0.00	66	10.0	8.0	Y
25	27	1	449.5	428.6	200.00	1.52	0.00	66	10.0	8.0	Y
26	28	1	444.5	444.5	200.00	1.52	0.00	66	10.0	8.0	Y
27	29	1	439.7	460.3	200.00	1.52	0.00	66	10.0	8.0	Y
28	30	1	435.7	475.7	200.00	1.52	0.00	66	10.0	8.0	Y
29	31	1	431.2	491.3	200.00	1.52	0.00	66	10.0	8.0	Y
30	32	1	427.2	506.1	200.00	1.52	0.00	66	10.0	8.0	Y
31	33	1	422.8	521.7	200.00	1.52	0.00	66	10.0	8.0	Y
32	34	1	418.5	538.7	200.00	1.52	0.00	66	10.0	8.0	Y
33	35	1	463.8	427.3	200.00	1.52	0.00	66	10.0	8.0	Y
34	36	1	459.8	443.7	200.00	1.52	0.00	66	10.0	8.0	Y
35	37	1	455.0	459.5	200.00	1.52	0.00	66	10.0	8.0	Y
36	38	1	450.3	474.9	200.00	1.52	0.00	66	10.0	8.0	Y
37	39	1	446.6	490.2	200.00	1.52	0.00	66	10.0	8.0	Y
38	40	1	441.5	505.3	200.00	1.52	0.00	66	10.0	8.0	Y
39	41	1	437.6	521.2	200.00	1.52	0.00	66	10.0	8.0	Y
40	42	1	479.4	426.2	200.00	1.52	0.00	66	10.0	8.0	Y
41	43	1	474.1	442.4	200.00	1.52	0.00	66	10.0	8.0	Y
42	44	1	470.1	457.7	200.00	1.52	0.00	66	10.0	8.0	Y
43	45	1	466.4	473.0	200.00	1.52	0.00	66	10.0	8.0	Y
44	46	1	461.1	488.9	200.00	1.52	0.00	66	10.0	8.0	Y
45	47	1	457.1	504.0	200.00	1.52	0.00	66	10.0	8.0	Y
46	48	1	493.9	425.2	200.00	1.52	0.00	66	10.0	8.0	Y
47	49	1	490.0	441.0	200.00	1.52	0.00	66	10.0	8.0	Y
48	50	1	485.7	456.6	200.00	1.52	0.00	66	10.0	8.0	Y
49	51	1	481.5	472.0	200.00	1.52	0.00	66	10.0	8.0	Y
50	52	1	477.0	487.9	200.00	1.52	0.00	66	10.0	8.0	Y
51	53	1	509.5	424.4	200.00	1.52	0.00	66	10.0	8.0	Y
52	54	1	505.3	440.0	200.00	1.52	0.00	66	10.0	8.0	Y
53	55	1	500.5	456.6	200.00	1.52	0.00	66	10.0	8.0	Y
54	56	1	496.8	471.2	200.00	1.52	0.00	66	10.0	8.0	Y
55	57	1	526.0	422.2	200.00	1.52	0.00	66	10.0	8.0	Y
56	58	1	520.9	439.4	200.00	1.52	0.00	66	10.0	8.0	Y
57	59	1	516.4	454.8	200.00	1.52	0.00	66	10.0	8.0	Y

58	60	1	512.7	470.4	200.00	1.52	0.00	66	10.0	8.0	Y

Eilar Associates
AH

22 March 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: B60301N1 Westmont La Mesa
RUN: Current Contours
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Calibration	1	1	0.0	65.8	66	65.8	10	----	65.8	0.0	8	-8.0
1	3	1	0.0	71.4	66	71.4	10	Snd Lvl	71.4	0.0	8	-8.0
2	4	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	8	-8.0
3	5	1	0.0	63.9	66	63.9	10	----	63.9	0.0	8	-8.0
4	6	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
5	7	1	0.0	62.8	66	62.8	10	----	62.8	0.0	8	-8.0
6	8	1	0.0	62.4	66	62.4	10	----	62.4	0.0	8	-8.0
7	9	1	0.0	62.1	66	62.1	10	----	62.1	0.0	8	-8.0
8	10	1	0.0	62.1	66	62.1	10	----	62.1	0.0	8	-8.0
9	11	1	0.0	70.7	66	70.7	10	Snd Lvl	70.7	0.0	8	-8.0
10	12	1	0.0	68.1	66	68.1	10	Snd Lvl	68.1	0.0	8	-8.0
11	13	1	0.0	66.1	66	66.1	10	Snd Lvl	66.1	0.0	8	-8.0
12	14	1	0.0	64.2	66	64.2	10	----	64.2	0.0	8	-8.0
13	15	1	0.0	62.7	66	62.7	10	----	62.7	0.0	8	-8.0
14	16	1	0.0	61.9	66	61.9	10	----	61.9	0.0	8	-8.0
15	17	1	0.0	61.4	66	61.4	10	----	61.4	0.0	8	-8.0
16	18	1	0.0	60.8	66	60.8	10	----	60.8	0.0	8	-8.0
17	19	1	0.0	69.9	66	69.9	10	Snd Lvl	69.9	0.0	8	-8.0
18	20	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	8	-8.0
19	21	1	0.0	66.5	66	66.5	10	Snd Lvl	66.5	0.0	8	-8.0
20	22	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
21	23	1	0.0	63.8	66	63.8	10	----	63.8	0.0	8	-8.0
22	24	1	0.0	62.6	66	62.6	10	----	62.6	0.0	8	-8.0
23	25	1	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0

24	26	1	0.0	60.7	66	60.7	10	----	60.7	0.0	8	-8.0
25	27	1	0.0	69.1	66	69.1	10	Snd Lvl	69.1	0.0	8	-8.0
26	28	1	0.0	67.3	66	67.3	10	Snd Lvl	67.3	0.0	8	-8.0
27	29	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	8	-8.0
28	30	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
29	31	1	0.0	63.8	66	63.8	10	----	63.8	0.0	8	-8.0
30	32	1	0.0	62.7	66	62.7	10	----	62.7	0.0	8	-8.0
31	33	1	0.0	61.7	66	61.7	10	----	61.7	0.0	8	-8.0
32	34	1	0.0	60.8	66	60.8	10	----	60.8	0.0	8	-8.0
33	35	1	0.0	68.6	66	68.6	10	Snd Lvl	68.6	0.0	8	-8.0
34	36	1	0.0	66.6	66	66.6	10	Snd Lvl	66.6	0.0	8	-8.0
35	37	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
36	38	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
37	39	1	0.0	63.9	66	63.9	10	----	63.9	0.0	8	-8.0
38	40	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
39	41	1	0.0	61.9	66	61.9	10	----	61.9	0.0	8	-8.0
40	42	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	8	-8.0
41	43	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	8	-8.0
42	44	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
43	45	1	0.0	64.4	66	64.4	10	----	64.4	0.0	8	-8.0
44	46	1	0.0	63.7	66	63.7	10	----	63.7	0.0	8	-8.0
45	47	1	0.0	62.8	66	62.8	10	----	62.8	0.0	8	-8.0
46	48	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	8	-8.0
47	49	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
48	50	1	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0
49	51	1	0.0	63.6	66	63.6	10	----	63.6	0.0	8	-8.0
50	52	1	0.0	63.0	66	63.0	10	----	63.0	0.0	8	-8.0
51	53	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
52	54	1	0.0	63.4	66	63.4	10	----	63.4	0.0	8	-8.0
53	55	1	0.0	63.3	66	63.3	10	----	63.3	0.0	8	-8.0
54	56	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
55	57	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
56	58	1	0.0	62.4	66	62.4	10	----	62.4	0.0	8	-8.0
57	59	1	0.0	62.2	66	62.2	10	----	62.2	0.0	8	-8.0
58	60	1	0.0	61.9	66	61.9	10	----	61.9	0.0	8	-8.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	59	0.0	0.0	0.0
All Impacted	16	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Eilar Associates **22 March 2016**
AH **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **B60301N1 Westmont La Mesa**
RUN: **Future Contours**

Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h
EB I-8	point1	1	6726	105	176	105	134	105	0	0	0	0
	point2	2	6726	105	176	105	134	105	0	0	0	0
	point3	3	6726	105	176	105	134	105	0	0	0	0
	point4	4	6726	105	176	105	134	105	0	0	0	0
	point5	5	6726	105	176	105	134	105	0	0	0	0
	point6	6	6726	105	176	105	134	105	0	0	0	0
	point7	7	6726	105	176	105	134	105	0	0	0	0
	point8	8										
WB I-8	point9	9	6820	105	178	105	136	105	0	0	0	0
	point10	10	6820	105	178	105	136	105	0	0	0	0
	point11	11	6820	105	178	105	136	105	0	0	0	0
	point12	12	6820	105	178	105	136	105	0	0	0	0
	point13	13	6820	105	178	105	136	105	0	0	0	0
	point14	14	6820	105	178	105	136	105	0	0	0	0
	point15	15	6820	105	178	105	136	105	0	0	0	0
	point16	16	6820	105	178	105	136	105	0	0	0	0
	point17	17										
NB SR-125	point18	18	4355	105	118	105	82	105	0	0	0	0
	point19	19	4355	105	118	105	82	105	0	0	0	0
	point64	64	4355	105	118	105	82	105	0	0	0	0
	point20	20	4355	105	118	105	82	105	0	0	0	0
	point21	21										
SB SR-125	point22	22	4355	105	118	105	82	105	0	0	0	0

	point23	23	4355	105	118	105	82	105	0	0	0	0
	point65	65	4355	105	118	105	82	105	0	0	0	0
	point24	24	4355	105	118	105	82	105	0	0	0	0
	point25	25										
EB Murray	point26	26	693	64	19	64	13	64	0	0	0	0
	point27	27	693	64	19	64	13	64	0	0	0	0
	point28	28	693	64	19	64	13	64	0	0	0	0
	point29	29	693	64	19	64	13	64	0	0	0	0
	point30	30	693	64	19	64	13	64	0	0	0	0
	point31	31	693	64	19	64	13	64	0	0	0	0
	point32	32	693	64	19	64	13	64	0	0	0	0
	point33	33	693	64	19	64	13	64	0	0	0	0
	point34	34	693	64	19	64	13	64	0	0	0	0
	point35	35	693	64	19	64	13	64	0	0	0	0
	point36	36	693	64	19	64	13	64	0	0	0	0
	point37	37	693	64	19	64	13	64	0	0	0	0
	point38	38										
WB Murray	point39	39	693	64	19	64	13	64	0	0	0	0
	point40	40	693	64	19	64	13	64	0	0	0	0
	point41	41	693	64	19	64	13	64	0	0	0	0
	point42	42	693	64	19	64	13	64	0	0	0	0
	point43	43	693	64	19	64	13	64	0	0	0	0
	point44	44	693	64	19	64	13	64	0	0	0	0
	point45	45	693	64	19	64	13	64	0	0	0	0
	point46	46	693	64	19	64	13	64	0	0	0	0
	point47	47	693	64	19	64	13	64	0	0	0	0
	point48	48	693	64	19	64	13	64	0	0	0	0
	point49	49										
Wakarusa	point59	59	264	40	1	40	1	40	0	0	0	0
	point60	60	264	40	1	40	1	40	0	0	0	0
	point61	61	264	40	1	40	1	40	0	0	0	0
	point62	62	264	40	1	40	1	40	0	0	0	0
	point63	63										

Eilar Associates
AH

22 March 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: B60301N1 Westmont La Mesa
RUN: Future Contours
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Calibration	1	1	0.0	68.2	66	68.2	10	Snd Lvl	68.2	0.0	8	-8.0
1	3	1	0.0	74.0	66	74.0	10	Snd Lvl	74.0	0.0	8	-8.0
2	4	1	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	8	-8.0
3	5	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
4	6	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
5	7	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
6	8	1	0.0	64.4	66	64.4	10	----	64.4	0.0	8	-8.0
7	9	1	0.0	64.2	66	64.2	10	----	64.2	0.0	8	-8.0
8	10	1	0.0	64.2	66	64.2	10	----	64.2	0.0	8	-8.0
9	11	1	0.0	73.4	66	73.4	10	Snd Lvl	73.4	0.0	8	-8.0
10	12	1	0.0	70.3	66	70.3	10	Snd Lvl	70.3	0.0	8	-8.0
11	13	1	0.0	68.2	66	68.2	10	Snd Lvl	68.2	0.0	8	-8.0
12	14	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	8	-8.0
13	15	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
14	16	1	0.0	63.9	66	63.9	10	----	63.9	0.0	8	-8.0
15	17	1	0.0	63.4	66	63.4	10	----	63.4	0.0	8	-8.0
16	18	1	0.0	62.8	66	62.8	10	----	62.8	0.0	8	-8.0
17	19	1	0.0	72.8	66	72.8	10	Snd Lvl	72.8	0.0	8	-8.0
18	20	1	0.0	70.3	66	70.3	10	Snd Lvl	70.3	0.0	8	-8.0
19	21	1	0.0	68.6	66	68.6	10	Snd Lvl	68.6	0.0	8	-8.0
20	22	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	8	-8.0
21	23	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
22	24	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
23	25	1	0.0	63.5	66	63.5	10	----	63.5	0.0	8	-8.0

24	26	1	0.0	62.7	66	62.7	10	----	62.7	0.0	8	-8.0
25	27	1	0.0	72.1	66	72.1	10	Snd Lvl	72.1	0.0	8	-8.0
26	28	1	0.0	69.7	66	69.7	10	Snd Lvl	69.7	0.0	8	-8.0
27	29	1	0.0	68.6	66	68.6	10	Snd Lvl	68.6	0.0	8	-8.0
28	30	1	0.0	67.2	66	67.2	10	Snd Lvl	67.2	0.0	8	-8.0
29	31	1	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	8	-8.0
30	32	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
31	33	1	0.0	63.7	66	63.7	10	----	63.7	0.0	8	-8.0
32	34	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
33	35	1	0.0	71.7	66	71.7	10	Snd Lvl	71.7	0.0	8	-8.0
34	36	1	0.0	69.0	66	69.0	10	Snd Lvl	69.0	0.0	8	-8.0
35	37	1	0.0	68.2	66	68.2	10	Snd Lvl	68.2	0.0	8	-8.0
36	38	1	0.0	67.2	66	67.2	10	Snd Lvl	67.2	0.0	8	-8.0
37	39	1	0.0	66.1	66	66.1	10	Snd Lvl	66.1	0.0	8	-8.0
38	40	1	0.0	65.1	66	65.1	10	----	65.1	0.0	8	-8.0
39	41	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
40	42	1	0.0	71.0	66	71.0	10	Snd Lvl	71.0	0.0	8	-8.0
41	43	1	0.0	68.8	66	68.8	10	Snd Lvl	68.8	0.0	8	-8.0
42	44	1	0.0	67.3	66	67.3	10	Snd Lvl	67.3	0.0	8	-8.0
43	45	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	8	-8.0
44	46	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
45	47	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
46	48	1	0.0	69.9	66	69.9	10	Snd Lvl	69.9	0.0	8	-8.0
47	49	1	0.0	67.3	66	67.3	10	Snd Lvl	67.3	0.0	8	-8.0
48	50	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0
49	51	1	0.0	65.8	66	65.8	10	----	65.8	0.0	8	-8.0
50	52	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
51	53	1	0.0	68.2	66	68.2	10	Snd Lvl	68.2	0.0	8	-8.0
52	54	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
53	55	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0
54	56	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
55	57	1	0.0	67.8	66	67.8	10	Snd Lvl	67.8	0.0	8	-8.0
56	58	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
57	59	1	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0
58	60	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	59	0.0	0.0	0.0
All Impacted	30	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Eilar Associates **31 March 2016**
AH **TNM 2.5**

INPUT: BARRIERS
PROJECT/CONTRACT: **B60301N1 Westmont La Mesa**
RUN: **Future Facades & Outdoor Use**

Barrier Name	Type	Height Min	Max	If Wall $ per Unit Area	If Berm $ per Unit Vol.	Top Width	Run:Rise	Add'tnl $ per Unit Length	Points Name	No.	Coordinates (bottom) X	Y	Z	Height at Point	Segment Seg Ht Increment	Perturbs #Up	#Dn	On Struct?	Important Reflections?
		m	m	$/sq m	$/cu m	m	m:m	$/m			m	m	m	m	m				
Barrier1	W	0.00	30.48	0.00				0.00	point1	1	401.0	424.6	194.00	4.69	0.00	0	0		
									point2	2	440.7	424.2	194.00	3.20	0.00	0	0		
									point3	3	449.8	424.2	194.00	0.00					
Bldg (B)	W	0.00	30.48	0.00				0.00	point25	25	400.1	481.5	200.00	9.14	0.00	0	0		
									point26	26	416.9	485.8	200.00	9.14	0.00	0	0		
									point27	27	415.8	490.1	200.00	9.14	0.00	0	0		
									point28	28	409.0	488.2	200.00	9.14	0.00	0	0		
									point29	29	404.5	507.3	200.00	9.14	0.00	0	0		
									point30	30	417.8	510.6	200.00	9.14	0.00	0	0		
									point31	31	422.7	488.6	200.00	9.14	0.00	0	0		
									point32	32	439.6	492.7	200.00	9.14	0.00	0	0		
									point33	33	432.0	522.9	200.00	9.14	0.00	0	0		
									point34	34	424.8	521.0	200.00	9.14	0.00	0	0		
									point35	35	421.9	530.5	200.00	9.14	0.00	0	0		
									point36	36	389.1	521.6	200.00	9.14	0.00	0	0		
									point37	37	400.1	481.5	200.00	9.14					
Bldg (A)	W	0.00	30.48	0.00				0.00	point77	77	402.7	482.0	200.00	9.14	0.00	0	0		
									point78	78	417.4	485.8	200.00	9.14	0.00	0	0		
									point79	79	418.0	482.4	200.00	9.14	0.00	0	0		
									point80	80	423.9	483.9	200.00	9.14	0.00	0	0		
									point81	81	422.8	488.3	200.00	9.14	0.00	0	0		
									point82	82	439.6	492.5	200.00	9.14	0.00	0	0		
									point83	83	443.6	476.1	200.00	9.14	0.00	0	0		
									point84	84	499.1	475.9	200.00	9.14	0.00	0	0		
									point85	85	499.7	452.0	200.00	9.14	0.00	0	0		
									point86	86	502.6	452.0	200.00	9.14	0.00	0	0		
									point87	87	502.2	437.5	200.00	9.14	0.00	0	0		
									point88	88	491.5	437.5	200.00	9.14	0.00	0	0		
									point89	89	491.9	454.1	200.00	9.14	0.00	0	0		
									point90	90	485.2	453.9	200.00	9.14	0.00	0	0		
									point91	91	484.6	457.5	200.00	9.14	0.00	0	0		
									point92	92	471.3	457.2	200.00	9.14	0.00	0	0		
									point93	93	471.3	450.9	200.00	9.14	0.00	0	0		
									point94	94	460.0	450.9	200.00	9.14	0.00	0	0		
									point95	95	460.0	454.5	200.00	9.14	0.00	0	0		

									point96	96	414.2	456.1	200.00	9.14	0.00	0	0			
									point97	97	409.4	460.0	200.00	9.14	0.00	0	0			
									point98	98	407.7	465.9	200.00	9.14	0.00	0	0			
									point99	99	414.5	467.7	200.00	9.14	0.00	0	0			
									point100	100	415.1	464.9	200.00	9.14	0.00	0	0			
									point101	101	417.7	465.7	200.00	9.14	0.00	0	0			
									point102	102	418.5	462.9	200.00	9.14	0.00	0	0			
									point103	103	430.2	463.1	200.00	9.14	0.00	0	0			
									point104	104	427.4	474.5	200.00	9.14	0.00	0	0			
									point105	105	419.5	472.6	200.00	9.14	0.00	0	0			
									point106	106	419.5	473.2	200.00	9.14	0.00	0	0			
									point107	107	415.8	472.4	200.00	9.14	0.00	0	0			
									point108	108	414.7	477.4	200.00	9.14	0.00	0	0			
									point109	109	412.5	476.7	200.00	9.14	0.00	0	0			
									point110	110	413.4	471.1	200.00	9.14	0.00	0	0			
									point111	111	406.5	468.8	200.00	9.14	0.00	0	0			
									point112	112	402.7	482.0	200.00	9.14						

Eilar Associates **31 March 2016**
AH **TNM 2.5**

INPUT: RECEIVERS
PROJECT/CONTRACT: **B60301N1 Westmont La Mesa**
RUN: **Future Facades & Outdoor Use**

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Sub'l	NR Goal	Active in Calc.
			m	m	m	m	dBA	dBA	dB	dB	
Calibration	1	1	472.9	448.2	200.00	1.52	0.00	66	10.0	8.0	
OU1	4	1	454.5	481.1	200.00	1.52	0.00	66	10.0	8.0	
OU2	5	1	413.0	498.3	200.00	1.52	0.00	66	10.0	8.0	
OU3	6	1	440.1	504.6	200.00	1.52	0.00	66	10.0	8.0	
OU4	7	1	427.1	525.1	200.00	1.52	0.00	66	10.0	8.0	
R1-1	8	1	497.2	436.2	200.00	1.52	0.00	66	10.0	8.0	
R2-1	9	1	463.3	449.7	200.00	1.52	0.00	66	10.0	8.0	
R3-1	10	1	428.1	453.1	200.00	1.52	0.00	66	10.0	8.0	
R4-1	11	1	405.1	467.7	200.00	1.52	0.00	66	10.0	8.0	
R5-1	12	1	392.7	501.8	200.00	1.52	0.00	66	10.0	8.0	
R6-1	13	1	402.7	526.7	200.00	1.52	0.00	66	10.0	8.0	
R7-1	14	1	436.1	513.5	200.00	1.52	0.00	66	10.0	8.0	
R8-1	15	1	466.5	478.0	200.00	1.52	0.00	66	10.0	8.0	
R9-1	16	1	501.1	465.3	200.00	1.52	0.00	66	10.0	8.0	
R10-1	17	1	503.8	443.6	200.00	1.52	0.00	66	10.0	8.0	
R1-2	18	1	497.2	436.2	200.00	4.57	0.00	66	10.0	8.0	
R2-2	19	1	463.3	449.7	200.00	4.57	0.00	66	10.0	8.0	
R3-2	20	1	428.1	453.1	200.00	4.57	0.00	66	10.0	8.0	
R4-2	21	1	405.1	467.7	200.00	4.57	0.00	66	10.0	8.0	
R5-2	22	1	392.7	501.8	200.00	4.57	0.00	66	10.0	8.0	
R6-2	23	1	402.7	526.7	200.00	4.57	0.00	66	10.0	8.0	
R7-2	24	1	436.1	513.5	200.00	4.57	0.00	66	10.0	8.0	

R8-2	25	1	466.5	478.0	200.00	4.57	0.00	66	10.0	8.0	
R9-2	26	1	501.1	465.3	200.00	4.57	0.00	66	10.0	8.0	
R10-2	27	1	503.8	443.6	200.00	4.57	0.00	66	10.0	8.0	
R1-3	28	1	497.2	436.2	200.00	7.62	0.00	66	10.0	8.0	
R2-3	29	1	463.3	449.7	200.00	7.62	0.00	66	10.0	8.0	
R3-3	30	1	428.1	453.1	200.00	7.62	0.00	66	10.0	8.0	
R4-3	31	1	405.1	467.7	200.00	7.62	0.00	66	10.0	8.0	
R5-3	32	1	392.7	501.8	200.00	7.62	0.00	66	10.0	8.0	
R6-3	33	1	402.7	526.7	200.00	7.62	0.00	66	10.0	8.0	
R7-3	34	1	436.1	513.5	200.00	7.62	0.00	66	10.0	8.0	
R8-3	35	1	466.5	478.0	200.00	7.62	0.00	66	10.0	8.0	
R9-3	36	1	501.1	465.3	200.00	7.62	0.00	66	10.0	8.0	
R10-3	37	1	503.8	443.6	200.00	7.62	0.00	66	10.0	8.0	
OU5	62	1	419.8	486.6	200.00	4.57	0.00	66	10.0	8.0	Y
OU6	63	1	416.5	469.4	200.00	4.57	0.00	66	10.0	8.0	Y
OU7	64	1	448.0	477.4	200.00	4.57	0.00	66	10.0	8.0	Y
OU8	66	1	416.0	509.1	200.00	4.57	0.00	66	10.0	8.0	Y
OU9	67	1	419.8	486.6	200.00	7.62	0.00	66	10.0	8.0	Y
OU10	68	1	416.0	509.1	200.00	7.62	0.00	66	10.0	8.0	Y

Eilar Associates
AH

31 March 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: B60301N1 Westmont La Mesa
RUN: Future Facades & Outdoor Use
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Calibration	1	1	0.0	68.1	66	68.1	10	Snd Lvl	68.1	0.0	8	-8.0
OU1	4	1	0.0	44.9	66	44.9	10	----	44.9	0.0	8	-8.0
OU2	5	1	0.0	44.4	66	44.4	10	----	44.4	0.0	8	-8.0
OU3	6	1	0.0	49.8	66	49.8	10	----	49.8	0.0	8	-8.0
OU4	7	1	0.0	49.7	66	49.7	10	----	49.7	0.0	8	-8.0
R1-1	8	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	8	-8.0
R2-1	9	1	0.0	68.2	66	68.2	10	Snd Lvl	68.2	0.0	8	-8.0
R3-1	10	1	0.0	69.3	66	69.3	10	Snd Lvl	69.3	0.0	8	-8.0
R4-1	11	1	0.0	67.2	66	67.2	10	Snd Lvl	67.2	0.0	8	-8.0
R5-1	12	1	0.0	63.6	66	63.6	10	----	63.6	0.0	8	-8.0
R6-1	13	1	0.0	54.6	66	54.6	10	----	54.6	0.0	8	-8.0
R7-1	14	1	0.0	50.3	66	50.3	10	----	50.3	0.0	8	-8.0
R8-1	15	1	0.0	44.7	66	44.7	10	----	44.7	0.0	8	-8.0
R9-1	16	1	0.0	56.7	66	56.7	10	----	56.7	0.0	8	-8.0
R10-1	17	1	0.0	59.4	66	59.4	10	----	59.4	0.0	8	-8.0
R1-2	18	1	0.0	69.8	66	69.8	10	Snd Lvl	69.8	0.0	8	-8.0
R2-2	19	1	0.0	70.0	66	70.0	10	Snd Lvl	70.0	0.0	8	-8.0
R3-2	20	1	0.0	70.8	66	70.8	10	Snd Lvl	70.8	0.0	8	-8.0
R4-2	21	1	0.0	71.9	66	71.9	10	Snd Lvl	71.9	0.0	8	-8.0
R5-2	22	1	0.0	71.5	66	71.5	10	Snd Lvl	71.5	0.0	8	-8.0
R6-2	23	1	0.0	59.4	66	59.4	10	----	59.4	0.0	8	-8.0
R7-2	24	1	0.0	52.9	66	52.9	10	----	52.9	0.0	8	-8.0
R8-2	25	1	0.0	48.3	66	48.3	10	----	48.3	0.0	8	-8.0
R9-2	26	1	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0

R10-2	27	1	0.0	63.1	66	63.1	10	----	63.1	0.0	8	-8.0
R1-3	28	1	0.0	71.9	66	71.9	10	Snd Lvl	71.9	0.0	8	-8.0
R2-3	29	1	0.0	71.5	66	71.5	10	Snd Lvl	71.5	0.0	8	-8.0
R3-3	30	1	0.0	72.9	66	72.9	10	Snd Lvl	72.9	0.0	8	-8.0
R4-3	31	1	0.0	74.5	66	74.5	10	Snd Lvl	74.5	0.0	8	-8.0
R5-3	32	1	0.0	74.4	66	74.4	10	Snd Lvl	74.4	0.0	8	-8.0
R6-3	33	1	0.0	66.5	66	66.5	10	Snd Lvl	66.5	0.0	8	-8.0
R7-3	34	1	0.0	55.4	66	55.4	10	----	55.4	0.0	8	-8.0
R8-3	35	1	0.0	51.8	66	51.8	10	----	51.8	0.0	8	-8.0
R9-3	36	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
R10-3	37	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	8	-8.0
OU5	62	1	0.0	46.4	66	46.4	10	----	46.4	0.0	8	-8.0
OU6	63	1	0.0	57.9	66	57.9	10	----	57.9	0.0	8	-8.0
OU7	64	1	0.0	46.6	66	46.6	10	----	46.6	0.0	8	-8.0
OU8	66	1	0.0	46.1	66	46.1	10	----	46.1	0.0	8	-8.0
OU9	67	1	0.0	52.8	66	52.8	10	----	52.8	0.0	8	-8.0
OU10	68	1	0.0	53.2	66	53.2	10	----	53.2	0.0	8	-8.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	41	0.0	0.0	0.0
All Impacted	17	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX D

Manufacturer Data Sheets

528150-YTG-N-0912

YORK®

Heating and Air Conditioning

TECHNICAL GUIDE
R-410A
ZH/ZJ/ZR SERIES
3 - 12-1/2 TON
60 Hertz

PREDATOR®

ZH/ZJ/ZR 3 THROUGH 10 TON

ZH 12-1/2 TON

ZJ/ZR 12-1/2 TON

Description

ASHRAE 90.1 COMPLIANT

YORK® Predator® units are convertible single packages with a common footprint cabinet and common roof curb for all 3 through 12-1/2 ton models. All 6-1/2 through 12-1/2 ton units have two compressors with independent refrigeration circuits to provide 2 stages of cooling. The units were designed for light commercial applications and can be easily installed on a roof curb, slab, or frame.

All Predator® units are self-contained and assembled on rigid full perimeter base rails allowing for 3-way forklift access and overhead rigging. Every unit is completely charged, wired, piped, and tested at the factory to provide a quick and easy field installation.

All units are convertible between side and down airflow. Independent economizer designs are used on side and down discharge applications, as well as all tonnage sizes.

Predator® units are available in the following configurations: cooling only, cooling with electric heat, cooling with gas heat, reheat only, reheat with electric heat and reheat with gas heat. Electric heaters are available as factory-installed options or field-installed accessories.

All units provide constant supply air volume. A variable air volume (VAV) option, featuring a variable frequency drive, is available on 6-1/2 through 12-1/2 ton ZH/ZJ models only.

Tested in accordance with:

DESIGN CERTIFIED

C US

AHRI CERTIFIED

AHRI CERTIFIED

FOR DISTRIBUTION USE ONLY - NOT TO BE USED AT POINT OF RETAIL SALE

Indoor Sound Power Levels (6.5 thru 12.5 Ton)

Size (Tons)	Model	CFM	ESP (IWG)	Blower		Sound Power, dB (10^{-12}) Watts								
						Sound Rating[1] dB (A)	Octave Band Centerline Frequency (Hz)							
				RPM	BHP		63	125	250	500	1000	2000	4000	8000
078 (6.5)	ZH/ZJ/ZR	2600	0.6	812	1.14	74	71	73	73	71	69	65	65	60
090 (7.5)	ZH/ZJ/ZR	3000	0.6	854	1.47	77	74	76	76	74	72	68	68	63
102 (8.5)	ZH/ZJ/ZR	3400	0.6	872	1.65	80	77	79	79	77	75	71	71	66
120 (10)	ZH/ZJ/ZR	4000	0.6	959	2.29	83	80	82	82	80	78	74	74	69
150 (12.5)	ZH/ZJ/ZR	5000	0.6	1132	3.74	87	84	86	86	84	82	78	78	73

1. These values have been accessed using a model of sound propagation from a point source into the hemispheric/free field. The dBA values provided are to be used for reference only. Calculation of dBA values cover matters of system design and the fan manufacture has no way of knowing the details of each system. This constitutes an exception to any specification or guarantee requiring a dBA value of sound data in any other form than sound power level ratings.

APPENDIX E

Cadna Analysis Data and Results

Cadna Noise Model - Sound Levels															
Name	ID	Type			Oktave Spectrum (dB)										Source
			Weight	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
York ZH120	L1	Lw			80	82	82	80	78	74	74	69	83.2	88	Mfr
York ZH150	L2	Lw			84	86	86	84	82	78	78	73	87.2	92	Mfr
Ref Truck	L3	Lw (c)			114.8	108.8	103.9	105.3	104	100.8	95.6	90	108.3	116.8	Measurements
Backup Alarm	L4	Lw (c)		34.7	34.7	34.7	34.7	34.7	110.7	34.7	34.7	34.7	110.7	110.7	Measurements

Cadna Noise Model-Line Sources											
Name	ID	Result. PWL	Result. PWL'	Lw/Li		Moving Pt. Src			Coordinates		
				Type	Value	Number per hr	Speed (km/h)		X	Y	Z
		(dBA)	(dBA)				Day	Night	(m)	(m)	(m)
Truck Route	LS_1	93.4	66.3	PWL-Pt	L3	1	16		514.18	409.19	1.52
									513.27	425.97	1.52
									501.29	432.06	1.52
									467.01	436.64	1.52
									408.33	441.2	1.52
									400.13	456.11	1.52
									394.4	477.84	1.52
									383.96	496.35	1.52
									380.91	515.89	1.52
									389.32	527.97	1.52
									407.07	534.58	1.52
									392.64	530.02	1.52
									380.81	526.07	1.52
									377.39	525.36	1.52
									366.72	528.94	1.52
									378.81	519.69	1.52
									377.13	512.73	1.52
									381.23	492.36	1.52
									394.15	469.77	1.52
									398.77	451.7	1.52
									409.38	446.14	1.52
									406.55	453.7	1.52
									412.85	437.73	1.52
									449.09	435.95	1.52
									487.85	431.43	1.52
									506.02	427.23	1.52
									509.49	422.4	1.52
									509.29	411.55	1.52

Cadna Noise Model - Point Sources									
Name	ID	Result. PWL	Lw / Li		Operating	Height	Coordinates		
			Type	Value	Time		X	Y	Z
		(dBA)			(min)	(m)	(m)	(m)	(m)
HVAC 1 (Kitchen)	S_1	87.2	Lw	L2		10.36	426.3	475.5	10.36
HVAC 2	S_2	83.2	Lw	L1		10.36	409.55	518.17	10.36
HVAC 3	S_3	83.2	Lw	L1		10.36	427.05	507.17	10.36
HVAC 4	S_4	83.2	Lw	L1		10.36	400.05	499.84	10.36
HVAC 5	S_5	83.2	Lw	L1		10.36	413.87	467.97	10.36
HVAC 6	S_6	83.2	Lw	L1		10.36	438.05	479.5	10.36
HVAC 7	S_7	83.2	Lw	L1		10.36	453.36	458.85	10.36
HVAC 8	S_8	83.2	Lw	L1		10.36	454.22	471.83	10.36
HVAC 9	S_9	83.2	Lw	L1		10.36	479.73	470.83	10.36
HVAC 10	S_10	83.2	Lw	L1		10.36	492.1	457.69	10.36
Backup Alarm	S_11	110.7	Lw	L4	1	1.52	406.7	453.77	1.52
Backup Alarm	S_12	110.7	Lw	L4	1	1.52	398.54	531.78	1.52

Cadna Noise Model - Buildings				
Name	Coordinates			
	X	Y	Z	Ground
	(m)	(m)	(m)	(m)
Building (North Portion)	400.11	481.49	9.14	0
	416.85	485.79	9.14	0
	415.8	490.06	9.14	0
	408.98	488.22	9.14	0
	404.46	507.33	9.14	0
	417.8	510.59	9.14	0
	422.69	488.56	9.14	0
	439.59	492.66	9.14	0
	432.01	522.92	9.14	0
	424.8	521	9.14	0
	421.9	530.5	9.14	0
	389.11	521.56	9.14	0
Building (South Portion)	402.67	482.1	9.14	0
	417.37	485.88	9.14	0
	418	482.52	9.14	0
	423.88	483.99	9.14	0
	422.83	488.4	9.14	0
	439.63	492.6	9.14	0
	443.62	476.22	9.14	0
	499.06	476.01	9.14	0
	499.69	452.07	9.14	0
	502.63	452.07	9.14	0
	502.21	437.58	9.14	0
	491.5	437.58	9.14	0
	491.92	454.17	9.14	0
	485.2	453.96	9.14	0
	484.57	457.53	9.14	0
	471.34	457.32	9.14	0
	471.34	451.02	9.14	0
	460	451.02	9.14	0
	460	454.59	9.14	0
	410.86	455.22	9.14	0

Cadna Noise Model - Noise Levels at Receivers - HVAC Only						
Name	ID	Level Lr	Height	Coordinates		
				X	Y	Z
		(dBA)	(m)	(m)	(m)	(m)
North	PL1	35.2	1.52	415.11	541.87	1.52
East	PL2	42.2	1.52	466.23	502.08	1.52
North-2	PL3	34.0	1.52	402.26	541.37	1.52
East-2	PL4	35.6	1.52	424.67	535.66	1.52

Cadna Noise Model - Noise Levels at Receivers - HVAC + Deliveries						
Name	ID	Level Lr	Height	Coordinates		
				X	Y	Z
		(dBA)	(m)	(m)	(m)	(m)
North	PL1	49.6	1.52	415.11	541.87	1.52
East	PL2	42.3	1.52	466.23	502.08	1.52
North-2	PL3	54.7	1.52	402.26	541.37	1.52
East-2	PL4	46.9	1.52	424.67	535.66	1.52

APPENDIX F

Construction Equipment Noise Calculations

Noise Attenuation by Distance Calculation

Job: Westmont La Mesa
Job #: B60301N1
Date: 3/21/2016
Source: Backhoe
Receiver: Northeast (Park)

Noise Source

Noise Level (dBA)	64	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:	120	feet			

Path Calculation

Source to Receiver Direct Path Distance:	**120**	feet

Sound Pressure Level **56.4** at 120 feet

Hours of Use:	**8**
Duty Cycle (%):	**40**
Level During 8 Hour day:	**52.4**

Summation

Number of Sources:	6
Level during 8 hour day:	**73.3**

Noise Attenuation by Distance Calculation

Job: Westmont La Mesa
Job #: B60301N1
Date: 3/21/2016
Source: Skip Loader
Receiver: Northeast (Park)

Noise Source

Noise Level (dBA)	64	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:	120	feet			

Path Calculation

Source to Receiver Direct Path Distance:	**120**	feet

Sound Pressure Level	**56.4**	at	120	feet
Hours of Use:	**8**			
Duty Cycle (%):	**40**			
Level During 8 Hour day:	**52.4**			

Noise Attenuation by Distance Calculation

Job: Westmont La Mesa
Job #: B60301N1
Date: 3/21/2016
Source: Dozer
Receiver: Northeast (Park)

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:	120	feet			

Path Calculation

Source to Receiver Direct Path Distance:	**120**	feet

Sound Pressure Level	**63.4**	at	120	feet
Hours of Use:	**8**			
Duty Cycle (%):	**40**			
Level During 8 Hour day:	**59.4**			

Noise Attenuation by Distance Calculation

Job: Westmont La Mesa
Job #: B60301N1
Date: 3/21/2016
Source: Dump Truck
Receiver: Northeast (Park)

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:	120	feet			

Path Calculation

Source to Receiver Direct Path Distance:	**120**	feet

Sound Pressure Level	**68.4**	at	120	feet
Hours of Use:	**8**			
Duty Cycle (%):	**40**			
Level During 8 Hour day:	**64.4**			

Noise Attenuation by Distance Calculation

Job: Westmont La Mesa
Job #: B60301N1
Date: 3/21/2016
Source: Water Truck
Receiver: Northeast (Park)

Noise Source

Noise Level (dBA)	77	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:	120	feet			

Path Calculation

Source to Receiver Direct Path Distance:	**120**	feet

Sound Pressure Level	**69.4**	at	120	feet
Hours of Use:	**8**			
Duty Cycle (%):	**40**			
Level During 8 Hour day:	**65.4**			

Noise Attenuation by Distance Calculation

Job: Westmont La Mesa
Job #: B60301N1
Date: 3/21/2016
Source: Excavator w/ Jackhammer
Receiver: Northeast (Park)

Noise Source

Noise Level (dBA)	86	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:	120	feet			

Path Calculation

Source to Receiver Direct Path Distance:	**120**	feet

Sound Pressure Level	**78.4**	at	120	feet
Hours of Use:	**8**			
Duty Cycle (%):	**20**			
Level During 8 Hour day:	**71.4**			