Attachment F:
Noise

F.1 - Noise Report

ACOUSTICAL ANALYSIS REPORT

Las Terrazas Apartments
275-291 Cypress Avenue
Colton, California

Prepared For

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1.0 EXECUTIVE SUMMARY

The proposed project, Las Terrazas Apartments, consists of the construction of 112-unit apartment development with five residential buildings, a community building, and a daycare facility. The project site is located at 275-291 Cypress Avenue in the unincorporated community of Colton, County of San Bernardino, California.

The primary noise sources in the vicinity of the project site are traffic noise from Interstate 10 (I-10), Valley Boulevard, and Cypress Avenue, and railway noise from the adjacent Union Pacific train lines. The County of San Bernardino requires that outdoor activity areas of noise sensitive land uses have noise levels of 65 CNEL or less. With the proposed building structures in place and an eight-foot high noise barrier around the Daycare Open Space, constructed as recommended in this report, all designated outdoor use areas are anticipated to meet the 65 CNEL noise limit. More details are available in Section 5.1.1.

Calculations show that future combined noise levels at proposed building facades will range from 55.0 CNEL at the north facade of the Community Building to 78.9 CNEL at the south facade of Building E, the southernmost residential building. The County of San Bernardino and State of California require interior noise levels of 45 CNEL or less in residential units. Exterior noise levels at many of the proposed building facades are shown to exceed 60 CNEL. Due to high exterior noise levels at building facades, an exterior-to-interior noise analysis is required by the California Building Code, prior to approval of building permits, to determine building features necessary to reduce interior noise levels to 45 CNEL or less in residential spaces, as required by the State of California and the County of San Bernardino. This analysis should be conducted when building plans become available.

The County of San Bernardino requires an analysis to determine whether the proposed project will have an adverse noise impact on surrounding properties. Project-generated noise impacts to surrounding properties are expected to be insignificant. Noise levels from ground-mounted air conditioning equipment will not exceed the applicable noise limits set by the County at any surrounding property lines, in compliance with the County of San Bernardino Development Code. Project-generated traffic noise will have an insignificant impact on surrounding properties. Temporary noise impacts from construction on site are expected to be controllable by standard construction noise control methods including adhering to permissible hours of operation, maintaining equipment in proper operating condition, and placing staging areas at farthest locations from noise sensitive receivers. More details are provided in Section 5.3.

2.0 INTRODUCTION

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

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

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

2.1 Project Location

The project site is located at 275-291 North Cypress Avenue in the unincorporated community of Colton, County of San Bernardino, California. The project site is located on an irregular shaped lot with an overall site area of approximately 5.92 acres. The lot is currently vacant. The Assessor's Parcel Numbers (APNs) for the property are 0274-182-34, -43, and -46.

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, respectively.

2.2 Project Description

The proposed project, Las Terrazas Apartments, consists of the construction of 112-unit apartment development with five residential buildings, a community building, and a daycare facility.

Land use surrounding the project site includes residential to the north, some residential and some vacant to the east, a storage facility to the west, and Valley Boulevard to the south.

This analysis is based on the project plans provided in Appendix A. Changes to these plans may invalidate the conclusions detailed within this study.

2.3 Applicable Noise Standards

The proposed project must meet the acoustical requirements of the County of San Bernardino in order to obtain approval. The County of San Bernardino Development Code states that exterior noise levels at outdoor use areas of residential property should typically not exceed 60 CNEL; however, noise levels of 65 CNEL at outdoor use areas shall be allowed if exterior noise levels have been substantially mitigated and interior noise levels do not exceed 45 CNEL. Section 5.1 addresses exterior noise impacts to the site.

The County Development Code also 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, or 60 dBA at any time of day at commercial properties, such as the adjacent storage unit. Noise levels from on-site mechanical equipment are assessed in Section 5.3 to determine compliance with these regulations.

Pertinent sections of the County of San Bernardino Development Code are provided in Appendix B.

3.0 ENVIRONMENTAL SETTING

3.1 Existing Noise Environment

The primary noise sources in the vicinity of the project site include railway traffic and automobile and truck traffic noise from Interstate 10 (I-10), Valley Boulevard, and Cypress Avenue.

3.1.1 Railway Noise Sources

The overall noise environment at the project site is also influenced by railway traffic traveling on a train track system traveling east-west to the south of the project site. A branch of tracks also extends north from these tracks and travels parallel to the western property line of the project site, to the west of the adjacent storage facility. Both of these lines are currently used for freight trains operated by the Union Pacific Railroad Company. A separate track system, operated by the Burlington Northern Santa Fe Railroad, is located approximately 4,300 feet east of the proposed project site; however, as this track system is located more than 3,000 feet from the site, noise from this source does not need to be evaluated per typical regulations. The railway traffic volume in the vicinity of the project area is based upon freight train estimates found in the Initial Study for the Colton Crossing Rail to Rail Grade Separation Project, prepared by the California Department of Transportation (see reference). According to this report, it is estimated that in the current noise environment, approximately 71 trains will use these tracks on a daily basis. As the number of trains on these tracks is expected to change in the future environment (year 2035), current noise contours were not calculated for this source as a noise model incorporating future train traffic data will provide a more conservative, worst-case analysis. Please refer to Section 3.2.1 for more details.

3.1.2 Roadway Traffic Noise

The Linscott, Law & Greenspan traffic study provided an analysis of project related traffic on October 9, 2015, however the study does not give current or future Average Daily Trip (ADT) traffic volumes for the roadways in the vicinity of the project, however, these projections were included in the previous traffic study dated March 12, 2013, which was used for this analysis. An evaluation of traffic noise impacts from the project itself is provided in Section 5.3.2. Pertinent sections of the traffic study are provided as Appendix C.

Interstate 10 (I-10) is an eight-lane, two-way freeway running east-west to the south of the project site. The posted speed limit is 65 mph. According to Caltrans, the 2010 traffic volume of this roadway is approximately 194,000 Average Daily Trips (ADT).

Valley Boulevard is a four-lane, two-way roadway running east-west to the south of the project site. The posted speed limit is 45 mph. According to LLG, the current traffic volume of this roadway is approximately 7,200 ADT.

Cypress Avenue is a two-lane, two-way roadway running north-south to the east of the project site. The posted speed limit is 25 mph. According to LLG, the 2012 traffic volume of this roadway is approximately 1,210 ADT.

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

Table 1. Overall Roadway Traffic Information					
Roadway Name	**Speed Limit (mph)**	**Vehicle Mix (%)**		**Current ADT**	**Future ADT (2035)**
		Medium Trucks	**Heavy Trucks**		
Interstate 10	65	2.45%	7.55%	194,000	250,000
Valley Boulevard	45	2.0%	1.0%	7,200	9,325
Cypress Avenue	25	2.0%	1.0%	1,210	1,824

Traffic composition information for Interstate 10 was provided by Caltrans, but no traffic composition data was available for other roadways. The truck percentage mix of 2.45% medium trucks and 7.55% heavy trucks was applied to Interstate 10. Based on neighboring and surrounding land use, roadway classification, our professional experience and on-site observations, a truck percentage mix of 2.0% medium and 1.0% heavy trucks was used for Valley Boulevard and Cypress Avenue. More information is available in Appendix D: Traffic Noise Model (TNM) Data and Results.

Without mitigation or proposed project structures, the current traffic 65 CNEL contour is located approximately 100 feet to the north of the property, parallel with I-10. The current 70 CNEL contour is located along the southern facade of the proposed Building 2. The current 75 CNEL contour is located along the southern facade of the proposed office building, parallel with I-10. For a graphical representation of these contours, please refer to Figure 5: Site Plan Showing Current Traffic CNEL Contours and Noise Measurement Location.

3.1.3 Measured Noise Levels

A long-term noise monitor was placed at the site near the eastern property line bordering the vacant lot, approximately 40 feet from the Valley Boulevard centerline. The measured hourly L_{EQ} values are shown in Table 2 below.

Table 2. On-Site Long-Term Noise Monitor Results		
Date	**Starting Time**	**Hourly Noise Level (dBA L_{EQ})**
January 18, 2012	3:00 p.m.	70.4
	4:00 p.m.	70.8
	5:00 p.m.	70.8
	6:00 p.m.	69.6
	7:00 p.m.	70.2
	8:00 p.m.	70.7
	9:00 p.m.	69.5
	10:00 p.m.	69.2

Table 2. On-Site Long-Term Noise Monitor Results		
Date	**Starting Time**	**Hourly Noise Level (dBA L_{EQ})**
January 18, 2012	11:00 p.m.	68.3
January 19, 2012	12:00 a.m.	66.6
	1:00 a.m.	66.8
	2:00 a.m.	65.5
	3:00 a.m.	65.5
	4:00 a.m.	66.6
	5:00 a.m.	69.1
	6:00 a.m.	70.3
	7:00 a.m.	71.6
	8:00 a.m.	71.1
	9:00 a.m.	70.1
	10:00 a.m.	69.7
	11:00 a.m.	69.8
	12:00 p.m.	69.7
	1:00 p.m.	69.7
	2:00 p.m.	70.0

With the values above, the CNEL was calculated for the 24-hour period between the hours of 3 p.m. on January 18 and 3 p.m. on January 19. The CNEL was calculated to be 75.1 CNEL.

An on-site inspection and traffic noise measurement were made on the afternoon of Wednesday, January 18, 2012. The weather conditions were as follows: clear skies, moderate humidity, and temperature in the mid 70's with little to no measurable wind. A "one-hour" equivalent measurement was made approximately 30 feet from the centerline of Valley Boulevard, at the eastern property line bordering the vacant lot. The microphone was placed at approximately five feet above the existing project site grade.

Traffic volumes for Valley Boulevard were recorded for automobiles, medium-size trucks, and large trucks during the measurement period. After a continuous 15-minute sound level measurement, no changes in the L_{EQ} were observable and results were recorded. The measured noise level and related weather conditions are found in Table 3. The calculated equivalent hourly vehicle traffic count adjustment and a complete tabular listing of all traffic data recorded during the on-site traffic noise measurement are found in Appendix D: Traffic Noise Model (TNM) Data and Results.

Table 3. On-Site Noise Measurement Conditions and Results	
Date	Wednesday, January 18, 2012
Time	1:10 p.m. – 1:25 p.m.
Conditions	Clear skies, little to no measurable wind, temperature in the mid 70's with moderate humidity
Measured Noise Level	76.4 dBA L_{EQ}

3.1.4 Calculated Noise Level

Noise levels were calculated for the site using the methodology described in Section 4.1 for the location, conditions, and traffic volumes counted during the noise measurements. The calculated noise levels (L_{EQ}) were compared with the measured on-site noise level to determine if adjustments or

corrections (calibration) should be applied to the traffic noise prediction model in the Traffic Noise Model software (TNM). Adjustments are intended to account for site-specific variances in overall reflectivity or absorption, which may not be accurately represented by the default settings in the model.

The measured noise level of 76.4 dBA L_{EQ} at 30 feet from the centerline of Valley Boulevard was compared to the calculated (modeled) noise level of 75.6 dBA L_{EQ}, for the same weather conditions and traffic flow. No adjustment was deemed necessary to model future noise levels for this location due to the small discrepancy between the measured and calculated levels. The Traffic Noise Model is assumed to be representative of actual traffic noise that is experienced on site. This information is presented in Table 4.

Table 4. Calculated versus Measured Traffic Noise Data

Calibration Receiver Position	Calculated	Measured	Difference	Correction
30' from Valley Blvd CL	75.6 dBA L_{EQ}	76.4 dBA L_{EQ}	0.8 dB	None applied

3.2 Future Noise Environment

The future noise environment at the site is expected to increase due to increased activity on the adjacent railroad and increased traffic volumes in the future.

3.2.1 Railway Noise Sources

According to the Caltrans Initial Study referenced above, the number of freight trains traveling on the adjacent railway is expected to increase to 120 trips in the future environment (year 2035). As there are two branches of the tracks near the project site, it was assumed that the train traffic would be evenly divided between these two track locations, with 60 trains traveling along the tracks to the south and 60 trains traveling along the tracks to the west. Please refer to Appendix E: Cadna Analysis Data and Results, Part 1: Railway Noise Calculations.

Without mitigation or proposed project structures, the future 80 CNEL railway noise contour is curved around the southwest corner of the project site, located approximately 150 feet from the property. The entire project site is exposed to railway noise levels ranging from 73 to 78 CNEL. For a graphical representation of noise contours, please refer to Figure 6: Site Plan Showing Future Railway CNEL Contours and Noise Measurement Location.

3.2.2 Roadway Traffic Noise

The LLG traffic analysis prepared for the project on October 9, 2015 does not give future (year 2035) Average Daily Trip (ADT) traffic volumes for the roadways in the vicinity of the project, however, these projections were included in the previous traffic study dated March 12, 2013, which was used for this analysis. According to the traffic study, Valley Boulevard is expected to carry 9,325 ADT by the year 2035. Cypress Avenue is expected to carry approximately 1,824 ADT by the year 2035. No future traffic information for Interstate 10 was provided by Caltrans or the project traffic study; however, according to Dan Kloos of LLG Engineers, a typical growth rate of one percent per year can be applied to this freeway. For this reason, the 2035 traffic volume of Interstate 10 is assumed to be approximately 250,000 ADT.

The same truck percentages from the existing traffic volumes were used for future traffic volume modeling. The roadway classification, speed limit, alignment and roadbed grade elevations are

expected to remain the same for these sections of roadways. For further roadway details and projected future ADT traffic volumes, please refer to Appendix D: Traffic Noise Model (TNM) Data and Results.

Without mitigation or proposed project structures, the current traffic 65 CNEL contour is located just to the north of the property, parallel with I-10. The current 75 CNEL contour is located along the southern end of the proposed project site, parallel with I-10. For a graphical representation of these contours, please refer to Figure 7: Site Plan Showing Future Traffic CNEL Contours and Noise Measurement Location.

3.2.3 Future Combined Noise Environment

Combined noise levels which take proposed building structures into account are calculated for the future noise environment at outdoor use areas and proposed building facades. This analysis is provided in Sections 5.1 and 5.2.

4.0 METHODOLOGY AND EQUIPMENT

4.1 Methodology

4.1.1 Field Measurement

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

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

4.1.2 Roadway Noise Calculation

The Traffic Noise Model software, TNM Version 2.5 released in February 2004 by the U. S. Department of Transportation was used for all traffic modeling in the preparation of this report. TNM calculates the daytime average Hourly Noise Level (HNL) from traffic data including road alignment, elevation, lane configuration, projected traffic volumes, estimated truck composition percentages and vehicle speeds. The HNL is equivalent to the L_{EQ}, and may be converted to CNEL by the addition of 2.0 decibels, as suggested in the Wyle Laboratories Study (see reference).

The daytime average hourly traffic volume, evaluated from Average Daily Trips (ADT) data as shown in the Wyle Study to be simply 5.8% of ADT, is then applied to models in TNM. Current and future CNEL is calculated for predetermined receiver locations. Further explanation can be supplied on request.

4.1.3 Railway Noise Calculation

The evaluation of a site's exposure to railway noise requires the consideration of the distance from the site to the railroad track centerline, the number of diesel and electric trains in both directions during an average 24-hour day, the fraction of trains that operate during the night, the average number of diesel locomotives, the average length of each train, the average train speed past the site, the rail types, and whether the site is nearby crossings where train whistles or horns are sounded. Railway calculations were performed using HUD methodology, and then incorporated into a Cadna model (See Section 4.1.4) to approximate the noise shielding effects of proposed on-site buildings and determine if additional mitigation is necessary.

4.1.4 Cadna Noise Modeling Software

Modeling of the outdoor noise environment is accomplished using Cadna Ver. 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 CAD model and uses the most up-to-date calculation standards to predict outdoor noise impacts.

4.2 Measurement Equipment

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

- Larson Davis Model 720 Type 2 Sound Level Meters, Serial #0219 and #0263
- Larson Davis Model CAL150 Type 2 Calibrator, Serial #0339
- Hand-bearing magnetic compass, microphone with windscreen, tripods
- Distance measurement wheel, digital camera

The sound level meter was field-calibrated prior to and following the noise measurement 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 SI.4-1983 (R2001). All instruments are maintained with National Bureau of Standards traceable calibrations, per the manufacturers' standards.

5.0 IMPACTS AND MITIGATION

5.1 Exterior

5.1.1 Noise Impacts to Outdoor Use Areas

The County of San Bernardino Development Code states that exterior noise levels at outdoor use areas of residential property should typically not exceed 60 CNEL; however, noise levels of 65 CNEL at outdoor use areas shall be allowed if exterior noise levels have been substantially mitigated and interior noise levels do not exceed 45 CNEL.

The four areas analyzed as outdoor-use spaces were the community garden, the tot lot, the pool area, and the daycare open space. Future traffic volumes were modeled using the methodology explained in Section 4.1.2 to determine the traffic noise impact to common outdoor use areas on site. Additionally, future railway noise was calculated using Cadna noise modeling to determine this impact at the same

locations. The two values were then combined to determine the overall impact at these receivers. The results are shown below in Table 5. A graphical representation of the receivers is shown in Figure 8.

Table 5. Unmitigated Future Combined Noise Levels at Proposed Outdoor Use Areas				
Receiver	**Description**	**Traffic Noise Level (CNEL)**	**Railway Noise Level (CNEL)**	**Combined Noise Level (CNEL)**
R1	Community Garden	54.7	61.2	62.1
R2	Community Garden	58.2	63.3	64.5
R3	Tot Lot	58.8	61.6	63.4
R4	Pool	54.2	58.1	59.6
R5	Daycare Open Space	70.1	67.6	**72.0**

As shown above, the noise impacts at the daycare open space are anticipated to exceed the County of San Bernardino standard of 65 CNEL. Another condition was analyzed with a eight-foot sound barrier around the perimeter of the daycare open space area. The results of this analysis can be seen below in Table 6.

Table 6. Mitigated Future Combined Noise Levels at Proposed Outdoor Use Areas				
Receiver	**Description**	**Traffic Noise Level (CNEL)**	**Railway Noise Level (CNEL)**	**Combined Noise Level (CNEL)**
R1	Community Garden	55.0	61.2	62.1
R2	Community Garden	58.2	63.1	64.3
R3	Tot Lot	55.2	60.6	61.7
R4	Pool	51.9	57.2	58.3
R5	Daycare Open Space	60.7	62.6	64.8

Noise at these receivers is anticipated to be attenuated to 65 CNEL or less by the proposed residential buildings and the eight-foot high noise barrier surrounding the perimeter of the daycare open space.

In order to serve as an effective sound attenuation barrier, the 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 one-inch thick or have a 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 door or gate(s) must be designed with overlapping closures on the bottom and sides and meet the minimum specifications of the wall materials described above. The gate(s) may be of ¾-inch thick or greater wood, solid-sheet metal of at least 18-gauge metal, or an exterior-grade solid-core steel door with prefabricated door jambs.

5.1.2 Noise Impacts at Building Facades

Noise impacts at building facades were calculated including the shielding of the proposed buildings, as well as the buildings at the adjacent storage facility. Buildings were arbitrarily assigned letters as designations for use in this analysis alone. The building designations can be found on a site plan showing receiver locations in Figure 9.

Calculations show that future noise levels at proposed building facades will range from 55.0 CNEL at the north facade Community Building to 78.9 CNEL at the south facade of Building E, the southernmost residential building. A complete list of combined traffic and train noise impacts is shown in Table 7. A graphic showing exterior facade noise impacts is provided as Figure 9.

Table 7. Future Combined Noise Levels at Building Facades

Receiver #	Building	Floor	Facade Location	Exterior Noise Levels (CNEL)		
				Train	Traffic	Combined
R-1	A	1	North	42.6	62.8	62.8
R-2		1	North	43.1	64.1	64.1
R-3		1	North	50.9	64.1	64.3
R-4		1	East	61.0	60.8	63.9
R-5		1	South	59.8	61.8	63.9
R-6		1	South	57.3	60.5	62.2
R-7		1	West	54.0	60.9	61.7
R-8		2	North	45.1	67.8	67.8
R-9		2	North	45.5	68.8	68.8
R-10		2	North	54.8	68.7	68.9
R-11		2	East	63.4	63.7	66.6
R-12		2	South	62.2	65.9	67.4
R-13		2	South	58.5	65.7	66.5
R-14		2	West	54.8	67.2	67.4
R-15		3	North	46.1	70.4	70.4
R-16		3	North	46.6	69.5	69.5
R-17		3	North	55.3	69.1	69.3
R-18		3	East	63.5	63.9	66.7
R-19		3	South	66.0	67.4	69.8
R-20		3	South	65.8	69.1	70.8
R-21		3	West	65.8	74.8	75.3
R-22	B	1	North	54.1	56.2	58.3
R-23		1	East	60.7	60.6	63.7
R-24		1	East	60.2	60.6	63.4
R-25		1	East	59.2	60.3	62.8
R-26		1	South	58.6	62.7	64.1
R-27		1	West	55.9	62.3	63.2
R-28		1	West	55.2	61.9	62.7
R-29		2	North	57.0	60.1	61.8
R-30		2	East	63.0	62.9	66.0
R-31		2	East	62.6	62.9	65.8
R-32		2	East	61.5	62.9	65.3
R-33		2	South	59.3	67	67.7
R-34		2	West	56.6	67.2	67.6
R-35		2	West	56.0	66.6	67.0

Table 7. Future Combined Noise Levels at Building Facades						
Receiver #	Building	Floor	Facade Location	Exterior Noise Levels (CNEL)		
				Train	Traffic	Combined
R-36	B	3	North	56.9	62.9	63.9
R-37		3	East	63.4	63.1	66.3
R-38		3	East	63.2	63.1	66.2
R-39		3	East	62.8	63.2	66.0
R-40		3	South	66.7	68.8	70.9
R-41		3	West	65.6	69.6	71.1
R-42		3	West	65.2	69	70.5
R-43	C	1	North	48.1	60.2	60.5
R-44		1	East	51.3	56.4	57.6
R-45		1	East	62.8	62.4	65.6
R-46		1	South	66.8	64.6	68.8
R-47		1	West	57.7	62.9	64.0
R-48		1	West	57.5	63.1	64.2
R-49		1	West	57.4	63	64.1
R-50		2	North	50.3	64.2	64.4
R-51		2	East	54.0	61.3	62.0
R-52		2	East	63.0	63.7	66.4
R-53		2	South	66.3	67.3	69.8
R-54		2	West	59.5	67.9	68.5
R-55		2	West	59.1	68	68.5
R-56		2	West	58.6	68	68.5
R-57		3	North	56.5	66.7	67.1
R-58		3	East	65.7	64.4	68.1
R-59		3	East	67.6	66.3	70.0
R-60		3	South	69.5	69	72.3
R-61		3	West	67.7	70.4	72.3
R-62		3	West	67.4	70.4	72.2
R-63		3	West	67.2	70.3	72.0
R-64	D	1	North	58.3	58.7	61.5
R-65		1	East	69.4	66.5	71.2
R-66		1	East	70.5	67.5	72.3
R-67		1	South	72.0	69.8	74.0
R-68		1	West	68.6	68.2	71.4
R-69		1	West	67.0	66.7	69.9
R-70		1	West	65.5	65.5	68.5
R-71		2	North	58.9	61.4	63.3
R-72		2	East	68.8	67	71.0
R-73		2	East	69.9	68.1	72.1
R-74		2	South	71.4	70.4	73.9
R-75		2	West	68.1	68.9	71.5
R-76		2	West	66.5	67.6	70.1
R-77		2	West	65.0	66.6	68.9
R-78	E	1	North	46.4	59.6	59.8
R-79		1	North	45.7	60.8	60.9
R-80		1	North	47.1	59.1	59.4
R-81		1	East	72.6	69.8	74.4
R-82		1	South	76.2	74.4	78.4
R-83		1	South	76.1	74.6	78.4

Table 7. Future Combined Noise Levels at Building Facades						
Receiver #	Building	Floor	Facade Location	Exterior Noise Levels (CNEL)		
				Train	Traffic	Combined
R-84	E	1	West	71.6	72	74.8
R-85		2	North	49.2	64	64.1
R-86		2	North	48.1	64.3	64.4
R-87		2	North	49.8	63	63.2
R-88		2	East	72.4	70.2	74.4
R-89		2	South	76.2	75.1	78.7
R-90		2	South	76.2	75.6	78.9
R-91		2	West	73.8	75.2	77.6
R-92		3	North	57.7	68.6	68.9
R-93		3	North	52.4	66.5	66.7
R-94		3	North	56.5	64.9	65.5
R-95		3	East	72.4	70.3	74.5
R-96		3	South	76.1	75.1	78.6
R-97		3	South	76.2	75.6	78.9
R-98		3	West	73.9	76.2	78.2
R-99	Community Bldg	1	North	47.7	54.1	55.0
R-100		1	East	68.2	66.9	70.6
R-101		1	South	69.2	68.1	71.7
R-102		1	West	55.8	57.8	59.9
R-103	Daycare Bldg	1	North	61.2	60	63.7
R-104		1	East	73.0	69.6	74.6
R-105		1	South	76.1	73.5	78.0
R-106		1	West	73.3	72.2	75.8

5.2 Interior

5.2.1 Transportation Noise Sources

The State of California and the County of San Bernardino 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 noise levels at proposed building facades will range from 55.0 CNEL at the north facade of the Community Building to 78.9 CNEL at the south facade of Building E, the southernmost residential building. Due to high noise levels on-site, an exterior to interior analysis should be performed when building plans become available, prior to the issuance of building permits.

5.2.2 Unit-to-Unit Noise Transmission

Another source of noise that may affect residential units in multi-family buildings is unit-to-unit noise transmission. The 2007 California State Building Code requires that the Sound Transmission Class (STC) rating of common wall assemblies separating residential units have a minimum laboratory rating of STC 50. The same STC requirement applies for floor/ceiling assemblies, and an added requirement

dictates that the Impact Insulation Class (IIC) rating of the floor/ceiling assembly is a minimum laboratory rating of IIC 50. Detailed calculations and product literature for the assemblies evaluated below are provided in Appendix F.

Although no wall and/or floor/ceiling assembly details were available at the time this analysis was prepared, assembly information was provided by Jay Ross of Amcal. In all cases shown below, the actual ratings achieved are determined by the quality of construction and attention to details in the installation of assemblies. Please be advised that these endorsements are strictly contingent upon observance of proper installation procedures. It is imperative that attention be paid to details such as the proper installation of resilient channels. Additionally, all cracks or gaps must be sealed with an acoustically resilient, non-skinning butyl caulking compound. Sealant application should be as generous as needed to ensure effective sound barrier isolation. The OSI Green Series Draft and Acoustical Sound Sealant and the Pecora AC-20 FTR Sealant are products specifically designed for this purpose. Please see Appendix G: Manufacturer Data Sheets.

Common Wall Assembly

According to Jay Ross, the common wall assembly will be constructed as follows:

- Single layer of 5/8-inch thick Type X gypsum board
- Plywood sheathing, where occurs
- Row of 4-inch wide wooden studs, placed 16 inches on-center and staggered at 8 inches on-center on 2-inch by 6-inch wood plates
- Acoustical batt insulation in both sides of cavity (3½-inch thick blankets)
- Plywood sheathing, where occurs
- Single layer of 5/8-inch thick Type X gypsum board

A similar assembly was laboratory-tested and did not include plywood sheathing. The tested assembly also incorporated ½-inch thick layers of drywall rather than 5/8-inch thick drywall as in the proposed assembly; however, this difference is anticipated to have little to no effect on the rating. The assembly was tested by Geiger and Hamme (test report OC-5FC) and was found to have an STC 51 rating. This assembly meets the minimum sound rating of STC 50 for a common wall assembly, and is acceptable for use in this capacity.

Floor/Ceiling Assembly

According to Jay Ross, the proposed floor/ceiling assembly is to be constructed as follows:

Option A

- Floor finish of: a) Hardwood flooring –OR– b) Ceramic tile
- Single layer of 1-5/8-inch thick lightweight concrete
- Single layer of 1/4-inch thick Acoustimat II underlayment
- Single layer of 5/8-inch plywood
- 10-inch deep wood floor joists, placed 16 inches on-center
- Single layer of fiberglass insulation in cavity
- Single layer of 5/8-inch thick Type X gypsum board, mounted on resilient channels

Option B

- Floor finish of carpet
- Single layer of 1-5/8-inch thick lightweight concrete
- Single layer of 5/8-inch plywood
- 10-inch deep wood floor joists, placed 16 inches on-center
- Single layer of fiberglass insulation in cavity
- Single layer of 5/8-inch thick Type X gypsum board, mounted on resilient channels

Regardless of floor finish, according to INSUL, the STC rating of this assembly is estimated to be approximately STC 62. This is expected to meet the California State Building Code STC requirement.

The IIC rating of the aforementioned assembly was determined by comparing test data of Acoustimat II and Enkasonic floor underlayments. Enkasonic is another floor underlayment manufactured by Maxxon which is similar to Acoustimat II. The above assembly was tested using Enkasonic floor underlayment in place of Acoustimat II, and was determined to have a rating of IIC 57. In order to determine the rating of the same assembly using Acoustimat, two additional tests of assemblies in which the only variable was the use of Enkasonic versus Acoustimat II were compared. It was determined that when Enkasonic was replaced with Acoustimat II in the assembly, the FIIC rating fell by four points. For this reason, it can be assumed that the rating of the above assembly would be approximately IIC 53. This is expected to meet California State Building Code requirements and is acceptable for use in this capacity. Pertinent test data for Enkasonic and Acoustimat II is provided in Appendix F.

With carpet, INSUL estimates an approximate IIC rating of 76, also meeting the minimum requirement for an IIC 50 rating. This assembly is also acceptable for use at the facility.

5.3 Project-Related Noise Impacts on Surrounding Property Lines

5.3.1 HVAC Noise

The County Development Code also 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, or 60 dBA at any time of day at commercial properties, such as the adjacent storage unit.

As proposed HVAC units are likely to be operational during nighttime hours, 45 dBA will be considered the noise limit at surrounding residential property lines. This project includes the installation of HVAC units for residential units as well as the community center and office. Noise created by HVAC units was evaluated at neighboring property lines to determine if a significant impact would occur at any of these surrounding locations. All HVAC units are currently proposed to be ground-mounted and are assumed to be Carrier 24ABA4030 (2.5 ton) units or equivalent, as specified by Jay Ross. Manufacturer data sheets for Carrier HVAC units are provided in Appendix G. Noise levels at receiver locations are shown in Table 8 below. A graphic showing receiver locations is also provided as Figure 11.

Table 8. Worst-Case HVAC Noise Levels at Surrounding Property Lines		
Receiver	**Description**	**Noise Level (dBA)**
R1	North Property Line	41.0
R2	East Property Line	33.1
R3	East Property Line	40.9
R4	South Property Line	41.5
R5	West Property Line	42.5
R6	West Property Line	38.8

As shown above, no additional mitigation is deemed necessary to attenuate noise levels from HVAC units at surrounding properties, as noise levels do not exceed limits set by the County of San Bernardino. Data sheets are provided in Appendix E: Cadna Analysis Data and Results, Section 2.

5.3.2 Project-Generated Vehicle Traffic Noise

The traffic impacts for the proposed project were evaluated to determine project-generated traffic noise impacts at neighboring receivers, based on the predicted traffic volumes provided in the LLG, dated October 9, 2015. The two intersections evaluated in depth were Cypress Avenue and Valley Boulevard, and Cypress Avenue and H Street. Existing AM/PM peak hour traffic volumes were first compared to the year 2018 AM/PM peak hour traffic volumes without the influence of the project to determine the increase in the noise environment. Next, the existing AM/PM peak hour traffic volumes were compared to the year 2018 AM/PM peak hour traffic volumes with the influence of project traffic to determine the increase in the noise environment. Finally, these two figures were subtracted to determine the impact caused by the proposed project itself.

After analyzing the two intersections in question, it has been determined that the maximum increase in the noise environment will be 0.9 dB. This increase is considered to be insignificant, as an increase of 3 dB is widely accepted as "barely perceptible" increase. Project-generated traffic noise will have an insignificant impact on surrounding properties. Pertinent sections of the traffic study are provided in Appendix B, and project-generated traffic noise calculations are provided in Appendix H.

5.3.3 Temporary Construction Noise

The County of San Bernardino Development Code states that temporary construction noise is exempt from the normal noise level limits determined within the code, provided temporary construction activity only takes place between the hours of 7 a.m. to 7 p.m., except Sundays and federal holidays. For this reason, a detailed analysis of temporary construction noise has not been provided.

For any project in which construction activity will take place near occupied residential properties, the following "good practice" recommendations should be adhered to whenever possible:

1. Turn off equipment when not in use.

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

3. Use equipment with effective mufflers.

4. Minimize the use of backup alarms.

5. Equipment staging areas should be placed at locations away from noise-sensitive (occupied) receivers.

These general recommendations, in addition to limiting construction equipment operation to the allowable hours detailed in the County of San Diego Noise Ordinance, will assist in maintaining the comfort of neighboring sensitive receivers during the construction of this site.

6.0 CONCLUSION

As shown above, with the proposed building structures in place and an eight-foot noise barrier around the Daycare Open Space, constructed as recommended, all designated outdoor use areas are anticipated to meet the 65 CNEL noise limit. Due to high exterior noise levels at building facades, an exterior-to-interior noise analysis is required by the California Building Code, prior to approval of building permits, to determine building features necessary to reduce interior noise levels to 45 CNEL or less in residential spaces, as required by the State of California and the County of San Bernardino. This analysis should be conducted when building plans become available.

Project-generated noise impacts to surrounding properties are expected to be insignificant. Noise levels from ground-mounted air conditioning equipment will not exceed the applicable noise limits set by the County at any surrounding property lines, in compliance with the County of San Bernardino Development Code. Project-generated traffic noise will have an insignificant impact on surrounding properties. Temporary noise impacts from construction on site are expected to be controllable by standard construction noise control methods including adhering to permissible hours of operation, maintaining equipment in proper operating condition, and placing staging areas at farthest locations from noise sensitive receivers.

7.0 CERTIFICATION

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

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 Las Terrazas Apartments in the unincorporated community of Colton, County of San Bernardino, California. This report was prepared by Jeff Russert and Amy Hool.

Amy Hool, Principal Acoustical Consultant

Jeff Russert, Acoustical Consultant

8.0 REFERENCES

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3. Federal Highway Administration, Traffic Noise Model Version 2.5.

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9. 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.

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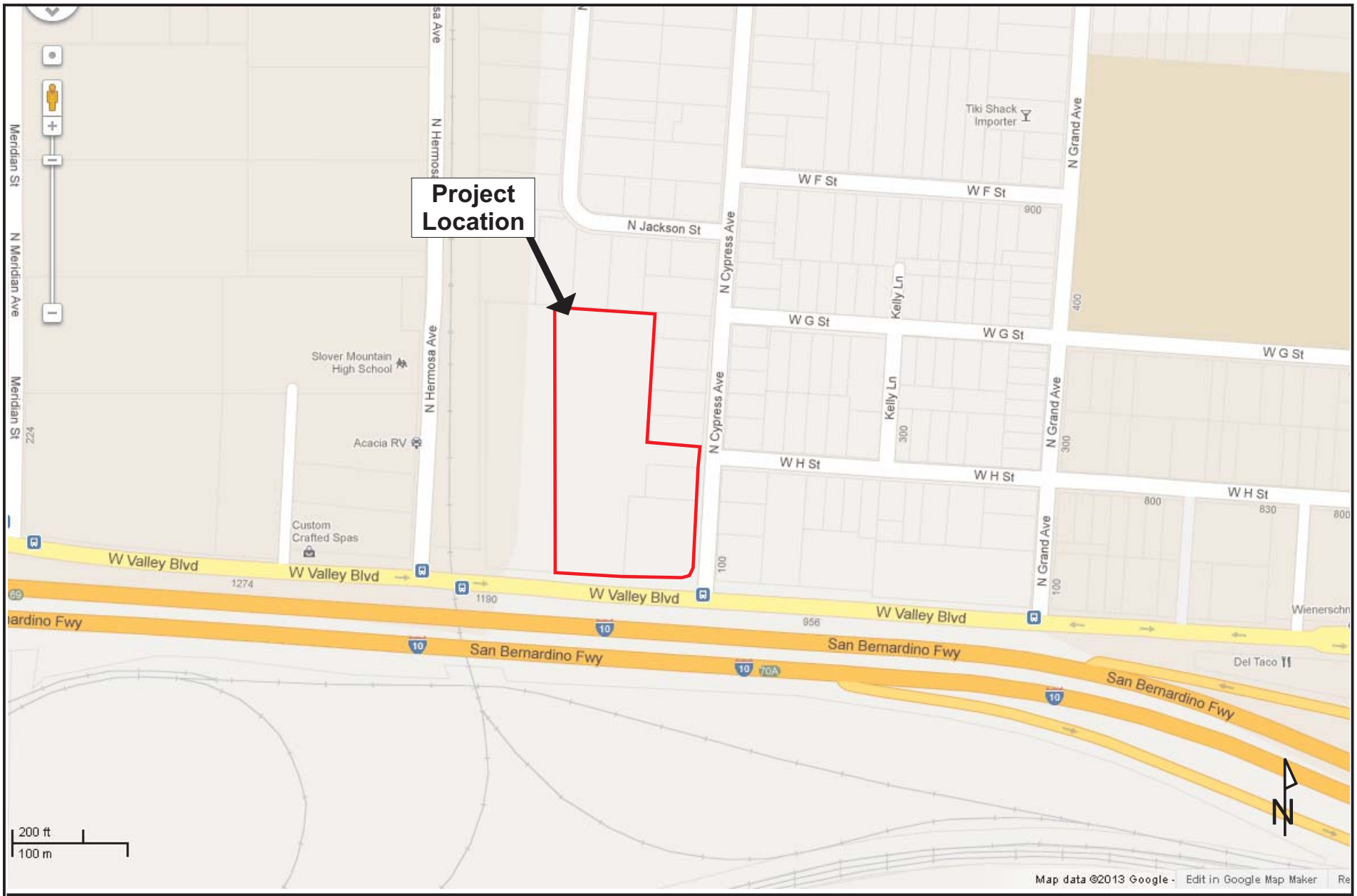
11. NBS Building Sciences Series 77, Acoustical and Thermal Performance on Exterior Residential Walls, U.S. Department of Commerce/National Bureau of Standards, November 1976.

12. 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.

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

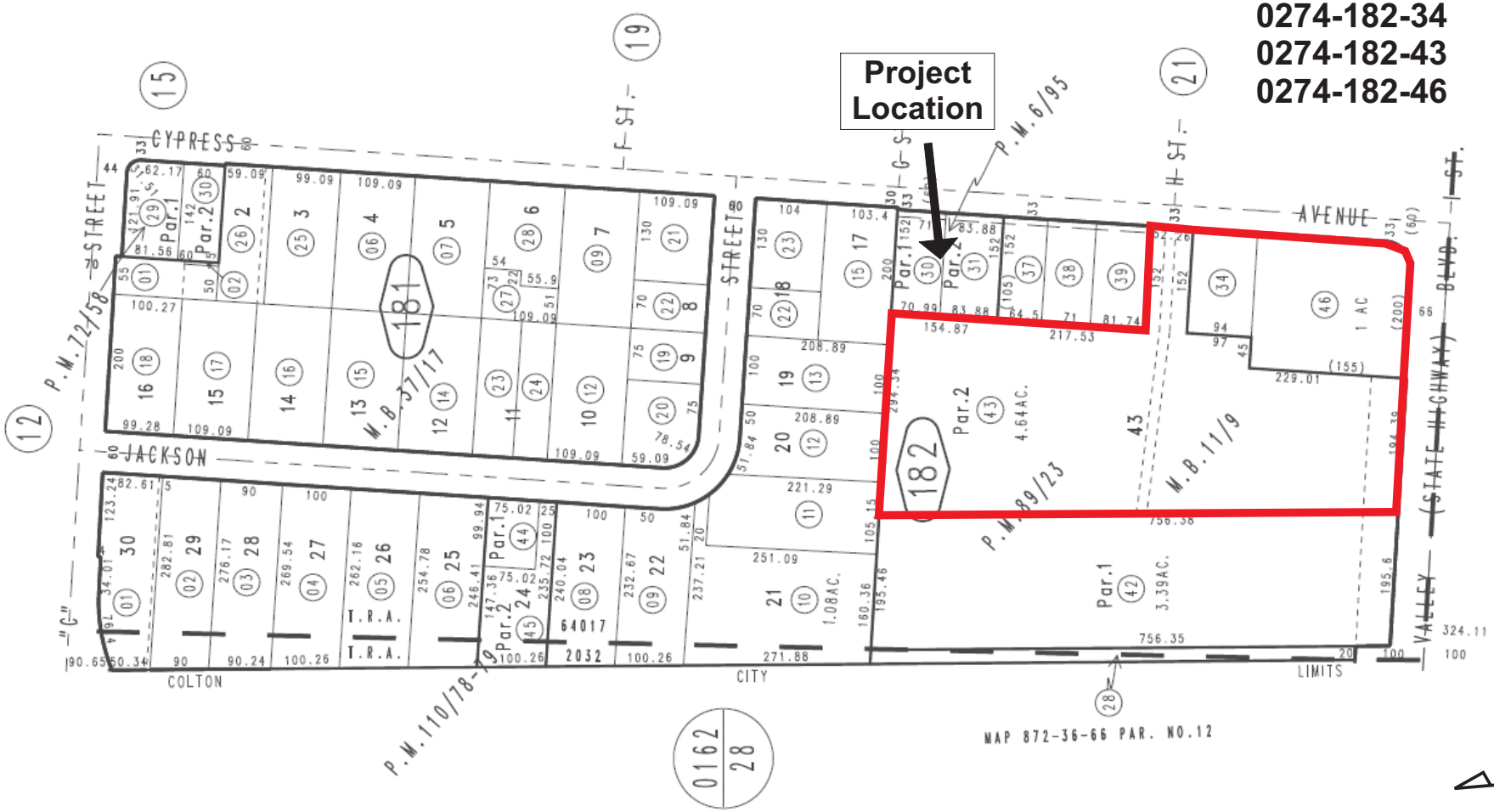
FIGURES



Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Vicinity Map** **Job #B30107N2**	**Figure 1**

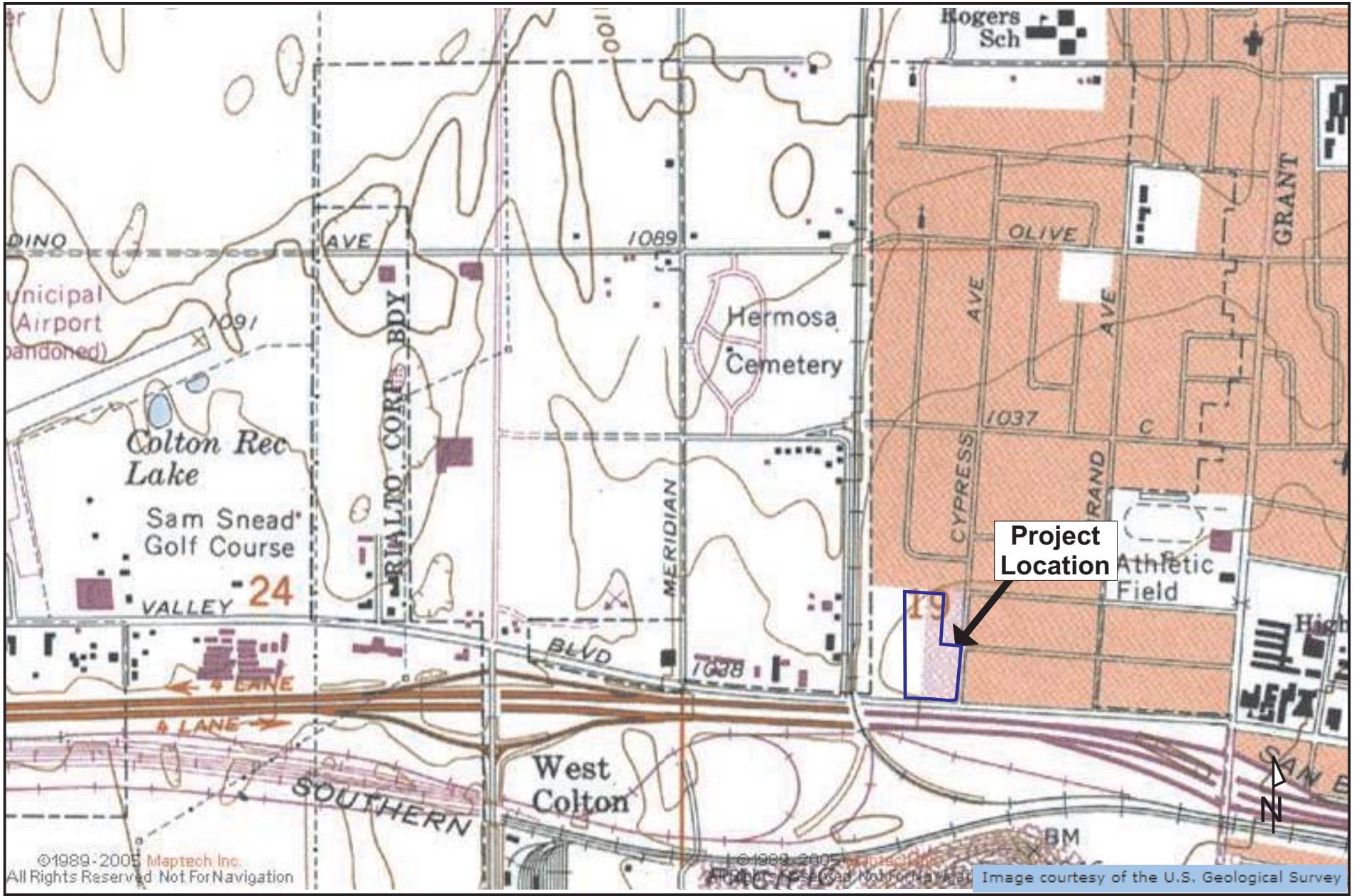
San Bernardino County Assessor's Parcel Number:

0274-182-34
0274-182-43
0274-182-46

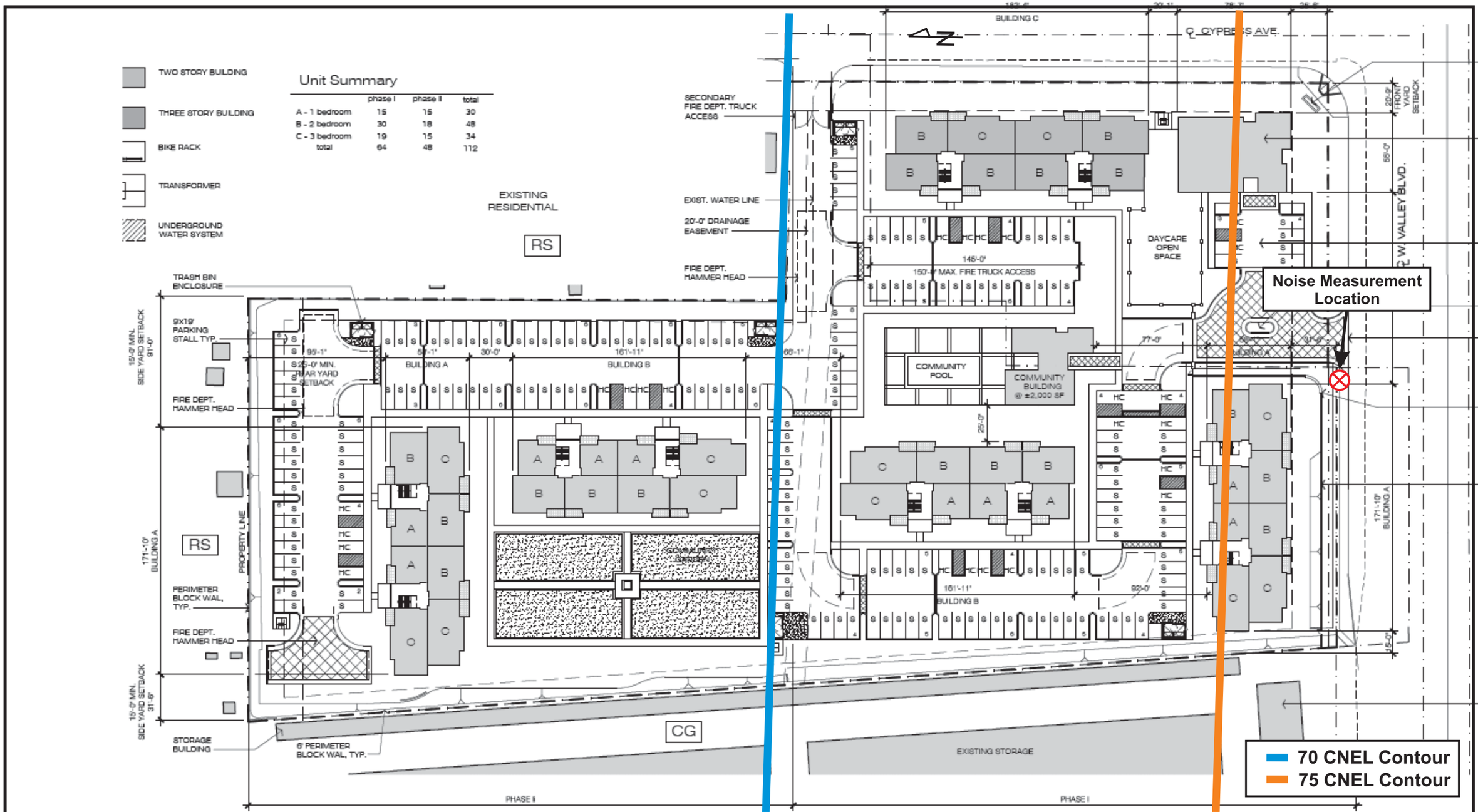


Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Assessor's Parcel Map** **Job # B30107N2**	**Figure 2**

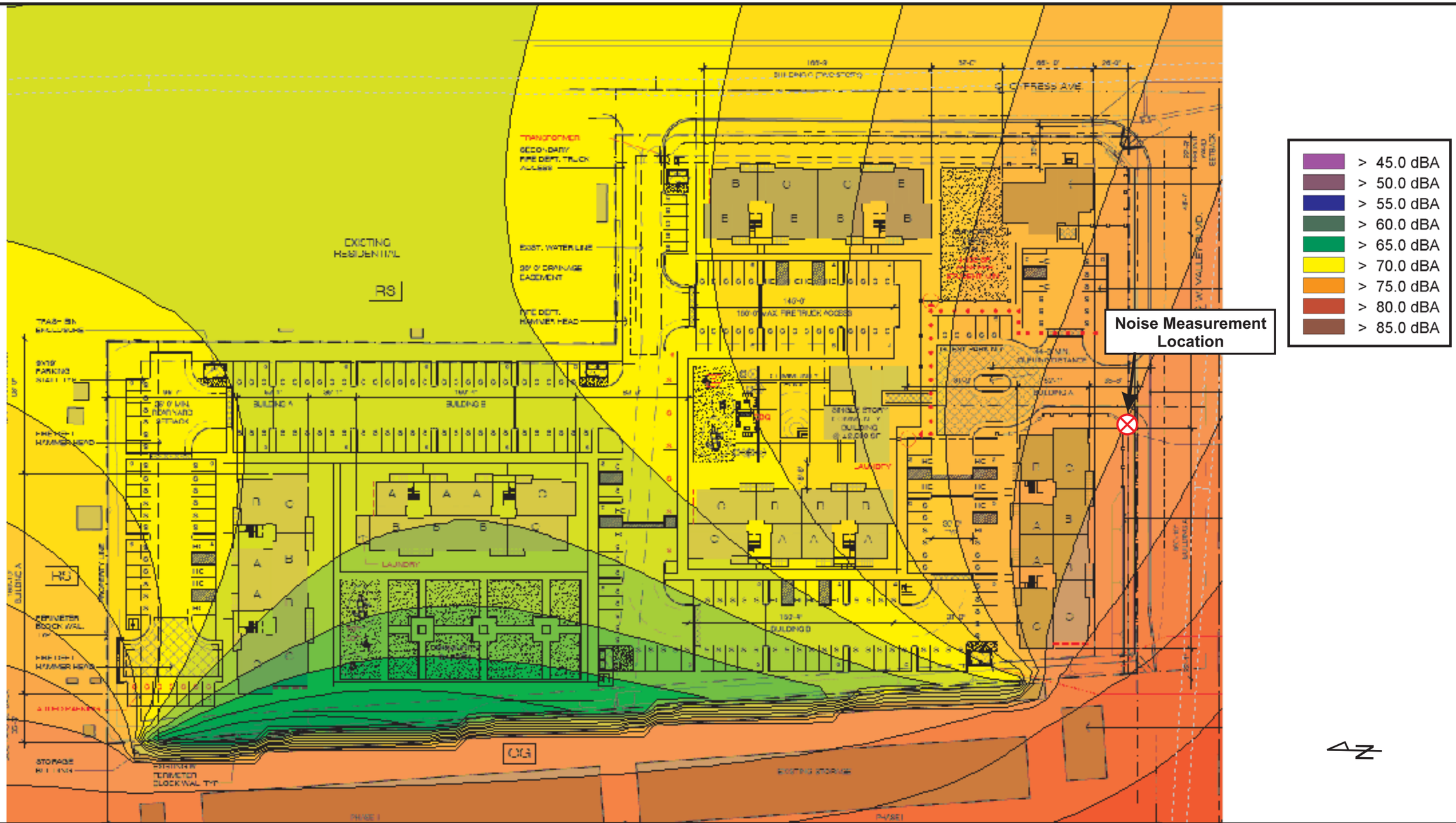
Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Satellite Aerial Photograph** **Job # B30107N2**	**Figure 3**



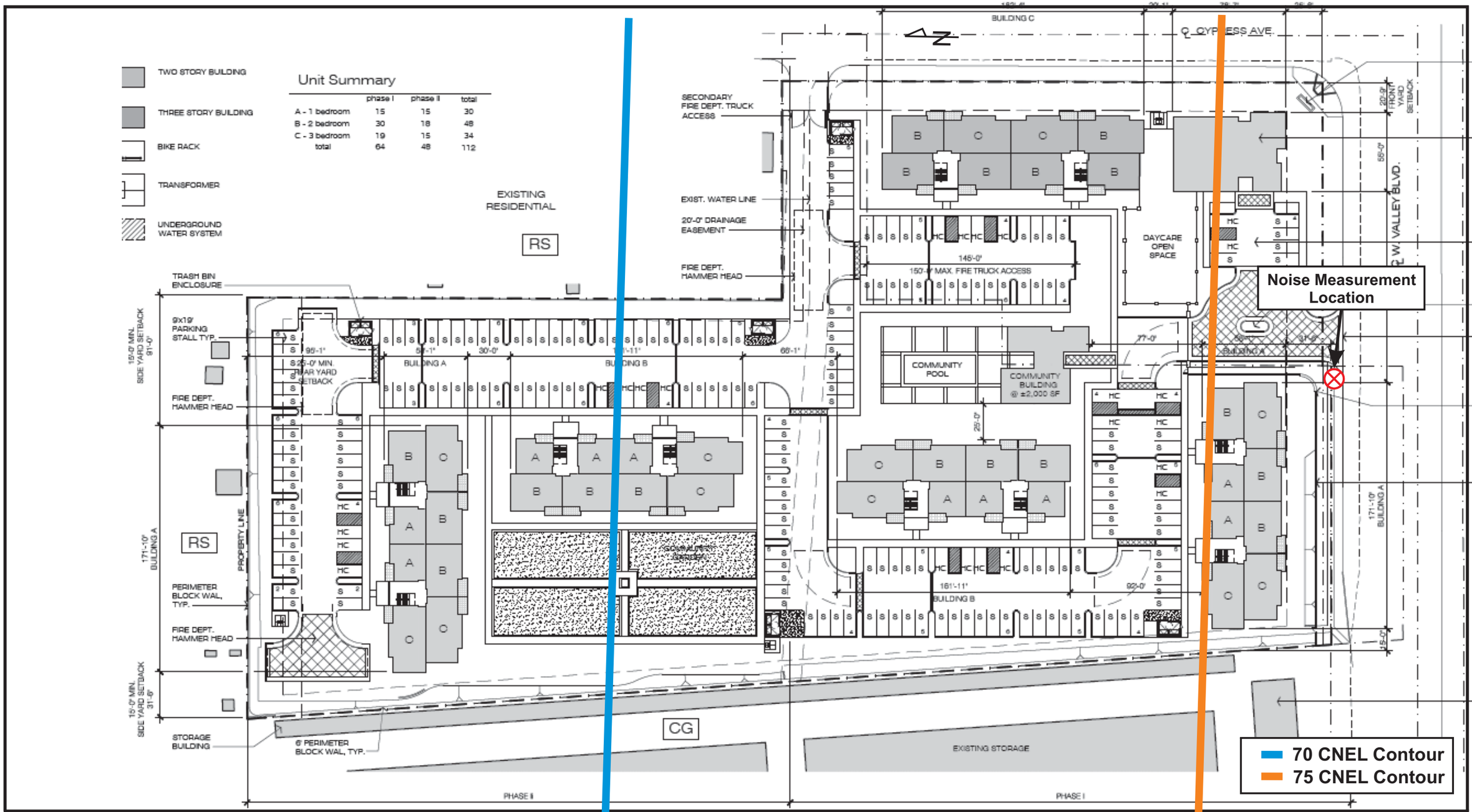
Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Topographic Map** **Job # B30107N2**	**Figure 4**



Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Site Plan Showing Current Traffic CNEL Contours and Noise Measurement Location** **Job # B30107N2**	**Figure 5**

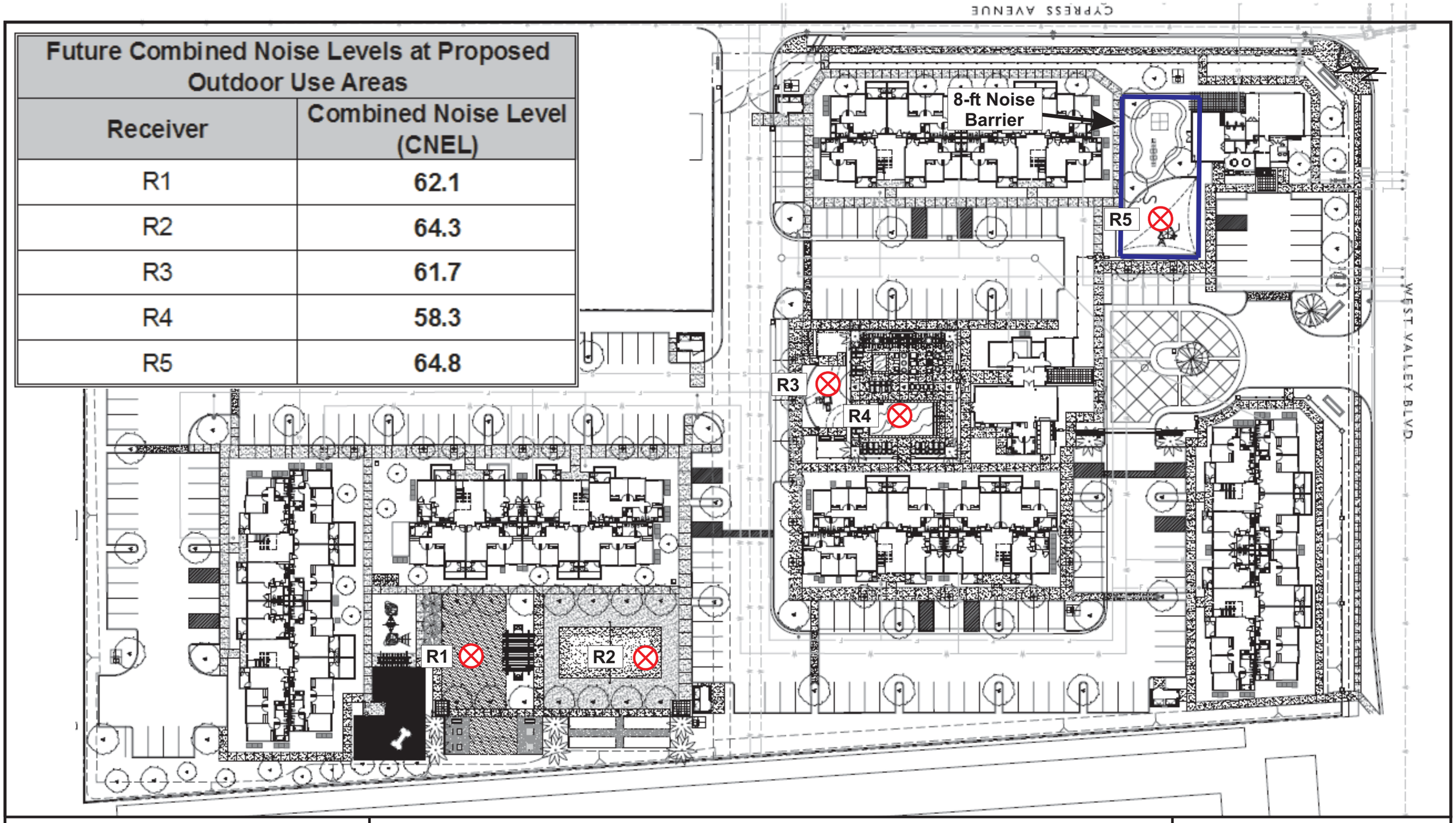


Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Site Plan Showing Future Railway CNEL Contours and Noise Measurement Location** **Job # B30107N2**	**Figure 6**



Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Site Plan Showing Future Traffic CNEL Contours and Noise Measurement Location** **Job # B30107N2**	**Figure 7**

Future Combined Noise Levels at Proposed Outdoor Use Areas	
Receiver	Combined Noise Level (CNEL)
R1	62.1
R2	64.3
R3	61.7
R4	58.3
R5	64.8



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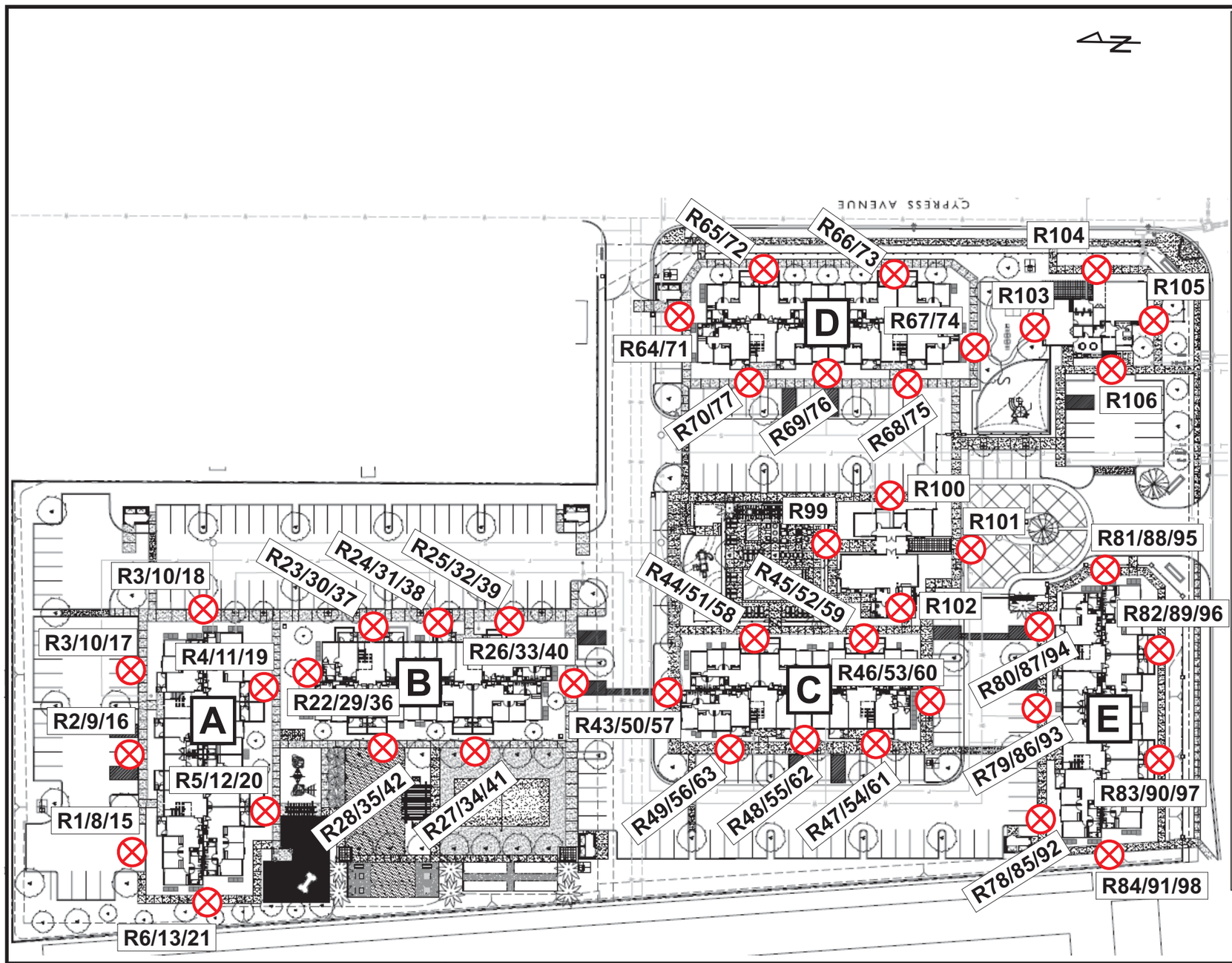
Site Plan Showing Combined Noise Impacts at Outdoor Use Areas
Job # B30107N2

Figure 8



Future Combined Noise Levels at Building Facades								
R#	Floor	Leq	R#	Floor	Leq	R#	Floor	Leq
R1	1	62.8	R37	3	66.3	R73	2	72.1
R2		64.1	R38		66.2	R74		73.9
R3		64.3	R39		66.0	R75		71.5
R4		63.9	R40		70.9	R76		70.1
R5		63.9	R41		71.1	R77		68.9
R6		62.2	R42		70.5	R78	1	59.8
R7		61.7	R43	2	60.5	R79		60.9
R8	2	67.8	R44		57.6	R80		59.4
R9		68.8	R45		65.6	R81		74.4
R10		68.9	R46	1	68.8	R82		78.4
R11		66.6	R47		64.0	R83		78.4
R12		67.4	R48		64.2	R84		74.8
R13		66.5	R49		64.1	R85	2	64.1
R14		67.4	R50	2	64.4	R86		64.4
R15	3	70.4	R51		62.0	R87		63.2
R16		69.5	R52		66.4	R88		74.4
R17		69.3	R53		69.8	R89		78.7
R18		66.7	R54		68.5	R90		78.9
R19		69.8	R55		68.5	R91		77.6
R20		70.8	R56		68.5	R92	3	68.9
R21		75.3	R57	3	67.1	R93		66.7
R22	1	58.3	R58		68.1	R94		65.5
R23		63.7	R59		70.0	R95		74.5
R24		63.4	R60		72.3	R96		78.6
R25		62.8	R61		72.3	R97		78.9
R26		64.1	R62		72.2	R98		78.2
R27		63.2	R63		72.0	R99	1	55.0
R28		62.7	R64	1	61.5	R100		70.6
R29	2	61.8	R65		71.2	R101		71.7
R30		66.0	R66		72.3	R102		59.9
R31		65.8	R67		74.0	R103		63.7
R32		65.3	R68		71.4	R104		74.6
R33		67.7	R69		69.9	R105		78.0
R34		67.6	R70		68.5	R106		75.8
R35	3	67.0	R71	2	63.3	--		
R36		63.9	R72		71.0			

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Site Plan Showing Combined Noise Impacts at Building Facades
Job # B30107N2

Figure 9

Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Site Plan Showing HVAC Contours and Noise Measurement Location** **Job # B30107N2**	**Figure 10**

APPENDIX A

Project Plans

PROJECT INFORMATION

PROJECT LOCATION:	Between N. Hermosa ave. & N. Cypress Ave. on W. Valley Blvd. and 275 & 291 N. Cypress Ave. Colton, CA 92324
APN:	0274-182-34, 43 & -46
TOTAL LOT AREA:	5.92 acres (257,988 SF)
TOTAL UNITS:	112 UNITS
TOTAL DENSITY:	18.9 DU/acre
CURRENT ZONING:	SAN BERNARDINO COUNTY DEVELOPMENT CODE
OCCUPANCY:	R-2, S-2, AND A
CONSTRUCTION TYPE:	TYPE V
ARCHITECTURAL STYLE:	MEDITERRANEAN
NUMBER OF STORIES:	2-3
BUILDING COVERAGE:	47,490 SF (18.4%)
TOTAL BUILDING AREA:	121,540 SF
BUILDING AREA TYPE 'A':	50,400 SF (3 STORIES x 2 BLDGS x 8,400 SF)
BUILDING AREA TYPE 'B':	47,280 SF (3 STORIES x 2 BLDGS x 7,880 SF)
BUILDING AREA TYPE 'C':	17,860 SF (2 STORY x 8,930 SF)
BUILDING AMMENITIES:	4,800 SF (2,500 DAYCARE + 2,300 COMMUNITY)
F.A.R.:	0.47 (121,540 SF/ 257,988 SF)

MINIMUM YARD SETBACKS:	REQUIRED:	PROVIDED:
FRONT YARD:	25'-0"	26'-0"
SIDE YARD:	15'-0"	18'-9" MIN.
REAR YARD:	25'-0"	96'-7"
AT BALCONY	22'-6"	90'-7"

BUILDABLE AREA SUMMARY

PHASE I - SOUTH (LIVABLE AREA)

PLAN	DESCRIPTION	QNTY	%	GROSS AREA	NET AREA	TOTAL GROSS AREA
A	1 BR 1 BA	15	23%	570 s.f.	525 s.f.	8,550 s.f.
B	2 BR 1 BA	30	47%	835 s.f.	780 s.f.	25,050 s.f.
C	3 BR 2 BA	19	30%	1,100 s.f.	1,020 s.f.	20,900 s.f.
		64	total units		0 s.f.	54,500 s.f.

BUILDABLE AREA SUMMARY

PHASE II - SOUTH (LIVABLE AREA)

PLAN	DESCRIPTION	QNTY	%	GROSS AREA	NET AREA	TOTAL GROSS AREA
A	1 BR 1 BA	15	31%	570 s.f.	525 s.f.	8,550 s.f.
B	2 BR 1 BA	18	38%	835 s.f.	780 s.f.	15,030 s.f.
C	3 BR 2 BA	15	31%	1,100 s.f.	1,020 s.f.	16,500 s.f.
		48	total units		0 s.f.	40,080 s.f.

AMENITIES:

COMMUNITY BUILDING	-	2,000 sf
DAYCARE / LEARNING CENTER	-	4,000 sf
TOT LOT / GARDEN / BBQ / LANDSCAPED AREAS	-	84,100 sf

ADA UNITS REQUIRED (112 unit x 10%): 12 UNITS
ALL GROUND FLOOR UNIT SHALL BE ADA ADAPTABLE UNITS PER CBC.2010 1104A.1.
ADA UNITS PROVIDED: 12 UNITS

PARKING SUMMARY

PHASE I - RESIDENTIAL

PARKING REQUIRED (PER SB1818)

1 BR units 15 x 1.0 spaces	=	15 spaces
2-3 BR units 49 x 2.0 spaces	=	98 spaces
TOTAL RESIDENTIAL PARKING REQUIRED *INCLUSIVE OF GUEST PARKING SPACES	=	113 spaces*

PHASE II - RESIDENTIAL

PARKING REQUIRED (PER SB1818)

1 BR units 15 x 1.0 spaces	=	15 spaces
2-3 BR units 33 x 2.0 spaces	=	66 spaces
TOTAL RESIDENTIAL PARKING REQUIRED *INCLUSIVE OF GUEST PARKING SPACES	=	81 spaces*

COMMUNITY SERVICE BUILDINGS:

PARKING REQUIRED (PER SBC DEVELOPMENT CODE 83.11.04)

CHILDCARE CENTER @ 2,500 SF 1.0 space per 5 STUDENT 0.2 space x 45 student	=	11 spaces
TOTAL PARKING REQUIRED	=	11 spaces
GRAND TOTAL PARKING REQUIRED	=	205 spaces

PARKING PROVIDED

RESIDENT. PARKING SPACES	=	172 spaces
RESIDENT AC PARKING SPACES	=	22 spaces
DAYCARE PARKING SPACES	=	9 spaces
DAYCARE AC PARKING SPACES	=	2 spaces
TOTAL PARKING PROVIDED	=	205 spaces

OPEN SPACE SUMMARY

PRIVATE OPEN SPACE

REQUIRED

125 SF / UNITS (112 x 125 SF)	=	14,000 SF

PROVIDED

60 SF AVG. x 112 UNITS	=	6,720 SF

COMMON OPEN SPACE

REQUIRED:

112 units x 125 + 25	=	14,025 SF
TOTAL OPEN SPACE PROVIDED =		14,025 SF

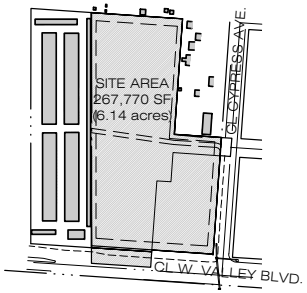
PROVIDED:

OPEN SPACE (INCLUDING SETBACKS):	30,000 SF
COMMUNITY ROOMS:	5,400 SF
TOTAL OPEN SPACE PROVIDED =	35,400 SF

DEVELOPER: AMCAL Multi-Housing, Inc.
30141 AGOURA ROAD, SUITE 100
AGOURA HILLS, CA 91301
(818) 706-0694

VICINITY MAP

SITE AREA DIAGRAM



LAS TERRAZAS

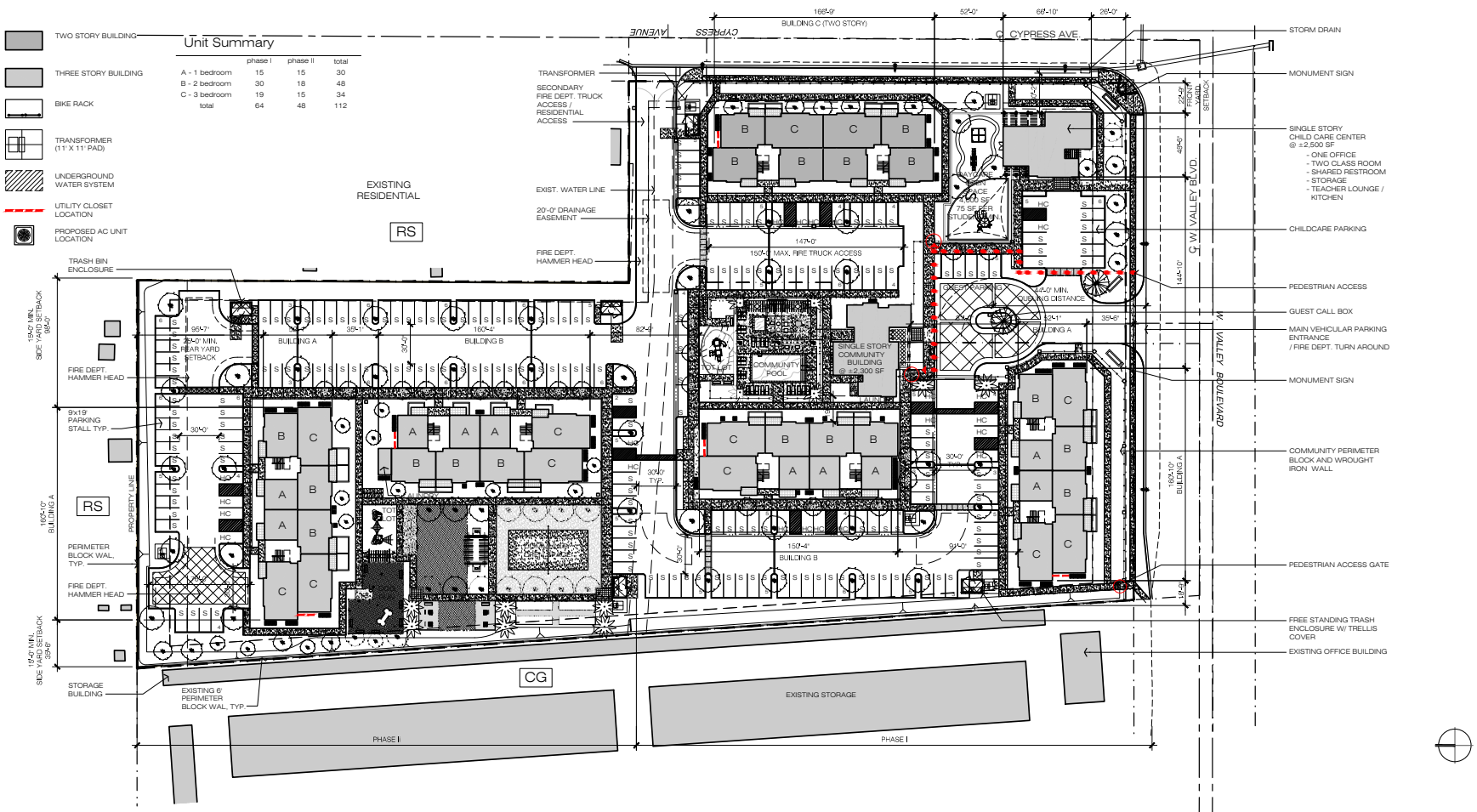
UNINCORPORATED SAN BERNARDINO COUNTY, COLTON , CA

-01-

PROJECT INFORMATION - SCHEME 17
LAS TERRAZAS AT COLTON CA
UNINCORPORATED SAN BERNARDINO COUN

APPLICANT / DEVELOPER
AMCAL MULTI - HOUSING, INC.

ARCHITECT
Withee Malcolm Architects, LLP
JOB NO. B1057.306
DATE: OCTOBER 06 , 2014



LAS TERRAZAS

UNINCORPORATED SAN BERNARDINO COUNTY, COLTON , CA

scale: 1" = 40'-0" (0, 40, 80)

-02-

SITE PLAN STUDY - SCHEME 24

LAS TERRAZAS AT COLTON CA

UNINCORPORATED SAN BERNARDINO COUN

APPLICANT / DEVELOPER

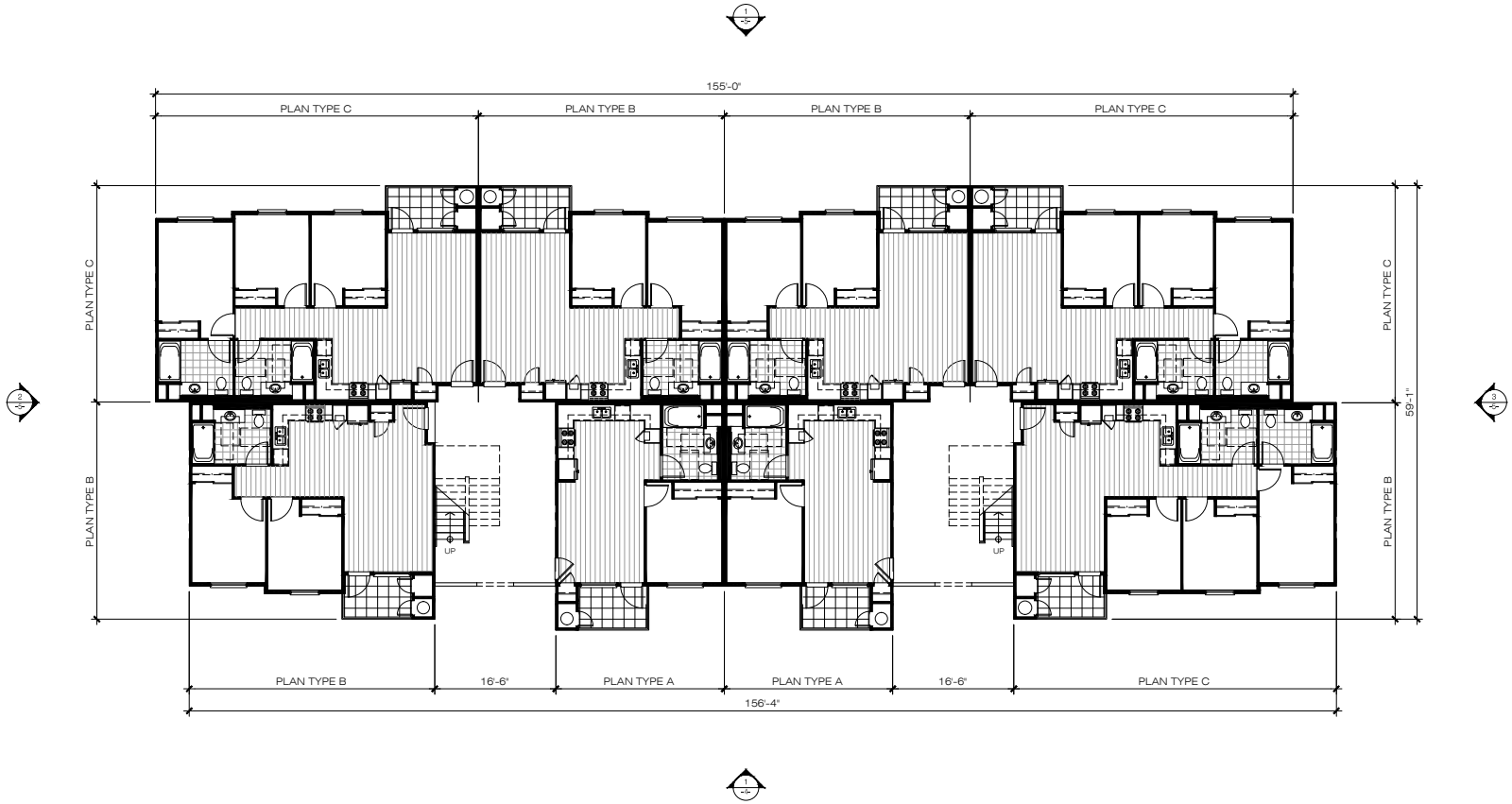
AMCAL MULTI - HOUSING, INC.

ARCHITECT

Withee Malcolm Architects, LLP

JOB NO. B1057.306

DATE: OCTOBER 06 , 2014



LAS TERRAZAS

UNINCORPORATED SAN BERNARDINO COUNTY, COLTON , CA

scale: 1/8" = 1'-0"

-03-

TYPICAL BUILDING A PLAN

LAS TERRAZAS AT COLTON CA
UNINCORPORATED SAN BERNARDINO COUN

APPLICANT / DEVELOPER
AMCAL MULTI - HOUSING, INC.

ARCHITECT
Withee Malcolm Architects, LLP

JOB NO. B1057.306

DATE: OCTOBER 06 , 2014

1. FRONT BUILDING ELEVATION

LAS TERRAZAS

UNINCORPORATED SAN BERNARDINO COUNTY, COLTON , CA

scale: 1/8" = 1'-0" 0 8 16

-04-

BUILDING A ELEVATIONS

LAS TERRAZAS AT COLTON CA
UNINCORPORATED SAN BERNARDINO COUN

APPLICANT / DEVELOPER
AMCAL MULTI - HOUSING, INC.

ARCHITECT
Withee Malcolm Architects, LLP

JOB NO. B1057.306

DATE: OCTOBER 06 , 2014

1. REAR BUILDING ELEVATION

3. SIDE BUILDING ELEVATION

2. SIDE BUILDING ELEVATION

LAS TERRAZAS

UNINCORPORATED SAN BERNARDINO COUNTY, COLTON , CA

scale: 1/8" = 1'-0" 0 8 16

BUILDING A ELEVATIONS

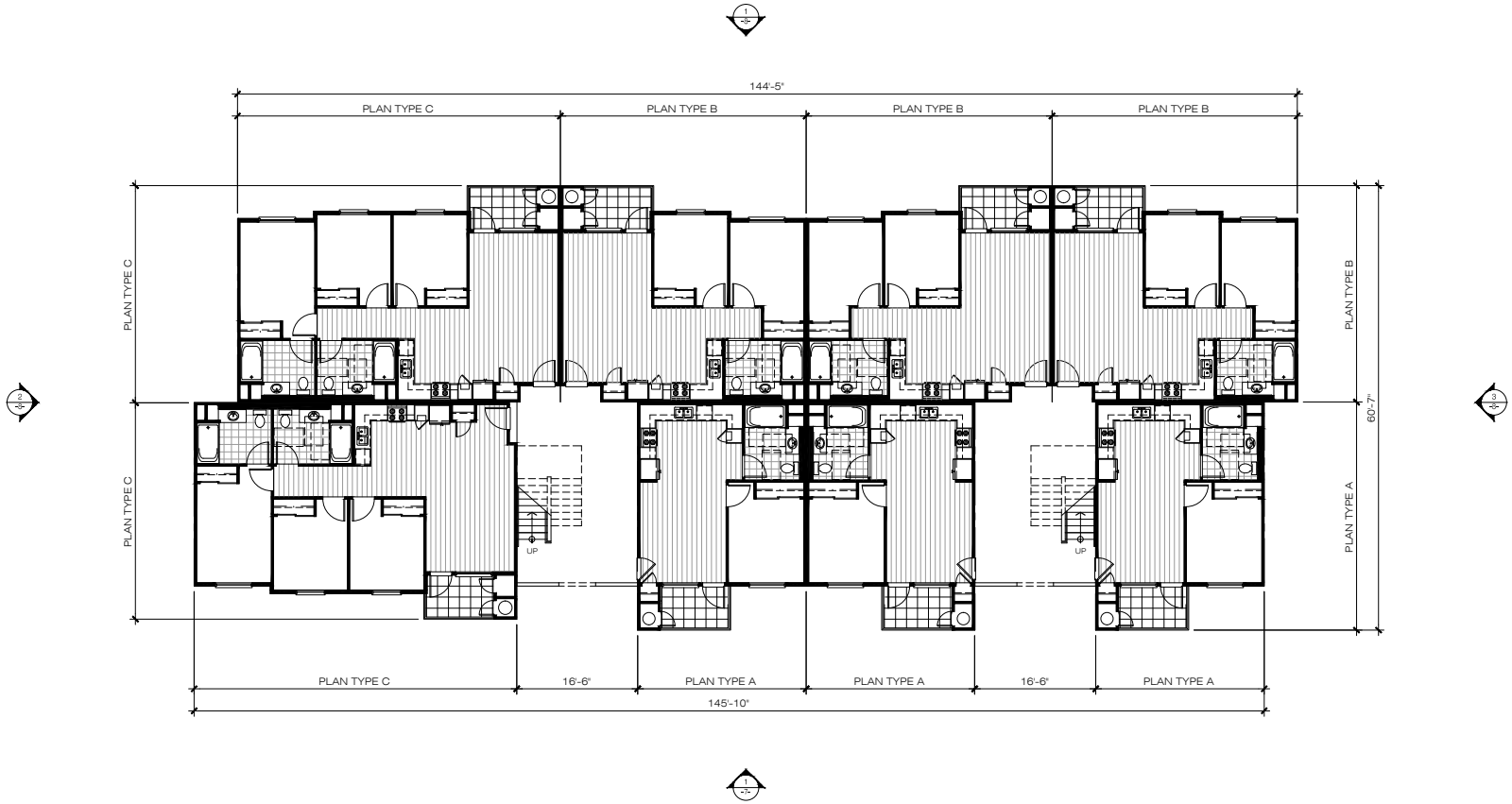
LAS TERRAZAS AT COLTON CA
UNINCORPORATED SAN BERNARDINO COUN

APPLICANT / DEVELOPER
AMCAL MULTI - HOUSING, INC.

ARCHITECT
Withee Malcolm Architects, LLP

JOB NO. B1057.306

DATE: OCTOBER 06 , 2014



LAS TERRAZAS

UNINCORPORATED SAN BERNARDINO COUNTY, COLTON , CA

scale: 1/8" = 1'-0" 0 8 16

-06-

TYPICAL BUILDING B PLAN

LAS TERRAZAS AT COLTON CA
UNINCORPORATED SAN BERNARDINO COUN

APPLICANT / DEVELOPER
AMCAL MULTI - HOUSING, INC.

ARCHITECT
Withee Malcolm Architects, LLP

JOB NO. B1057.306

DATE: OCTOBER 06 , 2014

1. FRONT BUILDING ELEVATION

LAS TERRAZAS

UNINCORPORATED SAN BERNARDINO COUNTY, COLTON , CA

scale: 1/8" = 1'-0" 0 8 16

-07-

BUILDING B ELEVATIONS

LAS TERRAZAS AT COLTON CA
UNINCORPORATED SAN BERNARDINO COUN

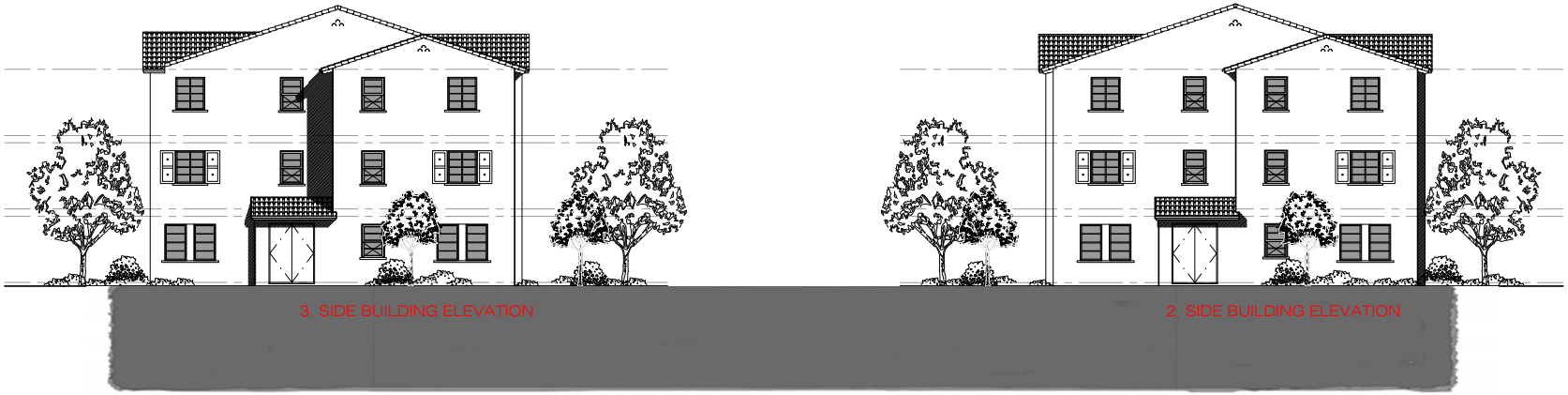
APPLICANT / DEVELOPER
AMCAL MULTI - HOUSING, INC.

ARCHITECT
Withee Malcolm Architects, LLP

JOB NO. B1057.306

DATE: OCTOBER 06 , 2014

1. REAR BUILDING ELEVATION



3. SIDE BUILDING ELEVATION

2. SIDE BUILDING ELEVATION

LAS TERRAZAS

UNINCORPORATED SAN BERNARDINO COUNTY, COLTON , CA

scale: 1/8" = 1'-0" 0 8 16

BUILDING B ELEVATIONS

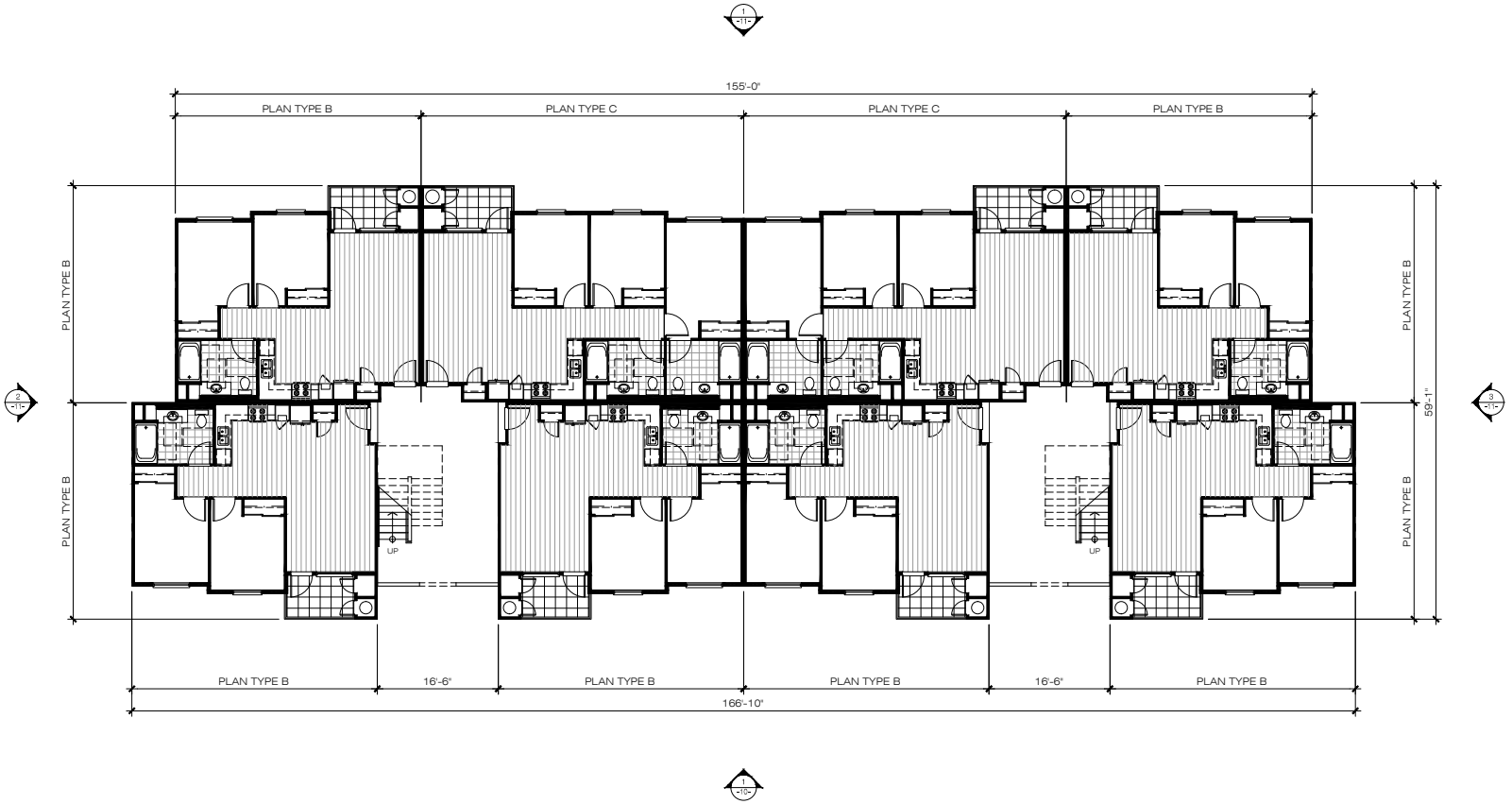
LAS TERRAZAS AT COLTON CA
UNINCORPORATED SAN BERNARDINO COUN

APPLICANT / DEVELOPER
AMCAL MULTI - HOUSING, INC.

ARCHITECT
Withee Malcolm Architects, LLP

JOB NO. B1057.306

DATE: OCTOBER 06 , 2014



LAS TERRAZAS

UNINCORPORATED SAN BERNARDINO COUNTY, COLTON , CA

scale: 1/8" = 1'-0"

-09-

TYPICAL BUILDING C PLAN

LAS TERRAZAS AT COLTON CA
UNINCORPORATED SAN BERNARDINO COUN

APPLICANT / DEVELOPER
AMCAL MULTI - HOUSING, INC.

ARCHITECT
Withee Malcolm Architects, LLP

JOB NO. B1057.306

DATE: OCTOBER 06 , 2014

1. FRONT BUILDING ELEVATION

LAS TERRAZAS

UNINCORPORATED SAN BERNARDINO COUNTY, COLTON , CA

scale: 1/8" = 1'-0" 0 8 16

BUILDING C ELEVATIONS

LAS TERRAZAS AT COLTON CA
UNINCORPORATED SAN BERNARDINO COUN

APPLICANT / DEVELOPER
AMCAL MULTI - HOUSING, INC.

ARCHITECT
Withee Malcolm Architects, LLP

JOB NO. B1057.306

DATE: OCTOBER 06 , 2014

1. REAR BUILDING ELEVATION

3. SIDE BUILDING ELEVATION

2. SIDE BUILDING ELEVATION

LAS TERRAZAS

UNINCORPORATED SAN BERNARDINO COUNTY, COLTON , CA

scale: 1/8" = 1'-0" 0 8 16

BUILDING C ELEVATIONS

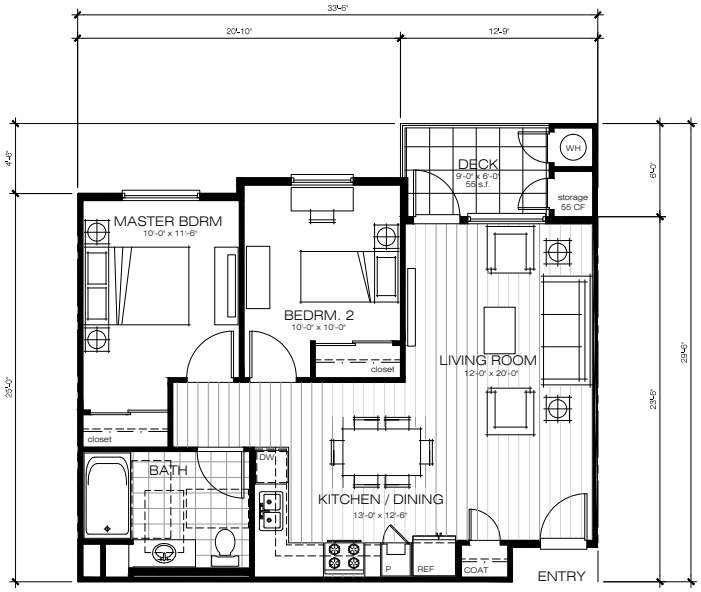
LAS TERRAZAS AT COLTON CA
UNINCORPORATED SAN BERNARDINO COUN

APPLICANT / DEVELOPER
AMCAL MULTI - HOUSING, INC.

ARCHITECT
Withee Malcolm Architects, LLP

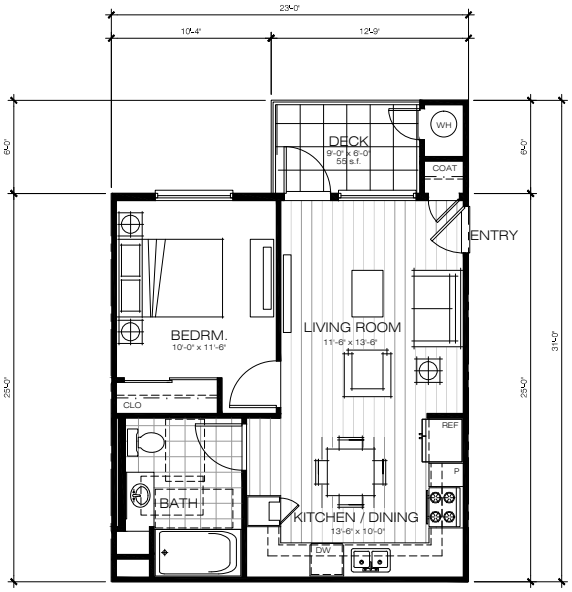
JOB NO. B1057.306

DATE: OCTOBER 06 , 2014



UNIT B

2 BEDROOM + 1 BATH
GROSS UNIT SF = 835 S.F.
LIVABLE UNIT SF = 780 S.F.
DECK AREA = 55 S.F.



UNIT A

1 BEDROOM + 1 BATH
GROSS UNIT SF = 570 S.F.
LIVABLE UNIT SF = 525 S.F.
DECK AREA = 55 S.F.

LAS TERRAZAS

UNINCORPORATED SAN BERNARDINO COUNTY, COLTON , CA

scale: 1/4" = 1'-0" 0 4 8

TYPICAL FAMILY UNIT FLOOR PLANS

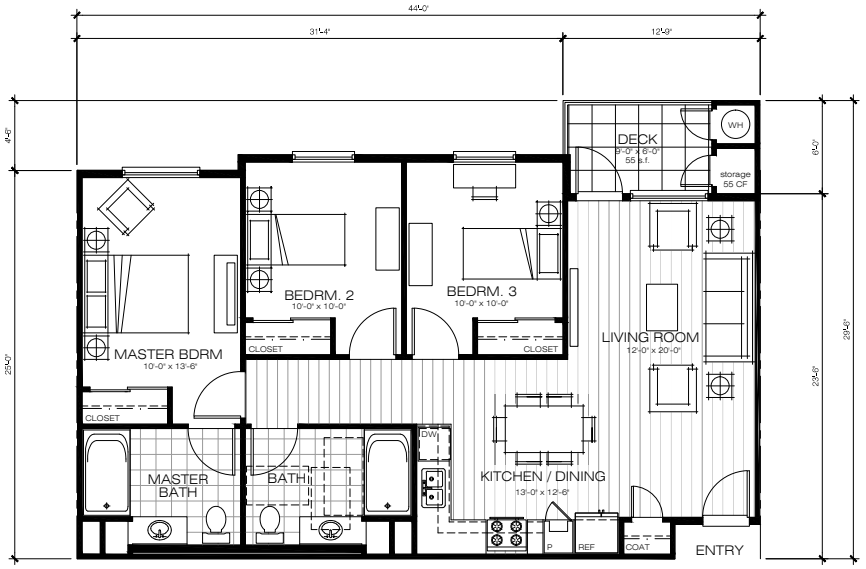
LAS TERRAZAS AT COLTON CA
UNINCORPORATED SAN BERNARDINO COUN

APPLICANT / DEVELOPER
AMCAL MULTI - HOUSING, INC.

ARCHITECT
Withee Malcolm Architects, LLP

JOB NO. B1057.306

DATE: OCTOBER 06 , 2014



UNIT C

3 BEDROOM + 2 BATH
GROSS UNIT SF = 1,100 S.F.
LIVABLE UNIT SF = 1,020 S.F.
DECK AREA = 55 S.F.

LAS TERRAZAS

UNINCORPORATED SAN BERNARDINO COUNTY, COLTON , CA

scale: 1/4" = 1'-0" 0 4 8

TYPICAL FAMILY UNIT FLOOR PLANS

LAS TERRAZAS AT COLTON CA
UNINCORPORATED SAN BERNARDINO COUN

APPLICANT / DEVELOPER
AMCAL MULTI - HOUSING, INC.

ARCHITECT
Withee Malcolm Architects, LLP

JOB NO. B1057.306
DATE: OCTOBER 06 , 2014

LAS TERRAZAS

UNINCORPORATED SAN BERNARDINO COUNTY, COLTON , CA

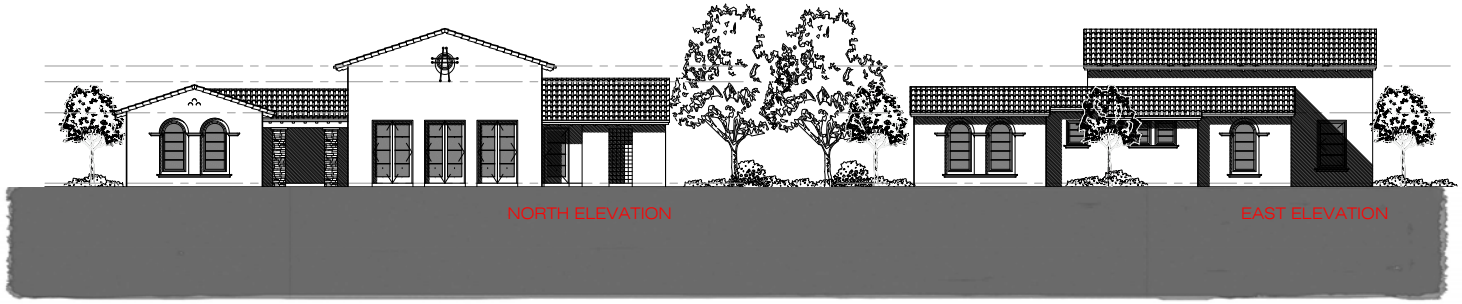
scale: 1/4" = 1'-0"

CHILDCARE BUILDING PLAN

LAS TERRAZAS AT COLTON CA
UNINCORPORATED SAN BERNARDINO COUN

APPLICANT / DEVELOPER
AMCAL MULTI - HOUSING, INC.

ARCHITECT
Withee Malcolm Architects, LLP
JOB NO. B1057.306
DATE: OCTOBER 06 , 2014



LAS TERRAZAS

UNINCORPORATED SAN BERNARDINO COUNTY, COLTON ,CA

scale: 1/8" = 1'-0" 0 8 16

CHILDCARE BUILDING ELEVATIONS

LAS TERRAZAS AT COLTON CA

UNINCORPORATED SAN BERNARDINO COUN

APPLICANT / DEVELOPER

AMCAL MULTI - HOUSING, INC.

ARCHITECT

Withee Malcolm Architects, LLP

JOB NO. B1057.306

DATE: OCTOBER 06 , 2014

APPENDIX B

Pertinent Sections of the County of San Bernardino Development Code

Table 83-2
Noise Standards for Stationary Noise Sources

Affected Land Uses (Receiving Noise)	7 am-10 pm Leq	10 pm-7 am Leq
Residential	55 dB(A)	45 dB(A)
Professional Services	55 dB(A)	55 dB(A)
Other Commercial	60 dB(A)	60 dB(A)
Industrial	70 dB(A)	70 dB(A)

Leq = (Equivalent Energy Level). The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period, typically 1, 8 or 24 hours.

dB(A) = (A-weighted Sound Pressure Level). The sound pressure level, in decibels, as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, placing greater emphasis on those frequencies within the sensitivity range of the human ear.

Ldn = (Day-Night Noise Level). The average equivalent A-weighted sound level during a 24-hour day obtained by adding 10 decibels to the hourly noise levels measured during the night (from 10 pm to 7 am). In this way Ldn takes into account the lower tolerance of people for noise during nighttime periods.

(2) Noise limit categories. No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporated or unincorporated, to exceed any one of the following:

(A) The noise standard for the receiving land use as specified in Subsection B (Noise-impacted areas), above, for a cumulative period of more than 30 minutes in any hour.

(B) The noise standard plus 5 dB(A) for a cumulative period of more than 15 minutes in any hour.

(C) The noise standard plus 10 dB(A) for a cumulative period of more than five minutes in any hour.

(D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.

(E) The noise standard plus 20 dB(A) for any period of time.

(d) Noise standards for adjacent mobile noise sources. Noise from mobile sources may affect adjacent properties adversely. When it does, the noise shall be mitigated for any new development to a level that shall not exceed the standards described in the following Table 83-3 (Noise Standards for Adjacent Mobile Noise Sources).

Table 83-3
Noise Standards for Adjacent Mobile Noise Sources

Land Use		Ldn (or CNEL) dB(A)	
Categories	Uses	Interior (1)	Exterior (2)
Residential	Single and multi-family, duplex, mobile homes	45	60 (3)
Commercial	Hotel, motel, transient housing	45	60 (3)
	Commercial retail, bank, restaurant	50	N/A
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	N/A
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library	45	65
Open Space	Park	N/A	65

Notes:

(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.

(2) The outdoor environment shall be limited to:

- Hospital/office building patios
- Hotel and motel recreation areas
- Mobile home parks
- Multi-family private patios or balconies
- Park picnic areas
- Private yard of single-family dwellings
- School playgrounds

(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.

CNEL = (Community Noise Equivalent Level). The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7 p.m. to 10 a.m. and 10 decibels to sound levels in the night before 7 a.m. and after 10 p.m.

(e) Increases in allowable noise levels. If the measured ambient level exceeds any of the first four noise limit categories in Subsection (d)(2), above, the allowable noise exposure standard shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category in Subsection (d)(2), above, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

(f) Reductions in allowable noise levels. If the alleged offense consists entirely of impact noise or simple tone noise, each of the noise levels in Table 83-2 (Noise Standards for Stationary Noise Sources) shall be reduced by 5 dB(A).

(g) Exempt noise. The following sources of noise shall be exempt from the regulations of this Section:

(1) Motor vehicles not under the control of the commercial or industrial use.

(2) Emergency equipment, vehicles, and devices.

(3) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

(h) Noise standards for other structures. All other structures shall be sound attenuated against the combined input of all present and projected exterior noise to not exceed the criteria.

Table 83-4
Noise Standards for Other Structures

Typical Uses	12-Hour Equivalent Sound Level (Interior) in dBA Ldn
Educational, institutions, libraries, meeting facilities, etc.	45
General office, reception, etc.	50
Retail stores, restaurants, etc.	55
Other areas for manufacturing, assembly, testing, warehousing, etc.	65

In addition, the average of the maximum levels on the loudest of intrusive sounds occurring during a 24-hour period shall not exceed 65 dBA interior.

Adopted Ordinance 4011 (2007)

83.01.090 Vibration

(a) Vibration standard. No ground vibration shall be allowed that can be felt without the aid of instruments at or beyond the lot line, nor shall any vibration be allowed which produces a particle velocity greater than or equal to two-tenths (0.2) inches per second measured at or beyond the lot line.

(b) Vibration measurement. Vibration velocity shall be measured with a seismograph or other instrument capable of measuring and recording displacement and frequency, particle velocity, or acceleration. Readings shall be made at points of maximum vibration along any lot line next to a parcel within a residential, commercial and industrial land use zoning district.

(c) Exempt vibrations. The following sources of vibration shall be exempt from the regulations of this Section.

(1) Motor vehicles not under the control of the subject use.

APPENDIX C

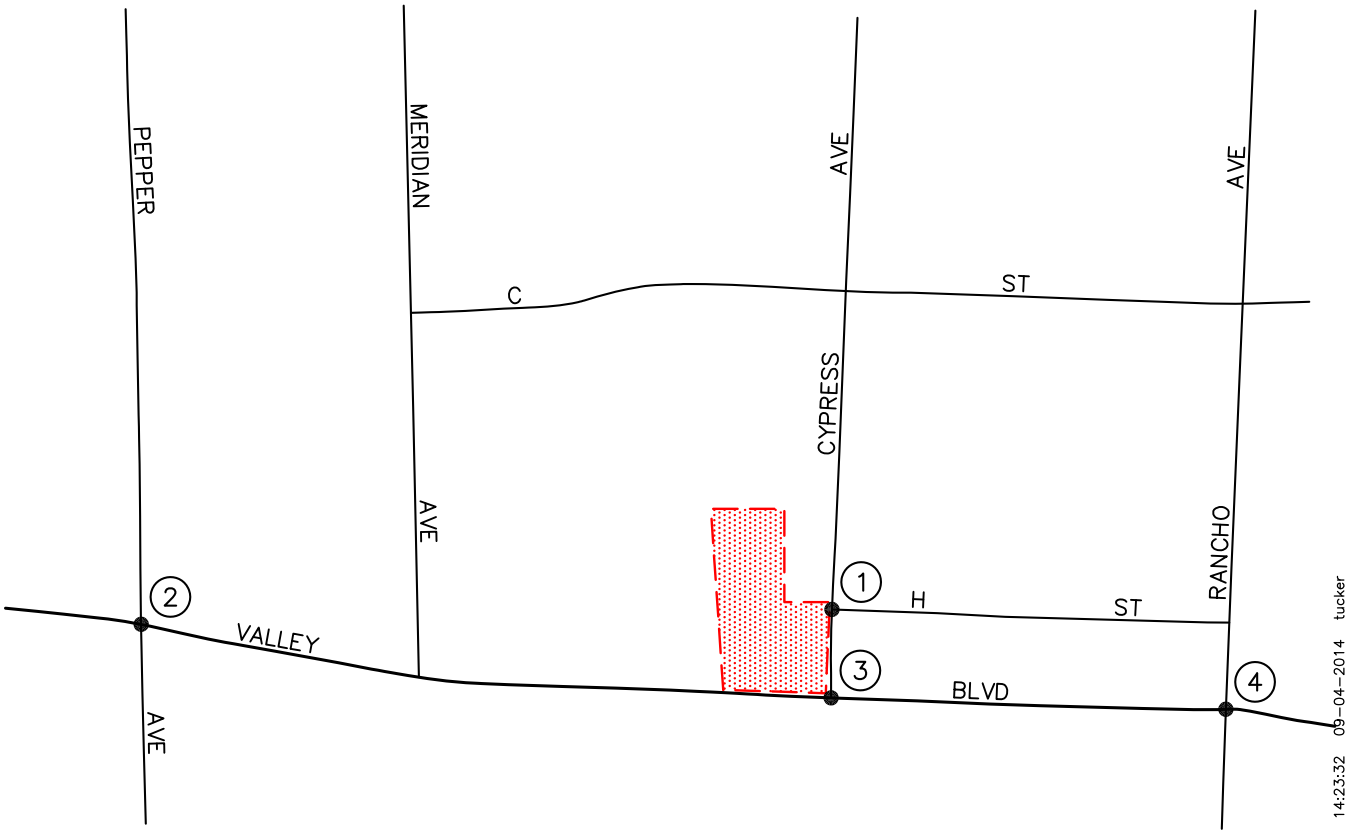
Pertinent Sections of LLG Engineers Traffic Study

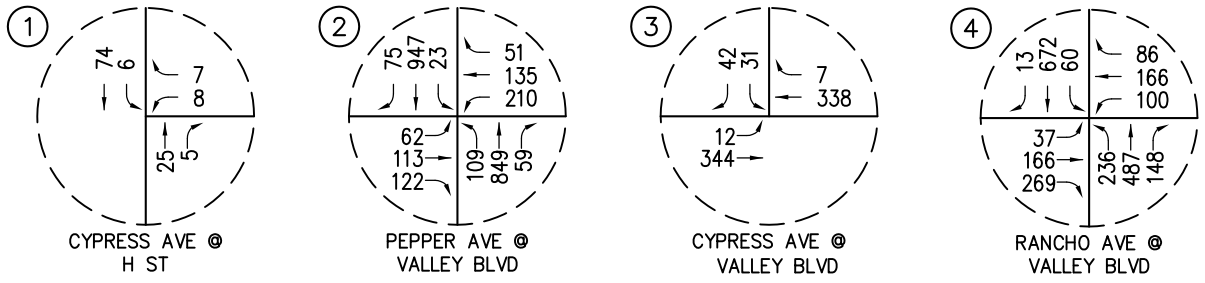
TABLE 5-1

PROJECT TRAFFIC GENERATION FORECAST[3]

ITE Land Use Code / Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Generation Factors:							
▪ 220: Apartments (TE/DU)	6.65	0.10	0.41	0.51	0.40	0.22	0.62
▪ 565: Day Care Center (TE/Student)	4.38	0.42	0.38	0.80	0.38	0.43	0.81
Generation Forecast:							
▪ Las Terrazas – Apartments (112 DU)	745	11	46	57	45	24	69
▪ Las Terrazas – Day Care Center (50 Students)	219	21	19	40	19	22	41
Traffic Generation Forecast	**964**	**32**	**65**	**97**	**64**	**46**	**110**

[3] Source: *Trip Generation*, 9th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2012).





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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

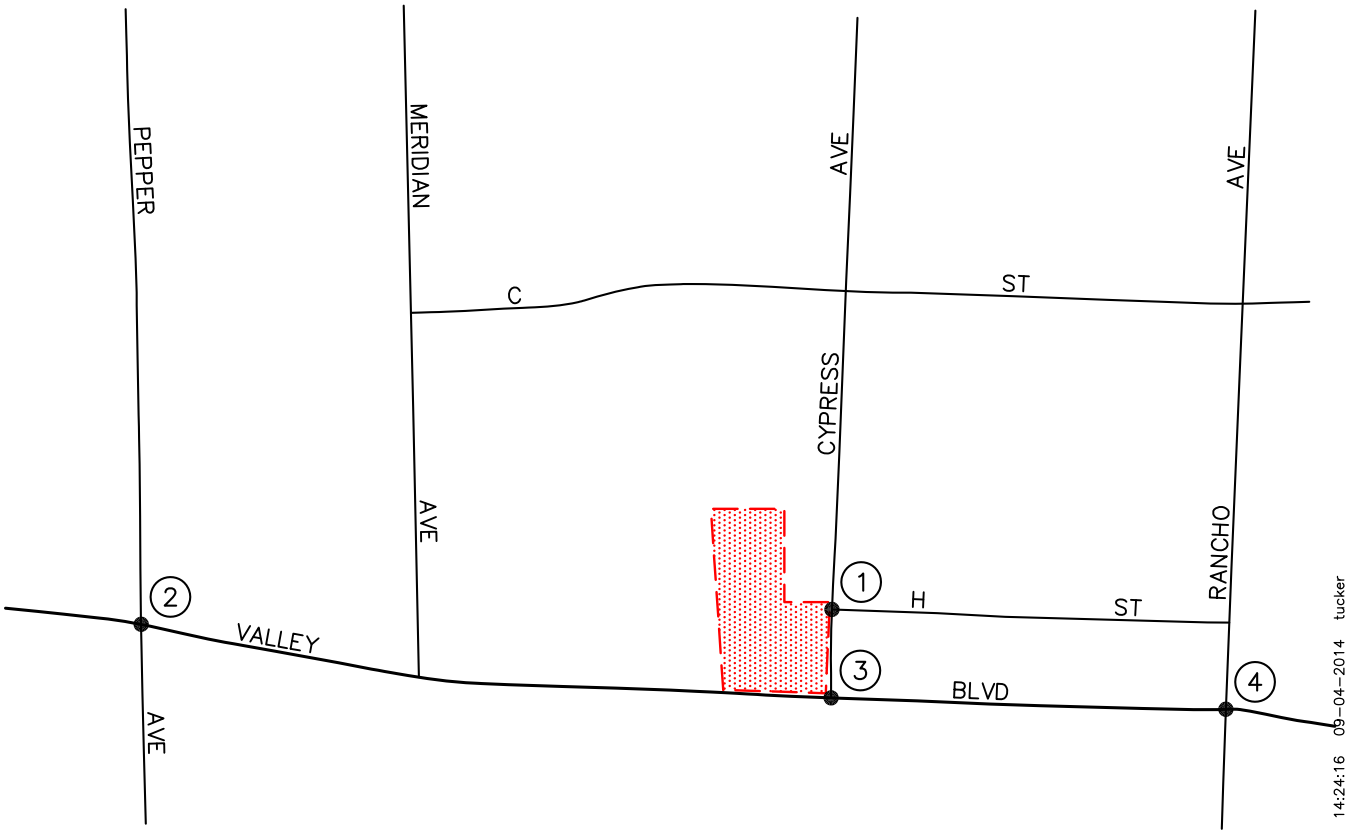
KEY

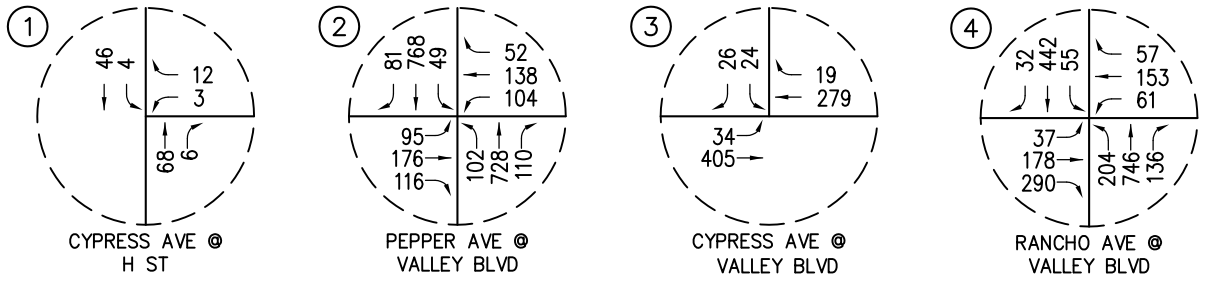
= PROJECT SITE

FIGURE 3-2

EXISTING AM PEAK HOUR TRAFFIC VOLUMES

LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO





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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

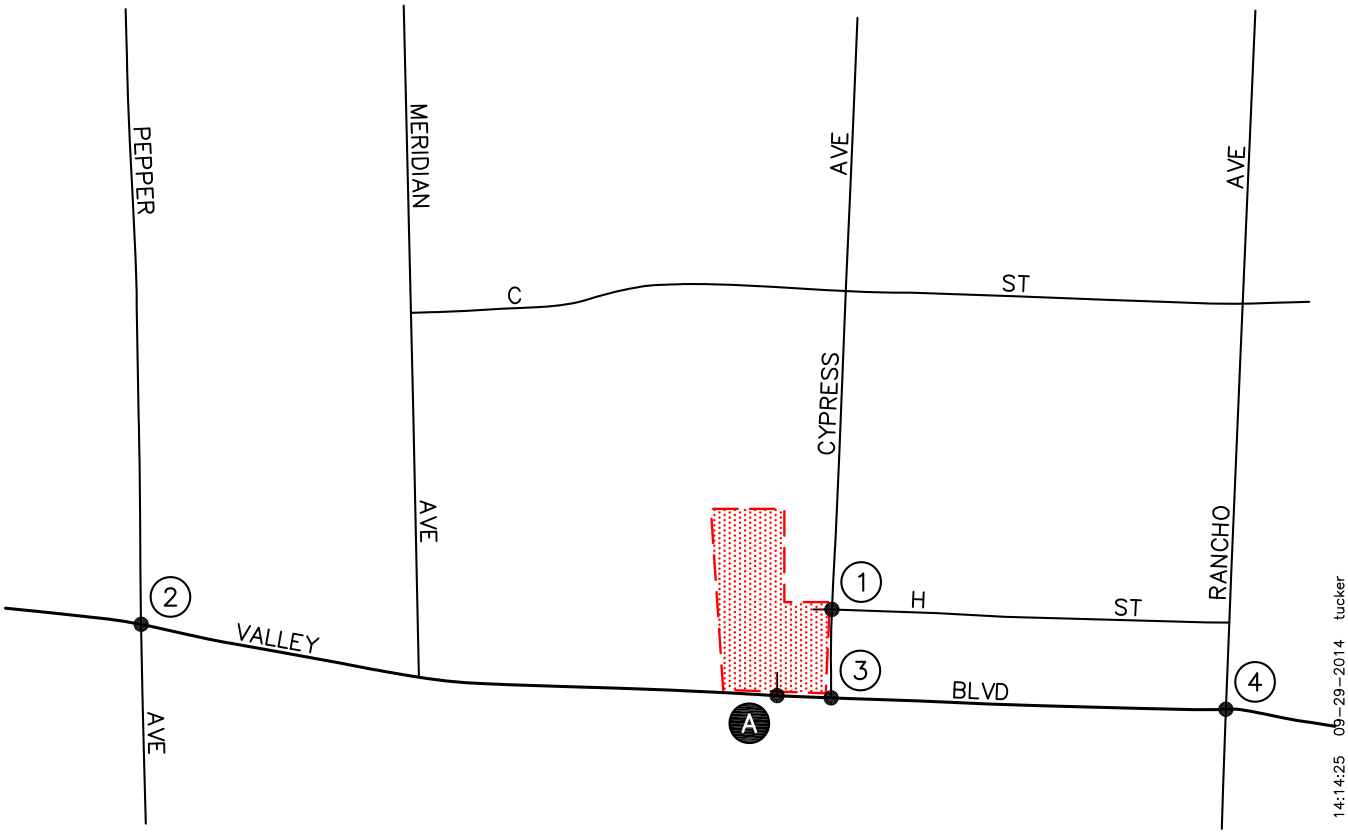
KEY

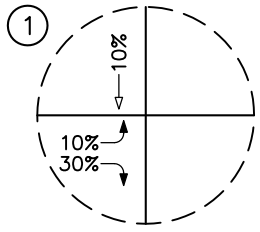
= PROJECT SITE

FIGURE 3-3

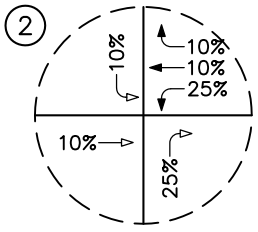
EXISTING PM PEAK HOUR TRAFFIC VOLUMES

LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO

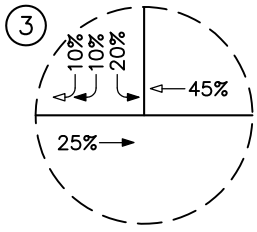




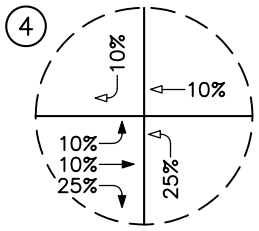
CYPRESS AVE @
H ST



PEPPER AVE @
VALLEY BLVD

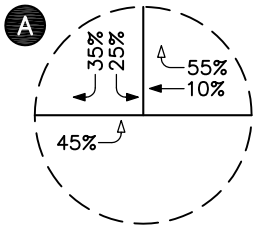


CYPRESS AVE @
VALLEY BLVD



RANCHO AVE @
VALLEY BLVD

PROJECT DRIVEWAY



PROJECT DWY 1 @
VALLEY BLVD

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LINSCOTT LAW & GREENSPAN engineers

N

NO SCALE

KEY

= INBOUND PERCENTAGE

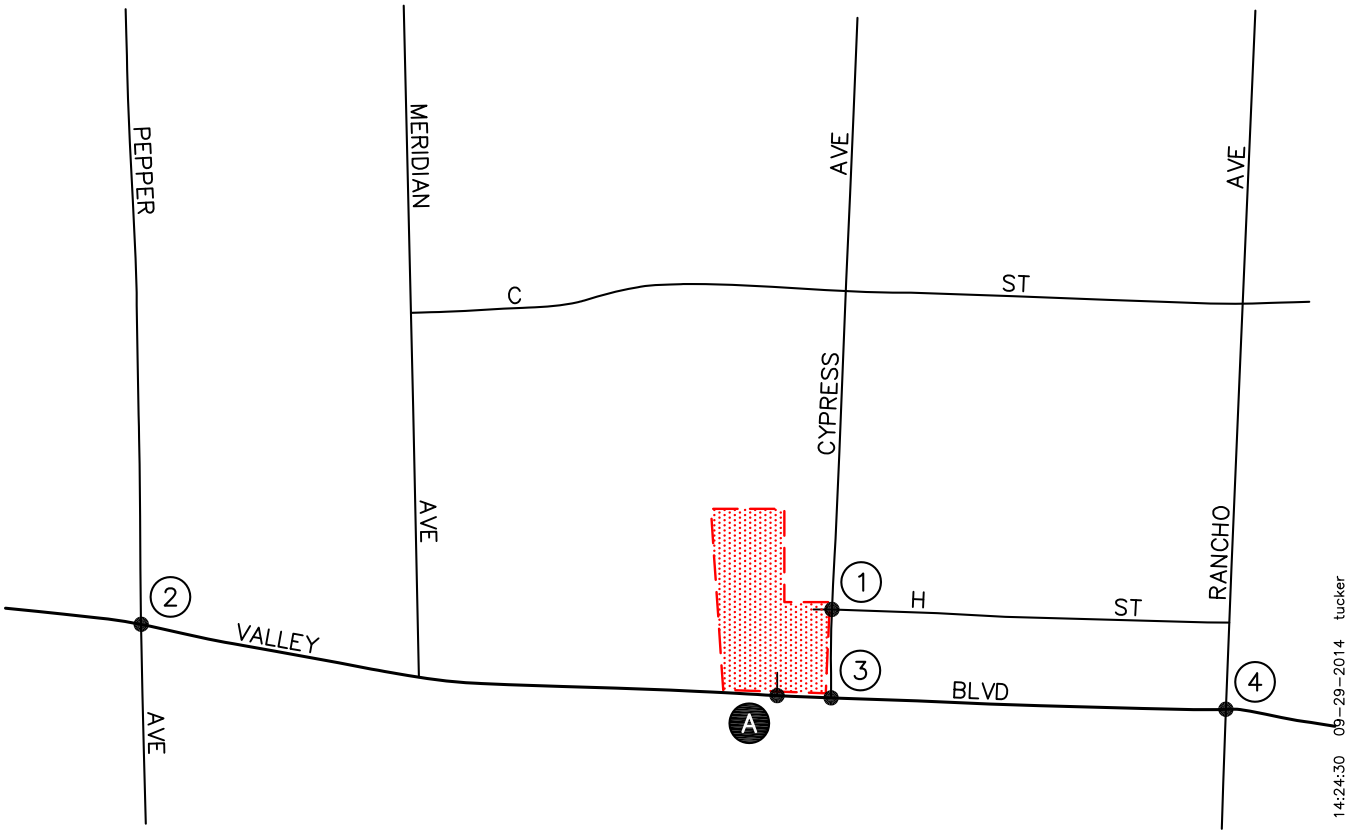
= OUTBOUND PERCENTAGE

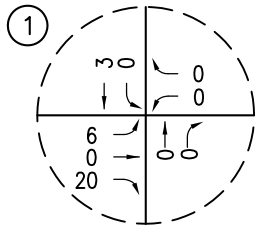
= PROJECT SITE

FIGURE 5-1

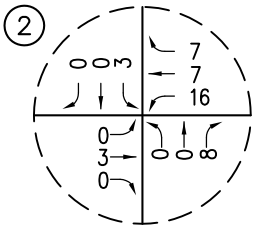
PROJECT TRAFFIC DISTRIBUTION PATTERN

LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO

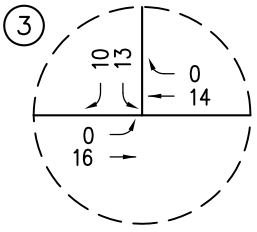




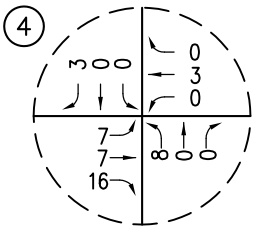
CYPRESS AVE @
H ST



PEPPER AVE @
VALLEY BLVD



CYPRESS AVE @
VALLEY BLVD



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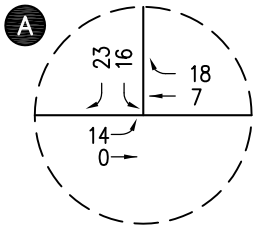
VALLEY BLVD

PROJECT DRIVEWAY



PROJECT DWY 1 @
VALLEY BLVD

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LINSCOTT LAW & GREENSPAN engineers

N

NO SCALE

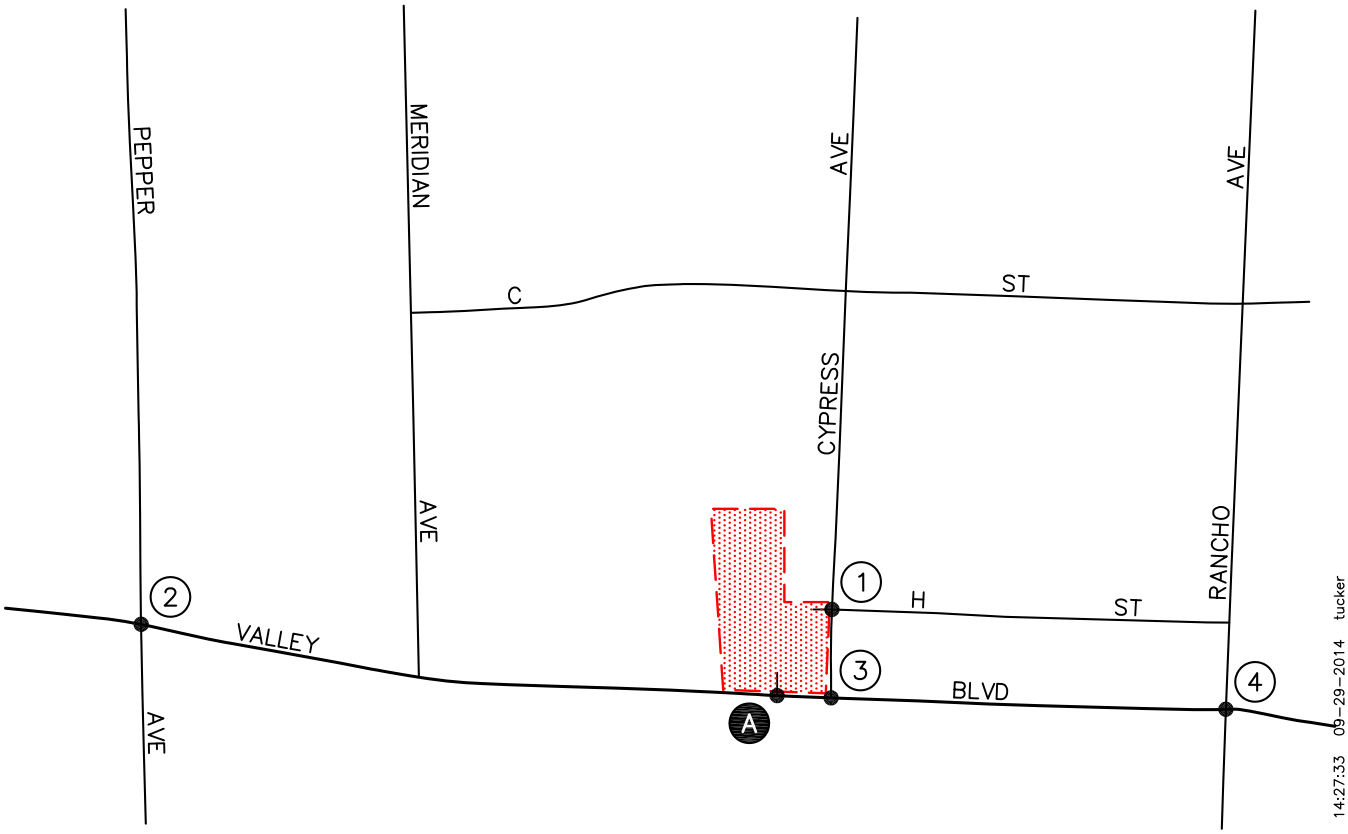
KEY

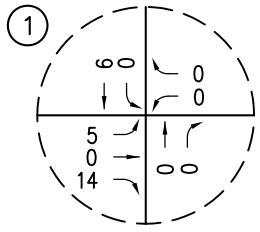
= PROJECT SITE

FIGURE 5-2

AM PEAK HOUR PROJECT TRAFFIC VOLUMES

LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO





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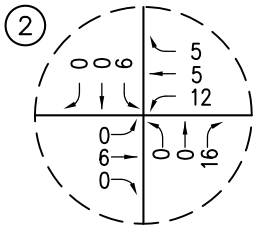

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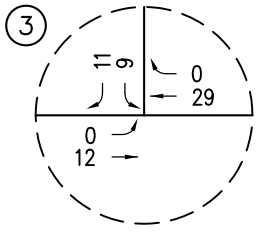
VALLEY BLVD



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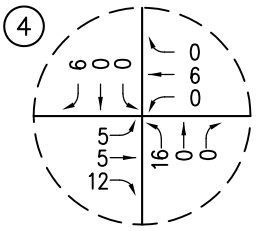
VALLEY BLVD



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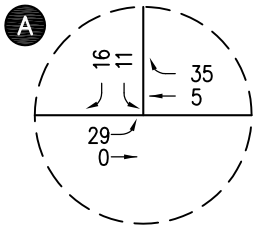
VALLEY BLVD

PROJECT DRIVEWAY



PROJECT DWY 1 @
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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

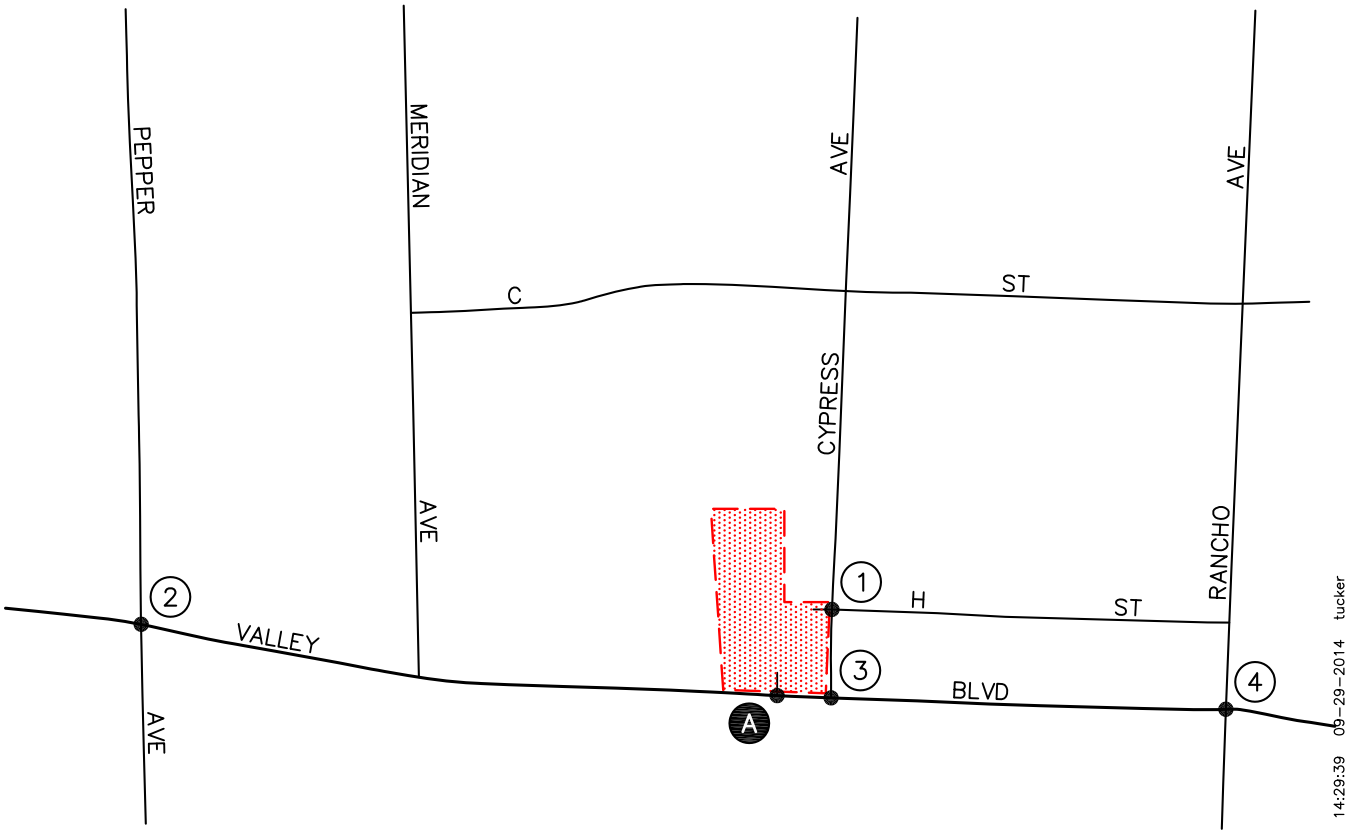
KEY

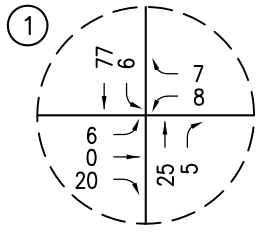
= PROJECT SITE

FIGURE 5-3

PM PEAK HOUR PROJECT TRAFFIC VOLUMES

LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO





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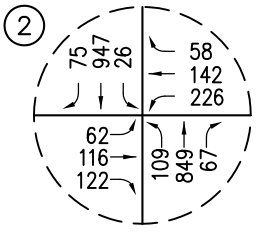

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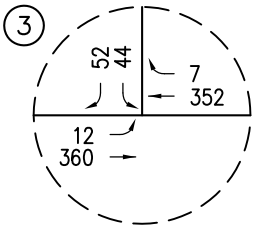

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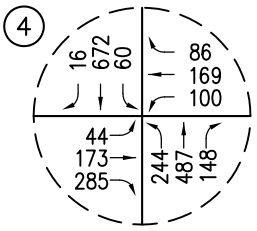
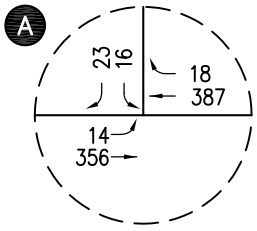
VALLEY BLVD



RANCHO AVE @
VALLEY BLVD

PROJECT DRIVEWAY



PROJECT DWY 1 @
VALLEY BLVD

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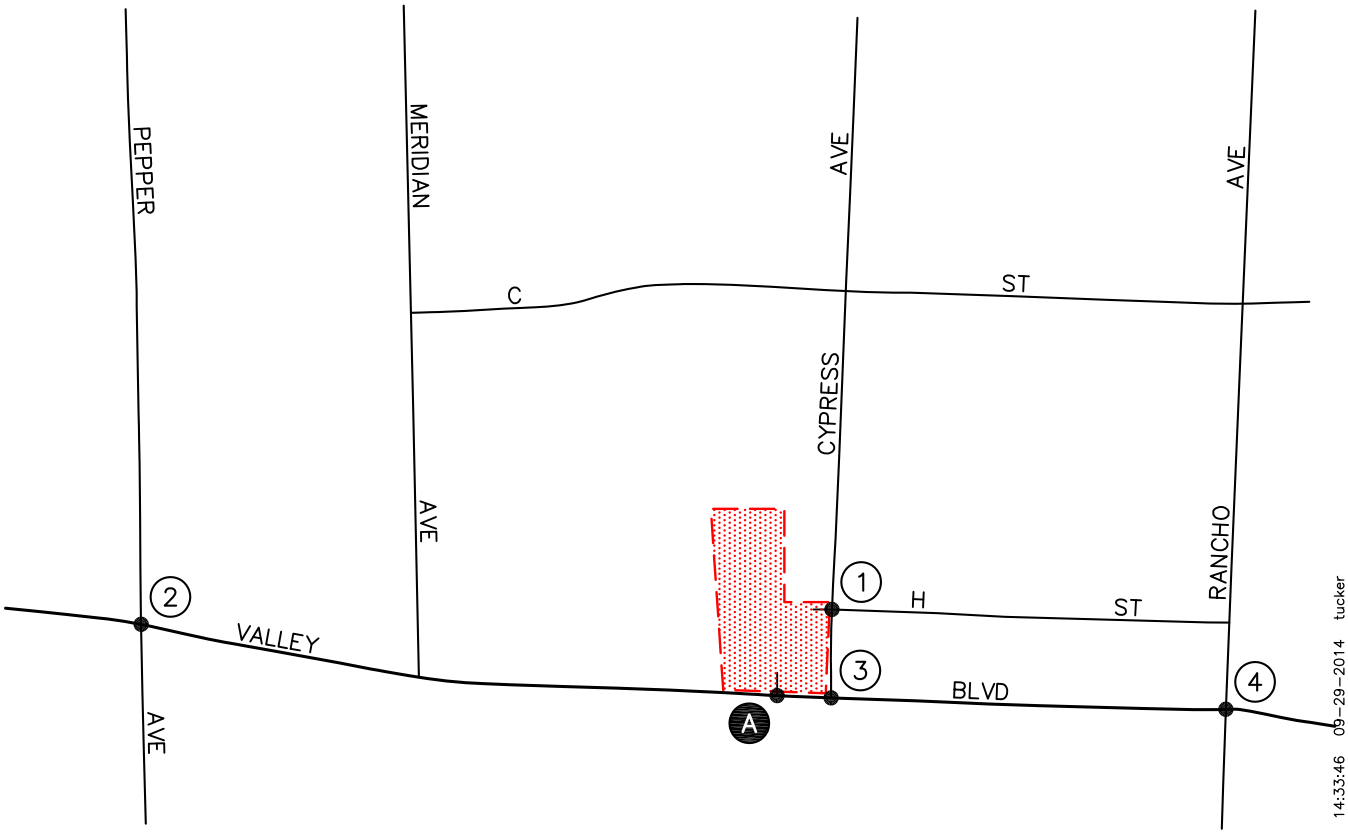
LINSCOTT LAW & GREENSPAN engineers

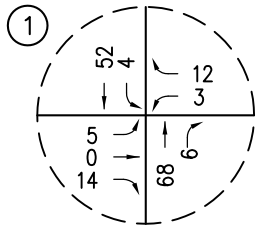
N NO SCALE

KEY
= PROJECT SITE

FIGURE 5-4

EXISTING PLUS PROJECT
AM PEAK HOUR TRAFFIC VOLUMES
LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO





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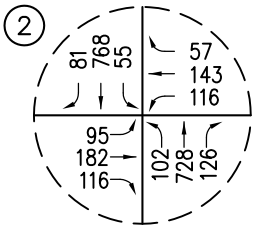
H ST



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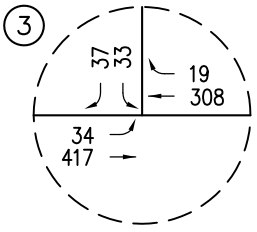
VALLEY BLVD



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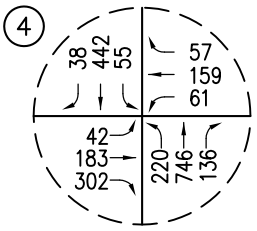
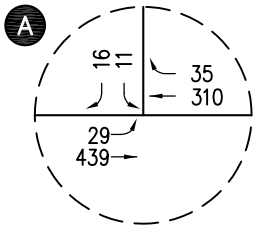
VALLEY BLVD



RANCHO AVE @
VALLEY BLVD

PROJECT DRIVEWAY



PROJECT DWY 1 @
VALLEY BLVD

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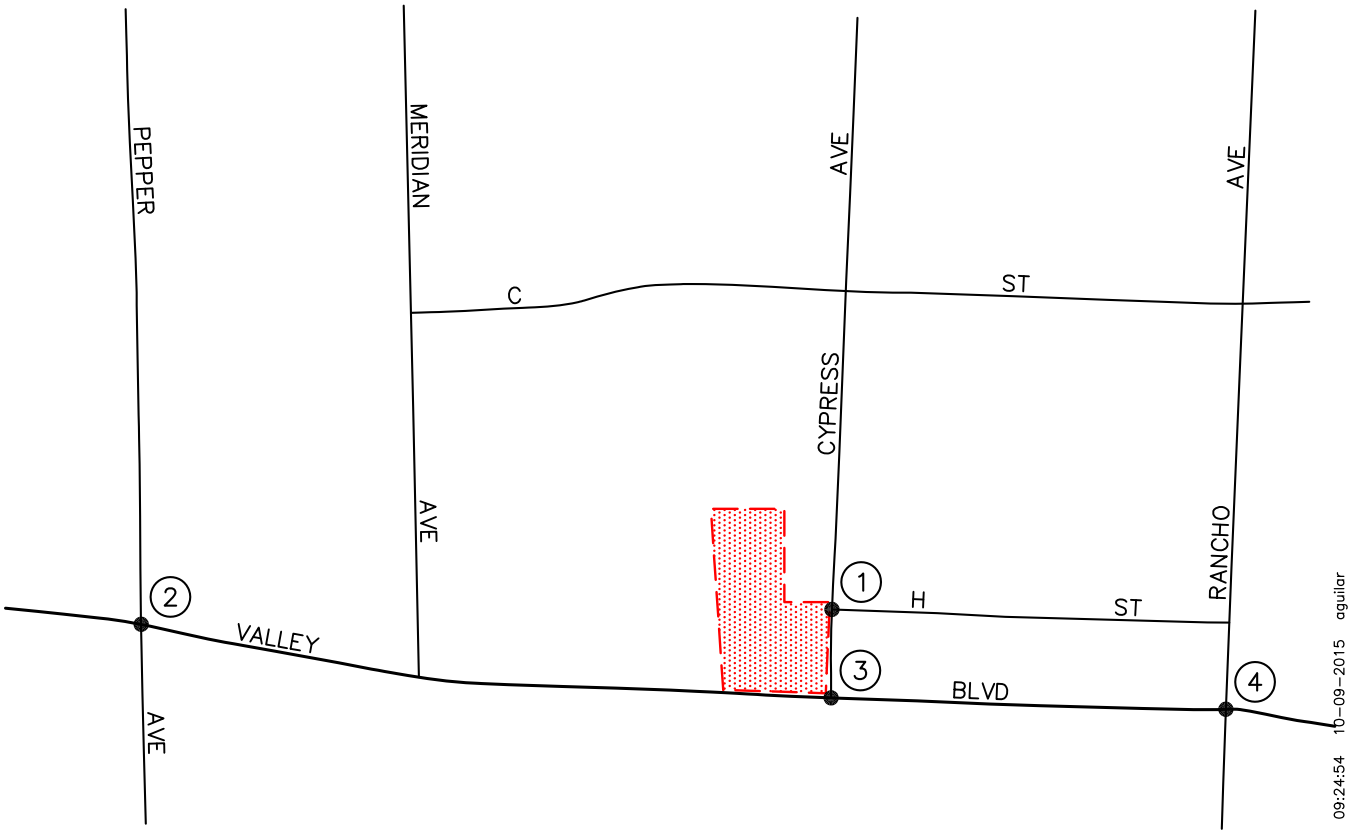
LINSCOTT LAW & GREENSPAN engineers

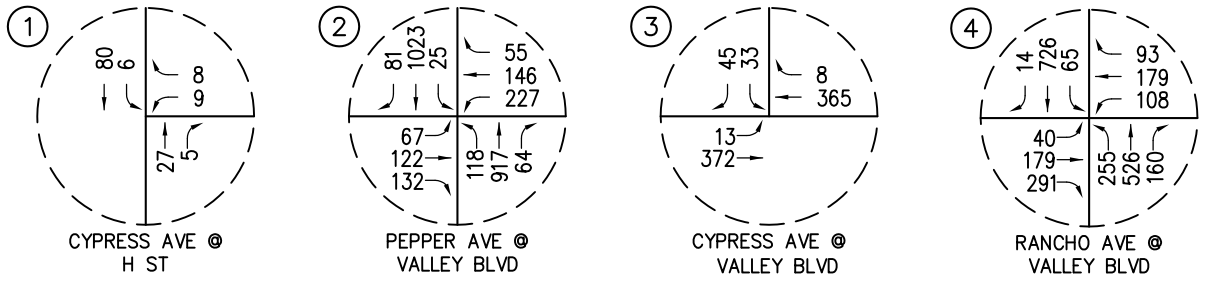
N NO SCALE

KEY
= PROJECT SITE

FIGURE 5-5

EXISTING PLUS PROJECT
PM PEAK HOUR TRAFFIC VOLUMES
LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO





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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

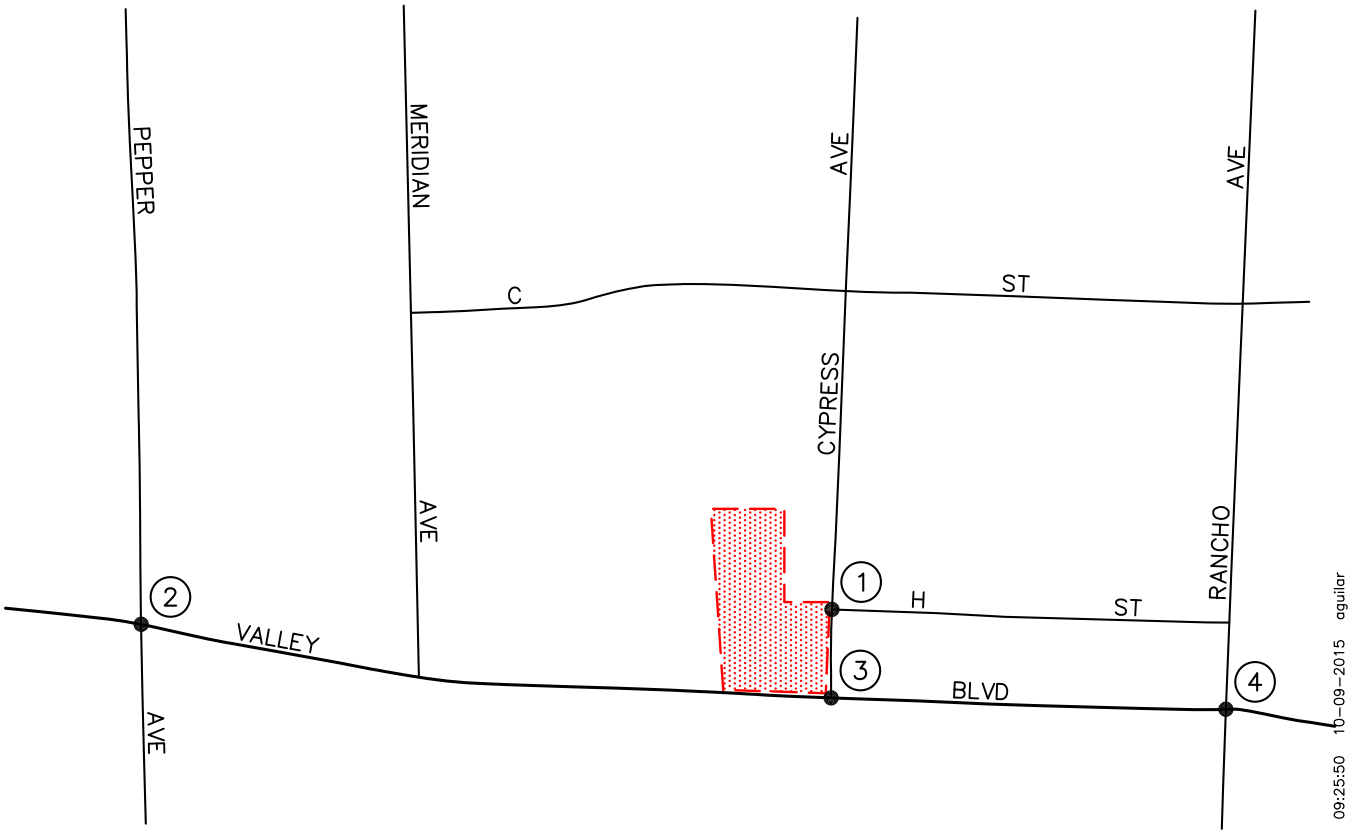
KEY

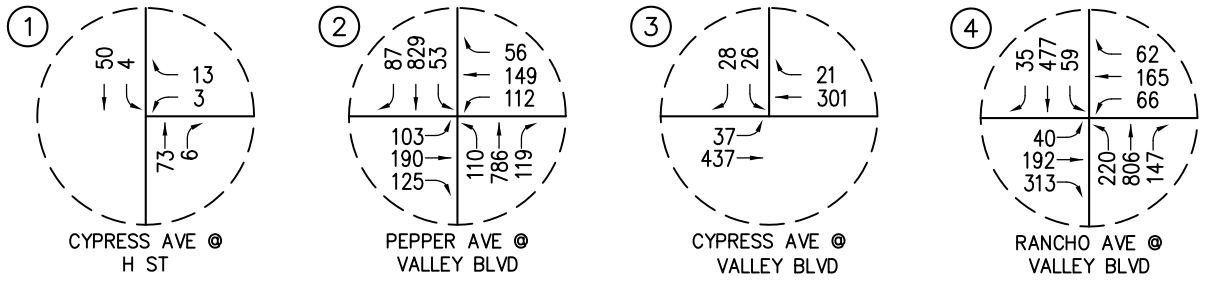
= PROJECT SITE

FIGURE 6-2

EXISTING PLUS AMBIENT (YEAR 2018) AM PEAK HOUR TRAFFIC VOLUMES

LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO





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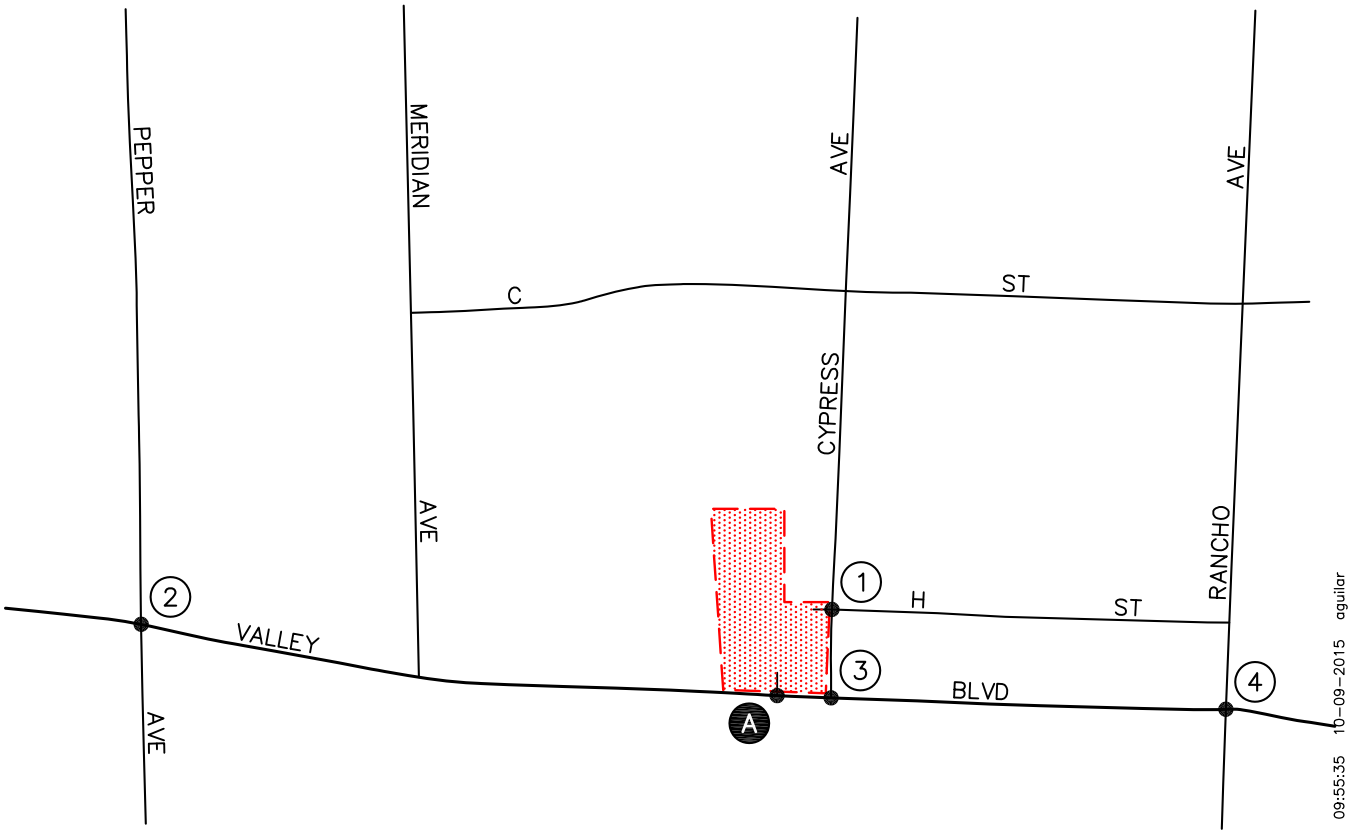
LINSCOTT LAW & GREENSPAN engineers

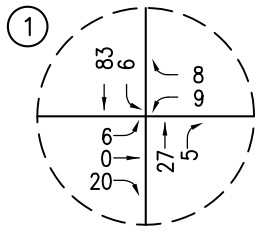
N NO SCALE

KEY
= PROJECT SITE

FIGURE 6-3

EXISTING PLUS AMBIENT (YEAR 2018)
PM PEAK HOUR TRAFFIC VOLUMES
LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO





CYPRESS AVE @
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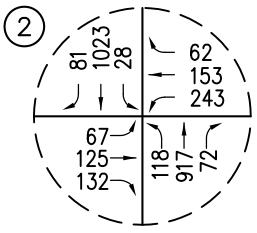
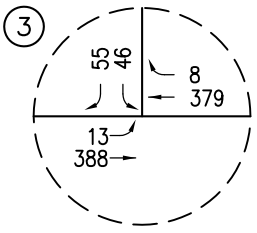
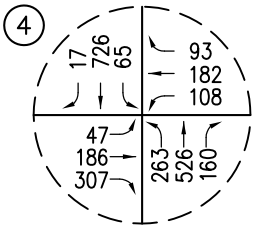


PEPPER AVE @
VALLEY BLVD

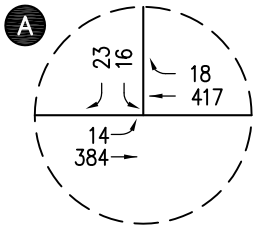


CYPRESS AVE @
VALLEY BLVD



RANCHO AVE @
VALLEY BLVD

PROJECT DRIVEWAY



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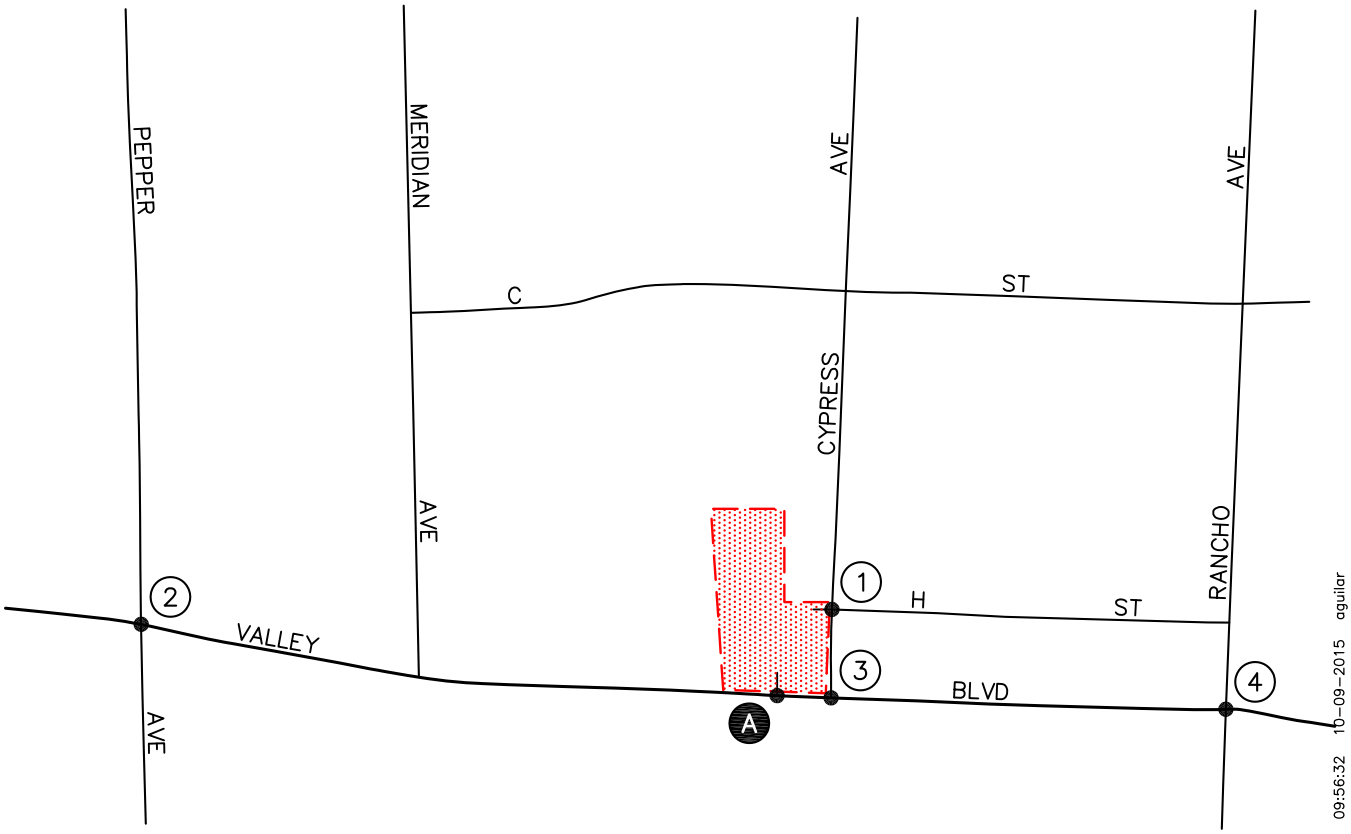
LINSCOTT LAW & GREENSPAN engineers

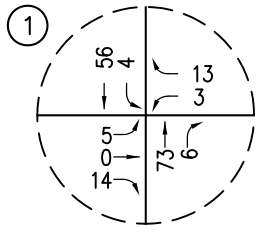
N NO SCALE

KEY
= PROJECT SITE

FIGURE 6-4

EXISTING PLUS AMBIENT
(YEAR 2018) PLUS PROJECT
AM PEAK HOUR TRAFFIC VOLUMES
LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO





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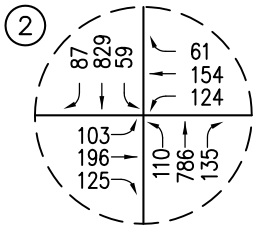
H ST



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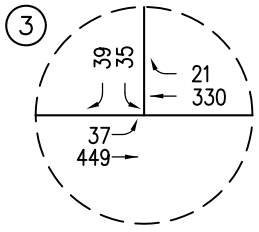
VALLEY BLVD



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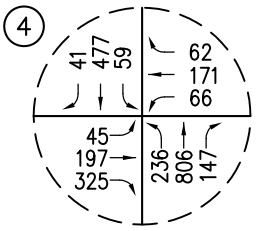
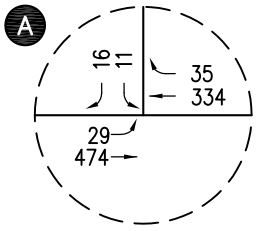
VALLEY BLVD



RANCHO AVE @
VALLEY BLVD

PROJECT DRIVEWAY



PROJECT DWY 1 @
VALLEY BLVD

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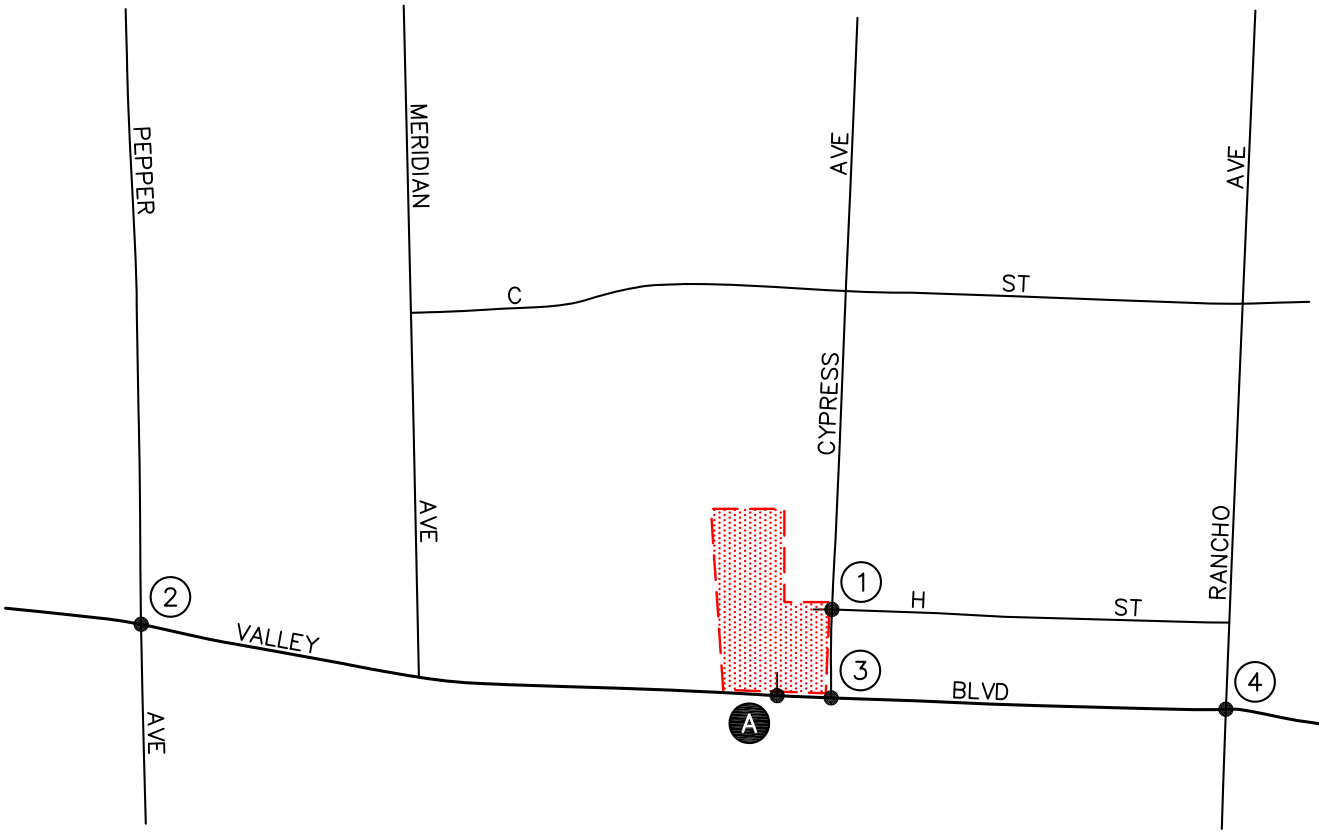
LINSCOTT LAW & GREENSPAN engineers

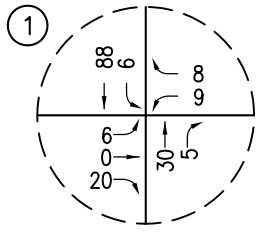
N NO SCALE

KEY
= PROJECT SITE

FIGURE 6-5

EXISTING PLUS AMBIENT
(YEAR 2018) PLUS PROJECT
PM PEAK HOUR TRAFFIC VOLUMES
LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO





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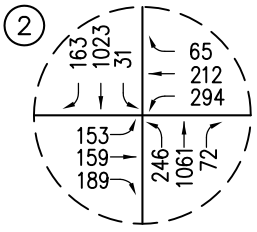
H ST



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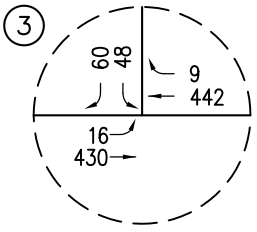
VALLEY BLVD



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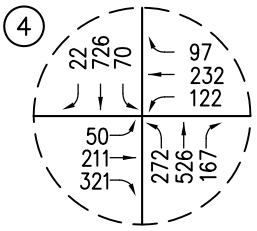
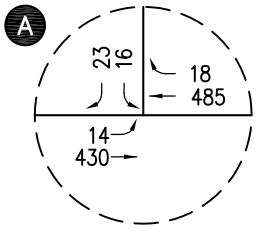
VALLEY BLVD



RANCHO AVE @
VALLEY BLVD

PROJECT DRIVEWAY



PROJECT DWY 1 @
VALLEY BLVD

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LINSCOTT LAW & GREENSPAN engineers

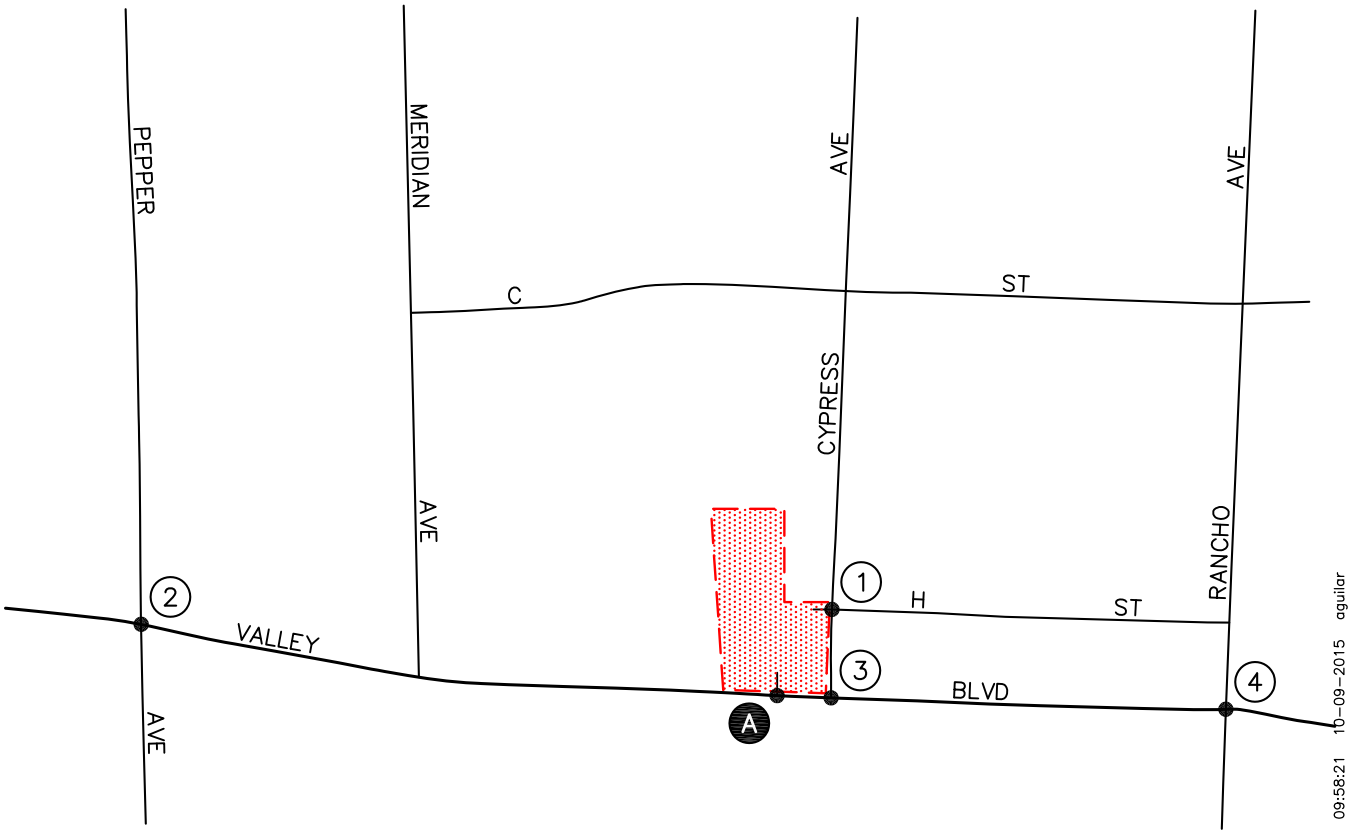
N NO SCALE

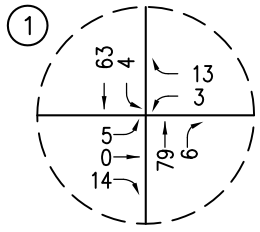
KEY
= PROJECT SITE

FIGURE 6-6

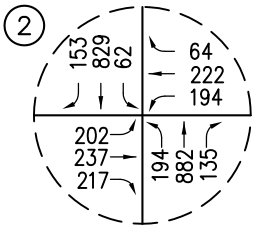
YEAR 2018 CUMULATIVE PLUS PROJECT AM PEAK HOUR TRAFFIC VOLUMES

LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO

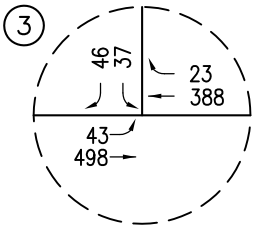




CYPRESS AVE @
H ST



PEPPER AVE @
VALLEY BLVD



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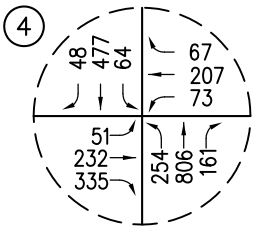
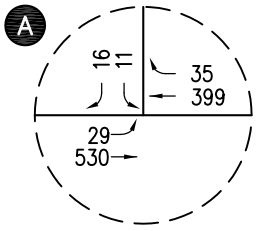
VALLEY BLVD



RANCHO AVE @
VALLEY BLVD

PROJECT DRIVEWAY



PROJECT DWY 1 @
VALLEY BLVD

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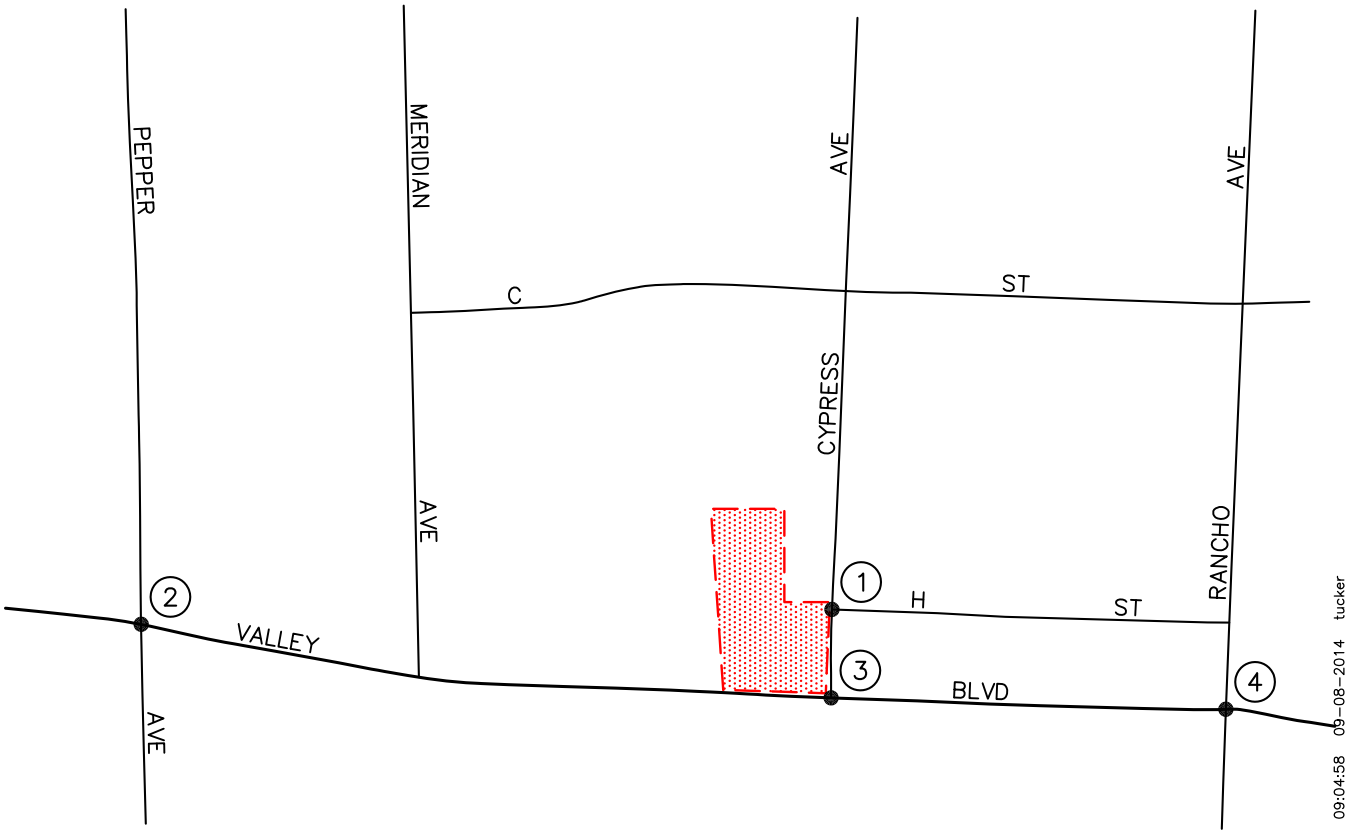
LINSCOTT LAW & GREENSPAN engineers

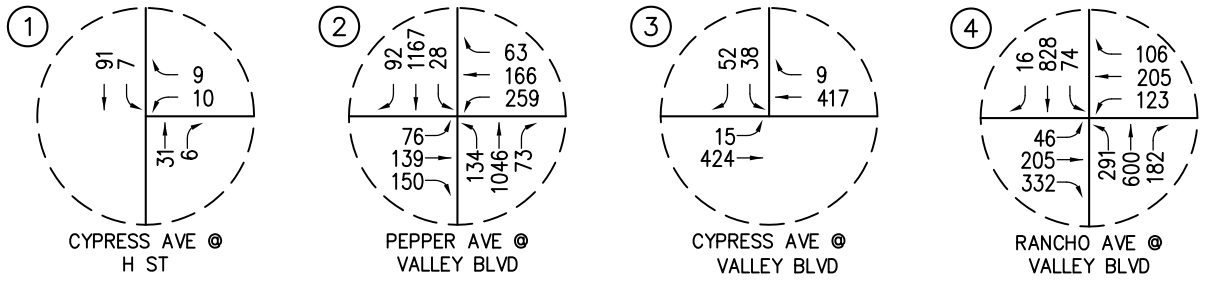
N NO SCALE

KEY
= PROJECT SITE

FIGURE 6-7

YEAR 2018 CUMULATIVE PLUS PROJECT
PM PEAK HOUR TRAFFIC VOLUMES
LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO





n:\3300\2123336 - las terrazas project, county of san bernardino\dwg\3336f6-8.dwg LDP 09:04:58 09-08-2014 tucker

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

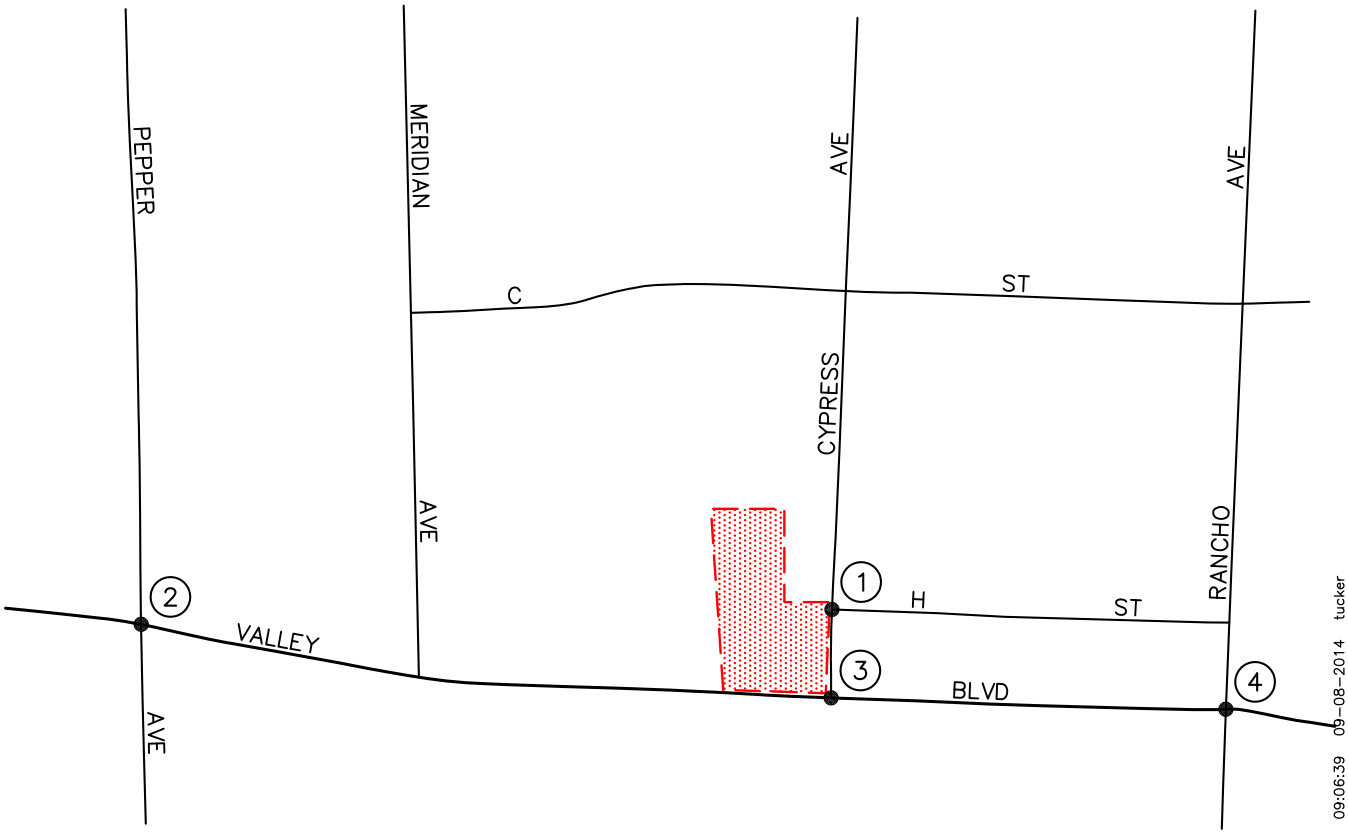
KEY

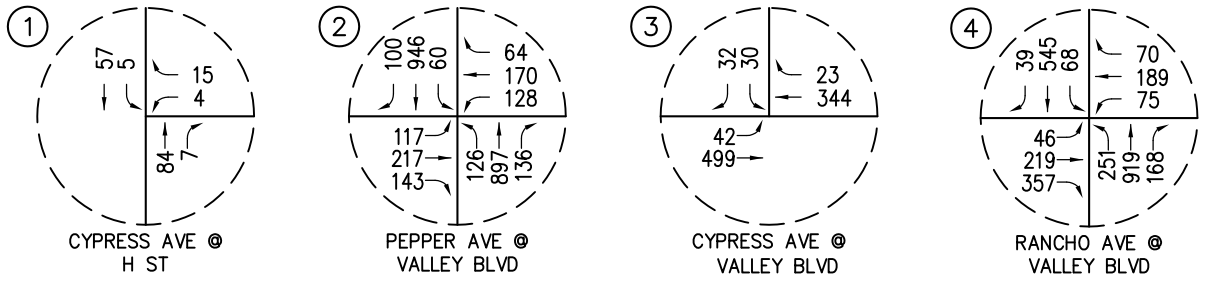
= PROJECT SITE

FIGURE 6-8

EXISTING PLUS AMBIENT (YEAR 2035 BUILDOUT) AM PEAK HOUR TRAFFIC VOLUMES

LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO





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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

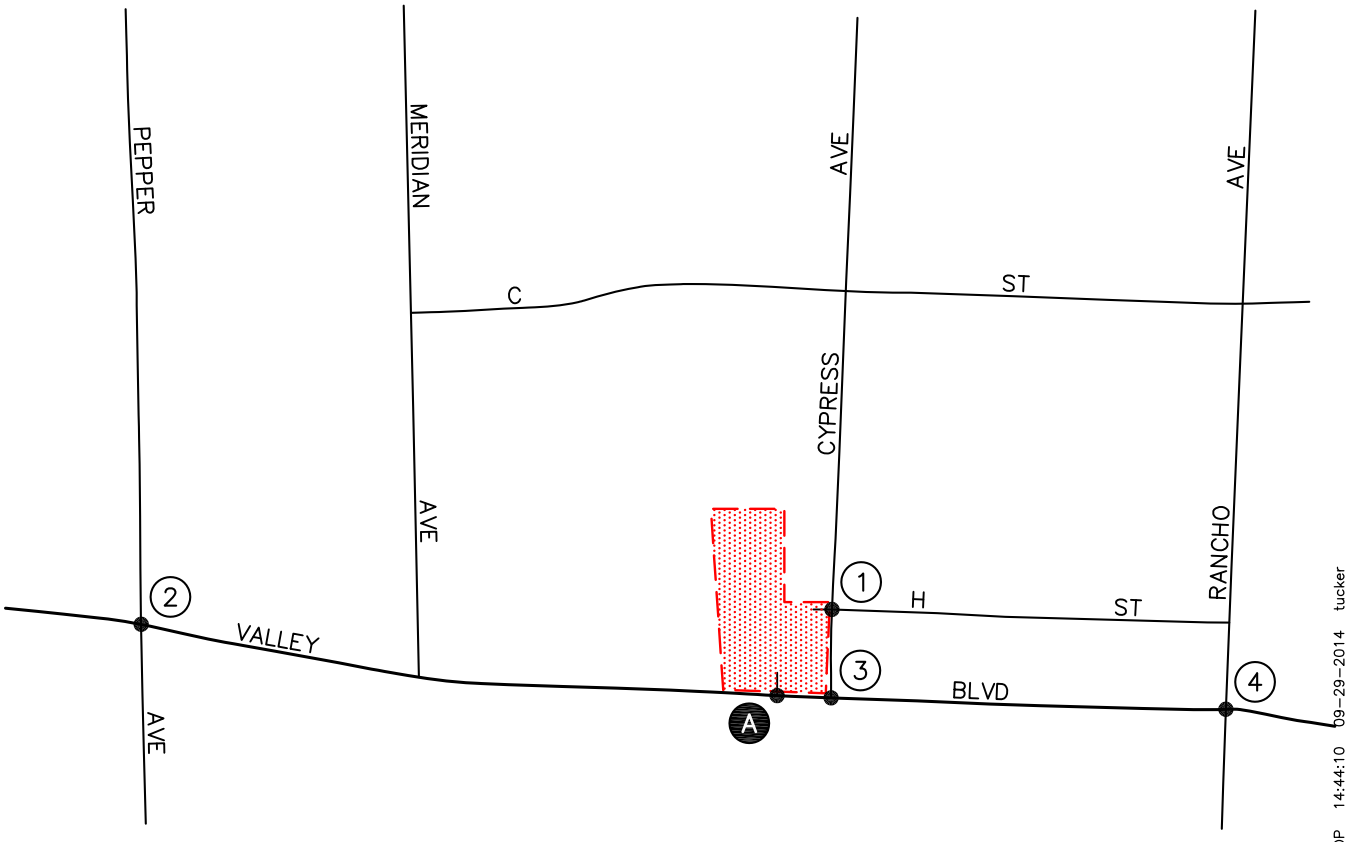
KEY

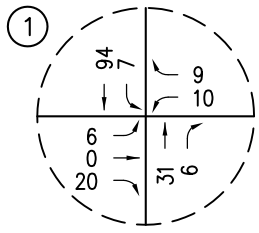
= PROJECT SITE

FIGURE 6-9

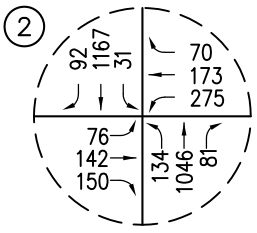
EXISTING PLUS AMBIENT (YEAR 2035 BUILDOUT) PM PEAK HOUR TRAFFIC VOLUMES

LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO

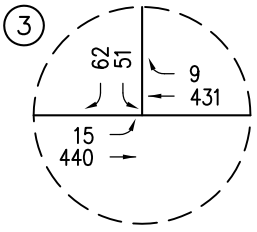




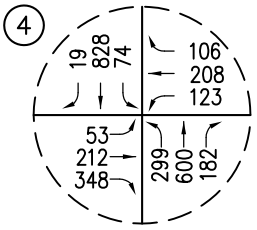
CYPRESS AVE @
H ST



PEPPER AVE @
VALLEY BLVD

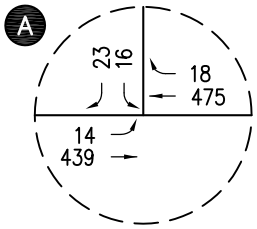


CYPRESS AVE @
VALLEY BLVD



RANCHO AVE @
VALLEY BLVD

PROJECT DRIVEWAY



PROJECT DWY 1 @
VALLEY BLVD

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

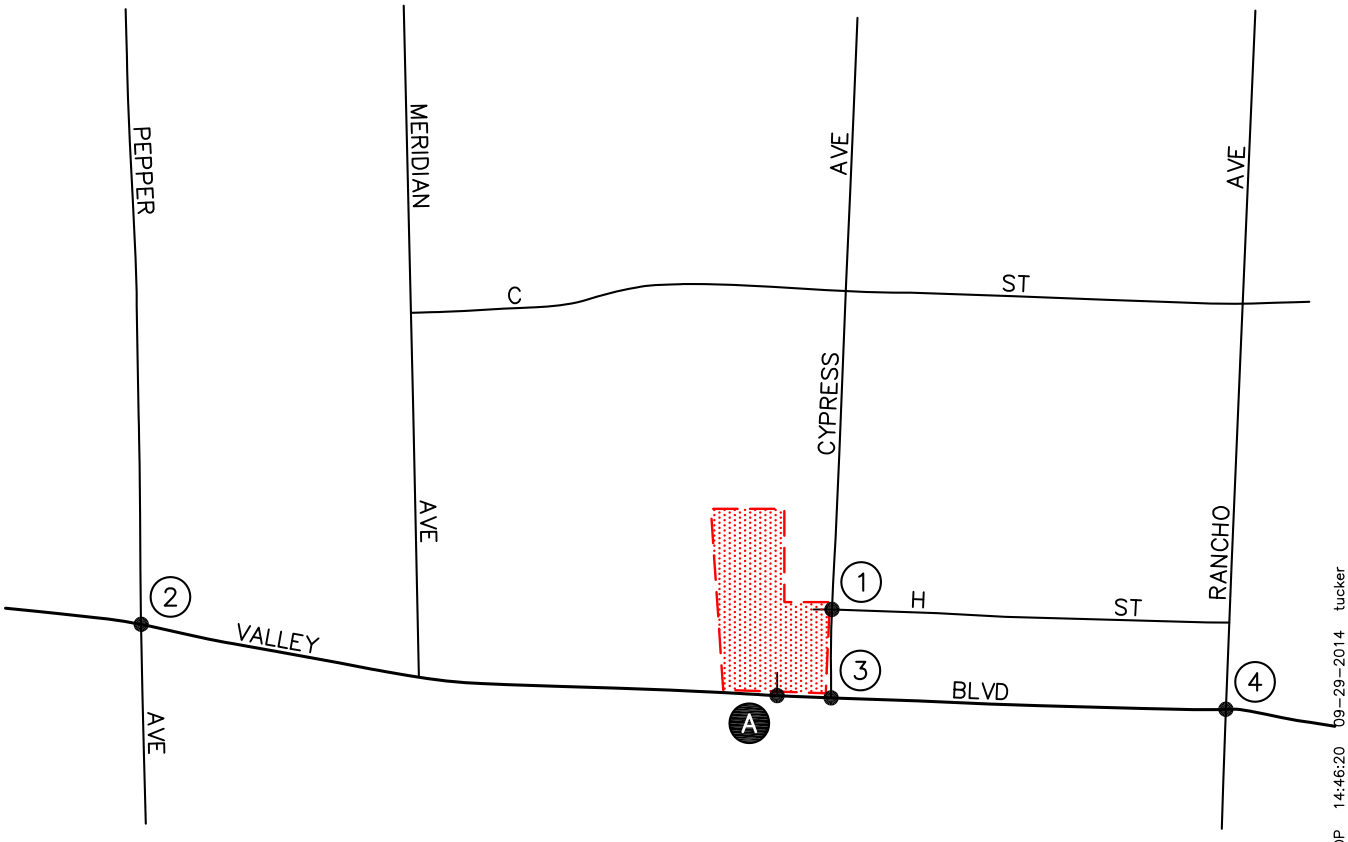
KEY

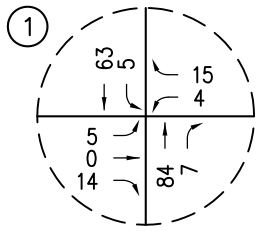
= PROJECT SITE

FIGURE 6-10

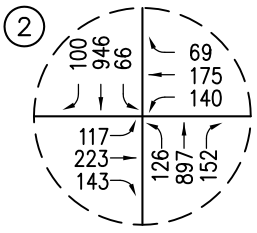
EXISTING PLUS AMBIENT
(YEAR 2035 BUILDOUT) PLUS PROJECT
AM PEAK HOUR TRAFFIC VOLUMES

LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO

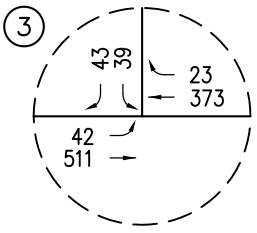




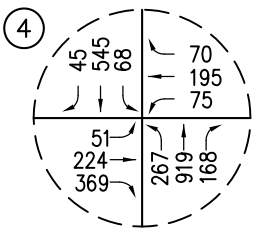
CYPRESS AVE @
H ST



PEPPER AVE @
VALLEY BLVD

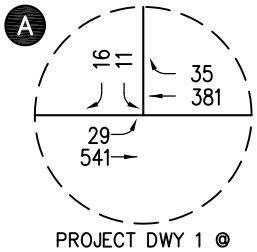


CYPRESS AVE @
VALLEY BLVD



RANCHO AVE @
VALLEY BLVD

PROJECT DRIVEWAY



PROJECT DWY 1 @
VALLEY BLVD

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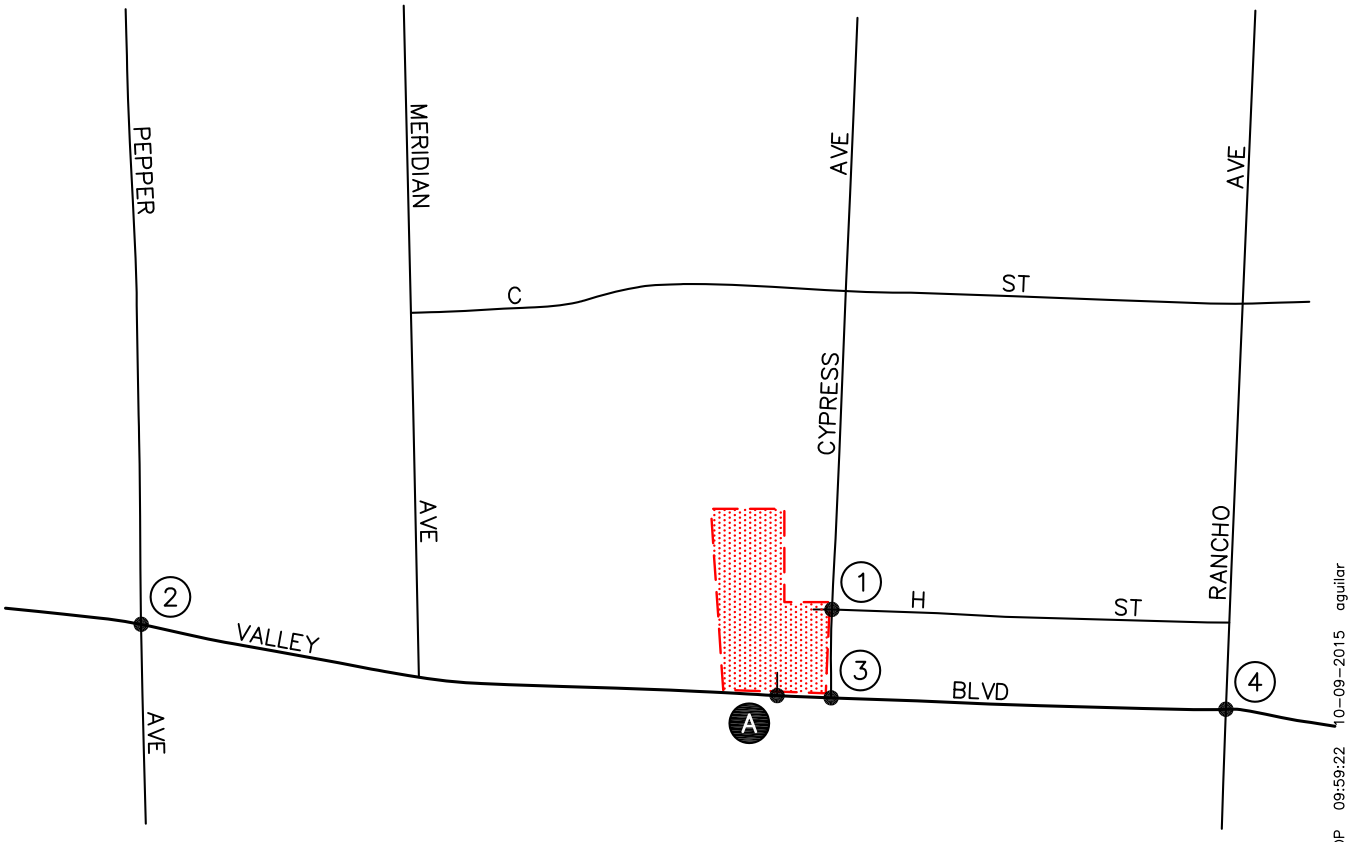
LINSCOTT LAW & GREENSPAN engineers

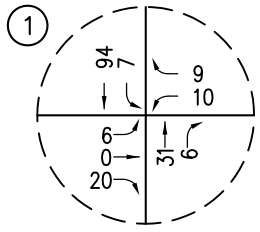
N NO SCALE

KEY
= PROJECT SITE

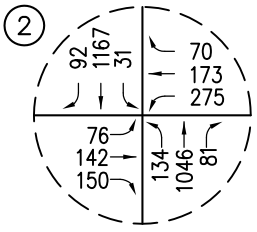
FIGURE 6-11

EXISTING PLUS AMBIENT
(YEAR 2035 BUILDOUT) PLUS PROJECT
PM PEAK HOUR TRAFFIC VOLUMES
LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO

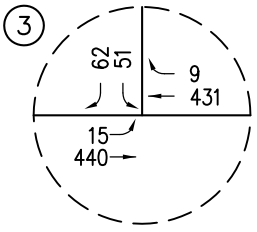




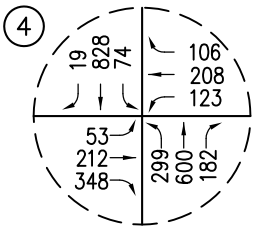
CYPRESS AVE @
H ST



PEPPER AVE @
VALLEY BLVD

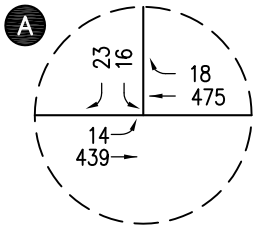


CYPRESS AVE @
VALLEY BLVD



RANCHO AVE @
VALLEY BLVD

PROJECT DRIVEWAY



PROJECT DWY 1 @
VALLEY BLVD

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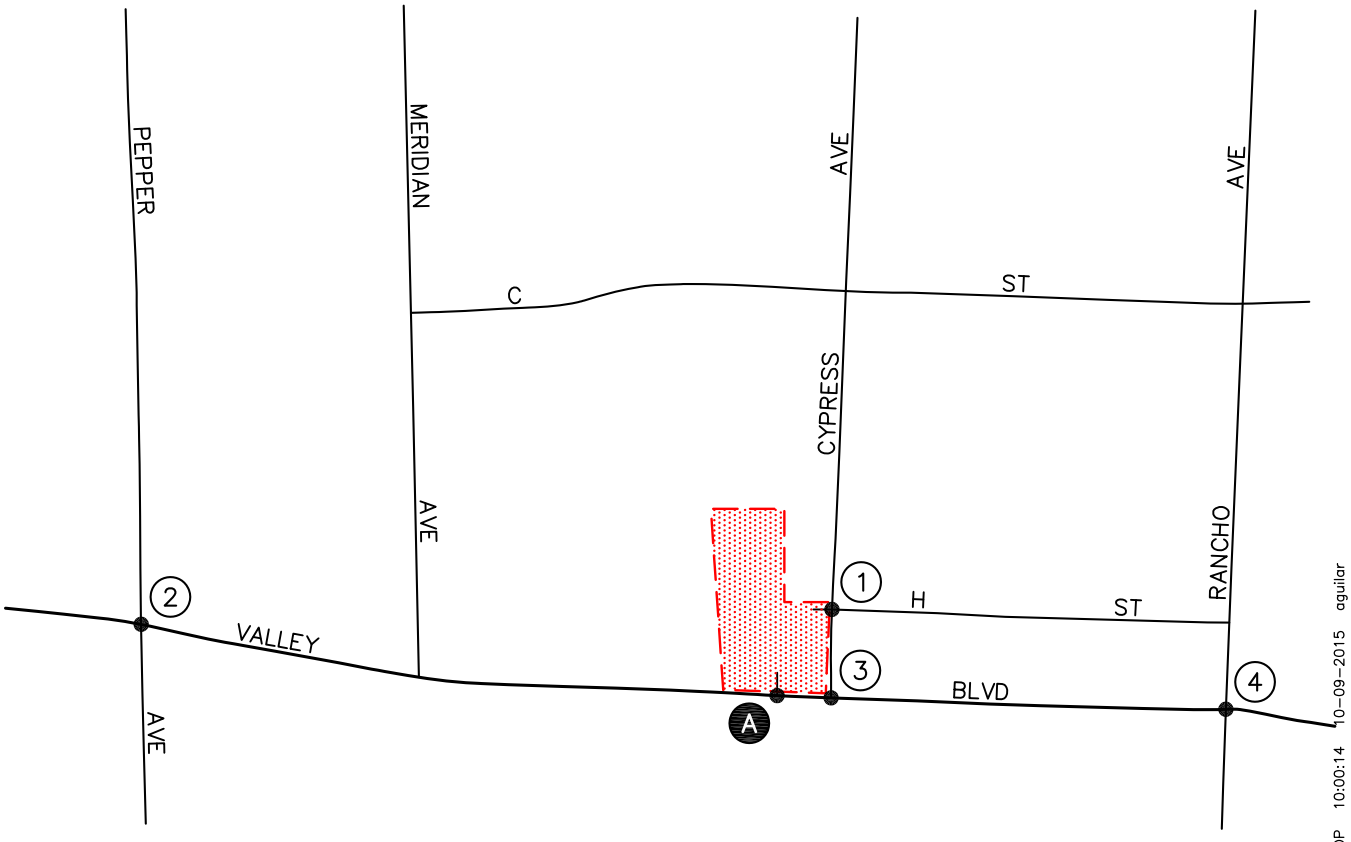
LINSCOTT LAW & GREENSPAN engineers

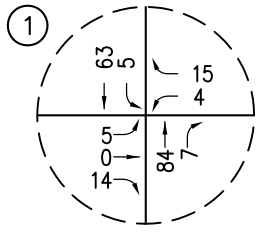
N NO SCALE

KEY
= PROJECT SITE

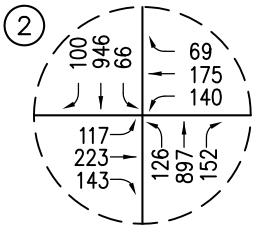
FIGURE 6-12

YEAR 2035 CUMULATIVE PLUS PROJECT
AM PEAK HOUR TRAFFIC VOLUMES
LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO

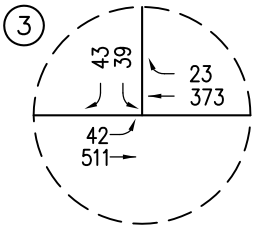




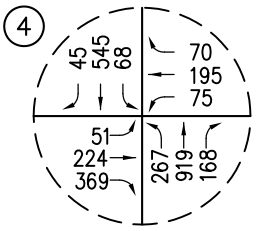
CYPRESS AVE @
H ST



PEPPER AVE @
VALLEY BLVD

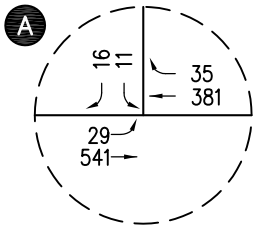


CYPRESS AVE @
VALLEY BLVD



RANCHO AVE @
VALLEY BLVD

PROJECT DRIVEWAY



PROJECT DWY 1 @
VALLEY BLVD

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY
= PROJECT SITE

FIGURE 6-13

YEAR 2035 CUMULATIVE PLUS PROJECT
PM PEAK HOUR TRAFFIC VOLUMES
LAS TERRAZAS PROJECT, COUNTY OF SAN BERNARDINO

APPENDIX D

Traffic Noise Model (TNM) Data and Results

Eilar Associates 8 October 2014
JR TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: Las Terrazas
RUN: Calibration

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

Roadway		Points					Flow Control				
Name	Width	Name	No.	Coordinates (pavement) X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	m			m	m	m		km/h	%		
Valley	3.7	point11	11	2,994.4	1,456.5	0.00				Average	
		point12	12	1,775.3	1,525.7	0.00				Average	
		point13	13	1,670.7	1,531.8	0.00				Average	
		point14	14	1,597.6	1,537.6	0.00				Average	
		point15	15	1,429.7	1,552.3	0.00				Average	
		point16	16	1,292.2	1,561.9	0.00				Average	
		point17	17	1,092.0	1,572.1	0.00				Average	
		point18	18	117.1	1,623.4	0.00					
I-10 WB	3.7	point26	26	2,988.2	1,421.1	2.00				Average	
		point27	27	1,773.7	1,492.5	2.00				Average	
		point28	28	1,639.7	1,503.9	2.00				Average	
		point29	29	1,429.9	1,517.2	2.00				Average	
		point30	30	1,282.7	1,524.3	2.00				Average	
		point31	31	1,090.8	1,540.6	2.00				Average	
		point32	32	119.6	1,592.3	2.00					
I-10 EB	3.7	point33	33	111.9	1,558.0	2.00				Average	
		point34	34	1,090.4	1,515.0	2.00				Average	
		point35	35	1,286.0	1,503.9	2.00				Average	
		point36	36	1,434.2	1,492.7	2.00				Average	
		point37	37	1,649.9	1,477.3	2.00				Average	
		point38	38	1,734.5	1,471.9	2.00				Average	
		point39	39	1,774.1	1,467.1	2.00				Average	
		point40	40	2,985.2	1,401.5	2.00					
Cypress	3.7	point41	41	1,500.4	1,547.2	0.00				Average	
		point42	42	1,508.2	1,665.8	0.00				Average	

		point43	43	1,517.3	1,790.4	0.00				Average	
		point44	44	1,539.8	2,166.7	0.00					

Eilar Associates **8 October 2014**
JR **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **Las Terrazas**
RUN: **Calibration**

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h
Valley	point11	11	508	72	4	72	12	72	0	0	0	0
	point12	12	508	72	4	72	12	72	0	0	0	0
	point13	13	508	72	4	72	12	72	0	0	0	0
	point14	14	508	72	4	72	12	72	0	0	0	0
	point15	15	508	72	4	72	12	72	0	0	0	0
	point16	16	508	72	4	72	12	72	0	0	0	0
	point17	17	508	72	4	72	12	72	0	0	0	0
	point18	18										
I-10 WB	point26	26	6305	72	156	72	409	72	0	0	0	0
	point27	27	6305	72	156	72	409	72	0	0	0	0
	point28	28	6305	72	156	72	409	72	0	0	0	0
	point29	29	6305	72	156	72	409	72	0	0	0	0
	point30	30	6305	72	156	72	409	72	0	0	0	0
	point31	31	6305	72	156	72	409	72	0	0	0	0
	point32	32										
I-10 EB	point33	33	6305	72	156	72	409	72	0	0	0	0
	point34	34	6305	72	156	72	409	72	0	0	0	0
	point35	35	6305	72	156	72	409	72	0	0	0	0
	point36	36	6305	72	156	72	409	72	0	0	0	0
	point37	37	6305	72	156	72	409	72	0	0	0	0
	point38	38	6305	72	156	72	409	72	0	0	0	0
	point39	39	6305	72	156	72	409	72	0	0	0	0
	point40	40										

Cypress	point41	41	79	40	2	40	1	40	0	0	0	0
	point42	42	79	40	2	40	1	40	0	0	0	0
	point43	43	79	40	2	40	1	40	0	0	0	0
	point44	44										

Eilar Associates 8 October 2014
JR TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Las Terrazas
RUN: Calibration

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			m	m	m	m	dBA	dBA	dB	dB	
Receiver1	1	1	1,428.3	1,560.7	0.00	1.50	0.00	66	10.0	8.0	Y

Eilar Associates
JR
8 October 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Las Terrazas
RUN: Calibration
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	75.6	66	75.6	10	Snd Lvl	75.6	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	1	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Eilar Associates **8 October 2014**
JR **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **Las Terrazas**
RUN: **Current**

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h
Valley	point11	11	403	72	8	72	4	72	0	0	0	0
	point12	12	403	72	8	72	4	72	0	0	0	0
	point13	13	403	72	8	72	4	72	0	0	0	0
	point14	14	403	72	8	72	4	72	0	0	0	0
	point15	15	403	72	8	72	4	72	0	0	0	0
	point16	16	403	72	8	72	4	72	0	0	0	0
	point17	17	403	72	8	72	4	72	0	0	0	0
	point18	18										
I-10 WB	point26	26	5432	72	134	72	353	72	0	0	0	0
	point27	27	5432	72	134	72	353	72	0	0	0	0
	point28	28	5432	72	134	72	353	72	0	0	0	0
	point29	29	5432	72	134	72	353	72	0	0	0	0
	point30	30	5432	72	134	72	353	72	0	0	0	0
	point31	31	5432	72	134	72	353	72	0	0	0	0
	point32	32										
I-10 EB	point33	33	5432	72	134	72	353	72	0	0	0	0
	point34	34	5432	72	134	72	353	72	0	0	0	0
	point35	35	5432	72	134	72	353	72	0	0	0	0
	point36	36	5432	72	134	72	353	72	0	0	0	0
	point37	37	5432	72	134	72	353	72	0	0	0	0
	point38	38	5432	72	134	72	353	72	0	0	0	0
	point39	39	5432	72	134	72	353	72	0	0	0	0
	point40	40										

INPUT: TRAFFIC FOR LAeq1h Volumes **Las Terrazas**

Cypress	point41	41	68	40	1	40	1	40	0	0	0	0
	point42	42	68	40	1	40	1	40	0	0	0	0
	point43	43	68	40	1	40	1	40	0	0	0	0
	point44	44										

Eilar Associates 8 October 2014
JR TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Las Terrazas
RUN: Current

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			m	m	m	m	dBA	dBA	dB	dB	
Receiver1	1	1	1,380.0	1,560.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver3	3	1	1,400.0	1,560.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver4	4	1	1,420.0	1,560.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver5	5	1	1,440.0	1,560.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver6	6	1	1,460.0	1,560.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver7	7	1	1,480.0	1,560.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver8	8	1	1,500.0	1,560.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver9	9	1	1,380.0	1,580.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver10	10	1	1,400.0	1,580.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver11	11	1	1,420.0	1,580.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver12	12	1	1,440.0	1,580.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver13	13	1	1,460.0	1,580.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver14	14	1	1,480.0	1,580.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver15	15	1	1,500.0	1,580.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver16	16	1	1,380.0	1,600.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver17	17	1	1,400.0	1,600.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver18	18	1	1,420.0	1,600.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver19	19	1	1,440.0	1,600.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver20	20	1	1,460.0	1,600.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver21	21	1	1,480.0	1,600.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver22	22	1	1,500.0	1,600.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver23	23	1	1,380.0	1,620.0	0.00	1.50	0.00	66	10.0	8.0	Y

Receiver24	24	1	1,400.0	1,620.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver25	25	1	1,420.0	1,620.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver26	26	1	1,440.0	1,620.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver27	27	1	1,460.0	1,620.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver28	28	1	1,480.0	1,620.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver29	29	1	1,500.0	1,620.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver30	30	1	1,380.0	1,640.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver31	31	1	1,400.0	1,640.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver32	32	1	1,420.0	1,640.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver33	33	1	1,440.0	1,640.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver34	34	1	1,460.0	1,640.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver35	35	1	1,480.0	1,640.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver36	36	1	1,500.0	1,640.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver37	37	1	1,380.0	1,660.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver38	38	1	1,400.0	1,660.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver39	39	1	1,420.0	1,660.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver40	40	1	1,440.0	1,660.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver41	41	1	1,460.0	1,660.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver42	42	1	1,480.0	1,660.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver43	43	1	1,500.0	1,660.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver44	44	1	1,380.0	1,680.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver45	45	1	1,400.0	1,680.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver46	46	1	1,420.0	1,680.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver47	47	1	1,440.0	1,680.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver48	48	1	1,460.0	1,680.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver49	49	1	1,480.0	1,680.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver50	50	1	1,500.0	1,680.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver51	51	1	1,380.0	1,700.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver52	52	1	1,400.0	1,700.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver53	53	1	1,420.0	1,700.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver54	54	1	1,440.0	1,700.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver55	55	1	1,460.0	1,700.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver56	56	1	1,480.0	1,700.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver57	57	1	1,500.0	1,700.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver58	58	1	1,380.0	1,720.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver59	59	1	1,400.0	1,720.0	0.00	1.50	0.00	66	10.0	8.0	Y

Receiver60	60	1	1,420.0	1,720.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver61	61	1	1,440.0	1,720.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver62	62	1	1,460.0	1,720.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver63	63	1	1,480.0	1,720.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver64	64	1	1,500.0	1,720.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver65	65	1	1,380.0	1,740.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver66	66	1	1,400.0	1,740.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver67	67	1	1,420.0	1,740.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver68	68	1	1,440.0	1,740.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver69	69	1	1,460.0	1,740.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver70	70	1	1,480.0	1,740.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver71	71	1	1,500.0	1,740.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver72	72	1	1,380.0	1,760.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver73	73	1	1,400.0	1,760.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver74	74	1	1,420.0	1,760.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver75	75	1	1,440.0	1,760.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver76	76	1	1,460.0	1,760.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver77	77	1	1,480.0	1,760.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver78	78	1	1,500.0	1,760.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver79	79	1	1,380.0	1,780.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver80	80	1	1,400.0	1,780.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver81	81	1	1,420.0	1,780.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver82	82	1	1,440.0	1,780.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver83	83	1	1,460.0	1,780.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver84	84	1	1,480.0	1,780.0	0.00	1.50	0.00	66	10.0	8.0	Y
Receiver85	85	1	1,500.0	1,780.0	0.00	1.50	0.00	66	10.0	8.0	Y

Eilar Associates **8 October 2014**
JR **TNM 2.5**

INPUT: BARRIERS
PROJECT/CONTRACT: **Las Terrazas**
RUN: **Current**

Barrier									**Points**										
Name	**Type**	**Height**		**If Wall**	**If Berm**			**Add'tnl**	**Name**	**No.**	**Coordinates (bottom)**			**Height**	**Segment**				
		Min	**Max**	**$ per**	**$ per**	**Top**	**Run:Rise**	**$ per**			**X**	**Y**	**Z**	**at**	**Seg Ht Perturbs**			**On**	**Important**
				Unit	**Unit**	**Width**		**Unit**						**Point**	**Incre-**	**#Up**	**#Dn**	**Struct?**	**Reflec-**
				Area	**Vol.**			**Length**							**ment**				**tions?**
		m	m	$/sq m	$/cu m	m	m:m	$/m			m	m	m	m	m				
Storage Building	W	0.00	30.48	0.00				0.00	point35	35	1,368.8	1,790.7	0.00	6.10	0.00	0	0		
									point36	36	1,372.1	1,791.0	0.00	6.10	0.00	0	0		
									point37	37	1,386.4	1,587.3	0.00	6.10	0.00	0	0		
									point38	38	1,382.9	1,587.0	0.00	6.10	0.00	0	0		
									point39	39	1,368.8	1,790.7	0.00	6.10					
Building A	W	0.00	30.48	0.00				0.00	point40	40	1,383.8	1,767.4	0.00	0.00	0.00	0	0		
									point41	41	1,397.1	1,767.5	0.00	0.00	0.00	0	0		
									point42	42	1,397.4	1,759.6	0.00	0.00	0.00	0	0		
									point43	43	1,402.1	1,759.7	0.00	0.00	0.00	0	0		
									point44	44	1,402.2	1,767.7	0.00	0.00	0.00	0	0		
									point45	45	1,416.6	1,767.2	0.00	0.00	0.00	0	0		
									point46	46	1,416.1	1,760.0	0.00	0.00	0.00	0	0		
									point47	47	1,421.5	1,759.9	0.00	0.00	0.00	0	0		
									point48	48	1,421.5	1,767.5	0.00	0.00	0.00	0	0		
									point49	49	1,431.9	1,767.4	0.00	0.00	0.00	0	0		
									point50	50	1,431.6	1,759.9	0.00	0.00	0.00	0	0		
									point51	51	1,432.9	1,759.8	0.00	0.00	0.00	0	0		
									point52	52	1,432.8	1,752.1	0.00	0.00	0.00	0	0		
									point53	53	1,385.8	1,752.0	0.00	0.00	0.00	0	0		
									point54	54	1,385.8	1,759.8	0.00	0.00	0.00	0	0		
									point55	55	1,384.0	1,759.8	0.00	0.00	0.00	0	0		
									point56	56	1,383.8	1,767.4	0.00	0.00					
Building B	W	0.00	30.48	0.00				0.00	point74	74	1,415.9	1,737.8	0.00	0.00	0.00	0	0		
									point75	75	1,431.0	1,736.9	0.00	0.00	0.00	0	0		
									point76	76	1,431.4	1,729.5	0.00	0.00	0.00	0	0		
									point77	77	1,423.7	1,729.7	0.00	0.00	0.00	0	0		
									point78	78	1,423.7	1,724.7	0.00	0.00	0.00	0	0		
									point79	79	1,431.0	1,724.7	0.00	0.00	0.00	0	0		
									point80	80	1,431.2	1,710.7	0.00	0.00	0.00	0	0		
									point81	81	1,424.0	1,710.8	0.00	0.00	0.00	0	0		
									point82	82	1,423.8	1,705.4	0.00	0.00	0.00	0	0		
									point83	83	1,431.6	1,705.5	0.00	0.00	0.00	0	0		
									point84	84	1,431.5	1,692.2	0.00	0.00	0.00	0	0		
									point85	85	1,423.5	1,692.1	0.00	0.00	0.00	0	0		
									point86	86	1,423.6	1,693.4	0.00	0.00	0.00	0	0		

									point87	87	1,415.6	1,693.9	0.00	0.00	0.00	0	0		
									point88	88	1,415.9	1,737.8	0.00	0.00					
Building C	W	0.00	30.48	0.00				0.00	point89	89	1,413.8	1,667.1	0.00	0.00	0.00	0	0		
									point90	90	1,421.7	1,666.9	0.00	0.00	0.00	0	0		
									point91	91	1,421.7	1,665.4	0.00	0.00	0.00	0	0		
									point92	92	1,429.5	1,665.1	0.00	0.00	0.00	0	0		
									point93	93	1,429.3	1,621.6	0.00	0.00	0.00	0	0		
									point94	94	1,421.8	1,621.4	0.00	0.00	0.00	0	0		
									point95	95	1,421.9	1,622.7	0.00	0.00	0.00	0	0		
									point96	96	1,414.4	1,622.7	0.00	0.00	0.00	0	0		
									point97	97	1,414.4	1,629.8	0.00	0.00	0.00	0	0		
									point98	98	1,422.2	1,629.5	0.00	0.00	0.00	0	0		
									point99	99	1,422.0	1,634.4	0.00	0.00	0.00	0	0		
									point100	100	1,414.4	1,634.4	0.00	0.00	0.00	0	0		
									point101	101	1,414.4	1,648.4	0.00	0.00	0.00	0	0		
									point102	102	1,421.8	1,648.4	0.00	0.00	0.00	0	0		
									point103	103	1,421.8	1,653.7	0.00	0.00	0.00	0	0		
									point104	104	1,414.1	1,653.5	0.00	0.00	0.00	0	0		
									point105	105	1,413.8	1,667.1	0.00	0.00					
Building D	W	0.00	30.48	0.00				0.00	point106	106	1,485.2	1,663.7	0.00	0.00	0.00	0	0		
									point107	107	1,492.9	1,663.5	0.00	0.00	0.00	0	0		
									point108	108	1,493.1	1,661.8	0.00	0.00	0.00	0	0		
									point109	109	1,500.8	1,662.0	0.00	0.00	0.00	0	0		
									point110	110	1,501.0	1,614.8	0.00	0.00	0.00	0	0		
									point111	111	1,493.2	1,614.7	0.00	0.00	0.00	0	0		
									point112	112	1,493.3	1,613.0	0.00	0.00	0.00	0	0		
									point113	113	1,485.2	1,612.6	0.00	0.00	0.00	0	0		
									point114	114	1,485.2	1,622.7	0.00	0.00	0.00	0	0		
									point115	115	1,493.0	1,622.8	0.00	0.00	0.00	0	0		
									point116	116	1,493.2	1,627.9	0.00	0.00	0.00	0	0		
									point117	117	1,485.3	1,627.7	0.00	0.00	0.00	0	0		
									point118	118	1,485.3	1,648.2	0.00	0.00	0.00	0	0		
									point119	119	1,493.1	1,648.5	0.00	0.00	0.00	0	0		
									point120	120	1,493.2	1,653.2	0.00	0.00	0.00	0	0		
									point121	121	1,485.3	1,653.4	0.00	0.00	0.00	0	0		
									point122	122	1,485.2	1,663.7	0.00	0.00					
Building E	W	0.00	30.48	0.00				0.00	point123	123	1,393.8	1,593.0	0.00	0.00	0.00	0	0		
									point124	124	1,407.3	1,593.0	0.00	0.00	0.00	0	0		
									point125	125	1,407.5	1,585.5	0.00	0.00	0.00	0	0		
									point126	126	1,412.5	1,585.7	0.00	0.00	0.00	0	0		
									point127	127	1,412.2	1,593.1	0.00	0.00	0.00	0	0		
									point128	128	1,426.7	1,593.1	0.00	0.00	0.00	0	0		
									point129	129	1,426.7	1,585.6	0.00	0.00	0.00	0	0		
									point130	130	1,431.1	1,585.4	0.00	0.00	0.00	0	0		
									point131	131	1,431.5	1,592.7	0.00	0.00	0.00	0	0		
									point132	132	1,441.5	1,592.6	0.00	0.00	0.00	0	0		
									point133	133	1,441.8	1,585.7	0.00	0.00	0.00	0	0		
									point134	134	1,443.0	1,585.6	0.00	0.00	0.00	0	0		
									point135	135	1,443.1	1,577.7	0.00	0.00	0.00	0	0		

									point136	136	1,395.8	1,578.0	0.00	0.00	0.00	0	0		
									point137	137	1,395.6	1,585.7	0.00	0.00	0.00	0	0		
									point138	138	1,394.0	1,585.7	0.00	0.00	0.00	0	0		
									point139	139	1,393.8	1,593.0	0.00	0.00					
Community Building	W	0.00	30.48	0.00				0.00	point140	140	1,435.5	1,629.4	0.00	0.00	0.00	0	0		
									point141	141	1,440.7	1,629.6	0.00	0.00	0.00	0	0		
									point142	142	1,440.4	1,636.9	0.00	0.00	0.00	0	0		
									point143	143	1,447.6	1,636.6	0.00	0.00	0.00	0	0		
									point144	144	1,447.9	1,629.9	0.00	0.00	0.00	0	0		
									point145	145	1,451.4	1,629.8	0.00	0.00	0.00	0	0		
									point146	146	1,451.4	1,635.3	0.00	0.00	0.00	0	0		
									point147	147	1,456.8	1,635.2	0.00	0.00	0.00	0	0		
									point148	148	1,456.9	1,618.2	0.00	0.00	0.00	0	0		
									point149	149	1,452.1	1,618.4	0.00	0.00	0.00	0	0		
									point150	150	1,451.2	1,623.6	0.00	0.00	0.00	0	0		
									point151	151	1,448.1	1,623.7	0.00	0.00	0.00	0	0		
									point152	152	1,448.0	1,622.2	0.00	0.00	0.00	0	0		
									point153	153	1,435.9	1,622.1	0.00	0.00	0.00	0	0		
									point154	154	1,435.5	1,629.4	0.00	0.00					
Child Care Building	W	0.00	30.48	0.00				0.00	point155	155	1,486.2	1,591.0	0.00	0.00	0.00	0	0		
									point156	156	1,488.8	1,591.1	0.00	0.00	0.00	0	0		
									point157	157	1,488.9	1,596.8	0.00	0.00	0.00	0	0		
									point158	158	1,497.7	1,596.8	0.00	0.00	0.00	0	0		
									point159	159	1,497.8	1,587.3	0.00	0.00	0.00	0	0		
									point160	160	1,501.1	1,587.3	0.00	0.00	0.00	0	0		
									point161	161	1,501.0	1,576.3	0.00	0.00	0.00	0	0		
									point162	162	1,491.1	1,576.2	0.00	0.00	0.00	0	0		
									point163	163	1,491.0	1,579.7	0.00	0.00	0.00	0	0		
									point164	164	1,488.1	1,579.6	0.00	0.00	0.00	0	0		
									point165	165	1,488.3	1,584.6	0.00	0.00	0.00	0	0		
									point166	166	1,486.2	1,584.5	0.00	0.00	0.00	0	0		
									point167	167	1,486.2	1,591.0	0.00	0.00					
Perimeter Wall	W	0.00	30.48	0.00				0.00	point168	168	1,509.8	1,682.3	0.00	0.00	0.00	0	0		
									point169	169	1,458.4	1,683.4	0.00	0.00	0.00	0	0		
									point170	170	1,462.9	1,797.3	0.00	0.00	0.00	0	0		
									point171	171	1,372.8	1,796.7	0.00	0.00	0.00	0	0		
									point172	172	1,388.7	1,567.5	0.00	0.00					

RESULTS: SOUND LEVELS **Las Terrazas**

Eilar Associates **8 October 2014**

JR **TNM 2.5**

Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: **Las Terrazas**

RUN: **Current**

BARRIER DESIGN: **INPUT HEIGHTS**

ATMOSPHERICS: **20 deg C, 50% RH**

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	75.6	66	75.6	10	Snd Lvl	75.6	0.0	8	-8.0
Receiver3	3	1	0.0	75.3	66	75.3	10	Snd Lvl	75.3	0.0	8	-8.0
Receiver4	4	1	0.0	75.1	66	75.1	10	Snd Lvl	75.1	0.0	8	-8.0
Receiver5	5	1	0.0	74.8	66	74.8	10	Snd Lvl	74.8	0.0	8	-8.0
Receiver6	6	1	0.0	74.6	66	74.6	10	Snd Lvl	74.6	0.0	8	-8.0
Receiver7	7	1	0.0	74.4	66	74.4	10	Snd Lvl	74.4	0.0	8	-8.0
Receiver8	8	1	0.0	74.3	66	74.3	10	Snd Lvl	74.3	0.0	8	-8.0
Receiver9	9	1	0.0	73.1	66	73.1	10	Snd Lvl	73.1	0.0	8	-8.0
Receiver10	10	1	0.0	73.0	66	73.0	10	Snd Lvl	73.0	0.0	8	-8.0
Receiver11	11	1	0.0	73.0	66	73.0	10	Snd Lvl	73.0	0.0	8	-8.0
Receiver12	12	1	0.0	72.8	66	72.8	10	Snd Lvl	72.8	0.0	8	-8.0
Receiver13	13	1	0.0	72.8	66	72.8	10	Snd Lvl	72.8	0.0	8	-8.0
Receiver14	14	1	0.0	72.7	66	72.7	10	Snd Lvl	72.7	0.0	8	-8.0
Receiver15	15	1	0.0	72.6	66	72.6	10	Snd Lvl	72.6	0.0	8	-8.0
Receiver16	16	1	0.0	69.9	66	69.9	10	Snd Lvl	69.9	0.0	8	-8.0
Receiver17	17	1	0.0	70.8	66	70.8	10	Snd Lvl	70.8	0.0	8	-8.0
Receiver18	18	1	0.0	71.4	66	71.4	10	Snd Lvl	71.4	0.0	8	-8.0
Receiver19	19	1	0.0	71.5	66	71.5	10	Snd Lvl	71.5	0.0	8	-8.0
Receiver20	20	1	0.0	71.5	66	71.5	10	Snd Lvl	71.5	0.0	8	-8.0
Receiver21	21	1	0.0	71.5	66	71.5	10	Snd Lvl	71.5	0.0	8	-8.0
Receiver22	22	1	0.0	71.4	66	71.4	10	Snd Lvl	71.4	0.0	8	-8.0
Receiver23	23	1	0.0	68.5	66	68.5	10	Snd Lvl	68.5	0.0	8	-8.0
Receiver24	24	1	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	8	-8.0
Receiver25	25	1	0.0	69.8	66	69.8	10	Snd Lvl	69.8	0.0	8	-8.0

Receiver26	26	1	0.0	70.1	66	70.1	10	Snd Lvl	70.1	0.0	8	-8.0
Receiver27	27	1	0.0	70.2	66	70.2	10	Snd Lvl	70.2	0.0	8	-8.0
Receiver28	28	1	0.0	70.3	66	70.3	10	Snd Lvl	70.3	0.0	8	-8.0
Receiver29	29	1	0.0	70.4	66	70.4	10	Snd Lvl	70.4	0.0	8	-8.0
Receiver30	30	1	0.0	52.9	66	52.9	10	----	52.9	0.0	8	-8.0
Receiver31	31	1	0.0	67.7	66	67.7	10	Snd Lvl	67.7	0.0	8	-8.0
Receiver32	32	1	0.0	68.4	66	68.4	10	Snd Lvl	68.4	0.0	8	-8.0
Receiver33	33	1	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	8	-8.0
Receiver34	34	1	0.0	69.1	66	69.1	10	Snd Lvl	69.1	0.0	8	-8.0
Receiver35	35	1	0.0	69.3	66	69.3	10	Snd Lvl	69.3	0.0	8	-8.0
Receiver36	36	1	0.0	69.4	66	69.4	10	Snd Lvl	69.4	0.0	8	-8.0
Receiver37	37	1	0.0	52.3	66	52.3	10	----	52.3	0.0	8	-8.0
Receiver38	38	1	0.0	66.6	66	66.6	10	Snd Lvl	66.6	0.0	8	-8.0
Receiver39	39	1	0.0	67.2	66	67.2	10	Snd Lvl	67.2	0.0	8	-8.0
Receiver40	40	1	0.0	67.7	66	67.7	10	Snd Lvl	67.7	0.0	8	-8.0
Receiver41	41	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	8	-8.0
Receiver42	42	1	0.0	68.2	66	68.2	10	Snd Lvl	68.2	0.0	8	-8.0
Receiver43	43	1	0.0	68.3	66	68.3	10	Snd Lvl	68.3	0.0	8	-8.0
Receiver44	44	1	0.0	65.1	66	65.1	10	----	65.1	0.0	8	-8.0
Receiver45	45	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
Receiver46	46	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	8	-8.0
Receiver47	47	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	8	-8.0
Receiver48	48	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	8	-8.0
Receiver49	49	1	0.0	67.3	66	67.3	10	Snd Lvl	67.3	0.0	8	-8.0
Receiver50	50	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	8	-8.0
Receiver51	51	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
Receiver52	52	1	0.0	65.1	66	65.1	10	----	65.1	0.0	8	-8.0
Receiver53	53	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0
Receiver54	54	1	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	8	-8.0
Receiver55	55	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	8	-8.0
Receiver56	56	1	0.0	66.5	66	66.5	10	Snd Lvl	66.5	0.0	8	-8.0
Receiver57	57	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	8	-8.0
Receiver58	58	1	0.0	63.9	66	63.9	10	----	63.9	0.0	8	-8.0
Receiver59	59	1	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0
Receiver60	60	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
Receiver61	61	1	0.0	65.3	66	65.3	10	----	65.3	0.0	8	-8.0
Receiver62	62	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0
Receiver63	63	1	0.0	65.8	66	65.8	10	----	65.8	0.0	8	-8.0
Receiver64	64	1	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	8	-8.0
Receiver65	65	1	0.0	63.4	66	63.4	10	----	63.4	0.0	8	-8.0
Receiver66	66	1	0.0	63.9	66	63.9	10	----	63.9	0.0	8	-8.0

Receiver67	67	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
Receiver68	68	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
Receiver69	69	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
Receiver70	70	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
Receiver71	71	1	0.0	65.4	66	65.4	10	----	65.4	0.0	8	-8.0
Receiver72	72	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
Receiver73	73	1	0.0	63.5	66	63.5	10	----	63.5	0.0	8	-8.0
Receiver74	74	1	0.0	63.8	66	63.8	10	----	63.8	0.0	8	-8.0
Receiver75	75	1	0.0	64.1	66	64.1	10	----	64.1	0.0	8	-8.0
Receiver76	76	1	0.0	64.4	66	64.4	10	----	64.4	0.0	8	-8.0
Receiver77	77	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
Receiver78	78	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
Receiver79	79	1	0.0	62.5	66	62.5	10	----	62.5	0.0	8	-8.0
Receiver80	80	1	0.0	63.0	66	63.0	10	----	63.0	0.0	8	-8.0
Receiver81	81	1	0.0	63.3	66	63.3	10	----	63.3	0.0	8	-8.0
Receiver82	82	1	0.0	63.6	66	63.6	10	----	63.6	0.0	8	-8.0
Receiver83	83	1	0.0	63.8	66	63.8	10	----	63.8	0.0	8	-8.0
Receiver84	84	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
Receiver85	85	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0

Dwelling Units		**# DUs**	**Noise Reduction**		
			Min	**Avg**	**Max**
			dB	**dB**	**dB**
All Selected		84	0.0	0.0	0.0
All Impacted		50	0.0	0.0	0.0
All that meet NR Goal		0	0.0	0.0	0.0

Eilar Associates **8 October 2014**
JR **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **Las Terrazas**
RUN: **Future**

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h
Valley	point11	11	522	72	1	72	5	72	0	0	0	0
	point12	12	522	72	1	72	5	72	0	0	0	0
	point13	13	522	72	1	72	5	72	0	0	0	0
	point14	14	522	72	1	72	5	72	0	0	0	0
	point15	15	522	72	1	72	5	72	0	0	0	0
	point16	16	522	72	1	72	5	72	0	0	0	0
	point17	17	522	72	1	72	5	72	0	0	0	0
	point18	18										
I-10 WB	point26	26	7000	72	173	72	454	72	0	0	0	0
	point27	27	7000	72	173	72	454	72	0	0	0	0
	point28	28	7000	72	173	72	454	72	0	0	0	0
	point29	29	7000	72	173	72	454	72	0	0	0	0
	point30	30	7000	72	173	72	454	72	0	0	0	0
	point31	31	7000	72	173	72	454	72	0	0	0	0
	point32	32										
I-10 EB	point33	33	7000	72	173	72	454	72	0	0	0	0
	point34	34	7000	72	173	72	454	72	0	0	0	0
	point35	35	7000	72	173	72	454	72	0	0	0	0
	point36	36	7000	72	173	72	454	72	0	0	0	0
	point37	37	7000	72	173	72	454	72	0	0	0	0
	point38	38	7000	72	173	72	454	72	0	0	0	0
	point39	39	7000	72	173	72	454	72	0	0	0	0
	point40	40										

INPUT: TRAFFIC FOR LAeq1h Volumes **Las Terrazas**

Cypress	point41	41	102	40	2	40	1	40	0	0	0	0
	point42	42	102	40	2	40	1	40	0	0	0	0
	point43	43	102	40	2	40	1	40	0	0	0	0
	point44	44										

Eilar Associates 8 October 2014
JR TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Las Terrazas
RUN: Future

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			m	m	m	m	dBA	dBA	dB	dB	
R1	49	1	1,380.0	1,560.0	0.00	1.50	0.00	66	10.0	8.0	
R2	50	1	1,400.0	1,560.0	0.00	1.50	0.00	66	10.0	8.0	
R3	51	1	1,420.0	1,560.0	0.00	1.50	0.00	66	10.0	8.0	
R4	52	1	1,440.0	1,560.0	0.00	1.50	0.00	66	10.0	8.0	
R5	53	1	1,460.0	1,560.0	0.00	1.50	0.00	66	10.0	8.0	
R6	54	1	1,480.0	1,560.0	0.00	1.50	0.00	66	10.0	8.0	
R7	55	1	1,500.0	1,560.0	0.00	1.50	0.00	66	10.0	8.0	
R8	56	1	1,380.0	1,580.0	0.00	1.50	0.00	66	10.0	8.0	
R9	57	1	1,400.0	1,580.0	0.00	1.50	0.00	66	10.0	8.0	
R10	58	1	1,420.0	1,580.0	0.00	1.50	0.00	66	10.0	8.0	
R11	59	1	1,440.0	1,580.0	0.00	1.50	0.00	66	10.0	8.0	
R12	60	1	1,460.0	1,580.0	0.00	1.50	0.00	66	10.0	8.0	
R13	61	1	1,480.0	1,580.0	0.00	1.50	0.00	66	10.0	8.0	
R14	62	1	1,500.0	1,580.0	0.00	1.50	0.00	66	10.0	8.0	
R15	63	1	1,380.0	1,600.0	0.00	1.50	0.00	66	10.0	8.0	
R16	64	1	1,400.0	1,600.0	0.00	1.50	0.00	66	10.0	8.0	
R17	65	1	1,420.0	1,600.0	0.00	1.50	0.00	66	10.0	8.0	
R18	66	1	1,440.0	1,600.0	0.00	1.50	0.00	66	10.0	8.0	
R19	67	1	1,460.0	1,600.0	0.00	1.50	0.00	66	10.0	8.0	
R20	68	1	1,480.0	1,600.0	0.00	1.50	0.00	66	10.0	8.0	
R21	69	1	1,500.0	1,600.0	0.00	1.50	0.00	66	10.0	8.0	
R22	70	1	1,380.0	1,620.0	0.00	1.50	0.00	66	10.0	8.0	

R23	71	1	1,400.0	1,620.0	0.00	1.50	0.00	66	10.0	8.0	
R24	72	1	1,420.0	1,620.0	0.00	1.50	0.00	66	10.0	8.0	
R25	73	1	1,440.0	1,620.0	0.00	1.50	0.00	66	10.0	8.0	
R26	74	1	1,460.0	1,620.0	0.00	1.50	0.00	66	10.0	8.0	
R27	75	1	1,480.0	1,620.0	0.00	1.50	0.00	66	10.0	8.0	
R28	76	1	1,500.0	1,620.0	0.00	1.50	0.00	66	10.0	8.0	
R29	77	1	1,380.0	1,640.0	0.00	1.50	0.00	66	10.0	8.0	
R30	78	1	1,400.0	1,640.0	0.00	1.50	0.00	66	10.0	8.0	
R31	79	1	1,420.0	1,640.0	0.00	1.50	0.00	66	10.0	8.0	
R32	80	1	1,440.0	1,640.0	0.00	1.50	0.00	66	10.0	8.0	
R33	81	1	1,460.0	1,640.0	0.00	1.50	0.00	66	10.0	8.0	
R34	82	1	1,480.0	1,640.0	0.00	1.50	0.00	66	10.0	8.0	
R35	83	1	1,500.0	1,640.0	0.00	1.50	0.00	66	10.0	8.0	
R36	84	1	1,380.0	1,660.0	0.00	1.50	0.00	66	10.0	8.0	
R37	85	1	1,400.0	1,660.0	0.00	1.50	0.00	66	10.0	8.0	
R38	86	1	1,420.0	1,660.0	0.00	1.50	0.00	66	10.0	8.0	
R39	87	1	1,440.0	1,660.0	0.00	1.50	0.00	66	10.0	8.0	
R40	88	1	1,460.0	1,660.0	0.00	1.50	0.00	66	10.0	8.0	
R41	89	1	1,480.0	1,660.0	0.00	1.50	0.00	66	10.0	8.0	
R42	90	1	1,500.0	1,660.0	0.00	1.50	0.00	66	10.0	8.0	
R43	91	1	1,380.0	1,680.0	0.00	1.50	0.00	66	10.0	8.0	
R44	92	1	1,400.0	1,680.0	0.00	1.50	0.00	66	10.0	8.0	
R45	93	1	1,420.0	1,680.0	0.00	1.50	0.00	66	10.0	8.0	
R46	94	1	1,440.0	1,680.0	0.00	1.50	0.00	66	10.0	8.0	
R47	95	1	1,460.0	1,680.0	0.00	1.50	0.00	66	10.0	8.0	
R48	96	1	1,480.0	1,680.0	0.00	1.50	0.00	66	10.0	8.0	
R49	97	1	1,500.0	1,680.0	0.00	1.50	0.00	66	10.0	8.0	
R50	98	1	1,380.0	1,700.0	0.00	1.50	0.00	66	10.0	8.0	
R51	99	1	1,400.0	1,700.0	0.00	1.50	0.00	66	10.0	8.0	
R52	100	1	1,420.0	1,700.0	0.00	1.50	0.00	66	10.0	8.0	
R53	101	1	1,440.0	1,700.0	0.00	1.50	0.00	66	10.0	8.0	
R54	102	1	1,460.0	1,700.0	0.00	1.50	0.00	66	10.0	8.0	
R55	103	1	1,480.0	1,700.0	0.00	1.50	0.00	66	10.0	8.0	
R56	104	1	1,500.0	1,700.0	0.00	1.50	0.00	66	10.0	8.0	
R57	105	1	1,380.0	1,720.0	0.00	1.50	0.00	66	10.0	8.0	
R58	106	1	1,400.0	1,720.0	0.00	1.50	0.00	66	10.0	8.0	

R59	107	1	1,420.0	1,720.0	0.00	1.50	0.00	66	10.0	8.0	
R60	108	1	1,440.0	1,720.0	0.00	1.50	0.00	66	10.0	8.0	
R61	109	1	1,460.0	1,720.0	0.00	1.50	0.00	66	10.0	8.0	
R62	110	1	1,480.0	1,720.0	0.00	1.50	0.00	66	10.0	8.0	
R63	111	1	1,500.0	1,720.0	0.00	1.50	0.00	66	10.0	8.0	
R64	112	1	1,380.0	1,740.0	0.00	1.50	0.00	66	10.0	8.0	Y
R65	113	1	1,400.0	1,740.0	0.00	1.50	0.00	66	10.0	8.0	Y
R66	114	1	1,420.0	1,740.0	0.00	1.50	0.00	66	10.0	8.0	Y
R67	117	1	1,440.0	1,740.0	0.00	1.50	0.00	66	10.0	8.0	Y
R68	118	1	1,460.0	1,740.0	0.00	1.50	0.00	66	10.0	8.0	Y
R69	119	1	1,480.0	1,740.0	0.00	1.50	0.00	66	10.0	8.0	Y
R70	120	1	1,500.0	1,740.0	0.00	1.50	0.00	66	10.0	8.0	Y
R71	121	1	1,380.0	1,760.0	0.00	1.50	0.00	66	10.0	8.0	Y
R72	122	1	1,400.0	1,760.0	0.00	1.50	0.00	66	10.0	8.0	Y
R73	123	1	1,420.0	1,760.0	0.00	1.50	0.00	66	10.0	8.0	Y
R74	124	1	1,440.0	1,760.0	0.00	1.50	0.00	66	10.0	8.0	Y
R75	125	1	1,460.0	1,760.0	0.00	1.50	0.00	66	10.0	8.0	Y
R76	126	1	1,480.0	1,760.0	0.00	1.50	0.00	66	10.0	8.0	Y
R77	127	1	1,500.0	1,760.0	0.00	1.50	0.00	66	10.0	8.0	Y
R78	128	1	1,380.0	1,780.0	0.00	1.50	0.00	66	10.0	8.0	Y
R79	129	1	1,400.0	1,780.0	0.00	1.50	0.00	66	10.0	8.0	Y
R80	130	1	1,420.0	1,780.0	0.00	1.50	0.00	66	10.0	8.0	Y
R81	131	1	1,440.0	1,780.0	0.00	1.50	0.00	66	10.0	8.0	Y
R82	132	1	1,460.0	1,780.0	0.00	1.50	0.00	66	10.0	8.0	Y
R83	133	1	1,480.0	1,780.0	0.00	1.50	0.00	66	10.0	8.0	Y
R84	134	1	1,500.0	1,780.0	0.00	1.50	0.00	66	10.0	8.0	Y

Eilar Associates **8 October 2014**
JR **TNM 2.5**

INPUT: BARRIERS
PROJECT/CONTRACT: **Las Terrazas**
RUN: **Future**

Barrier									**Points**										
Name	**Type**	**Height**		**If Wall**	**If Berm**			**Add'tnl**	**Name**	**No.**	**Coordinates (bottom)**			**Height**	**Segment**				
		Min	**Max**	**$ per**	**$ per**	**Top**	**Run:Rise**	**$ per**			**X**	**Y**	**Z**	**at**	**Seg Ht Perturbs**			**On**	**Important**
				Unit	**Unit**	**Width**		**Unit**						**Point**	**Incre-**	**#Up**	**#Dn**	**Struct?**	**Reflec-**
				Area	**Vol.**			**Length**							**ment**				**tions?**
		m	m	$/sq m	$/cu m	m	m:m	$/m			m	m	m	m	m				
Storage Building	W	0.00	30.48	0.00				0.00	point54	54	1,368.8	1,790.7	0.00	6.10	0.00	0	0		
									point55	55	1,372.1	1,791.0	0.00	6.10	0.00	0	0		
									point56	56	1,386.4	1,587.3	0.00	6.10	0.00	0	0		
									point57	57	1,382.9	1,587.0	0.00	6.10	0.00	0	0		
									point58	58	1,368.8	1,790.7	0.00	6.10					
Bldg A	W	0.00	30.48	0.00				0.00	point131	131	1,383.8	1,767.4	0.00	0.00	0.00	0	0		
									point132	132	1,397.1	1,767.5	0.00	0.00	0.00	0	0		
									point133	133	1,397.4	1,759.6	0.00	0.00	0.00	0	0		
									point134	134	1,402.1	1,759.7	0.00	0.00	0.00	0	0		
									point135	135	1,402.2	1,767.7	0.00	0.00	0.00	0	0		
									point136	136	1,416.6	1,767.2	0.00	0.00	0.00	0	0		
									point137	137	1,416.1	1,760.0	0.00	0.00	0.00	0	0		
									point138	138	1,421.5	1,759.9	0.00	0.00	0.00	0	0		
									point139	139	1,421.5	1,767.5	0.00	0.00	0.00	0	0		
									point140	140	1,431.9	1,767.4	0.00	0.00	0.00	0	0		
									point141	141	1,431.6	1,759.9	0.00	0.00	0.00	0	0		
									point142	142	1,432.9	1,759.8	0.00	0.00	0.00	0	0		
									point143	143	1,432.8	1,752.1	0.00	0.00	0.00	0	0		
									point144	144	1,385.8	1,752.0	0.00	0.00	0.00	0	0		
									point145	145	1,385.8	1,759.8	0.00	0.00	0.00	0	0		
									point146	146	1,384.0	1,759.8	0.00	0.00	0.00	0	0		
									point147	147	1,383.8	1,767.4	0.00	0.00					
Bldg B	W	0.00	30.48	0.00				0.00	point148	148	1,415.9	1,737.8	0.00	0.00	0.00	0	0		
									point149	149	1,431.0	1,736.9	0.00	0.00	0.00	0	0		
									point150	150	1,431.4	1,729.5	0.00	0.00	0.00	0	0		
									point151	151	1,423.7	1,729.7	0.00	0.00	0.00	0	0		
									point152	152	1,423.7	1,724.7	0.00	0.00	0.00	0	0		
									point153	153	1,431.0	1,724.7	0.00	0.00	0.00	0	0		
									point154	154	1,431.2	1,710.7	0.00	0.00	0.00	0	0		
									point155	155	1,424.0	1,710.8	0.00	0.00	0.00	0	0		
									point156	156	1,423.8	1,705.4	0.00	0.00	0.00	0	0		
									point157	157	1,431.6	1,705.5	0.00	0.00	0.00	0	0		
									point158	158	1,431.5	1,692.2	0.00	0.00	0.00	0	0		
									point159	159	1,423.5	1,692.1	0.00	0.00	0.00	0	0		
									point160	160	1,423.6	1,693.4	0.00	0.00	0.00	0	0		

									point161	161	1,415.6	1,693.9	0.00	0.00	0.00	0	0		
									point162	162	1,415.9	1,737.8	0.00	0.00					
Bldg C	W	0.00	30.48	0.00				0.00	point163	163	1,413.8	1,667.1	0.00	0.00	0.00	0	0		
									point164	164	1,421.7	1,666.9	0.00	0.00	0.00	0	0		
									point165	165	1,421.7	1,665.4	0.00	0.00	0.00	0	0		
									point166	166	1,429.5	1,665.1	0.00	0.00	0.00	0	0		
									point167	167	1,429.3	1,621.6	0.00	0.00	0.00	0	0		
									point168	168	1,421.8	1,621.4	0.00	0.00	0.00	0	0		
									point169	169	1,421.9	1,622.7	0.00	0.00	0.00	0	0		
									point170	170	1,414.4	1,622.7	0.00	0.00	0.00	0	0		
									point171	171	1,414.4	1,629.8	0.00	0.00	0.00	0	0		
									point172	172	1,422.2	1,629.5	0.00	0.00	0.00	0	0		
									point173	173	1,422.0	1,634.4	0.00	0.00	0.00	0	0		
									point174	174	1,414.4	1,634.4	0.00	0.00	0.00	0	0		
									point175	175	1,414.4	1,648.4	0.00	0.00	0.00	0	0		
									point176	176	1,421.8	1,648.4	0.00	0.00	0.00	0	0		
									point177	177	1,421.8	1,653.7	0.00	0.00	0.00	0	0		
									point178	178	1,414.1	1,653.5	0.00	0.00	0.00	0	0		
									point179	179	1,413.8	1,667.1	0.00	0.00					
Bldg D	W	0.00	30.48	0.00				0.00	point180	180	1,485.2	1,663.7	0.00	0.00	0.00	0	0		
									point181	181	1,492.9	1,663.5	0.00	0.00	0.00	0	0		
									point182	182	1,493.1	1,661.8	0.00	0.00	0.00	0	0		
									point183	183	1,500.8	1,662.0	0.00	0.00	0.00	0	0		
									point184	184	1,501.0	1,614.8	0.00	0.00	0.00	0	0		
									point185	185	1,493.2	1,614.7	0.00	0.00	0.00	0	0		
									point186	186	1,493.3	1,613.0	0.00	0.00	0.00	0	0		
									point187	187	1,485.2	1,612.6	0.00	0.00	0.00	0	0		
									point188	188	1,485.2	1,622.7	0.00	0.00	0.00	0	0		
									point189	189	1,493.0	1,622.8	0.00	0.00	0.00	0	0		
									point190	190	1,493.2	1,627.9	0.00	0.00	0.00	0	0		
									point191	191	1,485.3	1,627.7	0.00	0.00	0.00	0	0		
									point192	192	1,485.3	1,648.2	0.00	0.00	0.00	0	0		
									point193	193	1,493.1	1,648.5	0.00	0.00	0.00	0	0		
									point194	194	1,493.2	1,653.2	0.00	0.00	0.00	0	0		
									point195	195	1,485.3	1,653.4	0.00	0.00	0.00	0	0		
									point196	196	1,485.2	1,663.7	0.00	0.00					
Bldg E	W	0.00	30.48	0.00				0.00	point197	197	1,393.8	1,593.0	0.00	0.00	0.00	0	0		
									point198	198	1,407.3	1,593.0	0.00	0.00	0.00	0	0		
									point199	199	1,407.5	1,585.5	0.00	0.00	0.00	0	0		
									point200	200	1,412.5	1,585.7	0.00	0.00	0.00	0	0		
									point201	201	1,412.2	1,593.1	0.00	0.00	0.00	0	0		
									point202	202	1,426.7	1,593.1	0.00	0.00	0.00	0	0		
									point203	203	1,426.7	1,585.6	0.00	0.00	0.00	0	0		
									point204	204	1,431.1	1,585.4	0.00	0.00	0.00	0	0		
									point205	205	1,431.5	1,592.7	0.00	0.00	0.00	0	0		
									point206	206	1,441.5	1,592.6	0.00	0.00	0.00	0	0		
									point207	207	1,441.8	1,585.7	0.00	0.00	0.00	0	0		
									point208	208	1,443.0	1,585.6	0.00	0.00	0.00	0	0		
									point209	209	1,443.1	1,577.7	0.00	0.00	0.00	0	0		

									point210	210	1,395.8	1,578.0	0.00	0.00	0.00	0	0		
									point211	211	1,395.6	1,585.7	0.00	0.00	0.00	0	0		
									point212	212	1,394.0	1,585.7	0.00	0.00	0.00	0	0		
									point213	213	1,393.8	1,593.0	0.00	0.00					
Community Bldg	W	0.00	30.48	0.00				0.00	point214	214	1,435.5	1,629.4	0.00	0.00	0.00	0	0		
									point215	215	1,440.7	1,629.6	0.00	0.00	0.00	0	0		
									point216	216	1,440.4	1,636.9	0.00	0.00	0.00	0	0		
									point217	217	1,447.6	1,636.6	0.00	0.00	0.00	0	0		
									point218	218	1,447.9	1,629.9	0.00	0.00	0.00	0	0		
									point219	219	1,451.4	1,629.8	0.00	0.00	0.00	0	0		
									point220	220	1,451.4	1,635.3	0.00	0.00	0.00	0	0		
									point221	221	1,456.8	1,635.2	0.00	0.00	0.00	0	0		
									point222	222	1,456.9	1,618.2	0.00	0.00	0.00	0	0		
									point223	223	1,452.1	1,618.4	0.00	0.00	0.00	0	0		
									point224	224	1,451.2	1,623.6	0.00	0.00	0.00	0	0		
									point225	225	1,448.1	1,623.7	0.00	0.00	0.00	0	0		
									point226	226	1,448.0	1,622.2	0.00	0.00	0.00	0	0		
									point227	227	1,435.9	1,622.1	0.00	0.00	0.00	0	0		
									point228	228	1,435.5	1,629.4	0.00	0.00					
Barrier25	W	0.00	30.48	0.00				0.00	point229	229	1,486.2	1,591.0	0.00	0.00	0.00	0	0		
									point230	230	1,488.8	1,591.1	0.00	0.00	0.00	0	0		
									point231	231	1,488.9	1,596.8	0.00	0.00	0.00	0	0		
									point232	232	1,497.7	1,596.8	0.00	0.00	0.00	0	0		
									point233	233	1,497.8	1,587.3	0.00	0.00	0.00	0	0		
									point234	234	1,501.1	1,587.3	0.00	0.00	0.00	0	0		
									point235	235	1,501.0	1,576.3	0.00	0.00	0.00	0	0		
									point236	236	1,491.1	1,576.2	0.00	0.00	0.00	0	0		
									point237	237	1,491.0	1,579.7	0.00	0.00	0.00	0	0		
									point238	238	1,488.1	1,579.6	0.00	0.00	0.00	0	0		
									point239	239	1,488.3	1,584.6	0.00	0.00	0.00	0	0		
									point240	240	1,486.2	1,584.5	0.00	0.00	0.00	0	0		
									point241	241	1,486.2	1,591.0	0.00	0.00					
Perimeter Wall	W	0.00	30.48	0.00				0.00	point242	242	1,509.8	1,682.3	0.00	0.00	0.00	0	0		
									point243	243	1,458.4	1,683.4	0.00	0.00	0.00	0	0		
									point244	244	1,462.9	1,797.3	0.00	0.00	0.00	0	0		
									point245	245	1,372.8	1,796.7	0.00	0.00	0.00	0	0		
									point246	246	1,388.7	1,567.5	0.00	0.00					

Eilar Associates
8 October 2014
JR
TNM 2.5
Calculated with TNM 2.5
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Las Terrazas
RUN: Future
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	49	1	0.0	76.6	66	76.6	10	Snd Lvl	76.6	0.0	8	-8.0
R2	50	1	0.0	76.3	66	76.3	10	Snd Lvl	76.3	0.0	8	-8.0
R3	51	1	0.0	76.1	66	76.1	10	Snd Lvl	76.1	0.0	8	-8.0
R4	52	1	0.0	75.9	66	75.9	10	Snd Lvl	75.9	0.0	8	-8.0
R5	53	1	0.0	75.7	66	75.7	10	Snd Lvl	75.7	0.0	8	-8.0
R6	54	1	0.0	75.5	66	75.5	10	Snd Lvl	75.5	0.0	8	-8.0
R7	55	1	0.0	75.3	66	75.3	10	Snd Lvl	75.3	0.0	8	-8.0
R8	56	1	0.0	74.2	66	74.2	10	Snd Lvl	74.2	0.0	8	-8.0
R9	57	1	0.0	74.1	66	74.1	10	Snd Lvl	74.1	0.0	8	-8.0
R10	58	1	0.0	74.0	66	74.0	10	Snd Lvl	74.0	0.0	8	-8.0
R11	59	1	0.0	73.9	66	73.9	10	Snd Lvl	73.9	0.0	8	-8.0
R12	60	1	0.0	73.8	66	73.8	10	Snd Lvl	73.8	0.0	8	-8.0
R13	61	1	0.0	73.7	66	73.7	10	Snd Lvl	73.7	0.0	8	-8.0
R14	62	1	0.0	73.7	66	73.7	10	Snd Lvl	73.7	0.0	8	-8.0
R15	63	1	0.0	71.0	66	71.0	10	Snd Lvl	71.0	0.0	8	-8.0
R16	64	1	0.0	71.8	66	71.8	10	Snd Lvl	71.8	0.0	8	-8.0
R17	65	1	0.0	72.5	66	72.5	10	Snd Lvl	72.5	0.0	8	-8.0
R18	66	1	0.0	72.6	66	72.6	10	Snd Lvl	72.6	0.0	8	-8.0
R19	67	1	0.0	72.6	66	72.6	10	Snd Lvl	72.6	0.0	8	-8.0
R20	68	1	0.0	72.6	66	72.6	10	Snd Lvl	72.6	0.0	8	-8.0
R21	69	1	0.0	72.5	66	72.5	10	Snd Lvl	72.5	0.0	8	-8.0
R22	70	1	0.0	69.6	66	69.6	10	Snd Lvl	69.6	0.0	8	-8.0
R23	71	1	0.0	70.0	66	70.0	10	Snd Lvl	70.0	0.0	8	-8.0
R24	72	1	0.0	70.8	66	70.8	10	Snd Lvl	70.8	0.0	8	-8.0

R25	73	1	0.0	71.1	66	71.1	10	Snd Lvl	71.1	0.0	8	-8.0
R26	74	1	0.0	71.3	66	71.3	10	Snd Lvl	71.3	0.0	8	-8.0
R27	75	1	0.0	71.4	66	71.4	10	Snd Lvl	71.4	0.0	8	-8.0
R28	76	1	0.0	71.4	66	71.4	10	Snd Lvl	71.4	0.0	8	-8.0
R29	77	1	0.0	54.0	66	54.0	10	----	54.0	0.0	8	-8.0
R30	78	1	0.0	68.8	66	68.8	10	Snd Lvl	68.8	0.0	8	-8.0
R31	79	1	0.0	69.5	66	69.5	10	Snd Lvl	69.5	0.0	8	-8.0
R32	80	1	0.0	70.0	66	70.0	10	Snd Lvl	70.0	0.0	8	-8.0
R33	81	1	0.0	70.1	66	70.1	10	Snd Lvl	70.1	0.0	8	-8.0
R34	82	1	0.0	70.3	66	70.3	10	Snd Lvl	70.3	0.0	8	-8.0
R35	83	1	0.0	70.5	66	70.5	10	Snd Lvl	70.5	0.0	8	-8.0
R36	84	1	0.0	53.4	66	53.4	10	----	53.4	0.0	8	-8.0
R37	85	1	0.0	67.7	66	67.7	10	Snd Lvl	67.7	0.0	8	-8.0
R38	86	1	0.0	68.3	66	68.3	10	Snd Lvl	68.3	0.0	8	-8.0
R39	87	1	0.0	68.8	66	68.8	10	Snd Lvl	68.8	0.0	8	-8.0
R40	88	1	0.0	69.1	66	69.1	10	Snd Lvl	69.1	0.0	8	-8.0
R41	89	1	0.0	69.3	66	69.3	10	Snd Lvl	69.3	0.0	8	-8.0
R42	90	1	0.0	69.4	66	69.4	10	Snd Lvl	69.4	0.0	8	-8.0
R43	91	1	0.0	66.2	66	66.2	10	Snd Lvl	66.2	0.0	8	-8.0
R44	92	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0
R45	93	1	0.0	67.4	66	67.4	10	Snd Lvl	67.4	0.0	8	-8.0
R46	94	1	0.0	67.9	66	67.9	10	Snd Lvl	67.9	0.0	8	-8.0
R47	95	1	0.0	68.2	66	68.2	10	Snd Lvl	68.2	0.0	8	-8.0
R48	96	1	0.0	68.4	66	68.4	10	Snd Lvl	68.4	0.0	8	-8.0
R49	97	1	0.0	68.5	66	68.5	10	Snd Lvl	68.5	0.0	8	-8.0
R50	98	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0
R51	99	1	0.0	66.2	66	66.2	10	Snd Lvl	66.2	0.0	8	-8.0
R52	100	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	8	-8.0
R53	101	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	8	-8.0
R54	102	1	0.0	67.4	66	67.4	10	Snd Lvl	67.4	0.0	8	-8.0
R55	103	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	8	-8.0
R56	104	1	0.0	67.8	66	67.8	10	Snd Lvl	67.8	0.0	8	-8.0
R57	105	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
R58	106	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0
R59	107	1	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	8	-8.0
R60	108	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	8	-8.0
R61	109	1	0.0	66.6	66	66.6	10	Snd Lvl	66.6	0.0	8	-8.0
R62	110	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0
R63	111	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	8	-8.0
R64	112	1	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0
R65	113	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0

R66	114	1	0.0	65.4	66	65.4	10	----	65.4	0.0	8	-8.0
R67	117	1	0.0	65.8	66	65.8	10	----	65.8	0.0	8	-8.0
R68	118	1	0.0	66.1	66	66.1	10	Snd Lvl	66.1	0.0	8	-8.0
R69	119	1	0.0	66.2	66	66.2	10	Snd Lvl	66.2	0.0	8	-8.0
R70	120	1	0.0	66.5	66	66.5	10	Snd Lvl	66.5	0.0	8	-8.0
R71	121	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
R72	122	1	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0
R73	123	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
R74	124	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
R75	125	1	0.0	65.5	66	65.5	10	----	65.5	0.0	8	-8.0
R76	126	1	0.0	65.7	66	65.7	10	----	65.7	0.0	8	-8.0
R77	127	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
R78	128	1	0.0	63.6	66	63.6	10	----	63.6	0.0	8	-8.0
R79	129	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
R80	130	1	0.0	64.4	66	64.4	10	----	64.4	0.0	8	-8.0
R81	131	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
R82	132	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
R83	133	1	0.0	65.1	66	65.1	10	----	65.1	0.0	8	-8.0
R84	134	1	0.0	65.4	66	65.4	10	----	65.4	0.0	8	-8.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	84	0.0	0.0	0.0
All Impacted	61	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Eilar Associates **8 October 2014**
JR **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **Las Terrazas**
RUN: **Facades**

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h	veh/hr	km/h
Valley	point11	11	625	72	13	72	13	72	0	0	0	0
	point12	12	625	72	13	72	13	72	0	0	0	0
	point13	13	625	72	13	72	13	72	0	0	0	0
	point14	14	625	72	13	72	13	72	0	0	0	0
	point15	15	625	72	13	72	13	72	0	0	0	0
	point16	16	625	72	13	72	13	72	0	0	0	0
	point17	17	625	72	13	72	13	72	0	0	0	0
	point18	18										
I-10 WB	point26	26	7000	72	173	72	454	72	0	0	0	0
	point27	27	7000	72	173	72	454	72	0	0	0	0
	point28	28	7000	72	173	72	454	72	0	0	0	0
	point29	29	7000	72	173	72	454	72	0	0	0	0
	point30	30	7000	72	173	72	454	72	0	0	0	0
	point31	31	7000	72	173	72	454	72	0	0	0	0
	point32	32										
I-10 EB	point33	33	7000	72	173	72	454	72	0	0	0	0
	point34	34	7000	72	173	72	454	72	0	0	0	0
	point35	35	7000	72	173	72	454	72	0	0	0	0
	point36	36	7000	72	173	72	454	72	0	0	0	0
	point37	37	7000	72	173	72	454	72	0	0	0	0
	point38	38	7000	72	173	72	454	72	0	0	0	0
	point39	39	7000	72	173	72	454	72	0	0	0	0
	point40	40										

INPUT: TRAFFIC FOR LAeq1h Volumes **Las Terrazas**

Cypress	point41	41	112	40	2	40	2	40	0	0	0	0
	point42	42	112	40	2	40	2	40	0	0	0	0
	point43	43	112	40	2	40	2	40	0	0	0	0
	point44	44										

Eilar Associates 8 October 2014
JR TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Las Terrazas
RUN: Facades

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			m	m	m	m	dBA	dBA	dB	dB	
Bldg A - 1st Floor - North	49	1	1,391.5	1,768.6	0.00	1.52	0.00	66	10.0	8.0	
Bldg A - 1st Floor - North	50	1	1,409.5	1,768.4	0.00	1.52	0.00	66	10.0	8.0	
Bldg A - 1st Floor - North	51	1	1,428.2	1,768.9	0.00	1.52	0.00	66	10.0	8.0	
Bldg A - 1st Floor - East	52	1	1,434.1	1,759.8	0.00	1.52	0.00	66	10.0	8.0	
Bldg A - 1st Floor - South	53	1	1,419.6	1,751.0	0.00	1.52	0.00	66	10.0	8.0	
Bldg A - 1st Floor - South	54	1	1,398.7	1,751.2	0.00	1.52	0.00	66	10.0	8.0	
Bldg A - 1st Floor - West	55	1	1,383.4	1,759.0	0.00	1.52	0.00	66	10.0	8.0	
Bldg A - 2nd Floor - North	56	1	1,391.6	1,768.5	0.00	4.57	0.00	66	10.0	8.0	
Bldg A - 2nd Floor - North	57	1	1,409.5	1,768.6	0.00	4.57	0.00	66	10.0	8.0	
Bldg A - 2nd Floor - North	58	1	1,428.4	1,768.8	0.00	4.57	0.00	66	10.0	8.0	
Bldg A - 2nd Floor - East	59	1	1,434.4	1,759.7	0.00	4.57	0.00	66	10.0	8.0	
Bldg A - 2nd Floor - South	60	1	1,419.4	1,751.2	0.00	4.57	0.00	66	10.0	8.0	
Bldg A - 2nd Floor - South	61	1	1,398.7	1,751.1	0.00	4.57	0.00	66	10.0	8.0	
Bldg A - 2nd Floor - West	62	1	1,383.4	1,759.2	0.00	4.57	0.00	66	10.0	8.0	
Bldg A - 3rd Floor - North	63	1	1,391.5	1,768.3	0.00	7.62	0.00	66	10.0	8.0	
Bldg A - 3rd Floor - North	64	1	1,409.5	1,768.7	0.00	7.62	0.00	66	10.0	8.0	
Bldg A - 3rd Floor - North	65	1	1,428.2	1,769.0	0.00	7.62	0.00	66	10.0	8.0	
Bldg A - 3rd Floor - East	66	1	1,434.4	1,759.8	0.00	7.62	0.00	66	10.0	8.0	
Bldg A - 3rd Floor - South	67	1	1,418.9	1,751.1	0.00	7.62	0.00	66	10.0	8.0	
Bldg A - 3rd Floor - South	68	1	1,398.8	1,751.0	0.00	7.62	0.00	66	10.0	8.0	
Bldg A - 3rd Floor - West	69	1	1,383.4	1,759.2	0.00	7.62	0.00	66	10.0	8.0	
Bldg B - 1st Floor - North	70	1	1,424.8	1,740.1	0.00	1.52	0.00	66	10.0	8.0	

Bldg B - 1st Floor - East	71	1	1,433.1	1,731.4	0.00	1.52	0.00	66	10.0	8.0	
Bldg B - 1st Floor - East	72	1	1,432.7	1,717.8	0.00	1.52	0.00	66	10.0	8.0	
Bldg B - 1st Floor - East	73	1	1,433.1	1,701.8	0.00	1.52	0.00	66	10.0	8.0	
Bldg B - 1st Floor - South	74	1	1,423.3	1,690.7	0.00	1.52	0.00	66	10.0	8.0	
Bldg B - 1st Floor - West	75	1	1,414.4	1,707.4	0.00	1.52	0.00	66	10.0	8.0	
Bldg B - 1st Floor - West	76	1	1,414.2	1,728.1	0.00	1.52	0.00	66	10.0	8.0	
Bldg B - 2nd Floor - North	77	1	1,424.8	1,739.8	0.00	4.57	0.00	66	10.0	8.0	
Bldg B - 2nd Floor - East	78	1	1,433.1	1,731.5	0.00	4.57	0.00	66	10.0	8.0	
Bldg B - 2nd Floor - East	79	1	1,432.5	1,718.0	0.00	4.57	0.00	66	10.0	8.0	
Bldg B - 2nd Floor - East	80	1	1,433.4	1,701.4	0.00	4.57	0.00	66	10.0	8.0	
Bldg B - 2nd Floor - South	81	1	1,423.0	1,690.8	0.00	4.57	0.00	66	10.0	8.0	
Bldg B - 2nd Floor - West	82	1	1,414.4	1,707.4	0.00	4.57	0.00	66	10.0	8.0	
Bldg B - 2nd Floor - West	83	1	1,414.2	1,728.1	0.00	4.57	0.00	66	10.0	8.0	
Bldg B - 3rd Floor - North	84	1	1,424.5	1,739.5	0.00	7.62	0.00	66	10.0	8.0	
Bldg B - 3rd Floor - East	85	1	1,433.0	1,731.4	0.00	7.62	0.00	66	10.0	8.0	
Bldg B - 3rd Floor - East	86	1	1,432.6	1,718.0	0.00	7.62	0.00	66	10.0	8.0	
Bldg B - 3rd Floor - East	87	1	1,433.3	1,701.4	0.00	7.62	0.00	66	10.0	8.0	
Bldg B - 3rd Floor - South	88	1	1,423.1	1,690.7	0.00	7.62	0.00	66	10.0	8.0	
Bldg B - 3rd Floor - West	89	1	1,414.4	1,707.4	0.00	7.62	0.00	66	10.0	8.0	
Bldg B - 3rd Floor - West	90	1	1,414.1	1,728.3	0.00	7.62	0.00	66	10.0	8.0	
Bldg C - 1st Floor - North	91	1	1,422.0	1,668.3	0.00	1.52	0.00	66	10.0	8.0	
Bldg C - 1st Floor - East	92	1	1,430.8	1,651.8	0.00	1.52	0.00	66	10.0	8.0	
Bldg C - 1st Floor - East	93	1	1,431.0	1,631.5	0.00	1.52	0.00	66	10.0	8.0	
Bldg C - 1st Floor - South	94	1	1,421.5	1,620.6	0.00	1.52	0.00	66	10.0	8.0	
Bldg C - 1st Floor - West	95	1	1,412.7	1,627.8	0.00	1.52	0.00	66	10.0	8.0	
Bldg C - 1st Floor - West	96	1	1,413.2	1,641.3	0.00	1.52	0.00	66	10.0	8.0	
Bldg C - 1st Floor - West	97	1	1,413.0	1,655.8	0.00	1.52	0.00	66	10.0	8.0	
Bldg C - 2nd Floor - North	98	1	1,421.8	1,668.4	0.00	4.57	0.00	66	10.0	8.0	
Bldg C - 2nd Floor - East	99	1	1,430.8	1,651.8	0.00	4.57	0.00	66	10.0	8.0	
Bldg C - 2nd Floor - East	100	1	1,430.9	1,631.1	0.00	4.57	0.00	66	10.0	8.0	
Bldg C - 2nd Floor - South	101	1	1,421.5	1,620.7	0.00	4.57	0.00	66	10.0	8.0	
Bldg C - 2nd Floor - West	102	1	1,412.6	1,627.8	0.00	4.57	0.00	66	10.0	8.0	
Bldg C - 2nd Floor - West	103	1	1,413.3	1,641.2	0.00	4.57	0.00	66	10.0	8.0	
Bldg C - 2nd Floor - West	104	1	1,413.0	1,655.7	0.00	4.57	0.00	66	10.0	8.0	
Bldg C - 3rd Floor - North	105	1	1,422.0	1,668.5	0.00	7.62	0.00	66	10.0	8.0	
Bldg C - 3rd Floor - East	106	1	1,430.9	1,651.8	0.00	7.62	0.00	66	10.0	8.0	

Bldg C - 3rd Floor - East	107	1	1,430.9	1,631.2	0.00	7.62	0.00	66	10.0	8.0	
Bldg C - 3rd Floor - South	108	1	1,421.5	1,620.6	0.00	7.62	0.00	66	10.0	8.0	
Bldg C - 3rd Floor - West	109	1	1,412.7	1,627.6	0.00	7.62	0.00	66	10.0	8.0	
Bldg C - 3rd Floor - West	110	1	1,413.3	1,641.4	0.00	7.62	0.00	66	10.0	8.0	
Bldg C - 3rd Floor - West	111	1	1,412.8	1,655.7	0.00	7.62	0.00	66	10.0	8.0	
Bldg D - 1st Floor - North	112	1	1,493.2	1,664.7	0.00	1.52	0.00	66	10.0	8.0	Y
Bldg D - 1st Floor - East	113	1	1,502.0	1,651.4	0.00	1.52	0.00	66	10.0	8.0	Y
Bldg D - 1st Floor - East	114	1	1,502.0	1,624.6	0.00	1.52	0.00	66	10.0	8.0	Y
Bldg D - 1st Floor - South	117	1	1,493.9	1,612.5	0.00	1.52	0.00	66	10.0	8.0	Y
Bldg D - 1st Floor - West	118	1	1,484.4	1,621.8	0.00	1.52	0.00	66	10.0	8.0	Y
Bldg D - 1st Floor - West	119	1	1,483.9	1,638.1	0.00	1.52	0.00	66	10.0	8.0	Y
Bldg D - 1st Floor - West	120	1	1,484.2	1,654.5	0.00	1.52	0.00	66	10.0	8.0	Y
Bldg D - 2nd Floor - North	121	1	1,493.4	1,664.8	0.00	4.57	0.00	66	10.0	8.0	Y
Bldg D - 2nd Floor - East	122	1	1,501.8	1,651.9	0.00	4.57	0.00	66	10.0	8.0	Y
Bldg D - 2nd Floor - East	123	1	1,502.4	1,624.4	0.00	4.57	0.00	66	10.0	8.0	Y
Bldg D - 2nd Floor - South	124	1	1,494.0	1,612.6	0.00	4.57	0.00	66	10.0	8.0	Y
Bldg D - 2nd Floor - West	125	1	1,484.0	1,621.8	0.00	4.57	0.00	66	10.0	8.0	Y
Bldg D - 2nd Floor - West	126	1	1,483.9	1,638.0	0.00	4.57	0.00	66	10.0	8.0	Y
Bldg D - 2nd Floor - West	127	1	1,484.0	1,654.3	0.00	4.57	0.00	66	10.0	8.0	Y
Bldg E - 1st Floor - North	128	1	1,405.1	1,594.0	0.00	1.52	0.00	66	10.0	8.0	Y
Bldg E - 1st Floor - North	129	1	1,419.4	1,593.9	0.00	1.52	0.00	66	10.0	8.0	Y
Bldg E - 1st Floor - North	130	1	1,433.6	1,594.1	0.00	1.52	0.00	66	10.0	8.0	Y
Bldg E - 1st Floor - East	131	1	1,443.7	1,586.0	0.00	1.52	0.00	66	10.0	8.0	Y
Bldg E - 1st Floor - South	132	1	1,429.8	1,576.7	0.00	1.52	0.00	66	10.0	8.0	Y
Bldg E - 1st Floor - South	133	1	1,408.9	1,576.7	0.00	1.52	0.00	66	10.0	8.0	Y
Bldg E - 1st Floor - West	134	1	1,393.8	1,584.6	0.00	1.52	0.00	66	10.0	8.0	Y
Bldg E - 2nd Floor - North	136	1	1,405.1	1,594.0	0.00	4.57	0.00	66	10.0	8.0	Y
Bldg E - 2nd Floor - North	137	1	1,419.3	1,594.0	0.00	4.57	0.00	66	10.0	8.0	Y
Bldg E - 2nd Floor - North	138	1	1,433.6	1,594.1	0.00	4.57	0.00	66	10.0	8.0	Y
Bldg E - 2nd Floor - East	139	1	1,443.7	1,585.9	0.00	4.57	0.00	66	10.0	8.0	Y
Bldg E - 2nd Floor - South	140	1	1,429.8	1,576.6	0.00	4.57	0.00	66	10.0	8.0	Y
Bldg E - 2nd Floor - South	141	1	1,409.0	1,576.6	0.00	4.57	0.00	66	10.0	8.0	Y
Bldg E - 2nd Floor - West	142	1	1,393.8	1,584.6	0.00	4.57	0.00	66	10.0	8.0	Y
Bldg E - 3rd Floor - North	143	1	1,404.9	1,594.0	0.00	7.62	0.00	66	10.0	8.0	Y
Bldg E - 3rd Floor - North	144	1	1,419.3	1,593.7	0.00	7.62	0.00	66	10.0	8.0	Y
Bldg E - 3rd Floor - North	145	1	1,433.7	1,594.0	0.00	7.62	0.00	66	10.0	8.0	Y

Bldg E - 3rd Floor - East	146	1	1,443.9	1,585.9	0.00	7.62	0.00	66	10.0	8.0	Y
Bldg E - 3rd Floor - South	147	1	1,429.9	1,576.7	0.00	7.62	0.00	66	10.0	8.0	Y
Bldg E - 3rd Floor - South	134	1	1,408.9	1,576.8	0.00	7.62	0.00	66	10.0	8.0	Y
Bldg E - 3rd Floor - West	148	1	1,393.6	1,584.5	0.00	7.62	0.00	66	10.0	8.0	Y
Community Building - North	149	1	1,445.9	1,637.8	0.00	1.52	0.00	66	10.0	8.0	Y
Community Building - East	150	1	1,457.9	1,629.3	0.00	1.52	0.00	66	10.0	8.0	Y
Community Building - South	151	1	1,445.9	1,621.0	0.00	1.52	0.00	66	10.0	8.0	Y
Community Building - West	152	1	1,434.5	1,628.0	0.00	1.52	0.00	66	10.0	8.0	Y
Child Care Bldg - North	153	1	1,494.1	1,597.8	0.00	1.52	0.00	66	10.0	8.0	Y
Child Care Bldg - East	154	1	1,502.2	1,583.7	0.00	1.52	0.00	66	10.0	8.0	Y
Child Care Bldg - South	155	1	1,495.5	1,575.4	0.00	1.52	0.00	66	10.0	8.0	Y
Child Care Bldg - West	156	1	1,485.5	1,586.4	0.00	1.52	0.00	66	10.0	8.0	Y
Community Garden	157	1	1,397.8	1,734.7	0.00	1.52	0.00	66	10.0	8.0	Y
Community Garden	158	1	1,398.5	1,718.5	0.00	1.52	0.00	66	10.0	8.0	Y
Community Garden	159	1	1,398.1	1,699.4	0.00	1.52	0.00	66	10.0	8.0	Y
Tot Lot	160	1	1,446.7	1,659.5	0.00	1.52	0.00	66	10.0	8.0	Y
Pool	161	1	1,447.4	1,643.1	0.00	1.52	0.00	66	10.0	8.0	Y
Daycare Open Space	162	1	1,478.9	1,603.5	0.00	1.52	0.00	66	10.0	8.0	Y
Daycare Open Space	163	1	1,492.9	1,603.4	0.00	1.52	0.00	66	10.0	8.0	Y
Daycare Open Space	165	1	1,480.1	1,593.1	0.00	1.52	0.00	66	10.0	8.0	Y

Eilar Associates **8 October 2014**
JR **TNM 2.5**

INPUT: BARRIERS
PROJECT/CONTRACT: **Las Terrazas**
RUN: **Facades**

Barrier									**Points**										
Name	**Type**	**Height**		**If Wall**	**If Berm**			**Add'tnl**	**Name**	**No.**	**Coordinates (bottom)**			**Height**	**Segment**				
		Min	**Max**	**$ per**	**$ per**	**Top**	**Run:Rise**	**$ per**			**X**	**Y**	**Z**	**at**	**Seg Ht Perturbs**			**On**	**Important**
				Unit	**Unit**	**Width**		**Unit**						**Point**	**Incre-**	**#Up**	**#Dn**	**Struct?**	**Reflec-**
				Area	**Vol.**			**Length**							**ment**				**tions?**
		m	m	$/sq m	$/cu m	m	m:m	$/m			m	m	m	m	m				
Storage Building	W	0.00	30.48	0.00				0.00	point54	54	1,368.8	1,790.7	0.00	6.10	0.00	0	0		
									point55	55	1,372.1	1,791.0	0.00	6.10	0.00	0	0		
									point56	56	1,386.4	1,587.3	0.00	6.10	0.00	0	0		
									point57	57	1,382.9	1,587.0	0.00	6.10	0.00	0	0		
									point58	58	1,368.8	1,790.7	0.00	6.10					
Bldg A	W	0.00	30.48	0.00				0.00	point131	131	1,383.8	1,767.4	0.00	13.72	0.00	0	0		
									point132	132	1,397.1	1,767.5	0.00	13.72	0.00	0	0		
									point133	133	1,397.4	1,759.6	0.00	13.72	0.00	0	0		
									point134	134	1,402.1	1,759.7	0.00	13.72	0.00	0	0		
									point135	135	1,402.2	1,767.7	0.00	13.72	0.00	0	0		
									point136	136	1,416.6	1,767.2	0.00	13.72	0.00	0	0		
									point137	137	1,416.1	1,760.0	0.00	13.72	0.00	0	0		
									point138	138	1,421.5	1,759.9	0.00	13.72	0.00	0	0		
									point139	139	1,421.5	1,767.5	0.00	13.72	0.00	0	0		
									point140	140	1,431.9	1,767.4	0.00	13.72	0.00	0	0		
									point141	141	1,431.6	1,759.9	0.00	13.72	0.00	0	0		
									point142	142	1,432.9	1,759.8	0.00	13.72	0.00	0	0		
									point143	143	1,432.8	1,752.1	0.00	13.72	0.00	0	0		
									point144	144	1,385.8	1,752.0	0.00	13.72	0.00	0	0		
									point145	145	1,385.8	1,759.8	0.00	13.72	0.00	0	0		
									point146	146	1,384.0	1,759.8	0.00	13.72	0.00	0	0		
									point147	147	1,383.8	1,767.4	0.00	13.72					
Bldg B	W	0.00	30.48	0.00				0.00	point148	148	1,415.9	1,737.8	0.00	13.72	0.00	0	0		
									point149	149	1,431.0	1,736.9	0.00	13.72	0.00	0	0		
									point150	150	1,431.4	1,729.5	0.00	13.72	0.00	0	0		
									point151	151	1,423.7	1,729.7	0.00	13.72	0.00	0	0		
									point152	152	1,423.7	1,724.7	0.00	13.72	0.00	0	0		
									point153	153	1,431.0	1,724.7	0.00	13.72	0.00	0	0		
									point154	154	1,431.2	1,710.7	0.00	13.72	0.00	0	0		
									point155	155	1,424.0	1,710.8	0.00	13.72	0.00	0	0		
									point156	156	1,423.8	1,705.4	0.00	13.72	0.00	0	0		
									point157	157	1,431.6	1,705.5	0.00	13.72	0.00	0	0		
									point158	158	1,431.5	1,692.2	0.00	13.72	0.00	0	0		
									point159	159	1,423.5	1,692.1	0.00	13.72	0.00	0	0		
									point160	160	1,423.6	1,693.4	0.00	13.72	0.00	0	0		

									point161	161	1,415.6	1,693.9	0.00	13.72	0.00	0	0		
									point162	162	1,415.9	1,737.8	0.00	13.72					
Bldg C	W	0.00	30.48	0.00				0.00	point163	163	1,413.8	1,667.1	0.00	13.72	0.00	0	0		
									point164	164	1,421.7	1,666.9	0.00	13.72	0.00	0	0		
									point165	165	1,421.7	1,665.4	0.00	13.72	0.00	0	0		
									point166	166	1,429.5	1,665.1	0.00	13.72	0.00	0	0		
									point167	167	1,429.3	1,621.6	0.00	13.72	0.00	0	0		
									point168	168	1,421.8	1,621.4	0.00	13.72	0.00	0	0		
									point169	169	1,421.9	1,622.7	0.00	13.72	0.00	0	0		
									point170	170	1,414.4	1,622.7	0.00	13.72	0.00	0	0		
									point171	171	1,414.4	1,629.8	0.00	13.72	0.00	0	0		
									point172	172	1,422.2	1,629.5	0.00	13.72	0.00	0	0		
									point173	173	1,422.0	1,634.4	0.00	13.72	0.00	0	0		
									point174	174	1,414.4	1,634.4	0.00	13.72	0.00	0	0		
									point175	175	1,414.4	1,648.4	0.00	13.72	0.00	0	0		
									point176	176	1,421.8	1,648.4	0.00	13.72	0.00	0	0		
									point177	177	1,421.8	1,653.7	0.00	13.72	0.00	0	0		
									point178	178	1,414.1	1,653.5	0.00	13.72	0.00	0	0		
									point179	179	1,413.8	1,667.1	0.00	13.72					
Bldg D	W	0.00	30.48	0.00				0.00	point180	180	1,485.2	1,663.7	0.00	7.62	0.00	0	0		
									point181	181	1,492.9	1,663.5	0.00	7.62	0.00	0	0		
									point182	182	1,493.1	1,661.8	0.00	7.62	0.00	0	0		
									point183	183	1,500.8	1,662.0	0.00	7.62	0.00	0	0		
									point184	184	1,501.0	1,614.8	0.00	7.62	0.00	0	0		
									point185	185	1,493.2	1,614.7	0.00	7.62	0.00	0	0		
									point186	186	1,493.3	1,613.0	0.00	7.62	0.00	0	0		
									point187	187	1,485.2	1,612.6	0.00	7.62	0.00	0	0		
									point188	188	1,485.2	1,622.7	0.00	7.62	0.00	0	0		
									point189	189	1,493.0	1,622.8	0.00	7.62	0.00	0	0		
									point190	190	1,493.2	1,627.9	0.00	7.62	0.00	0	0		
									point191	191	1,485.3	1,627.7	0.00	7.62	0.00	0	0		
									point192	192	1,485.3	1,648.2	0.00	7.62	0.00	0	0		
									point193	193	1,493.1	1,648.5	0.00	7.62	0.00	0	0		
									point194	194	1,493.2	1,653.2	0.00	7.62	0.00	0	0		
									point195	195	1,485.3	1,653.4	0.00	7.62	0.00	0	0		
									point196	196	1,485.2	1,663.7	0.00	7.62					
Bldg E	W	0.00	30.48	0.00				0.00	point197	197	1,393.8	1,593.0	0.00	13.72	0.00	0	0		
									point198	198	1,407.3	1,593.0	0.00	13.72	0.00	0	0		
									point199	199	1,407.5	1,585.5	0.00	13.72	0.00	0	0		
									point200	200	1,412.5	1,585.7	0.00	13.72	0.00	0	0		
									point201	201	1,412.2	1,593.1	0.00	13.72	0.00	0	0		
									point202	202	1,426.7	1,593.1	0.00	13.72	0.00	0	0		
									point203	203	1,426.7	1,585.6	0.00	13.72	0.00	0	0		
									point204	204	1,431.1	1,585.4	0.00	13.72	0.00	0	0		
									point205	205	1,431.5	1,592.7	0.00	13.72	0.00	0	0		
									point206	206	1,441.5	1,592.6	0.00	13.72	0.00	0	0		
									point207	207	1,441.8	1,585.7	0.00	13.72	0.00	0	0		
									point208	208	1,443.0	1,585.6	0.00	13.72	0.00	0	0		
									point209	209	1,443.1	1,577.7	0.00	13.72	0.00	0	0		

									point210	210	1,395.8	1,578.0	0.00	13.72	0.00	0	0		
									point211	211	1,395.6	1,585.7	0.00	13.72	0.00	0	0		
									point212	212	1,394.0	1,585.7	0.00	13.72	0.00	0	0		
									point213	213	1,393.8	1,593.0	0.00	13.72					
Community Bldg	W	0.00	30.48	0.00				0.00	point214	214	1,435.5	1,629.4	0.00	6.10	0.00	0	0		
									point215	215	1,440.7	1,629.6	0.00	6.10	0.00	0	0		
									point216	216	1,440.4	1,636.9	0.00	6.10	0.00	0	0		
									point217	217	1,447.6	1,636.6	0.00	6.10	0.00	0	0		
									point218	218	1,447.9	1,629.9	0.00	6.10	0.00	0	0		
									point219	219	1,451.4	1,629.8	0.00	6.10	0.00	0	0		
									point220	220	1,451.4	1,635.3	0.00	6.10	0.00	0	0		
									point221	221	1,456.8	1,635.2	0.00	6.10	0.00	0	0		
									point222	222	1,456.9	1,618.2	0.00	6.10	0.00	0	0		
									point223	223	1,452.1	1,618.4	0.00	6.10	0.00	0	0		
									point224	224	1,451.2	1,623.6	0.00	6.10	0.00	0	0		
									point225	225	1,448.1	1,623.7	0.00	6.10	0.00	0	0		
									point226	226	1,448.0	1,622.2	0.00	6.10	0.00	0	0		
									point227	227	1,435.9	1,622.1	0.00	6.10	0.00	0	0		
									point228	228	1,435.5	1,629.4	0.00	6.10					
Child Care Bldg	W	0.00	30.48	0.00				0.00	point229	229	1,486.2	1,591.0	0.00	6.10	0.00	0	0		
									point230	230	1,488.8	1,591.1	0.00	6.10	0.00	0	0		
									point231	231	1,488.9	1,596.8	0.00	6.10	0.00	0	0		
									point232	232	1,497.7	1,596.8	0.00	6.10	0.00	0	0		
									point233	233	1,497.8	1,587.3	0.00	6.10	0.00	0	0		
									point234	234	1,501.1	1,587.3	0.00	6.10	0.00	0	0		
									point235	235	1,501.0	1,576.3	0.00	6.10	0.00	0	0		
									point236	236	1,491.1	1,576.2	0.00	6.10	0.00	0	0		
									point237	237	1,491.0	1,579.7	0.00	6.10	0.00	0	0		
									point238	238	1,488.1	1,579.6	0.00	6.10	0.00	0	0		
									point239	239	1,488.3	1,584.6	0.00	6.10	0.00	0	0		
									point240	240	1,486.2	1,584.5	0.00	6.10	0.00	0	0		
									point241	241	1,486.2	1,591.0	0.00	6.10					
Perimeter Wall	W	0.00	30.48	0.00				0.00	point242	242	1,509.8	1,682.3	0.00	1.83	0.00	0	0		
									point243	243	1,458.4	1,683.4	0.00	1.83	0.00	0	0		
									point244	244	1,462.9	1,797.3	0.00	1.83	0.00	0	0		
									point245	245	1,372.8	1,796.7	0.00	1.83	0.00	0	0		
									point246	246	1,388.7	1,567.5	0.00	1.83					

Eilar Associates
8 October 2014
JR
TNM 2.5
Calculated with TNM 2.5
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Las Terrazas
RUN: Facades
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 50% RH
Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Bldg A - 1st Floor - North	49	1	0.0	40.6	66	40.6	10	----	40.6	0.0	8	-8.0
Bldg A - 1st Floor - North	50	1	0.0	41.1	66	41.1	10	----	41.1	0.0	8	-8.0
Bldg A - 1st Floor - North	51	1	0.0	48.9	66	48.9	10	----	48.9	0.0	8	-8.0
Bldg A - 1st Floor - East	52	1	0.0	59.0	66	59.0	10	----	59.0	0.0	8	-8.0
Bldg A - 1st Floor - South	53	1	0.0	57.8	66	57.8	10	----	57.8	0.0	8	-8.0
Bldg A - 1st Floor - South	54	1	0.0	55.3	66	55.3	10	----	55.3	0.0	8	-8.0
Bldg A - 1st Floor - West	55	1	0.0	52.0	66	52.0	10	----	52.0	0.0	8	-8.0
Bldg A - 2nd Floor - North	56	1	0.0	43.1	66	43.1	10	----	43.1	0.0	8	-8.0
Bldg A - 2nd Floor - North	57	1	0.0	43.5	66	43.5	10	----	43.5	0.0	8	-8.0
Bldg A - 2nd Floor - North	58	1	0.0	52.8	66	52.8	10	----	52.8	0.0	8	-8.0
Bldg A - 2nd Floor - East	59	1	0.0	61.4	66	61.4	10	----	61.4	0.0	8	-8.0
Bldg A - 2nd Floor - South	60	1	0.0	60.2	66	60.2	10	----	60.2	0.0	8	-8.0
Bldg A - 2nd Floor - South	61	1	0.0	56.5	66	56.5	10	----	56.5	0.0	8	-8.0
Bldg A - 2nd Floor - West	62	1	0.0	52.8	66	52.8	10	----	52.8	0.0	8	-8.0
Bldg A - 3rd Floor - North	63	1	0.0	44.1	66	44.1	10	----	44.1	0.0	8	-8.0
Bldg A - 3rd Floor - North	64	1	0.0	44.6	66	44.6	10	----	44.6	0.0	8	-8.0
Bldg A - 3rd Floor - North	65	1	0.0	53.3	66	53.3	10	----	53.3	0.0	8	-8.0
Bldg A - 3rd Floor - East	66	1	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0
Bldg A - 3rd Floor - South	67	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
Bldg A - 3rd Floor - South	68	1	0.0	63.8	66	63.8	10	----	63.8	0.0	8	-8.0
Bldg A - 3rd Floor - West	69	1	0.0	63.8	66	63.8	10	----	63.8	0.0	8	-8.0
Bldg B - 1st Floor - North	70	1	0.0	52.1	66	52.1	10	----	52.1	0.0	8	-8.0
Bldg B - 1st Floor - East	71	1	0.0	58.7	66	58.7	10	----	58.7	0.0	8	-8.0
Bldg B - 1st Floor - East	72	1	0.0	58.2	66	58.2	10	----	58.2	0.0	8	-8.0

Bldg B - 1st Floor - East	73	1	0.0	57.2	66	57.2	10	----	57.2	0.0	8	-8.0
Bldg B - 1st Floor - South	74	1	0.0	56.6	66	56.6	10	----	56.6	0.0	8	-8.0
Bldg B - 1st Floor - West	75	1	0.0	53.9	66	53.9	10	----	53.9	0.0	8	-8.0
Bldg B - 1st Floor - West	76	1	0.0	53.2	66	53.2	10	----	53.2	0.0	8	-8.0
Bldg B - 2nd Floor - North	77	1	0.0	55.0	66	55.0	10	----	55.0	0.0	8	-8.0
Bldg B - 2nd Floor - East	78	1	0.0	61.0	66	61.0	10	----	61.0	0.0	8	-8.0
Bldg B - 2nd Floor - East	79	1	0.0	60.6	66	60.6	10	----	60.6	0.0	8	-8.0
Bldg B - 2nd Floor - East	80	1	0.0	59.5	66	59.5	10	----	59.5	0.0	8	-8.0
Bldg B - 2nd Floor - South	81	1	0.0	57.3	66	57.3	10	----	57.3	0.0	8	-8.0
Bldg B - 2nd Floor - West	82	1	0.0	54.6	66	54.6	10	----	54.6	0.0	8	-8.0
Bldg B - 2nd Floor - West	83	1	0.0	54.0	66	54.0	10	----	54.0	0.0	8	-8.0
Bldg B - 3rd Floor - North	84	1	0.0	54.9	66	54.9	10	----	54.9	0.0	8	-8.0
Bldg B - 3rd Floor - East	85	1	0.0	61.4	66	61.4	10	----	61.4	0.0	8	-8.0
Bldg B - 3rd Floor - East	86	1	0.0	61.2	66	61.2	10	----	61.2	0.0	8	-8.0
Bldg B - 3rd Floor - East	87	1	0.0	60.8	66	60.8	10	----	60.8	0.0	8	-8.0
Bldg B - 3rd Floor - South	88	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
Bldg B - 3rd Floor - West	89	1	0.0	63.6	66	63.6	10	----	63.6	0.0	8	-8.0
Bldg B - 3rd Floor - West	90	1	0.0	63.2	66	63.2	10	----	63.2	0.0	8	-8.0
Bldg C - 1st Floor - North	91	1	0.0	46.1	66	46.1	10	----	46.1	0.0	8	-8.0
Bldg C - 1st Floor - East	92	1	0.0	49.3	66	49.3	10	----	49.3	0.0	8	-8.0
Bldg C - 1st Floor - East	93	1	0.0	60.8	66	60.8	10	----	60.8	0.0	8	-8.0
Bldg C - 1st Floor - South	94	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
Bldg C - 1st Floor - West	95	1	0.0	55.7	66	55.7	10	----	55.7	0.0	8	-8.0
Bldg C - 1st Floor - West	96	1	0.0	55.5	66	55.5	10	----	55.5	0.0	8	-8.0
Bldg C - 1st Floor - West	97	1	0.0	55.4	66	55.4	10	----	55.4	0.0	8	-8.0
Bldg C - 2nd Floor - North	98	1	0.0	48.3	66	48.3	10	----	48.3	0.0	8	-8.0
Bldg C - 2nd Floor - East	99	1	0.0	52.0	66	52.0	10	----	52.0	0.0	8	-8.0
Bldg C - 2nd Floor - East	100	1	0.0	61.0	66	61.0	10	----	61.0	0.0	8	-8.0
Bldg C - 2nd Floor - South	101	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
Bldg C - 2nd Floor - West	102	1	0.0	57.5	66	57.5	10	----	57.5	0.0	8	-8.0
Bldg C - 2nd Floor - West	103	1	0.0	57.1	66	57.1	10	----	57.1	0.0	8	-8.0
Bldg C - 2nd Floor - West	104	1	0.0	56.6	66	56.6	10	----	56.6	0.0	8	-8.0
Bldg C - 3rd Floor - North	105	1	0.0	54.5	66	54.5	10	----	54.5	0.0	8	-8.0
Bldg C - 3rd Floor - East	106	1	0.0	63.7	66	63.7	10	----	63.7	0.0	8	-8.0
Bldg C - 3rd Floor - East	107	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0
Bldg C - 3rd Floor - South	108	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	8	-8.0
Bldg C - 3rd Floor - West	109	1	0.0	65.7	66	65.7	10	----	65.7	0.0	8	-8.0
Bldg C - 3rd Floor - West	110	1	0.0	65.4	66	65.4	10	----	65.4	0.0	8	-8.0
Bldg C - 3rd Floor - West	111	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
Bldg D - 1st Floor - North	112	1	0.0	56.3	66	56.3	10	----	56.3	0.0	8	-8.0
Bldg D - 1st Floor - East	113	1	0.0	67.4	66	67.4	10	Snd Lvl	67.4	0.0	8	-8.0

Bldg D - 1st Floor - East	114	1	0.0	68.5	66	68.5	10	Snd Lvl	68.5	0.0	8	-8.0
Bldg D - 1st Floor - South	117	1	0.0	70.0	66	70.0	10	Snd Lvl	70.0	0.0	8	-8.0
Bldg D - 1st Floor - West	118	1	0.0	66.6	66	66.6	10	Snd Lvl	66.6	0.0	8	-8.0
Bldg D - 1st Floor - West	119	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
Bldg D - 1st Floor - West	120	1	0.0	63.5	66	63.5	10	----	63.5	0.0	8	-8.0
Bldg D - 2nd Floor - North	121	1	0.0	56.9	66	56.9	10	----	56.9	0.0	8	-8.0
Bldg D - 2nd Floor - East	122	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	8	-8.0
Bldg D - 2nd Floor - East	123	1	0.0	67.9	66	67.9	10	Snd Lvl	67.9	0.0	8	-8.0
Bldg D - 2nd Floor - South	124	1	0.0	69.4	66	69.4	10	Snd Lvl	69.4	0.0	8	-8.0
Bldg D - 2nd Floor - West	125	1	0.0	66.1	66	66.1	10	Snd Lvl	66.1	0.0	8	-8.0
Bldg D - 2nd Floor - West	126	1	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0
Bldg D - 2nd Floor - West	127	1	0.0	63.0	66	63.0	10	----	63.0	0.0	8	-8.0
Bldg E - 1st Floor - North	128	1	0.0	44.4	66	44.4	10	----	44.4	0.0	8	-8.0
Bldg E - 1st Floor - North	129	1	0.0	43.7	66	43.7	10	----	43.7	0.0	8	-8.0
Bldg E - 1st Floor - North	130	1	0.0	45.1	66	45.1	10	----	45.1	0.0	8	-8.0
Bldg E - 1st Floor - East	131	1	0.0	70.6	66	70.6	10	Snd Lvl	70.6	0.0	8	-8.0
Bldg E - 1st Floor - South	132	1	0.0	74.2	66	74.2	10	Snd Lvl	74.2	0.0	8	-8.0
Bldg E - 1st Floor - South	133	1	0.0	74.1	66	74.1	10	Snd Lvl	74.1	0.0	8	-8.0
Bldg E - 1st Floor - West	134	1	0.0	69.6	66	69.6	10	Snd Lvl	69.6	0.0	8	-8.0
Bldg E - 2nd Floor - North	136	1	0.0	47.2	66	47.2	10	----	47.2	0.0	8	-8.0
Bldg E - 2nd Floor - North	137	1	0.0	46.1	66	46.1	10	----	46.1	0.0	8	-8.0
Bldg E - 2nd Floor - North	138	1	0.0	47.8	66	47.8	10	----	47.8	0.0	8	-8.0
Bldg E - 2nd Floor - East	139	1	0.0	70.4	66	70.4	10	Snd Lvl	70.4	0.0	8	-8.0
Bldg E - 2nd Floor - South	140	1	0.0	74.2	66	74.2	10	Snd Lvl	74.2	0.0	8	-8.0
Bldg E - 2nd Floor - South	141	1	0.0	74.2	66	74.2	10	Snd Lvl	74.2	0.0	8	-8.0
Bldg E - 2nd Floor - West	142	1	0.0	71.8	66	71.8	10	Snd Lvl	71.8	0.0	8	-8.0
Bldg E - 3rd Floor - North	143	1	0.0	55.7	66	55.7	10	----	55.7	0.0	8	-8.0
Bldg E - 3rd Floor - North	144	1	0.0	50.4	66	50.4	10	----	50.4	0.0	8	-8.0
Bldg E - 3rd Floor - North	145	1	0.0	54.5	66	54.5	10	----	54.5	0.0	8	-8.0
Bldg E - 3rd Floor - East	146	1	0.0	70.4	66	70.4	10	Snd Lvl	70.4	0.0	8	-8.0
Bldg E - 3rd Floor - South	147	1	0.0	74.1	66	74.1	10	Snd Lvl	74.1	0.0	8	-8.0
Bldg E - 3rd Floor - South	134	1	0.0	74.2	66	74.2	10	Snd Lvl	74.2	0.0	8	-8.0
Bldg E - 3rd Floor - West	148	1	0.0	71.9	66	71.9	10	Snd Lvl	71.9	0.0	8	-8.0
Community Building - North	149	1	0.0	45.7	66	45.7	10	----	45.7	0.0	8	-8.0
Community Building - East	150	1	0.0	66.2	66	66.2	10	Snd Lvl	66.2	0.0	8	-8.0
Community Building - South	151	1	0.0	67.2	66	67.2	10	Snd Lvl	67.2	0.0	8	-8.0
Community Building - West	152	1	0.0	53.8	66	53.8	10	----	53.8	0.0	8	-8.0
Child Care Bldg - North	153	1	0.0	59.2	66	59.2	10	----	59.2	0.0	8	-8.0
Child Care Bldg - East	154	1	0.0	71.0	66	71.0	10	Snd Lvl	71.0	0.0	8	-8.0
Child Care Bldg - South	155	1	0.0	74.1	66	74.1	10	Snd Lvl	74.1	0.0	8	-8.0
Child Care Bldg - West	156	1	0.0	71.3	66	71.3	10	Snd Lvl	71.3	0.0	8	-8.0

Community Garden	157	1	0.0	53.3	66	53.3	10	----	53.3	0.0	8	-8.0
Community Garden	158	1	0.0	54.0	66	54.0	10	----	54.0	0.0	8	-8.0
Community Garden	159	1	0.0	56.7	66	56.7	10	----	56.7	0.0	8	-8.0
Tot Lot	160	1	0.0	56.8	66	56.8	10	----	56.8	0.0	8	-8.0
Pool	161	1	0.0	52.5	66	52.5	10	----	52.5	0.0	8	-8.0
Daycare Open Space	162	1	0.0	69.9	66	69.9	10	Snd Lvl	69.9	0.0	8	-8.0
Daycare Open Space	163	1	0.0	69.2	66	69.2	10	Snd Lvl	69.2	0.0	8	-8.0
Daycare Open Space	165	1	0.0	71.1	66	71.1	10	Snd Lvl	71.1	0.0	8	-8.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	114	0.0	0.0	0.0
All Impacted	29	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Eilar Associates 8 October 2014
JR TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Las Terrazas
RUN: Facades

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			m	m	m	m	dBA	dBA	dB	dB	
Community Garden	157	1	1,397.8	1,734.7	0.00	1.52	0.00	66	10.0	8.0	Y
Community Garden	158	1	1,398.5	1,718.5	0.00	1.52	0.00	66	10.0	8.0	Y
Community Garden	159	1	1,398.1	1,699.4	0.00	1.52	0.00	66	10.0	8.0	Y
Tot Lot	160	1	1,446.7	1,659.5	0.00	1.52	0.00	66	10.0	8.0	Y
Pool	161	1	1,447.4	1,643.1	0.00	1.52	0.00	66	10.0	8.0	Y
Daycare Open Space	163	1	1,493.6	1,601.3	0.00	1.52	0.00	66	10.0	8.0	Y

Eilar Associates **8 October 2014**
JR **TNM 2.5**

INPUT: BARRIERS
PROJECT/CONTRACT: **Las Terrazas**
RUN: **Facades**

Barrier									**Points**										
Name	**Type**	**Height**		**If Wall**	**If Berm**			**Add'tnl**	**Name**	**No.**	**Coordinates (bottom)**			**Height**	**Segment**				
		Min	**Max**	**$ per**	**$ per**	**Top**	**Run:Rise**	**$ per**			**X**	**Y**	**Z**	**at**	**Seg Ht Perturbs**			**On**	**Important**
				Unit	**Unit**	**Width**		**Unit**						**Point**	**Incre-**	**#Up**	**#Dn**	**Struct?**	**Reflec-**
				Area	**Vol.**			**Length**							**ment**				**tions?**
		m	m	$/sq m	$/cu m	m	m:m	$/m			m	m	m	m	m				
Storage Building	W	0.00	30.48	0.00				0.00	point54	54	1,368.8	1,790.7	0.00	6.10	0.00	0	0		
									point55	55	1,372.1	1,791.0	0.00	6.10	0.00	0	0		
									point56	56	1,386.4	1,587.3	0.00	6.10	0.00	0	0		
									point57	57	1,382.9	1,587.0	0.00	6.10	0.00	0	0		
									point58	58	1,368.8	1,790.7	0.00	6.10					
Bldg A	W	0.00	30.48	0.00				0.00	point131	131	1,383.8	1,767.4	0.00	13.72	0.00	0	0		
									point132	132	1,397.1	1,767.5	0.00	13.72	0.00	0	0		
									point133	133	1,397.4	1,759.6	0.00	13.72	0.00	0	0		
									point134	134	1,402.1	1,759.7	0.00	13.72	0.00	0	0		
									point135	135	1,402.2	1,767.7	0.00	13.72	0.00	0	0		
									point136	136	1,416.6	1,767.2	0.00	13.72	0.00	0	0		
									point137	137	1,416.1	1,760.0	0.00	13.72	0.00	0	0		
									point138	138	1,421.5	1,759.9	0.00	13.72	0.00	0	0		
									point139	139	1,421.5	1,767.5	0.00	13.72	0.00	0	0		
									point140	140	1,431.9	1,767.4	0.00	13.72	0.00	0	0		
									point141	141	1,431.6	1,759.9	0.00	13.72	0.00	0	0		
									point142	142	1,432.9	1,759.8	0.00	13.72	0.00	0	0		
									point143	143	1,432.8	1,752.1	0.00	13.72	0.00	0	0		
									point144	144	1,385.8	1,752.0	0.00	13.72	0.00	0	0		
									point145	145	1,385.8	1,759.8	0.00	13.72	0.00	0	0		
									point146	146	1,384.0	1,759.8	0.00	13.72	0.00	0	0		
									point147	147	1,383.8	1,767.4	0.00	13.72					
Bldg B	W	0.00	30.48	0.00				0.00	point148	148	1,415.9	1,737.8	0.00	13.72	0.00	0	0		
									point149	149	1,431.0	1,736.9	0.00	13.72	0.00	0	0		
									point150	150	1,431.4	1,729.5	0.00	13.72	0.00	0	0		
									point151	151	1,423.7	1,729.7	0.00	13.72	0.00	0	0		
									point152	152	1,423.7	1,724.7	0.00	13.72	0.00	0	0		
									point153	153	1,431.0	1,724.7	0.00	13.72	0.00	0	0		
									point154	154	1,431.2	1,710.7	0.00	13.72	0.00	0	0		
									point155	155	1,424.0	1,710.8	0.00	13.72	0.00	0	0		
									point156	156	1,423.8	1,705.4	0.00	13.72	0.00	0	0		
									point157	157	1,431.6	1,705.5	0.00	13.72	0.00	0	0		
									point158	158	1,431.5	1,692.2	0.00	13.72	0.00	0	0		
									point159	159	1,423.5	1,692.1	0.00	13.72	0.00	0	0		
									point160	160	1,423.6	1,693.4	0.00	13.72	0.00	0	0		

									point161	161	1,415.6	1,693.9	0.00	13.72	0.00	0	0		
									point162	162	1,415.9	1,737.8	0.00	13.72					
Bldg C	W	0.00	30.48	0.00				0.00	point163	163	1,413.8	1,667.1	0.00	13.72	0.00	0	0		
									point164	164	1,421.7	1,666.9	0.00	13.72	0.00	0	0		
									point165	165	1,421.7	1,665.4	0.00	13.72	0.00	0	0		
									point166	166	1,429.5	1,665.1	0.00	13.72	0.00	0	0		
									point167	167	1,429.3	1,621.6	0.00	13.72	0.00	0	0		
									point168	168	1,421.8	1,621.4	0.00	13.72	0.00	0	0		
									point169	169	1,421.9	1,622.7	0.00	13.72	0.00	0	0		
									point170	170	1,414.4	1,622.7	0.00	13.72	0.00	0	0		
									point171	171	1,414.4	1,629.8	0.00	13.72	0.00	0	0		
									point172	172	1,422.2	1,629.5	0.00	13.72	0.00	0	0		
									point173	173	1,422.0	1,634.4	0.00	13.72	0.00	0	0		
									point174	174	1,414.4	1,634.4	0.00	13.72	0.00	0	0		
									point175	175	1,414.4	1,648.4	0.00	13.72	0.00	0	0		
									point176	176	1,421.8	1,648.4	0.00	13.72	0.00	0	0		
									point177	177	1,421.8	1,653.7	0.00	13.72	0.00	0	0		
									point178	178	1,414.1	1,653.5	0.00	13.72	0.00	0	0		
									point179	179	1,413.8	1,667.1	0.00	13.72					
Bldg D	W	0.00	30.48	0.00				0.00	point180	180	1,485.2	1,663.7	0.00	7.62	0.00	0	0		
									point181	181	1,492.9	1,663.5	0.00	7.62	0.00	0	0		
									point182	182	1,493.1	1,661.8	0.00	7.62	0.00	0	0		
									point183	183	1,500.8	1,662.0	0.00	7.62	0.00	0	0		
									point184	184	1,501.0	1,614.8	0.00	7.62	0.00	0	0		
									point185	185	1,493.2	1,614.7	0.00	7.62	0.00	0	0		
									point186	186	1,493.3	1,613.0	0.00	7.62	0.00	0	0		
									point187	187	1,485.2	1,612.6	0.00	7.62	0.00	0	0		
									point188	188	1,485.2	1,622.7	0.00	7.62	0.00	0	0		
									point189	189	1,493.0	1,622.8	0.00	7.62	0.00	0	0		
									point190	190	1,493.2	1,627.9	0.00	7.62	0.00	0	0		
									point191	191	1,485.3	1,627.7	0.00	7.62	0.00	0	0		
									point192	192	1,485.3	1,648.2	0.00	7.62	0.00	0	0		
									point193	193	1,493.1	1,648.5	0.00	7.62	0.00	0	0		
									point194	194	1,493.2	1,653.2	0.00	7.62	0.00	0	0		
									point195	195	1,485.3	1,653.4	0.00	7.62	0.00	0	0		
									point196	196	1,485.2	1,663.7	0.00	7.62					
Bldg E	W	0.00	30.48	0.00				0.00	point197	197	1,393.8	1,593.0	0.00	13.72	0.00	0	0		
									point198	198	1,407.3	1,593.0	0.00	13.72	0.00	0	0		
									point199	199	1,407.5	1,585.5	0.00	13.72	0.00	0	0		
									point200	200	1,412.5	1,585.7	0.00	13.72	0.00	0	0		
									point201	201	1,412.2	1,593.1	0.00	13.72	0.00	0	0		
									point202	202	1,426.7	1,593.1	0.00	13.72	0.00	0	0		
									point203	203	1,426.7	1,585.6	0.00	13.72	0.00	0	0		
									point204	204	1,431.1	1,585.4	0.00	13.72	0.00	0	0		
									point205	205	1,431.5	1,592.7	0.00	13.72	0.00	0	0		
									point206	206	1,441.5	1,592.6	0.00	13.72	0.00	0	0		
									point207	207	1,441.8	1,585.7	0.00	13.72	0.00	0	0		
									point208	208	1,443.0	1,585.6	0.00	13.72	0.00	0	0		
									point209	209	1,443.1	1,577.7	0.00	13.72	0.00	0	0		

									point210	210	1,395.8	1,578.0	0.00	13.72	0.00	0	0		
									point211	211	1,395.6	1,585.7	0.00	13.72	0.00	0	0		
									point212	212	1,394.0	1,585.7	0.00	13.72	0.00	0	0		
									point213	213	1,393.8	1,593.0	0.00	13.72					
Community Bldg	W	0.00	30.48	0.00				0.00	point214	214	1,435.5	1,629.4	0.00	6.10	0.00	0	0		
									point215	215	1,440.7	1,629.6	0.00	6.10	0.00	0	0		
									point216	216	1,440.4	1,636.9	0.00	6.10	0.00	0	0		
									point217	217	1,447.6	1,636.6	0.00	6.10	0.00	0	0		
									point218	218	1,447.9	1,629.9	0.00	6.10	0.00	0	0		
									point219	219	1,451.4	1,629.8	0.00	6.10	0.00	0	0		
									point220	220	1,451.4	1,635.3	0.00	6.10	0.00	0	0		
									point221	221	1,456.8	1,635.2	0.00	6.10	0.00	0	0		
									point222	222	1,456.9	1,618.2	0.00	6.10	0.00	0	0		
									point223	223	1,452.1	1,618.4	0.00	6.10	0.00	0	0		
									point224	224	1,451.2	1,623.6	0.00	6.10	0.00	0	0		
									point225	225	1,448.1	1,623.7	0.00	6.10	0.00	0	0		
									point226	226	1,448.0	1,622.2	0.00	6.10	0.00	0	0		
									point227	227	1,435.9	1,622.1	0.00	6.10	0.00	0	0		
									point228	228	1,435.5	1,629.4	0.00	6.10					
Child Care Bldg	W	0.00	30.48	0.00				0.00	point229	229	1,486.2	1,591.0	0.00	6.10	0.00	0	0		
									point230	230	1,488.8	1,591.1	0.00	6.10	0.00	0	0		
									point231	231	1,488.9	1,596.8	0.00	6.10	0.00	0	0		
									point232	232	1,497.7	1,596.8	0.00	6.10	0.00	0	0		
									point233	233	1,497.8	1,587.3	0.00	6.10	0.00	0	0		
									point234	234	1,501.1	1,587.3	0.00	6.10	0.00	0	0		
									point235	235	1,501.0	1,576.3	0.00	6.10	0.00	0	0		
									point236	236	1,491.1	1,576.2	0.00	6.10	0.00	0	0		
									point237	237	1,491.0	1,579.7	0.00	6.10	0.00	0	0		
									point238	238	1,488.1	1,579.6	0.00	6.10	0.00	0	0		
									point239	239	1,488.3	1,584.6	0.00	6.10	0.00	0	0		
									point240	240	1,486.2	1,584.5	0.00	6.10	0.00	0	0		
									point241	241	1,486.2	1,591.0	0.00	6.10					
Perimeter Wall	W	0.00	30.48	0.00				0.00	point242	242	1,509.8	1,682.3	0.00	1.83	0.00	0	0		
									point243	243	1,458.4	1,683.4	0.00	1.83	0.00	0	0		
									point244	244	1,462.9	1,797.3	0.00	1.83	0.00	0	0		
									point245	245	1,372.8	1,796.7	0.00	1.83	0.00	0	0		
									point246	246	1,388.7	1,567.5	0.00	1.83					
Barrier27	W	0.00	30.48	0.00				0.00	point247	247	1,488.0	1,595.8	0.00	2.44	0.00	0	0		
									point248	248	1,471.3	1,595.8	0.00	2.44	0.00	0	0		
									point249	249	1,471.4	1,610.6	0.00	2.44	0.00	0	0		
									point250	250	1,501.3	1,610.7	0.00	2.44	0.00	0	0		
									point251	251	1,500.7	1,597.3	0.00	2.44	0.00	0	0		
									point252	252	1,487.3	1,597.3	0.00	2.44					

Eilar Associates
8 October 2014
JR
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Las Terrazas
RUN: Facades
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Community Garden	157	1	0.0	52.7	66	52.7	10	----	52.7	0.0	8	-8.0
Community Garden	158	1	0.0	53.3	66	53.3	10	----	53.3	0.0	8	-8.0
Community Garden	159	1	0.0	55.8	66	55.8	10	----	55.8	0.0	8	-8.0
Tot Lot	160	1	0.0	51.8	66	51.8	10	----	51.8	0.0	8	-8.0
Pool	161	1	0.0	49.6	66	49.6	10	----	49.6	0.0	8	-8.0
Daycare Open Space	163	1	0.0	59.7	66	59.7	10	----	59.7	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	6	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 E

Cadna Analysis Data and Results

Cadna Noise Model - Local Sound Levels												
Name	**ID**	**Type**	**Oktave Spectrum (dB)**									**Source**
			Weight.	**125**	**250**	**500**	**1000**	**2000**	**4000**	**A**	**lin**	
Carrier 24ABA4036	T_1	Lw	A	52	62	65.5	67.5	63	61	70.8	71.6	Manufacturer Data Sheets
Freight Train	T_2	Lw	A	98.5	92	98.4	98.6	97.8	94.6	103.5	105	HUD/Colton Crossing AQ Study

Cadna Noise Model - Line Sources									
Name	ID	Result. PWL			Result. PWL'			Lw / Li	
		Day	Evening	Night	Day	Evening	Night	Type	Value
		(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)		
UPRR North Rail	S_1	134.7	134.7	134.7	103.5	103.5	103.5	Lw'	L_2
UPRR West Rail	S_2	138.1	138.1	138.1	103.5	103.5	103.5	Lw'	L_2

Cadna Noise Model - Train Noise Levels at Receivers					
Name	ID	Level Lr	Coordinates		
		Lden	X	Y	Z
		(dBA)	(m)	(m)	(m)
Bldg A - 1st Floor - North	R_1	62.8	1391.48	1768.57	1.52
Bldg A - 1st Floor - North	R_2	64.1	1409.46	1768.45	1.52
Bldg A - 1st Floor - North	R_3	64.1	1428.21	1768.87	1.52
Bldg A - 1st Floor - East	R_4	60.4	1434.14	1759.79	1.52
Bldg A - 1st Floor - South	R_5	61.8	1419.6	1751.01	1.52
Bldg A - 1st Floor - South	R_6	60.5	1398.66	1751.24	1.52
Bldg A - 1st Floor - West	R_7	60.9	1383.41	1759.02	1.52
Bldg A - 2nd Floor - North	R_8	67.8	1391.59	1768.51	4.57
Bldg A - 2nd Floor - North	R_9	68.8	1409.51	1768.63	4.57
Bldg A - 2nd Floor - North	R_10	68.7	1428.44	1768.81	4.57
Bldg A - 2nd Floor - East	R_11	63.4	1434.38	1759.73	4.57
Bldg A - 2nd Floor - South	R_12	65.9	1419.36	1751.24	4.57
Bldg A - 2nd Floor - South	R_13	65.7	1398.71	1751.12	4.57
Bldg A - 2nd Floor - West	R_14	67.2	1383.41	1759.19	4.57
Bldg A - 3rd Floor - North	R_15	70.4	1391.53	1768.3	7.62
Bldg A - 3rd Floor - North	R_16	69.5	1409.53	1768.72	7.62
Bldg A - 3rd Floor - North	R_17	69.1	1428.22	1769.01	7.62
Bldg A - 3rd Floor - North	R_18	63.9	1434.39	1759.82	7.62
Bldg A - 3rd Floor - North	R_19	67.4	1418.9	1751.09	7.62
Bldg A - 3rd Floor - North	R_20	69.1	1398.79	1751.03	7.62
Bldg A - 3rd Floor - North	R_21	74.8	1383.42	1759.16	7.62
Bldg B - 1st Floor - North	R_22	56.2	1424.77	1740.1	1.52
Bldg B - 1st Floor - East	R_23	60.1	1433.06	1731.43	1.52
Bldg B - 1st Floor - East	R_24	60.0	1432.69	1717.82	1.52
Bldg B - 1st Floor - East	R_25	59.6	1433.14	1701.75	1.52
Bldg B - 1st Floor - South	R_26	62.6	1423.27	1690.68	1.52
Bldg B - 1st Floor - West	R_27	62.3	1414.37	1707.36	1.52
Bldg B - 1st Floor - West	R_28	61.9	1414.22	1728.06	1.52
Bldg B - 2nd Floor - North	R_29	60.1	1424.77	1739.8	4.57
Bldg B - 2nd Floor - East	R_30	62.5	1433.14	1731.5	4.57
Bldg B - 2nd Floor - East	R_31	62.5	1432.54	1717.97	4.57
Bldg B - 2nd Floor - East	R_32	62.5	1433.44	1701.45	4.57
Bldg B - 2nd Floor - South	R_33	67.0	1422.97	1690.83	4.57
Bldg B - 2nd Floor - West	R_34	67.2	1414.37	1707.36	4.57
Bldg B - 2nd Floor - West	R_35	66.6	1414.22	1728.14	4.57
Bldg B - 3rd Floor - North	R_36	62.9	1424.48	1739.52	7.62
Bldg B - 3rd Floor - North	R_37	63.1	1433.04	1731.45	7.62
Bldg B - 3rd Floor - North	R_38	63.1	1432.62	1718.04	7.62
Bldg B - 3rd Floor - North	R_39	63.2	1433.27	1701.42	7.62
Bldg B - 3rd Floor - North	R_40	68.9	1423.13	1690.68	7.62
Bldg B - 3rd Floor - North	R_41	69.6	1414.4	1707.42	7.62
Bldg B - 3rd Floor - North	R_42	69.0	1414.11	1728.3	7.62
Bldg C - 1st Floor - North	R_43	60.1	1421.97	1668.35	1.52
Bldg C - 1st Floor - East	R_44	56.3	1430.78	1651.82	1.52
Bldg C - 1st Floor - East	R_45	62.4	1430.96	1631.47	1.52
Bldg C - 1st Floor - South	R_46	64.6	1421.47	1620.61	1.52
Bldg C - 1st Floor - West	R_47	62.9	1412.74	1627.79	1.52
Bldg C - 1st Floor - West	R_48	63.1	1413.16	1641.26	1.52
Bldg C - 1st Floor - West	R_49	63.0	1413.04	1655.80	1.52
Bldg C - 2nd Floor - North	R_50	64.2	1421.82	1668.44	4.57
Bldg C - 2nd Floor - East	R_51	61.2	1430.78	1651.76	4.57
Bldg C - 2nd Floor - East	R_52	63.7	1430.90	1631.11	4.57
Bldg C - 2nd Floor - South	R_53	67.3	1421.47	1620.67	4.57
Bldg C - 2nd Floor - West	R_54	67.9	1412.56	1627.85	4.57
Bldg C - 2nd Floor - West	R_55	68.0	1413.28	1641.20	4.57
Bldg C - 2nd Floor - West	R_56	68.0	1412.98	1655.74	4.57

Cadna Noise Model - Train Noise Levels at Receivers					
Name	ID	Level Lr	Coordinates		
		Lden	X	Y	Z
		(dBA)	(m)	(m)	(m)
Bldg C - 2nd Floor - North	R_50	64.2	1421.82	1668.44	4.57
Bldg C - 2nd Floor - East	R_51	61.2	1430.78	1651.76	4.57
Bldg C - 2nd Floor - East	R_52	63.7	1430.90	1631.11	4.57
Bldg C - 2nd Floor - South	R_53	67.3	1421.47	1620.67	4.57
Bldg C - 2nd Floor - West	R_54	67.9	1412.56	1627.85	4.57
Bldg C - 2nd Floor - West	R_55	68.0	1413.28	1641.20	4.57
Bldg C - 2nd Floor - West	R_56	68.0	1412.98	1655.74	4.57
Bldg C - 3rd Floor - North	R_57	66.7	1421.96	1668.53	7.62
Bldg C - 3rd Floor - North	R_58	64.4	1430.86	1651.78	7.62
Bldg C - 3rd Floor - North	R_59	66.3	1430.93	1631.22	7.62
Bldg C - 3rd Floor - North	R_60	69.1	1421.51	1620.60	7.62
Bldg C - 3rd Floor - North	R_61	70.4	1412.69	1627.63	7.62
Bldg C - 3rd Floor - North	R_62	70.4	1413.29	1641.39	7.62
Bldg C - 3rd Floor - North	R_63	70.3	1412.84	1655.74	7.62
Bldg D - 1st Floor - North	R_64	58.6	1493.21	1664.67	1.52
Bldg D - 1st Floor - East	R_65	66.5	1501.96	1651.44	1.52
Bldg D - 1st Floor - East	R_66	67.5	1502.03	1624.60	1.52
Bldg D - 1st Floor - South	R_67	60.0	1493.88	1612.49	1.52
Bldg D - 1st Floor - West	R_68	63.4	1484.39	1621.83	1.52
Bldg D - 1st Floor - West	R_69	64.6	1483.94	1638.06	1.52
Bldg D - 1st Floor - West	R_70	64.2	1484.16	1654.50	1.52
Bldg D - 2nd Floor - North	R_71	61.4	1493.36	1664.82	4.57
Bldg D - 2nd Floor - East	R_72	67.0	1501.81	1651.89	4.57
Bldg D - 2nd Floor - East	R_73	68.1	1502.40	1624.45	4.57
Bldg D - 2nd Floor - South	R_74	70.4	1494.03	1612.64	4.57
Bldg D - 2nd Floor - West	R_75	69.0	1484.01	1621.83	4.57
Bldg D - 2nd Floor - West	R_76	67.6	1483.86	1637.98	4.57
Bldg D - 2nd Floor - West	R_77	66.4	1484.01	1654.28	4.57
Bldg E - 1st Floor - North	R_78	59.6	1405.05	1594.02	1.52
Bldg E - 1st Floor - North	R_79	60.8	1419.36	1593.88	1.52
Bldg E - 1st Floor - North	R_80	59.1	1433.63	1594.07	1.52
Bldg E - 1st Floor - East	R_81	69.8	1443.66	1585.97	1.52
Bldg E - 1st Floor - South	R_82	74.4	1429.77	1576.74	1.52
Bldg E - 1st Floor - South	R_83	74.6	1408.95	1576.65	1.52
Bldg E - 1st Floor - West	R_84	72.0	1393.79	1584.61	1.52
Bldg E - 2nd Floor - North	R_85	64.0	1405.14	1593.98	4.57
Bldg E - 2nd Floor - North	R_86	64.3	1419.32	1593.98	4.57
Bldg E - 2nd Floor - North	R_87	63.0	1433.63	1594.07	4.57
Bldg E - 2nd Floor - East	R_88	70.2	1443.71	1585.88	4.57
Bldg E - 2nd Floor - South	R_89	75.1	1429.77	1576.60	4.57
Bldg E - 2nd Floor - South	R_90	75.6	1409.00	1576.55	4.57
Bldg E - 2nd Floor - West	R_91	75.2	1393.79	1584.56	4.57
Bldg E - 3rd Floor - North	R_92	68.6	1404.95	1593.99	7.62
Bldg E - 3rd Floor - North	R_93	66.5	1419.31	1593.69	7.62
Bldg E - 3rd Floor - North	R_94	64.9	1433.67	1593.99	7.62
Bldg E - 3rd Floor - North	R_95	70.3	1443.88	1585.86	7.62
Bldg E - 3rd Floor - North	R_96	75.1	1429.87	1576.66	7.62
Bldg E - 3rd Floor - North	R_97	75.6	1408.87	1576.78	7.62
Bldg E - 3rd Floor - North	R_98	76.2	1393.56	1584.55	7.62
Community Building - North	R_99	53.9	1445.95	1637.78	1.52
Community Building - East	R_100	66.2	1457.94	1629.30	1.52
Community Building - South	R_101	68.0	1445.95	1620.99	1.52
Community Building - West	R_102	57.8	1434.50	1627.99	1.52
Child Care Bldg - North	R_103	57.3	1494.13	1597.85	1.52
Child Care Bldg - East	R_104	69.6	1502.20	1583.73	1.52
Child Care Bldg - South	R_105	73.5	1495.50	1575.42	1.52
Child Care Bldg - West	R_106	72.2	1485.47	1586.45	1.52
Community Garden	OU_1	61.2	1397.82	1734.70	1.52
Community Garden	OU_3	63.1	1398.10	1699.37	1.52
Tot Lot	OU_4	60.6	1446.70	1659.55	1.52
Pool	OU_5	57.2	1447.36	1643.12	1.52
Daycare Open Space	OU_6	62.6	1493.58	1601.29	1.52

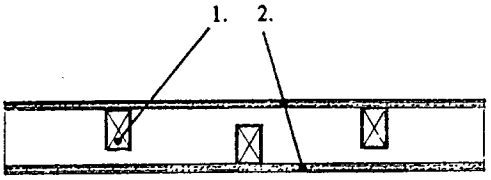
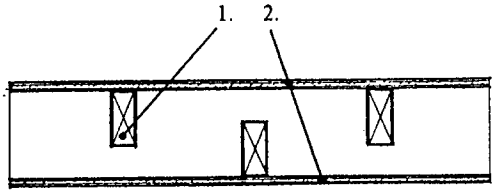
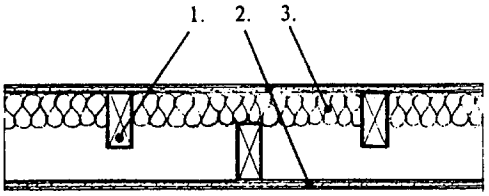
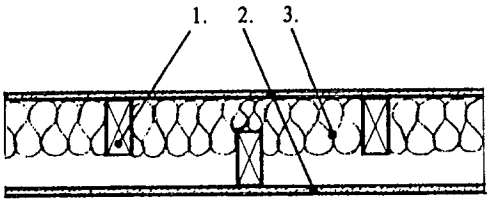
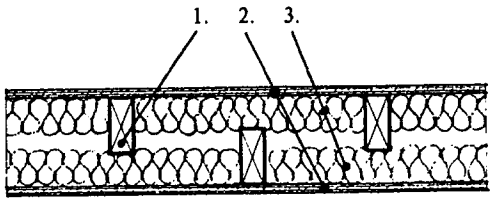
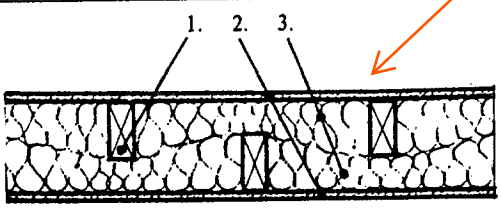
Cadna Noise Model - AC Point Sources							
Name	ID	Result. PWL	Lw / Li		Coordinates		
		Day	Type	Value	X	Y	Z
		(dBA)			(m)	(m)	(m)
Carrier Compressor	AC_1	70.8	Lw	L_1	1432.5	1767.06	1.22
Carrier Compressor	AC_2	70.8	Lw	L_1	1432.5	1766.46	1.22
Carrier Compressor	AC_3	70.8	Lw	L_1	1432.44	1765.69	1.22
Carrier Compressor	AC_4	70.8	Lw	L_1	1432.2	1762.19	1.22
Carrier Compressor	AC_5	70.8	Lw	L_1	1432.14	1761.48	1.22
Carrier Compressor	AC_6	70.8	Lw	L_1	1432.14	1760.53	1.22
Carrier Compressor	AC_7	70.8	Lw	L_1	1433.56	1759.64	1.22
Carrier Compressor	AC_8	70.8	Lw	L_1	1433.56	1758.93	1.22
Carrier Compressor	AC_9	70.8	Lw	L_1	1433.62	1757.98	1.22
Carrier Compressor	AC_10	70.8	Lw	L_1	1433.45	1754.12	1.22
Carrier Compressor	AC_11	70.8	Lw	L_1	1433.51	1753.47	1.22
Carrier Compressor	AC_12	70.8	Lw	L_1	1433.51	1752.7	1.22
Carrier Compressor	AC_13	70.8	Lw	L_1	1409.77	1751.69	1.22
Carrier Compressor	AC_14	70.8	Lw	L_1	1408.88	1751.63	1.22
Carrier Compressor	AC_15	70.8	Lw	L_1	1406.03	1751.39	1.22
Carrier Compressor	AC_16	70.8	Lw	L_1	1385.15	1752.76	1.22
Carrier Compressor	AC_17	70.8	Lw	L_1	1385.15	1753.94	1.22
Carrier Compressor	AC_18	70.8	Lw	L_1	1385.21	1755.01	1.22
Carrier Compressor	AC_19	70.8	Lw	L_1	1383.19	1760.41	1.22
Carrier Compressor	AC_20	70.8	Lw	L_1	1383.19	1761.36	1.22
Carrier Compressor	AC_21	70.8	Lw	L_1	1383.25	1762.49	1.22
Carrier Compressor	AC_22	70.8	Lw	L_1	1383.07	1765.69	1.22
Carrier Compressor	AC_23	70.8	Lw	L_1	1383.07	1766.23	1.22
Carrier Compressor	AC_24	70.8	Lw	L_1	1383.13	1766.94	1.22
Carrier Compressor	AC_25	70.8	Lw	L_1	1402.53	1773.58	1.22
Carrier Compressor	AC_26	70.8	Lw	L_1	1416.69	1738.84	1.22
Carrier Compressor	AC_27	70.8	Lw	L_1	1416.63	1739.91	1.22
Carrier Compressor	AC_28	70.8	Lw	L_1	1416.63	1740.8	1.22
Carrier Compressor	AC_29	70.8	Lw	L_1	1427.55	1737.95	1.22
Carrier Compressor	AC_30	70.8	Lw	L_1	1428.79	1738.07	1.22
Carrier Compressor	AC_31	70.8	Lw	L_1	1429.62	1738.19	1.22
Carrier Compressor	AC_32	70.8	Lw	L_1	1430.57	1738.19	1.22
Carrier Compressor	AC_33	70.8	Lw	L_1	1432	1718.31	1.22
Carrier Compressor	AC_34	70.8	Lw	L_1	1432	1716.71	1.22
Carrier Compressor	AC_35	70.8	Lw	L_1	1431.05	1691.78	1.22
Carrier Compressor	AC_36	70.8	Lw	L_1	1430.22	1691.78	1.22
Carrier Compressor	AC_37	70.8	Lw	L_1	1429.21	1691.78	1.22
Carrier Compressor	AC_38	70.8	Lw	L_1	1426.48	1691.78	1.22
Carrier Compressor	AC_39	70.8	Lw	L_1	1425.59	1691.6	1.22
Carrier Compressor	AC_40	70.8	Lw	L_1	1424.34	1691.66	1.22
Carrier Compressor	AC_41	70.8	Lw	L_1	1423.04	1693.02	1.22
Carrier Compressor	AC_42	70.8	Lw	L_1	1421.97	1692.96	1.22
Carrier Compressor	AC_43	70.8	Lw	L_1	1420.9	1693.14	1.22
Carrier Compressor	AC_44	70.8	Lw	L_1	1417.93	1693.32	1.22
Carrier Compressor	AC_45	70.8	Lw	L_1	1417.22	1693.32	1.22
Carrier Compressor	AC_46	70.8	Lw	L_1	1416.45	1693.32	1.22
Carrier Compressor	AC_47	70.8	Lw	L_1	1415.2	1717.29	1.22
Carrier Compressor	AC_48	70.8	Lw	L_1	1415.32	1718.3	1.22
Carrier Compressor	AC_49	70.8	Lw	L_1	1415.15	1721.27	1.22
Carrier Compressor	AC_50	70.8	Lw	L_1	1425.71	1665.71	1.22
Carrier Compressor	AC_51	70.8	Lw	L_1	1426.36	1665.68	1.22
Carrier Compressor	AC_52	70.8	Lw	L_1	1427.93	1665.58	1.22
Carrier Compressor	AC_53	70.8	Lw	L_1	1428.89	1665.52	1.22
Carrier Compressor	AC_54	70.8	Lw	L_1	1429.97	1661.7	1.22
Carrier Compressor	AC_55	70.8	Lw	L_1	1430	1658.8	1.22
Carrier Compressor	AC_56	70.8	Lw	L_1	1429.88	1642.41	1.22
Carrier Compressor	AC_57	70.8	Lw	L_1	1429.91	1641.11	1.22

Cadna Noise Model - AC Point Sources							
Name	ID	Result. PWL	Lw / Li		Coordinates		
		Day	Type	Value	X	Y	Z
		(dBA)			(m)	(m)	(m)
Carrier Compressor	AC_58	70.8	Lw	L_1	1429.97	1638.21	1.22
Carrier Compressor	AC_59	70.8	Lw	L_1	1430.22	1624.54	1.22
Carrier Compressor	AC_60	70.8	Lw	L_1	1421.27	1622.1	1.22
Carrier Compressor	AC_61	70.8	Lw	L_1	1420.53	1622.1	1.22
Carrier Compressor	AC_62	70.8	Lw	L_1	1419.82	1622.07	1.22
Carrier Compressor	AC_63	70.8	Lw	L_1	1419.26	1622.07	1.22
Carrier Compressor	AC_64	70.8	Lw	L_1	1418.09	1622.07	1.22
Carrier Compressor	AC_65	70.8	Lw	L_1	1417.32	1622.19	1.22
Carrier Compressor	AC_66	70.8	Lw	L_1	1416.05	1622.1	1.22
Carrier Compressor	AC_67	70.8	Lw	L_1	1414.75	1622.13	1.22
Carrier Compressor	AC_68	70.8	Lw	L_1	1413.77	1641.51	1.22
Carrier Compressor	AC_69	70.8	Lw	L_1	1413.64	1642.13	1.22
Carrier Compressor	AC_70	70.8	Lw	L_1	1413.71	1644.17	1.22
Carrier Compressor	AC_71	70.8	Lw	L_1	1413.46	1660.92	1.22
Carrier Compressor	AC_72	70.8	Lw	L_1	1413.52	1663.67	1.22
Carrier Compressor	AC_73	70.8	Lw	L_1	1413.49	1664.44	1.22
Carrier Compressor	AC_74	70.8	Lw	L_1	1485.43	1663.86	1.22
Carrier Compressor	AC_75	70.8	Lw	L_1	1485.96	1663.92	1.22
Carrier Compressor	AC_76	70.8	Lw	L_1	1491.92	1663.9	1.22
Carrier Compressor	AC_77	70.8	Lw	L_1	1492.72	1663.99	1.22
Carrier Compressor	AC_78	70.8	Lw	L_1	1498.61	1662.36	1.22
Carrier Compressor	AC_79	70.8	Lw	L_1	1499.29	1662.3	1.22
Carrier Compressor	AC_80	70.8	Lw	L_1	1500.19	1662.3	1.22
Carrier Compressor	AC_81	70.8	Lw	L_1	1500.54	1662.3	1.22
Carrier Compressor	AC_82	70.8	Lw	L_1	1500.64	1614.18	1.22
Carrier Compressor	AC_83	70.8	Lw	L_1	1500.13	1614.16	1.22
Carrier Compressor	AC_84	70.8	Lw	L_1	1494.64	1614.11	1.22
Carrier Compressor	AC_85	70.8	Lw	L_1	1493.88	1614.09	1.22
Carrier Compressor	AC_86	70.8	Lw	L_1	1492.88	1612.25	1.22
Carrier Compressor	AC_87	70.8	Lw	L_1	1492.17	1612.27	1.22
Carrier Compressor	AC_88	70.8	Lw	L_1	1486.78	1612.37	1.22
Carrier Compressor	AC_89	70.8	Lw	L_1	1485.38	1612.37	1.22
Carrier Compressor	AC_90	70.8	Lw	L_1	1418.72	1593.63	1.22
Carrier Compressor	AC_91	70.8	Lw	L_1	1419.7	1593.68	1.22
Carrier Compressor	AC_92	70.8	Lw	L_1	1442.47	1589.42	1.22
Carrier Compressor	AC_93	70.8	Lw	L_1	1442.57	1588.73	1.22
Carrier Compressor	AC_94	70.8	Lw	L_1	1442.18	1587.65	1.22
Carrier Compressor	AC_95	70.8	Lw	L_1	1442.23	1586.43	1.22
Carrier Compressor	AC_96	70.8	Lw	L_1	1443.5	1585.2	1.22
Carrier Compressor	AC_97	70.8	Lw	L_1	1443.5	1584.37	1.22
Carrier Compressor	AC_98	70.8	Lw	L_1	1443.45	1583.05	1.22
Carrier Compressor	AC_99	70.8	Lw	L_1	1443.36	1580.06	1.22
Carrier Compressor	AC_100	70.8	Lw	L_1	1443.55	1579.08	1.22
Carrier Compressor	AC_101	70.8	Lw	L_1	1443.5	1577.95	1.22
Carrier Compressor	AC_102	70.8	Lw	L_1	1420.19	1577.17	1.22
Carrier Compressor	AC_103	70.8	Lw	L_1	1419.3	1577.02	1.22
Carrier Compressor	AC_104	70.8	Lw	L_1	1394.86	1578.49	1.22
Carrier Compressor	AC_105	70.8	Lw	L_1	1394.96	1579.47	1.22
Carrier Compressor	AC_106	70.8	Lw	L_1	1395.01	1580.5	1.22
Carrier Compressor	AC_107	70.8	Lw	L_1	1395.01	1581.77	1.22
Carrier Compressor	AC_108	70.8	Lw	L_1	1393.34	1586.23	1.22
Carrier Compressor	AC_109	70.8	Lw	L_1	1393.34	1587.46	1.22
Carrier Compressor	AC_110	70.8	Lw	L_1	1393.34	1588.73	1.22
Carrier Compressor	AC_111	70.8	Lw	L_1	1393.24	1591.67	1.22
Carrier Compressor	AC_112	70.8	Lw	L_1	1393.19	1592.4	1.22
Carrier Compressor	AC_113	70.8	Lw	L_1	1393.19	1593.33	1.22
Carrier Compressor	AC_114	70.8	Lw	L_1	1457.64	1627.91	1.22
Carrier Compressor	AC_115	70.8	Lw	L_1	1457.6	1626.59	1.22
Carrier Compressor	AC_116	70.8	Lw	L_1	1501.92	1582.87	1.22
Carrier Compressor	AC_117	70.8	Lw	L_1	1501.87	1580.94	1.22

Cadna Noise Model - AC Noise Levels at Receivers					
Name	**ID**	**Level Lr**	**Coordinates**		
		Lden	**X**	**Y**	**Z**
		(dBA)	**(m)**	**(m)**	**(m)**
North PL	R_1	41.0	1408.66	1796.37	1.52
East PL	R_2	33.1	1461.14	1750.2	1.52
East PL	R_3	40.9	1523.42	1615.23	1.52
South PL	R_4	41.5	1491.74	1568.72	1.52
West PL	R_5	42.5	1386.54	1588.65	1.52
West PL	R_6	38.8	1375.10	1760.83	1.52

APPENDIX F

Sound Insulation Prediction Results

Sketch	Brief Description	...	Laboratory Test Number Year Frequencies Tested Source of Data	STC	Section Numbe
	1. 2x3 studs spaced 16"o.c. and staggered 8"o.c. on 2x4 plates. 2. 1/2" gypsum board nailed with 5d nails 6-8"o.c.	...	National Bureau of Standards NBS #242 NA 11f Domtar Gypsum America Inc.	44	1.2.3.1.4
	1. 2x4 studs spaced 16"o.c. and staggered 8"o.c. on 2x6 plates. 2. 1/2" gypsum board screwed 12"o.c.	...	Geiger and Hamme OC-3FC 1972 16f Owens/Corning Fiberglas	39	1.2.3.1.4
	1. 2x4 studs spaced 16"o.c. and staggered 8"o.c. on 2x6 plates. 2. 1/2" gypsum board screwed 12"o.c. 3. 2 1/4" thick sound attenuation blanket.	...	Geiger and Hamme OC-2FC 1972 16f Owens/Corning Fiberglas	48	1.2.3.1.4
	1. 2x4 studs spaced 16"o.c. and staggered 8"o.c. on 2x6 plates. 2. 1/2" gypsum board screwed 12"o.c. 3. 3 1/2" thick sound attenuation blanket.	...	Geiger and Hamme OC-4FC 1972 16f Owens/Corning Fiberglas	49	1.2.3.1.4
	1. 2x4 studs spaced 16"o.c. and staggered 8"o.c. on 2x6 plates. 2. 1/2" gypsum board screwed 12"o.c. 3. 2 1/4" thick sound attenuation blankets in both stud cavities.	...	Geiger and Hamme OC-1FC 1972 16f Owens/Corning Fiberglas	49	1.2.3.1.4
	1. 2x4 studs spaced 16"o.c. and staggered 8"o.c. on 2x6 plates. 2. 1/2" gypsum board screwed 12"o.c. 3. 3 1/2" thick sound attenuation blankets in both stud cavities.	...	Geiger and Hamme OC-5FC 1972 16f Owens/Corning Fiberglas	51	1.2.3.1.4

TESTED WALL ASSEMBLY

Sound Insulation Prediction (v6.4)

Eilar Associates - Key No. 1866

Margin of error is generally within STC +/- 3 dB

Job Name:Las Terrazas

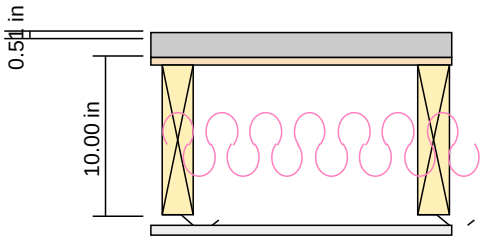
Job No.:B11206N Page No.:

Date: 9 Feb 12 Initials:AH

File Name: Floor-Ceiling STC.ins

Notes:

Floor/Ceiling STC



STC 62

OITC 54

System description

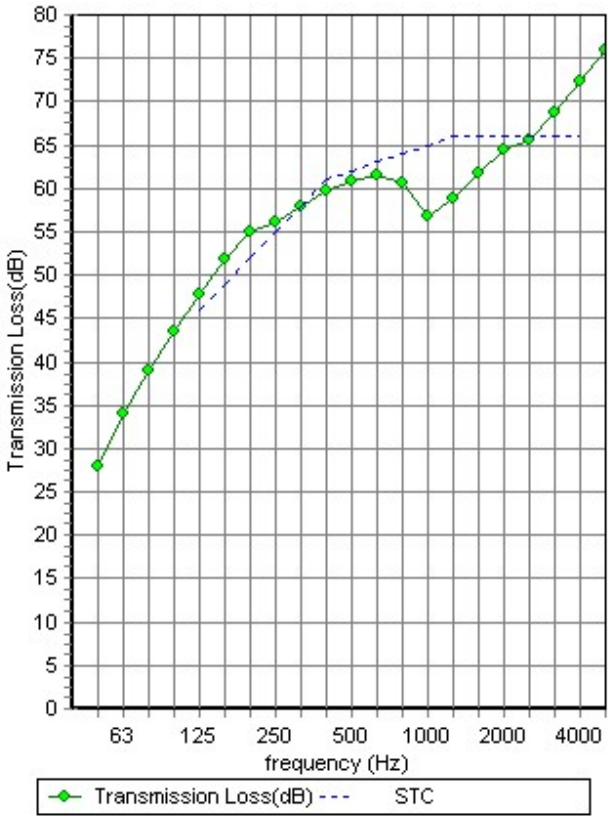
Panel 1 Outer layer: 1 x 1.63 in Lightweight concrete- (m=10.99 lb/ft2, fc=932 Hz, damping=0.01)
Panel 1 Inner layer: 1 x 0.50 in Plywood (m=1.46 lb/ft2, fc=1828 Hz,damping=0.01)

Cavity: Resilient clip or channel @ 0 in , Infill 4" fiberglass (1.4 lb/ft3) Thickness 4 in
Panel 2 Inner layer: 1 x 0.63 in Type X Gypsum Board- (m=2.24 lb/ft2, fc=2511 Hz, damping=0.01)

Mass-air-mass resonant frequency =39 Hz

Panel Size 8.9x13 ft

frequency (Hz)	TL(dB)	TL(dB)
50	28	
63	34	32
80	39	
100	43	
125	48	46
160	52	
200	55	
250	56	56
315	58	
400	60	
500	61	61
630	62	
800	61	
1000	57	58
1250	59	
1600	62	
2000	64	64
2500	65	
3150	69	
4000	72	71
5000	76	



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312/232-0104
FOUNDED 1918 BY
WALLACE CLEMENT SABINE

REPORT

FOR: Ceramic Tile Institute

Impact Sound Transmission
Test RAL™-IN88-2

ON: CTI Case #24B Floor/Ceiling Assembly
With 5/8" Gypsum Board Hanging Ceiling

CONDUCTED: 3 May 1988

TEST METHOD

Unless otherwise designated, the measurements reported below were made with all facilities and procedures in explicit conformity with the ASTM Designation E492-86, as well as other pertinent standards. Riverbank Acoustical Laboratories has been accredited by the U.S. Department of Commerce, National Bureau of Standards under the National Voluntary Laboratory Accreditation Program (NVLAP) for this test procedure. A description of the measuring technique is available separately. The serial number of the measuring microphone was 792729.

DESCRIPTION OF THE SPECIMEN

The test specimen was designated by the manufacturer as a CTI Case #24B floor/ceiling assembly with 5/8" gypsum board hanging ceiling. The overall dimensions of the specimen as measured were 4.3 m (168 in.) wide by 6.1 m (240 in.) long and nominally 33.5 cm (13.2 in.) thick. The test specimen was constructed directly in the laboratory's 4.3 m (14 ft) by 6.1 m (20 ft) test opening and was sealed on the periphery (both sides) with a dense mastic. The room temperature at the time of the test was 20°C (68°F) and 60% relative humidity. The description of the specimen was as follows: A grouted ceramic tile surface floor was bonded to a layer of NOBLESEAL TS® with a thin set mortar mix. The NOBLESEAL TS® was bonded to a layer of Gyp-Crete 2000 with another layer of thin set mortar mix. The Gyp-Crete 2000 set on a layer of Enkasonic Sound Control Matting. The combination of all of the above set on a plywood subfloor supported by wood joists. The cavities between the joists were lined with insulation. The ceiling assembly consisted of resilient channels and gypsum board. A more detailed itemized description follows:

REPORT

Ceramic Tile Institute RAL™-IN88-2

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DESCRIPTION OF THE SPECIMEN (con't)

Wood Subfloor and Joist Assembly

A 5.1 cm (2 in.) by 25.4 cm (10 in.) box sill utilized a 6.1 m (240 in.) header placed on 5.1 cm (2 in.) by 15.2 cm (6 in.) wood plates. Matching 5.1 cm (2 in.) by 25.4 cm (10 in.), actual dimensions 23.34 cm ± 0.32 cm (9.1875 ± 0.125 in.) by 3.8 cm (1.5 in.), Hemfir wood joists were cut to 4.2 m (165 in.) lengths and spaced on 40.6 cm (16 in.) centers. The joists were toe nailed with two 16d nails to the header. The joists were supported with 2.5 cm (1 in.) by 7.6 cm (3 in.) wood cross bridges at the center location of each cavity. The subfloor surface was 1.5 cm (0.59 in.) thick APA rated sheathing plywood. The plywood was fastened to the wood joists with 8d nails spaced on 20.3 cm (8 in.) centers. The nominal 6.4 mm (0.250 in.) peripheral gap between the plywood floor and the laboratory wall was sealed with a dense mastic. The weights of the various wood floor components were as follows: box header, 43.8 kg (96.5 lbs); wood joists, 275 kg (607 lbs); plywood, 221.6 kg (488.5 lbs); bridging, 8.2 kg (18 lbs); hardware, 1.4 kg (3 lbs). The total weight of the wood subfloor and joist assembly as calculated was 550 kg (1213 lbs).

Insulation

The cavities between the joists were lined with Owens-Corning R-19 unfaced fiberglass. The insulation was cut to friction fit in between each joist and was placed up against the bottom side of the plywood floor. The nominally 64 m (210 ft) of insulation weighed 31.1 kg (68.5 lbs).

Isolation

The surface floor was isolated on the periphery from the laboratory walls by a single layer of 2.7 pcf, 6.4 mm (0.250 in.) thick, nominally 6.4 cm (2.5 in.) wide American Excelsior Amcel 27, polyethylene foam. The foam was trimmed flush with the top surface of the tile and grout. The foam weighed 0.45 kg (1.0 lb).

REPORT

Ceramic Tile Institute RAL™-IN88-2

3 May 1988

DESCRIPTION OF THE SPECIMEN (con't)

Underlayment

The underlayment consisted of three materials. The first (uppermost) material was a layer of NOBLESEAL TS®, manufactured by The Noble Company of Grand Haven, Michigan. The NOBLESEAL TS® was installed according to manufacturer's instructions with a 6.4 cm (2.5 in.) wide overlap and sandwiched between two layers of H. R. Fuller, Full-Flex Universal Latex modified, thin set mortar. The NOBLESEAL TS® underlayment and thin set mortar combination was installed on top of the layer of Gyp-Crete 2000. The NOBLESEAL TS® weighed 20.9 kg (46.0 lbs). The second (middle) underlayment material was a layer of nominal 3.8 cm (1.5 in.) thick 1.8 mix Gyp-Crete 2000. The Gyp-Crete 2000 material, floor primer, and surface conditioner were installed in accordance with Gyp-Crete's application procedures. The Gyp-Crete 2000 was mixed and poured by Deckert & Associates, represented by Mr. Sergio Hernandez (spreader) and Mr. Filepe Lucio (finisher). The preparation and installation of all Gyp-Crete material was monitored and at various times assisted by Gyp-Crete representative, Mr. Patrick Giles. The Gyp-Crete 2000 density of 114.5 $\pm$ 0.5 pcf was determined from four samples. The total test specimen weight of the Gyp-Crete 2000 was determined and averaged to be 1814 kg (4000 lbs). The third underlayment material, located between the layer of Gyp-Crete 2000 and the plywood floor, consisted of a layer of Enkasonic Sound Control Matting, type no. 9110. The composite nonwoven fabric and extruded nylon filament, 10.2 mm (0.4 in.) thick, material came in a 97.8 cm (38.5 in.) wide roll. There were four full rows and one cut row to cover the 26 m^2 (280 ft^2) area. The Enkasonic matting material was installed in accordance with BASF Corporation's instructions with the mesh side down, filter fabric (scrim) side up, and the filter fabric overlapping the adjacent strip to make sure there were no gaps. The overlapping seams were taped with 5.1 cm (2 in.) wide duct tape. The filter fabric (scrim) was sealed with three coats of Gyp-Crete surface conditioner, referenced earlier, diluted 3:1 with water. The Enkasonic and NOBLESEAL TS® were installed by the BASF representative, Mr. Rick Bowen and the Enkasonic area representative, Mr. Don Lutyens of the American Excelsior Company. The Enkasonic weighed 21 kg (46.5 lbs). The combined weight of the NOBLESEAL TS®, Enkasonic and averaged Gyp-Crete 2000 was determined to be 1856 kg (4092.5 lbs).

REPORT

Ceramic Tile Institute RAL™-IN88-2

3 May 1988

DESCRIPTION OF THE SPECIMEN (con't)

Surface Floor

The surface floor consisted of 614.25, 20.0 cm (7.875 in.) by 20.0 cm (7.875 in.) by 7.9 mm (0.3125 in.) thick, #8683, nominal 8 X 8, Natura Dusty Rose Tiles, manufactured by Florida Tile. Each tile weighed 0.7 kg (1.609 lbs), and the combined weight of the tiles was 448 kg (988.5 lbs). The tiles were set in the earlier described H. B. Fuller Thin Set Mortar. The tiles were grouted with H. B. Fuller Joint Filler Flour Grout, white #660 mixed with H. B. Fuller grout additive #868. The total weight of the mortar, grout, and thin set for the 25.8 m^2 (278 ft^2) of coverage as calculated was 52 kg (115 lbs).

Ceiling Assembly

There were eight, 5.8 m (19 ft) runs of USG, RC-1 resilient channel. Each run consisted of two pieces that overlapped 10.2 cm (4 in.) at their junction point located at a joist. The channels were attached to the wood joists with 2.9 cm (1.125 in.) long, type W screws. The ceiling surface material consisted of a single layer of USG, 1.6 cm (0.625 in.) thick, Type X Drywall-USG Type SCX attached to the RC-1 channels with 2.5 cm (1 in.) long type S screws spaced on 30.5 cm (12 in.) centers. The weight of the ceiling materials combined was 265 kg (585 lbs).

Other Information

All construction and/or installation other than the installation of NOBLESEAL TS®, Enkasonic, and Gyp-Crete was preformed by the Klamer Construction Company of Lodi, Wisconsin. The installation of the plywood floor, Enkasonic, NOBLESEAL TS®, Gyp-Crete, and the ceramic tile composite was monitored by Mr. Gerald Halweg of the Ceramic Tile Institute of California. Enkasonic, BASF, NOBLESEAL TS®, and Gyp-Crete installation documents utilized for this test are maintained on file.

Area/Weight

The weight of the entire specimen as determined was 3204 kg (7064 lbs) an average of 123 kg/m^2 (25.2 lbs/ft^2). The total area used in the impact sound transmission test was 26 m^2 (280 ft^2).

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REPORT

Ceramic Tile Institute

RAL™-IN88-2

3 May 1988

TEST RESULTS

Sound pressure levels at 1/3 octave intervals, normalized to 10 square meters, are given in tabular form. The impact insulation class, IIC, was computed in accordance with ASTM E989-84 and ASTM E492-86.

FREQ.	ISL.	C.L.	DEV.	FREQ.	ISL.	C.L.	DEV.
100	60	0.38	5	630	53	0.28	1
125	56	0.41	1	800	49	0.25	0
160	58	0.40	3	1000	42	0.28	0
200	57	0.32	2	1250	40	0.28	0
250	57	0.34	2	1600	37	0.25	0
315	55	0.31	0	2000	39	0.27	0
400	58	0.24	4	2500	42	0.27	4
500	56	0.29	3	3150	36	0.33	1

IIC = 57

ABBREVIATION INDEX

FREQ. = FREQUENCY, HERTZ, (cps)
ISL. = IMPACT SOUND PRESSURE LEVEL, dB
C.L. = UNCERTAINTY IN dB, FOR A 95% CONFIDENCE LIMIT
DEV. = DEVIATION
IIC = IMPACT INSULATION CLASS

Reviewed by Peter E. Straus
Peter E. Straus
Senior Technician

Submitted by John W. Kopec
John W. Kopec
Supervisor, Riverbank
Acoustical Laboratories

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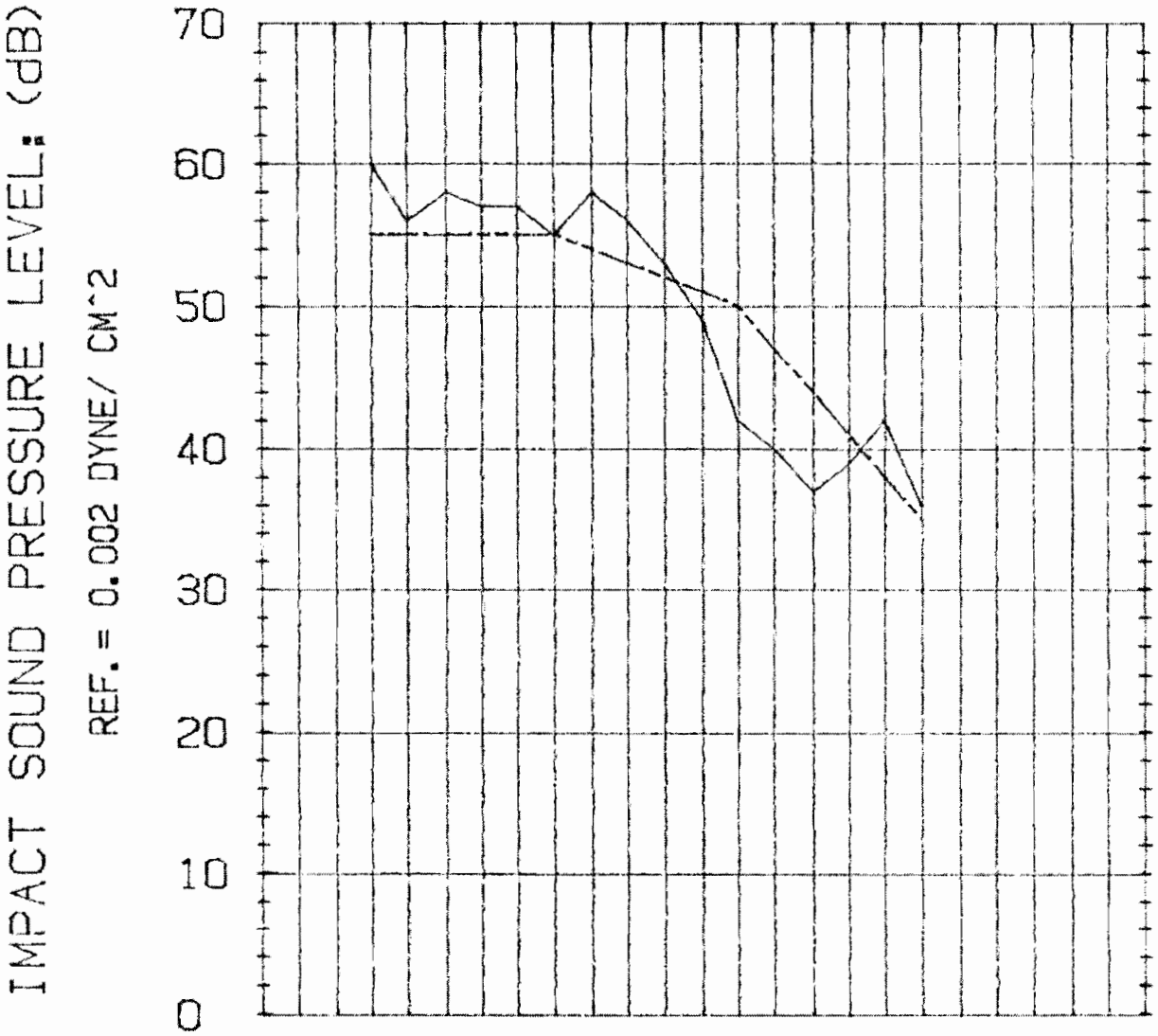
REPORT

IMPACT INSULATION REPORT
RAL IN88-2



IIC = 57

PROJECT NUMBER: 1801 99 1736.4

DATE: August 3, 1999

STORK \ TWIN CITY TESTING CORPORATION
662 Cromwell Avenue
St. Paul, Minnesota 55114-1776
Phone: (651) 659-7300 Fax: (651) 659-7348

FIELD IMPACT INSULATION CLASS (F-IIC) TEST CONDUCTED ON A TJI FLOOR/CEILING SYSTEM AT AUGSBURG COLLEGE STUDENT HOUSING

Prepared for:

Maxxon Incorporated
Attention: Mr. Patrick Giles
920 Hamel Road
Hamel, MN. 55340

Client Purchase Order Number: Verbal (7/19/99) - Patrick Giles

Prepared by:

Randy R. Hochstein P.E.
Acoustical/Vibration Engineer
Mechanical/Metallurgical Department
Phone: (651) 659-7317

Reviewed by:

Richard O. Thomalla
Acoustical Services Manager
Mechanical/Metallurgical Department

The test results contained in this report pertain only to the actual assemblies tested and not necessarily to all similar constructions.

FIELD IMPACT INSULATION CLASS (F-IIC) - ASTM E1007(90)

INTRODUCTION:

This report presents the results of a Field Impact Insulation Class (F-IIC) test of a Floor/Ceiling system at the Augsburg College Student Housing Project, 715-20th Avenue South, Minneapolis, MN. This test was requested by Mr. Patrick Giles of Maxxon, Inc., Hamel, MN on July 19, 1999 and was completed on July 27, 1999.

TEST RESULTS SUMMARY:

The Field Impact Insulation Class (**F-IIC**) of the Floor/ceiling Assembly between the NW bedrooms of Units 319A and 219A, with Ceramic Tile over 1" MAXXON gypsum floot topping over **AcoustiMat II** on a TJI (12" nominal) joist floor/ceiling system was **52**. This is 7 points above the minimum UBC requirement of 45.

A tabular and graphical presentation of the data and Specimen Description is presented under "Test Results and Specimen Description".

TEST PROCEDURE and EQUIPMENT:

F-IIC Test: ASTM Standard E1007(90), "Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures", was followed in every respect. The instrumentation was calibrated before and after tests with a sound level calibrator. The F-IIC value was obtained by applying the Ln (Normalized Impact Sound Pressure Level) values to the standard contour of ASTM E989-89.

Manufacturer	Model	Description	S/N
IVIE, Inc.	PC-40	Spectrum Analyzer	4587A130
Larson Davis	2541	1/2" Free Field Mic.	1150
Brüel & Kjær	4230	Sound Calibrator	282266(cal due: 2/11/00)
IVIE, Inc.	IE-20B	Noise Generator	741C853
Yamaha	MS60S	Monitor Speaker	KK01498
Brüel & Kjær	3204	Tapping Machine	84667

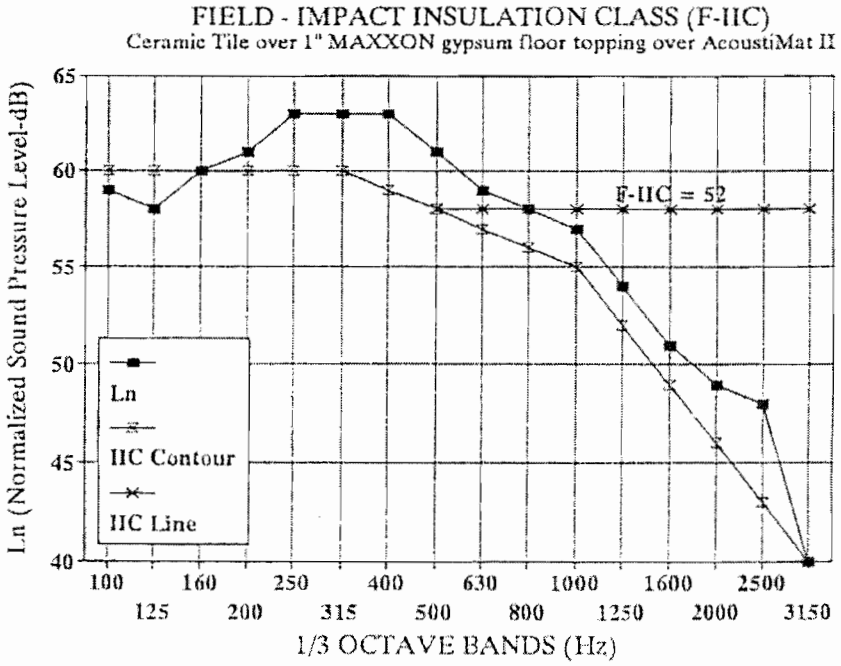
g:\shared\mmfiles\rrh\99-stork\maxtji-4.iic

TEST RESULTS and SPECIMEN IDENTIFICATION F-IIC of Floor/Ceiling System:

Test Date: July 27, 1999

Project: Augsburg College Student Housing
Client: Maxxon
Specimen: Ceramic Tile over 1" MAXXON gypsum floor topping over AcoustiMat II

F(Hz)* 1/3 octave	Ln (dB)	Def. (dB)
100	59	0
125	58	0
160	60	0
200	61	1
250	63	3
315	63	3
400	63	4
500	61	3
630	59	2
800	58	2
1000	57	2
1250	54	2
1600	51	2
2000	49	3
2500	48	5
3150	40	0
F-IIC:	**52**	
Total deficiencies:		32



* **Where:** F(Hz) = 1/3 octave band center frequency; Ln = normalized sound pressure level; Def. = Deficiencies

Specimen Description:

Source Room: Unit 319A, Bedroom 1 - NW
Term. Room: Unit 219A, Bedroom 1 - NW
Area: 158.7 ft^2
Volume: 1254.1 ft^3
Specimen Wt: 20.1 psf (estimated)

Temp: 77 F
Rel Hum: 70 %

Construction Details:
- Ceramic Tile
- 1" MAXXON gypsum floor topping
- Acousti-Mat II
- 3/4" O.S.B. flooring
- TJI joists, 11-7/8" @ 16" o.c.
- by Truss Joist Macmillan
- R-11 fiberglass batt insulation
- Resilient channel
- 5/8" type X gypsum

Impact Sound Prediction (v6.4)

Eilar Associates - Key No. 1866

Margin of error for Impact Sound Prediction is generally within IIC +/- 5 dB

Job Name:Las Terrazas

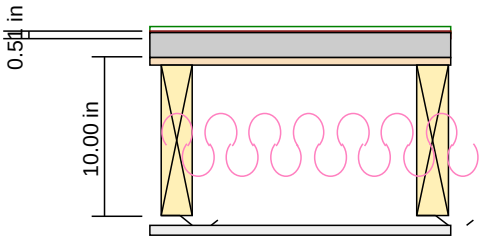
Job No.:B11206N Page No.:

Date: 9 Feb 12 Initials:AH

File Name: Floor-Ceiling IIC Carpet.ins

Notes:

Floor/Ceiling IIC - Carpet



IIC 76

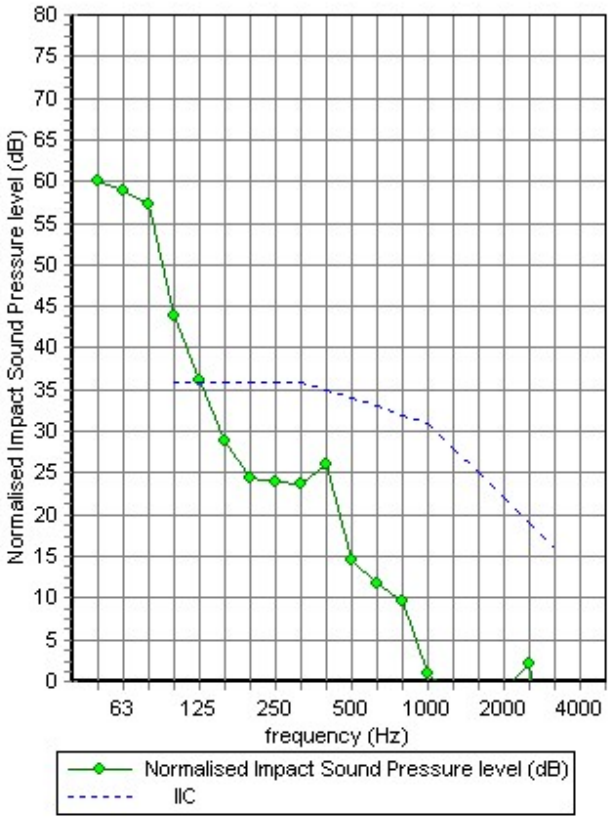
System description

Floor Cover: Carpet (66oz) on hair pad (50oz)
Panel 1 Outer layer: 1 x 1.63 in Lightweight concrete- (m=10.99 lb/ft2, fc=932 Hz, damping=0.01)
Panel 1 Inner layer: 1 x 0.50 in Plywood (m=1.46 lb/ft2, fc=1828 Hz,damping=0.01)
Joists: 1.97 in x10.00 in @ 16 in (100.36 (lbs/ft3), Youngs Modulus =717937(psi), damping=0.04)
Cavity: Resilient clip or channel, Infill 4" fiberglass (1.4 lb/ft3) Thickness 4 in
Panel 2 Inner layer: 1 x 0.63 in Type X Gypsum Board- (m=2.24 lb/ft2, fc=2511 Hz, damping=0.01)

Mass-air-mass resonant frequency =39 Hz

Panel Size 7.9x7.9 ft

frequency (Hz)	Ln(dB)	Ln(dB)
50	60	
63	59	59
80	57	
100	44	
125	36	33
160	29	
200	24	
250	24	24
315	24	
400	26	
500	15	15
630	12	
800	10	
1000	1	1
1250	-2	
1600	-4	
2000	-1	-2
2500	2	
3150	-17	
4000	-21	-23
5000	-26	



APPENDIX G

Manufacturer Data Sheets

TECHNICAL DATA

DRAFT & ACOUSTICAL
SOUND SEALANT

OSI® Greenseries™ Draft & Acoustical Sound Sealant is a non-flammable, latex-based sealant specially designed to reduce sound transmissions and drafts in all types of wall systems where a sound-rated assembly is required. Its primary function is to achieve and maintain the specific STC (Sound Transmission Class) value of the system designed.

The paintable sealant remains flexible and adheres firmly to wood, metal studs, concrete, gypsum board and most other building materials. The easy-to-use sealant cleans up easily with soap and water.

FEATURES
- Permanently flexible
- Easy application and cleanup
- UL Classification – R9732; UL 723
- Easy water cleanup
- Low VOC, compliant formula
- Will not harden, crack or separate
- Non-staining & non-migrating
- High degree of adhesive and cohesive strength.

USES
Greenseries™ Draft & Acoustical was developed primarily for commercial construction utilizing light weight cavity walls and floor systems. Draft & Acoustical Sealant is used successfully in office buildings, hotels, apartment complexes, and other types of commercial & residential construction.

PHYSICAL PROPERTIES

Type	Synthetic Latex Rubber
Color	White
Solids by weight	75%
Toxicity	Toxic only if swallowed. Refer to MSDS.
Flammability	Nonflammable
Flash Point	200°F. TCC (minimum amount of solvent present)
Tooling/Open Time	15 minutes
Tack Free Time	30 minutes
Cure Time	2-7 days
Application Temperature	40°F minimum
Service Temperature	-5°F - 170°F
Freeze-Thaw Stability	3 cycles. Unaffected by freezing after curing
Shelf Life	1 year from date made at 75°F
Sag or Slump	Nil (ASTM D2202)
VOC Level	22g/l or <1% by wt.
Shore "A" Hardness	45 +/-5 (Cured 30 days @ room temp.)
Clean-up	Water and soap before curing
Accelerated Weathering	No cracks, discoloration or chalking: 1000 hrs. in Xenon Arc Weatherometer

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The sealant is used for exposed and unexposed applications at perimeter joints, floor and ceiling runners, cut outs in gypsum board, veneer plaster systems and other areas where a sound rated assembly is required. The sealant can also be applied or buttered around all electrical boxes and outlets, cold air returns, heating and air conditioning ducts, and other utility equipment penetrating wall surfaces for increased acoustical performance. Also works well for sealing sill and and base plates in residential construction.

SPECIFICATIONS
- UL Classified – 48S9 (R9732). Tested in accordance with and conforms to UL 723: U.B.C. Standard No. 42-1 Class I.
- ASTM E84: Surface Burning Characteristics of Building Materials.
- ASTM E90-85: Laboratory Measurement of Airborne-Sound Transmission Loss of Building Materials.
- ASTM D217: Testing Standard for Consistency.
- ASTM C919-79: Standard Practice for Use of Sealants in Acoustical Applications.
- SCAQMD Rule 1168 V.O.C.; CARB; and BAAQMD compliant
- GREENGUARD Certified
- Meets LEEDS requirements

LIMITATIONS
- Keep from freezing
- Do not use below 40°F. (5°C.).
- Not recommended for use on mirrors or underwater applications.
- Not recommended for exterior use.

PACKAGING
28 oz. cartridges – 12 per case (Item No. GS79928)

STORAGE
Store at 70°F. +/- 5° (21°C) for long shelf life and easy application. Do not store below 40°F. (5°C.).

COVERAGE
3/8" round bead size: approx. 40 lin. ft. per 28 oz. cartridge.
¼" round bead size: Approx. 89 lin. ft. / 28oz cartridge.

PERFORMANCE CHARACTERISTICS

1. Underwriters Laboratories Inc. Classified 48S9 (R9732) UL 723: Sealant tested for surface burning characteristics

	Applied to organic Reinforced Cement Board*
Flame Spread	5
Smoke Development	5

*Tested as applied in two 1/2in. beads, 8in. on center. The sealant covered 5.6 percent of the exposed sample area.

2. ASTM E90-85: STC Value – Effect of sealing the opening on a test wall partition.

APPLICATION PROCEEDURES

All surfaces must be clean and free of dust, dirt, oil, moisture and other foreign substances which could interfere with the bond of the sealant.

DIRECTIONS

1. Cut spout on tube to desired bead size (3/8" round bead recommended) and puncture seal inside spout.
2. Sealant should be applied as specified in the sound-rated system being installed (either wood or metal studs)

A. Bottom & Top Runners: Apply a continuous 3/8" round bead of sealant on runners before setting gypsum board. Gypsum board shall be set into sealant to form complete contact with adjacent materials. Fill joint on top runners to complete seal. Repeat procedure for double layer applications.

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

3. Maximum joint size should not exceed ⅝" x ½".
4. Clean tools and excess sealant immediately after application with soap and water.
5. If necessary, sealant can be painted as applicable to meet project requirements after 24 hours.

CAUTION! CONTAINS ETHYLENE GLYCOL , MINERAL SPIRITS and crystalline silica. Avoid eye contact. Do not take internally. If swallowed, may cause abdominal discomfort. Use with adequate ventilation. Refer to MSDS.

WARNING: This product contains a chemical known to the State of California to cause cancer.

KEEP OUT OF REACH OF CHILDREN

FIRST AID

Eye Contact: In case of eye contact, flush with clean water for at least 15 minutes. Skin Contact: Wash skin thoroughly with soap and water. Ingestion: DO NOT induce vomiting. Seek medical attention. If dizziness occurs, remove to fresh air.

NOTICE TO PURCHASER

Henkel Corporation warrants this product when used according to directions. If not satisfied with the product's performance when used as directed, return sales receipt and used container to Henkel Corporation, 32150 Just Imagine Drive, Avon OH, 44011 for product replacement or refund. User shall determine suitability of product for use and assumes all risk.

QUESTIONS?

For commercial use or other questions pertaining to this product, call Henkel Technical Service at 800-321-0253 M-F, 9am – 4pm. or visit our website at www.greenseries.com.

Test partition consisted of metal studs 24" O.C. with double layer gypsum board, Fire code "C" and attached with screws on both sides. Inside of partition was filled with sound insulation. Partition system was erected and shimmed out 4.75 mm (0.1875in.) at top, bottom and edges.

Results: Sound Transmission Class Value

1. Un-sealed partition – Arrows show sound travel around or through partitions.
   a. STC=15
2. Single bead of sealant used at top and bottom runners only – both sides of partition system.
   a. STC=24

Metal Stud Partition Door/Window frame in a hollow partition

3. Single bead of sealant used at top, bottom and perimeter joints – both sides of system.
   a. STC=45
4. Double bead of sealant used at top, bottom and perimeter joints – both sides of system.
   a. STC=55

OSI® GreenSeries™ Draft & Acoustical Sound Sealant is currently under going tested by GREENGUARD.
The GREENGUARD INDOOR AIR QUALITY CERTIFIED Mark is a registered certification mark used under license through the GREENGUARD Environmental Institute.

Henkel Consumer Adhesives
Professional Adhesives & Sealants
32150 Just Imagine Drive
Avon, OH 44011
U.S.A.

Phone: (440) 937-7000
Fax: (440) 937-7092

AC-20 FTR®

(Fire & Temperature Rated) Acoustical & Insulation Sealant

Specification Data Sheet

PECORA CORPORATION

BASIC USES

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

2. MANUFACTURER

Pecora Corporation
165 Wambold Road
Harleysville, PA 19438

Phone: 215-723-6051
800-523-6688
Fax: 215-721-0286
Website: www.pecora.com

3. PRODUCT DESCRIPTION

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

Other Uses: Excellent adhesive, flexibility and durability qualities make AC-20 FTR® ideal for insulating and weatherproofing around windows, doors, panels, siding, duct work, base plates, etc. It is compatible with all common building materials including specialties such as polystyrene, polyurethane, cork, vinyl, foamed and fibrous glass.

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

PACKAGING

• 30 fl. oz. (.887 liter) fiber cartridges
• 5-gallon (18.9 liter) pails

COLOR

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

4. TECHNICAL DATA

Applicable Standards: ASTM C-834-86 specification for latex sealing compounds.

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

UL CLASSIFIED

UNDERWRITERS LABORATORIES INC.® CLASSIFIED JOINT TREATMENT MATERIALS FIRE RESISTANCE CLASSIFICATION

DESIGNS J900H (FFS 0006) &U900 "O" (WWS 0010), J900Z (FFS 2002), U900Z-009 (WWS 2008), J900Z-007 (FFS 1010), U900Z-015 (WWS 1012)

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

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

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

5. INSTALLATION

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

Application: Refer to Pecora Firestopping Manual 07270 and UL Fire Resistance Directory for installation details on fire-rated joint and through penetration systems. For insulating and weatherproofing purposes, fill all window, door, and panel perimeter joints using a resilient backer rod to control sealant depth to 1/2" (13mm) maximum. For best results, protect sealant from excessive low temperatures and apply above 40°F (4°C). For acoustical purposes, apply continuous

TYPICAL PHYSICAL PROPERTIES

Test Property	Value	Procedure
Modulus @ 100% (psi)	15-20	ASTM D412
Ultimate Tensile (psi)	30-40	ASTM D412
Ultimate Elongation (%)	400-500	ASTM D412
Movement Capability (%)	±7 1/2	ASTM D412
VOC Content	31 g/L	

beads of sealant to seal perimeters of all sound-rated partitions. Apply sealant in the angles formed by metal components or base-layer panels and abutting surfaces. Apply sealant around all openings formed for outlets; electrical, telephone, light fixtures, etc.

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

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

Shelf Life: AC-20 FTR® has a shelf life well in excess of one year when stored in unopened containers below 80° F (27°C).

Precautions: AC-20 FTR® is non-flammable, non-toxic, non-irritating and environmentally safe. However, do not take internally. Refer to Material Safety Data Sheet for additional information.

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

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

6. AVAILABILITY AND COST

Pecora products are available from our stocking distributors in all major cities. For the name and telephone number of your nearest representative call one of our locations listed below or visit our website at www.pecora.com.

7. WARRANTY

Pecora Corporation warrants its products to be free of defects. Under this warranty, we will provide, at no charge, replacement materials for, or refund the purchase price of, any product proven to be defective when installed in accordance with our published recommendations and in applications considered by us as suitable from this product. This warranty in lieu of any and all other warranties expressed or implied, and in no case will Pecora be liable for incidental or consequential damages.

8. MAINTENANCE

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

9. TECHNICAL SERVICES

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

ISO 9001:2000
KEMA CERTIFICATE
Accredited by ANSI-RAB NAP

PECORA CORPORATION
www.pecora.com
PEOPLE • PRODUCTS • PERFORMANCE

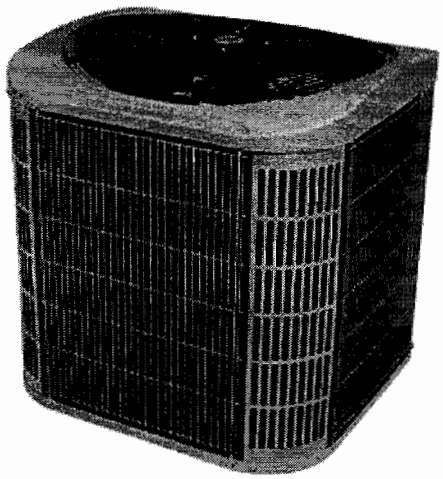
HARLEYSVILLE, PA
165 Wambold Road, Harleysville, PA 19438
Phone: 800-523-6688 • 215-723-6051 • FAX: 215-721-0286

DALLAS, TX
11501 Hillguard Road, Dallas, TX 75243
Phone: 800-233-9754 • 214-348-5313 • FAX: 214-348-5421

24ABA4
Base™ Series 14 Air Conditioner with Puron® Refrigerant

Carrier®
Turn to the Experts.

Product Data



Puron™
the environmentally sound refrigerant

A04030

Carrier's Air Conditioners with Puron® refrigerant provide a collection of features unmatched by any other family of equipment. The 24ABA has been designed utilizing Carrier's Puron refrigerant. The environmentally sound refrigerant allows you to make a responsible decision in the protection of the earth's ozone layer. Carrier's air conditioning system with Puron refrigerant meets the Energy Star® guidelines for energy efficiency.

INDUSTRY LEADING FEATURES / BENEFITS

Efficiency

- 14 SEER/11 EER
- Microtube Technology™ refrigeration system
- Indoor air quality accessories available

Sound

- Sound level as low as 76 dBA

Comfort

- System supports Thermidistat™ or standard thermostat controls

Reliability

- Puron® refrigerant - environmentally sound, won't deplete the ozone layer and low lifetime servce cost.
- Front-seating service valves
- Scroll compressor
- Internal pressure relief valve
- Internal thermal overload
- Filter drier
- Balanced refrigeration system for maximum reliability

Durability

WeatherArmor™ protection package:

- Solid, Durable sheet metal construction
- Dense wire coil guard
- Baked-on, complete coverage, powder paint

Applications

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

Warranty

- 5 year limited compressor warranty
- 5 year limited parts warranty

PHYSICAL DATA

UNIT SIZE SERIES	18–30	24–30	30–30	36–30	42–30	48–30	60–30
Operating Weight (lb)	171	185	188	191	237	239	295
Shipping Weight (lb)	199	214	217	225	272	272	330
Compressor Type	Scroll						
REFRIGERANT	Puron® (R–410A)						
Control	TXV (Puron® Hard Shutoff)						
Charge (lb)	5.7	7.25	7.1	7.25	10.9	11	13.9
COND FAN	Propeller Type, Direct Drive						
Air Discharge	Vertical						
Air Qty (CFM)	2235	2615	3170	3800	3800	3800	4050
Motor HP	1/12	1/10	1/5	1/5	1/5	1/5	1/5
Motor RPM	800	1100	1100	800	800	800	800
COND COIL							
Face Area (Sq ft)	19.40	23.71	23.71	22.63	30.18	20.12	30.18
Fins per In.	25	25	25	25	25	20	20
Rows	1	1	1	1	1	2	2
Circuits	3	4	4	5	7	7	7
VALVE CONNECT. (In. ID)							
Vapor	5/8	5/8	3/4	3/4	7/8	7/8	7/8
Liquid	3/8	3/8	3/8	3/8	3/8	3/8	3/8
REFRIGERANT TUBES* (In. OD)							
Vapor (0–50 Ft Tube Length)	5/8		3/4		7/8		1–1/8
Vapor (Max Diameter for long–Line applications	3/4		7/8		1–1/8		1–1/8
Liquid (0–50 Ft Tube Length)	3/8"						
Liquid (For Long–Line applications)	3/8"						

* For tubing sets between 80 and 200 ft. horizontal or 20 ft. vertical differential, consult the Longline Guideline.
Note: See unit Installation Instruction for proper installation.

24ABA4

VAPOR LINE SIZING AND COOLING CAPACITY LOSS PURON 1-STAGE AIR CONDITIONER APPLICATIONS

LONG LINE APPLICATION: An application is considered "Long line" when the total equivalent tubing length exceeds 80 ft or when there is more than 20 Ft vertical separation between indoor and outdoor units. These applications require additional accessories and system modifications for reliable system operation. The maximum allowable total equivalent length is 250Ft. The maximum vertical separation is 200 Ft when outdoor unit is above indoor unit, and 50 Ft when the outdoor unit is below the indoor unit. Refer to Accessory Usage Guideline below for required accessories. See Long-Line Application Guideline for required piping and system modifications. Also, refer to the table below for the acceptable vapor tube diameters based on the total length to minimize the cooling capacity loss.

Unit Nominal Size (Btuh)	Acceptable Vapor Line Diameters (In. OD)	Cooling Capacity Loss (%) Total Equivalent Line Length (ft)										
		Standard Application			Long Line Application Requires Accessories							
		25	50	80	80+	100	125	150	175	200	225	250
18000	1/2	1	2	4	4	5	6	7	8	10	11	12
1 Stage Puron AC	5/8	0	1	1	1	2	2	2	3	3	3	4
24000	5/8	1	1	2	2	3	3	4	4	5	6	6
1 Stage Puron AC	3/4	0	1	1	1	1	1	2	2	2	2	2
	7/8	0	0	0	0	1	1	1	1	1	1	1
30000	5/8	1	2	3	3	4	5	6	7	8	9	9
1 Stage Puron AC	3/4	0	1	1	1	2	2	2	3	3	3	4
	7/8	0	0	1	1	1	1	1	1	1	2	2
36000	5/8	1	3	4	4	5	6	7	9	11	12	13
1 Stage Puron AC	3/4	1	1	2	2	3	3	3	3	4	4	5
	7/8	0	1	1	1	1	1	2	2	2	2	3
42000	3/4	1	1	2	2	3	3	4	5	5	6	7
1 Stage Puron AC	7/8	0	1	1	1	1	2	2	2	3	3	3
	1 1/8	0	0	0	0	0	1	1	1	1	1	1
48000	3/4	1	2	3	3	4	4	5	6	7	8	8
1 Stage Puron AC	7/8	0	1	1	1	2	2	3	3	3	4	4
	1 1/8	0	0	0	0	1	1	1	1	1	1	1
60000	3/4	1	3	4	4	5	6	8	9	10	11	13
1 Stage Puron AC	7/8	1	1	2	2	3	3	4	4	5	6	6
	1 1/8	0	0	1	1	1	1	1	1	1	2	2

Standard Length = 80 Ft or less total equivalent length

Applications in this area are long line. Accessories are required as shown recommended on Long Line Application Guidelines.

Applications in this area may have height restrictions that limit allowable total equivalent length, when outdoor unit is below indoor unit. See Long Line Application Guidelines

Accessory Description and Usage (Listed Alphabetically) - Continued

13. Time-Delay Relay

An SPST delay relay which briefly continues operation of indoor blower motor to provide additional cooling after the compressor cycles off.

NOTE: Most indoor unit controls include this feature. For those that do not, use the guideline below.

Usage Guideline:

For improved efficiency ratings for certain combinations of indoor and outdoor units. Refer to ARI Unitary Directory.

14. Winter Start Control

This control is designed to alleviate nuisance opening of the low-pressure switch by bypassing it for the first 3 minutes of operation.

ELECTRICAL DATA

UNIT SIZE	V/PH	OPER VOLTS*		COMPR		FAN	MCA	MIN WIRE SIZE† 60° C	MIN WIRE SIZE† 75° C	MAX LENGTH (FT)‡ 60° C	MAX LENGTH (FT)‡ 75° C	MAX FUSE** or CKT BRK AMPS
		MAX	MIN	LRA	RLA	FLA						
18	208/230/1	253	197	48.0	9.0	0.5	11.7	14	14	67	64	15
24				58.3	13.5	0.7	17.6	14	14	45	43	25
30				73.0	14.1	1.1	18.7	14	14	42	40	30
36				79.0	16.7	1.2	22.0	12	12	57	54	35
42				112.0	17.9	1.2	23.6	10	10	85	81	40
48				117.0	21.8	1.2	28.4	10	10	70	67	40
60				134.0	26.4	1.2	34.2	8	8	91	86	50

* Permissible limits of the voltage range at which the unit will operate satisfactorily

† If wire is applied at ambient greater than 30° C (86° F), consult table 310-16 of the NEC (ANSI/NFPA 70). The ampacity of non-metallic-sheathed cable (NM), trade name ROMEX, shall be that of 60° C (140° F) conditions, per the NEC (ANSI/NFPA 70) Article 336-26. If other than uncoated (no-plated), 60 or 75° C (140 or 167° C) insulation, copper wire (solid wire for 10 AWG or smaller, stranded wire for larger than 10 AWG) is used, consult applicable tables of the NEC (ANSI/NFPA 70).

‡ Length shown is as measured 1 way along wire path between unit and service panel for voltage drop not to exceed 2%.

** Time-Delay fuse.

FLA – Full Load Amps
LRA – Locked Rotor Amps
MCA – Minimum Circuit Amps
RLA – Rated Load Amps

NOTE: Control circuit is 24-V on all units and requires external power source. Copper wire must be used from service disconnect to unit. All motors/compressors contain internal overload protection.

A-WEIGHTED SOUND POWER (DBA)

UNIT SIZE	STANDARD RATING	TYPICAL OCTAVE BAND SPECTRUM (without tone adjustment)						
		125	250	500	1000	2000	4000	8000
18	76	56.0	60.0	65.0	72.0	65.0	60.5	53.5
24	76	52.5	62.5	66.0	69.5	66.5	62.0	57.0
30	76	53.5	64.5	69.0	70.0	68.5	66.0	59.5
36	76	52.0	60.0	65.5	69.5	64.0	63.0	56.0
42	77	50.5	58.5	63.0	72.0	66.0	62.5	57.5
48	78	58.0	64.5	66.5	69.0	65.0	63.5	59.0
60	78	53.5	67.0	65.5	67.5	65.5	63.0	60.0

A-WEIGHTED SOUND POWER (DBA) WITH ACCESSORY SOUND HOOD

UNIT SIZE	STANDARD RATING	TYPICAL OCTAVE BAND SPECTRUM (without tone adjustment)						
		125	250	500	1000	2000	4000	8000
18	74	56.0	60.0	65.0	69.0	63.0	60.0	52.5
24	74	52.0	62.0	66.5	68.5	66.0	61.0	56.5
30	75	53.5	64.5	69.0	69.5	68.0	65.5	59.0
36	75	52.0	62.0	65.5	67.5	63.0	61.0	53.5
42	75	51.0	60.0	62.5	68.5	64.0	61.0	55.0
48	75	59.5	63.5	66.5	67.5	64.0	62.0	55.5
60	75	54.0	63.5	65.0	66.0	63.5	61.0	57.0

CHARGING SUBCOOLING (TXV-TYPE EXPANSION DEVICE)

UNIT SIZE-SERIES	REQUIRED SUBCOOLING (°F)
18-30	10
24-30	11
30-30	8
36-30	10
42-30	12
48-30	9
60-30	9

APPENDIX H

Project-Generated Traffic Noise Calculations

EILAR ASSOCIATES, INC.
Acoustical and Environmental Consulting

Project-Generated Traffic Noise Impact Calculations

Project Name: Las Terrazas
Project #: B11206N2
Date: 10/13/2015

Intersection: Cypress and H

AM Peak Hour Traffic

Approach	Existing		Year 2018 w/o Project		Year 2018 w/ Project	
	Volume	*Total*	*Volume*	*Total*	*Volume*	*Total*
North Right	0	112	0	121	0	130
North Straight	74		80		83	
North Left	6		6		6	
East Right	7	26	8	28	8	28
East Straight	0		0		0	
East Left	8		9		9	
South Right	5	112	5	121	5	144
South Straight	25		27		27	
South Left	0		0		0	
West Right	0	0	0	0	20	26
West Straight	0		0		0	
West Left	0		0		6	

Existing v. 2018 w/o Project	
North	0.3
East	0.3
South	0.3
West	N/A

Existing v. 2018 w/ Project	
North	0.6
South	0.3
East	1.1
West	N/A

Project Contribution	
North	**0.3**
East	**0.0**
South	**0.8**
West	**N/A**

210 South Juniper Street, Suite 100, Encinitas, CA 92024 • Phone: 760-738-5570 • Fax: 760-738-5227 • info@eilarassociates.com

Project Name: Las Terrazas
Project #: B11206N2
Date: 10/13/2015

Intersection: Cypress and H

PM Peak Hour Traffic

Approach	Existing		Year 2018 w/o Project		Year 2018 w/ Project	
	Volume	*Total*	*Volume*	*Total*	*Volume*	*Total*
North Right	0	130	0	140	0	151
North Straight	46		50		56	
North Left	4		4		4	
East Right	12	25	13	26	13	26
East Straight	0		0		0	
East Left	3		3		3	
South Right	6	123	6	132	6	152
South Straight	68		73		73	
South Left	0		0		0	
West Right	0	0	0	0	14	19
West Straight	0		0		0	
West Left	0		0		5	

Existing v. 2018 w/o Project	
North	0.3
East	0.2
South	0.3
West	N/A

Existing v. 2018 w/ Project	
North	0.7
South	0.2
East	0.9
West	N/A

Project Contribution	
North	**0.3**
East	**0.0**
South	**0.6**
West	**N/A**

Project-Generated Traffic Noise Impact Calculations

Project Name: Las Terrazas
Project #: B11206N2
Date: 10/13/2015

Intersection: Cypress and Valley

AM Peak Hour Traffic

Approach	Existing		Year 2018 w/o Project		Year 2018 w/ Project	
	Volume	*Total*	*Volume*	*Total*	*Volume*	*Total*
North Right	42	92	45	99	55	122
North Straight	0		0		0	
North Left	31		33		46	
East Right	7	720	8	771	8	821
East Straight	338		358		379	
East Left	0		0		0	
South Right	0	0	0	0	0	0
South Straight	0		0		0	
South Left	0		0		0	
West Right	0	736	0	788	0	835
West Straight	344		372		388	
West Left	12		13		13	

Existing v. 2018 w/o Project	
North	0.3
East	0.3
South	N/A
West	0.3

Existing v. 2018 w/ Project	
North	1.2
South	0.6
East	N/A
West	0.5

Project Contribution	
North	**0.9**
East	**0.3**
South	**N/A**
West	**0.3**

Project Name: Las Terrazas
Project #: B11206N2
Date: 10/13/2015

Intersection: Cypress and Valley

PM Peak Hour Traffic

Approach	Existing		Year 2018 w/o Project		Year 2018 w/ Project	
	Volume	*Total*	*Volume*	*Total*	*Volume*	*Total*
North Right	26	103	28	112	39	132
North Straight	0		0		0	
North Left	24		26		35	
East Right	19	727	21	785	21	835
East Straight	279		301		330	
East Left	0		0		0	
South Right	0	0	0	0	0	0
South Straight	0		0		0	
South Left	0		0		0	
West Right	0	744	0	803	0	855
West Straight	405		437		449	
West Left	34		37		37	

Existing v. 2018 w/o Project	
North	0.4
East	0.3
South	N/A
West	0.3

Existing v. 2018 w/ Project	
North	1.1
South	0.6
East	N/A
West	0.6

Project Contribution	
North	**0.7**
East	**0.3**
South	**N/A**
West	**0.3**

F.2 - Recreational Areas

EILAR ASSOCIATES, INC.

Acoustical and Environmental Consulting

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January 28, 2016

Job #B60117N1

AMCAL Multi-Housing, Inc.
Attention: Jay Ross
30141 Agoura Hills Road, Suite 100
Agoura Hills, California 91301

Subject: Noise Analysis Report for Outdoor Use Areas at Las Terrazas Apartments

Eilar Associates has prepared this letter for the Las Terrazas Apartments Project, to be located at 275-291 Cypress Avenue in the unincorporated community of Colton, County of San Bernardino, California. The proposed project consists of the construction of 112-unit apartment development with five residential buildings, a community building, and a daycare facility. This letter documents the noise assessment performed for activity at outdoor use areas including the tot lots, the pool area, and the courtyard. For project plans showing the proposed outdoor use areas, please refer to Appendix A: Project Plans.

On-Site Noise Sources

The only sources of noise anticipated to be present at the outdoor use areas will be human voices. In order to approximate noise levels of the users in the outdoor areas, measurements shown in the *Handbook of Acoustical Measurements and Noise Control* were consulted. The *Handbook* shows noise levels of speech for both males and females for five different vocal efforts: casual, normal, raised, loud, and shout. Measurements for “loud” and “raised” voices were considered to be appropriate for this analysis. It should be noted that although there is a vocal effort level above loud voice (shouting), this level of vocal effort would not be sustainable over a long period of time. Although a person may occasionally shout, performing calculations assuming a mixture of raised and loud voices is expected to account for an occasional shout combined with normal conversation. The *Handbook* states that, at a distance of 3.28 feet, an average male will generate a noise level of 75 dBA when speaking with a loud voice, and 65 dBA when speaking with a raised voice. A female will generate a noise level of 71 dBA when speaking with a loud voice, and 62 dBA when speaking with a raised voice. It should be noted that these noise measurements assume constant speech, and do not account for averaging of sound levels with periods of lower noise levels, such as during pauses or breathing. As no noise measurements are available for children, it was assumed that children have a similar voice characteristic as that of women.

Noise and Sound Level Descriptors

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

stated frequency, with half of the bandwidth above and half of the bandwidth below each stated frequency.

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

Applicable Noise Standards

The County of San Bernardino Development 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. All receivers assessed in this analysis are residential properties. As there will be relatively little activity at the project related outdoor use areas during the nighttime hours, the daytime limit of 55 dBA was considered as the applicable noise limit for this analysis. Pertinent sections of the County of San Bernardino Development Code are provided in Appendix B.

Methodology

Modeling of the outdoor noise environment is accomplished using Cadna Ver. 4.5, which is an industry-standard, 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. Noise standards used by Cadna that are particularly relevant to this analysis include ISO 9613 (Attenuation of sound during propagation outdoors). Cadna provides results that are in line with basic acoustical calculations for distance attenuation and barrier insertion loss. Further explanation may be provided upon request.

Analysis

Worst-case assumptions were made for the number of individuals occupying each gathering area. The two tot lots were each assumed to include 50 children. The pool area was assumed to include 25 men and 25 women, and the courtyard was assumed to include 50 men and 50 women. All gathering areas were assumed to be composed of 50 percent of users using loud voices and 50 percent of users using raised voices. Each individual was calculated as speaking for 100 percent of every hour, which does not account for pauses within speech as well as breaks for listening. The model considered all outdoor use areas to be occupied and completely active for a full hour. These assumptions are considered to be extremely conservative and are unlikely to be fulfilled at any time.

The model included reflection and shielding provided by project buildings and the perimeter wall, as well as the eight-foot wall around the tot lot at the childcare facility. In order to model the noise from many spread out sources, an area source was used, which divides all of the sound power along the surface of a plane, which better accounts for individuals moving around within the area. The results of this analysis can be seen below in Table 1, and a graphical representation of activity noise contours are provided as Figure 1. Please refer to Appendix C: Cadna Calculations Input and Results for more details.

Table 1. Calculated Noise Impacts from Outdoor Use Areas			
Receiver Number	**Approximate Distance to Pool Area (feet)**	**Noise Limit (dBA)**	**Exterior Noise Impact (dBA)**
R-1 North Property Line	435	55	42
R-2 East Property Line	85	55	54
R-3 East Property Line (Across Cypress Ave)	235	55	50

As shown above, even considering the highly conservative assumptions detailed herein, noise impacts from activity within outdoor use areas on the project site are not anticipated to exceed the applicable daytime noise limit at surrounding residential properties with the project as currently designed. For this reason, no mitigation is deemed necessary for the attenuation of outdoor activity noise impacts.

Conclusion

Even considering highly conservative assumptions of usage within proposed outdoor areas on the project site, noise impacts from activity at outdoor use areas on the property are anticipated to remain in compliance with County of San Bernardino daytime noise limits at all surrounding properties with the project as currently designed. For this reason, no mitigation is deemed necessary for the attenuation of outdoor activity noise impacts. This analysis is based upon a current worst-case scenario of anticipated, typical information for this type of activity. These conclusions and recommendations are based on the best and most current project-related information available at the time this study was prepared.

This letter was prepared by Jeff Russert and Amy Hool.

Sincerely,

EILAR ASSOCIATES, INC.

Amy Hool, Principal Acoustical Consultant

Jeff Russert, Senior Acoustical Consultant

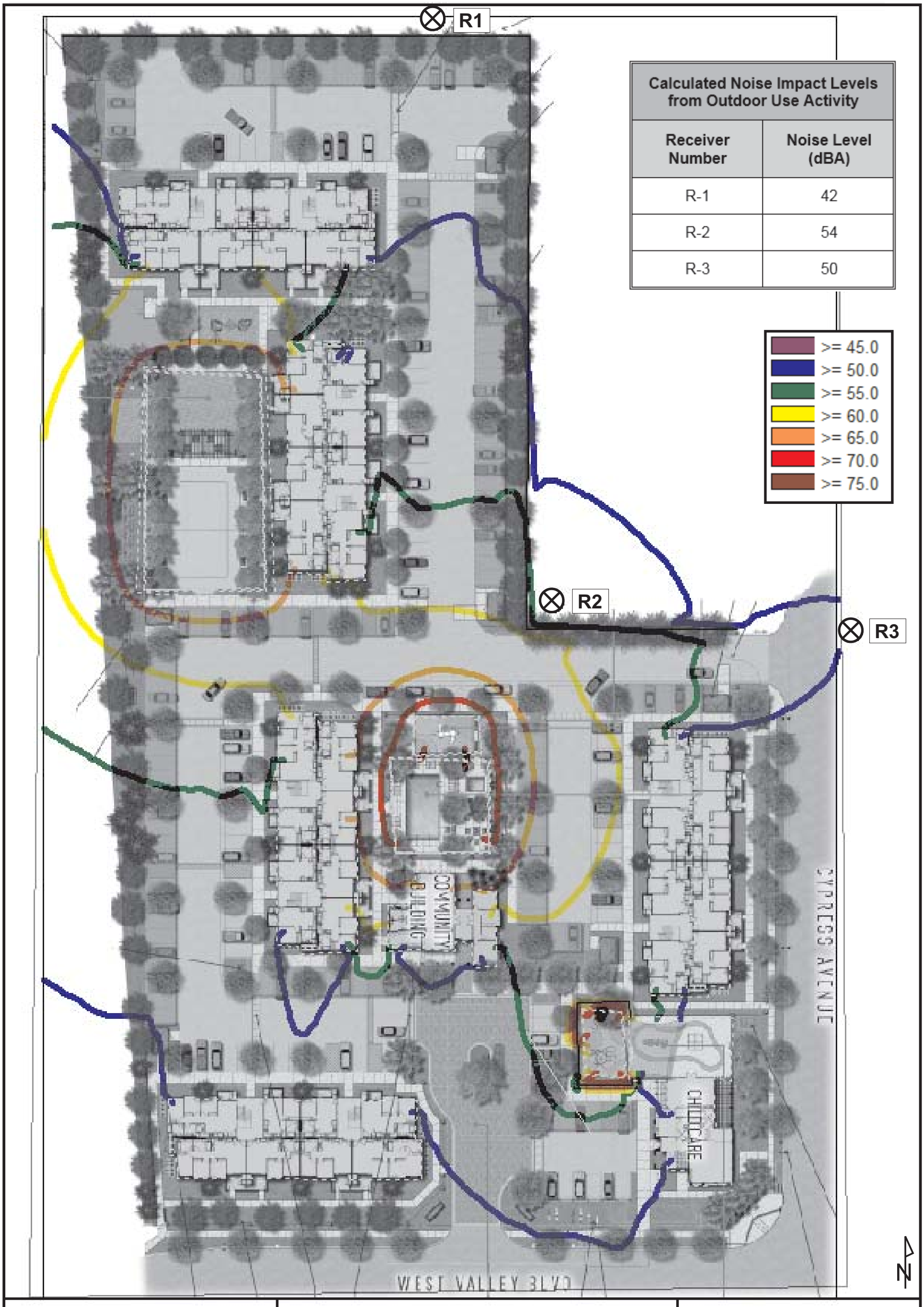
Figures

1. Site Plan Showing Activity Noise Contours

Appendices

A. Project Plans
B. Pertinent Sections of the County of San Bernardino Development Code
C. Cadna Calculations Input and Results

FIGURES



Calculated Noise Impact Levels from Outdoor Use Activity	
Receiver Number	**Noise Level (dBA)**
R-1	42
R-2	54
R-3	50

Eilar Associates, Inc. **210 South Juniper Street, Suite 100** **Escondido, California 92025** **760-738-5570**	**Site Plan Showing Noise Contours from Activity at Outdoor Use Area** **Job # B60117N1**	**Figure 1**

APPENDIX A

Project Plans

LANDSCAPE AREA TAKEOFFS:	
SITE AREA:	257,988 s.f.
ACTIVATED COURTYARD SPACE:	43,218 s.f.
SOFTSCAPE PLANTING AREAS:	69,688 s.f.
TOTAL OPENSPACE AREA:	111,569 s.f.

LAS TERRAZAS - COLTON, CA

AMCAL MULTI-HOUSING INC.

November 12, 2015

CONCEPTUAL LANDSCAPE PLAN

0' 15' 30' 60'

MJS LANDSCAPE ARCHITECTURE

APPENDIX B

Pertinent Sections of the County of San Bernardino Development Code

Table 83-2
Noise Standards for Stationary Noise Sources

Affected Land Uses (Receiving Noise)	7 am-10 pm Leq	10 pm-7 am Leq
Residential	55 dB(A)	45 dB(A)
Professional Services	55 dB(A)	55 dB(A)
Other Commercial	60 dB(A)	60 dB(A)
Industrial	70 dB(A)	70 dB(A)

Leq = (Equivalent Energy Level). The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period, typically 1, 8 or 24 hours.

dB(A) = (A-weighted Sound Pressure Level). The sound pressure level, in decibels, as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, placing greater emphasis on those frequencies within the sensitivity range of the human ear.

Ldn = (Day-Night Noise Level). The average equivalent A-weighted sound level during a 24-hour day obtained by adding 10 decibels to the hourly noise levels measured during the night (from 10 pm to 7 am). In this way Ldn takes into account the lower tolerance of people for noise during nighttime periods.

(2) Noise limit categories. No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporated or unincorporated, to exceed any one of the following:

(A) The noise standard for the receiving land use as specified in Subsection B (Noise-impacted areas), above, for a cumulative period of more than 30 minutes in any hour.

(B) The noise standard plus 5 dB(A) for a cumulative period of more than 15 minutes in any hour.

(C) The noise standard plus 10 dB(A) for a cumulative period of more than five minutes in any hour.

(D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.

(E) The noise standard plus 20 dB(A) for any period of time.

(d) Noise standards for adjacent mobile noise sources. Noise from mobile sources may affect adjacent properties adversely. When it does, the noise shall be mitigated for any new development to a level that shall not exceed the standards described in the following Table 83-3 (Noise Standards for Adjacent Mobile Noise Sources).

Table 83-3
Noise Standards for Adjacent Mobile Noise Sources

Land Use		Ldn (or CNEL) dB(A)	
Categories	Uses	Interior (1)	Exterior (2)
Residential	Single and multi-family, duplex, mobile homes	45	60 (3)
Commercial	Hotel, motel, transient housing	45	60 (3)
	Commercial retail, bank, restaurant	50	N/A
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	N/A
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library	45	65
Open Space	Park	N/A	65

Notes:

(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.

(2) The outdoor environment shall be limited to:

- Hospital/office building patios
- Hotel and motel recreation areas
- Mobile home parks
- Multi-family private patios or balconies
- Park picnic areas
- Private yard of single-family dwellings
- School playgrounds

(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.

CNEL = (Community Noise Equivalent Level). The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7 p.m. to 10 a.m. and 10 decibels to sound levels in the night before 7 a.m. and after 10 p.m.

(e) Increases in allowable noise levels. If the measured ambient level exceeds any of the first four noise limit categories in Subsection (d)(2), above, the allowable noise exposure standard shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category in Subsection (d)(2), above, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

(f) Reductions in allowable noise levels. If the alleged offense consists entirely of impact noise or simple tone noise, each of the noise levels in Table 83-2 (Noise Standards for Stationary Noise Sources) shall be reduced by 5 dB(A).

(g) Exempt noise. The following sources of noise shall be exempt from the regulations of this Section:

(1) Motor vehicles not under the control of the commercial or industrial use.

(2) Emergency equipment, vehicles, and devices.

(3) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

(h) Noise standards for other structures. All other structures shall be sound attenuated against the combined input of all present and projected exterior noise to not exceed the criteria.

Table 83-4
Noise Standards for Other Structures

Typical Uses	12-Hour Equivalent Sound Level (Interior) in dBA Ldn
Educational, institutions, libraries, meeting facilities, etc.	45
General office, reception, etc.	50
Retail stores, restaurants, etc.	55
Other areas for manufacturing, assembly, testing, warehousing, etc.	65

In addition, the average of the maximum levels on the loudest of intrusive sounds occurring during a 24-hour period shall not exceed 65 dBA interior.

Adopted Ordinance 4011 (2007)

83.01.090 Vibration

(a) Vibration standard. No ground vibration shall be allowed that can be felt without the aid of instruments at or beyond the lot line, nor shall any vibration be allowed which produces a particle velocity greater than or equal to two-tenths (0.2) inches per second measured at or beyond the lot line.

(b) Vibration measurement. Vibration velocity shall be measured with a seismograph or other instrument capable of measuring and recording displacement and frequency, particle velocity, or acceleration. Readings shall be made at points of maximum vibration along any lot line next to a parcel within a residential, commercial and industrial land use zoning district.

(c) Exempt vibrations. The following sources of vibration shall be exempt from the regulations of this Section.

(1) Motor vehicles not under the control of the subject use.

APPENDIX C

Cadna Analysis Data and Results

Cadna Noise Model - Sound Levels													
Name	**ID**	**Type**											**Source**
			Weight	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**A**	**lin**	
Male - Loud	V_1	Lw (c)		67.1	77.1	85.1	82.1	76.1	72.1	63.1	86	87.8	Harris (16.3)
Male - Raised	V_2	Lw (c)		68.5	72.5	76.5	70.5	63.5	60.5	53.5	76	79.3	Harris (16.3)
Female - Loud	V_4	Lw (c)		37.7	72.7	76.7	78.7	74.7	71.7	63.7	82	82.7	Harris (16.3)
Female - Raised	V_5	Lw (c)		40.8	68.8	71.8	68.8	62.8	60.8	55.8	73	75.3	Harris (16.3)

Cadna Noise Model - Area Sources					
Name	**ID**	**Result. PWL**	**Lw / Li**		**Height**
		Day	**Type**	**Value**	
		(dBA)			**(m)**
Child Care Facility - Tot Lot - Loud Female Voices	S_1	96	PWL-Pt	V_4	1.52
Pool - Loud Female	S_2	93.1	PWL-Pt	V_4	1.52
Pool - Loud Male	S_2	97.2	PWL-Pt	V_1	1.52
Recreation Area - Tot Lot - Loud Female Voices	S_1	96	PWL-Pt	V_4	1.52
Central Park - Loud Female Voices	S_3	96	PWL-Pt	V_4	1.52
Central Park - Loud Male Voices	S_3	100	PWL-Pt	V_1	1.52
Child Care Facility - Tot Lot - Raised Female Voices	S_1	87	PWL-Pt	V_5	1.52
Pool - Raised Female	S_2	83.8	PWL-Pt	V_5	1.52
Pool - Raised Male	S_2	86.8	PWL-Pt	V_2	1.52
Recreation Area - Tot Lot - Raised Female Voices	S_1	90	PWL-Pt	V_2	1.52
Central Park - Raised Female Voices	S_3	87	PWL-Pt	V_5	1.52
Central Park - Raised Male Voices	S_3	90	PWL-Pt	V_2	1.52

Cadna Noise Model - Contour Lines									
Name	ID	Coordinates			Name	ID	Coordinates		
		X	Y	Z			X	Y	Z
		(m)	(m)	(m)			(m)	(m)	(m)
Building 1		462.37	614.89	8.75	Building 5		563.65	511.25	8.75
		509.79	614.39	8.75			571.15	511.25	8.75
		509.62	610.55	8.75			571.32	509.67	8.75
		511.04	610.05	8.75			578.74	509.58	8.75
		511.2	599.55	8.75			578.99	462.33	8.75
		464.2	599.47	8.75			574.4	462.66	8.75
		464.2	606.8	8.75			574.99	460.41	8.75
		462.53	606.72	8.75			563.9	460.66	8.75
Building 2		494.49	585.5	8.75	Building 6		471.73	440.96	8.75
		505.16	585.33	8.75			519.23	440.8	8.75
		505.5	583.92	8.75			519.07	433.21	8.75
		509.25	584	8.75			520.07	433.13	8.75
		509.33	539.91	8.75			520.15	425.46	8.75
		502.24	539.75	8.75			473.64	425.8	8.75
		502.16	541.33	8.75			473.39	430.3	8.75
		494.83	541.41	8.75			472.23	430.3	8.75
Building 3		492.66	514.55	8.75	Building 7		513.72	478.03	3.05
		500.33	514.38	8.75			518.15	477.96	3.05
		500.41	512.96	8.75			519.14	477.96	3.05
		507.58	512.55	8.75			519.01	483.91	3.05
		507.83	469.13	8.75			526.42	483.65	3.05
		497.08	468.79	8.75			526.55	477.5	3.05
		496.66	470.21	8.75			527.15	476.97	3.05
		492.5	470.29	8.75			530.12	476.84	3.05
Building 4		559.65	456.74	4.88			530.12	480.81	3.05
		579.71	456.53	4.88			534.36	480.61	3.05
		579.39	444.56	4.88			534.56	466.38	3.05
		575.88	444.87	4.88			530.06	466.05	3.05
		576.4	434.69	4.88			529.73	470.75	3.05
		579.39	434.69	4.88			526.82	471.08	3.05
		579.18	424.66	4.88			526.49	471.08	3.05
		571.05	424.5	4.88			526.49	469.16	3.05
		570.78	427.44	4.88			520.53	469.56	3.05
		567.06	427.44	4.88			519.41	469.43	3.05
		566.95	444.4	4.88			513.65	469.36	3.05
		559.92	444.45	4.88					

Cadna Noise Model - Noise Levels at Receivers						
Name	**ID**	**Level Lr**	**Height**	**Coordinates**		
		Day		**X**	**Y**	**Z**
		(dBA)	**(m)**	**(m)**	**(m)**	**(m)**
North PL	R_1	41.7	1.52	522.59	647.31	1.52
East PL	R_2	53.6	1.52	545.34	535.91	1.52
East PL (Across Cypress	R_3	49.9	1.52	602.21	530.40	1.52