

ACOUSTICAL ANALYSIS REPORT

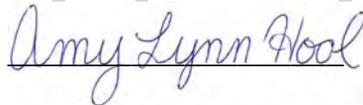
**Panwebster Tentative Parcel Map
San Diego County Tentative Map 21204
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Lead Agency:

County of San Diego
Department of Planning and Land Use
Contact: Emmet Aquino
5510 Overland Avenue, Suite 110
San Diego, California 92123
Phone: 858-694-8845

Preparer:

Amy L. Hool
Eilar Associates, Inc.
Acoustical & Environmental Consulting
321 Willowspring Drive North
Encinitas, California 92024
www.eilarassociates.com
Phone: 760-738-5570
Fax: 760-738-5227


Amy Lynn Hool

Project Proponent:

Panwebster Investments, Inc.
Attention: Jonathan Webster
2445 Brant Street #511
San Diego, California 92101
Phone: 310-871-6806

Job #B30814N1

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TABLE OF CONTENTS

	<u>Page</u>
EXECUTIVE SUMMARY	1
1.0 INTRODUCTION	1
1.1 Project Description	
1.2 Environmental Settings and Existing Conditions	
1.3 Methodology and Equipment	
2.0 NOISE SENSITIVE LAND USES AFFECTED BY AIRBORNE NOISE	6
2.1 Guidelines for Determination of Significance	
2.2 Potential Noise Impacts	
3.0 PROJECT-GENERATED AIRBORNE NOISE	9
3.1 Guidelines for Determination of Significance	
3.2 Potential Operational Noise Impacts	
3.3 Temporary Construction Noise	
4.0 CONCLUSION	12
5.0 CERTIFICATION	12
6.0 REFERENCES	13

FIGURES

1. Vicinity Map
2. Assessor's Parcel Map
3. Satellite Aerial Photograph
4. Topographic Map
5. Site Plan Showing Current Traffic CNEL Contours
6. Site Plan Showing Future Traffic CNEL Contours
7. Site Plan Showing Future Traffic CNEL Contours – 2nd Story Receivers
8. Site Plan Showing Future Traffic CNEL Impacts at Lot 1 and Sound Attenuation Barrier Location
9. Site Plan Showing Future Traffic CNEL Impacts at Lot 2 and Sound Attenuation Barrier Location
10. Site Plan Showing Future Traffic CNEL Impacts at Lot 3
11. Site Plan Showing Future Traffic CNEL Impacts at Lot 4 and Remainder Lot
12. Site Plan Showing Representative Construction Noise Contours During Grading with Mitigation
13. Site Plan Showing Representative Construction Noise Contours During Paving

APPENDICES

- A. Project Plans
- B. Traffic Noise Model (TNM) Data and Results
- C. Pertinent Sections of the County of San Diego Noise Element to the General Plan and Noise Ordinance
- D. Construction Equipment Noise Calculations

EXECUTIVE SUMMARY

The proposed project, the Panwebster Tentative Parcel Map (TPM) 21204, consists of the subdivision of a 3.5-acre parcel into four parcels and a remainder parcel for residential development. The project site is located on Los Coches Road between Ha-Hana Road and Bower Lane in the unincorporated community of Lakeside, County of San Diego, California. The project site is currently vacant.

The primary noise source in the vicinity of the project site is automobile and truck traffic noise from Los Coches Road. Without mitigation, future exterior noise levels at TPM 21204 will range from 50 CNEL where shielded by topography to 70 CNEL at the southern edge of the project site. Future noise contours show that Lots 1, 2, 3, as well as the remainder lot are anticipated to be exposed to noise levels greater than 60 CNEL at ground level in the future noise environment.

For lots with a net area between 4,000 square feet and 10 acres, the County of San Diego requires that at least 10% of the net lot area be protected from noise levels greater than 60 CNEL. Noise attenuation barriers have been modeled for Lots 1 and 2 to demonstrate that achieving 60 CNEL at 10% of the net lot area is feasible. At the time of building permit application, alternate mitigation measures may be proposed, including the use of architectural features (the residential structure) as mitigation or the combination of the residential structure and a free-standing sound wall, provided the lot can still provide the required noise-protected area.

A noise protection easement should be applied to the project in the location of the second story receiver 60 CNEL contour, shown in Figure 7. This easement would contain Lots 1, 2, 3, and the remainder lot, and signifies that, due to potentially high noise levels at future second-story building facades, an exterior-to-interior analysis should be performed for each of these lots at the time of building permit application. This analysis is required to demonstrate that interior noise levels will remain in compliance with County of San Diego and State of California noise regulations.

It is determined that typical construction activities will exceed the County of San Diego temporary construction noise limit of 75 dBA at adjacent property lines during the grading phase of construction. To control these impacts, an eight-foot high noise barrier should be used when grading activities are located within 75 feet of a residential property line.

1.0 INTRODUCTION

This acoustical analysis report is submitted to satisfy the acoustical requirements of the County of San Diego for Tentative Parcel Map approval. Its purpose is to assess noise impacts from nearby roadway traffic and to identify project features or requirements necessary to achieve exterior noise levels of 60 CNEL or less at outdoor usable areas, in compliance with the County of San Diego noise regulations. Feasibility of interior noise mitigation will also be addressed.

All noise level or sound level values presented herein are expressed in terms of decibels, with A-weighting to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ} , for a specified duration. The Community Noise Equivalent Level (CNEL) is a calculated 24-hour weighted average, where sound levels during evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dB weighting, and sound levels during nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dB weighting. This is similar to the Day-Night sound level, L_{DN} , which is a 24-hour average with an added 10 dB weighting on the same nighttime hours but no

added weighting on the evening hours. Sound levels expressed in CNEL are always based on A-weighted decibels. These metrics are used to express noise levels for both measurement and municipal regulations, for land use guidelines, and for enforcement of noise ordinances. Further explanation can be provided upon request.

1.1 Project Description

The proposed project, Tentative Map 21204, consists of the division of a 3.5-acre parcel into four parcels and a remainder parcel for residential use. The net lot areas of the proposed parcels would range from 11,187 square feet to 52,692 square feet. Please refer to project plans provided as Appendix A for more details.

1.2 Environmental Settings & Existing Conditions

1.2.1 Project Location

The project site is located on Los Coches Road between Ha-Hana Road and Bower Lane in the unincorporated community of Lakeside, County of San Diego, California. The Assessor's Parcel Number (APN) for the property is 397-060-80-00. The property has an overall site area of approximately 3.5 acres. Currently, the project site is vacant.

The subject site is currently zoned for residential use. Neighboring land use is primarily residential as is future land use. The project location is shown on the Vicinity Map, Figure 1, following this report. An Assessor's Parcel Map, Satellite Aerial Photograph, and Topographic Map of this area are also provided as Figures 2 through 4.

1.2.2 Existing Traffic Volumes

The primary noise source in the vicinity of the project site is automobile and truck traffic noise from Los Coches Road. Noise associated with aircraft overflight operations from Gillespie Field Airport is insignificant as the project site is located well outside of the 60 CNEL airport noise contours. No other noise source is considered significant.

Los Coches Road is a two-lane, two-way Community Collector 2.1C running northwest-southeast along the south boundary of the project site. The posted speed limit is 45 mph. The actual speed of vehicles traveling on Los Coches Road, in the vicinity of the project site, is estimated to be 50 mph. According to the SanDAG Series 12 Traffic Forecast for the year 2008, Los Coches Road, in the vicinity of the project site, currently carries a traffic volume of approximately 12,900 Average Daily Trips (ADT).

Truck percentages were not available for Los Coches Road, but based on neighboring and surrounding land use, roadway classification, professional experience and on-site observations, a truck percentage mix of 3.0% medium and 2.0% heavy trucks was used.

Without mitigation or proposed project structures, the project site is currently exposed to noise levels of 45 CNEL to 70 CNEL at ground level. The noise contours are irregularly shaped due to site topography. For a graphical representation of these contours, please refer to Figure 5: Site Plan Showing Current Traffic CNEL Contours, and for additional information, please refer to Appendix B: Traffic Noise Model (TNM) Data and Results.

1.2.3 Measured Noise Level

An on-site inspection and traffic noise measurement were made on the afternoon of Thursday, September 5, 2013. The weather conditions were as follows: clear skies, low humidity, temperatures in the mid 90's with winds from the north at 5-10 mph. A noise measurement was made on the southern sidewalk of Los Coches Road. The microphone position was approximately five feet above grade and approximately 40 feet from the centerline of Los Coches Road. Traffic volumes were recorded for automobiles, medium-size trucks, and large trucks during the measurement period. After a continuous 10-minute sound level measurement, there was no change in the L_{EQ} and results were then recorded. The measured noise level and related weather conditions are found below in Table 1. More information can be found in Appendix B: Traffic Noise Model (TNM) Data and Results.

Table 1. On-Site Noise Measurement Conditions and Results	
Date	Thursday, September 5, 2013
Time	12:30 p.m. - 12:40 p.m.
Conditions	Clear Skies, Winds from the north @ 5-10 mph, Temperature mid 90's, Low Humidity
Measured Noise Level	69.1 dBA L_{EQ}

1.3 Methodology and Equipment

1.3.1 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 using the appropriate multiplier.

Other field data gathered includes measuring or estimating distances, angles-of-view, slopes, elevations, roadway grades, and vehicle speeds. This data was checked against the available maps and records.

1.3.2 Roadway Noise Calculation

The Traffic Noise Model, Version 2.5 program released by the U.S. Department of Transportation was used to calculate the future daytime average hourly noise level (HNL) at various locations at the project site. The daytime average hourly traffic volume is calculated as 0.058 times the ADT, based on the studies made by Wyle Laboratories (see reference). The HNL is equivalent to the L_{EQ} , and both are converted to the CNEL by adding 2.0 decibels, as shown in the Wyle Study. Future CNEL is calculated for desired receptor locations using future road alignment, elevations, lane configurations, projected traffic volumes, estimated truck mixes, and vehicle speeds. Noise

attenuation methods may be analyzed, tested, and planned with TNM, as required. Further explanation can be supplied on request.

Noise levels were calculated for the site using the methodology described above 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 69.1 dBA L_{EQ} was compared to the calculated (modeled) noise level of 67.8 dBA L_{EQ} , for the same conditions and traffic flow. As there was only a 1.4 dBA difference between the measured and the calculated noise level, no adjustment was deemed necessary to model future noise levels for this location. Please refer to Table 2 for further evaluation.

Table 2. Calculated versus Measured Traffic Noise Data				
Location	Calculated	Measured	Difference	Correction
40 feet from Los Coches Road CL	67.8 dBA L_{EQ}	69.1 dBA L_{EQ}	1.3 dB	None Applied

1.3.3 Cadna Noise Modeling

Modeling of the outdoor noise environment to determine temporary construction noise impacts is accomplished using Cadna Version 3.7, 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 mitigation 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.

Summary of Site Specific Features Included in Cadna Model

The terrain in the immediate vicinity of the proposed lots slopes up towards the eastern property line, and reaches its highest elevation near the northeastern corner of Lot 3. The topography shown on the tentative parcel map has been included in the Cadna model.

Calculated Noise Levels for Model Comparison

In order to validate the results of the Cadna noise prediction model, the noise impacts from the construction equipment were manually calculated as attenuation by distance. These values were compared to those predicted by Cadna. The Cadna model includes additional attenuation due to ground absorption and site topography, to which the differences in modeled and calculated noise levels are attributed. Noise impacts were calculated with grading impacts centered around the pad for Lot 3, as this represents the worst-case noise exposure for the east property line. This data is summarized in Table 3 and manual calculation sheets are provided in Appendix D.

Table 3. Calculated Noise Levels for Model Comparison						
Noise Source	Receiver #	Receiver Location	Distance from Source (ft)	Calculated Noise Level ² (dBA)	Cadna Model Noise Level ³ (dBA)	Difference (dB)
D6 Dozer, Grader, Water Truck, Excavator with Breaker ¹	R1	North PL	383	66.6	50.2	16.4 ⁴
	R2	South PL ⁵	344	67.6	64.2	3.4 ⁴
	R3	East PL	60	82.9	81.5	1.4 ⁴
	R4	West PL	240	70.6	65.8	4.8 ⁴

¹40% duty cycle assumed for all equipment except Excavator with Breaker, which was assumed to be 25%.

²Calculated as attenuation by distance only, $L_2 = L_1 - 20\log(d_2/d_1)$

³As predicted by Cadna model

⁴Differences between calculated and Cadna noise levels can be attributed to site topography and ground absorption.

⁵Nearest property line to the south across Los Coches Road

1.3.4 Formulas and Calculations

Attenuation Due To Distance

Attenuation due to distance is calculated by the equation:

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

where SPL_1 = Calculated sound pressure level at distance,

SPL_2 = Known sound pressure level at known distance,

D_1 = Distance from source to 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.

Barrier Insertion Loss

When a barrier is placed between a source and receiver, sound attenuation can be achieved. The amount of attenuation is dependent on the height of the barrier, the wavelength of the sound, and the distance between source and receiver, source and barrier, and barrier and receiver. The amount of attenuation achieved is known as "insertion loss." The maximum amount of sound attenuation that can be achieved by a barrier is usually between 15 and 20 dB. Further information can be provided upon request.

1.3.5 Measurement Equipment

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

- Larson Davis Model 720 Integrating Sound Level Meter, Type 2, Serial # 0190
- Larson Davis Model CA150 Calibrator, Serial # 2139
- Hand-bearing magnetic compass, microphone with windscreen, tripods
- Distance measurement wheel, digital camera

The sound level meter was field-calibrated immediately prior to the noise measurement and checked afterward, to ensure accuracy. All sound level measurements conducted and presented in this report, in accordance with the regulations, were made with a sound level meter that conforms to the American National Standards Institute specifications for sound level meters ANSI S1.4-1983 (R2001). All instruments are maintained with National Bureau of Standards traceable calibration, per the manufacturers' standards.

2.0 NOISE SENSITIVE LAND USES AFFECTED BY AIRBORNE NOISE

2.1 Guidelines for the Determination of Significance

The County of San Diego Noise Element to the General Plan states that exterior noise levels at outdoor use areas of residential property should not exceed 60 CNEL. In the event that noise levels exceed 60 CNEL, mitigation must be proposed to bring noise levels into compliance. For lots with net areas ranging from 4,000 square feet to 10 acres, as is the case for all lots on this project site, at least 10% of the net lot area must be noise-protected. In addition, the interior noise levels of the on-site residences must not exceed 45 CNEL, as per the County of San Diego Noise Element as well as the State of California Building Code. Pertinent sections of the County of San Diego Noise Element are provided as Appendix C.

2.2 Potential Noise Impacts

2.2.1 Potential Build-out Noise Conditions & Impacts

The future traffic volume was determined using the San Diego County General Plan Update 2030 Planning Commission Recommended LOS and Volume Plot for the Lakeside area, provided by County Noise Specialist Emmet Aquino. According to Mr. Aquino, the adjusted forecasted volume should be used in the analysis. According to the map, the adjusted traffic volume for the year 2030 is expected to be 16,600 ADT for this stretch of Los Coches Road.

2.2.1.1 Exterior

The exterior noise impacts at the project site are primarily the result of automobile and truck traffic traveling on Los Coches Road. Without mitigation or proposed project structures, the project site will be exposed to noise levels of 50 CNEL to 70 CNEL at ground level in the future noise environment. The noise contours are irregularly shaped due to site topography. For a graphical representation of these contours, please refer to Figure 6: Site Plan Showing Future Traffic CNEL Contours, and for additional information, please refer to Appendix B: Traffic Noise Model (TNM) Data and Results. As shown on this graphic, all of Lots 1 and 2 as well as a portion of Lot 3 and the remainder parcel will be contained within the 60 CNEL contour. The proposed location of Lot 4 is

shown to be almost entirely protected from ground level noise exceeding 60 CNEL, and therefore, no additional analysis is required for ground level exterior noise levels at this lot.

Due to the topography of the site, second story receiver contours have also been generated to ensure that any lots with two-story residences will be adequately protected from interior noise levels exceeding 45 CNEL. These contours are a similar shape; however, the pad location for the remainder parcel is shown to be exposed to greater than 60 CNEL at the second story. For this reason, this 60 CNEL contour should be considered the boundary of the noise protection easement for the site. The noise protection easement signifies that, at the time of building permit application, a supplemental noise study will be required for each of these lots (Lots 1, 2, 3, and the remainder parcel) to ensure exterior and interior noise levels are in compliance with the noise regulations of the County of San Diego and the State of California. With the currently proposed pad location for Lot 4, it is not anticipated that a future interior noise analysis would be required, as second-story receivers are exposed to less than 60 CNEL. For a graphical representation of these contours and the suggested location of the noise protection easement, please refer to Figure 7: Future Traffic CNEL Contours – 2nd Story Receivers.

Noise levels have been evaluated at all lots. For each lot, four receivers have been placed that encompass at least 10% of the net lot area that must be noise-protected, per County Requirements.

Please refer to Table 4 for calculated unmitigated traffic noise levels at outdoor use areas. For a graphical representation of receiver locations, please refer to Figures 8 through 11.

Table 4. Future Traffic CNEL at Proposed Outdoor Use Areas – Unmitigated					
Parcel	Net Area (sf)	Minimum Required Noise-Protected Area (sf)	Receiver #	Future Exterior Traffic CNEL	Total Area Calculated (sf)
Lot 1	19,491	1,949	1-1	70	2,103 (~11%)
			1-2	70	
			1-3	66	
			1-4	66	
Lot 2	11,187	1,119	2-1	64	1,181 (~11%)
			2-2	63	
			2-3	65	
			2-4	62	
Lot 3	13,699	1,370	3-1	60	1,505 (~11%)
			3-2	59	
			3-3	60	
			3-4	58	
Lot 4	37,878	3,788	4-1	59	> 24,132 (> 64%)
			4-2	58	
			4-3	51	
			4-4	49	
Remainder Parcel	52,692	5,269	5-1	58	> 9,256 (> 18%)
			5-2	58	
			5-3	50	
			5-4	51	

Noise levels are shown to exceed 60 CNEL at calculated receiver locations for Lots 1 and 2. Mitigation will be required for these parcels. Lots 3, 4, and the remainder parcel are anticipated to

receive sufficient noise attenuation due to the topography and current configuration of the lots; however, Lot 3 and the remainder parcel will still be subject to additional evaluation at the time of building permit application to confirm that the required noise-protected area will be provided. Please refer to Section 2.2.2.1 for mitigation details.

2.2.1.2 Interior

The State of California and the County of San Diego require buildings to be designed in order to attenuate, control, and maintain interior noise levels to below 45 CNEL 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 second story noise levels exceed 60 CNEL at the proposed pad locations of Lots 1, 2, 3, and the remainder lot. All of these lots are contained within the suggested site noise protection easement shown on Figure 7. Due to potentially high noise levels at future building facades, an exterior-to-interior analysis should be performed for each of these lots at the time of building permit application. As the pad location for Lot 4 is located outside of the 60 CNEL contour, an interior noise analysis is not anticipated to be needed for this lot.

2.2.2 Design Considerations & Mitigation Measures

2.2.2.1 Exterior

As Lots 1 and 2 are shown to be exposed to ground level noise impacts of greater than 60 CNEL at 10% of their net lot areas, mitigation has been proposed that is expected to bring noise levels into compliance. Noise attenuation barriers have been modeled to demonstrate that achieving 60 CNEL at 10% of the net lot area is feasible. At the time of building permit application, alternate mitigation measures may be proposed for any lot, including the use of architectural features (the residential structure) as mitigation or the combination of the residential structure and a free-standing sound wall, provided the lot can still provide the required noise-protected area. Approximate sound barrier locations are shown in Figures 8 and 9. Mitigated noise levels are shown in Table 5.

Table 5. Future Traffic CNEL at Proposed Outdoor Use Areas – Mitigated					
Parcel	Total Area Calculated (sf)	Sound Barrier Height (ft)	Receiver #	Future Exterior Traffic CNEL	In Compliance?
Lot 1	2,103 (~11%)	8	1-1	57	Yes
			1-2	57	
			1-3	57	
			1-4	60	
Lot 2	1,181 (~11%)	6	2-1	57	Yes
			2-2	60	
			2-3	54	
			2-4	59	

With the modeled sound attenuation barriers in place, noise levels are anticipated to comply with the County of San Diego requirement for 10% of the net lot area to be noise-protected. The sound

attenuation barriers may be a single sound wall in design or a combination of a sound wall atop an earthen berm, provided the minimum height requirements of eight and six feet are fulfilled for Lots 1 and 2, respectively.

A sound wall should be solid and constructed of masonry, wood, plastic, fiberglass, steel, or a combination of those materials, with no cracks or gaps, through or below the wall. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove and must be at least 7/8-inch thick or have a surface density of at least 3½ pounds per square foot. Where architectural or aesthetic factors allow, glass or clear plastic may be used on the upper portion, if it is desirable to preserve a view. Sheet metal of 18-gauge (minimum) may be used, if it meets the other criteria and is properly supported and stiffened so that it does not rattle or create noise itself from vibration or wind. Any gate(s) proposed to be constructed in a sound wall must be designed with overlapping closures. The gate(s) may be of ¾-inch or better wood, solid-sheet metal of at least 18-gauge metal, or an exterior-grade solid-core steel door with prefabricated door jambs.

It should be noted that the barrier walls shown in the attached figures have been modeled to show the feasibility of achieving compliance with County noise regulations. At the time of building permit application, alternate mitigation measures may be proposed, including the use of architectural features (the residential structure) as mitigation or the combination of the residential structure and a free-standing sound wall, provided the lot can still provide the required noise-protected area.

2.2.2.2 Interior

As detailed above, Lots 1, 2, 3, and the remainder lot will require interior noise analyses to determine mitigation measures necessary to achieve interior noise levels of 45 CNEL. An analysis can be prepared for each lot at the time of building permit application.

3.0 PROJECT-GENERATED AIRBORNE NOISE

3.1 Guidelines for Determination of Significance

The County of San Diego Municipal Code states that noise levels from stationary sources shall not exceed 55 dBA between the hours of 7 a.m. and 10 p.m. and 45 dBA between the hours of 10 p.m. and 7 a.m. at residential properties.

Section 36.409 of the County of San Diego Noise Ordinance states it is unlawful to operate construction equipment that exceeds an average sound level of 75 dBA for an eight-hour period, between 7 a.m. and 7 p.m. when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received. In addition, according to Section 36.408 of the ordinance, construction activities must be limited to the hours of 7 a.m. to 7 p.m., Monday through Saturday (except legal holidays). No construction activity is permitted on Sunday. Section 36.410 provides noise limits for impulsive noise, which is defined as a high peak noise level of short duration (one second or less). Impulsive activity includes blasting and the use of equipment such as a rock crusher, hoe ram, pile driver, or drill rig. This section states that noise levels of the impulsive activity may exceed 82 dBA at neighboring residential property lines for up to 25 percent of an eight-hour period (2 hours), provided that the eight-hour average noise level remains at 75 dBA or less. Pertinent sections of the County of San Diego Noise Ordinance are provided as Appendix C.

3.2 Potential Operational Noise Impacts

The only anticipated operational noise impact from the proposed project would be residential HVAC units. The units are anticipated to be small capacity, and are not expected to have a significant noise impact on any surrounding property. If needed, these noise sources can be evaluated at the time of building permit application.

3.3 Potential General Construction Noise Impacts

According to the County of San Diego Noise Ordinance, temporary construction noise must be adequately controlled at occupied properties. The occupied properties surrounding the site include receivers to the north, east, and west, as well as to the south, across Los Coches Road. Noise-sensitive receivers to the south are located at a greater distance from potential noise sources and therefore, will be exposed to less noise due to distance attenuation and shielding provided by intervening structures or topography.

Construction information was obtained from Elliott May, project engineer. Grading will be the first phase of construction, and will be accomplished using a Caterpillar D6 or D8 dozer, a grader, and a water truck. All of this equipment may be in use simultaneously. According to Mr. May, there will be no import or export, and thus no dump trucks will be present. Site grading will take between four and six weeks. The need for impulsive construction is currently unknown, but as the site is very rocky, there may be a need for this type of activity, and therefore, an excavator with a breaker attachment has also been included in this analysis. The plans also show an access road on the project site, so construction noise associated with paving was also analyzed. Paving was assumed to include one paver and one roller.

Please refer to Table 6 for typical noise levels of construction equipment planned to be used on site, as described above.

Noise Source	Duty Cycle (%)	Measured Noise Level (L_{MAX}) at 32.8 feet (dBA)
Dozer	40	81
Grader	40	86
Water Truck ²	40	87
Excavator with Breaker	25	90
Paver	40	77
Roller	40	77

¹Source: UK Department for Environment, Food, and Rural Affairs (DEFRA) Construction Noise Database, unless otherwise noted.

²Source: Wieland Associates, 1999.

Receivers on all property lines were calculated for each phase of construction. During the grading phase, it was assumed that all four pieces of equipment (dozer, grader, water truck, excavator with breaker) would be operating simultaneously (considering duty cycle), spread out among various portions of each lot. This method should account for the varying distance from source to receiver as equipment moves around the site. Grading activities were analyzed at the worst case location at the pad on Lot 3, which is the closest location to the adjacent residences, and is roughly the highest

point on the project site. Paving calculations were analyzed at the location closest to the west property line.

Noise levels for each phase of construction are shown in Table 7. Detailed calculations can be found in Appendix D: Construction Equipment Noise Calculations. Graphical representations of source and receiver locations and noise contours for grading and paving activities are shown in Figures 12 and 13, respectively.

Table 7. Temporary Construction Noise Levels at Neighboring Properties			
Phase	Equipment Used	Receiver Location	8-Hour Average Noise Level (dBA)
GRADING	D6 Dozer, Grader, Water Truck, Excavator with Breaker	North PL	50
		South PL	64
		East PL	82
		West PL	66
PAVING	Paver, Roller	North PL	31
		South PL	55
		East PL	43
		West PL	73

2.2.2 Design Considerations and Temporary Mitigation Measures

As shown above, noise levels from temporary construction are expected to exceed the County of San Diego eight-hour average equivalent noise limit of 75 dBA at nearby residential property lines during grading activity. For this reason, a temporary noise barrier should be used any time grading activity occurs within 75 feet of a residential property line. The noise barrier should be a minimum of eight feet tall, and 250 feet in length. It should be placed such that the approximate center of the wall is aligned with the approximate center of grading activities. Mitigated noise levels were calculated with equipment at a representative location to show noise reduction provided by the wall. Mitigated noise levels are shown in Table 8, and a sample wall configuration is shown in Figure 12.

Table 8. Mitigated Temporary Construction Noise Levels at Neighboring Properties			
Phase	Equipment Used	Receiver Location	8-Hour Average Noise Level (dBA)
GRADING	D6 Dozer, Grader, Water Truck, Excavator with Breaker	North PL	50
		South PL	64
		East PL	70
		West PL	66

The noise barrier should be solid and constructed of wood, steel, or a combination of those materials, with no cracks or gaps, through or below the wall. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove and must be at least 7/8-inch thick or have a surface density of at least 3½ pounds per square foot. Sheet metal of 18-gauge (minimum) may be used, if it meets the other criteria and is properly supported and stiffened so that it does not rattle or create noise itself from vibration or wind. Sound attenuation blankets may be used in place of a

sound attenuation barrier, provided they have an STC rating of at least 18. If the above conditions are not met, the sound attenuation provided by the barrier may be inadequate.

In addition to the required noise barrier, equipment used in construction shall be maintained in proper operating condition, and engines shall be equipped with appropriate mufflers. Additionally, if any impulsive activity is to take place on site, it must be limited to a duty cycle of 25 percent (2 hours in an 8 hour day). If impulsive equipment must be used for a longer duration, an additional noise barrier should be placed directly surrounding the equipment to provide further noise shielding. With the above recommendations in place, controlled access to the site, and limiting construction activity to the hours of 7 a.m. to 7 p.m., Mondays through Saturdays (except legal holidays), it is expected that construction equipment noise levels will be at or below an average 8-hour equivalent noise level of 75 dBA at all residential property lines and in compliance with County of San Diego regulations.

4.0 CONCLUSION

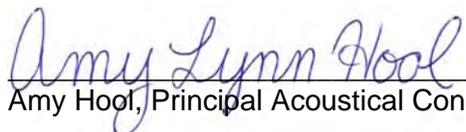
For these lot sizes, the County of San Diego requires that at least 10% of the net lot area be protected from noise levels greater than 60 CNEL. Calculations have been performed to demonstrate that meeting this requirement is feasible for all lots. At the time of building permit application, alternate mitigation measures may be proposed, including the use of architectural features (the residential structure) as mitigation or the combination of the residential structure and a free-standing sound wall, provided the lot can still provide the required noise-protected area.

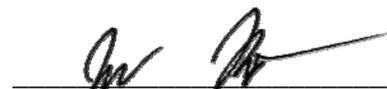
A noise protection easement should be applied to the project in the location of the second story receiver 60 CNEL contour, shown in Figure 7. This easement would contain Lots 1, 2, 3, and the remainder lot, and signifies that, due to high noise levels at future building facades, an exterior-to-interior analysis should be performed for each of these lots at the time of building permit application. This analysis is required to demonstrate that interior noise levels will remain in compliance with County of San Diego and State of California noise regulations.

It is determined that typical construction activities will exceed the County of San Diego temporary construction noise limit of 75 dBA at all adjacent property lines. To control these impacts, an 8-foot high noise barrier should be used when grading activities are centered within 75 feet of a residential property line.

5.0 CERTIFICATION

The findings and recommendations of this acoustical analysis report are based on the information available and are a true and factual analysis of the potential acoustical issues associated with the proposed Panwebster Tentative Parcel Map 21204, located within the County of San Diego, California. This report was prepared by Jonathan Brothers, Jeff Russert, and Amy Hool.

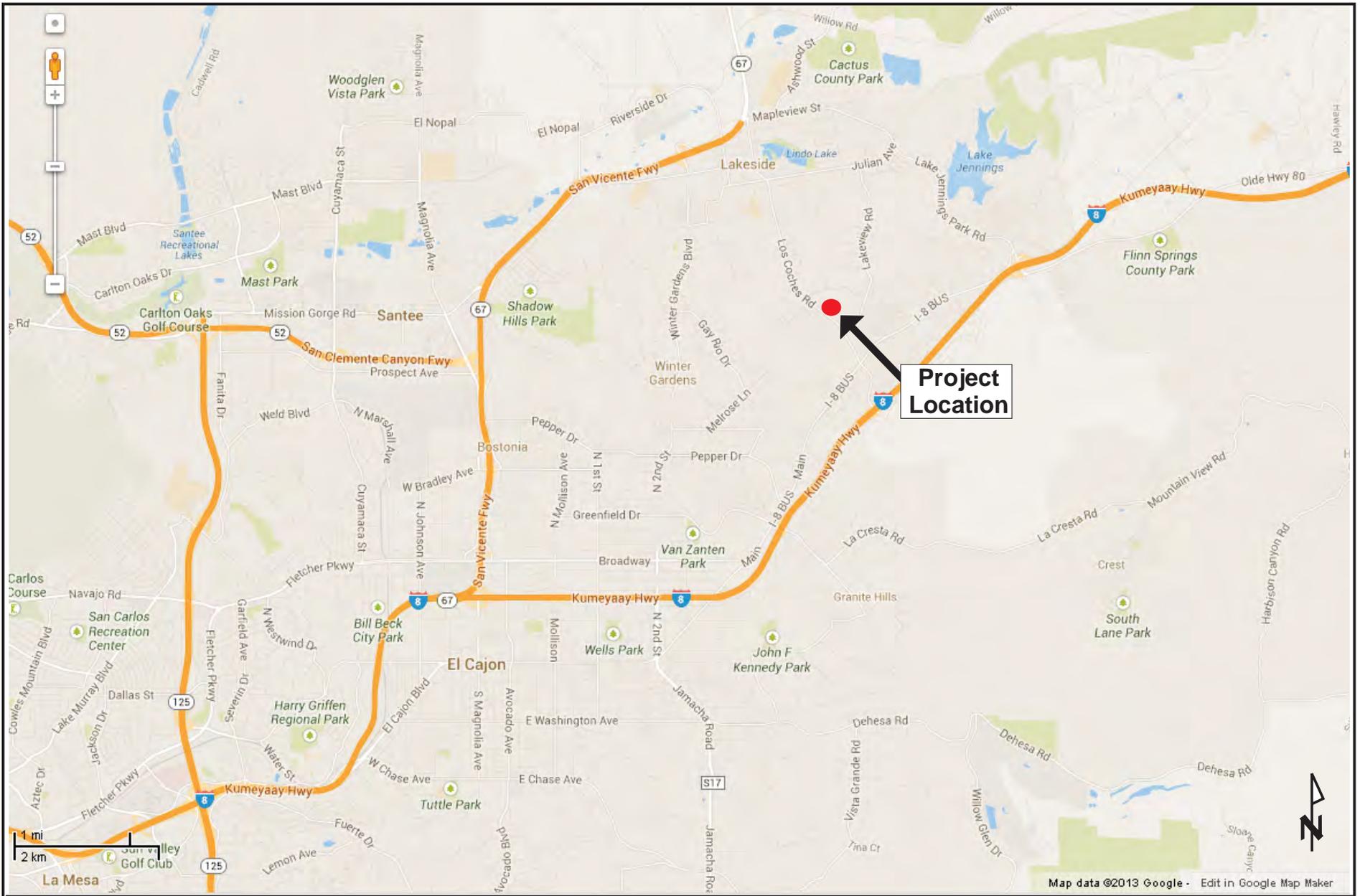

Amy Hool, Principal Acoustical Consultant


Jeff Russert, Acoustical Consultant

6.0 REFERENCES

1. 2007 California Building Code, Based on the 2006 International Building Code, Chapter 12, Section 1207 - *Sound Transmission Control*.
2. Federal Highway Administration, Traffic Noise Model Version 2.5.
3. County of San Diego Noise Element to the General Plan.
4. County of San Diego Noise Ordinance.
5. Harris, Cyril M., Handbook of Acoustical Measurements and Noise Control, 3rd Edition, Acoustical Society of America, 1998.
6. Heeden, Robert A., Compendium of Materials for Noise Control, U.S. Department of Health, Education and Welfare, National Institute for Occupational Safety and Health, November 1978.
7. Irvine, Leland K., Richards, Roy L., Acoustics and Noise Control Handbook for Architects and Builders, Kreiger Publishing Company, 1998.
8. NBS Building Sciences Series 77, Acoustical and Thermal Performance on Exterior Residential Walls, U.S. Department of Commerce/National Bureau of Standards, November 1976.
9. Western Electro-Acoustic Laboratory, Inc., 1711 Sixteenth Street, Santa Monica, California 90404, 213-80-9268, Sound Transmission Loss Vs. Glazing Type, Window Size and Air Filtration, January 1985. The research described in this report was prepared for the California Association of Window Manufacturers, 823 North Harbor Boulevard, Suite E, Fullerton, California 92632, 714-525-7088.
10. United States Department of Transportation Federal Highway Administration, Highway Construction Noise Handbook, Section 9.0 "Construction Equipment Noise Levels and Ranges," August 2006.
11. Wyle Laboratories, Development of Ground Transportation Systems Noise Contours for the San Diego Region, December, 1973

FIGURES

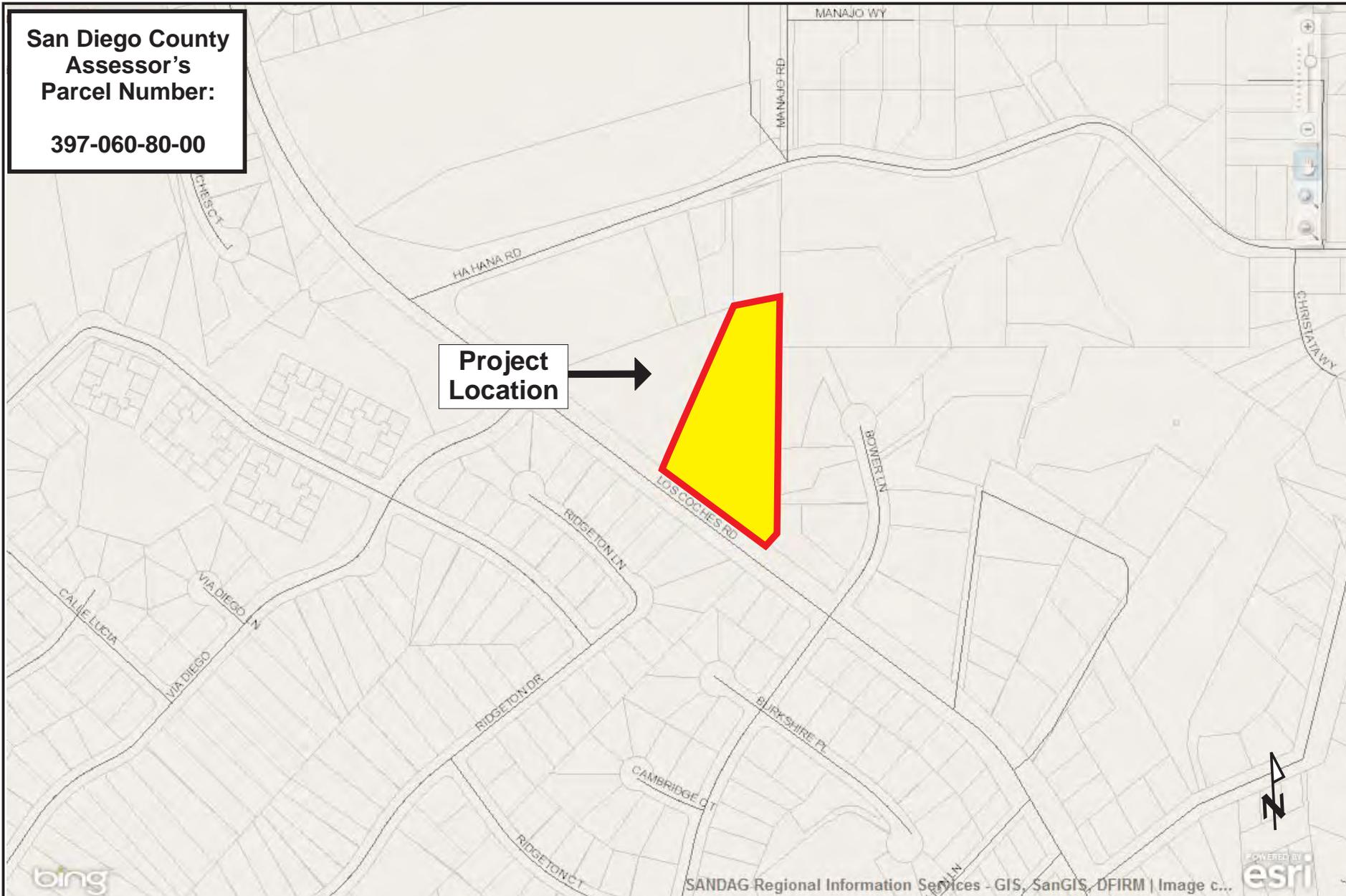


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Encinitas, California 92024
760-738-5570

Vicinity Map
Job # B30814N1

Figure 1

**San Diego County
Assessor's
Parcel Number:
397-060-80-00**



**Eilar Associates, Inc.
321 Willowspring Drive North
Encinitas, California 92024
760-738-5570**

**Assessor's Parcel Map
Job # B30814N1**

Figure 2



Imagery ©2013 DigitalGlobe, U.S. Geological Survey, USDA Farm Service Agency, Map data ©2013 Google - Edit in Google Map Maker Rep

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Satellite Aerial Photograph
Job # B30814N1

Figure 3

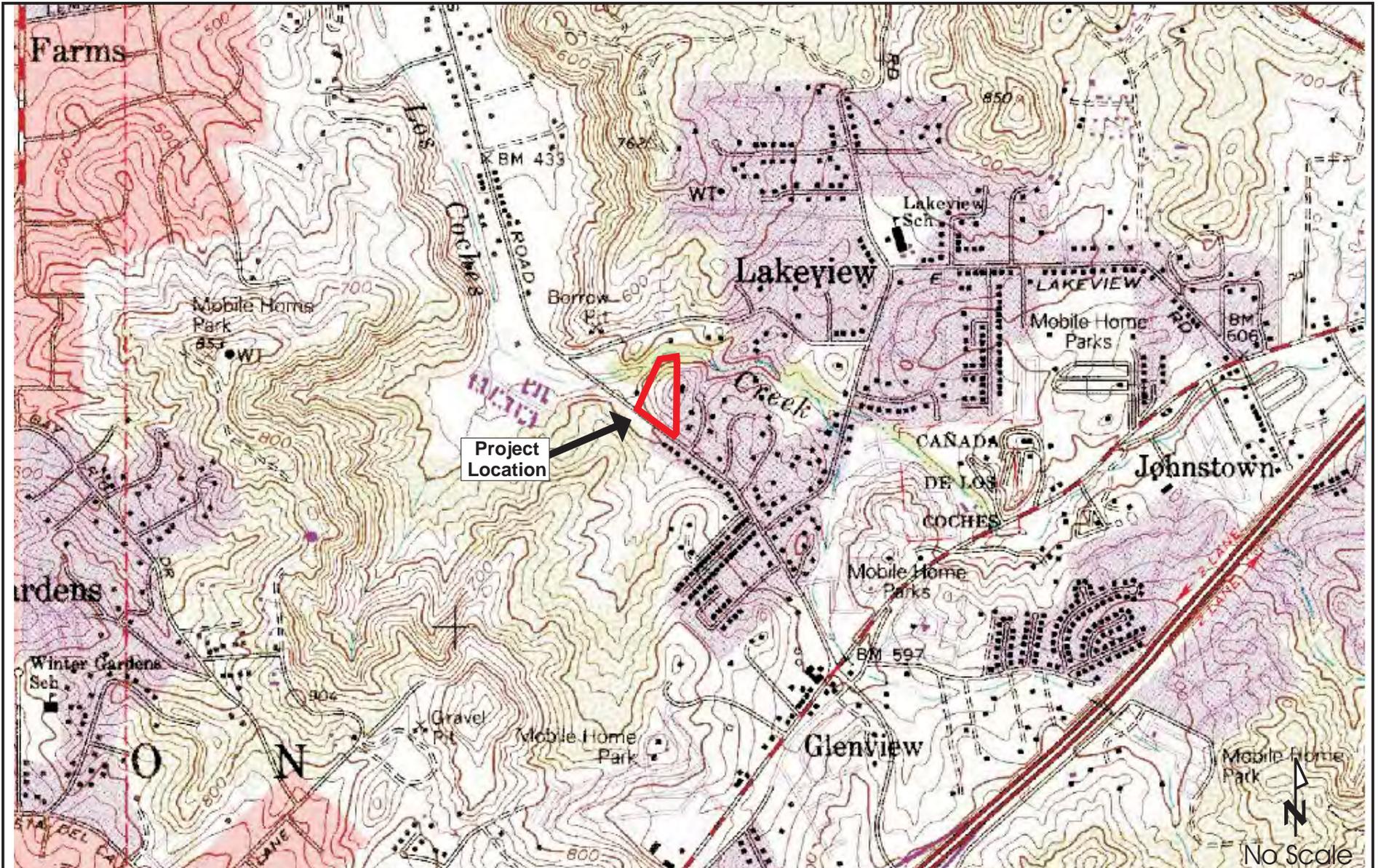
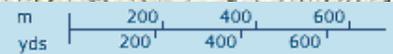


Image courtesy of the U.S. Geological Survey



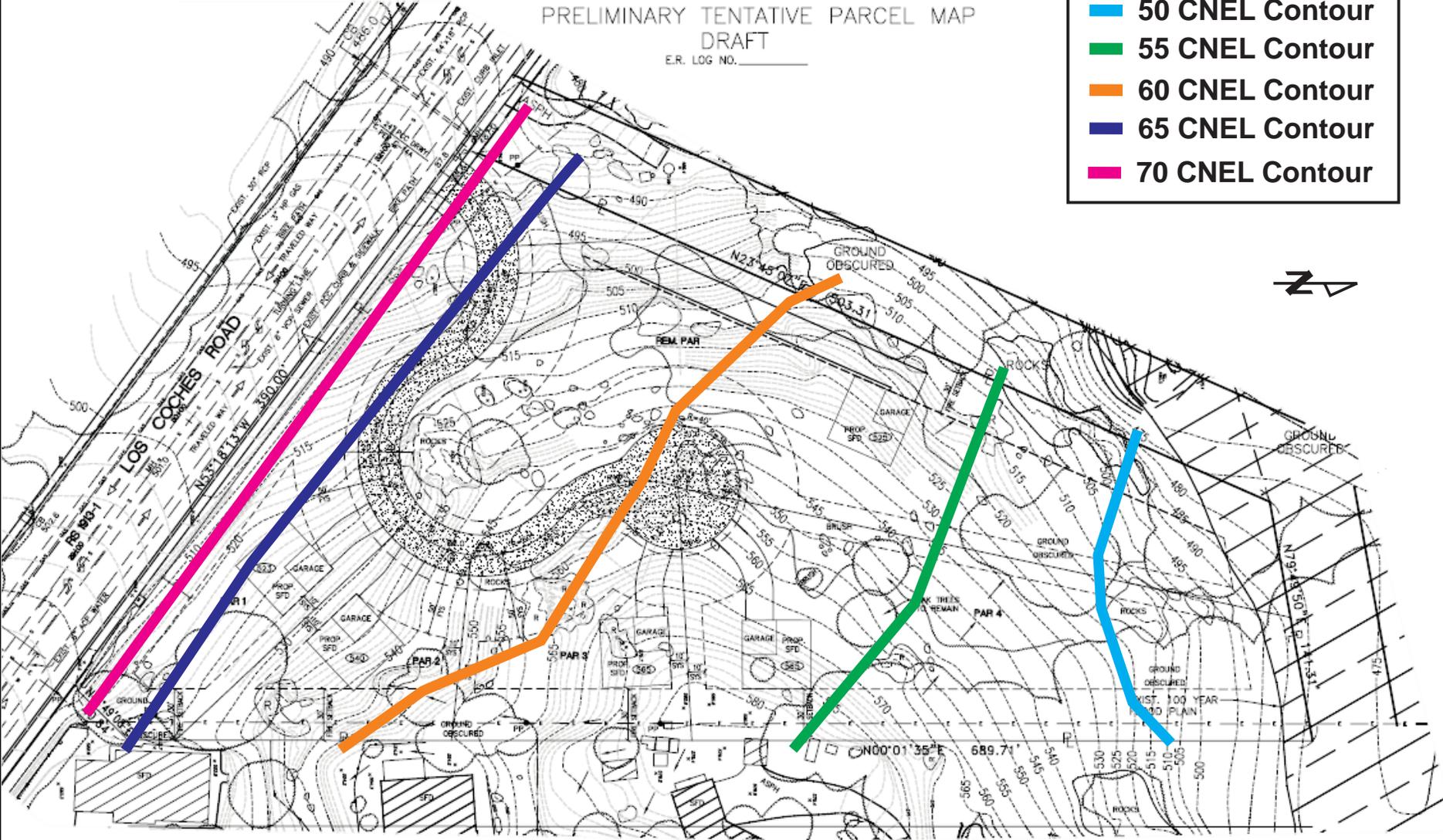
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 Encinitas, California 92024
 760-738-5570

Topographic Map
 Job # B30814N1

Figure 4

PRELIMINARY TENTATIVE PARCEL MAP
DRAFT
E.R. LOG NO. _____

- 50 CNEL Contour
- 55 CNEL Contour
- 60 CNEL Contour
- 65 CNEL Contour
- 70 CNEL Contour



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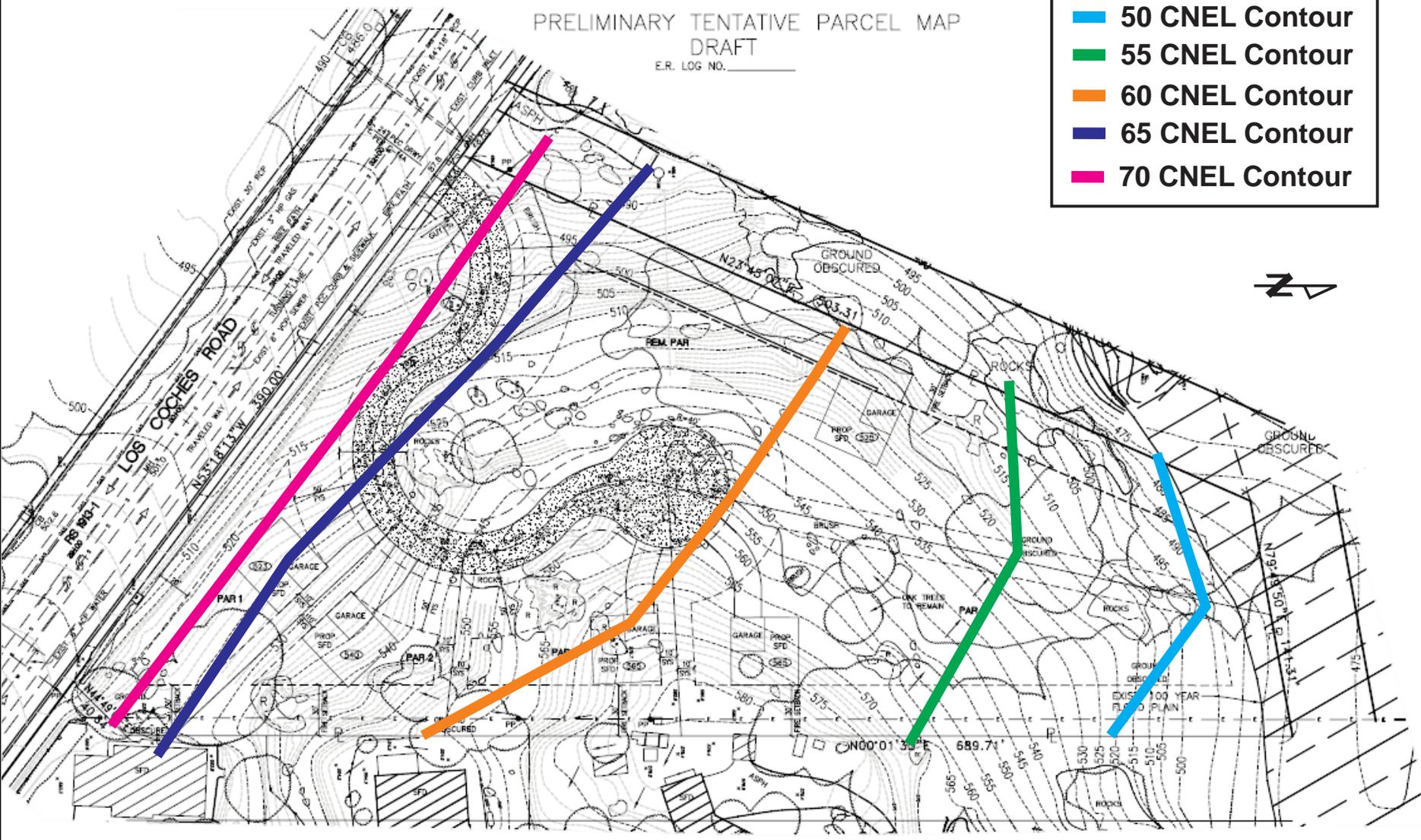
Site Plan Showing Current
Traffic CNEL Contours
Job # B30814N1

Figure 5

PRELIMINARY TENTATIVE PARCEL MAP
DRAFT

E.R. LOG NO. _____

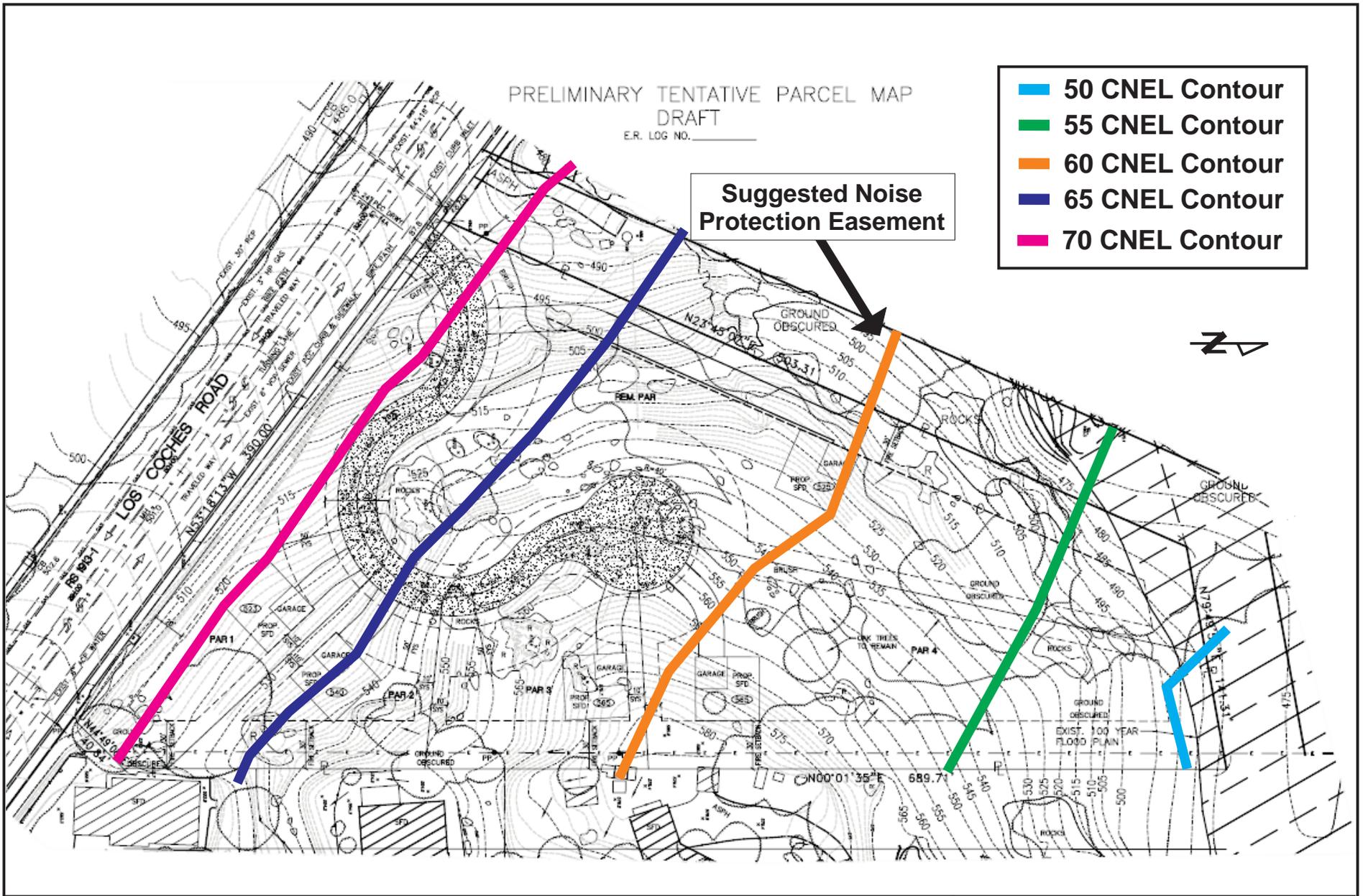
- 50 CNEL Contour
- 55 CNEL Contour
- 60 CNEL Contour
- 65 CNEL Contour
- 70 CNEL Contour



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Site Plan Showing Future
Traffic CNEL Contours
Job # B30814N1

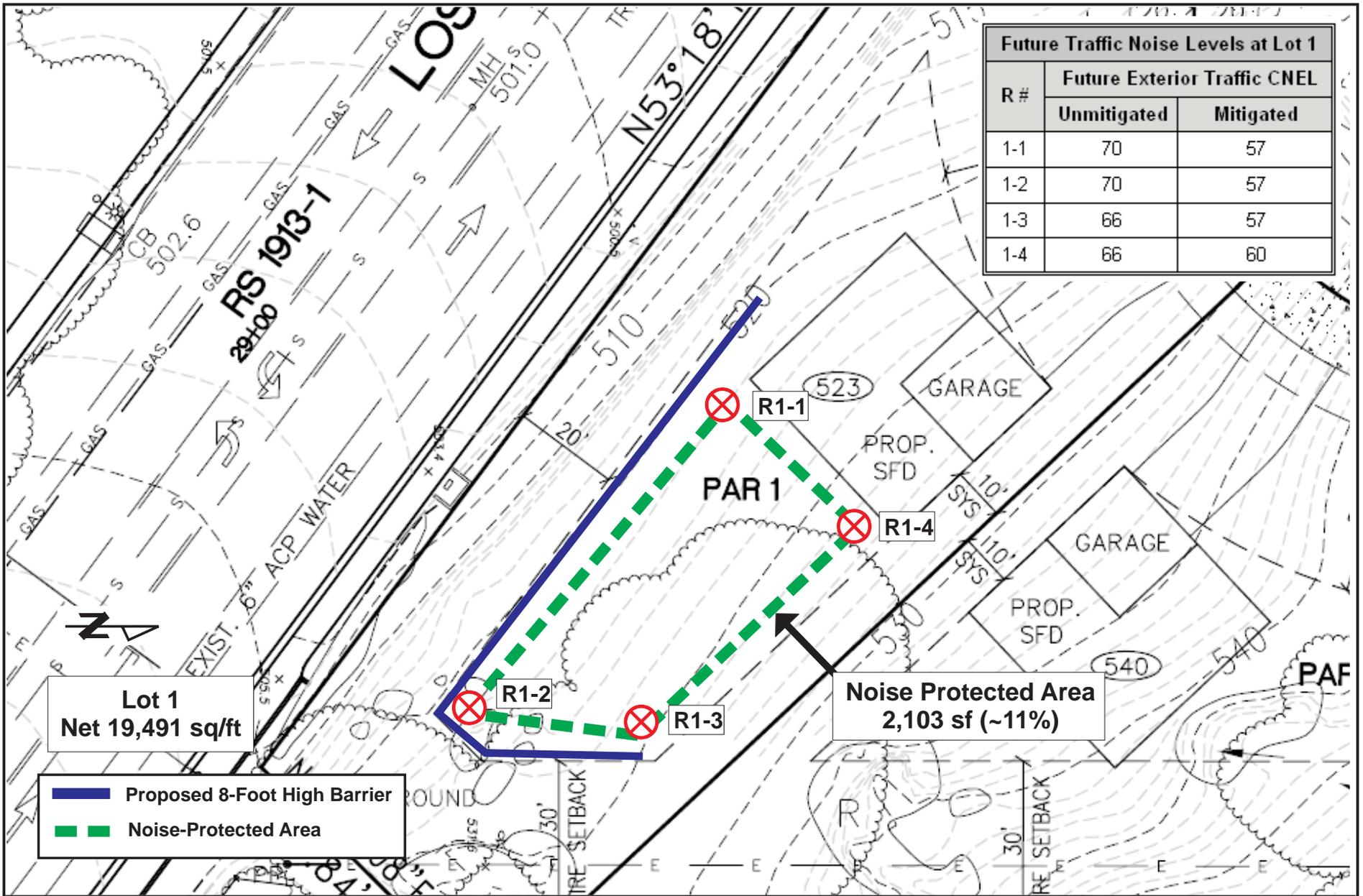
Figure 6



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**Site Plan Showing Future Traffic
CNEL Contours - 2nd Story Receivers
Job # B30814N1**

Figure 7



Future Traffic Noise Levels at Lot 1		
R #	Future Exterior Traffic CNEL	
	Unmitigated	Mitigated
1-1	70	57
1-2	70	57
1-3	66	57
1-4	66	60

Lot 1
Net 19,491 sq/ft

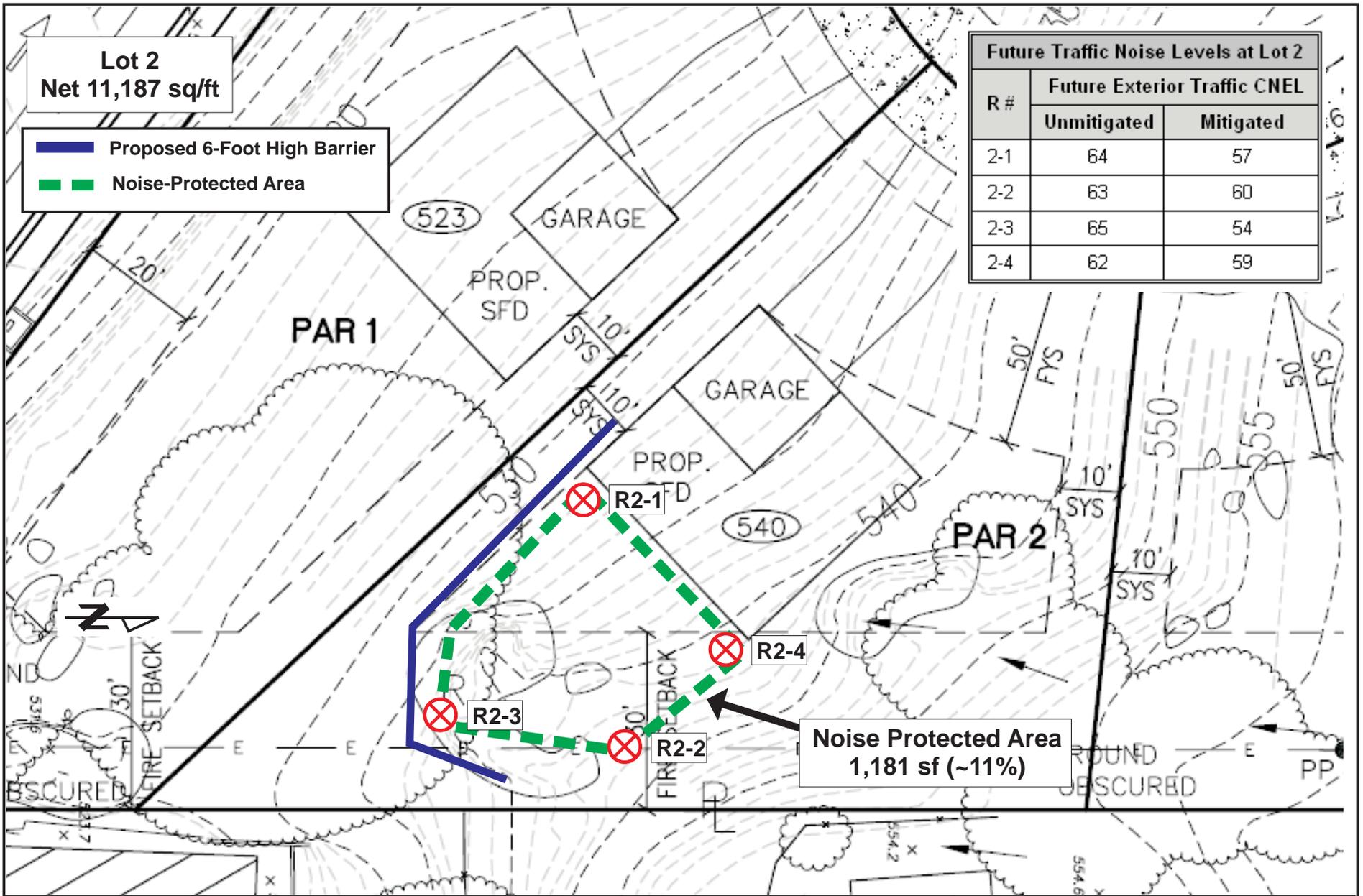
- Proposed 8-Foot High Barrier
- - - Noise-Protected Area

Noise Protected Area
2,103 sf (~11%)

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**Site Plan Showing Future Traffic
CNEL Impacts at Lot 1 and Sound
Attenuation Barrier Location**
Job # B30814N1

Figure 8



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Site Plan Showing Future Traffic
CNEL Impacts at Lot 2 and Sound
Attenuation Barrier Location
Job # B30814N1

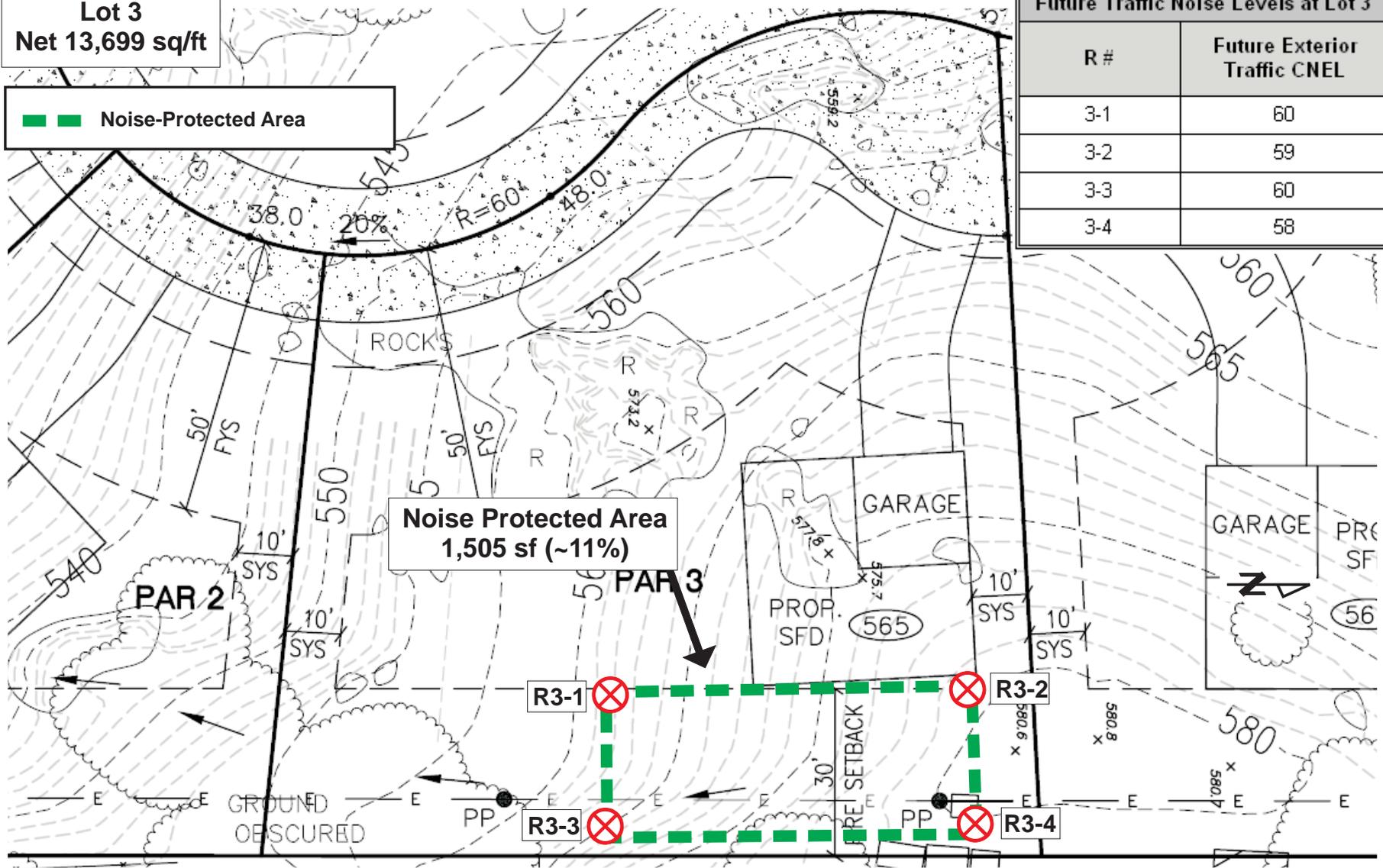
Figure 9

Lot 3
Net 13,699 sq/ft

 **Noise-Protected Area**

Future Traffic Noise Levels at Lot 3

R #	Future Exterior Traffic CNEL
3-1	60
3-2	59
3-3	60
3-4	58

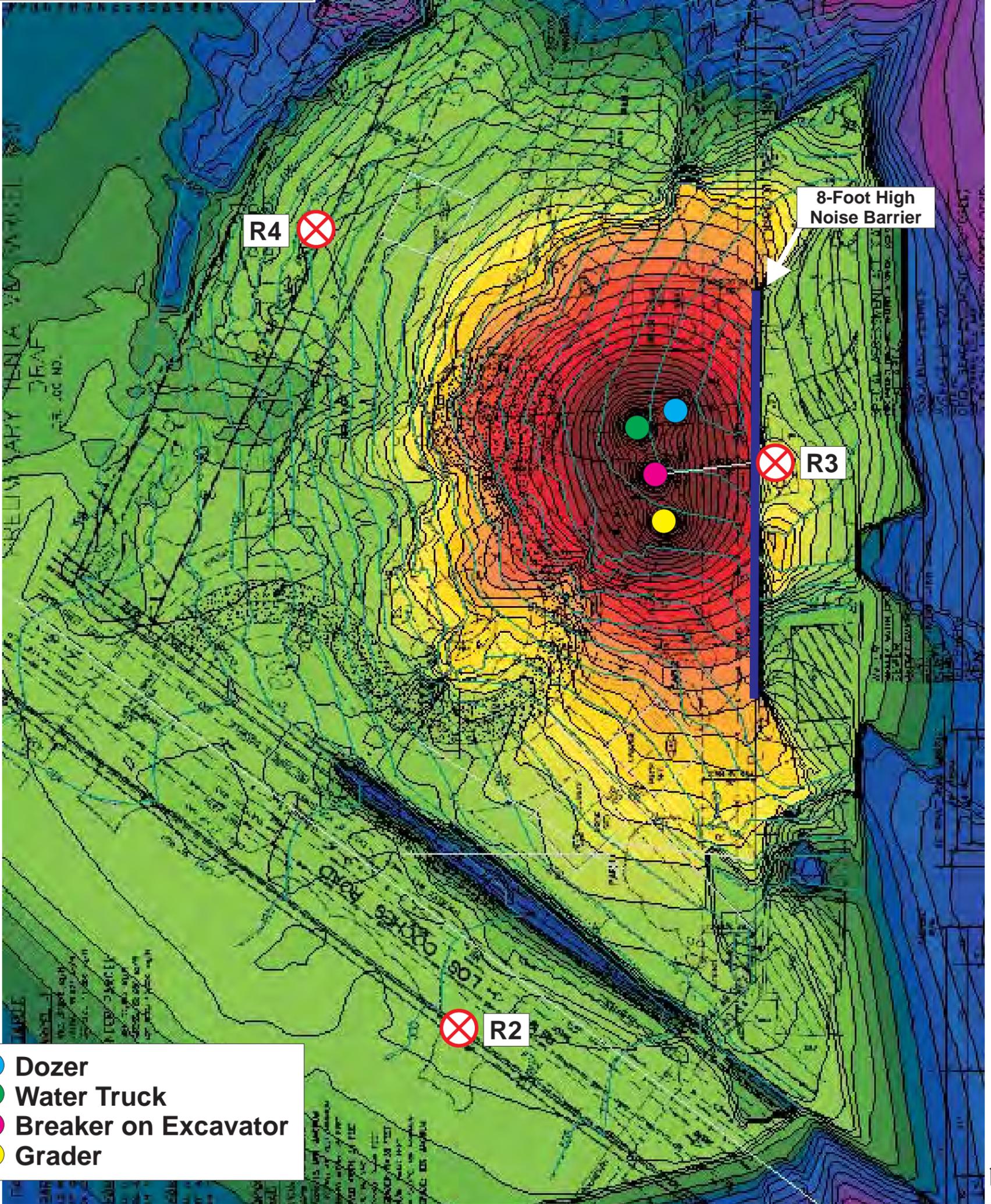
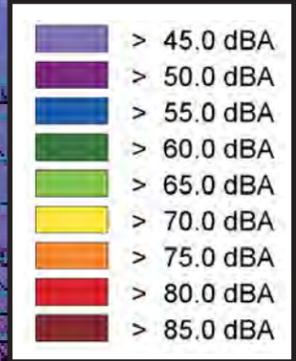


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**Site Plan Showing Future
 Traffic CNEL Impacts at Lot 3
 Job # B30814N1**

Figure 10

Calculated Construction Noise Impacts		
Receiver Number	Equipment Noise Level (dBA)	
	Unmitigated	Mitigated
R-1	50	50
R-2	64	64
R-3	82	70
R-4	66	66



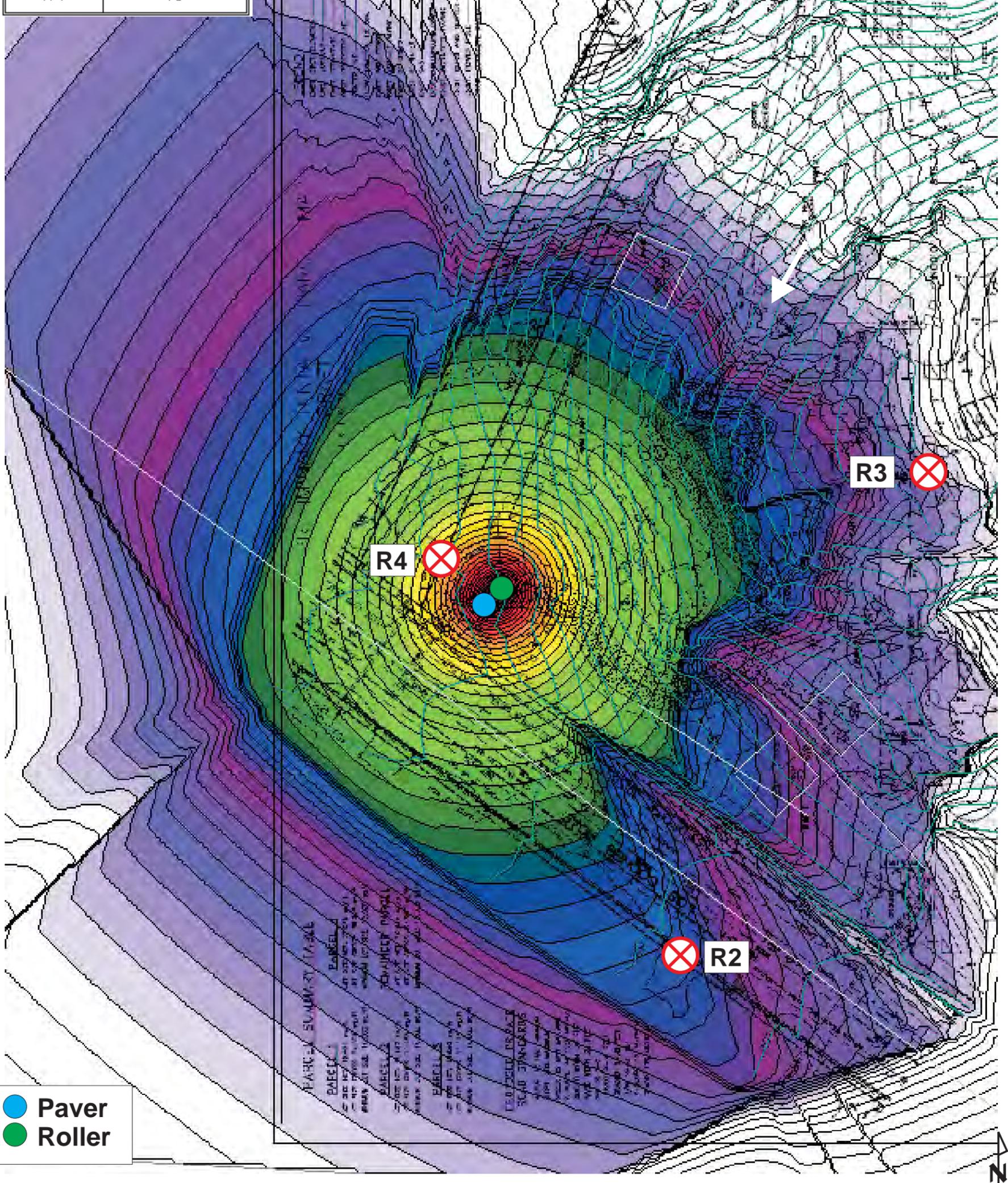
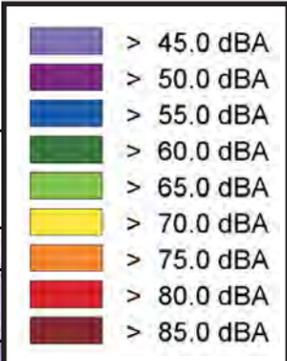
- Dozer
- Water Truck
- Breaker on Excavator
- Grader

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Site Plan Showing Representative Construction Noise Contours During Grading with Mitigation
 Job #B30814N1

Figure 12

Calculated Construction Noise Impacts	
Receiver Number	Equipment Noise Level (dBA)
R-1	31
R-2	55
R-3	43
R-4	73



● Paver
● Roller

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Site Plan Showing Representative
 Construction Noise Contours During Paving
 Job #B30814N1

Figure 13

APPENDIX A

Project Plans

PARCEL SUMMARY TABLE

PARCEL 1 LOT SIZE NET: 19,491 sq/ft LOT SIZE GROSS: 24,206 sq/ft MINIMUM LOT SIZE: 10,000 sq/ft	PARCEL 4 LOT SIZE NET: 37,878 sq/ft LOT SIZE GROSS: 38,925 sq/ft MINIMUM LOT SIZE: 10,000 sq/ft
PARCEL 2 LOT SIZE NET: 11,187 sq/ft LOT SIZE GROSS: 12,183 sq/ft MINIMUM LOT SIZE: 10,000 sq/ft	REMAINDER PARCEL LOT SIZE NET: 52,692 sq/ft LOT SIZE GROSS: 62,660 sq/ft MINIMUM LOT SIZE: 10,000 sq/ft
PARCEL 3 LOT SIZE NET: 13,699 sq/ft LOT SIZE GROSS: 17,118 sq/ft MINIMUM LOT SIZE: 10,000 sq/ft	

PROPOSED PRIVATE ROAD STANDARDS

- RADIUS: 60 FEET MINIMUM
- SLOPE: 20% MAXIMUM
- SPEED: 15 MPH MAXIMUM
- V. CURVE: 40 FEET MINIMUM
- GRADED WIDTH: 28 FEET
- PAVED WIDTH: 24 FEET
- CUL-DE-SAC
- PAVED: R=36 FEET
- GRADED: R=38 FEET
- R/W: R=40 FEET
- X-SLOPE: 5% MAXIMUM
- GRADE: 10% MAXIMUM

PRELIMINARY TENTATIVE PARCEL MAP DRAFT

E.R. LOG NO. _____

LEGEND

- EXIST. SPOT ELEVATION ——— X 46.45
- EXIST. CONTOUR ———
- EXIST. STRUCTURE ———
- PROP. PROPERTY LINE ———
- CENTER LINE ———
- FLOW DIRECTION 1% MIN. ———
- EXIST. WIRE FENCE ———
- EXIST. ASPHALT PAVING ———
- EXIST. 8" SEWER ———
- EXIST. 6" WATER ———
- EXIST. GAS ———
- EXIST. UNDERGROUND POWER ——— ET
- EXIST. CONCRETE PAVING ———
- EXIST. CURB AND GUTTER ———
- EXIST. POWER POLE ——— PP
- PROP. CONCRETE PAVING ———

OWNERS CERTIFICATE

I CERTIFY THAT I AM THE RECORD OWNER, AS SHOWN ON THE LATEST EQUALIZED COUNTY ASSESSMENT, OF THE PROPERTY SHOWN ON THE TENTATIVE MAP. ALL OF MY CONTIGUOUS OWNERSHIP WITHIN AND BEYOND THE BOUNDARIES OF THE PARCEL MAP IS SHOWN, THE BASIS OF CREATION OF LOTS IN MY OWNERSHIP (E.G. PARCEL MAP FINAL MAP, CERTIFICATE OF COMPLIANCE, REDDED DEED BEFORE 2-1-1972) IS INDICATED ON THE TENTATIVE PARCEL MAP. I UNDERSTAND THAT PROPERTY IS CONSIDERED AS CONTIGUOUS EVEN IF IT IS SEPARATED BY ROADS, STREETS, UTILITY EASEMENTS, OR RAILROAD RIGHT-OF-WAY. TREEWAY, AS DEFINED IN SECTION 23.5 OF THE STREETS AND HIGHWAY CODES, SHALL NOT BE CONSIDERED AS ROADS OR STREETS.

I FURTHER CERTIFY THAT I WILL NOT, BY THIS APPLICATION, CREATE OR CAUSE TO BE CREATED, OR WILL NOT HAVE PARTICIPATED IN THE CREATION OF MORE THAN FOUR PARCELS ON CONTIGUOUS PROPERTY UNLESS SUCH CONTIGUOUS PARCELS WERE CREATED BY A MAJOR SUBDIVISION FOR PURPOSES OF THIS CERTIFICATION. THE TERM "PARTICIPATED" MEANS HAVING COOPERATED WITH OR ACTED IN A PLANNING, COORDINATING, OR DECISION-MAKING CAPACITY IN ANY FORMAL OR INFORMAL ASSOCIATION, OR PARTNERSHIP, FOR THE PURPOSE OF DIVIDING REAL PROPERTY. I CERTIFY UNDER PENALTY THAT THE FOREGOING IS TRUE AND CORRECT.

EXECUTED THIS _____ DAY OF _____ AT SAN DIEGO, CALIFORNIA

AS OWNER _____ DATE _____

APPLICANT/OWNER

JONATHAN WEBSTER

PHONE: _____

SOLAR NOTE:

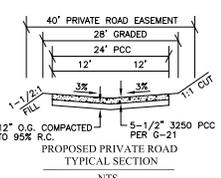
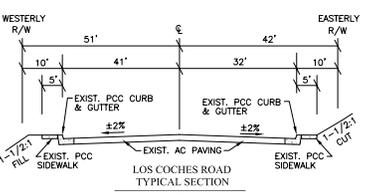
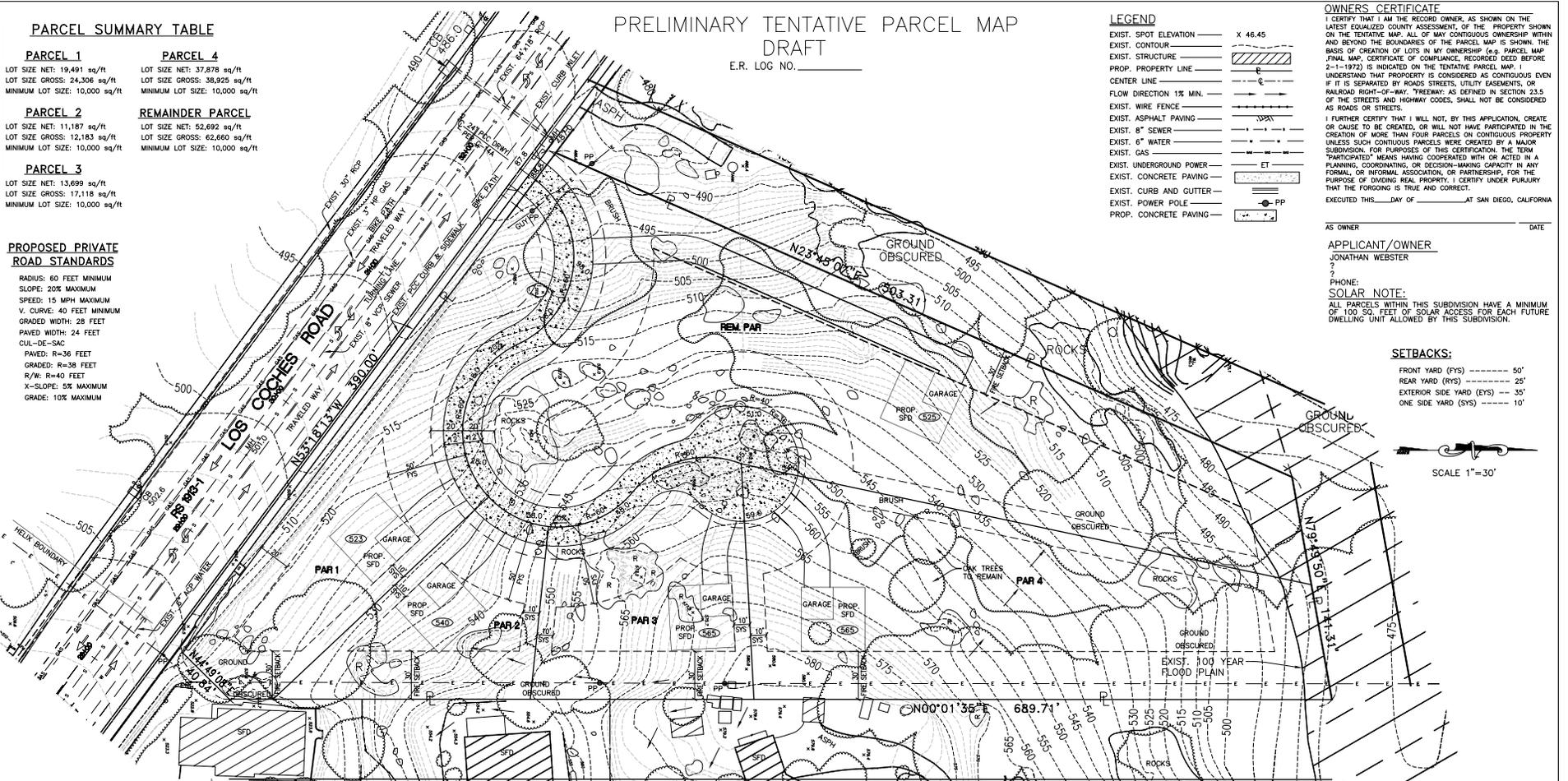
ALL PARCELS WITHIN THIS SUBDIVISION HAVE A MINIMUM OF 100 SQ. FEET OF SOLAR ACCESS FOR EACH FUTURE DWELLING UNIT ALLOWED BY THIS SUBDIVISION.

SETBACKS:

- FRONT YARD (FYS) ----- 50'
- REAR YARD (RYS) ----- 25'
- EXTERIOR SIDE YARD (EYS) --- 35'
- ONE SIDE YARD (SYS) ----- 10'



SCALE 1"=30'



WATER
LAKESIDE WATER DISTRICT

SEWER
LAKESIDE SANITATION DISTRICT

FIRE
LAKESIDE FIRE PROTECTION DISTRICT

POWER
SDG&E

TELEPHONE
A.P.N.

LAND USE
REGULATION RS4

ADDITIONAL REQUIREMENTS
SAN DIEGO STREET LIGHTING STANDARDS TO BE COMPLIED WITH SUBMITTER TO PAY PARK FEES IN LIEU OF PROPERTY REDUCTION IMPROVEMENTS ARE NOT TO BE CONSTRUCTED UNDER A SPECIAL ASSESSMENT ACT.

SPECIAL ASSESSMENT ACT STATEMENT
THIS PROJECT DOES NOT REQUIRE A SPECIAL ASSESSMENT ACT.

TOTAL AREA
3.56 AC GR.

ASSOCIATED PERMITS
NONE

AVERAGE LOT SIZE
0.712 AC

OPEN SPACE EASEMENT (PROPOSED)
SEE SEPARATE O.S.E. MAP

PUBLICLY MAINTAINED ACCESS ROAD
LOS COCHES ROAD

COMMUNITY/SUB-REGIONAL PLAN AREA
LAKESIDE

LAND USE DESIGNATION
R54 PER DOC. 99-682384 IN LOT 139

GRADING (SEE PHOTOS)
M.A.P.S. C.Y. FILL C.Y.

SCHOOL DISTRICTS
GROSSMONT UNION HIGH SCHOOL DISTRICT AND THE LAKESIDE UNION SCHOOL DISTRICT

REGIONAL CATEGORY
CT/RDA (SEE MAP)



TAX RATE AREA	RS4
USE REGULATIONS	C
ANIMAL REGULATIONS	C
DENSITY	2.35
LOT SIZE	10000
BUILDING TYPE	C
MAX. F.L.R. AREA	—
F.L.R. AREA RATIO	—
HEIGHT	G
COVERAGE	H
SETBACK	—
OPEN SPACE	—
SPECIAL AREA REGS.	—

MAY ENGINEERING & SURVEYING
12222 A WOODSIDE AVE. #237, LAKESIDE, CALIFORNIA 92040 PH. (619) 463-8580 FAX. (619) 561-3997 ELLIOTT@ELLOTTMAY.COM

ENGINEER OF WORK _____

ELLIOTT M. MAY R.C.E. 18592 DATE _____

APPENDIX B

Traffic Noise Model (TNM) Data and Results

INPUT: ROADWAYS**Panwebster TPM 21204**

		point20	20	622.1	334.8	163.00				Average	
		point21	21	627.0	380.1	164.00				Average	
		point22	22	608.8	441.3	162.00					

INPUT: TRAFFIC FOR LAeq1h Volumes

Panwebster TPM 21204

Eilar Associates		12 September 2013											
AH		TNM 2.5											
INPUT: TRAFFIC FOR LAeq1h Volumes													
PROJECT/CONTRACT:		Panwebster TPM 21204											
RUN:		Calibration											
Roadway		Points											
Name		Name	No.	Segment		MTrucks		HTrucks		Buses		Motorcycles	
				Autos									
				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
Los Coches NW	point1	1	291	80	6	80	3	80	0	0	0	0	
	point2	2	291	80	6	80	3	80	0	0	0	0	
	point3	3	291	80	6	80	3	80	0	0	0	0	
	point4	4	291	80	6	80	3	80	0	0	0	0	
	point42	42	291	80	6	80	3	80	0	0	0	0	
	point43	43	291	80	6	80	3	80	0	0	0	0	
	point5	5	291	80	6	80	3	80	0	0	0	0	
	point44	44	291	80	6	80	3	80	0	0	0	0	
	point6	6	291	80	6	80	3	80	0	0	0	0	
	point7	7	291	80	6	80	3	80	0	0	0	0	
	point8	8											
Los Coches SE	point9	9	291	80	6	80	3	80	0	0	0	0	
	point47	47	291	80	6	80	3	80	0	0	0	0	
	point10	10	291	80	6	80	3	80	0	0	0	0	
	point11	11	291	80	6	80	3	80	0	0	0	0	
	point46	46	291	80	6	80	3	80	0	0	0	0	
	point12	12	291	80	6	80	3	80	0	0	0	0	
	point45	45	291	80	6	80	3	80	0	0	0	0	
	point13	13	291	80	6	80	3	80	0	0	0	0	
	point14	14	291	80	6	80	3	80	0	0	0	0	
	point15	15											
Ha Hana Rd	point16	16	84	48	0	0	0	0	0	0	0	0	
	point17	17	84	48	0	0	0	0	0	0	0	0	

INPUT: TRAFFIC FOR LAeq1h Volumes**Panwebster TPM 21204**

	point18	18										
Bower Ln	point19	19	0	0	0	0	0	0	0	0	0	0
	point20	20	0	0	0	0	0	0	0	0	0	0
	point21	21	0	0	0	0	0	0	0	0	0	0
	point22	22										

INPUT: RECEIVERS

Panwebster TPM 21204

Eilar Associates							12 September 2013				
AH							TNM 2.5				
INPUT: RECEIVERS											
PROJECT/CONTRACT:		Panwebster TPM 21204									
RUN:		Calibration									
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active
			X	Y	Z	above	Existing	Impact Criteria		NR	in
						Ground	LAeq1h	LAeq1h	Sub'l	Goal	Calc.
			m	m	m	m	dBA	dBA	dB	dB	
Calibration	2	1	373.3	424.2	150.00	1.50	0.00	66	10.0	8.0	Y

RESULTS: SOUND LEVELS

Panwebster TPM 21204

Eilar Associates													12 September 2013	
AH													TNM 2.5	
													Calculated with TNM 2.5	
RESULTS: SOUND LEVELS														
PROJECT/CONTRACT:			Panwebster TPM 21204											
RUN:			Calibration											
BARRIER DESIGN:			INPUT HEIGHTS											
													Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.	
ATMOSPHERICS:			20 deg C, 50% RH											
Receiver														
Name		No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing		With Barrier					
							Calculated	Crit'n	Type Impact	Calculated LAeq1h	Noise Reduction		Calculated minus Goal	
								Sub'l Inc			Calculated	Goal	Calculated minus Goal	
				dB	dB	dB	dB	dB		dB	dB	dB	dB	
Calibration		2	1	0.0	67.8	66	67.8	10	Snd Lvl	67.8	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								

INPUT: TRAFFIC FOR LAeq1h Volumes

Panwebster TPM 21204

Eilar Associates		12 September 2013										
AH		TNM 2.5										
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:		Panwebster TPM 21204										
RUN:		Current Contours										
Roadway	Points											
Name	Name	No.	Segment		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
Los Coches NW	point1	1	355	80	11	80	7	80	0	0	0	0
	point2	2	355	80	11	80	7	80	0	0	0	0
	point3	3	355	80	11	80	7	80	0	0	0	0
	point4	4	355	80	11	80	7	80	0	0	0	0
	point42	42	355	80	11	80	7	80	0	0	0	0
	point43	43	355	80	11	80	7	80	0	0	0	0
	point5	5	355	80	11	80	7	80	0	0	0	0
	point44	44	355	80	11	80	7	80	0	0	0	0
	point6	6	355	80	11	80	7	80	0	0	0	0
	point7	7	355	80	11	80	7	80	0	0	0	0
	point8	8										
Los Coches SE	point9	9	355	80	11	80	7	80	0	0	0	0
	point47	47	355	80	11	80	7	80	0	0	0	0
	point10	10	355	80	11	80	7	80	0	0	0	0
	point11	11	355	80	11	80	7	80	0	0	0	0
	point46	46	355	80	11	80	7	80	0	0	0	0
	point12	12	355	80	11	80	7	80	0	0	0	0
	point45	45	355	80	11	80	7	80	0	0	0	0
	point13	13	355	80	11	80	7	80	0	0	0	0
	point14	14	355	80	11	80	7	80	0	0	0	0
	point15	15										
Ha Hana Rd	point16	16	84	48	0	0	0	0	0	0	0	0
	point17	17	84	48	0	0	0	0	0	0	0	0

INPUT: TRAFFIC FOR LAeq1h Volumes**Panwebster TPM 21204**

	point18	18										
Bower Ln	point19	19	0	0	0	0	0	0	0	0	0	0
	point20	20	0	0	0	0	0	0	0	0	0	0
	point21	21	0	0	0	0	0	0	0	0	0	0
	point22	22										

INPUT: TERRAIN LINES

Panwebster TPM 21204

Eilar Associates			12 September 2013	
AH			TNM 2.5	
INPUT: TERRAIN LINES				
PROJECT/CONTRACT:	Panwebster TPM 21204			
RUN:	Current Contours			
Terrain Line	Points			
Name	No.	Coordinates (ground)		
		X	Y	Z
		m	m	m
500	15	498.9	361.1	152.40
	16	466.5	388.4	152.40
	17	464.8	394.4	152.40
	18	460.4	404.1	152.40
	19	461.5	407.8	152.40
	20	462.3	412.6	152.40
	21	460.7	417.8	152.40
	22	457.3	422.0	152.40
	23	458.5	426.9	152.40
	24	458.5	438.9	152.40
	25	455.9	448.9	152.40
	26	451.0	459.3	152.40
	27	452.0	460.4	152.40
	28	450.8	463.4	152.40
	29	452.6	469.0	152.40
	30	460.3	484.6	152.40
	31	471.7	498.0	152.40
	32	473.1	501.6	152.40
	33	473.0	503.7	152.40
	34	477.3	505.4	152.40
	35	483.0	509.9	152.40
	36	485.7	511.0	152.40
	37	487.7	514.0	152.40
	38	488.2	516.5	152.40

INPUT: TERRAIN LINES

Panwebster TPM 21204

	39	492.0	520.0	152.40
	40	496.3	518.8	152.40
	41	506.5	523.9	152.40
	42	508.3	524.9	152.40
	43	516.7	533.9	152.40
	44	517.9	537.2	152.40
	45	519.5	537.5	152.40
	46	520.6	535.7	152.40
	47	549.4	535.7	152.40
	48	554.5	535.5	152.40
	49	558.7	538.1	152.40
510	75	549.4	323.5	155.50
	76	532.3	336.1	155.50
	77	532.2	338.3	155.50
	78	526.5	342.8	155.50
	79	524.2	343.4	155.50
	80	516.2	350.7	155.50
	81	487.6	374.8	155.50
	82	479.8	381.0	155.50
	83	478.6	385.3	155.50
	84	470.5	404.9	155.50
	85	471.4	411.4	155.50
	86	470.1	418.1	155.50
	87	467.2	425.8	155.50
	88	464.3	439.8	155.50
	89	464.3	441.4	155.50
	90	465.4	445.3	155.50
	91	463.3	458.2	155.50
	92	459.4	462.9	155.50
	93	459.9	469.6	155.50
	94	462.0	471.9	155.50
	95	463.3	477.8	155.50
	96	470.5	487.4	155.50
	97	476.8	494.1	155.50
	98	481.2	498.8	155.50
	99	482.5	501.6	155.50

INPUT: TERRAIN LINES

Panwebster TPM 21204

	100	491.8	507.4	155.50
	101	497.5	511.5	155.50
	102	509.4	518.5	155.50
	103	514.1	523.6	155.50
	104	514.5	525.6	155.50
	105	516.0	526.4	155.50
	106	517.6	528.1	155.50
	107	524.8	531.2	155.50
	108	547.9	530.3	155.50
	109	555.2	532.0	155.50
	110	558.5	534.8	155.50
520	146	550.7	325.2	158.50
	147	537.8	334.9	158.50
	148	535.0	341.0	158.50
	149	530.0	345.4	158.50
	150	530.2	346.6	158.50
	151	505.0	366.6	158.50
	152	503.2	368.9	158.50
	153	499.3	378.3	158.50
	154	494.1	385.8	158.50
	155	486.1	393.9	158.50
	156	485.8	395.5	158.50
	157	481.3	401.2	158.50
	158	478.1	406.6	158.50
	159	476.9	417.6	158.50
	160	477.2	423.4	158.50
	161	472.8	432.8	158.50
	162	471.9	437.2	158.50
	163	472.2	453.3	158.50
	164	472.1	463.9	158.50
	165	469.8	465.1	158.50
	166	472.4	474.5	158.50
	167	479.4	482.3	158.50
	168	486.1	487.0	158.50
	169	490.2	492.3	158.50
	170	501.9	499.9	158.50

INPUT: TERRAIN LINES

Panwebster TPM 21204

	171	517.4	513.8	158.50
	172	524.6	522.5	158.50
	173	527.9	524.0	158.50
	174	549.7	524.1	158.50
	175	556.1	525.7	158.50
	176	557.5	527.1	158.50
	177	558.4	531.0	158.50
530	178	557.7	367.7	161.60
	179	545.5	367.0	161.60
	180	544.5	366.1	161.60
	181	542.9	362.3	161.60
	182	541.4	361.2	161.60
	183	532.0	367.0	161.60
	184	524.8	373.8	161.60
	185	505.6	392.9	161.60
	186	499.1	397.3	161.60
	187	492.8	397.7	161.60
	188	490.8	397.7	161.60
	189	490.2	397.9	161.60
	190	490.0	398.8	161.60
	191	489.2	399.6	161.60
	192	487.7	398.4	161.60
	193	486.9	400.6	161.60
	194	486.9	404.1	161.60
	195	488.6	406.5	161.60
	196	486.0	412.9	161.60
	197	485.1	417.0	161.60
	198	484.0	417.1	161.60
	199	482.9	416.3	161.60
	200	482.7	417.6	161.60
	201	483.5	422.4	161.60
	202	482.8	427.9	161.60
	203	479.3	436.1	161.60
	204	479.1	447.0	161.60
	205	480.5	453.6	161.60
	206	480.9	459.4	161.60

INPUT: TERRAIN LINES

Panwebster TPM 21204

	207	485.3	471.1	161.60
	208	489.0	476.1	161.60
	209	492.8	479.5	161.60
	210	503.9	491.8	161.60
	211	527.8	514.3	161.60
	212	532.8	516.5	161.60
	213	539.1	517.8	161.60
	214	547.5	518.1	161.60
	215	555.5	520.1	161.60
	216	555.9	521.8	161.60
	217	558.6	521.2	161.60
540	218	558.5	515.5	164.60
	219	555.2	513.0	164.60
	220	550.7	512.2	164.60
	221	538.8	507.1	164.60
	222	533.5	505.8	164.60
	223	525.0	500.7	164.60
	224	516.8	492.5	164.60
	225	510.0	485.7	164.60
	226	497.5	473.0	164.60
	227	489.1	461.3	164.60
	228	486.0	450.8	164.60
	229	484.8	446.4	164.60
	230	485.1	440.7	164.60
	231	485.4	438.7	164.60
	232	487.3	436.5	164.60
	233	487.5	433.8	164.60
	234	489.4	432.4	164.60
	235	490.2	426.5	164.60
	236	492.5	421.6	164.60
	237	493.4	418.2	164.60
	238	492.9	415.5	164.60
	239	494.3	412.0	164.60
	240	496.5	410.3	164.60
	241	505.3	403.7	164.60
	242	514.6	399.0	164.60

INPUT: TERRAIN LINES

Panwebster TPM 21204

	243	521.6	397.7	164.60
	244	524.4	395.7	164.60
	245	530.9	386.2	164.60
	246	534.6	379.9	164.60
	247	535.3	375.6	164.60
	248	535.3	374.3	164.60
	249	533.4	372.3	164.60
	250	533.8	371.8	164.60
	251	535.8	373.1	164.60
	252	536.8	372.8	164.60
	253	537.7	371.0	164.60
	254	538.5	370.7	164.60
	255	539.7	372.2	164.60
	256	540.4	373.5	164.60
	257	551.8	373.7	164.60
	258	555.5	376.1	164.60
	259	558.4	376.7	164.60
550	260	558.6	510.6	167.70
	261	552.0	505.9	167.70
	262	539.6	499.7	167.70
	263	533.9	496.8	167.70
	264	528.5	492.2	167.70
	265	527.6	490.1	167.70
	266	516.1	479.1	167.70
	267	514.5	478.7	167.70
	268	508.3	472.6	167.70
	269	506.2	469.0	167.70
	270	506.1	466.4	167.70
	271	499.8	458.7	167.70
	272	493.9	452.5	167.70
	273	492.5	447.3	167.70
	274	490.2	445.7	167.70
	275	491.5	443.4	167.70
	276	492.9	442.0	167.70
	277	495.2	438.2	167.70
	253	497.1	432.9	167.70

INPUT: TERRAIN LINES

Panwebster TPM 21204

	279	500.8	425.4	167.70
	280	501.6	422.3	167.70
	281	502.0	417.9	167.70
	282	507.6	412.8	167.70
	283	509.2	412.3	167.70
	284	510.0	409.6	167.70
	285	511.5	409.5	167.70
	286	512.5	407.9	167.70
	287	515.2	408.2	167.70
	288	519.8	407.1	167.70
	289	528.0	406.2	167.70
	290	530.1	405.4	167.70
	291	531.8	400.8	167.70
	292	537.5	394.1	167.70
	293	539.2	391.4	167.70
	294	540.4	386.8	167.70
	295	543.7	380.5	167.70
	296	546.1	379.1	167.70
	297	549.9	379.2	167.70
	298	558.3	382.3	167.70
Terrain Line16	299	559.2	502.3	170.70
	300	541.8	492.2	170.70
	301	534.8	486.5	170.70
	302	532.1	485.1	170.70
	303	528.9	485.2	170.70
	304	526.7	482.6	170.70
	305	526.7	479.8	170.70
	306	518.7	473.1	170.70
	307	515.6	468.1	170.70
	308	514.3	464.4	170.70
	309	513.5	461.3	170.70
	310	507.5	454.3	170.70
	311	503.6	448.5	170.70
	312	503.1	445.9	170.70
	313	501.9	444.3	170.70
	314	501.6	442.3	170.70

INPUT: TERRAIN LINES

Panwebster TPM 21204

	315	503.3	441.6	170.70
	316	504.4	440.1	170.70
	317	504.0	436.8	170.70
	318	504.9	434.8	170.70
	319	508.4	431.7	170.70
	320	509.1	427.9	170.70
	321	510.9	423.7	170.70
	322	513.4	420.7	170.70
	323	512.9	417.3	170.70
	324	514.4	416.5	170.70
	325	516.9	415.7	170.70
	326	518.2	417.2	170.70
	327	520.8	415.9	170.70
	328	526.6	416.4	170.70
	329	534.8	414.9	170.70
	330	537.1	412.4	170.70
	331	540.0	407.8	170.70
	332	544.4	409.1	170.70
	333	546.3	410.4	170.70
	334	547.6	411.2	170.70
	335	549.7	411.5	170.70
	336	551.8	411.0	170.70
	337	552.9	412.5	170.70
	338	554.7	413.2	170.70
	339	560.1	413.3	170.70
570	341	559.2	489.0	173.80
	342	550.6	488.3	173.80
	343	547.0	490.0	173.80
	344	544.9	490.9	173.80
	345	543.2	489.1	173.80
	346	544.2	486.7	173.80
	347	540.3	483.1	173.80
	348	534.3	478.5	173.80
	349	526.3	467.5	173.80
	350	520.1	454.9	173.80
	351	516.3	449.0	173.80

INPUT: TERRAIN LINES

Panwebster TPM 21204

	352	515.5	444.5	173.80
	353	514.4	438.6	173.80
	354	516.8	434.5	173.80
	355	523.5	428.5	173.80
	356	529.6	426.7	173.80
	357	537.9	425.4	173.80
	358	542.1	419.4	173.80
	359	546.0	416.6	173.80
	360	550.3	417.4	173.80
580	361	539.3	458.7	176.80
	362	537.1	460.5	176.80
	363	535.3	458.2	176.80
	364	533.6	452.5	176.80
	365	532.2	448.0	176.80
	366	531.6	446.8	176.80
	367	531.8	444.7	176.80
	368	533.2	442.9	176.80
	369	538.2	440.2	176.80
	370	539.8	440.8	176.80
	371	539.4	443.9	176.80
	372	538.8	446.1	176.80
	373	539.6	458.3	176.80
	374	539.3	458.7	176.80
490	375	558.2	544.5	149.40
	376	533.1	547.1	149.40
	377	526.7	546.8	149.40
	378	522.1	547.4	149.40
	379	518.4	545.0	149.40
	380	510.4	537.8	149.40
	381	503.4	529.7	149.40
	382	498.3	526.7	149.40
	383	492.3	524.7	149.40
	384	489.1	521.7	149.40
	385	488.0	521.2	149.40
	386	486.4	518.8	149.40
	387	484.7	516.7	149.40

INPUT: TERRAIN LINES

Panwebster TPM 21204

	388	484.3	515.6	149.40
	389	484.1	513.0	149.40
	390	482.5	511.4	149.40
	391	479.8	510.0	149.40
	392	478.1	510.8	149.40
	393	475.8	510.1	149.40
	394	472.7	507.1	149.40
	395	466.1	500.0	149.40
	396	456.2	489.2	149.40
	397	450.4	481.0	149.40
	398	448.0	473.4	149.40
	399	444.6	462.7	149.40
	400	444.8	456.5	149.40
	401	443.7	454.2	149.40
	402	444.5	449.8	149.40
	403	443.6	446.7	149.40
	404	445.9	441.0	149.40
	405	445.3	432.0	149.40
	406	445.9	423.6	149.40
	407	443.4	419.3	149.40
	408	444.8	416.0	149.40
	409	446.7	414.3	149.40
	410	444.8	410.8	149.40
	411	449.0	401.2	149.40
	412	450.8	397.9	149.40
480	413	558.2	554.3	146.30
	414	547.9	553.4	146.30
	415	530.2	555.4	146.30
	416	515.6	554.9	146.30
	417	510.0	550.2	146.30
	418	504.6	544.3	146.30
	419	500.7	538.2	146.30
	420	497.9	532.5	146.30
	421	494.4	529.6	146.30
	422	491.7	527.5	146.30
	423	488.1	524.0	146.30

INPUT: TERRAIN LINES

	424	486.8	522.9	146.30
	425	484.9	519.8	146.30
	426	480.1	515.3	146.30
	427	471.9	511.3	146.30
	428	468.4	510.7	146.30
	429	463.5	505.5	146.30
	430	442.9	483.4	146.30
	431	439.3	464.1	146.30
	432	433.5	441.3	146.30
	433	431.1	438.8	146.30
	434	430.4	437.8	146.30
	435	429.5	436.6	146.30
	436	428.3	433.3	146.30
	437	429.7	428.6	146.30
	438	425.6	425.1	146.30
	439	422.8	424.2	146.30
470	440	497.2	566.2	143.30
	441	492.8	555.0	143.30
	442	489.1	546.2	143.30
	443	488.4	535.9	143.30
	444	486.4	530.5	143.30
	445	485.0	524.5	143.30
	446	480.7	519.0	143.30
	447	476.8	516.4	143.30
	448	472.9	514.9	143.30
	449	467.7	515.4	143.30

Panwebster TPM 21204

INPUT: RECEIVERS**Panwebster TPM 21204**

22	25	1	499.5	546.8	145.44	1.50	0.00	66	10.0	8.0	Y
23	26	1	525.0	534.9	153.09	1.50	0.00	66	10.0	8.0	Y
24	27	1	541.9	522.3	159.45	1.50	0.00	66	10.0	8.0	Y
25	28	1	532.0	554.5	146.60	1.50	0.00	66	10.0	8.0	Y

RESULTS: SOUND LEVELS

Panwebster TPM 21204

24	27	1	0.0	49.0	66	49.0	10	----	49.0	0.0	8	-8.0	
25	28	1	0.0	43.6	66	43.6	10	----	43.6	0.0	8	-8.0	
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		26	0.0	0.0	0.0								
All Impacted		6	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								

Eilar Associates		12 September 2013										
AH		TNM 2.5										
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:		Panwebster TPM 21204										
RUN:		Future Contours										
Roadway	Points											
Name	Name	No.	Segment		MTrucks		HTrucks		Buses		Motorcycles	
			Autos		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
Los Coches NW	point1	1	457	80	14	80	10	80	0	0	0	0
	point2	2	457	80	14	80	10	80	0	0	0	0
	point3	3	457	80	14	80	10	80	0	0	0	0
	point4	4	457	80	14	80	10	80	0	0	0	0
	point42	42	457	80	14	80	10	80	0	0	0	0
	point43	43	457	80	14	80	10	80	0	0	0	0
	point5	5	457	80	14	80	10	80	0	0	0	0
	point44	44	457	80	14	80	10	80	0	0	0	0
	point6	6	457	80	14	80	10	80	0	0	0	0
	point7	7	457	80	14	80	10	80	0	0	0	0
	point8	8										
Los Coches SE	point9	9	457	80	14	80	10	80	0	0	0	0
	point47	47	457	80	14	80	10	80	0	0	0	0
	point10	10	457	80	14	80	10	80	0	0	0	0
	point11	11	457	80	14	80	10	80	0	0	0	0
	point46	46	457	80	14	80	10	80	0	0	0	0
	point12	12	457	80	14	80	10	80	0	0	0	0
	point45	45	457	80	14	80	10	80	0	0	0	0
	point13	13	457	80	14	80	10	80	0	0	0	0
	point14	14	457	80	14	80	10	80	0	0	0	0
	point15	15										
Ha Hana Rd	point16	16	84	48	0	0	0	0	0	0	0	0
	point17	17	84	48	0	0	0	0	0	0	0	0

INPUT: TRAFFIC FOR LAeq1h Volumes**Panwebster TPM 21204**

	point18	18										
Bower Ln	point19	19	0	0	0	0	0	0	0	0	0	0
	point20	20	0	0	0	0	0	0	0	0	0	0
	point21	21	0	0	0	0	0	0	0	0	0	0
	point22	22										

RESULTS: SOUND LEVELS

Panwebster TPM 21204

24	27	1	0.0	50.1	66	50.1	10	----	50.1	0.0	8	-8.0	
25	28	1	0.0	44.8	66	44.8	10	----	44.8	0.0	8	-8.0	
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		26	0.0	0.0	0.0								
All Impacted		6	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								

INPUT: RECEIVERS**Panwebster TPM 21204**

22	25	1	499.5	546.8	145.44	4.57	0.00	66	10.0	8.0	Y
23	26	1	525.0	534.9	153.09	4.57	0.00	66	10.0	8.0	Y
24	27	1	541.9	522.3	159.45	4.57	0.00	66	10.0	8.0	Y
25	28	1	532.0	554.5	146.60	4.57	0.00	66	10.0	8.0	Y

RESULTS: SOUND LEVELS

Panwebster TPM 21204

24	27	1	0.0	52.1	66	52.1	10	----	52.1	0.0	8	-8.0	
25	28	1	0.0	49.1	66	49.1	10	----	49.1	0.0	8	-8.0	
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		26	0.0	0.0	0.0								
All Impacted		6	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								

INPUT: RECEIVERS

Panwebster TPM 21204

Eilar Associates							12 September 2013				
AH							TNM 2.5				
INPUT: RECEIVERS											
PROJECT/CONTRACT:			Panwebster TPM 21204								
RUN:			Future Outdoor Use-Unmitigated								
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height above Ground	Input Sound Levels and Criteria				Active in Calc.
			X	Y	Z		Existing LAeq1h	Impact Criteria LAeq1h	Sub'l	NR Goal	
			m	m	m	m	dBA	dBA	dB	dB	
1-1	31	1	512.5	364.4	158.98	1.50	0.00	66	10.0	8.0	
1-2	32	1	528.2	350.4	158.79	1.50	0.00	66	10.0	8.0	
1-3	33	1	530.8	359.8	160.16	1.50	0.00	66	10.0	8.0	
1-4	34	1	518.0	370.3	160.26	1.50	0.00	66	10.0	8.0	
2-1	36	1	526.1	377.5	162.34	1.50	0.00	66	10.0	8.0	
2-2	37	1	539.0	379.1	164.63	1.50	0.00	66	10.0	8.0	
2-3	38	1	538.0	368.5	163.11	1.50	0.00	66	10.0	8.0	
2-4	39	1	533.1	384.9	164.48	1.50	0.00	66	10.0	8.0	
3-1	40	1	533.9	422.0	172.79	1.50	0.00	66	10.0	8.0	
3-2	41	1	534.2	441.6	176.70	1.50	0.00	66	10.0	8.0	
3-3	42	1	539.7	422.0	173.61	1.50	0.00	66	10.0	8.0	
3-4	43	1	539.9	442.0	176.81	1.50	0.00	66	10.0	8.0	
4-1	44	1	500.9	455.4	168.80	1.50	0.00	66	10.0	8.0	
4-2	45	1	537.4	448.3	176.83	1.50	0.00	66	10.0	8.0	
4-3	46	1	521.5	537.3	151.98	1.50	0.00	66	10.0	8.0	
4-4	47	1	536.1	537.5	152.03	1.50	0.00	66	10.0	8.0	
5-1	48	1	483.3	486.8	158.18	1.50	0.00	66	10.0	8.0	Y
5-2	49	1	500.7	478.2	164.11	1.50	0.00	66	10.0	8.0	Y
5-3	50	1	505.6	539.6	147.20	1.50	0.00	66	10.0	8.0	
5-4	51	1	514.3	538.9	149.99	1.50	0.00	66	10.0	8.0	

RESULTS: SOUND LEVELS**Panwebster TPM 21204**

All Selected		20	0.0	0.0	0.0							
All Impacted		2	0.0	0.0	0.0							
All that meet NR Goal		0	0.0	0.0	0.0							

Eilar Associates	12 September 2013
AH	TNM 2.5

INPUT: BARRIERS

PROJECT/CONTRACT: Panwebster TPM 21204
 RUN: Future Outdoor Use-Mitigated

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-
		m	m	Area	Vol.		m:m	Length			m	m	m	m	m				tions?
				\$/sq m	\$/cu m			\$/m											
Lot 1 Wall	W	0.00	30.48	0.00				0.00	point31	31	501.9	373.8	158.63	2.44	0.00	0	0		
									point32	32	504.8	367.3	158.58	2.44	0.00	0	0		
									point30	30	529.7	347.6	158.61	2.44	0.00	0	0		
									point29	29	531.8	350.1	159.05	2.44	0.00	0	0		
									point28	28	532.3	359.3	160.21	2.44					
Lot 2 Wall	W	0.00	30.48	0.00				0.00	point33	33	522.3	378.7	161.92	1.83	0.00	0	0		
									point34	34	531.0	370.3	162.58	1.83	0.00	0	0		
									point36	36	539.1	366.8	163.21	1.83	0.00	0	0		
									point35	35	541.0	373.0	164.46	1.83					

RESULTS: SOUND LEVELS**Panwebster TPM 21204**

All Selected		20	0.0	0.0	0.0							
All Impacted		0	0.0	0.0	0.0							
All that meet NR Goal		0	0.0	0.0	0.0							

APPENDIX C

Pertinent Sections of the County of San Diego Noise Element to the General Plan and Noise Ordinance



Noise Effects

Noise has a significant effect on quality of life. An individual's reaction to a particular noise depends on many factors such as the source of the noise, its loudness relative to the background noise level, and the time of day. The reaction to noise can also be highly subjective; the perceived effect of a particular noise can vary widely among individuals in a community. Because of the nature of the human ear, a sound must be about ten dB greater than the reference sound to be judged as twice as loud. In general, a three dB change in community noise levels is perceivable, while one to two dB changes generally are not perceived. Although the reaction to noise may vary, it is clear that noise is a significant component of the environment, and excessively noisy conditions can affect an individual's health and well-being. The effects of noise are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure. The effects of noise on a community can be organized into six broad categories: noise-induced hearing loss; interference with communication; effects on sleep; effects on performance and behavior; extra-auditory health effects; and annoyance.

Noise Standards

Noise exposure criteria are incorporated into land use planning to reduce future conflicts between noise and land use. This is achieved by specifying acceptable noise exposure ranges for various land uses throughout the County. The County uses the Noise Compatibility Guidelines listed in Table N-1 (Noise Compatibility Guidelines) to determine the compatibility of land use when evaluating proposed development projects.

The Noise Compatibility Guidelines indicate ranges of compatibility and are intended to be flexible enough to apply to a range of projects and environments. For example, a commercial project would be evaluated differently than a residential project in a rural area or a mixed-use project in a more densely developed area of the County.

A land use located in an area identified as "acceptable" indicates that standard construction methods would attenuate exterior noise to an acceptable indoor noise level and that people can carry out outdoor activities with minimal noise interference. Land uses that fall into the "conditionally acceptable" noise environment should have an acoustical study that considers the type of noise source, the sensitivity of the noise receptor, and the degree to which the noise source may interfere with sleep, speech, or other activities characteristic of the land use. For land uses indicated as "conditionally acceptable," structures must be able to attenuate the exterior noise to the indoor noise level as indicated in the Noise Standards listed in Table N-2 (Noise Standards). For land uses where the exterior noise levels fall within the "unacceptable" range, new construction generally should not be undertaken.

BACKGROUND INFORMATION

Land Use Category		Exterior Noise Level (CNEL)					
		55	60	65	70	75	80
A	Residential—single family residences, mobile homes, senior housing, convalescent homes						
B	Residential—multi-family residences, mixed-use (commercial/residential)						
C	Transient lodging—motels, hotels, resorts						
D*	Schools, churches, hospitals, nursing homes, child care facilities						
E*	Passive recreational parks, nature preserves, contemplative spaces, cemeteries						
F*	Active parks, golf courses, athletic fields, outdoor spectator sports, water recreation						
G*	Office/professional, government, medical/dental, commercial, retail, laboratories						
H*	Industrial, manufacturing, utilities, agriculture, mining, stables, ranching, warehouse, maintenance/repair						
	ACCEPTABLE—Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal construction, without any special noise insulation requirements.						
	CONDITIONALLY ACCEPTABLE—New construction or development should be undertaken only after a detailed noise analysis is conducted to determine if noise reduction measures are necessary to achieve acceptable levels for land use. Criteria for determining exterior and interior noise levels are listed in Table N-2, Noise Standards. If a project cannot mitigate noise to a level deemed Acceptable, the appropriate county decision-maker must determine that mitigation has been provided to the greatest extent practicable or that extraordinary circumstances exist.						
	UNACCEPTABLE—New construction or development shall not be undertaken.						

* Denotes facilities used for part of the day; therefore, an hourly standard would be used rather than CNEL (refer to Table N-2).

Note: For projects located within an Airport Influence Area of an adopted Airport Land Use Compatibility Plan (ALUCP), additional Noise Compatibility Criteria restrictions may apply as specified in the ALUCP.



Table N-2 Noise Standards^{Note}	
1.	The exterior noise level (as defined in Item 3) standard for Category A shall be 60 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
2.	The exterior noise level standard for Categories B and C shall be 65 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
3.	The exterior noise level standard for Categories D and G shall be 65 CNEL and the interior noise level standard shall be 50 dBA L _{eq} (one hour average).
4.	For single-family detached dwelling units, "exterior noise level" is defined as the noise level measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum net lot area: (i) for lots less than 4,000 square feet in area, the exterior area shall include 400 square feet, (ii) for lots between 4,000 square feet to 10 acres in area, the exterior area shall include 10 percent of the lot area; (iii) for lots over 10 acres in area, the exterior area shall include 1 acre.
5.	For all other residential land uses, "exterior noise level" is defined as noise measured at exterior areas which are provided for private or group usable open space purposes. "Private Usable Open Space" is defined as usable open space intended for use of occupants of one dwelling unit, normally including yards, decks, and balconies. When the noise limit for Private Usable Open Space cannot be met, then a Group Usable Open Space that meets the exterior noise level standard shall be provided. "Group Usable Open Space" is defined as usable open space intended for common use by occupants of a development, either privately owned and maintained or dedicated to a public agency, normally including swimming pools, recreation courts, patios, open landscaped areas, and greenbelts with pedestrian walkways and equestrian and bicycle trails, but not including off-street parking and loading areas or driveways.
6.	For non-residential noise sensitive land uses, exterior noise level is defined as noise measured at the exterior area provided for public use.
7.	For noise sensitive land uses where people normally do not sleep at night, the exterior and interior noise standard may be measured using either CNEL or the one-hour average noise level determined at the loudest hour during the period when the facility is normally occupied.
8.	The exterior noise standard does not apply for land uses where no exterior use area is proposed or necessary, such as a library.
9.	For Categories E and F the exterior noise level standard shall not exceed the limit defined as "Acceptable" in Table N-1 or an equivalent one-hour noise standard.

Note: Exterior Noise Level compatibility guidelines for Land Use Categories A-H are identified in Table N-1, Noise Compatibility Guidelines.

In addition, the County has adopted community noise control standards as part of the County's Noise Abatement and Control Ordinance (County Code of Regulatory Ordinances, Title 3, Division 6, Chapter 4) and provides guidance for implementation of the County's noise policies and ordinance in the County's *California Environmental Quality Act* (CEQA) Guidelines for Determining Significance for Noise. The Noise Ordinance defines limits for activities that generate excessive noise and sets noise level limits for land uses. The County's CEQA significance guidelines provide guidance on the use of the General Plan Noise Element and the County Noise Abatement and Control Ordinance when considering the environmental impact of noise exposure to high or excessive noise levels.

Cross reference(s)--Definitions, § [12.101](#) et seq.

SEC. 36.403. SOUND LEVEL MEASUREMENT.

(a) A sound level measurement made pursuant to this chapter shall be measured with a sound level meter using A-weighting and a "slow" response time, as these terms are used in ANSI S1.1-1994 or its latest revision.

(b) Each measurement shall be conducted at the boundary line of the property on which the noise source is located or any place on the affected property, but no closer than five feet from the noise source.

(c) The sound level meter shall be calibrated and adjusted by means of an acoustical calibrator of the coupler-type to assure meter accuracy within the tolerances in the ANSI specifications for sound level meters, ANSI S1.4-1983 or its latest revision. The sound level meter shall be used as provided in the manufacturer's instructions.

(Amended by Ord. No. 9962 (N.S.), effective 1-9-09)

SEC. 36.404. GENERAL SOUND LEVEL LIMITS.

(a) Except as provided in section [36.409](#) of this chapter, it shall be unlawful for any person to cause or allow the creation of any noise, which exceeds the one-hour average sound level limits in [Table 36.404](#), when the one-hour average sound level is measured at the property line of the property on which the noise is produced or at any location on a property that is receiving the noise.

**TABLE 36.404
SOUND LEVEL LIMITS IN DECIBELS (dBA)**

ZONE	TIME	ONE-HOUR AVERAGE SOUND LEVEL LIMITS (dBA)
(1) RS, RD, RR, RMH, A70, A72, S80, S81, S90, S92, RV, and RU with a General Plan Land Use Designation density of less than 10.9 dwelling units per acre.	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
(2) RRO, RC, RM, S86, V5, RV and RU with a General Plan Land Use Designation density of 10.9 or more dwelling units per acre.	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
(3) S94, V4, and all commercial zones.	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
(4) V1, V2	7 a.m. to 7 p.m.	60
V1, V2	7 p.m. to 10 p.m.	55
V1	10 p.m. to 7 a.m.	55
V2	10 p.m. to 7 a.m.	50
V3	7 a.m. to 10 p.m.	70
	10 p.m. to 7 a.m.	65
(5) M50, M52, and M54	Anytime	70

(6)	S82, M56, and M58.	Anytime	75
(7)	S88 (see subsection (c) below)		

(b) Where a noise study has been conducted and the noise mitigation measures recommended by that study have been made conditions of approval of a Major Use Permit, which authorizes the noise-generating use or activity and the decision making body approving the Major Use Permit determined that those mitigation measures reduce potential noise impacts to a level below significance, implementation and compliance with those noise mitigation measures shall constitute compliance with subsection (a) above.

(c) S88 zones are Specific Planning Areas which allow different uses. The sound level limits in [Table 36.404](#) above that apply in an S88 zone depend on the use being made of the property. The limits in [Table 36.404](#), subsection (1) apply to property with a residential, agricultural or civic use. The limits in subsection (3) apply to property with a commercial use. The limits in subsection (5) apply to property with an industrial use that would only be allowed in an M50, M52 or M54 zone. The limits in subsection (6) apply to all property with an extractive use or a use that would only be allowed in an M56 or M58 zone.

(d) If the measured ambient noise level exceeds the applicable limit in [Table 36.404](#), the allowable one-hour average sound level shall be the one-hour average ambient noise level, plus three decibels. The ambient noise level shall be measured when the alleged noise violation source is not operating.

(e) The sound level limit at a location on a boundary between two zones is the arithmetic mean of the respective limits for the two zones. The one-hour average sound level limit applicable to extractive industries, however, including but not limited to borrow pits and mines, shall be 75 decibels at the property line regardless of the zone in which the extractive industry is located.

(f) A fixed-location public utility distribution or transmission facility located on or adjacent to a property line shall be subject to the sound level limits of this section measured at or beyond six feet from the boundary of the easement upon which the facility is located.

(Amended by Ord. No. 7094 (N.S.), effective 3-25-86; amended by Ord. No. 9478 (N.S.), effective 7-19-02; amended by Ord. No. 9621 (N.S.), effective 1-9-04; amended by Ord. No. 9962 (N.S.), effective 1-9-09; amended by Ord. No. 10211 (N.S.), effective 6-1-12)

📖 SEC. 36.405. REPAIRING, REBUILDING OR TESTING MOTOR VEHICLES.

It shall be unlawful for any person to repair, rebuild or test any motor vehicle in such a manner as to cause a disturbing, excessive or offensive noise as defined in section [36.402](#) of this chapter.

(Amended by Ord. No. 9962 (N.S.), effective 1-9-09)

📖 SEC. 36.406. POWERED MODEL VEHICLES.

It shall be unlawful for any person to operate a powered model vehicle between 9 p.m. and 7 a.m. A powered model vehicle operated in a County park shall meet the daytime sound level standards for an RS zone measured at a point 100 feet from the park property line or 100 feet from where the model vehicle is being operated, whichever is less.

(Amended by Ord. No. 9962 (N.S.), effective 1-9-09)

📖 SEC. 36.407. REFUSE VEHICLES & PARKING LOT SWEEPERS.

No person shall operate or allow to be operated, a refuse compacting, processing, or collection vehicle or a parking lot sweeper between the hours of 10 p.m. to 6 a.m., in or within 100 feet of a residential zone.

(Amended by Ord. No. 7428 (N.S.), effective 2-4-88; amended by Ord. No. 9962 (N.S.), effective 1-9-09)

SEC. 36.408. HOURS OF OPERATION OF CONSTRUCTION EQUIPMENT.

Except for emergency work, it shall be unlawful for any person to operate or cause to be operated, construction equipment:

(a) Between 7 p.m. and 7 a.m.

(b) On a Sunday or a holiday. For purposes of this section, a holiday means January 1st, the last Monday in May, July 4th, the first Monday in September, December 25th and any day appointed by the President as a special national holiday or the Governor of the State as a special State holiday. A person may, however, operate construction equipment on a Sunday or holiday between the hours of 10 a.m. and 5 p.m. at the person's residence or for the purpose of constructing a residence for himself or herself, provided that the operation of construction equipment is not carried out for financial consideration or other consideration of any kind and does not violate the limitations in sections [36.409](#) and [36.410](#).

(Amended by Ord. No. 9962 (N.S.), effective 1-9-09)

SEC. 36.409. SOUND LEVEL LIMITATIONS ON CONSTRUCTION EQUIPMENT.

Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an eight-hour period, between 7 a.m. and 7 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

(Amended by Ord. No. 9700 (N.S.), effective 2-4-05; amended by Ord. No. 9962 (N.S.), effective 1-9-09)

SEC. 36.410. SOUND LEVEL LIMITATIONS ON IMPULSIVE NOISE.

In addition to the general limitations on sound levels in section [36.404](#) and the limitations on construction equipment in section [36.409](#), the following additional sound level limitations shall apply:

(a) Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in [Table 36.410A](#), when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in [Table 36.410A](#) are as described in the County Zoning Ordinance.

**TABLE 36.410A.
MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY IN DECIBELS (dBA)**

OCCUPIED PROPERTY USE	DECIBELS (dBA)
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

(b) Except for emergency work, no person working on a public road project shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in [Table 36.410B](#), when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in [Table 36.410B](#) are as described in the County Zoning Ordinance.

**TABLE 36.410B.
MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY IN DECIBELS (dBA)
FOR PUBLIC ROAD PROJECTS**

OCCUPIED PROPERTY USE	dB(A)
Residential, village zoning or civic use	85
Agricultural, commercial or industrial use	90

(c) The minimum measurement period for any measurements conducted under this section shall be one hour. During the measurement period a measurement shall be conducted every minute from a fixed location on an occupied property. The measurements shall measure the maximum sound level during each minute of the measurement period. If the sound level caused by construction equipment or the producer of the impulsive noise exceeds the maximum sound level for any portion of any minute, it will be deemed that the maximum sound level was exceeded during that minute.

(Added by Ord. No. 9962 (N.S.), effective 1-9-09)

 **SEC. 36.411. CONTAINERS AND CONSTRUCTION MATERIAL.**

It shall be unlawful for any person to handle, transport, or cause to be handled or transported in any public place, any container or any construction material in such a way as to create a disturbing, excessive, or offensive noise as defined in section [36.402](#) of this chapter.

(Amended by Ord. No. 9962 (N.S.), effective 1-9-09)

 **SEC. 36.412. SIGNAL DEVICE FOR FOOD TRUCKS.**

No person shall operate or cause to have operated or used any sound signal device other than sound-amplification equipment attached to a motor vehicle wagon or manually propelled cart from which food or any other items are sold which emits a sound signal more frequently than once every ten minutes in any one street block and with a duration of more than ten seconds for any single emission. The sound level of this sound signal shall not exceed 90 decibels at 50 feet from the point of the noise source.

(Amended by Ord. No. 9962 (N.S.), effective 1-9-09)

 **SEC. 36.413. MULTIPLE FAMILY DWELLING UNITS.**

Notwithstanding any other provision of this chapter it shall be unlawful for any person to create, maintain or cause to be maintained any sound within the interior of any multiple family dwelling unit which causes the noises level to exceed those limits set forth below in another dwelling unit:

**TABLE 36.413
ALLOWABLE INTERIOR NOISE LEVEL**

<i>Type of Land Use</i>	Hours		Allowable Interior Noise Level (dBA)	
		No Time	1 min in 1 hour	5 min in 1 hour
Multifamily	10 pm- 7 am	> 45	40	35
Residential	7 am-10 pm	> 55	50	35

(> greater than)

APPENDIX D

Construction Equipment Noise Calculations

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Cadna Noise Model - Sound Levels														
Name	ID	Type	Weight	Oktave Spectrum (dB)										Source
				63	125	250	500	1000	2000	4000	8000	A	lin	
Dozer (142 kW, 20 ton)	C_5	Lw (c)	A	116.0	105.0	107.0	104.0	103.0	109.0	93.0	87.0	111.7	117.8	Defra
Grader (205 kW, 25 ton)	C_7	Lw (c)	A	119.0	118.0	114.0	110.0	115.0	109.0	105.0	96.0	117.5	123.4	Defra
Water Truck	C_8	Lw (c)	A	105.6	109.5	107.6	112.8	116.5	114.0	106.5	95.5	119.7	120.5	Weiland Associates
Breaker on Excavator (121kW, 15 ton breaker)	BR	Lw (c)	A	119.0	119.0	117.0	120.0	114.0	114.0	111.0	107.0	121.3	125.8	Defra
Paver	PV	Lw (c)	A	103.0	108.0	105.0	103.0	102.0	101.0	98.0	91.0	107.5	112.3	Defra
Roller	RO	Lw (c)	A	115.0	115.0	109.0	101.0	101.0	101.0	98.0	92.0	108.0	118.8	Defra

EILAR ASSOCIATES, INC.
ACOUSTICAL AND ENVIRONMENTAL CONSULTING

Cadna Noise Model - Grading - Point Sources								
Name	ID	Result. PWL	Lw / Li		Height	Coordinates		
		Day	Type	Value		X	Y	Z
		(dBA)			(m)	(m)	(m)	(m)
Dozer	L_1	111.7	Lw	C_5	1.52	527.65	444.25	177.59
Grader	L_2	117.5	Lw	C_7	1.52	526.21	425.22	174.81
Water Truck	L_2	119.7	Lw	C_8	1.52	521.63	441.5	176.51
Breaker on Excavator	BR	121.3	Lw	BR	1.52	524.19	433.28	176.33

EILAR ASSOCIATES, INC.
ACOUSTICAL AND ENVIRONMENTAL CONSULTING

Cadna Noise Model - Paving - Point Sources								
Name	ID	Result. PWL	Lw / Li		Height	Coordinates		
		Day	Type	Value		X	Y	Z
		(dBA)			(m)	(m)	(m)	(m)
Paver	PV	107.5	Lw	PV	1.52	452.05	409.78	152
Roller	RO	108	Lw	RO	1.52	454.2	411.93	152.41

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Cadna Noise Model - Grading - Noise Levels at Receivers Unmitigated						
Name	ID	Level Lr	Height	Coordinates		
		Day		X	Y	Z
		(dBA)	(m)	(m)	(m)	(m)
North PL	R_1	50.2	1.52	520.27	550.3	149.44
South PL	R_2	64.2	1.52	490.08	337.03	154.18
East PL	R_3	81.5	1.52	543.89	435.63	177.66
West PL	R_4	65.8	1.52	466.79	475.39	158.66

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Cadna Noise Model - Paving - Noise Levels at Receivers						
Name	ID	Level Lr	Height	Coordinates		
		Day (dBA)	(m)	X (m)	Y (m)	Z (m)
North PL	R_1	31.4	1.52	520.27	550.3	149.44
South PL	R_2	54.6	1.52	490.08	337.03	154.18
East PL	R_3	42.8	1.52	543.89	435.63	177.66
West PL	R_4	72.5	1.52	441.65	417.33	150.25

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Cadna Noise Model - Grading - Barrier					
Name	ID	Coordinates			
		X	Y	Z	Ground
		(m)	(m)	(m)	(m)
Noise Barrier	BA_1	542.14	396.62	170.91	168.47
		542.24	410.99	174.42	171.98
		542.08	416.53	175.36	172.92
		541.75	425.66	177.56	175.12
		541.75	433.32	178.26	175.82
		542.08	440.01	179.07	176.63
		541.75	445.22	179.05	176.61
		541.91	449.79	179.06	176.62
		542.04	465.27	178.83	176.39

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Cadna Noise Model - Grading - Noise Levels at Receivers Mitigated						
Name	ID	Level Lr	Height	Coordinates		
		Day		X	Y	Z
		(dBA)	(m)	(m)	(m)	(m)
North PL	R_1	50.2	1.52	520.27	550.3	149.44
South PL	R_2	64.2	1.52	490.08	337.03	154.18
East PL	R_3	70.0	1.52	543.89	435.63	177.66
West PL	R_4	65.8	1.52	466.79	475.39	158.66

Noise Attenuation by Distance Calculation

Job: TPM 21204
Job #: B30814N1
Date: 9/12/2013
Source: Dozer
Receiver: North

Noise Source
Noise Level (dBA) <u>81</u> at <u>32.8</u> feet

Distances
Source Elevation <u>575</u> feet at <u>5</u> feet above grade
Receiver Elevation: <u>485</u> feet at <u>5</u> feet above grade
Source to Receiver Distance: <u>383</u> feet

Path Calculation
Source to Receiver Direct Path Distance: <u>393</u> feet

Sound Pressure Level	<u>59.4</u>	at	<u>393</u>	feet
Hours of Use:	<u>8</u>			
Duty Cycle (%):	<u>40</u>			
Level During 8 Hour day:	<u>55.4</u>			

Summation
Number of Sources: <u>4</u>
Level during 8 hour day: <u>66.6</u>

Noise Attenuation by Distance Calculation

Job: TPM 21204
Job #: B30814N1
Date: 9/12/2013
Source: Grader
Receiver: North

Noise Source		
Noise Level (dBA)	<u>86</u>	at <u>32.8</u> feet

Distances		
Source Elevation	<u>575</u>	feet at <u>5</u> feet above grade
Receiver Elevation:	<u>485</u>	feet at <u>5</u> feet above grade
Source to Receiver Distance:	<u>383</u>	feet

Path Calculation	
Source to Receiver Direct Path Distance:	<u>393</u> feet

Sound Pressure Level	
	<u>64.4</u> at <u>393</u> feet
Hours of Use:	<u>8</u>
Duty Cycle (%):	<u>40</u>
Level During 8 Hour day:	<u>60.4</u>

Noise Attenuation by Distance Calculation

Job: TPM 21204
Job #: B30814N1
Date: 9/12/2013
Source: **Water Truck**
Receiver: North

Noise Source			
Noise Level (dBA)	<u>87</u>	at	<u>32.8</u> feet

Distances			
Source Elevation	<u>575</u>	feet	at <u>5</u> feet above grade
Receiver Elevation:	<u>485</u>	feet	at <u>5</u> feet above grade
Source to Receiver Distance:	<u>383</u>	feet	

Path Calculation	
Source to Receiver Direct Path Distance:	<u>393</u> feet

Sound Pressure Level	<u>65.4</u>	at	<u>393</u> feet
Hours of Use:	<u>8</u>		
Duty Cycle (%):	<u>40</u>		
Level During 8 Hour day:	<u>61.4</u>		

Noise Attenuation by Distance Calculation

Job: TPM 21204
Job #: B30814N1
Date: 9/12/2013
Source: **Excavator with Breake**
Receiver: North

Noise Source	
Noise Level (dBA) <u>90</u>	at <u>32.8</u> feet

Distances	
Source Elevation: <u>575</u> feet	at <u>5</u> feet above grade
Receiver Elevation: <u>485</u> feet	at <u>5</u> feet above grade
Source to Receiver Distance: <u>383</u> feet	

Path Calculation	
Source to Receiver Direct Path Distance: <u>393</u> feet	

Sound Pressure Level <u>68.4</u>	at <u>393</u> feet
Hours of Use: <u>8</u>	
Duty Cycle (%): <u>25</u>	
Level During 8 Hour day: <u>62.4</u>	

Noise Attenuation by Distance Calculation

Job: TPM 21204
Job #: B30814N1
Date: 9/12/2013
Source: Dozer
Receiver: South

Noise Source
Noise Level (dBA) <u>81</u> at <u>32.8</u> feet

Distances
Source Elevation <u>575</u> feet at <u>5</u> feet above grade
Receiver Elevation: <u>500</u> feet at <u>5</u> feet above grade
Source to Receiver Distance: <u>344</u> feet

Path Calculation
Source to Receiver Direct Path Distance: <u>352</u> feet

Sound Pressure Level	<u>60.4</u>	at	<u>352</u>	feet
Hours of Use:	<u>8</u>			
Duty Cycle (%):	<u>40</u>			
Level During 8 Hour day:	<u>56.4</u>			

Summation
Number of Sources: <u>4</u>
Level during 8 hour day: <u>67.6</u>

Noise Attenuation by Distance Calculation

Job: TPM 21204
Job #: B30814N1
Date: 9/12/2013
Source: Grader
Receiver: South

Noise Source

Noise Level (dBA) 86 at 32.8 feet

Distances

Source Elevation: 575 feet at 5 feet above grade
Receiver Elevation: 500 feet at 5 feet above grade
Source to Receiver Distance: 344 feet

Path Calculation

Source to Receiver Direct Path Distance: 352 feet

Sound Pressure Level 65.4 at 352 feet
Hours of Use: 8
Duty Cycle (%): 40
Level During 8 Hour day: 61.4

Noise Attenuation by Distance Calculation

Job: TPM 21204
Job #: B30814N1
Date: 9/12/2013
Source: **Water Truck**
Receiver: South

Noise Source			
Noise Level (dBA)	<u>87</u>	at	<u>32.8</u> feet

Distances			
Source Elevation	<u>575</u>	feet	at <u>5</u> feet above grade
Receiver Elevation:	<u>500</u>	feet	at <u>5</u> feet above grade
Source to Receiver Distance:	<u>344</u>	feet	

Path Calculation	
Source to Receiver Direct Path Distance:	<u>352</u> feet

Sound Pressure Level	<u>66.4</u>	at	<u>352</u> feet
Hours of Use:	<u>8</u>		
Duty Cycle (%):	<u>40</u>		
Level During 8 Hour day:	<u>62.4</u>		

Noise Attenuation by Distance Calculation

Job: TPM 21204
Job #: B30814N1
Date: 9/12/2013
Source: Excavator with Breake
Receiver: South

Noise Source			
Noise Level (dBA)	<u>90</u>	at	<u>32.8</u> feet

Distances			
Source Elevation	<u>575</u>	feet	at <u>5</u> feet above grade
Receiver Elevation:	<u>500</u>	feet	at <u>5</u> feet above grade
Source to Receiver Distance:	<u>344</u>	feet	

Path Calculation	
Source to Receiver Direct Path Distance:	<u>352</u> feet

Sound Pressure Level	<u>69.4</u>	at	<u>352</u> feet
Hours of Use:	<u>8</u>		
Duty Cycle (%):	<u>25</u>		
Level During 8 Hour day:	<u>63.4</u>		

Noise Attenuation by Distance Calculation

Job: TPM 21204
Job #: B30814N1
Date: 9/12/2013
Source: Dozer
Receiver: East

Noise Source
Noise Level (dBA) <u>81</u> at <u>32.8</u> feet

Distances
Source Elevation <u>575</u> feet at <u>5</u> feet above grade
Receiver Elevation: <u>577</u> feet at <u>5</u> feet above grade
Source to Receiver Distance: <u>60</u> feet

Path Calculation
Source to Receiver Direct Path Distance: <u>60</u> feet

Sound Pressure Level	<u>75.7</u>	at	<u>60</u>	feet
Hours of Use:	<u>8</u>			
Duty Cycle (%):	<u>40</u>			
Level During 8 Hour day:	<u>71.8</u>			

Summation
Number of Sources: <u>4</u>
Level during 8 hour day: <u>82.9</u>

Noise Attenuation by Distance Calculation

Job: TPM 21204
Job #: B30814N1
Date: 9/12/2013
Source: Grader
Receiver: East

Noise Source	
Noise Level (dBA)	<u>86</u> at <u>32.8</u> feet

Distances	
Source Elevation	<u>575</u> feet at <u>5</u> feet above grade
Receiver Elevation:	<u>577</u> feet at <u>5</u> feet above grade
Source to Receiver Distance:	<u>60</u> feet

Path Calculation	
Source to Receiver Direct Path Distance:	<u>60</u> feet

Sound Pressure Level	<u>80.7</u> at <u>60</u> feet
Hours of Use:	<u>8</u>
Duty Cycle (%):	<u>40</u>
Level During 8 Hour day:	<u>76.8</u>

Noise Attenuation by Distance Calculation

Job: TPM 21204
Job #: B30814N1
Date: 9/12/2013
Source: **Water Truck**
Receiver: East

Noise Source	
Noise Level (dBA) <u>87</u>	at <u>32.8</u> feet

Distances	
Source Elevation: <u>575</u> feet	at <u>5</u> feet above grade
Receiver Elevation: <u>577</u> feet	at <u>5</u> feet above grade
Source to Receiver Distance: <u>60</u> feet	

Path Calculation	
Source to Receiver Direct Path Distance: <u>60</u> feet	

Sound Pressure Level	<u>81.7</u>	at	<u>60</u>	feet
Hours of Use:	<u>8</u>			
Duty Cycle (%):	<u>40</u>			
Level During 8 Hour day:	<u>77.8</u>			

Noise Attenuation by Distance Calculation

Job: TPM 21204
Job #: B30814N1
Date: 9/12/2013
Source: Excavator with Breake
Receiver: East

Noise Source		
Noise Level (dBA)	<u>90</u>	at <u>32.8</u> feet

Distances			
Source Elevation	<u>575</u>	feet	at <u>5</u> feet above grade
Receiver Elevation:	<u>577</u>	feet	at <u>5</u> feet above grade
Source to Receiver Distance:	<u>60</u>	feet	

Path Calculation	
Source to Receiver Direct Path Distance:	<u>60</u> feet

Sound Pressure Level	<u>84.7</u>	at <u>60</u> feet
Hours of Use:	<u>8</u>	
Duty Cycle (%):	<u>25</u>	
Level During 8 Hour day:	<u>78.7</u>	

Noise Attenuation by Distance Calculation

Job: TPM 21204
Job #: B30814N1
Date: 9/12/2013
Source: Dozer
Receiver: West

Noise Source
Noise Level (dBA) <u>81</u> at <u>32.8</u> feet

Distances
Source Elevation <u>575</u> feet at <u>5</u> feet above grade
Receiver Elevation: <u>515</u> feet at <u>5</u> feet above grade
Source to Receiver Distance: <u>240</u> feet

Path Calculation
Source to Receiver Direct Path Distance: <u>247</u> feet

Sound Pressure Level	<u>63.4</u>	at	<u>247</u>	feet
Hours of Use:	<u>8</u>			
Duty Cycle (%):	<u>40</u>			
Level During 8 Hour day:	<u>59.5</u>			

Summation
Number of Sources: <u>4</u>
Level during 8 hour day: <u>70.6</u>

Noise Attenuation by Distance Calculation

Job: TPM 21204
Job #: B30814N1
Date: 9/12/2013
Source: Grader
Receiver: West

Noise Source	
Noise Level (dBA)	<u>86</u> at <u>32.8</u> feet

Distances	
Source Elevation	<u>575</u> feet at <u>5</u> feet above grade
Receiver Elevation:	<u>515</u> feet at <u>5</u> feet above grade
Source to Receiver Distance:	<u>240</u> feet

Path Calculation	
Source to Receiver Direct Path Distance:	<u>247</u> feet

Sound Pressure Level	<u>68.4</u> at <u>247</u> feet
Hours of Use:	<u>8</u>
Duty Cycle (%):	<u>40</u>
Level During 8 Hour day:	<u>64.5</u>

Noise Attenuation by Distance Calculation

Job: TPM 21204
Job #: B30814N1
Date: 9/12/2013
Source: **Water Truck**
Receiver: West

Noise Source	
Noise Level (dBA) <u>87</u>	at <u>32.8</u> feet

Distances	
Source Elevation: <u>575</u> feet	at <u>5</u> feet above grade
Receiver Elevation: <u>515</u> feet	at <u>5</u> feet above grade
Source to Receiver Distance: <u>240</u> feet	

Path Calculation	
Source to Receiver Direct Path Distance: <u>247</u> feet	

Sound Pressure Level <u>69.4</u>	at <u>247</u> feet
Hours of Use: <u>8</u>	
Duty Cycle (%): <u>40</u>	
Level During 8 Hour day: <u>65.5</u>	

Noise Attenuation by Distance Calculation

Job: TPM 21204
Job #: B30814N1
Date: 9/12/2013
Source: Excavator with Breake
Receiver: West

Noise Source			
Noise Level (dBA)	<u>90</u>	at	<u>32.8</u> feet

Distances			
Source Elevation	<u>575</u>	feet	at <u>5</u> feet above grade
Receiver Elevation:	<u>515</u>	feet	at <u>5</u> feet above grade
Source to Receiver Distance:	<u>240</u>	feet	

Path Calculation	
Source to Receiver Direct Path Distance:	<u>247</u> feet

Sound Pressure Level	<u>72.4</u>	at	<u>247</u> feet
Hours of Use:	<u>8</u>		
Duty Cycle (%):	<u>25</u>		
Level During 8 Hour day:	<u>66.4</u>		