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Mr. Derek Empey  
Senior Vice President of Development / Partner  
Reylenn Properties LLC  
444 South Cedros Avenue, Suite 180  
Solana Beach, California 92075

***Subject: Noise Study - Solana Torrance Multifamily Residential Project***

Dear Mr. Empey:

This letter report presents the results of our noise study for the subject project. The proposed project would construct a 300-unit multifamily residential project in the City of Torrance (City), California, west of Hawthorne Boulevard and south of Via Valmonte.

Dudek acoustical specialists have evaluated the potential noise impacts associated with the proposed project. The analysis addressed potential noise impacts from construction of the project at adjacent noise-sensitive receivers and from traffic noise at the proposed future on-site residential land uses. Noise from Torrance Municipal Airport, located approximately 0.5 mile to the northeast, is also addressed. Residential land uses are located to the north, east and west of the proposed project.

The results indicate that the proposed project would not result in a measurable or audible increase in traffic noise levels at nearby noise-sensitive land uses. With implementation of mitigation measures specified in this report, on-site traffic and operational noise levels would be in compliance with the City noise standards corresponding to low medium density residential land uses. Similarly, with implementation of mitigation measures construction noise will be in compliance with applicable City municipal code standards for construction.

## **NOISE TERMINOLOGY**

The following is a brief discussion of fundamental noise concepts and basic terminology.

### **Sound Pressure Levels and Decibels**

The amplitude of a sound determines its loudness. Loudness of sound increases with increasing amplitude. Sound pressure amplitude is measured in units of micronewton per square meter, also called micropascal. One micropascal is approximately one-hundred billionth (0.0000000001) of

normal atmospheric pressure. The pressure of a very loud sound may be 200 million micropascals, or 10 million times the pressure of the weakest audible sound. Because expressing sound levels in terms of micropascal would be very cumbersome, sound pressure level in logarithmic units is used instead to describe the ratio of actual sound pressure to a reference pressure squared. These units are called Bels. To provide a finer resolution, a Bel is subdivided into 10 decibels (dB).

### **A-Weighted Sound Level**

Sound pressure level alone is not a reliable indicator of loudness. The frequency, or pitch, of a sound also has a substantial effect on how humans will respond. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness, or human response, is determined by the characteristics of the human ear.

Human hearing is limited not only in the range of audible frequencies, but also in the way it perceives the sound in that range. In general, the healthy human ear is most sensitive to sounds between 1,000 and 5,000 hertz, and it perceives a sound within that range as more intense than a sound of higher or lower frequency with the same magnitude. To approximate the frequency response of the human ear, a series of sound level adjustments is usually applied to the sound measured by a sound level meter. The adjustments (referred to as a weighting network) are frequency-dependent.

The A-scale weighting network approximates the frequency response of the average young ear when listening to ordinary sounds. When people make judgments about the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special situations (e.g., B-scale, C-scale, D-scale), but these scales are rarely used in conjunction with most environmental noise. Noise levels are typically reported in terms of A-weighted sound levels. All sound levels discussed in this report are A-weighted decibels (dBA). Examples of typical noise levels for common indoor and outdoor activities are depicted in Table 1.

**Table 1**  
**Typical Sound Levels in the Environment and Industry**

<b>Common Outdoor Activities</b>	<b>Noise Level (dB)</b>	<b>Common Indoor Activities</b>
	110	Rock band
Jet fly over at 300 meters (1,000 feet)	100	
Gas lawn mower at 1 meter (3 feet)	90	
Diesel truck at 15 meters (50 feet), at 80 kilometers per hour (50 miles per hour)	80	Food blender at 1 meter (3 feet); garbage disposal at 1 meter (3 feet)

**Table 1**  
**Typical Sound Levels in the Environment and Industry**

Common Outdoor Activities	Noise Level (dB)	Common Indoor Activities
Noisy urban area, daytime; gas lawn mower at 30 meters (100 feet)	70	Vacuum cleaner at 3 meters (10 feet)
Commercial area; heavy traffic at 90 meters (300 feet)	60	Normal speech at 1 meter (3 feet)
Quite urban, daytime	50	Large business office; dishwasher next room
Quite urban, nighttime	40	Theater; large conference room (background)
Quite suburban, nighttime	30	Library
Quite rural, nighttime	20	Bedroom at night; concert hall (background)
	10	Broadcast/Recording studio
Lowest threshold of human hearing	0	Lowest threshold of human hearing

Source: Caltrans 1998

### Human Response to Changes in Noise Levels

Under controlled conditions in an acoustics laboratory, the trained, healthy human ear is able to discern changes in sound levels of 1 dBA when exposed to steady, single-frequency signals in the mid-frequency range. Outside such controlled conditions, the trained ear can detect changes of 2 dBA in normal environmental noise. It is widely accepted that the average healthy ear, however, can barely perceive noise level changes of 3 dBA. A change of 5 dBA is readily perceptible, and a change of 10 dBA is perceived as twice or half as loud. A doubling of sound energy results in a 3 dBA increase in sound, which means that a doubling of sound energy (e.g., doubling the volume of traffic on a road) would result in a barely perceptible change in sound level).

### Noise Descriptors

Additional units of measure have been developed to evaluate the long-term characteristics of sound. The equivalent sound level ( $L_{eq}$ ) is also referred to as the time-average sound level. It is the equivalent steady-state sound level that in a stated period of time would contain the same acoustical energy as the time-varying sound level during the same time period. The 1-hour A-weighted equivalent sound level,  $L_{eq}(h)$ , is the energy average of the A-weighted sound levels occurring during a 1-hour period, and is the basis for the City of Torrance noise ordinance criteria for stationary sources.

People are generally more sensitive and annoyed by noise occurring during the evening and nighttime hours. Thus, another noise descriptor used in community noise assessments—the community noise equivalent level (CNEL)—was introduced. The CNEL scale represents a time-weighted, 24-hour average noise level based on the A-weighted sound level. The CNEL accounts

for the increased noise sensitivity during the evening hours (7 p.m. to 10 p.m.) and nighttime hours (10 p.m. to 7 a.m.) by adding 5 dBA and 10 dBA, respectively, to the average sound levels occurring during the evening and nighttime hours. The CNEL noise metric (or a similar noise metric the Day Night Level ( $L_{dn}$ <sup>1</sup>) is the basis for the City's standards for mobile source noise such as traffic and aircraft noise.

## Sound Propagation

Sound propagation (i.e., the passage of sound from a noise source to a receiver) is influenced by geometric spreading, ground absorption, atmospheric effects, and shielding by natural and/or built features.

Sound levels attenuate (or diminish) at a rate of approximately 6 dBA per doubling of distance from an outdoor point source due to the geometric spreading of the sound waves. Atmospheric conditions such as humidity, temperature, and wind gradients can also temporarily either increase or decrease sound levels. In general, the greater the distance the receiver is from the source, the greater the potential for variation in sound levels due to atmospheric effects. Additional sound attenuation can result from built features such as intervening walls and buildings, and by natural features such as hills and dense woods.

## Groundborne Vibration Fundamentals

Groundborne vibration is a small, rapidly fluctuating motion transmitted through the ground. The strength of groundborne vibration attenuates fairly rapidly over distance. Some soil types transmit vibration quite efficiently; other types (primarily sandy soils) do not. Several basic measurement units are commonly used to describe the intensity of ground vibration. The descriptors used by the Federal Transit Administration are peak particle velocity (PPV), in units of inches per second, and velocity decibel (VdB). The calculation to determine PPV at a given distance is as follows:

$$PPV_{\text{distance}} = PPV_{\text{ref}} * (25/D)^{1.5}$$

Where:

$PPV_{\text{equip}}$  = the peak particle velocity in inches per second of the equipment adjusted for distance

$PPV_{\text{ref}}$  = the reference vibration level in inches per second at 25 feet

$D$  = the distance from the equipment to the receiver

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<sup>1</sup>  $L_{dn}$  (also known as DNL) is comparable to CNEL, except that there is no evening component: the period from 7 a.m. to 10 p.m. is classified as daytime, and no adjustment to the noise levels is made during these hours; the period from 10 p.m. to 7 a.m. is classified as nighttime and 10 decibels is added to the hourly  $L_{eqs}$  occurring during these hours.

The velocity parameter (instead of acceleration or displacement) best correlates with human perception of vibration. Thus, the response of humans, buildings, and sensitive equipment to vibration is described in this section in terms of the root-mean square velocity level in VdB units relative to 1 micro-inch per second. As a point of reference, the average person can just barely perceive vibration velocity levels below 70 VdB (typically in the vertical direction). The calculation to determine the root-mean square at a given distance is as follows:

$$L_v(D) = L_v(25 \text{ feet}) - 30 * \log(D/25)$$

Where:

$L_v(D)$  = the vibration level at the receiver

$L_v(25 \text{ feet})$  = the reference source vibration level

$D$  = the distance from the vibration activity to the receiver

Typical background vibration levels are between 50 and 60 VdB, and the level for minor cosmetic damage to fragile buildings or blasting generally begins at 100 VdB.

## REGULATORY STANDARDS

### Federal

No federal noise standards apply to this project

### State

State of California regulation CCR Title 24 requires that an affected building be oriented, shielded, and designed to have sound insulation such that with all exterior doors and windows in the closed position, the interior noise exposure level attributable to exterior sources will not exceed 45 dBA Day-Night Average Sound Level ( $L_{dn}$ ) in any habitable room. CCR Title 24 thus requires an acoustical analysis for any new multi-family residential structures located in an area with a noise level of 60 dBA  $L_{dn}$ /CNEL or greater.

### City of Torrance General Plan Noise Element

Recognizing that environmental noise is an important factor in the quality of life for both residents and visitors, the City adopted an update to the Noise Element of the General Plan in 2010. The Noise Element establishes policies to guard against creation of new noise/land use conflicts and to minimize the impact of existing noise sources on the community.

The Noise Element’s Table N-3 (Torrance Noise/Land Use Compatibility Guidelines (Torrance, 2010)), provided here as Table 2, specifies exterior and interior noise standards by proposed land use type and proposed density (for residential projects). The proposed project would have a density of 12.1 dwelling units per acre (DU/AC) which equates to a low medium density, pursuant to the City Housing Element (adopted October 1, 2013). As shown in Table 2, the exterior noise standard for low medium density residential uses is 65 dBA L<sub>dn</sub> or CNEL, and the interior noise standard is 45 dBA L<sub>dn</sub> or CNEL. The maximum acceptable exposure from aircraft-related noise is 60 dBA CNEL.

As stated in the Noise Element, “These compatibility criteria serve as guidelines. For example, an acoustical analysis must be prepared when noise-sensitive land uses are proposed within noise impact areas. The analysis must show that the project is designed to attenuate noise to meet the City’s noise standards in order to receive approval. If the project design does not meet the noise standards, mitigation can be recommended in the analysis. If the analysis demonstrates that the noise standards can be met by implementing the mitigation measures, the project can be approved conditioned upon implementation of the mitigation measures.”

**Table 2**  
**Torrance Noise/Land Use Compatibility Guidelines**

Property Receiving Noise		Maximum Noise Level Ldn or CNEL, dB(A)	
Type of Use	Land Use Designations	Interior	Exterior <sup>3</sup>
	Low Density Residential	45	60/65 <sup>1</sup>
	Low Medium Density Residential		
	Medium Density Residential		
	Medium High Density Residential		
	High Density Residential	45	70 <sup>1</sup>
Commercial and Office	General Commercial	--	70
	Commercial Center		
	Residential Office		
Industrial	Business Park	55	75
	Light Industrial		
	Heavy Industrial		
Public and Medical Uses	Public/Quasi-Public/Open Space	50	65
	Hospital/Medical	50	70
Airport	Airport	--	70

**Source:** Table N-3, Torrance General Plan Noise Element

<sup>1</sup> The normally acceptable standard is 60 db(A). The higher standard is acceptable subject to inclusion of noise-reduction features in project design and construction.

<sup>2</sup> Maximum exterior noise levels up to 70 dB CNEL are allowed for Multiple-Family Housing.

<sup>3</sup> Regarding aircraft-related noise, the maximum acceptable exposure for new residential opment is 60 dB(A) CNEL.

## City of Torrance Municipal Code

**Stationary Source Noise.** The City's Municipal Code, Division 4: Public Health and Welfare (Chapter 6 – Noise Regulation) establishes noise level limits in most residential areas of 50 to 55 dBA between 7 A.M. to 10 P.M., and 45-50 dBA between 10 P.M. to 7 A.M., depending on location. The regulations establish regions with differing noise regulations, with the noise standards in Region 3 (where this project site is located as well as the residences to the north) being the most stringent. The maximum noise level for residences in Region 3 is 50 dBA from 7 A.M. to 10 P.M. and 45 dB(A) from 10 P.M. to 7 A.M..

Noise from construction activities is regulated in the Municipal Code (Article 3, Construction, Section 46.3.1, Construction of Buildings and Projects. It is unlawful for any person within the City to operate power construction tools, equipment, or engage in the performance of any outside construction or repair work on buildings, structures, or projects in or adjacent to a residential area involving the creation of noise beyond 50 decibels (dB) as measured at property lines, except between the hours of 7:30 A.M. to 6:00 P.M. Monday through Friday and 9:00 A.M. to 5:00 P.M. on Saturdays. Construction is prohibited on Sundays and Holidays observed by City Hall. An exception exists between the hours of 10:00 A.M. to 4:00 P.M. for homeowners that reside at the property.

Additionally, heavy construction equipment such as pile drivers, mechanical shovels, derricks, hoists, pneumatic hammers, compressors or similar devices are prohibited to be operated at any time, within or adjacent to a residential area, without first obtaining from the Community Development Director permission to do so. Such request for permission shall include a list and type of equipment to be used, the requested hours and locations of its use, and the applicant shall be required to show that the selection of equipment and construction techniques has been based on minimization of noise within the limitations of such equipment as is commercially available or combinations of such equipment and auxiliary sound barriers. Such permission to operate heavy construction equipment will be revoked if operation of such equipment is not in accordance to approval (Torrance, 1984).

## METHODOLOGY

A field noise study was conducted to measure existing on- and off-site noise conditions. Sound-level data was collected over 15-minute periods at two on-site locations as well as at two adjacent noise-sensitive land uses. Potential impacts from excavation and grading, and construction noise at nearby noise-sensitive land uses was evaluated based on construction equipment data from typical construction activities associated with residential construction projects and noise modeling methods developed by the Environmental Protection Agency. Long-term (operational) noise effects from traffic on Hawthorne Boulevard were evaluated using the project's traffic study and the Federal Highway Administration's Traffic Noise Model (TNM)

version 2.5. In the cases where noise impacts were identified, mitigation measures were developed and recommended to reduce impacts to a “less than significant” level and to comply with City noise standards.

### Existing Noise Conditions

Ambient noise measurements were conducted on and near the project site in January 2016 to characterize the existing noise environment. The measurements were conducted on May 11, 2016, using a Piccolo Integrating Sound Level Meter equipped with a 0.5-inch, pre-polarized condenser microphone with pre-amplifier. The sound level meter meets the current American National Standards Institute (ANSI) standard for a Type 2 (General Use) sound level meter. The calibration of the sound level meter was verified before and after the measurements, and the measurements were conducted with the measurement microphone covered with a windscreen and positioned approximately five feet above the ground.

Four noise measurement locations were selected (ST1–ST4), representing existing and/or future noise-sensitive receptors on the project site and in the project vicinity. The measurement locations are shown in Figure 1 (Noise Measurement Locations), and the measured average noise levels and measurement locations are provided in Table 3. Noise measurement data is also included in Attachment A. As shown in Table 3, measured ambient noise levels ranged from approximately 58 dBA  $L_{eq}$  at ST1 (southeast side of proposed project site ) to 64 dBA  $L_{eq}$  at ST2 (northeast side of proposed project). The primary noise sources at the sites consisted of traffic along the adjacent roadways. Secondary noise sources included aircraft noise, birds, rustling leaves, distant aircraft, and distant landscaping activities.

**Table 3**  
**Measured Noise Levels**

Receptors	Location/Address	Date	Time	$L_{eq}$ (dBA)	$L_{max}$ (dBA)
ST1	Southeast side of project site adjacent to Hawthorne Blvd.	May 11, 2016	11:53 a.m. – 12:08 p.m.	57.5	64.9
ST2	Northeast side of project site, adjacent to Via Valmonte	May 11, 2016	12:28 p.m. – 12:42 p.m.	64.4	74.0
ST3	Residence at 3662 Blair Way, east of project site	May 11, 2016	1:33 p.m. – 1:48 p.m.	62.9	68.5
ST4	Residence at 24648 Via Valmonte, north of project site	May 11, 2016	2:02 p.m. – 2:17 p.m.	60.5	74.5

Source: Attachment A

Notes:  $L_{eq}$  = equivalent continuous sound level (time-averaged sound level);  $L_{max}$  = maximum sound level during the measurement interval

## **SIGNIFICANCE CRITERIA**

Based on the criteria identified in Appendix G of the CEQA Guidelines, the proposed project would have a significant impact on noise if it would result in:

1. The exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
2. The exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
3. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
4. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

### **Significant Changes In Ambient Noise Levels**

Some guidance regarding the determination of a substantial permanent increase in ambient noise levels in the project vicinity above existing levels is provided by the 1992 findings of the Federal Interagency Committee on Noise (FICON), which assessed the annoyance effects of changes in ambient noise levels resulting from aircraft operations. The FICON recommendations are based upon studies that relate aircraft and traffic noise levels to the percentage of persons highly annoyed by the noise. Annoyance is a qualitative measure of the adverse reaction of people to noise that generates speech interference, sleep disturbance, or interference with the desire for a tranquil environment.

The rationale for the FICON recommendations is that it is possible to consistently describe the annoyance of people exposed to transportation noise in terms of  $L_{dn}$ . The changes in noise exposure that are shown in Table 4 are expected to result in equal changes in annoyance at sensitive land uses. Although the FICON recommendations were specifically developed to address aircraft noise impacts, they are used in this analysis to define a substantial increase in community noise levels related to all transportation noise sources and permanent non-transportation noise sources.

**Table 4**  
**Measures of Substantial Increase for Community Noise Sources**

Ambient Noise Level Without Project (L <sub>dn</sub> )	Significant Impact Assumed to Occur if the Project Increases Ambient Noise Levels by:
<60 dB	+ 5 dB or more
60-65 dB	+ 3 dB or more
>65 dB	+ 2 dB or more

### **Vibration Significance Criteria**

Impacts related to excessive ground-borne vibration would be significant if the project results in the exposure of persons to or generation of excessive ground-borne vibration equal to or in excess of 0.2 inches/second PPV. Construction activities within 200 feet and pile driving within 600 feet would be potentially disruptive to vibration-sensitive operations (Caltrans 2002).

## **NOISE AND VIBRATION IMPACTS**

### **Traffic Noise**

The primary noise-related effect that most projects produce is a potential for on-site and off-site increases in traffic, which is the main source of noise in most urban and rural areas. Acoustical calculations were performed for existing traffic levels (presented in Section 2.1) as traffic is often a major contributor to the ambient or community noise level, and it is helpful therefore to quantify existing traffic related noise levels.

The proposed project would generate traffic along Hawthorne Boulevard and Via Valmonte. Potential noise effects from vehicular traffic were assessed using FHWA's Traffic Noise Model, version 2.5. The TNM 2.5 traffic noise prediction model was calibrated first, using the measured average noise levels and the concurrently counted traffic volumes previously shown in Table 2. The same traffic volumes and vehicle composition ratios counted during the noise measurements were used to calibrate the model and verify the input used in the noise model. The modeled Leq's for the monitoring locations were within two decibels of the measured noise levels. This result confirms the assumptions used in the noise model; traffic noise modeling data, as well as the traffic volume input data, is included as Attachment B.

Consistent with the Traffic Impact Study provided by KHR Associates (KHR, 2016), the modeled traffic scenarios included the Existing (i.e., baseline conditions), Existing plus Project, Cumulative (Year 2019), and Cumulative plus Project traffic volumes and speeds. Noise levels were modeled at representative on-site and off-site noise-sensitive receivers. The receivers,

which represent noise-sensitive receivers with the most potential to be impacted by project-related traffic noise, are shown in Figure 4. As shown in Figure 4, ST3, ST4 and R45 represent the existing off-site receivers and R1 through R44 represent the proposed on-site receivers.

The information provided from this modeling was compared to the noise impact significance criteria in the City’s General Plan (i.e., a 65 dBA  $L_{dn}$  noise standard for noise-sensitive land uses) and the FICON thresholds for noise increase (i.e., a 5 dBA increase in an ambient noise environment of less than 60 dBA  $L_{dn}$ , a 3 dBA noise increase in an ambient noise environment of 60 - 65 dBA  $L_{dn}$  and a 2 dBA increase in an ambient noise environment of more than 65 dBA  $L_{dn}$ ) to assess whether project traffic noise would cause a significant impact and, if so, where.

**Off-Site Traffic Noise Levels.** The results of the comparisons for nearby existing off-site receivers (as represented by ST-3, ST-4 and R-45) are presented in Table 5.

**Table 5**  
**Traffic Noise at Adjacent Noise-Sensitive Receivers (dBA Ldn)**

Receiver	Existing	Existing + Project	Noise Increase (dB)	Cumulative	Cumulative + Project	Noise Increase (dB)
ST3 – Residences east of project site	62	62	0	62	62	0
ST4 - Residence north of project	63	63	0	64	64	0
R45 - Residences northeast of project	66	66	0	66	66	0

Source: Attachment B

As shown in Table 5, modeled existing and cumulative traffic noise levels range from approximately 62 dBA  $L_{dn}$  at receiver ST3 to 66 dBA  $L_{dn}$  at R45, both with and without the proposed project. The incremental increase resulting from project-related traffic would increase the traffic noise levels by less than 1 dBA (0 dB when rounded to whole numbers) along the study area roadways. The project would not cause an exceedance of City noise standards for transportation noise, and would not result in an audible or measurable increase in traffic noise. Project-related traffic noise impacts would therefore be less than significant.

**On-Site Exterior Traffic Noise Levels.** The results of the noise analysis for traffic noise levels at proposed on-site receivers is provided in Table 6. On-site noise sensitive receiver locations consisted of the three “parking level” floors (P1, P2 and P3) constituting Building D (which would also include residential units with balconies on the northern and eastern sides), the 1<sup>st</sup> floor building facades and

Mr. Derek Empey

Subject: Noise Study - Solana Torrance Multifamily Residential Project

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patios of Buildings A, B and C, the 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> (as applicable<sup>2</sup>) floors building facades and balconies of Buildings A, B and C, and the proposed on-site outdoor recreation/relaxation areas. Based upon information provided by the applicant, each of the residential units would have usable outdoor private spaces in the form of either patio areas or balconies.

As shown in Table 6, the results of the noise modeling indicate that on-site noise levels at the facades with a direct view of Hawthorne Boulevard would range from 64 to 72 dBA L<sub>dn</sub>. These noise levels would exceed the City Noise/Land Use Compatibility noise standard for low medium density residential land uses of 65 dBA L<sub>dn</sub>. Because the project's proposed balconies and patio areas are subject to the 65 dB L<sub>dn</sub> noise standard, noise mitigation is required for these exterior areas. In order to achieve the desired noise reduction (as much as 7 decibels reduction) a noise barrier with a minimum height of 6 feet should be constructed along the length of each of the balconies / patio areas with predicted traffic noise levels exceeding 65 dB L<sub>dn</sub> (as shown in Table 6 and Figure 5). The noise barriers may be constructed of a material such as tempered glass, acrylic glass (or similar material), masonry material, manufactured lumber (or a combination of these) with a surface density of at least three pounds per square foot. The noise barriers should have no openings or cracks. With inclusion of this mitigation measure, the resultant noise level would meet the City's noise standard of 65 dBA L<sub>dn</sub> or lower and thus would be less than significant.

The future noise level at the ground-level recreation areas is predicted to range from 48 to 61 dBA L<sub>dn</sub>, and thus would meet the City's exterior noise level criterion. Therefore, no mitigation would be required for the shared (common) exterior areas.

**On-Site Noise Levels from Torrance Municipal Airport.** Based upon the City's General Plan Noise Element (City of Torrance, 2010), the project site is located approximately 2,200 feet southwest of the airport's 60 dBA CNEL noise contour, and thus noise from aircraft operations would be well below 60 dBA CNEL. Noise from aircraft would be less than significant.

**Table 6**  
**Summary of On-Site Future (Cumulative plus Project)**  
**Unmitigated Traffic Noise Levels (dBA L<sub>dn</sub>)**

Modeled Receiver #	Floor Level							
	P3	P2	P1	1st Level	2nd Level	3rd Level	4th Level	5th Level
R1	64	65	65	n/a	n/a	n/a	n/a	n/a
R2	66	66	66	n/a	n/a	n/a	n/a	n/a

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<sup>2</sup> The northernmost and easternmost portions of the Building A cluster would have 4 floors, whereas the remaining residential structures on the project site would have 5 floors.

**Table 6**  
**Summary of On-Site Future (Cumulative plus Project)**  
**Unmitigated Traffic Noise Levels (dBA L<sub>dn</sub>)**

Modeled Receiver #	Floor Level							
	P3	P2	P1	1st Level	2nd Level	3rd Level	4th Level	5th Level
R3	68	68	68	n/a	n/a	n/a	n/a	n/a
R4	72	72	72	n/a	n/a	n/a	n/a	n/a
R5	72	72	72	n/a	n/a	n/a	n/a	n/a
R6	72	72	72	n/a	n/a	n/a	n/a	n/a
R7	72	72	72	n/a	n/a	n/a	n/a	n/a
R8	72	72	72	n/a	n/a	n/a	n/a	n/a
R9	n/a	n/a	n/a	64	65	65	65	n/a
R10	n/a	n/a	n/a	65	65	65	65	n/a
R11	n/a	n/a	n/a	44	46	46	48	n/a
R12	n/a	n/a	n/a	45	49	51	52	n/a
R13	n/a	n/a	n/a	67	68	68	68	n/a
R14	n/a	n/a	n/a	71	71	71	71	n/a
R15	n/a	n/a	n/a	72	71	71	71	n/a
R16	n/a	n/a	n/a	57	68	68	68	n/a
R17	n/a	n/a	n/a	34	35	37	37	39
R18	n/a	n/a	n/a	40	42	41	44	44
R19	n/a	n/a	n/a	44	44	47	53	59
R20	n/a	n/a	n/a	42	42	43	46	50
R21	n/a	n/a	n/a	46	47	50	55	60
R22	n/a	n/a	n/a	59	69	69	69	n/a
R23	n/a	n/a	n/a	63	70	70	70	n/a
R24	n/a	n/a	n/a	48	48	49	51	51
R25	n/a	n/a	n/a	48	50	52	52	53
R26	n/a	n/a	n/a	34	36	37	38	39
R27	n/a	n/a	n/a	33	35	36	37	39
R28	n/a	n/a	n/a	33	36	37	38	39
R29	n/a	n/a	n/a	63	71	70	71	n/a
R30	n/a	n/a	n/a	53	60	65	65	n/a
R31	n/a	n/a	n/a	41	42	42	44	48
R32	n/a	n/a	n/a	44	44	46	53	54
R33	n/a	n/a	n/a	53	61	63	65	n/a
R34	n/a	n/a	n/a	63	66	66	67	n/a
R35	n/a	n/a	n/a	45	47	53	56	56
R36	n/a	n/a	n/a	55	60	61	61	61
R37	n/a	n/a	n/a	40	43	46	46	46
R38	n/a	n/a	n/a	39	42	46	47	47

**Table 6**  
**Summary of On-Site Future (Cumulative plus Project)**  
**Unmitigated Traffic Noise Levels (dBA L<sub>dn</sub>)**

Modeled Receiver #	Floor Level							
	P3	P2	P1	1st Level	2nd Level	3rd Level	4th Level	5th Level
R39 - Rec Area	n/a	n/a	n/a	48	n/a	n/a	n/a	n/a
R40 - Rec Area	n/a	n/a	n/a	53	n/a	n/a	n/a	n/a
R41 - Rec Area	n/a	n/a	n/a	58	n/a	n/a	n/a	n/a
R42 - Rec Area	n/a	n/a	n/a	57	n/a	n/a	n/a	n/a
R43 - Rec Area	n/a	n/a	n/a	53	n/a	n/a	n/a	n/a
R44 - Rec Area	n/a	n/a	n/a	61	n/a	n/a	n/a	n/a

Source: Attachment B

**Notes:**

**Bolded** numbers represent receiver locations exceeding 60 dBA L<sub>dn</sub>; these units will require subsequent interior noise analysis to verify compliance with the 45 dBA L<sub>dn</sub> noise standard for habitable rooms.

**Shaded** numbers represent receiver locations exceeding 65 dBA L<sub>dn</sub>; these units will require noise barriers at balconies / patio areas to comply with the 65 dBA L<sub>dn</sub> noise standard for outdoor areas.

**On-Site Interior Traffic Noise Levels.** The City and the State require that interior noise levels not exceed a CNEL or L<sub>dn</sub> of 45 dBA within the habitable rooms of residences. Typically, with the windows open, building shells provide approximately 15 dB of noise reduction. Therefore, rooms exposed to an exterior L<sub>dn</sub> greater than 60 dBA could result in an interior L<sub>dn</sub> greater than 45 dB. The State Building Code recognizes this relationship and, therefore requires interior noise studies when the exterior noise level is projected to exceed 60 dBA L<sub>dn</sub>.

The data shown in Table 6 indicate that the future noise levels would range up to 72 dBA L<sub>dn</sub> at the facades of the residences adjacent to Hawthorne Boulevard. Thus, the unmitigated interior noise level within the habitable rooms of these dwelling units could exceed the 45 dB CNEL noise criterion. A subsequent interior noise analysis will be required for these units, which are depicted in Figure 6. Dwelling units which are oriented such that the doors and windows are interior to the project site (i.e., do not have a direct view of Hawthorne Boulevard) would have traffic noise level exposures of less than 60 dB L<sub>dn</sub>.

**Construction Noise**

As detailed above in Regulatory Standards, the City restricts the times of day when construction may occur (i.e., 7:30 a.m. to 6 p.m. Mondays through Fridays, 9 a.m. to 5 p.m. on Saturdays and

*Mr. Derek Empey*

*Subject: Noise Study - Solana Torrance Multifamily Residential Project*

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not at all on Sundays or on holidays observed by City Hall). Additionally, operation of heavy construction equipment such as pile drivers, mechanical shovels, compressors or similar devices are prohibited without first obtaining permission from the Community Development Director.

Construction of the proposed project would take place within the hours specified in Article 3, Section 46.3.1 of the City's Municipal Code. No special construction techniques (i.e., pile driving or blasting) are anticipated to be necessary for this project. Routine noise levels from conventional construction activities (with a typical number of three to four pieces of equipment operational on the site) range from 75 to 86 dBA  $L_{eq}$  at a distance of 50 feet. The typically quietest phase of building site construction for similar projects (i.e., multi-family residences) is that associated with constructing foundations (75 dBA  $L_{eq}$  at a distance of 50 feet), and the typically loudest phases, producing 86 dBA  $L_{eq}$  at 50 feet, are those associated with grading and finishing activities. Noise levels from construction activities generally decrease at a rate of 6 dB per doubling of distance away from the activity.

The nearest noise-sensitive land uses (a residence) is located approximately 50 feet north of the project site, approximately 150 feet or more from actual building construction work, and approximately 250 feet away from the acoustic center of construction activity (the idealized point from which the energy sum of all construction activity noise near and far would be centered). A construction noise level of 86 dBA  $L_{eq}$  at 50 feet would attenuate to approximately 72 dBA  $L_{eq}$  250 feet from the source. This noise level is higher than the typical ambient daytime noise levels measured in the area and would be readily audible at times. During short periods of time, construction activities would take place within approximately 70 feet of the nearest residential properties; during these periods, noise levels could be as high as 83 dBA  $L_{eq}$ .

The City's Municipal Code exempts noise from construction provided that construction is limited to between the hours of 7:30 a.m. to 6 p.m. 7:30 a.m. to 6 p.m. Mondays through Fridays, 9 a.m. to 5 p.m. on Saturdays and not at all on Sundays or on holidays observed by City Hall, and permission is sought and granted by the Community Development Director. Noise-producing construction activities will be limited to these hours and permission will be requested; thus, noise from construction would be less than significant.

Temporary noise from construction would be readily audible at the nearest sensitive receptors and at times could represent a substantial temporary increase. Impacts are considered less than significant with mitigation incorporated (please see Mitigation Measures, below).

## Construction Vibration

The heavier pieces of construction equipment used at this site could include bulldozers, graders, loaded trucks, water trucks, and pavers. Groundborne vibration information related to construction activities has been collected by the California Department of Transportation (Caltrans) (Caltrans 2004). Based on published vibration data, the anticipated construction equipment would generate a peak particle velocity of approximately .09 inch/second or less at a distance of 25 feet (FTA 2006). Information from Caltrans indicates that continuous vibrations with a peak particle velocity of approximately 0.1 inch/second begin to annoy people. Groundborne vibration is typically attenuated over short distances. The closest existing residences are approximately 70 feet or more from the construction area. At this distance and with the anticipated construction equipment, the peak particle velocity would be approximately 0.016 inch/second. Therefore, construction activities are anticipated to result in continuous vibration below levels that typically annoy people, and well below damage criteria (approximately 0.5 inch/second or greater for buildings of reinforced-concrete, steel or timber construction). Construction vibration impacts would be less than significant. No mitigation measures are required.

## On-Site Operational Noise

While not shown in the current, preliminary set of plans, when the project is submitted for building plan approval, any mechanical equipment associated with the project (such as HVAC equipment and pool pumps/motors, if applicable) should comply with the property line noise level limits contained within the City Municipal Code. Therefore, noise from mechanical equipment associated with the project should be evaluated as part of the building plan submittal to ensure compliance with the City's noise limits.

## MITIGATION MEASURES

The following mitigation measures would mitigate long-term (operational) and temporary noise level impacts.

### Operational Noise Mitigation Measures

**Exterior Noise.** To comply with the City's 65 dB CNEL exterior noise standard for low medium density residential outdoor use areas, the proposed balconies and patio areas as designated in Table 6 and depicted in Figure 5 would require a noise barrier with a minimum height of 6 feet. The noise barriers may be constructed of a material such as tempered glass, acrylic glass (or similar material), masonry material, manufactured lumber (or a combination of these) with a surface density of at least three pounds per square foot. The noise barriers should have no openings or cracks.

**Interior Noise.** To comply with the City and State’s 45 dB CNEL interior noise standard, the dwelling units so designated in Table 6 and depicted in Figure 6 will most likely require mechanical ventilation system or air conditioning system and possibly sound-rated windows. An interior noise analysis will be required for these dwelling units prior to issuance of building permits.

**Mechanical Equipment Noise.** Noise from mechanical equipment associated with the project (mechanical ventilation/air conditioning, pool pumps/motors etc.) should be evaluated as part of the building plan submittal to ensure compliance with the noise limits of the City’s Municipal Code.

### **Construction Noise Mitigation Measures**

Construction noise is unavoidable and could adversely affect nearby residents during construction. However, the noise would be temporary and limited to the duration of the construction. The following measures should be incorporated into the Project contract specifications to minimize construction noise impacts:

1. All noise-producing Project equipment and vehicles using internal combustion engines shall be equipped with mufflers, air-inlet silencers where appropriate, and any other shrouds, shields, or other noise-reducing features in good operating condition that meet or exceed original factory specification. Mobile or fixed “package” equipment (e.g., arc-welders, air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment.
2. All mobile or fixed noise-producing equipment used on the Project that are regulated for noise output by a local, state, or federal agency shall comply with such regulation while in the course of Project activity.
3. Electrically powered equipment shall be used instead of pneumatic or internal combustion powered equipment, where feasible.
4. Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive receptors.
5. Construction site and access road speed limits shall be established and enforced during the construction period.
6. Construction operations shall not occur between 6:00 p.m. and 7:30 a.m. Monday through Friday, 5 p.m. to 9 a.m. on Saturday or at any time on Sunday or on federal holidays. The hours of construction, including noisy maintenance activities and all spoils and material transport, shall be restricted to the periods and days permitted by the local noise or other

Mr. Derek Empey

Subject: Noise Study - Solana Torrance Multifamily Residential Project

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applicable ordinance. Permission for operation of heavy equipment shall be submitted to the Community Development Director.

7. The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.
8. No Project-related public address or music system shall be audible at any adjacent receptor.
9. The on-site construction supervisor shall have the responsibility and authority to receive and resolve noise complaints. A clear appeal process to the owner shall be established prior to construction commencement that will allow for resolution of noise problems that cannot be immediately solved by the site supervisor.

**Level of Significance after Mitigation.** With implementation of the listed mitigation measures, temporary construction noise and operational noise would be reduced to a level below significance.

This concludes our noise assessment. If you have any questions, please call me at 949.373.8317 or email me at: mgreene@dudek.com.

Sincerely,



Mike Greene, INCE Bd. Cert.  
Environmental Specialist / Acoustics

*Attachments: Figures 1–6  
Attachment A, Field Noise Data Sheets  
Attachment B, Traffic Noise Model Input/Output and Noise Barrier Calculations*

## REFERENCES

California Department of Transportation (Caltrans). October, 1998. Technical Noise Supplement (TeNS), A Technical Supplement to the Traffic Noise Analysis Protocol. Environmental Program, Environmental Engineering - Noise, Air Quality and Hazardous Waste Management Office. Sacramento, California.

California Department of Transportation. 2004. Transportation and Construction Induced Vibration Guidance Manual. Sacramento, California. Prepared by Jones & Stokes, Sacramento, CA. Prepared for California Department of Transportation, Noise, Vibration, and Hazardous Waste Management Office, Sacramento, California.

*Mr. Derek Empey*

*Subject: Noise Study - Solana Torrance Multifamily Residential Project*

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Caltrans. 2002. *Transportation-Related Earthborne Vibrations*. Report No. TAV-02-01-R9201. California Department of Transportation; Environmental Program; Environmental Engineering; Noise, Air Quality, and Hazardous Waste Management Office. February 20, 2002. <http://www.dot.ca.gov/hq/env/noise/pub/TRANSPORTATION%20RELATED%20EARTHBORNE%20VIBRATIONS.pdf>.

City of Torrance. 2010. General Plan, Chapter 5, Noise Element. April 6, 2010.

City of Torrance. 1984. Municipal Code, Chapter 6, Noise Regulation.

KHR Associates. 2016. Traffic Impact Study, Solana Torrance. July 29, 2016.

U.S. Department of Transportation, Federal Transit Administration, Office of Planning and Environment. May, 2006. FTA-VA-90-1003-06. Transit Noise and Vibration Impact Assessment. (Prepared under contract by Harris, Miller, Miller and Hanson). Burlington, Massachusetts.

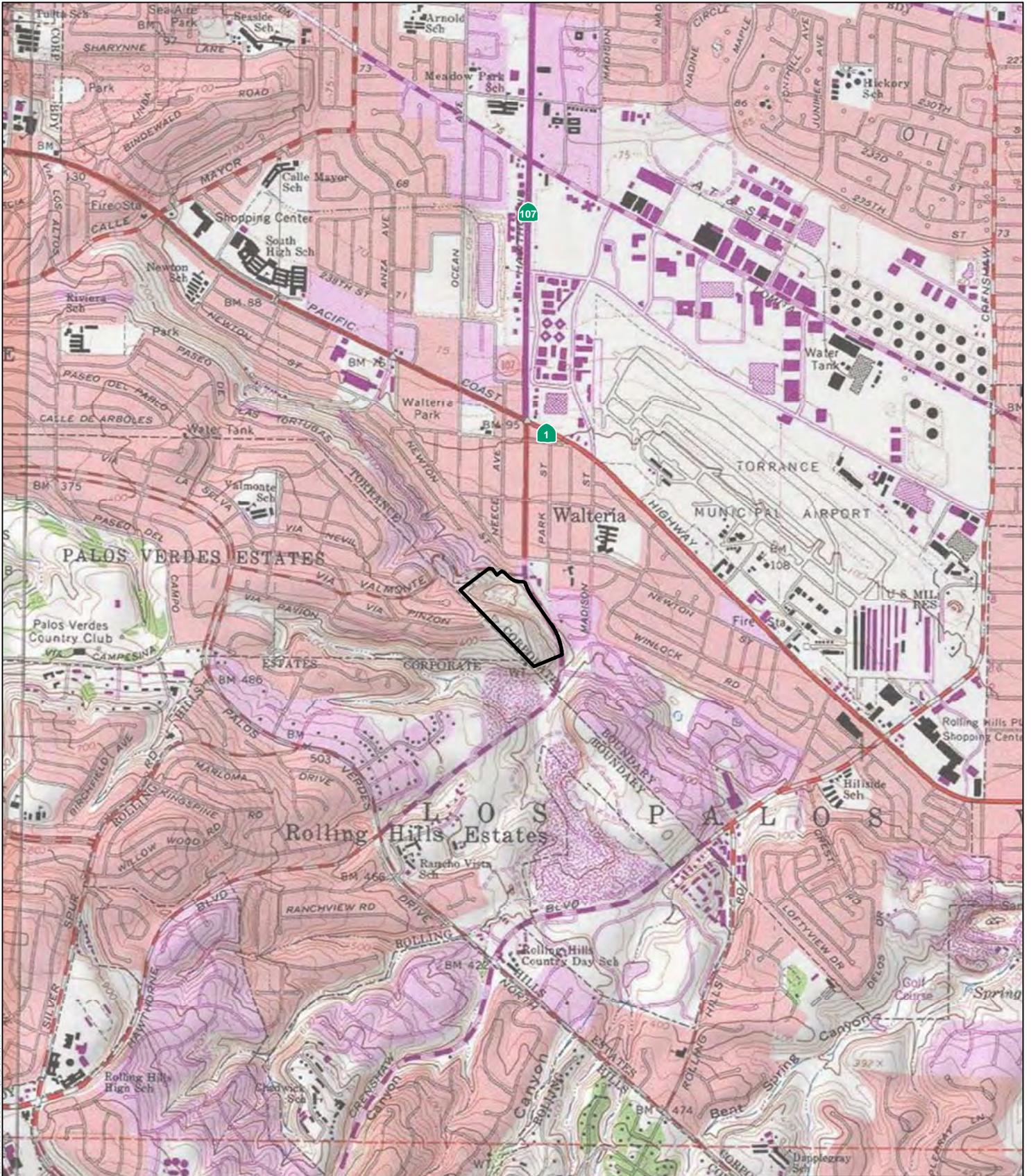


## *Figures*









 Property Boundary

SOURCE: USGS 7.5-Minute Series Torrance Quadrangle

**DUDEK**

Solana Torrance Project

**FIGURE 2**  
Vicinity Map

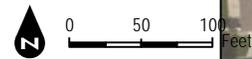








-  Noise Modeling Receiver Locations
-  Property Boundary
-  Project Development Footprint



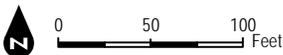
SOURCE: Withee Malcom, 2016

**DUDEK**

Solana Torrance Project

**FIGURE 4**  
Noise Modeling Receiver Locations





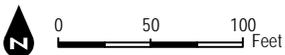
SOURCE: Withee Malcom, 2016

**DUDEK**

Solana Torrance Project

**FIGURE 5**  
Units Requiring Exterior Noise Mitigation





SOURCE: Withee Malcom, 2016

**DUDEK**

Solana Torrance Project

**FIGURE 6**  
Units Requiring Subsequent Interior Noise Analysis



**ATTACHMENT A**  
*Field Noise Data Sheets*



# FIELD NOISE MEASUREMENT DATA

DUDEK

PROJECT <u>Solana Torrance</u>	PROJECT # <u>9671</u>
SITE ID <u>M1 - Project Site (S/E Corner)</u>	OBSERVER(S) <u>Stephanie Tang</u>
SITE ADDRESS _____	
START DATE <u>5/11/16</u> END DATE <u>5/11/16</u>	
START TIME <u>11:53AM</u> END TIME <u>12:08PM</u>	

**METEOROLOGICAL CONDITIONS**

TEMP 65.9 F      HUMIDITY 72.7 % R.H.      WIND CALM    LIGHT    MODERATE  
WINDSPD 3.4 MPH      DIR. N NE S (SE) S SW W NW      VARIABLE    STEADY    GUSTY  
SKY (SUNNY) CLEAR      OVRCAST (PRTLY CLDY)      FOG      RAIN

**ACOUSTIC MEASUREMENTS**

MEAS. INSTRUMENT Piccolo SLM      TYPE 1 (2)      SERIAL # 13625008  
CALIBRATOR BSWA CAL14      SERIAL # 490151  
CALIBRATION CHECK      PRE-TEST 94.0 dBA SPL      POST-TEST 94.0 dBA SPL      WINDSCRN ✓

SETTINGS      (A-WTD)      (SLOW)      FAST      FRONTAL      RANDOM      ANSI      OTHER: \_\_\_\_\_

REC. #	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC)
<u>M1</u>	<u>11:53AM</u>	<u>12:08PM</u>	<u>57.5</u>	<u>64.9</u>	<u>52.3</u>				

COMMENTS  
Noise Sources: Aircraft; Rustling leaves; Birds; Roadway Traffic Noise along Via Valmonte & Hawthorne Blvd

**SOURCE INFO AND TRAFFIC COUNTS** N/A

PRIMARY NOISE SOURCE \_\_\_\_\_      TRAFFIC AIRCRAFT RAIL INDUSTRIAL OTHER: \_\_\_\_\_  
ROADWAY TYPE: \_\_\_\_\_      DIST. TO RDWY C/L OR EOP: \_\_\_\_\_

TRAFFIC COUNT DURATION: _____	MIN		SPEED		IF COUNTING BOTH DIRECTIONS AS ONE, CHECK HERE	MIN		SPEED	
	NB/EB	SB/WB	NB/EB	SB/WB		NB/EB	SB/WB	NB/EB	SB/WB
COUNT 1 (OR RDWY 1) DIRECTION									
AUTOS									
MED TRKS									
HVY TRKS									
BUSES									
MOTOCLS									
COUNT 2 (OR RDWY 2)									

ESTIMATED BY: RADAR / DRIVING THE PACE  
SPEED LIMIT SIGNS SAY: \_\_\_\_\_

OTHER NOISE SOURCES (BACKGROUND): DIST. AIRCRAFT RUSTLING LEAVES DIST. BARKING DOGS BIRDS DIST. INDUSTRIAL  
DIST. KIDS PLAYING DIST. CONVRSTNS / YELLING DIST. TRAFFIC (LIST RDWYS BELOW) DISTD GARDENERS/LANDSCAPING NOISE  
OTHER: \_\_\_\_\_

**DESCRIPTION / SKETCH**

TERRAIN (HARD) SOFT MIXED (FLAT) OTHER: Dirt Area

PHOTOS See Attached

OTHER COMMENTS / SKETCH

# FIELD NOISE MEASUREMENT DATA

DUDEK

PROJECT <u>Solana Torrance</u>	PROJECT # <u>9641</u>
SITE ID <u>M2-Project Site (N/E corner)</u>	OBSERVER(S) <u>Stephanie Tang</u>
SITE ADDRESS _____	
START DATE <u>5/11/16</u>	END DATE <u>5/11/16</u>
START TIME <u>12:28pm</u>	END TIME <u>12:42pm</u>

**METEOROLOGICAL CONDITIONS**

TEMP 73.2 F HUMIDITY 64.7 % R.H. WIND CALM LIGHT MODERATE  
 WINDSPD 2-3 MPH DIR. N NE S SE S SW W NW VARIABLE STEADY GUSTY  
 SKY SUNNY CLEAR OVRCAST PRTLY CLDY FOG RAIN

**ACOUSTIC MEASUREMENTS**

MEAS. INSTRUMENT Piccolo SLM TYPE 1 (2) SERIAL # 130625008  
 CALIBRATOR BSCWA CA 114 SERIAL # 490151  
 CALIBRATION CHECK PRE-TEST \_\_\_\_\_ dBA SPL POST-TEST 94.0 dBA SPL WINDSCRN ✓

SETTINGS (A-WTD) (SLOW) FAST FRONTAL RANDOM ANSI OTHER: \_\_\_\_\_

REC. #	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC)
<u>M2</u>	<u>12:28pm</u>	<u>12:43pm</u>	<u>64.4</u>	<u>74.0</u>	<u>55.2</u>				

COMMENTS \_\_\_\_\_

**SOURCE INFO AND TRAFFIC COUNTS**

PRIMARY NOISE SOURCE TRAFFIC AIRCRAFT RAIL INDUSTRIAL OTHER: \_\_\_\_\_  
 ROADWAY TYPE: Hawthorne Blvd DIST. TO RDWY C/L OR EOP: ~120'

TRAFFIC COUNT DURATION: 15 MIN SPEED MIN SPEED

COUNT 1 (OR RDWY 1)	DIRECTION		SPEED		IF COUNTING BOTH DIRECTIONS AS ONE, CHECK HERE	COUNT 2 (OR RDWY 2)		SPEED	
	NB/EB	SB/WB	NB/EB	SB/WB		NB/EB	SB/WB	NB/EB	SB/WB
AUTOS	<u>331</u>	<u>254</u>				<u>67</u>	<u>69</u>		
MED TRKS	<u>4</u>	<u>0</u>				<u>0</u>	<u>2</u>		
HVY TRKS	<u>8</u>	<u>2</u>				<u>0</u>	<u>0</u>		
BUSES	<u>1</u>	<u>1</u>				<u>0</u>	<u>0</u>		
MOTRCLS	<u>0</u>	<u>1</u>				<u>0</u>	<u>0</u>		

SPEEDS ESTIMATED BY: RADAR / DRIVING THE PACE  
 POSTED SPEED LIMIT SIGNS SAY: 45mph Via Valmonte 25mph

OTHER NOISE SOURCES (BACKGROUND): DIST. AIRCRAFT RUSTLING LEAVES DIST. BARKING DOGS (BIRDS) DIST. INDUSTRIAL  
 DIST. KIDS PLAYING DIST. CONVRSTNS / YELLING DIST. TRAFFIC (LIST RDWYS BELOW) DISTD GARDENERS/LANDSCAPING NOISE  
 OTHER: Car Alarm Lock

**DESCRIPTION / SKETCH**

TERRAIN HARD SOFT MIXED (FLAT) OTHER: Dirt Area

PHOTOS See Attached

OTHER COMMENTS / SKETCH

The sketch shows a grid with a north arrow. A road labeled 'Via Valmonte' runs vertically. Another road labeled 'Hawthorne Blvd' runs horizontally. The 'Project Site' is marked with an asterisk at the intersection. Surrounding areas are labeled 'Res' (Residential) and 'Comm' (Commercial). A note indicates the asterisk is the '\* Noise Measurement Location'.

# FIELD NOISE MEASUREMENT DATA

PROJECT Solano Terrace PROJECT # 9641  
 SITE ID M3 - SP2 (Backyard)  
 SITE ADDRESS 3662 Blair Terrace, GA OBSERVER(S) Stephanie Tang  
 START DATE 5/11/16 END DATE 5/11/16  
 START TIME 1:33pm END TIME 1:48pm

**METEOROLOGICAL CONDITIONS**

TEMP 79.0 F HUMIDITY 60.7 % R.H. WIND CALM LIGHT MODERATE  
 WINDSPD 6 MPH DIR. N NE S SE S SW W NW VARIABLE STEADY GUSTY  
 SKY SUNNY CLEAR OVRCAST PRTLY CLDY FOG RAIN

**ACOUSTIC MEASUREMENTS**

MEAS. INSTRUMENT Piccolo SLM TYPE 1 2 SERIAL # 130625008  
 CALIBRATOR BSSWA CA 114 SERIAL # 490151  
 CALIBRATION CHECK PRE-TEST 94.0 dBA SPL POST-TEST 94.0 dBA SPL WINDSCRN

**SETTINGS**

A-WTD SLOW FAST FRONTAL RANDOM ANSI OTHER: \_\_\_\_\_

REC. #	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC)
<u>M3</u>	<u>1:33pm</u>	<u>1:48pm</u>	<u>62.9</u>	<u>68.5</u>	<u>51.9</u>				

**COMMENTS**

Noise Sources: Rustling leaves, vehicular traffic noise off Hawthorne Blvd & Blair Ave; Birds, Distant Aircraft; Distant Landscape Noise; Dist. Trash trucks  
 Comments: Noise measurements @ Elevation Below Hawthorne Blvd. (~10' +) leakage S. Mainway Block along Western Boundary + Ornamental trees

**SOURCE INFO AND TRAFFIC COUNTS**

PRIMARY NOISE SOURCE N/A TRAFFIC AIRCRAFT RAIL INDUSTRIAL OTHER: \_\_\_\_\_  
 ROADWAY TYPE \_\_\_\_\_ DIST. TO RDWY C/L OR EOP: \_\_\_\_\_

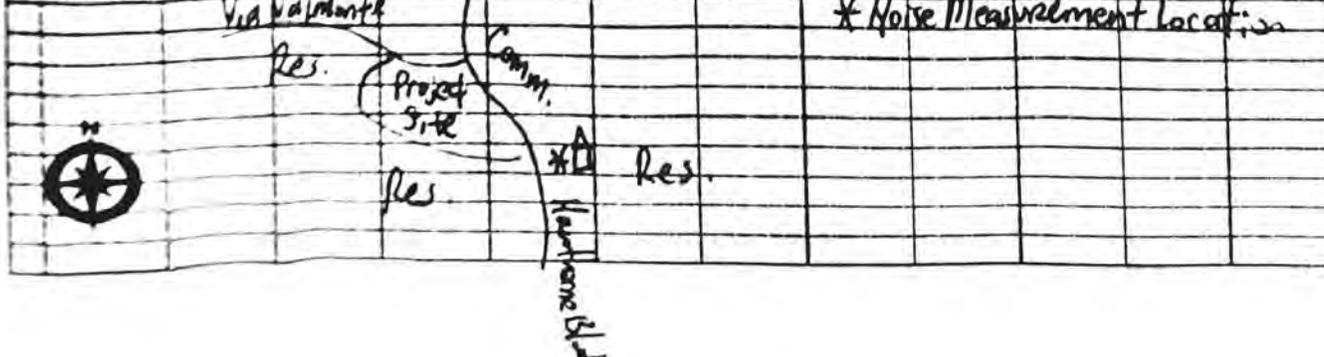
TRAFFIC COUNT DURATION: _____	MIN		SPEED		IF COUNTING BOTH DIRECTIONS AS ONE, CHECK HERE	MIN		SPEED	
	NB/EB	SB/WB	NB/EB	SB/WB		NB/EB	SB/WB	NB/EB	SB/WB
COUNT 1 (OR RDWY 1)									
AUTOS									
MED TRKS									
HVY TRKS									
BUSES									
MOTOCLS									
COUNT 2 (OR RDWY 2)									

SPEEDS ESTIMATED BY: RADAR / DRIVING THE PACE  
 POSTED SPEED LIMIT SIGNS SAY: \_\_\_\_\_

OTHER NOISE SOURCES (BACKGROUND): DIST. AIRCRAFT RUSTLING LEAVES DIST. BARKING DOGS BIRDS DIST. INDUSTRIAL  
 DIST. KIDS PLAYING DIST. CONVRSTNS / YELLING DIST. TRAFFIC (LIST RDWYS BELOW) DISTD GARDENERS/LANDSCAPING NOISE  
 OTHER: \_\_\_\_\_

**DESCRIPTION / SKETCH**

TERRAIN HARD SOFT MIXED FLAT OTHER: \_\_\_\_\_  
 PHOTOS See Attached  
 OTHER COMMENTS / SKETCH \_\_\_\_\_



# FIELD NOISE MEASUREMENT DATA

DUDEK

PROJECT <u>Solana Terrace</u>	PROJECT # <u>9641</u>
SITE ID <u>M4-SFR</u>	
SITE ADDRESS <u>24610 Via Valmonte Terrace, CA</u>	OBSERVER(S) <u>Stephanie Tang</u>
START DATE <u>5/11/16</u>	END DATE <u>5/11/16</u>
START TIME <u>2:02pm</u>	END TIME <u>2:17pm</u>

**METEOROLOGICAL CONDITIONS**

TEMP <u>71.4</u> F	HUMIDITY <u>66.4</u> % R.H.	WIND	CALM	<u>LIGHT</u>	MODERATE
WINDSPD <u>1.5</u> MPH	DIR. <u>N NE S SE S SW W NW</u>		VARIABLE	STEADY	GUSTY
SKY <u>SUNNY</u>	OVRCAST <u>PRTL CLDY</u>	FOG	RAIN		

**ACOUSTIC MEASUREMENTS**

MEAS. INSTRUMENT <u>Piccolo SLM</u>	TYPE 1 <u>(2)</u>	SERIAL # <u>130625008</u>
CALIBRATOR <u>BSWA CA, 114</u>		SERIAL # <u>490151</u>
CALIBRATION CHECK	PRE-TEST <u>94.0</u> dBA SPL	POST-TEST <u>94.0</u> dBA SPL
		WINDSCRN <u>✓</u>

**SETTINGS**

(A-WTD) (SLOW) FAST FRONTAL RANDOM ANSI OTHER: \_\_\_\_\_

REC. #	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC)
<u>M4</u>	<u>2:02AM</u>	<u>2:17AM</u>	<u>60.5</u>	<u>74.5</u>	<u>53.2</u>				

**COMMENTS**

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**SOURCE INFO AND TRAFFIC COUNTS**

PRIMARY NOISE SOURCE TRAFFIC AIRCRAFT RAIL INDUSTRIAL OTHER: \_\_\_\_\_

ROADWAY TYPE: Via Valmonte DIST. TO RDWY C/L OR EOP: \_\_\_\_\_

TRAFFIC COUNT DURATION: 5 MIN SPEED \_\_\_\_\_

COUNT 1 (OR RDWY 1)	DIRECTION	SPEED		IF COUNTING BOTH DIRECTIONS AS ONE, CHECK HERE	COUNT 2 (OR RDWY 2)	SPEED	
		NB/EB	SB/WB			NB/EB	SB/WB
AUTOS	<u>57</u>	<u>68</u>					
MED TRKS	<u>1</u>	<u>0</u>					
HVY TRKS	<u>0</u>	<u>0</u>					
BUSES	<u>0</u>	<u>0</u>					
MOTRCLS	<u>0</u>	<u>0</u>					

SPEEDS ESTIMATED BY: RADAR / DRIVING THE PACE  
POSTED SPEED LIMIT SIGNS SAY: 25mph

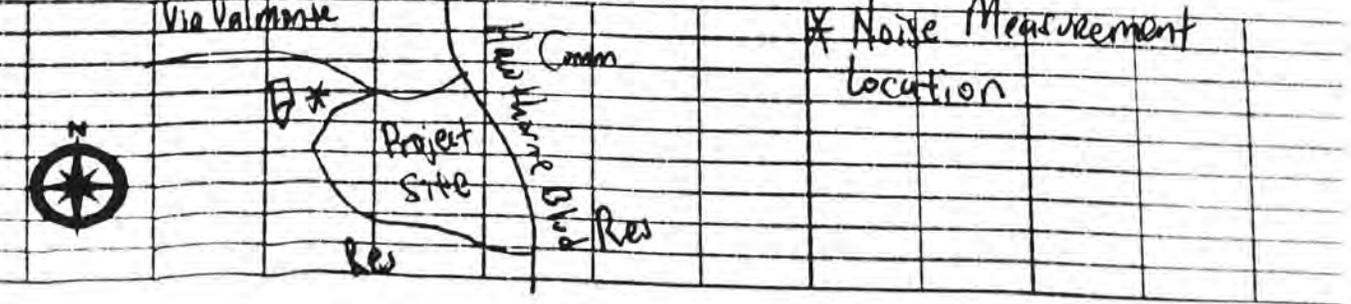
OTHER NOISE SOURCES (BACKGROUND): DIST. AIRCRAFT RUSTLING LEAVES DIST. BARKING DOGS BIRDS DIST. INDUSTRIAL  
DIST. KIDS PLAYING DIST. CONVRTSNTS/YELLING DIST. TRAFFIC (LIST RDWYS BELOW) DIST. GARDENERS/LANDSCAPING NOISE  
 OTHER: Wind Chime; Distant Auto Repair Op. Noise; Distant Backing up Noise.

**DESCRIPTION / SKETCH**

TERRAIN HARD SOFT MIXED FLAT OTHER: \_\_\_\_\_

PHOTOS See Attached

OTHER COMMENTS / SKETCH



# **ATTACHMENT B**

*Traffic Noise Model Input/Output  
and Noise Barrier Calculations*



INPUT: ROADWAYS

9641

Dudek					4 August 2016					
M Greene / S Tang					TNM 2.5					
INPUT: ROADWAYS										
PROJECT/CONTRACT:	9641								Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA	
RUN:	Solana Torrance MF Resi - Cal Run									

Roadway	Width	Points	Coordinates (pavement)			Flow Control			Segment		
Name		Name	No.	X	Y	Z	Control	Speed	Percent	Pvmt	On
							Device	Constraint	Vehicles	Type	Struct?
	ft			ft	ft	ft		mph	Affected		
									%		
Hawthorne Blvd	85.0	point61	61	37,319,396.0	12,273,000.0	146.00				Average	
		point62	62	37,319,388.0	12,272,721.0	159.00				Average	
		point63	63	37,319,404.0	12,272,503.0	175.00				Average	
		point64	64	37,319,436.0	12,272,393.0	179.00				Average	
		point65	65	37,319,488.0	12,272,258.0	184.00				Average	
		point66	66	37,319,584.0	12,272,104.0	190.00				Average	
		point67	67	37,319,696.0	12,271,939.0	197.00				Average	
		point68	68	37,319,792.0	12,271,802.0	201.00				Average	
		point69	69	37,319,880.0	12,271,674.0	213.00				Average	
		point70	70	37,319,936.0	12,271,567.0	219.00				Average	
		point71	71	37,319,976.0	12,271,392.0	225.00				Average	
		point72	72	37,319,992.0	12,271,281.0	230.00				Average	
		point73	73	37,319,992.0	12,271,103.0	230.00				Average	
		point74	74	37,319,992.0	12,271,053.0	231.00				Average	
		point75	75	37,319,936.0	12,270,887.0	243.00				Average	
		point76	76	37,319,868.0	12,270,705.0	255.00				Average	
		point77	77	37,319,764.0	12,270,563.0	268.00				Average	
		point78	78	37,319,632.0	12,270,451.0	278.00				Average	
		point79	79	37,319,476.0	12,270,339.0	291.00				Average	
		point80	80	37,319,192.0	12,270,148.0	315.00				Average	
		point81	81	37,318,608.0	12,269,751.0	358.00				Average	
		point82	82	37,318,296.0	12,269,532.0	379.00				Average	
		point83	83	37,318,112.0	12,269,350.0	400.00				Average	
		point84	84	37,317,624.0	12,268,899.0	440.00					
Via Valmonte	35.0	point95	95	37,318,584.0	12,272,539.0	265.00				Average	
		point86	86	37,318,724.0	12,272,585.0	252.00				Average	
		point87	87	37,318,860.0	12,272,578.0	239.00				Average	

**INPUT: ROADWAYS**

**9641**

		point88	88	37,319,020.0	12,272,548.0	214.00				Average	
		point89	89	37,319,080.0	12,272,536.0	208.00				Average	
		point90	90	37,319,160.0	12,272,477.0	200.00				Average	
		point91	91	37,319,236.0	12,272,411.0	191.00				Average	
		point92	92	37,319,288.0	12,272,393.0	187.00				Average	
		point93	93	37,319,328.0	12,272,393.0	185.00				Average	
		point21	21	37,319,420.0	12,272,414.0	178.00					
Roadway7	24.0	point96	96	37,319,220.0	12,272,399.0	190.00				Average	
		point97	97	37,319,200.0	12,272,363.0	191.00				Average	
		point98	98	37,319,172.0	12,272,353.0	192.00				Average	
		point99	99	37,319,148.0	12,272,353.0	192.00				Average	
		point100	100	37,319,084.0	12,272,359.0	192.00				Average	
		point101	101	37,318,952.0	12,272,367.0	192.00					



**INPUT: TRAFFIC FOR LAeq1h Percentages**

**9641**

	point86	86	504	99	25	1	25	0	0	0	0	0	0
	point87	87	504	99	25	1	25	0	0	0	0	0	0
	point88	88	504	99	25	1	25	0	0	0	0	0	0
	point89	89	504	99	25	1	25	0	0	0	0	0	0
	point90	90	504	99	25	1	25	0	0	0	0	0	0
	point91	91	504	99	25	1	25	0	0	0	0	0	0
	point92	92	504	99	25	1	25	0	0	0	0	0	0
	point93	93	504	99	25	1	25	0	0	0	0	0	0
	point21	21											
Roadway7	point96	96	0	0	0	0	0	0	0	0	0	0	0
	point97	97	0	0	0	0	0	0	0	0	0	0	0
	point98	98	0	0	0	0	0	0	0	0	0	0	0
	point99	99	0	0	0	0	0	0	0	0	0	0	0
	point100	100	0	0	0	0	0	0	0	0	0	0	0
	point101	101											

**INPUT: RECEIVERS**

9641

Dudek							4 August 2016				
M Greene / S Tang							TNM 2.5				
<b>INPUT: RECEIVERS</b>											
<b>PROJECT/CONTRACT:</b>		9641									
<b>RUN:</b>		Solana Torrance MF Resi - Cal Run									
<b>Receiver</b>											
Name	No.	#DUs	Coordinates (ground)			Height above Ground	Input Sound Levels and Criteria				Active in Calc.
			X	Y	Z		Existing LAeq1h	Impact LAeq1h	Criteria Sub'l	NR Goal	
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ST1 - On-Site SE side	1	1	37,319,456.0	12,272,000.0	234.00	5.00	8.00	66	10.0	8.0	
ST2 - On-Site NE corner	2	1	37,319,300.0	12,272,318.0	198.00	5.00	64.40	66	10.0	8.0	Y
ST3 - Resi Area E. of Proj.	45	1	37,319,732.0	12,272,061.0	172.00	5.00	0.00	66	10.0	8.0	
ST4 - Resi Area N. of Proj.	47	1	37,319,028.0	12,272,507.0	223.00	5.00	60.50	66	10.0	8.0	Y

**INPUT: TERRAIN LINES**

9641

Dudek					4 August 2016
M Greene / S Tang					TNM 2.5
<b>INPUT: TERRAIN LINES</b>					
<b>PROJECT/CONTRACT:</b>		9641			
<b>RUN:</b>		Solana Torrance MF Resi - Cal Run			
<b>Terrain Line</b>		<b>Points</b>			
<b>Name</b>		<b>No.</b>	<b>Coordinates (ground)</b>		
			<b>X</b>	<b>Y</b>	<b>Z</b>
			ft	ft	ft
Terrain Line8		65	37,319,264.0	12,272,337.0	190.00
		66	37,319,356.0	12,272,343.0	200.00
		67	37,319,580.0	12,271,902.0	240.00



INPUT: ROADWAYS

9641

Dudek					4 August 2016					
M Greene / S Tang					TNM 2.5					
INPUT: ROADWAYS										
PROJECT/CONTRACT:	9641									Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA
RUN:	Solana Torrance MF Resi - Existing									

Roadway	Width	Points	No.	Coordinates (pavement)			Flow Control			Segment
Name		Name		X	Y	Z	Control	Speed	Percent	Pvmt
							Device	Constraint	Vehicles	On
									Affected	Struct?
	ft			ft	ft	ft		mph	%	
Hawthorne Blvd -N of Via Valmonte	85.0	point61	61	37,319,396.0	12,273,000.0	146.00				Average
		point62	62	37,319,388.0	12,272,721.0	159.00				Average
		point63	63	37,319,404.0	12,272,503.0	175.00				Average
		point64	64	37,319,436.0	12,272,393.0	179.00				
Via Valmonte	35.0	point95	95	37,318,584.0	12,272,539.0	265.00				Average
		point86	86	37,318,724.0	12,272,585.0	252.00				Average
		point87	87	37,318,860.0	12,272,578.0	239.00				Average
		point88	88	37,319,020.0	12,272,548.0	214.00				Average
		point89	89	37,319,080.0	12,272,536.0	208.00				Average
		point90	90	37,319,160.0	12,272,477.0	200.00				Average
		point91	91	37,319,236.0	12,272,411.0	191.00				Average
		point92	92	37,319,288.0	12,272,393.0	187.00				Average
		point93	93	37,319,328.0	12,272,393.0	185.00				Average
		point21	21	37,319,420.0	12,272,414.0	178.00				
Hawthorne Blvd -S of Via Valmonte	85.0	point123	123	37,319,436.0	12,272,393.0	179.00				Average
		point65	65	37,319,488.0	12,272,258.0	184.00				Average
		point66	66	37,319,584.0	12,272,104.0	190.00				Average
		point67	67	37,319,696.0	12,271,939.0	197.00				Average
		point68	68	37,319,792.0	12,271,802.0	201.00				Average
		point69	69	37,319,880.0	12,271,674.0	213.00				Average
		point70	70	37,319,936.0	12,271,567.0	219.00				Average
		point71	71	37,319,976.0	12,271,392.0	225.00				Average
		point72	72	37,319,992.0	12,271,281.0	230.00				Average
		point73	73	37,319,992.0	12,271,103.0	230.00				Average
		point74	74	37,319,992.0	12,271,053.0	231.00				Average
		point75	75	37,319,936.0	12,270,887.0	243.00				Average
		point76	76	37,319,868.0	12,270,705.0	255.00				Average

**INPUT: ROADWAYS**

**9641**

		point77	77	37,319,764.0	12,270,563.0	268.00				Average	
		point78	78	37,319,632.0	12,270,451.0	278.00				Average	
		point79	79	37,319,476.0	12,270,339.0	291.00				Average	
		point80	80	37,319,192.0	12,270,148.0	315.00				Average	
		point81	81	37,318,608.0	12,269,751.0	358.00				Average	
		point82	82	37,318,296.0	12,269,532.0	379.00				Average	
		point83	83	37,318,112.0	12,269,350.0	400.00				Average	
		point84	84	37,317,624.0	12,268,899.0	440.00					



**INPUT: TRAFFIC FOR LAeq1h Percentages****9641**

	point75	75	3589	97	45	1	45	2	45	0	0	0	0
	point76	76	3589	97	45	1	45	2	45	0	0	0	0
	point77	77	3589	97	45	1	45	2	45	0	0	0	0
	point78	78	3589	97	45	1	45	2	45	0	0	0	0
	point79	79	3589	97	45	1	45	2	45	0	0	0	0
	point80	80	3589	97	45	1	45	2	45	0	0	0	0
	point81	81	3589	97	45	1	45	2	45	0	0	0	0
	point82	82	3589	97	45	1	45	2	45	0	0	0	0
	point83	83	3589	97	45	1	45	2	45	0	0	0	0
	point84	84											

**INPUT: RECEIVERS**

9641

<b>Dudek</b>							<b>4 August 2016</b>				
<b>M Greene / S Tang</b>							<b>TNM 2.5</b>				
<b>INPUT: RECEIVERS</b>											
<b>PROJECT/CONTRACT:</b>		<b>9641</b>									
<b>RUN:</b>		<b>Solana Torrance MF Resi - Existing</b>									
<b>Receiver</b>											
Name	No.	#DUs	Coordinates (ground)			Height above Ground	Input Sound Levels and Criteria				Active in Calc.
			X	Y	Z		Existing LAeq1h	Impact LAeq1h	Criteria Sub'I	NR Goal	
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ST1 - On-Site SE side	1	1	37,319,456.0	12,272,000.0	234.00	5.00	8.00	66	10.0	8.0	Y
ST2 - On-Site NE corner	2	1	37,319,300.0	12,272,318.0	198.00	5.00	8.00	66	10.0	8.0	Y
ST3 - Resi Area E. of Proj.	45	1	37,319,732.0	12,272,061.0	172.00	5.00	8.00	66	10.0	8.0	Y
ST4 - Resi Area N. of Proj.	47	1	37,319,028.0	12,272,507.0	223.00	5.00	8.00	66	10.0	8.0	Y
R45 - Resi's northeast of Project	50	1	37,319,512.0	12,272,516.0	160.00	5.00	0.00	66	10.0	8.0	Y

**INPUT: TERRAIN LINES**

9641

<b>Dudek</b>				
				<b>4 August 2016</b>
<b>M Greene / S Tang</b>				<b>TNM 2.5</b>
<b>INPUT: TERRAIN LINES</b>				
<b>PROJECT/CONTRACT:</b>		<b>9641</b>		
<b>RUN:</b>		<b>Solana Torrance MF Resi - Existing</b>		
<b>Terrain Line</b>	<b>Points</b>			
<b>Name</b>	<b>No.</b>	<b>Coordinates (ground)</b>		
		<b>X</b>	<b>Y</b>	<b>Z</b>
		ft	ft	ft
Terrain Line8	65	37,319,264.0	12,272,337.0	190.00
	66	37,319,356.0	12,272,343.0	200.00
	67	37,319,580.0	12,271,902.0	240.00



INPUT: ROADWAYS

9641

Dudek					4 August 2016					
M Greene / S Tang					TNM 2.5					
INPUT: ROADWAYS										
PROJECT/CONTRACT:	9641								Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA	
RUN:	Solana Trrrnce MF Resi - ExWP 072716									

Roadway	Width	Points		Coordinates (pavement)			Flow Control			Segment	
Name		Name	No.	X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Hawthorne Blvd - North of Via Valmonte	85.0	point61	61	37,319,396.0	12,273,000.0	146.00				Average	
		point62	62	37,319,388.0	12,272,721.0	159.00				Average	
		point63	63	37,319,404.0	12,272,503.0	175.00				Average	
		point64	64	37,319,436.0	12,272,393.0	179.00					
Via Valmonte - W. of Project Entrance	35.0	point95	95	37,318,584.0	12,272,539.0	265.00				Average	
		point86	86	37,318,724.0	12,272,585.0	252.00				Average	
		point87	87	37,318,860.0	12,272,578.0	239.00				Average	
		point186	186	37,319,020.0	12,272,548.0	214.00				Average	
		point88	88	37,319,080.0	12,272,536.0	208.00				Average	
		point89	89	37,319,160.0	12,272,477.0	200.00				Average	
Via Valmonte- E. of Project Entrance	35.0	point90	90	37,319,236.0	12,272,411.0	191.00					
		point111	111	37,319,236.0	12,272,411.0	191.00				Average	
		point92	92	37,319,288.0	12,272,393.0	187.00				Average	
		point93	93	37,319,328.0	12,272,393.0	185.00				Average	
		point21	21	37,319,420.0	12,272,414.0	178.00					
Project Entrance - Hawthorne Blvd	24.0	point177	177	37,319,616.0	12,271,965.0	195.00				Average	
		point168	168	37,319,600.0	12,271,957.0	193.00				Average	
		point169	169	37,319,580.0	12,271,956.0	192.00				Average	
		point170	170	37,319,560.0	12,271,968.0	192.00				Average	
		point171	171	37,319,540.0	12,271,988.0	192.00				Average	
		point172	172	37,319,516.0	12,271,999.0	192.00				Average	
Project Entrance - fm Via Valmonte	24.0	point173	173	37,319,444.0	12,272,007.0	192.00					
		point187	187	37,319,220.0	12,272,399.0	190.00				Average	
		point188	188	37,319,200.0	12,272,363.0	191.00				Average	
		point189	189	37,319,172.0	12,272,353.0	192.00				Average	
		point190	190	37,319,148.0	12,272,353.0	192.00				Average	
		point191	191	37,319,084.0	12,272,359.0	192.00				Average	

**INPUT: ROADWAYS**

**9641**

		point192	192	37,318,952.0	12,272,367.0	192.00					
Hawthorne Blvd- South of Via Valmonte	85.0	point194	194	37,319,436.0	12,272,393.0	179.00				Average	
		point65	65	37,319,488.0	12,272,258.0	184.00				Average	
		point66	66	37,319,584.0	12,272,104.0	190.00				Average	
		point67	67	37,319,696.0	12,271,939.0	197.00				Average	
		point68	68	37,319,800.0	12,271,804.0	201.00				Average	
		point69	69	37,319,880.0	12,271,674.0	213.00				Average	
		point70	70	37,319,936.0	12,271,567.0	219.00				Average	
		point71	71	37,319,976.0	12,271,392.0	225.00				Average	
		point72	72	37,319,992.0	12,271,281.0	230.00				Average	
		point73	73	37,319,992.0	12,271,103.0	230.00				Average	
		point74	74	37,319,992.0	12,271,053.0	231.00				Average	
		point75	75	37,319,936.0	12,270,887.0	243.00				Average	
		point76	76	37,319,868.0	12,270,705.0	255.00				Average	
		point77	77	37,319,764.0	12,270,563.0	268.00				Average	
		point78	78	37,319,632.0	12,270,451.0	278.00				Average	
		point79	79	37,319,476.0	12,270,339.0	291.00				Average	
		point80	80	37,319,192.0	12,270,148.0	315.00				Average	
		point81	81	37,318,608.0	12,269,751.0	358.00				Average	
		point82	82	37,318,296.0	12,269,532.0	379.00				Average	
		point83	83	37,318,112.0	12,269,350.0	400.00				Average	
		point84	84	37,317,624.0	12,268,899.0	440.00					



**INPUT: TRAFFIC FOR LAeq1h Percentages**

**9641**

	point190	190	114	99	15	1	15	0	0	0	0	0	0
	point191	191	114	99	15	1	15	0	0	0	0	0	0
	point192	192											
Hawthorne Blvd- South of Via Valmonte	point194	194	3651	97	45	1	45	2	45	0	0	0	0
	point65	65	3651	97	45	1	45	2	45	0	0	0	0
	point66	66	3651	97	45	1	45	2	45	0	0	0	0
	point67	67	3651	97	45	1	45	2	45	0	0	0	0
	point68	68	3651	97	45	1	45	2	45	0	0	0	0
	point69	69	3651	97	45	1	45	2	45	0	0	0	0
	point70	70	3651	97	45	1	45	2	45	0	0	0	0
	point71	71	3651	97	45	1	45	2	45	0	0	0	0
	point72	72	3651	97	45	1	45	2	45	0	0	0	0
	point73	73	3651	97	45	1	45	2	45	0	0	0	0
	point74	74	3651	97	45	1	45	2	45	0	0	0	0
	point75	75	3651	97	45	1	45	2	45	0	0	0	0
	point76	76	3651	97	45	1	45	2	45	0	0	0	0
	point77	77	3651	97	45	1	45	2	45	0	0	0	0
	point78	78	3651	97	45	1	45	2	45	0	0	0	0
	point79	79	3651	97	45	1	45	2	45	0	0	0	0
	point80	80	3651	97	45	1	45	2	45	0	0	0	0
	point81	81	3651	97	45	1	45	2	45	0	0	0	0
	point82	82	3651	97	45	1	45	2	45	0	0	0	0
	point83	83	3651	97	45	1	45	2	45	0	0	0	0
	point84	84											

**INPUT: RECEIVERS**

9641

<b>Dudek</b>						<b>4 August 2016</b>					
<b>M Greene / S Tang</b>						<b>TNM 2.5</b>					
<b>INPUT: RECEIVERS</b>											
<b>PROJECT/CONTRACT:</b>		<b>9641</b>									
<b>RUN:</b>		<b>Solana Trrnce MF Resi - ExWP 072716</b>									
<b>Receiver</b>											
Name	No.	#DUs	Coordinates (ground)			Height above Ground	Input Sound Levels and Criteria			NR Goal	Active in Calc.
			X	Y	Z		Existing LAeq1h	Impact LAeq1h	Criteria Sub'I		
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ST3 - Resi Area E. of Proj.	1	1	37,319,732.0	12,272,061.0	172.00	5.00	0.00	66	10.0	8.0	Y
ST4 - Resi Area N. of Proj.	2	1	37,319,028.0	12,272,507.0	223.00	5.00	0.00	66	10.0	8.0	Y
R1 - P3	247	1	37,319,236.0	12,272,340.0	192.00	5.00	0.00	66	10.0	8.0	
R2 - P3	248	1	37,319,272.0	12,272,337.0	192.00	5.00	0.00	66	10.0	8.0	
R3 - P3	249	1	37,319,332.0	12,272,334.0	192.00	5.00	0.00	66	10.0	8.0	
R4 - P3	250	1	37,319,380.0	12,272,314.0	192.00	5.00	0.00	66	10.0	8.0	
R5 - P3	251	1	37,319,400.0	12,272,273.0	192.00	5.00	0.00	66	10.0	8.0	
R6 - P3	252	1	37,319,428.0	12,272,224.0	192.00	5.00	0.00	66	10.0	8.0	
R7 - P3	253	1	37,319,448.0	12,272,186.0	192.00	5.00	0.00	66	10.0	8.0	
R8 - P3	254	1	37,319,468.0	12,272,155.0	192.00	5.00	0.00	66	10.0	8.0	
R1 - P2	255	1	37,319,236.0	12,272,340.0	192.00	15.00	0.00	66	10.0	8.0	
R2 - P2	256	1	37,319,272.0	12,272,337.0	192.00	15.00	0.00	66	10.0	8.0	
R3 - P2	257	1	37,319,332.0	12,272,334.0	192.00	15.00	0.00	66	10.0	8.0	
R4 - P2	258	1	37,319,380.0	12,272,314.0	192.00	15.00	0.00	66	10.0	8.0	
R5 - P2	259	1	37,319,400.0	12,272,273.0	192.00	15.00	0.00	66	10.0	8.0	
R6 - P2	261	1	37,319,428.0	12,272,224.0	192.00	15.00	0.00	66	10.0	8.0	
R7 - P2	262	1	37,319,448.0	12,272,186.0	192.00	15.00	0.00	66	10.0	8.0	
R8 - P2	263	1	37,319,468.0	12,272,155.0	192.00	15.00	0.00	66	10.0	8.0	
R1 - P1	264	1	37,319,236.0	12,272,340.0	192.00	25.00	0.00	66	10.0	8.0	
R2 - P1	265	1	37,319,272.0	12,272,337.0	192.00	25.00	0.00	66	10.0	8.0	
R3 - P1	266	1	37,319,332.0	12,272,334.0	192.00	25.00	0.00	66	10.0	8.0	
R4 - P1	267	1	37,319,380.0	12,272,314.0	192.00	25.00	0.00	66	10.0	8.0	
R5 - P1	268	1	37,319,400.0	12,272,273.0	192.00	25.00	0.00	66	10.0	8.0	
R6 - P1	269	1	37,319,428.0	12,272,224.0	192.00	25.00	0.00	66	10.0	8.0	

**INPUT: RECEIVERS****9641**

R7 - P1	270	1	37,319,448.0	12,272,186.0	192.00	25.00	0.00	66	10.0	8.0
R8 - P1	271	1	37,319,468.0	12,272,155.0	192.00	25.00	0.00	66	10.0	8.0
R9 - 1st Level	272	1	37,319,408.0	12,272,020.0	223.00	5.00	0.00	66	10.0	8.0
R10 - 1st Level	273	1	37,319,436.0	12,272,066.0	223.00	5.00	0.00	66	10.0	8.0
R11 - 1st Level	274	1	37,319,436.0	12,272,099.0	223.00	5.00	0.00	66	10.0	8.0
R12 - 1st Level	275	1	37,319,384.0	12,272,016.0	223.00	5.00	0.00	66	10.0	8.0
R13 - 1st Level	276	1	37,319,476.0	12,272,083.0	223.00	5.00	0.00	66	10.0	8.0
R14 - 1st Level	277	1	37,319,480.0	12,272,108.0	223.00	5.00	0.00	66	10.0	8.0
R15 - 1st Level	278	1	37,319,460.0	12,272,145.0	223.00	5.00	0.00	66	10.0	8.0
R16 - 1st Level	279	1	37,319,428.0	12,272,166.0	223.00	5.00	0.00	66	10.0	8.0
R17 - 1st Level	281	1	37,319,376.0	12,272,042.0	223.00	5.00	0.00	66	10.0	8.0
R18 - 1st Level	282	1	37,319,416.0	12,272,107.0	223.00	5.00	0.00	66	10.0	8.0
R19 - 1st Level	283	1	37,319,384.0	12,272,122.0	223.00	5.00	0.00	66	10.0	8.0
R20 - 1st Level	284	1	37,319,340.0	12,272,115.0	223.00	5.00	0.00	66	10.0	8.0
R21 - 1st Level	286	1	37,319,364.0	12,272,151.0	223.00	5.00	0.00	66	10.0	8.0
R22 - 1st Level	287	1	37,319,408.0	12,272,201.0	223.00	5.00	0.00	66	10.0	8.0
R23 - 1st Level	289	1	37,319,408.0	12,272,225.0	223.00	5.00	0.00	66	10.0	8.0
R24 - 1st Level	290	1	37,319,296.0	12,272,073.0	223.00	5.00	0.00	66	10.0	8.0
R25 - 1st Level	291	1	37,319,348.0	12,272,039.0	223.00	5.00	0.00	66	10.0	8.0
R26 - 1st Level	292	1	37,319,284.0	12,272,089.0	223.00	5.00	0.00	66	10.0	8.0
R27 - 1st Level	295	1	37,319,324.0	12,272,158.0	223.00	5.00	0.00	66	10.0	8.0
R28 - 1st Level	298	1	37,319,356.0	12,272,213.0	223.00	5.00	0.00	66	10.0	8.0
R29 - 1st Level	300	1	37,319,384.0	12,272,264.0	223.00	5.00	0.00	66	10.0	8.0
R30 - 1st Level	301	1	37,319,352.0	12,272,264.0	223.00	5.00	0.00	66	10.0	8.0
R31 - 1st Level	302	1	37,319,232.0	12,272,121.0	223.00	5.00	0.00	66	10.0	8.0
R32 - 1st Level	303	1	37,319,272.0	12,272,212.0	223.00	5.00	0.00	66	10.0	8.0
R33 - 1st Level	304	1	37,319,308.0	12,272,287.0	223.00	5.00	0.00	66	10.0	8.0
R34 - 1st Level	305	1	37,319,300.0	12,272,315.0	223.00	5.00	0.00	66	10.0	8.0
R35 - 1st Level	306	1	37,319,136.0	12,272,166.0	223.00	5.00	0.00	66	10.0	8.0
R36 - 1st Level	307	1	37,319,160.0	12,272,286.0	223.00	5.00	0.00	66	10.0	8.0
R37 - 1st Level	308	1	37,319,032.0	12,272,188.0	223.00	5.00	0.00	66	10.0	8.0
R38 - 1st Level	309	1	37,318,976.0	12,272,191.0	223.00	5.00	0.00	66	10.0	8.0
R9 - 2nd Level	310	1	37,319,408.0	12,272,020.0	223.00	15.00	0.00	66	10.0	8.0
R10 - 2nd Level	311	1	37,319,436.0	12,272,066.0	223.00	15.00	0.00	66	10.0	8.0
R11 - 2nd Level	312	1	37,319,436.0	12,272,099.0	223.00	15.00	0.00	66	10.0	8.0
R12 - 2nd Level	313	1	37,319,384.0	12,272,016.0	223.00	15.00	0.00	66	10.0	8.0
R13 - 2nd Level	314	1	37,319,476.0	12,272,083.0	223.00	15.00	0.00	66	10.0	8.0

**INPUT: RECEIVERS****9641**

R14 - 2nd Level	315	1	37,319,480.0	12,272,108.0	223.00	15.00	0.00	66	10.0	8.0
R15 - 2nd Level	316	1	37,319,460.0	12,272,145.0	223.00	15.00	0.00	66	10.0	8.0
R16 - 2nd Level	317	1	37,319,428.0	12,272,166.0	223.00	15.00	0.00	66	10.0	8.0
R17 - 2nd Level	318	1	37,319,376.0	12,272,042.0	223.00	15.00	0.00	66	10.0	8.0
R18 - 2nd Level	319	1	37,319,416.0	12,272,107.0	223.00	15.00	0.00	66	10.0	8.0
R19 - 2nd Level	320	1	37,319,384.0	12,272,122.0	223.00	15.00	0.00	66	10.0	8.0
R20 - 2nd Level	321	1	37,319,340.0	12,272,115.0	223.00	15.00	0.00	66	10.0	8.0
R21 - 2nd Level	322	1	37,319,364.0	12,272,151.0	223.00	15.00	0.00	66	10.0	8.0
R22 - 2nd Level	323	1	37,319,408.0	12,272,201.0	223.00	15.00	0.00	66	10.0	8.0
R23 - 2nd Level	324	1	37,319,408.0	12,272,225.0	223.00	15.00	0.00	66	10.0	8.0
R24 - 2nd Level	325	1	37,319,296.0	12,272,073.0	223.00	15.00	0.00	66	10.0	8.0
R25 - 2nd Level	326	1	37,319,348.0	12,272,039.0	223.00	15.00	0.00	66	10.0	8.0
R26 - 2nd Level	327	1	37,319,284.0	12,272,089.0	223.00	15.00	0.00	66	10.0	8.0
R27 - 2nd Level	328	1	37,319,324.0	12,272,158.0	223.00	15.00	0.00	66	10.0	8.0
R28 - 2nd Level	329	1	37,319,356.0	12,272,213.0	223.00	15.00	0.00	66	10.0	8.0
R29 - 2nd Level	330	1	37,319,384.0	12,272,264.0	223.00	15.00	0.00	66	10.0	8.0
R30 - 2nd Level	331	1	37,319,352.0	12,272,264.0	223.00	15.00	0.00	66	10.0	8.0
R31 - 2nd Level	332	1	37,319,232.0	12,272,121.0	223.00	15.00	0.00	66	10.0	8.0
R32 - 2nd Level	333	1	37,319,272.0	12,272,212.0	223.00	15.00	0.00	66	10.0	8.0
R33 - 2nd Level	334	1	37,319,308.0	12,272,287.0	223.00	15.00	0.00	66	10.0	8.0
R34 - 2nd Level	335	1	37,319,300.0	12,272,315.0	223.00	15.00	0.00	66	10.0	8.0
R35 - 2nd Level	336	1	37,319,136.0	12,272,166.0	223.00	15.00	0.00	66	10.0	8.0
R36 - 2nd Level	337	1	37,319,160.0	12,272,286.0	223.00	15.00	0.00	66	10.0	8.0
R37 - 2nd Level	338	1	37,319,032.0	12,272,188.0	223.00	15.00	0.00	66	10.0	8.0
R38 - 2nd Level	339	1	37,318,976.0	12,272,191.0	223.00	15.00	0.00	66	10.0	8.0
R9 - 3rd Level	340	1	37,319,408.0	12,272,020.0	223.00	25.00	0.00	66	10.0	8.0
R10 - 3rd Level	341	1	37,319,436.0	12,272,066.0	223.00	25.00	0.00	66	10.0	8.0
R11 - 3rd Level	342	1	37,319,436.0	12,272,099.0	223.00	25.00	0.00	66	10.0	8.0
R12 - 3rd Level	343	1	37,319,384.0	12,272,016.0	223.00	25.00	0.00	66	10.0	8.0
R13 - 3rd Level	344	1	37,319,476.0	12,272,083.0	223.00	25.00	0.00	66	10.0	8.0
R14 - 3rd Level	345	1	37,319,480.0	12,272,108.0	223.00	25.00	0.00	66	10.0	8.0
R15 - 3rd Level	346	1	37,319,460.0	12,272,145.0	223.00	25.00	0.00	66	10.0	8.0
R16 - 3rd Level	347	1	37,319,428.0	12,272,166.0	223.00	25.00	0.00	66	10.0	8.0
R17 - 3rd Level	348	1	37,319,376.0	12,272,042.0	223.00	25.00	0.00	66	10.0	8.0
R18 - 3rd Level	349	1	37,319,416.0	12,272,107.0	223.00	25.00	0.00	66	10.0	8.0
R19 - 3rd Level	350	1	37,319,384.0	12,272,122.0	223.00	25.00	0.00	66	10.0	8.0
R20 - 3rd Level	351	1	37,319,340.0	12,272,115.0	223.00	25.00	0.00	66	10.0	8.0

**INPUT: RECEIVERS****9641**

R21 - 3rd Level	352	1	37,319,364.0	12,272,151.0	223.00	25.00	0.00	66	10.0	8.0
R22 - 3rd Level	353	1	37,319,408.0	12,272,201.0	223.00	25.00	0.00	66	10.0	8.0
R23 - 3rd Level	354	1	37,319,408.0	12,272,225.0	223.00	25.00	0.00	66	10.0	8.0
R24 - 3rd Level	355	1	37,319,296.0	12,272,073.0	223.00	25.00	0.00	66	10.0	8.0
R25 - 3rd Level	356	1	37,319,348.0	12,272,039.0	223.00	25.00	0.00	66	10.0	8.0
R26 - 3rd Level	357	1	37,319,284.0	12,272,089.0	223.00	25.00	0.00	66	10.0	8.0
R27 - 3rd Level	358	1	37,319,324.0	12,272,158.0	223.00	25.00	0.00	66	10.0	8.0
R28 - 3rd Level	359	1	37,319,356.0	12,272,213.0	223.00	25.00	0.00	66	10.0	8.0
R29 - 3rd Level	360	1	37,319,384.0	12,272,264.0	223.00	25.00	0.00	66	10.0	8.0
R30 - 3rd Level	361	1	37,319,352.0	12,272,264.0	223.00	25.00	0.00	66	10.0	8.0
R31 - 3rd Level	362	1	37,319,232.0	12,272,121.0	223.00	25.00	0.00	66	10.0	8.0
R32 - 3rd Level	363	1	37,319,272.0	12,272,212.0	223.00	25.00	0.00	66	10.0	8.0
R33 - 3rd Level	365	1	37,319,308.0	12,272,287.0	223.00	25.00	0.00	66	10.0	8.0
R34 - 3rd Level	366	1	37,319,300.0	12,272,315.0	223.00	25.00	0.00	66	10.0	8.0
R35 - 3rd Level	367	1	37,319,136.0	12,272,166.0	223.00	25.00	0.00	66	10.0	8.0
R36 - 3rd Level	368	1	37,319,160.0	12,272,286.0	223.00	25.00	0.00	66	10.0	8.0
R37 - 3rd Level	369	1	37,319,032.0	12,272,188.0	223.00	25.00	0.00	66	10.0	8.0
R38 - 3rd Level	370	1	37,318,976.0	12,272,191.0	223.00	25.00	0.00	66	10.0	8.0
R9 - 4th Level	371	1	37,319,408.0	12,272,020.0	223.00	35.00	0.00	66	10.0	8.0
R10 - 4th Level	372	1	37,319,436.0	12,272,066.0	223.00	35.00	0.00	66	10.0	8.0
R11 - 4th Level	373	1	37,319,436.0	12,272,099.0	223.00	35.00	0.00	66	10.0	8.0
R12 - 4th Level	374	1	37,319,384.0	12,272,016.0	223.00	35.00	0.00	66	10.0	8.0
R13 - 4th Level	375	1	37,319,476.0	12,272,083.0	223.00	35.00	0.00	66	10.0	8.0
R14 - 4th Level	376	1	37,319,480.0	12,272,108.0	223.00	35.00	0.00	66	10.0	8.0
R15 - 4th Level	377	1	37,319,460.0	12,272,145.0	223.00	35.00	0.00	66	10.0	8.0
R16 - 4th Level	378	1	37,319,428.0	12,272,166.0	223.00	35.00	0.00	66	10.0	8.0
R17 - 4th Level	379	1	37,319,376.0	12,272,042.0	223.00	35.00	0.00	66	10.0	8.0
R18 - 4th Level	380	1	37,319,416.0	12,272,107.0	223.00	35.00	0.00	66	10.0	8.0
R19 - 4th Level	381	1	37,319,384.0	12,272,122.0	223.00	35.00	0.00	66	10.0	8.0
R20 - 4th Level	382	1	37,319,340.0	12,272,115.0	223.00	35.00	0.00	66	10.0	8.0
R21 - 4th Level	383	1	37,319,364.0	12,272,151.0	223.00	35.00	0.00	66	10.0	8.0
R22 - 4th Level	384	1	37,319,408.0	12,272,201.0	223.00	35.00	0.00	66	10.0	8.0
R23 - 4th Level	385	1	37,319,408.0	12,272,225.0	223.00	35.00	0.00	66	10.0	8.0
R24 - 4th Level	386	1	37,319,296.0	12,272,073.0	223.00	35.00	0.00	66	10.0	8.0
R25 - 4th Level	387	1	37,319,348.0	12,272,039.0	223.00	35.00	0.00	66	10.0	8.0
R26 - 4th Level	388	1	37,319,284.0	12,272,089.0	223.00	35.00	0.00	66	10.0	8.0
R27 - 4th Level	389	1	37,319,324.0	12,272,158.0	223.00	35.00	0.00	66	10.0	8.0

**INPUT: RECEIVERS**

**9641**

R28 - 4th Level	390	1	37,319,356.0	12,272,213.0	223.00	35.00	0.00	66	10.0	8.0	
R29 - 4th Level	391	1	37,319,384.0	12,272,264.0	223.00	35.00	0.00	66	10.0	8.0	
R30 - 4th Level	392	1	37,319,352.0	12,272,264.0	223.00	35.00	0.00	66	10.0	8.0	
R31 - 4th Level	393	1	37,319,232.0	12,272,121.0	223.00	35.00	0.00	66	10.0	8.0	
R32 - 4th Level	394	1	37,319,272.0	12,272,212.0	223.00	35.00	0.00	66	10.0	8.0	
R33 - 4th Level	395	1	37,319,308.0	12,272,287.0	223.00	35.00	0.00	66	10.0	8.0	
R34 - 4th Level	396	1	37,319,300.0	12,272,315.0	223.00	35.00	0.00	66	10.0	8.0	
R35 - 4th Level	397	1	37,319,136.0	12,272,166.0	223.00	35.00	0.00	66	10.0	8.0	
R36 - 4th Level	398	1	37,319,160.0	12,272,286.0	223.00	35.00	0.00	66	10.0	8.0	
R37 - 4th Level	399	1	37,319,032.0	12,272,188.0	223.00	35.00	0.00	66	10.0	8.0	
R38 - 4th Level	400	1	37,318,976.0	12,272,191.0	223.00	35.00	0.00	66	10.0	8.0	
R17 - 5th Level	401	1	37,319,376.0	12,272,042.0	223.00	45.00	0.00	66	10.0	8.0	
R18 - 5th Level	402	1	37,319,416.0	12,272,107.0	223.00	45.00	0.00	66	10.0	8.0	
R19 - 5th Level	403	1	37,319,384.0	12,272,122.0	223.00	45.00	0.00	66	10.0	8.0	
R20 - 5th Level	404	1	37,319,340.0	12,272,115.0	223.00	45.00	0.00	66	10.0	8.0	
R21 - 5th Level	405	1	37,319,364.0	12,272,151.0	223.00	45.00	0.00	66	10.0	8.0	
R24 - 5th Level	407	1	37,319,296.0	12,272,073.0	223.00	45.00	0.00	66	10.0	8.0	
R25 - 5th Level	408	1	37,319,348.0	12,272,039.0	223.00	45.00	0.00	66	10.0	8.0	
R26 - 5th Level	409	1	37,319,284.0	12,272,089.0	223.00	45.00	0.00	66	10.0	8.0	
R27 - 5th Level	410	1	37,319,324.0	12,272,158.0	223.00	45.00	0.00	66	10.0	8.0	
R28 - 5th Level	411	1	37,319,356.0	12,272,213.0	223.00	45.00	0.00	66	10.0	8.0	
R31 - 5th Level	412	1	37,319,232.0	12,272,121.0	223.00	45.00	0.00	66	10.0	8.0	
R32 - 5th Level	413	1	37,319,272.0	12,272,212.0	223.00	45.00	0.00	66	10.0	8.0	
R35 - 5th Level	414	1	37,319,136.0	12,272,166.0	223.00	45.00	0.00	66	10.0	8.0	
R36 - 5th Level	415	1	37,319,160.0	12,272,286.0	223.00	45.00	0.00	66	10.0	8.0	
R37 - 5th Level	416	1	37,319,032.0	12,272,188.0	223.00	45.00	0.00	66	10.0	8.0	
R38 - 5th Level	417	1	37,318,976.0	12,272,191.0	223.00	45.00	0.00	66	10.0	8.0	
R39 - Rec Area	418	1	37,319,424.0	12,272,134.0	223.00	5.00	0.00	66	10.0	8.0	
R40 - Rec Area	419	1	37,319,408.0	12,272,171.0	223.00	5.00	0.00	66	10.0	8.0	
R41 - Rec Area	420	1	37,319,416.0	12,272,186.0	223.00	5.00	0.00	66	10.0	8.0	
R42 - Rec Area	421	1	37,319,332.0	12,272,291.0	223.00	5.00	0.00	66	10.0	8.0	
R43 - Rec Area	423	1	37,319,216.0	12,272,288.0	223.00	5.00	0.00	66	10.0	8.0	
R44 - Rec Area	424	1	37,319,196.0	12,272,318.0	223.00	5.00	0.00	66	10.0	8.0	
R45 - Resi's northeast of Project	426	1	37,319,512.0	12,272,516.0	160.00	5.00	0.00	66	10.0	8.0	Y

Dudek M Greene / S Tang	4 August 2016 TNM 2.5
INPUT: BARRIERS	
PROJECT/CONTRACT:	9641
RUN:	Solana Trrrnce MF Resi - ExWP 072716

Barrier									Points											
Name	Type	Height		If Wall	If Berm		Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment			On	Important		
		Min	Max	\$ per Unit Area	\$ per Unit Vol.	Top Width	Run:Rise	\$ per Unit Length			X	Y	Z	at Point	Seg Ht	Perturbs	#Up	#Dn	Struct?	Reflec-tions?
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft			ft	ft	ft	ft	ft	ft				
Bldg A Northeast	W	0.00	100.00	0.00				0.00	point110	110	37,319,416.0	12,272,157.0	223.00	50.00	0.00	0	0			
									point112	112	37,319,440.0	12,272,169.0	223.00	50.00	0.00	0	0			
									point113	113	37,319,444.0	12,272,159.0	223.00	50.00	0.00	0	0			
									point114	114	37,319,448.0	12,272,161.0	223.00	50.00	0.00	0	0			
									point115	115	37,319,480.0	12,272,101.0	223.00	50.00	0.00	0	0			
									point116	116	37,319,480.0	12,272,098.0	223.00	50.00	0.00	0	0			
									point117	117	37,319,480.0	12,272,087.0	223.00	50.00	0.00	0	0			
									point118	118	37,319,460.0	12,272,075.0	223.00	50.00						
Bldg C West	W	0.00	100.00	0.00				0.00	point239	239	37,318,876.0	12,272,256.0	223.00	60.00	0.00	0	0			
									point233	233	37,318,876.0	12,272,251.0	223.00	60.00	0.00	0	0			
									point234	234	37,318,888.0	12,272,249.0	223.00	60.00	0.00	0	0			
									point235	235	37,318,880.0	12,272,219.0	223.00	60.00	0.00	0	0			
									point236	236	37,318,816.0	12,272,237.0	223.00	60.00	0.00	0	0			
									point237	237	37,318,820.0	12,272,264.0	223.00	60.00	0.00	0	0			
									point111	111	37,318,832.0	12,272,261.0	223.00	60.00						
Bldg C North	W	0.00	100.00	0.00				0.00	point241	241	37,318,896.0	12,272,284.0	223.00	50.00	0.00	0	0			
									point213	213	37,318,960.0	12,272,270.0	223.00	50.00	0.00	0	0			
									point214	214	37,318,960.0	12,272,263.0	223.00	60.00	0.00	0	0			
									point215	215	37,318,976.0	12,272,260.0	223.00	60.00	0.00	0	0			
									point216	216	37,318,980.0	12,272,277.0	223.00	60.00	0.00	0	0			
									point217	217	37,318,976.0	12,272,279.0	223.00	60.00	0.00	0	0			
									point218	218	37,318,984.0	12,272,305.0	223.00	60.00	0.00	0	0			
									point219	219	37,318,992.0	12,272,302.0	223.00	60.00	0.00	0	0			
									point220	220	37,318,996.0	12,272,307.0	223.00	60.00	0.00	0	0			
									point221	221	37,319,008.0	12,272,303.0	223.00	60.00	0.00	0	0			
									point222	222	37,318,996.0	12,272,239.0	223.00	60.00	0.00	0	0			
									point223	223	37,318,988.0	12,272,241.0	223.00	60.00	0.00	0	0			
									point224	224	37,318,988.0	12,272,231.0	223.00	60.00	0.00	0	0			
									point225	225	37,318,892.0	12,272,253.0	223.00	60.00						
Bldg C East	W	0.00	100.00	0.00				0.00	point243	243	37,319,024.0	12,272,178.0	223.00	60.00	0.00	0	0			
									point208	208	37,319,040.0	12,272,249.0	223.00	60.00	0.00	0	0			
									point209	209	37,319,040.0	12,272,260.0	223.00	60.00	0.00	0	0			
									point210	210	37,319,012.0	12,272,265.0	223.00	60.00	0.00	0	0			
									point211	211	37,318,996.0	12,272,185.0	223.00	60.00						
Bldg C	W	0.00	100.00	0.00				0.00	point245	245	37,318,896.0	12,272,244.0	223.00	60.00	0.00	0	0			
									point227	227	37,318,996.0	12,272,221.0	223.00	60.00	0.00	0	0			
									point228	228	37,318,988.0	12,272,194.0	223.00	60.00	0.00	0	0			

INPUT: BARRIERS

9641

									point229	229	37,318,980.0	12,272,197.0	223.00	60.00	0.00	0	0		
									point230	230	37,318,980.0	12,272,192.0	223.00	60.00	0.00	0	0		
									point231	231	37,318,888.0	12,272,213.0	223.00	60.00					
Bldg B Northwest	W	0.00	100.00	0.00			0.00		point247	247	37,319,120.0	12,272,290.0	223.00	60.00	0.00	0	0		
									point201	201	37,319,124.0	12,272,314.0	223.00	60.00	0.00	0	0		
									point202	202	37,319,096.0	12,272,320.0	223.00	60.00	0.00	0	0		
									point203	203	37,319,096.0	12,272,308.0	223.00	60.00	0.00	0	0		
									point204	204	37,319,092.0	12,272,310.0	223.00	60.00	0.00	0	0		
									point205	205	37,319,092.0	12,272,297.0	223.00	60.00					
Bldg B	W	0.00	100.00	0.00			0.00		point249	249	37,319,112.0	12,272,208.0	223.00	60.00	0.00	0	0		
									point183	183	37,319,132.0	12,272,311.0	223.00	60.00	0.00	0	0		
									point184	184	37,319,160.0	12,272,306.0	223.00	60.00	0.00	0	0		
									point185	185	37,319,156.0	12,272,294.0	223.00	60.00	0.00	0	0		
									point186	186	37,319,160.0	12,272,292.0	223.00	60.00	0.00	0	0		
									point187	187	37,319,144.0	12,272,213.0	223.00	60.00	0.00	0	0		
									point188	188	37,319,140.0	12,272,213.0	223.00	60.00	0.00	0	0		
									point189	189	37,319,136.0	12,272,201.0	223.00	60.00					
Bldg B West	W	0.00	100.00	0.00			0.00		point251	251	37,319,116.0	12,272,281.0	223.00	60.00	0.00	0	0		
									point198	198	37,319,088.0	12,272,288.0	223.00	60.00	0.00	0	0		
									point199	199	37,319,060.0	12,272,171.0	223.00	60.00					
Bldg B South	W	0.00	100.00	0.00			0.00		point253	253	37,319,100.0	12,272,169.0	223.00	60.00	0.00	0	0		
									point191	191	37,319,108.0	12,272,190.0	223.00	60.00	0.00	0	0		
									point192	192	37,319,136.0	12,272,183.0	223.00	60.00	0.00	0	0		
									point194	194	37,319,132.0	12,272,172.0	223.00	60.00	0.00	0	0		
									point195	195	37,319,132.0	12,272,162.0	223.00	60.00	0.00	0	0		
									point196	196	37,319,100.0	12,272,168.0	223.00	60.00					
Community Space & Gym	W	0.00	100.00	0.00			0.00		point255	255	37,319,220.0	12,272,193.0	223.00	20.00	0.00	0	0		
									point179	179	37,319,276.0	12,272,313.0	223.00	20.00	0.00	0	0		
									point180	180	37,319,244.0	12,272,329.0	223.00	20.00	0.00	0	0		
									point181	181	37,319,188.0	12,272,208.0	223.00	20.00					
Bldg B East	W	0.00	100.00	0.00			0.00		point259	259	37,319,268.0	12,272,278.0	223.00	60.00	0.00	0	0		
									point168	168	37,319,296.0	12,272,264.0	223.00	60.00	0.00	0	0		
									point169	169	37,319,224.0	12,272,114.0	223.00	60.00	0.00	0	0		
									point170	170	37,319,192.0	12,272,129.0	223.00	60.00	0.00	0	0		
									point171	171	37,319,268.0	12,272,277.0	223.00	60.00					
Bldg B Northeast	W	0.00	100.00	0.00			0.00		point260	260	37,319,268.0	12,272,278.0	223.00	50.00	0.00	0	0		
									point173	173	37,319,288.0	12,272,320.0	223.00	50.00	0.00	0	0		
									point174	174	37,319,312.0	12,272,308.0	223.00	50.00	0.00	0	0		
									point175	175	37,319,304.0	12,272,297.0	223.00	50.00	0.00	0	0		
									point176	176	37,319,308.0	12,272,295.0	223.00	50.00	0.00	0	0		
									point177	177	37,319,296.0	12,272,265.0	223.00	50.00					
Bldg A East	W	0.00	100.00	0.00			0.00		point262	262	37,319,388.0	12,272,055.0	223.00	60.00	0.00	0	0		
									point120	120	37,319,424.0	12,272,105.0	223.00	60.00	0.00	0	0		
									point121	121	37,319,444.0	12,272,091.0	223.00	60.00	0.00	0	0		
									point122	122	37,319,440.0	12,272,081.0	223.00	60.00	0.00	0	0		
									point123	123	37,319,444.0	12,272,078.0	223.00	60.00	0.00	0	0		
									point124	124	37,319,428.0	12,272,058.0	223.00	60.00	0.00	0	0		
									point125	125	37,319,424.0	12,272,061.0	223.00	60.00	0.00	0	0		
									point126	126	37,319,416.0	12,272,051.0	223.00	60.00	0.00	0	0		
									point127	127	37,319,424.0	12,272,046.0	223.00	60.00	0.00	0	0		

INPUT: BARRIERS

9641

									point128	128	37,319,416.0	12,272,037.0	223.00	60.00				
Bldg A	W	0.00	100.00	0.00			0.00	point264	264	37,319,380.0	12,272,236.0	223.00	50.00	0.00	0	0		
								point136	136	37,319,388.0	12,272,229.0	223.00	50.00	0.00	0	0		
								point137	137	37,319,392.0	12,272,234.0	223.00	50.00	0.00	0	0		
								point138	138	37,319,416.0	12,272,218.0	223.00	50.00	0.00	0	0		
								point139	139	37,319,396.0	12,272,187.0	223.00	50.00	0.00	0	0		
								point140	140	37,319,388.0	12,272,191.0	223.00	50.00	0.00	0	0		
								point141	141	37,319,332.0	12,272,104.0	223.00	50.00	0.00	0	0		
								point142	142	37,319,328.0	12,272,105.0	223.00	50.00	0.00	0	0		
								point143	143	37,319,320.0	12,272,091.0	223.00	50.00	0.00	0	0		
								point144	144	37,319,356.0	12,272,065.0	223.00	50.00	0.00	0	0		
								point145	145	37,319,368.0	12,272,080.0	223.00	50.00	0.00	0	0		
								point146	146	37,319,364.0	12,272,083.0	223.00	50.00	0.00	0	0		
								point147	147	37,319,392.0	12,272,133.0	223.00	50.00	0.00	0	0		
								point148	148	37,319,420.0	12,272,115.0	223.00	60.00	0.00	0	0		
								point149	149	37,319,372.0	12,272,037.0	223.00	60.00	0.00	0	0		
								point150	150	37,319,364.0	12,272,042.0	223.00	60.00	0.00	0	0		
								point151	151	37,319,356.0	12,272,034.0	223.00	60.00	0.00	0	0		
								point152	152	37,319,292.0	12,272,077.0	223.00	60.00	0.00	0	0		
								point153	153	37,319,296.0	12,272,086.0	223.00	60.00	0.00	0	0		
								point154	154	37,319,288.0	12,272,092.0	223.00	60.00	0.00	0	0		
								point155	155	37,319,372.0	12,272,233.0	223.00	60.00	0.00	0	0		
								point156	156	37,319,388.0	12,272,259.0	223.00	60.00	0.00	0	0		
								point157	157	37,319,372.0	12,272,270.0	223.00	60.00	0.00	0	0		
								point158	158	37,319,372.0	12,272,267.0	223.00	60.00	0.00	0	0		
								point159	159	37,319,364.0	12,272,273.0	223.00	60.00	0.00	0	0		
								point160	160	37,319,348.0	12,272,249.0	223.00	60.00	0.00	0	0		
								point161	161	37,319,344.0	12,272,242.0	223.00	60.00	0.00	0	0		
								point162	162	37,319,336.0	12,272,232.0	223.00	60.00	0.00	0	0		
								point163	163	37,319,332.0	12,272,234.0	223.00	60.00	0.00	0	0		
								point164	164	37,319,252.0	12,272,105.0	223.00	60.00	0.00	0	0		
								point165	165	37,319,280.0	12,272,088.0	223.00	60.00	0.00	0	0		
								point166	166	37,319,364.0	12,272,228.0	223.00	60.00	0.00	0	0		
Bldg A East - 2	W	0.00	100.00	0.00			0.00	point266	266	37,319,372.0	12,272,024.0	223.00	60.00	0.00	0	0		
								point130	130	37,319,388.0	12,272,049.0	223.00	60.00	0.00	0	0		
								point131	131	37,319,412.0	12,272,032.0	223.00	60.00	0.00	0	0		
								point132	132	37,319,404.0	12,272,018.0	223.00	60.00	0.00	0	0		
								point133	133	37,319,400.0	12,272,020.0	223.00	60.00	0.00	0	0		
								point134	134	37,319,392.0	12,272,010.0	223.00	60.00	0.00	0	0		
Parking Structure / Base	W	0.00	99.99	0.00			0.00	point267	267	37,319,476.0	12,272,133.0	192.00	31.00	0.00	0	0		
								point269	269	37,319,496.0	12,272,091.0	192.00	31.00	0.00	0	0		
								point270	270	37,319,464.0	12,272,073.0	192.00	31.00	0.00	0	0		
								point271	271	37,319,444.0	12,272,074.0	192.00	31.00	0.00	0	0		
								point272	272	37,319,444.0	12,272,072.0	192.00	31.00	0.00	0	0		
								point273	273	37,319,440.0	12,272,069.0	192.00	31.00	0.00	0	0		
								point274	274	37,319,440.0	12,272,067.0	192.00	31.00	0.00	0	0		
								point275	275	37,319,432.0	12,272,010.0	192.00	31.00	0.00	0	0		
								point276	276	37,319,424.0	12,272,001.0	192.00	31.00	0.00	0	0		
								point277	277	37,319,396.0	12,272,003.0	192.00	31.00	0.00	0	0		
								point278	278	37,319,384.0	12,272,012.0	192.00	31.00	0.00	0	0		

INPUT: BARRIERS

9641

									point279	279	37,319,368.0	12,271,984.0	192.00	31.00	0.00	0	0		
									point280	280	37,319,372.0	12,271,979.0	192.00	31.00					
Parking Structure / Base-2	W	0.00	99.99	0.00				0.00	point295	295	37,319,372.0	12,271,973.0	192.00	31.00	0.00	0	0		
									point281	281	37,319,080.0	12,272,149.0	192.00	31.00	0.00	0	0		
									point282	282	37,318,792.0	12,272,215.0	192.00	31.00	0.00	0	0		
									point283	283	37,318,804.0	12,272,280.0	192.00	31.00	0.00	0	0		
									point284	284	37,318,872.0	12,272,268.0	192.00	31.00	0.00	0	0		
									point285	285	37,318,876.0	12,272,298.0	192.00	31.00	0.00	0	0		
									point286	286	37,318,952.0	12,272,334.0	192.00	31.00	0.00	0	0		
									point287	287	37,319,040.0	12,272,314.0	192.00	31.00	0.00	0	0		
									point288	288	37,319,036.0	12,272,274.0	192.00	31.00	0.00	0	0		
									point289	289	37,319,068.0	12,272,267.0	192.00	31.00	0.00	0	0		
									point290	290	37,319,080.0	12,272,330.0	192.00	31.00	0.00	0	0		
									point291	291	37,319,216.0	12,272,321.0	192.00	31.00	0.00	0	0		
									point293	293	37,319,216.0	12,272,339.0	192.00	31.00	0.00	0	0		
									point294	294	37,319,368.0	12,272,330.0	192.00	31.00	0.00	0	0		
									point268	268	37,319,472.0	12,272,139.0	192.00	31.00					

**INPUT: TERRAIN LINES**

9641

<b>Dudek</b>		<b>4 August 2016</b>		
<b>M Greene / S Tang</b>		<b>TNM 2.5</b>		
<b>INPUT: TERRAIN LINES</b>				
<b>PROJECT/CONTRACT:</b>		<b>9641</b>		
<b>RUN:</b>		<b>Solana Trrnce MF Resi - ExWP 072716</b>		
<b>Terrain Line</b>	<b>Points</b>			
<b>Name</b>	<b>No.</b>	<b>Coordinates (ground)</b>		
		<b>X</b>	<b>Y</b>	<b>Z</b>
		ft	ft	ft
Terrain Line8	65	37,319,212.0	12,272,346.0	192.00
	67	37,319,372.0	12,272,336.0	192.00
	68	37,319,500.0	12,272,102.0	192.00
	69	37,319,512.0	12,272,073.0	192.00
Toe of Slope	126	37,319,624.0	12,271,954.0	192.00
	99	37,319,604.0	12,271,942.0	192.00
	100	37,319,588.0	12,271,941.0	192.00
	101	37,319,568.0	12,271,946.0	192.00
	102	37,319,544.0	12,271,960.0	192.00
	103	37,319,536.0	12,271,969.0	192.00
	104	37,319,468.0	12,271,962.0	192.00
	105	37,319,388.0	12,271,966.0	192.00
	106	37,319,236.0	12,272,060.0	192.00
	107	37,319,080.0	12,272,151.0	192.00
	108	37,318,792.0	12,272,215.0	192.00
Terrain Line	128	37,319,572.0	12,271,913.0	210.00
	110	37,319,528.0	12,271,913.0	220.00
	111	37,319,500.0	12,271,913.0	240.00
	112	37,319,476.0	12,271,909.0	260.00
	113	37,319,388.0	12,271,923.0	280.00
	114	37,319,312.0	12,271,955.0	300.00
	115	37,319,300.0	12,271,969.0	330.00
	116	37,319,208.0	12,272,017.0	360.00
	117	37,319,188.0	12,272,014.0	380.00
	118	37,319,108.0	12,272,062.0	380.00
	119	37,319,028.0	12,272,105.0	380.00

**INPUT: TERRAIN LINES**

**9641**

	120	37,318,964.0	12,272,105.0	380.00
	121	37,318,896.0	12,272,120.0	380.00
	122	37,318,864.0	12,272,126.0	380.00
	66	37,318,824.0	12,272,158.0	380.00

RESULTS: SOUND LEVELS

9641

Dudek M Greene / S Tang										4 August 2016 TNM 2.5 Calculated with TNM 2.5			
RESULTS: SOUND LEVELS PROJECT/CONTRACT: RUN: BARRIER DESIGN: ATMOSPHERICS:		9641											
		Solana Trrnce MF Resi - ExWP 072716											
		INPUT HEIGHTS								Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.			
		68 deg F, 50% RH											

Receiver													
Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Increase over existing			Type	With Barrier LAeq1h	Noise Reduction			
				Calculated	Crit'n	Calculated	Crit'n	Impact		Calculated	Goal	Calculated	Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB	minus Goal
							Sub'l Inc						
ST3 - Resi Area E. of Proj.	1	1	0.0	61.7	66	61.7	10	----	61.7	0.0	8		-8.0
ST4 - Resi Area N. of Proj.	2	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8		-8.0
R1 - P3	247	1	0.0	63.9	66	63.9	10	----	63.9	0.0	8		-8.0
R2 - P3	248	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8		-8.0
R3 - P3	249	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	8		-8.0
R4 - P3	250	1	0.0	71.3	66	71.3	10	Snd Lvl	71.3	0.0	8		-8.0
R5 - P3	251	1	0.0	71.4	66	71.4	10	Snd Lvl	71.4	0.0	8		-8.0
R6 - P3	252	1	0.0	71.7	66	71.7	10	Snd Lvl	71.7	0.0	8		-8.0
R7 - P3	253	1	0.0	71.7	66	71.7	10	Snd Lvl	71.7	0.0	8		-8.0
R8 - P3	254	1	0.0	71.8	66	71.8	10	Snd Lvl	71.8	0.0	8		-8.0
R1 - P2	255	1	0.0	64.4	66	64.4	10	----	64.4	0.0	8		-8.0
R2 - P2	256	1	0.0	65.7	66	65.7	10	----	65.7	0.0	8		-8.0
R3 - P2	257	1	0.0	68.1	66	68.1	10	Snd Lvl	68.1	0.0	8		-8.0
R4 - P2	258	1	0.0	71.5	66	71.5	10	Snd Lvl	71.5	0.0	8		-8.0
R5 - P2	259	1	0.0	71.8	66	71.8	10	Snd Lvl	71.8	0.0	8		-8.0
R6 - P2	261	1	0.0	72.1	66	72.1	10	Snd Lvl	72.1	0.0	8		-8.0
R7 - P2	262	1	0.0	72.0	66	72.0	10	Snd Lvl	72.0	0.0	8		-8.0
R8 - P2	263	1	0.0	72.1	66	72.1	10	Snd Lvl	72.1	0.0	8		-8.0
R1 - P1	264	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8		-8.0
R2 - P1	265	1	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	8		-8.0
R3 - P1	266	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	8		-8.0
R4 - P1	267	1	0.0	71.3	66	71.3	10	Snd Lvl	71.3	0.0	8		-8.0
R5 - P1	268	1	0.0	71.5	66	71.5	10	Snd Lvl	71.5	0.0	8		-8.0
R6 - P1	269	1	0.0	71.7	66	71.7	10	Snd Lvl	71.7	0.0	8		-8.0
R7 - P1	270	1	0.0	71.7	66	71.7	10	Snd Lvl	71.7	0.0	8		-8.0

**RESULTS: SOUND LEVELS**

**9641**

R8 - P1	271	1	0.0	71.8	66	71.8	10	Snd Lvl	71.8	0.0	8	-8.0
R9 - 1st Level	272	1	0.0	63.2	66	63.2	10	----	63.2	0.0	8	-8.0
R10 - 1st Level	273	1	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0
R11 - 1st Level	274	1	0.0	43.1	66	43.1	10	----	43.1	0.0	8	-8.0
R12 - 1st Level	275	1	0.0	44.4	66	44.4	10	----	44.4	0.0	8	-8.0
R13 - 1st Level	276	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	8	-8.0
R14 - 1st Level	277	1	0.0	71.1	66	71.1	10	Snd Lvl	71.1	0.0	8	-8.0
R15 - 1st Level	278	1	0.0	71.2	66	71.2	10	Snd Lvl	71.2	0.0	8	-8.0
R16 - 1st Level	279	1	0.0	56.3	66	56.3	10	----	56.3	0.0	8	-8.0
R17 - 1st Level	281	1	0.0	33.3	66	33.3	10	----	33.3	0.0	8	-8.0
R18 - 1st Level	282	1	0.0	39.3	66	39.3	10	----	39.3	0.0	8	-8.0
R19 - 1st Level	283	1	0.0	43.1	66	43.1	10	----	43.1	0.0	8	-8.0
R20 - 1st Level	284	1	0.0	41.7	66	41.7	10	----	41.7	0.0	8	-8.0
R21 - 1st Level	286	1	0.0	45.5	66	45.5	10	----	45.5	0.0	8	-8.0
R22 - 1st Level	287	1	0.0	58.3	66	58.3	10	----	58.3	0.0	8	-8.0
R23 - 1st Level	289	1	0.0	63.0	66	63.0	10	----	63.0	0.0	8	-8.0
R24 - 1st Level	290	1	0.0	47.4	66	47.4	10	----	47.4	0.0	8	-8.0
R25 - 1st Level	291	1	0.0	47.8	66	47.8	10	----	47.8	0.0	8	-8.0
R26 - 1st Level	292	1	0.0	33.8	66	33.8	10	----	33.8	0.0	8	-8.0
R27 - 1st Level	295	1	0.0	32.2	66	32.2	10	----	32.2	0.0	8	-8.0
R28 - 1st Level	298	1	0.0	32.8	66	32.8	10	----	32.8	0.0	8	-8.0
R29 - 1st Level	300	1	0.0	63.1	66	63.1	10	----	63.1	0.0	8	-8.0
R30 - 1st Level	301	1	0.0	52.1	66	52.1	10	----	52.1	0.0	8	-8.0
R31 - 1st Level	302	1	0.0	40.5	66	40.5	10	----	40.5	0.0	8	-8.0
R32 - 1st Level	303	1	0.0	43.4	66	43.4	10	----	43.4	0.0	8	-8.0
R33 - 1st Level	304	1	0.0	52.9	66	52.9	10	----	52.9	0.0	8	-8.0
R34 - 1st Level	305	1	0.0	62.2	66	62.2	10	----	62.2	0.0	8	-8.0
R35 - 1st Level	306	1	0.0	44.5	66	44.5	10	----	44.5	0.0	8	-8.0
R36 - 1st Level	307	1	0.0	54.2	66	54.2	10	----	54.2	0.0	8	-8.0
R37 - 1st Level	308	1	0.0	39.7	66	39.7	10	----	39.7	0.0	8	-8.0
R38 - 1st Level	309	1	0.0	38.7	66	38.7	10	----	38.7	0.0	8	-8.0
R9 - 2nd Level	310	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
R10 - 2nd Level	311	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
R11 - 2nd Level	312	1	0.0	46.1	66	46.1	10	----	46.1	0.0	8	-8.0
R12 - 2nd Level	313	1	0.0	48.9	66	48.9	10	----	48.9	0.0	8	-8.0
R13 - 2nd Level	314	1	0.0	67.9	66	67.9	10	Snd Lvl	67.9	0.0	8	-8.0
R14 - 2nd Level	315	1	0.0	71.0	66	71.0	10	Snd Lvl	71.0	0.0	8	-8.0
R15 - 2nd Level	316	1	0.0	71.0	66	71.0	10	Snd Lvl	71.0	0.0	8	-8.0
R16 - 2nd Level	317	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	8	-8.0
R17 - 2nd Level	318	1	0.0	35.0	66	35.0	10	----	35.0	0.0	8	-8.0
R18 - 2nd Level	319	1	0.0	41.8	66	41.8	10	----	41.8	0.0	8	-8.0
R19 - 2nd Level	320	1	0.0	44.0	66	44.0	10	----	44.0	0.0	8	-8.0

**RESULTS: SOUND LEVELS**

**9641**

R20 - 2nd Level	321	1	0.0	41.4	66	41.4	10	----	41.4	0.0	8	-8.0
R21 - 2nd Level	322	1	0.0	46.7	66	46.7	10	----	46.7	0.0	8	-8.0
R22 - 2nd Level	323	1	0.0	68.8	66	68.8	10	Snd Lvl	68.8	0.0	8	-8.0
R23 - 2nd Level	324	1	0.0	70.0	66	70.0	10	Snd Lvl	70.0	0.0	8	-8.0
R24 - 2nd Level	325	1	0.0	47.8	66	47.8	10	----	47.8	0.0	8	-8.0
R25 - 2nd Level	326	1	0.0	49.7	66	49.7	10	----	49.7	0.0	8	-8.0
R26 - 2nd Level	327	1	0.0	35.9	66	35.9	10	----	35.9	0.0	8	-8.0
R27 - 2nd Level	328	1	0.0	34.1	66	34.1	10	----	34.1	0.0	8	-8.0
R28 - 2nd Level	329	1	0.0	35.9	66	35.9	10	----	35.9	0.0	8	-8.0
R29 - 2nd Level	330	1	0.0	70.3	66	70.3	10	Snd Lvl	70.3	0.0	8	-8.0
R30 - 2nd Level	331	1	0.0	59.6	66	59.6	10	----	59.6	0.0	8	-8.0
R31 - 2nd Level	332	1	0.0	41.5	66	41.5	10	----	41.5	0.0	8	-8.0
R32 - 2nd Level	333	1	0.0	43.3	66	43.3	10	----	43.3	0.0	8	-8.0
R33 - 2nd Level	334	1	0.0	61.1	66	61.1	10	----	61.1	0.0	8	-8.0
R34 - 2nd Level	335	1	0.0	65.1	66	65.1	10	----	65.1	0.0	8	-8.0
R35 - 2nd Level	336	1	0.0	46.8	66	46.8	10	----	46.8	0.0	8	-8.0
R36 - 2nd Level	337	1	0.0	59.3	66	59.3	10	----	59.3	0.0	8	-8.0
R37 - 2nd Level	338	1	0.0	42.4	66	42.4	10	----	42.4	0.0	8	-8.0
R38 - 2nd Level	339	1	0.0	41.6	66	41.6	10	----	41.6	0.0	8	-8.0
R9 - 3rd Level	340	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
R10 - 3rd Level	341	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
R11 - 3rd Level	342	1	0.0	45.2	66	45.2	10	----	45.2	0.0	8	-8.0
R12 - 3rd Level	343	1	0.0	51.0	66	51.0	10	----	51.0	0.0	8	-8.0
R13 - 3rd Level	344	1	0.0	67.7	66	67.7	10	Snd Lvl	67.7	0.0	8	-8.0
R14 - 3rd Level	345	1	0.0	70.8	66	70.8	10	Snd Lvl	70.8	0.0	8	-8.0
R15 - 3rd Level	346	1	0.0	70.7	66	70.7	10	Snd Lvl	70.7	0.0	8	-8.0
R16 - 3rd Level	347	1	0.0	67.8	66	67.8	10	Snd Lvl	67.8	0.0	8	-8.0
R17 - 3rd Level	348	1	0.0	36.3	66	36.3	10	----	36.3	0.0	8	-8.0
R18 - 3rd Level	349	1	0.0	40.7	66	40.7	10	----	40.7	0.0	8	-8.0
R19 - 3rd Level	350	1	0.0	46.6	66	46.6	10	----	46.6	0.0	8	-8.0
R20 - 3rd Level	351	1	0.0	42.6	66	42.6	10	----	42.6	0.0	8	-8.0
R21 - 3rd Level	352	1	0.0	49.5	66	49.5	10	----	49.5	0.0	8	-8.0
R22 - 3rd Level	353	1	0.0	68.6	66	68.6	10	Snd Lvl	68.6	0.0	8	-8.0
R23 - 3rd Level	354	1	0.0	69.7	66	69.7	10	Snd Lvl	69.7	0.0	8	-8.0
R24 - 3rd Level	355	1	0.0	48.9	66	48.9	10	----	48.9	0.0	8	-8.0
R25 - 3rd Level	356	1	0.0	51.8	66	51.8	10	----	51.8	0.0	8	-8.0
R26 - 3rd Level	357	1	0.0	36.6	66	36.6	10	----	36.6	0.0	8	-8.0
R27 - 3rd Level	358	1	0.0	35.8	66	35.8	10	----	35.8	0.0	8	-8.0
R28 - 3rd Level	359	1	0.0	36.6	66	36.6	10	----	36.6	0.0	8	-8.0
R29 - 3rd Level	360	1	0.0	70.1	66	70.1	10	Snd Lvl	70.1	0.0	8	-8.0
R30 - 3rd Level	361	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
R31 - 3rd Level	362	1	0.0	41.7	66	41.7	10	----	41.7	0.0	8	-8.0

**RESULTS: SOUND LEVELS**

**9641**

R32 - 3rd Level	363	1	0.0	45.6	66	45.6	10	----	45.6	0.0	8	-8.0
R33 - 3rd Level	365	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
R34 - 3rd Level	366	1	0.0	65.7	66	65.7	10	----	65.7	0.0	8	-8.0
R35 - 3rd Level	367	1	0.0	53.1	66	53.1	10	----	53.1	0.0	8	-8.0
R36 - 3rd Level	368	1	0.0	60.5	66	60.5	10	----	60.5	0.0	8	-8.0
R37 - 3rd Level	369	1	0.0	45.6	66	45.6	10	----	45.6	0.0	8	-8.0
R38 - 3rd Level	370	1	0.0	45.6	66	45.6	10	----	45.6	0.0	8	-8.0
R9 - 4th Level	371	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
R10 - 4th Level	372	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
R11 - 4th Level	373	1	0.0	47.3	66	47.3	10	----	47.3	0.0	8	-8.0
R12 - 4th Level	374	1	0.0	52.0	66	52.0	10	----	52.0	0.0	8	-8.0
R13 - 4th Level	375	1	0.0	67.4	66	67.4	10	Snd Lvl	67.4	0.0	8	-8.0
R14 - 4th Level	376	1	0.0	70.4	66	70.4	10	Snd Lvl	70.4	0.0	8	-8.0
R15 - 4th Level	377	1	0.0	70.6	66	70.6	10	Snd Lvl	70.6	0.0	8	-8.0
R16 - 4th Level	378	1	0.0	67.9	66	67.9	10	Snd Lvl	67.9	0.0	8	-8.0
R17 - 4th Level	379	1	0.0	37.1	66	37.1	10	----	37.1	0.0	8	-8.0
R18 - 4th Level	380	1	0.0	43.5	66	43.5	10	----	43.5	0.0	8	-8.0
R19 - 4th Level	381	1	0.0	52.3	66	52.3	10	----	52.3	0.0	8	-8.0
R20 - 4th Level	382	1	0.0	45.3	66	45.3	10	----	45.3	0.0	8	-8.0
R21 - 4th Level	383	1	0.0	54.6	66	54.6	10	----	54.6	0.0	8	-8.0
R22 - 4th Level	384	1	0.0	68.6	66	68.6	10	Snd Lvl	68.6	0.0	8	-8.0
R23 - 4th Level	385	1	0.0	69.5	66	69.5	10	Snd Lvl	69.5	0.0	8	-8.0
R24 - 4th Level	386	1	0.0	50.5	66	50.5	10	----	50.5	0.0	8	-8.0
R25 - 4th Level	387	1	0.0	52.1	66	52.1	10	----	52.1	0.0	8	-8.0
R26 - 4th Level	388	1	0.0	37.2	66	37.2	10	----	37.2	0.0	8	-8.0
R27 - 4th Level	389	1	0.0	36.3	66	36.3	10	----	36.3	0.0	8	-8.0
R28 - 4th Level	390	1	0.0	37.6	66	37.6	10	----	37.6	0.0	8	-8.0
R29 - 4th Level	391	1	0.0	70.2	66	70.2	10	Snd Lvl	70.2	0.0	8	-8.0
R30 - 4th Level	392	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
R31 - 4th Level	393	1	0.0	44.0	66	44.0	10	----	44.0	0.0	8	-8.0
R32 - 4th Level	394	1	0.0	52.8	66	52.8	10	----	52.8	0.0	8	-8.0
R33 - 4th Level	395	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
R34 - 4th Level	396	1	0.0	67.0	66	67.0	10	Snd Lvl	67.0	0.0	8	-8.0
R35 - 4th Level	397	1	0.0	55.1	66	55.1	10	----	55.1	0.0	8	-8.0
R36 - 4th Level	398	1	0.0	60.6	66	60.6	10	----	60.6	0.0	8	-8.0
R37 - 4th Level	399	1	0.0	45.8	66	45.8	10	----	45.8	0.0	8	-8.0
R38 - 4th Level	400	1	0.0	46.3	66	46.3	10	----	46.3	0.0	8	-8.0
R17 - 5th Level	401	1	0.0	38.3	66	38.3	10	----	38.3	0.0	8	-8.0
R18 - 5th Level	402	1	0.0	43.6	66	43.6	10	----	43.6	0.0	8	-8.0
R19 - 5th Level	403	1	0.0	58.6	66	58.6	10	----	58.6	0.0	8	-8.0
R20 - 5th Level	404	1	0.0	49.8	66	49.8	10	----	49.8	0.0	8	-8.0
R21 - 5th Level	405	1	0.0	59.2	66	59.2	10	----	59.2	0.0	8	-8.0

**RESULTS: SOUND LEVELS**

**9641**

R24 - 5th Level	407	1	0.0	51.0	66	51.0	10	----	51.0	0.0	8	-8.0
R25 - 5th Level	408	1	0.0	53.1	66	53.1	10	----	53.1	0.0	8	-8.0
R26 - 5th Level	409	1	0.0	38.6	66	38.6	10	----	38.6	0.0	8	-8.0
R27 - 5th Level	410	1	0.0	38.1	66	38.1	10	----	38.1	0.0	8	-8.0
R28 - 5th Level	411	1	0.0	39.1	66	39.1	10	----	39.1	0.0	8	-8.0
R31 - 5th Level	412	1	0.0	47.2	66	47.2	10	----	47.2	0.0	8	-8.0
R32 - 5th Level	413	1	0.0	53.8	66	53.8	10	----	53.8	0.0	8	-8.0
R35 - 5th Level	414	1	0.0	56.1	66	56.1	10	----	56.1	0.0	8	-8.0
R36 - 5th Level	415	1	0.0	60.7	66	60.7	10	----	60.7	0.0	8	-8.0
R37 - 5th Level	416	1	0.0	46.0	66	46.0	10	----	46.0	0.0	8	-8.0
R38 - 5th Level	417	1	0.0	46.6	66	46.6	10	----	46.6	0.0	8	-8.0
R39 - Rec Area	418	1	0.0	47.6	66	47.6	10	----	47.6	0.0	8	-8.0
R40 - Rec Area	419	1	0.0	52.2	66	52.2	10	----	52.2	0.0	8	-8.0
R41 - Rec Area	420	1	0.0	57.7	66	57.7	10	----	57.7	0.0	8	-8.0
R42 - Rec Area	421	1	0.0	56.9	66	56.9	10	----	56.9	0.0	8	-8.0
R43 - Rec Area	423	1	0.0	52.1	66	52.1	10	----	52.1	0.0	8	-8.0
R44 - Rec Area	424	1	0.0	60.6	66	60.6	10	----	60.6	0.0	8	-8.0
R45 - Resi's northeast of Project	426	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0
<b>Dwelling Units</b>		<b># DUs</b>	<b>Noise Reduction</b>									
			<b>Min</b>	<b>Avg</b>	<b>Max</b>							
			<b>dB</b>	<b>dB</b>	<b>dB</b>							
All Selected		169	0.0	0.0	0.0							
All Impacted		44	0.0	0.0	0.0							
All that meet NR Goal		0	0.0	0.0	0.0							



**INPUT: ROADWAYS****9641**

		point87	87	37,318,860.0	12,272,578.0	239.00				Average	
		point88	88	37,319,020.0	12,272,548.0	214.00				Average	
		point89	89	37,319,080.0	12,272,536.0	208.00				Average	
		point90	90	37,319,160.0	12,272,477.0	200.00				Average	
		point127	127	37,319,236.0	12,272,411.0	191.00				Average	
		point92	92	37,319,288.0	12,272,393.0	187.00				Average	
		point93	93	37,319,328.0	12,272,393.0	185.00				Average	
		point21	21	37,319,420.0	12,272,414.0	178.00					



**INPUT: TRAFFIC FOR LAeq1h Percentages**

**9641**

Via Valmonte	point95	95	786	99	25	1	25	0	0	0	0	0	0
	point86	86	786	99	25	1	25	0	0	0	0	0	0
	point87	87	786	99	25	1	25	0	0	0	0	0	0
	point88	88	786	99	25	1	25	0	0	0	0	0	0
	point89	89	786	99	25	1	25	0	0	0	0	0	0
	point90	90	786	99	25	1	25	0	0	0	0	0	0
	point127	127	786	99	25	1	25	0	0	0	0	0	0
	point92	92	786	99	25	1	25	0	0	0	0	0	0
	point93	93	786	99	25	1	25	0	0	0	0	0	0
	point21	21											

**INPUT: RECEIVERS**

9641

<b>Dudek</b>							<b>4 August 2016</b>				
<b>M Greene / S Tang</b>							<b>TNM 2.5</b>				
<b>INPUT: RECEIVERS</b>											
<b>PROJECT/CONTRACT:</b>		<b>9641</b>									
<b>RUN:</b>		<b>Solana Torrance MF Resi - Future</b>									
<b>Receiver</b>											
Name	No.	#DUs	Coordinates (ground)			Height above Ground	Input Sound Levels and Criteria				Active in Calc.
			X	Y	Z		Existing LAeq1h	Impact LAeq1h	Criteria Sub'I	NR Goal	
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ST1 - On-Site SE side	1	1	37,319,456.0	12,272,000.0	234.00	5.00	8.00	66	10.0	8.0	Y
ST2 - On-Site NE corner	2	1	37,319,300.0	12,272,318.0	198.00	5.00	8.00	66	10.0	8.0	Y
ST3 - Resi Area E. of Proj.	45	1	37,319,732.0	12,272,061.0	172.00	5.00	8.00	66	10.0	8.0	Y
ST4 - Resi Area N. of Proj.	47	1	37,319,028.0	12,272,507.0	223.00	5.00	8.00	66	10.0	8.0	Y
R45 - Resi's northeast of Project	50	1	37,319,512.0	12,272,516.0	160.00	5.00	0.00	66	10.0	8.0	Y

**INPUT: TERRAIN LINES**

9641

<b>Dudek</b>				
				<b>4 August 2016</b>
<b>M Greene / S Tang</b>				<b>TNM 2.5</b>
<b>INPUT: TERRAIN LINES</b>				
<b>PROJECT/CONTRACT:</b>		<b>9641</b>		
<b>RUN:</b>		<b>Solana Torrance MF Resi - Future</b>		
<b>Terrain Line</b>	<b>Points</b>			
<b>Name</b>	<b>No.</b>	<b>Coordinates (ground)</b>		
		<b>X</b>	<b>Y</b>	<b>Z</b>
		ft	ft	ft
Terrain Line8	65	37,319,264.0	12,272,337.0	190.00
	66	37,319,356.0	12,272,343.0	200.00
	67	37,319,580.0	12,271,902.0	240.00



INPUT: ROADWAYS

9641

Dudek					4 August 2016					
M Greene / S Tang					TNM 2.5					
INPUT: ROADWAYS										
PROJECT/CONTRACT:	9641								Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA	
RUN:	Solana Torrance MF Resi - FWP 072716									

Roadway	Width	Points	Coordinates (pavement)			Flow Control			Segment		
Name		Name	No.	X	Y	Z	Control	Speed	Percent	Pvmt	On
							Device	Constraint	Vehicles	Type	Struct?
	ft			ft	ft	ft		mph	%	Affected	
Hawthorne Blvd- North of Via Valmonte	85.0	point61	61	37,319,396.0	12,273,000.0	146.00				Average	
		point62	62	37,319,388.0	12,272,721.0	159.00				Average	
		point63	63	37,319,404.0	12,272,503.0	175.00				Average	
		point64	64	37,319,436.0	12,272,393.0	179.00					
Via Valmonte - W. of Project Entrance	35.0	point95	95	37,318,584.0	12,272,539.0	265.00				Average	
		point86	86	37,318,724.0	12,272,585.0	252.00				Average	
		point87	87	37,318,860.0	12,272,578.0	239.00				Average	
		point186	186	37,319,020.0	12,272,548.0	214.00				Average	
		point88	88	37,319,080.0	12,272,536.0	208.00				Average	
		point89	89	37,319,160.0	12,272,477.0	200.00				Average	
Via Valmonte- E. of Project Entrance	35.0	point90	90	37,319,236.0	12,272,411.0	191.00					
		point111	111	37,319,236.0	12,272,411.0	191.00				Average	
		point92	92	37,319,288.0	12,272,393.0	187.00				Average	
		point93	93	37,319,328.0	12,272,393.0	185.00				Average	
		point21	21	37,319,420.0	12,272,414.0	178.00					
Project Entrance - Hawthorne Blvd	24.0	point177	177	37,319,616.0	12,271,965.0	195.00				Average	
		point168	168	37,319,600.0	12,271,957.0	193.00				Average	
		point169	169	37,319,580.0	12,271,956.0	192.00				Average	
		point170	170	37,319,560.0	12,271,968.0	192.00				Average	
		point171	171	37,319,540.0	12,271,988.0	192.00				Average	
		point172	172	37,319,516.0	12,271,999.0	192.00				Average	
		point173	173	37,319,444.0	12,272,007.0	192.00					
Project Entrance - fm Via Valmonte	24.0	point187	187	37,319,220.0	12,272,399.0	190.00				Average	
		point188	188	37,319,200.0	12,272,363.0	191.00				Average	
		point189	189	37,319,172.0	12,272,353.0	192.00				Average	
		point190	190	37,319,148.0	12,272,353.0	192.00				Average	
		point191	191	37,319,084.0	12,272,359.0	192.00				Average	

**INPUT: ROADWAYS**

**9641**

		point192	192	37,318,952.0	12,272,367.0	192.00					
Hawthorne Blvd- South of Via Valmonte	85.0	point194	194	37,319,436.0	12,272,393.0	179.00				Average	
		point65	65	37,319,488.0	12,272,258.0	184.00				Average	
		point66	66	37,319,584.0	12,272,104.0	190.00				Average	
		point67	67	37,319,696.0	12,271,939.0	197.00				Average	
		point68	68	37,319,800.0	12,271,804.0	201.00				Average	
		point69	69	37,319,880.0	12,271,674.0	213.00				Average	
		point70	70	37,319,936.0	12,271,567.0	219.00				Average	
		point71	71	37,319,976.0	12,271,392.0	225.00				Average	
		point72	72	37,319,992.0	12,271,281.0	230.00				Average	
		point73	73	37,319,992.0	12,271,103.0	230.00				Average	
		point74	74	37,319,992.0	12,271,053.0	231.00				Average	
		point75	75	37,319,936.0	12,270,887.0	243.00				Average	
		point76	76	37,319,868.0	12,270,705.0	255.00				Average	
		point77	77	37,319,764.0	12,270,563.0	268.00				Average	
		point78	78	37,319,632.0	12,270,451.0	278.00				Average	
		point79	79	37,319,476.0	12,270,339.0	291.00				Average	
		point80	80	37,319,192.0	12,270,148.0	315.00				Average	
		point81	81	37,318,608.0	12,269,751.0	358.00				Average	
		point82	82	37,318,296.0	12,269,532.0	379.00				Average	
		point83	83	37,318,112.0	12,269,350.0	400.00				Average	
		point84	84	37,317,624.0	12,268,899.0	440.00					



**INPUT: TRAFFIC FOR LAeq1h Percentages**

**9641**

	point190	190	114	99	15	1	15	0	0	0	0	0	0
	point191	191	114	99	15	1	15	0	0	0	0	0	0
	point192	192											
Hawthorne Blvd- South of Via Valmonte	point194	194	3933	97	45	1	45	2	45	0	0	0	0
	point65	65	3933	97	45	1	45	2	45	0	0	0	0
	point66	66	3933	97	45	1	45	2	45	0	0	0	0
	point67	67	3933	97	45	1	45	2	45	0	0	0	0
	point68	68	3933	97	45	1	45	2	45	0	0	0	0
	point69	69	3933	97	45	1	45	2	45	0	0	0	0
	point70	70	3933	97	45	1	45	2	45	0	0	0	0
	point71	71	3933	97	45	1	45	2	45	0	0	0	0
	point72	72	3933	97	45	1	45	2	45	0	0	0	0
	point73	73	3933	97	45	1	45	2	45	0	0	0	0
	point74	74	3933	97	45	1	45	2	45	0	0	0	0
	point75	75	3933	97	45	1	45	2	45	0	0	0	0
	point76	76	3933	97	45	1	45	2	45	0	0	0	0
	point77	77	3933	97	45	1	45	2	45	0	0	0	0
	point78	78	3933	97	45	1	45	2	45	0	0	0	0
	point79	79	3933	97	45	1	45	2	45	0	0	0	0
	point80	80	3933	97	45	1	45	2	45	0	0	0	0
	point81	81	3933	97	45	1	45	2	45	0	0	0	0
	point82	82	3933	97	45	1	45	2	45	0	0	0	0
	point83	83	3933	97	45	1	45	2	45	0	0	0	0
	point84	84											

**INPUT: RECEIVERS**

9641

<b>Dudek</b>						<b>4 August 2016</b>					
<b>M Greene / S Tang</b>						<b>TNM 2.5</b>					
<b>INPUT: RECEIVERS</b>											
<b>PROJECT/CONTRACT:</b>		<b>9641</b>									
<b>RUN:</b>		<b>Solana Torrance MF Resi - FWP 072716</b>									
<b>Receiver</b>											
Name	No.	#DUs	Coordinates (ground)			Height above Ground	Input Sound Levels and Criteria			NR Goal	Active in Calc.
			X	Y	Z		Existing LAeq1h	Impact LAeq1h	Criteria Sub'I		
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ST3 - Resi Area E. of Proj.	1	1	37,319,732.0	12,272,061.0	172.00	5.00	0.00	66	10.0	8.0	Y
ST4 - Resi Area N. of Proj.	2	1	37,319,028.0	12,272,507.0	223.00	5.00	0.00	66	10.0	8.0	Y
R1 - P3	247	1	37,319,236.0	12,272,340.0	192.00	5.00	0.00	66	10.0	8.0	Y
R2 - P3	248	1	37,319,272.0	12,272,337.0	192.00	5.00	0.00	66	10.0	8.0	Y
R3 - P3	249	1	37,319,332.0	12,272,334.0	192.00	5.00	0.00	66	10.0	8.0	Y
R4 - P3	250	1	37,319,380.0	12,272,314.0	192.00	5.00	0.00	66	10.0	8.0	Y
R5 - P3	251	1	37,319,400.0	12,272,273.0	192.00	5.00	0.00	66	10.0	8.0	Y
R6 - P3	252	1	37,319,428.0	12,272,224.0	192.00	5.00	0.00	66	10.0	8.0	Y
R7 - P3	253	1	37,319,448.0	12,272,186.0	192.00	5.00	0.00	66	10.0	8.0	Y
R8 - P3	254	1	37,319,468.0	12,272,155.0	192.00	5.00	0.00	66	10.0	8.0	Y
R1 - P2	255	1	37,319,236.0	12,272,340.0	192.00	15.00	0.00	66	10.0	8.0	Y
R2 - P2	256	1	37,319,272.0	12,272,337.0	192.00	15.00	0.00	66	10.0	8.0	Y
R3 - P2	257	1	37,319,332.0	12,272,334.0	192.00	15.00	0.00	66	10.0	8.0	Y
R4 - P2	258	1	37,319,380.0	12,272,314.0	192.00	15.00	0.00	66	10.0	8.0	Y
R5 - P2	259	1	37,319,400.0	12,272,273.0	192.00	15.00	0.00	66	10.0	8.0	Y
R6 - P2	261	1	37,319,428.0	12,272,224.0	192.00	15.00	0.00	66	10.0	8.0	Y
R7 - P2	262	1	37,319,448.0	12,272,186.0	192.00	15.00	0.00	66	10.0	8.0	Y
R8 - P2	263	1	37,319,468.0	12,272,155.0	192.00	15.00	0.00	66	10.0	8.0	Y
R1 - P1	264	1	37,319,236.0	12,272,340.0	192.00	25.00	0.00	66	10.0	8.0	Y
R2 - P1	265	1	37,319,272.0	12,272,337.0	192.00	25.00	0.00	66	10.0	8.0	Y
R3 - P1	266	1	37,319,332.0	12,272,334.0	192.00	25.00	0.00	66	10.0	8.0	Y
R4 - P1	267	1	37,319,380.0	12,272,314.0	192.00	25.00	0.00	66	10.0	8.0	Y
R5 - P1	268	1	37,319,400.0	12,272,273.0	192.00	25.00	0.00	66	10.0	8.0	Y
R6 - P1	269	1	37,319,428.0	12,272,224.0	192.00	25.00	0.00	66	10.0	8.0	Y

**INPUT: RECEIVERS**

**9641**

R7 - P1	270	1	37,319,448.0	12,272,186.0	192.00	25.00	0.00	66	10.0	8.0	Y
R8 - P1	271	1	37,319,468.0	12,272,155.0	192.00	25.00	0.00	66	10.0	8.0	Y
R9 - 1st Level	272	1	37,319,408.0	12,272,020.0	223.00	5.00	0.00	66	10.0	8.0	Y
R10 - 1st Level	273	1	37,319,436.0	12,272,066.0	223.00	5.00	0.00	66	10.0	8.0	Y
R11 - 1st Level	274	1	37,319,436.0	12,272,099.0	223.00	5.00	0.00	66	10.0	8.0	Y
R12 - 1st Level	275	1	37,319,384.0	12,272,016.0	223.00	5.00	0.00	66	10.0	8.0	Y
R13 - 1st Level	276	1	37,319,476.0	12,272,083.0	223.00	5.00	0.00	66	10.0	8.0	Y
R14 - 1st Level	277	1	37,319,480.0	12,272,108.0	223.00	5.00	0.00	66	10.0	8.0	Y
R15 - 1st Level	278	1	37,319,460.0	12,272,145.0	223.00	5.00	0.00	66	10.0	8.0	Y
R16 - 1st Level	279	1	37,319,428.0	12,272,166.0	223.00	5.00	0.00	66	10.0	8.0	Y
R17 - 1st Level	281	1	37,319,376.0	12,272,042.0	223.00	5.00	0.00	66	10.0	8.0	Y
R18 - 1st Level	282	1	37,319,416.0	12,272,107.0	223.00	5.00	0.00	66	10.0	8.0	Y
R19 - 1st Level	283	1	37,319,384.0	12,272,122.0	223.00	5.00	0.00	66	10.0	8.0	Y
R20 - 1st Level	284	1	37,319,340.0	12,272,115.0	223.00	5.00	0.00	66	10.0	8.0	Y
R21 - 1st Level	286	1	37,319,364.0	12,272,151.0	223.00	5.00	0.00	66	10.0	8.0	Y
R22 - 1st Level	287	1	37,319,408.0	12,272,201.0	223.00	5.00	0.00	66	10.0	8.0	Y
R23 - 1st Level	289	1	37,319,408.0	12,272,225.0	223.00	5.00	0.00	66	10.0	8.0	Y
R24 - 1st Level	290	1	37,319,296.0	12,272,073.0	223.00	5.00	0.00	66	10.0	8.0	Y
R25 - 1st Level	291	1	37,319,348.0	12,272,039.0	223.00	5.00	0.00	66	10.0	8.0	Y
R26 - 1st Level	292	1	37,319,284.0	12,272,089.0	223.00	5.00	0.00	66	10.0	8.0	Y
R27 - 1st Level	295	1	37,319,324.0	12,272,158.0	223.00	5.00	0.00	66	10.0	8.0	Y
R28 - 1st Level	298	1	37,319,356.0	12,272,213.0	223.00	5.00	0.00	66	10.0	8.0	Y
R29 - 1st Level	300	1	37,319,384.0	12,272,264.0	223.00	5.00	0.00	66	10.0	8.0	Y
R30 - 1st Level	301	1	37,319,352.0	12,272,264.0	223.00	5.00	0.00	66	10.0	8.0	Y
R31 - 1st Level	302	1	37,319,232.0	12,272,121.0	223.00	5.00	0.00	66	10.0	8.0	Y
R32 - 1st Level	303	1	37,319,272.0	12,272,212.0	223.00	5.00	0.00	66	10.0	8.0	Y
R33 - 1st Level	304	1	37,319,308.0	12,272,287.0	223.00	5.00	0.00	66	10.0	8.0	Y
R34 - 1st Level	305	1	37,319,300.0	12,272,315.0	223.00	5.00	0.00	66	10.0	8.0	Y
R35 - 1st Level	306	1	37,319,136.0	12,272,166.0	223.00	5.00	0.00	66	10.0	8.0	Y
R36 - 1st Level	307	1	37,319,160.0	12,272,286.0	223.00	5.00	0.00	66	10.0	8.0	Y
R37 - 1st Level	308	1	37,319,032.0	12,272,188.0	223.00	5.00	0.00	66	10.0	8.0	Y
R38 - 1st Level	309	1	37,318,976.0	12,272,191.0	223.00	5.00	0.00	66	10.0	8.0	Y
R9 - 2nd Level	310	1	37,319,408.0	12,272,020.0	223.00	15.00	0.00	66	10.0	8.0	Y
R10 - 2nd Level	311	1	37,319,436.0	12,272,066.0	223.00	15.00	0.00	66	10.0	8.0	Y
R11 - 2nd Level	312	1	37,319,436.0	12,272,099.0	223.00	15.00	0.00	66	10.0	8.0	Y
R12 - 2nd Level	313	1	37,319,384.0	12,272,016.0	223.00	15.00	0.00	66	10.0	8.0	Y
R13 - 2nd Level	314	1	37,319,476.0	12,272,083.0	223.00	15.00	0.00	66	10.0	8.0	Y

**INPUT: RECEIVERS****9641**

R14 - 2nd Level	315	1	37,319,480.0	12,272,108.0	223.00	15.00	0.00	66	10.0	8.0	Y
R15 - 2nd Level	316	1	37,319,460.0	12,272,145.0	223.00	15.00	0.00	66	10.0	8.0	Y
R16 - 2nd Level	317	1	37,319,428.0	12,272,166.0	223.00	15.00	0.00	66	10.0	8.0	Y
R17 - 2nd Level	318	1	37,319,376.0	12,272,042.0	223.00	15.00	0.00	66	10.0	8.0	Y
R18 - 2nd Level	319	1	37,319,416.0	12,272,107.0	223.00	15.00	0.00	66	10.0	8.0	Y
R19 - 2nd Level	320	1	37,319,384.0	12,272,122.0	223.00	15.00	0.00	66	10.0	8.0	Y
R20 - 2nd Level	321	1	37,319,340.0	12,272,115.0	223.00	15.00	0.00	66	10.0	8.0	Y
R21 - 2nd Level	322	1	37,319,364.0	12,272,151.0	223.00	15.00	0.00	66	10.0	8.0	Y
R22 - 2nd Level	323	1	37,319,408.0	12,272,201.0	223.00	15.00	0.00	66	10.0	8.0	Y
R23 - 2nd Level	324	1	37,319,408.0	12,272,225.0	223.00	15.00	0.00	66	10.0	8.0	Y
R24 - 2nd Level	325	1	37,319,296.0	12,272,073.0	223.00	15.00	0.00	66	10.0	8.0	Y
R25 - 2nd Level	326	1	37,319,348.0	12,272,039.0	223.00	15.00	0.00	66	10.0	8.0	Y
R26 - 2nd Level	327	1	37,319,284.0	12,272,089.0	223.00	15.00	0.00	66	10.0	8.0	Y
R27 - 2nd Level	328	1	37,319,324.0	12,272,158.0	223.00	15.00	0.00	66	10.0	8.0	Y
R28 - 2nd Level	329	1	37,319,356.0	12,272,213.0	223.00	15.00	0.00	66	10.0	8.0	Y
R29 - 2nd Level	330	1	37,319,384.0	12,272,264.0	223.00	15.00	0.00	66	10.0	8.0	Y
R30 - 2nd Level	331	1	37,319,352.0	12,272,264.0	223.00	15.00	0.00	66	10.0	8.0	Y
R31 - 2nd Level	332	1	37,319,232.0	12,272,121.0	223.00	15.00	0.00	66	10.0	8.0	Y
R32 - 2nd Level	333	1	37,319,272.0	12,272,212.0	223.00	15.00	0.00	66	10.0	8.0	Y
R33 - 2nd Level	334	1	37,319,308.0	12,272,287.0	223.00	15.00	0.00	66	10.0	8.0	Y
R34 - 2nd Level	335	1	37,319,300.0	12,272,315.0	223.00	15.00	0.00	66	10.0	8.0	Y
R35 - 2nd Level	336	1	37,319,136.0	12,272,166.0	223.00	15.00	0.00	66	10.0	8.0	Y
R36 - 2nd Level	337	1	37,319,160.0	12,272,286.0	223.00	15.00	0.00	66	10.0	8.0	Y
R37 - 2nd Level	338	1	37,319,032.0	12,272,188.0	223.00	15.00	0.00	66	10.0	8.0	Y
R38 - 2nd Level	339	1	37,318,976.0	12,272,191.0	223.00	15.00	0.00	66	10.0	8.0	Y
R9 - 3rd Level	340	1	37,319,408.0	12,272,020.0	223.00	25.00	0.00	66	10.0	8.0	Y
R10 - 3rd Level	341	1	37,319,436.0	12,272,066.0	223.00	25.00	0.00	66	10.0	8.0	Y
R11 - 3rd Level	342	1	37,319,436.0	12,272,099.0	223.00	25.00	0.00	66	10.0	8.0	Y
R12 - 3rd Level	343	1	37,319,384.0	12,272,016.0	223.00	25.00	0.00	66	10.0	8.0	Y
R13 - 3rd Level	344	1	37,319,476.0	12,272,083.0	223.00	25.00	0.00	66	10.0	8.0	Y
R14 - 3rd Level	345	1	37,319,480.0	12,272,108.0	223.00	25.00	0.00	66	10.0	8.0	Y
R15 - 3rd Level	346	1	37,319,460.0	12,272,145.0	223.00	25.00	0.00	66	10.0	8.0	Y
R16 - 3rd Level	347	1	37,319,428.0	12,272,166.0	223.00	25.00	0.00	66	10.0	8.0	Y
R17 - 3rd Level	348	1	37,319,376.0	12,272,042.0	223.00	25.00	0.00	66	10.0	8.0	Y
R18 - 3rd Level	349	1	37,319,416.0	12,272,107.0	223.00	25.00	0.00	66	10.0	8.0	Y
R19 - 3rd Level	350	1	37,319,384.0	12,272,122.0	223.00	25.00	0.00	66	10.0	8.0	Y
R20 - 3rd Level	351	1	37,319,340.0	12,272,115.0	223.00	25.00	0.00	66	10.0	8.0	Y

**INPUT: RECEIVERS**

**9641**

R21 - 3rd Level	352	1	37,319,364.0	12,272,151.0	223.00	25.00	0.00	66	10.0	8.0	Y
R22 - 3rd Level	353	1	37,319,408.0	12,272,201.0	223.00	25.00	0.00	66	10.0	8.0	Y
R23 - 3rd Level	354	1	37,319,408.0	12,272,225.0	223.00	25.00	0.00	66	10.0	8.0	Y
R24 - 3rd Level	355	1	37,319,296.0	12,272,073.0	223.00	25.00	0.00	66	10.0	8.0	Y
R25 - 3rd Level	356	1	37,319,348.0	12,272,039.0	223.00	25.00	0.00	66	10.0	8.0	Y
R26 - 3rd Level	357	1	37,319,284.0	12,272,089.0	223.00	25.00	0.00	66	10.0	8.0	Y
R27 - 3rd Level	358	1	37,319,324.0	12,272,158.0	223.00	25.00	0.00	66	10.0	8.0	Y
R28 - 3rd Level	359	1	37,319,356.0	12,272,213.0	223.00	25.00	0.00	66	10.0	8.0	Y
R29 - 3rd Level	360	1	37,319,384.0	12,272,264.0	223.00	25.00	0.00	66	10.0	8.0	Y
R30 - 3rd Level	361	1	37,319,352.0	12,272,264.0	223.00	25.00	0.00	66	10.0	8.0	Y
R31 - 3rd Level	362	1	37,319,232.0	12,272,121.0	223.00	25.00	0.00	66	10.0	8.0	Y
R32 - 3rd Level	363	1	37,319,272.0	12,272,212.0	223.00	25.00	0.00	66	10.0	8.0	Y
R33 - 3rd Level	365	1	37,319,308.0	12,272,287.0	223.00	25.00	0.00	66	10.0	8.0	Y
R34 - 3rd Level	366	1	37,319,300.0	12,272,315.0	223.00	25.00	0.00	66	10.0	8.0	Y
R35 - 3rd Level	367	1	37,319,136.0	12,272,166.0	223.00	25.00	0.00	66	10.0	8.0	Y
R36 - 3rd Level	368	1	37,319,160.0	12,272,286.0	223.00	25.00	0.00	66	10.0	8.0	Y
R37 - 3rd Level	369	1	37,319,032.0	12,272,188.0	223.00	25.00	0.00	66	10.0	8.0	Y
R38 - 3rd Level	370	1	37,318,976.0	12,272,191.0	223.00	25.00	0.00	66	10.0	8.0	Y
R9 - 4th Level	371	1	37,319,408.0	12,272,020.0	223.00	35.00	0.00	66	10.0	8.0	Y
R10 - 4th Level	372	1	37,319,436.0	12,272,066.0	223.00	35.00	0.00	66	10.0	8.0	Y
R11 - 4th Level	373	1	37,319,436.0	12,272,099.0	223.00	35.00	0.00	66	10.0	8.0	Y
R12 - 4th Level	374	1	37,319,384.0	12,272,016.0	223.00	35.00	0.00	66	10.0	8.0	Y
R13 - 4th Level	375	1	37,319,476.0	12,272,083.0	223.00	35.00	0.00	66	10.0	8.0	Y
R14 - 4th Level	376	1	37,319,480.0	12,272,108.0	223.00	35.00	0.00	66	10.0	8.0	Y
R15 - 4th Level	377	1	37,319,460.0	12,272,145.0	223.00	35.00	0.00	66	10.0	8.0	Y
R16 - 4th Level	378	1	37,319,428.0	12,272,166.0	223.00	35.00	0.00	66	10.0	8.0	Y
R17 - 4th Level	379	1	37,319,376.0	12,272,042.0	223.00	35.00	0.00	66	10.0	8.0	Y
R18 - 4th Level	380	1	37,319,416.0	12,272,107.0	223.00	35.00	0.00	66	10.0	8.0	Y
R19 - 4th Level	381	1	37,319,384.0	12,272,122.0	223.00	35.00	0.00	66	10.0	8.0	Y
R20 - 4th Level	382	1	37,319,340.0	12,272,115.0	223.00	35.00	0.00	66	10.0	8.0	Y
R21 - 4th Level	383	1	37,319,364.0	12,272,151.0	223.00	35.00	0.00	66	10.0	8.0	Y
R22 - 4th Level	384	1	37,319,408.0	12,272,201.0	223.00	35.00	0.00	66	10.0	8.0	Y
R23 - 4th Level	385	1	37,319,408.0	12,272,225.0	223.00	35.00	0.00	66	10.0	8.0	Y
R24 - 4th Level	386	1	37,319,296.0	12,272,073.0	223.00	35.00	0.00	66	10.0	8.0	Y
R25 - 4th Level	387	1	37,319,348.0	12,272,039.0	223.00	35.00	0.00	66	10.0	8.0	Y
R26 - 4th Level	388	1	37,319,284.0	12,272,089.0	223.00	35.00	0.00	66	10.0	8.0	Y
R27 - 4th Level	389	1	37,319,324.0	12,272,158.0	223.00	35.00	0.00	66	10.0	8.0	Y

**INPUT: RECEIVERS**

**9641**

R28 - 4th Level	390	1	37,319,356.0	12,272,213.0	223.00	35.00	0.00	66	10.0	8.0	Y
R29 - 4th Level	391	1	37,319,384.0	12,272,264.0	223.00	35.00	0.00	66	10.0	8.0	Y
R30 - 4th Level	392	1	37,319,352.0	12,272,264.0	223.00	35.00	0.00	66	10.0	8.0	Y
R31 - 4th Level	393	1	37,319,232.0	12,272,121.0	223.00	35.00	0.00	66	10.0	8.0	Y
R32 - 4th Level	394	1	37,319,272.0	12,272,212.0	223.00	35.00	0.00	66	10.0	8.0	Y
R33 - 4th Level	395	1	37,319,308.0	12,272,287.0	223.00	35.00	0.00	66	10.0	8.0	Y
R34 - 4th Level	396	1	37,319,300.0	12,272,315.0	223.00	35.00	0.00	66	10.0	8.0	Y
R35 - 4th Level	397	1	37,319,136.0	12,272,166.0	223.00	35.00	0.00	66	10.0	8.0	Y
R36 - 4th Level	398	1	37,319,160.0	12,272,286.0	223.00	35.00	0.00	66	10.0	8.0	Y
R37 - 4th Level	399	1	37,319,032.0	12,272,188.0	223.00	35.00	0.00	66	10.0	8.0	Y
R38 - 4th Level	400	1	37,318,976.0	12,272,191.0	223.00	35.00	0.00	66	10.0	8.0	Y
R17 - 5th Level	401	1	37,319,376.0	12,272,042.0	223.00	45.00	0.00	66	10.0	8.0	Y
R18 - 5th Level	402	1	37,319,416.0	12,272,107.0	223.00	45.00	0.00	66	10.0	8.0	Y
R19 - 5th Level	403	1	37,319,384.0	12,272,122.0	223.00	45.00	0.00	66	10.0	8.0	Y
R20 - 5th Level	404	1	37,319,340.0	12,272,115.0	223.00	45.00	0.00	66	10.0	8.0	Y
R21 - 5th Level	405	1	37,319,364.0	12,272,151.0	223.00	45.00	0.00	66	10.0	8.0	Y
R24 - 5th Level	407	1	37,319,296.0	12,272,073.0	223.00	45.00	0.00	66	10.0	8.0	Y
R25 - 5th Level	408	1	37,319,348.0	12,272,039.0	223.00	45.00	0.00	66	10.0	8.0	Y
R26 - 5th Level	409	1	37,319,284.0	12,272,089.0	223.00	45.00	0.00	66	10.0	8.0	Y
R27 - 5th Level	410	1	37,319,324.0	12,272,158.0	223.00	45.00	0.00	66	10.0	8.0	Y
R28 - 5th Level	411	1	37,319,356.0	12,272,213.0	223.00	45.00	0.00	66	10.0	8.0	Y
R31 - 5th Level	412	1	37,319,232.0	12,272,121.0	223.00	45.00	0.00	66	10.0	8.0	Y
R32 - 5th Level	413	1	37,319,272.0	12,272,212.0	223.00	45.00	0.00	66	10.0	8.0	Y
R35 - 5th Level	414	1	37,319,136.0	12,272,166.0	223.00	45.00	0.00	66	10.0	8.0	Y
R36 - 5th Level	415	1	37,319,160.0	12,272,286.0	223.00	45.00	0.00	66	10.0	8.0	Y
R37 - 5th Level	416	1	37,319,032.0	12,272,188.0	223.00	45.00	0.00	66	10.0	8.0	Y
R38 - 5th Level	417	1	37,318,976.0	12,272,191.0	223.00	45.00	0.00	66	10.0	8.0	Y
R39 - Rec Area	418	1	37,319,424.0	12,272,134.0	223.00	5.00	0.00	66	10.0	8.0	Y
R40 - Rec Area	419	1	37,319,408.0	12,272,171.0	223.00	5.00	0.00	66	10.0	8.0	Y
R41 - Rec Area	420	1	37,319,416.0	12,272,186.0	223.00	5.00	0.00	66	10.0	8.0	Y
R42 - Rec Area	421	1	37,319,332.0	12,272,291.0	223.00	5.00	0.00	66	10.0	8.0	Y
R43 - Rec Area	423	1	37,319,216.0	12,272,288.0	223.00	5.00	0.00	66	10.0	8.0	Y
R44 - Rec Area	424	1	37,319,196.0	12,272,318.0	223.00	5.00	0.00	66	10.0	8.0	Y
R45 - Resi's northeast of Project	426	1	37,319,512.0	12,272,516.0	160.00	5.00	0.00	66	10.0	8.0	Y

Dudek M Greene / S Tang	4 August 2016 TNM 2.5
INPUT: BARRIERS PROJECT/CONTRACT: RUN:	9641 Solana Torrance MF Resi - FWP 072716

Barrier									Points										
Name	Type	Height		If Wall	If Berm		Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment			On	Important	
		Min	Max	\$ per Unit Area	\$ per Unit Vol.	Top Width	Run:Rise	\$ per Unit Length		X	Y	Z	at Point	Seg Ht	Perturbs	#Up	#Dn	Struct?	Reflec-tions?
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft		ft	ft	ft	ft	ft	ft				
Bldg A Northeast	W	0.00	100.00	0.00				0.00	point110	110	37,319,416.0	12,272,157.0	223.00	50.00	0.00	0	0		
									point112	112	37,319,440.0	12,272,169.0	223.00	50.00	0.00	0	0		
									point113	113	37,319,444.0	12,272,159.0	223.00	50.00	0.00	0	0		
									point114	114	37,319,448.0	12,272,161.0	223.00	50.00	0.00	0	0		
									point115	115	37,319,480.0	12,272,101.0	223.00	50.00	0.00	0	0		
									point116	116	37,319,480.0	12,272,098.0	223.00	50.00	0.00	0	0		
									point117	117	37,319,480.0	12,272,087.0	223.00	50.00	0.00	0	0		
									point118	118	37,319,460.0	12,272,075.0	223.00	50.00					
Bldg C West	W	0.00	100.00	0.00				0.00	point239	239	37,318,876.0	12,272,256.0	223.00	60.00	0.00	0	0		
									point233	233	37,318,876.0	12,272,251.0	223.00	60.00	0.00	0	0		
									point234	234	37,318,888.0	12,272,249.0	223.00	60.00	0.00	0	0		
									point235	235	37,318,880.0	12,272,219.0	223.00	60.00	0.00	0	0		
									point236	236	37,318,816.0	12,272,237.0	223.00	60.00	0.00	0	0		
									point237	237	37,318,820.0	12,272,264.0	223.00	60.00	0.00	0	0		
									point111	111	37,318,832.0	12,272,261.0	223.00	60.00					
Bldg C North	W	0.00	100.00	0.00				0.00	point241	241	37,318,896.0	12,272,284.0	223.00	50.00	0.00	0	0		
									point213	213	37,318,960.0	12,272,270.0	223.00	50.00	0.00	0	0		
									point214	214	37,318,960.0	12,272,263.0	223.00	60.00	0.00	0	0		
									point215	215	37,318,976.0	12,272,260.0	223.00	60.00	0.00	0	0		
									point216	216	37,318,980.0	12,272,277.0	223.00	60.00	0.00	0	0		
									point217	217	37,318,976.0	12,272,279.0	223.00	60.00	0.00	0	0		
									point218	218	37,318,984.0	12,272,305.0	223.00	60.00	0.00	0	0		
									point219	219	37,318,992.0	12,272,302.0	223.00	60.00	0.00	0	0		
									point220	220	37,318,996.0	12,272,307.0	223.00	60.00	0.00	0	0		
									point221	221	37,319,008.0	12,272,303.0	223.00	60.00	0.00	0	0		
									point222	222	37,318,996.0	12,272,239.0	223.00	60.00	0.00	0	0		
									point223	223	37,318,988.0	12,272,241.0	223.00	60.00	0.00	0	0		
									point224	224	37,318,988.0	12,272,231.0	223.00	60.00	0.00	0	0		
									point225	225	37,318,892.0	12,272,253.0	223.00	60.00					
Bldg C East	W	0.00	100.00	0.00				0.00	point243	243	37,319,024.0	12,272,178.0	223.00	60.00	0.00	0	0		
									point208	208	37,319,040.0	12,272,249.0	223.00	60.00	0.00	0	0		
									point209	209	37,319,040.0	12,272,260.0	223.00	60.00	0.00	0	0		
									point210	210	37,319,012.0	12,272,265.0	223.00	60.00	0.00	0	0		
									point211	211	37,318,996.0	12,272,185.0	223.00	60.00					
Bldg C	W	0.00	100.00	0.00				0.00	point245	245	37,318,896.0	12,272,244.0	223.00	60.00	0.00	0	0		
									point227	227	37,318,996.0	12,272,221.0	223.00	60.00	0.00	0	0		
									point228	228	37,318,988.0	12,272,194.0	223.00	60.00	0.00	0	0		



INPUT: BARRIERS

9641

									point128	128	37,319,416.0	12,272,037.0	223.00	60.00				
Bldg A	W	0.00	100.00	0.00			0.00		point264	264	37,319,380.0	12,272,236.0	223.00	50.00	0.00	0	0	
									point136	136	37,319,388.0	12,272,229.0	223.00	50.00	0.00	0	0	
									point137	137	37,319,392.0	12,272,234.0	223.00	50.00	0.00	0	0	
									point138	138	37,319,416.0	12,272,218.0	223.00	50.00	0.00	0	0	
									point139	139	37,319,396.0	12,272,187.0	223.00	50.00	0.00	0	0	
									point140	140	37,319,388.0	12,272,191.0	223.00	50.00	0.00	0	0	
									point141	141	37,319,332.0	12,272,104.0	223.00	50.00	0.00	0	0	
									point142	142	37,319,328.0	12,272,105.0	223.00	50.00	0.00	0	0	
									point143	143	37,319,320.0	12,272,091.0	223.00	50.00	0.00	0	0	
									point144	144	37,319,356.0	12,272,065.0	223.00	50.00	0.00	0	0	
									point145	145	37,319,368.0	12,272,080.0	223.00	50.00	0.00	0	0	
									point146	146	37,319,364.0	12,272,083.0	223.00	50.00	0.00	0	0	
									point147	147	37,319,392.0	12,272,133.0	223.00	50.00	0.00	0	0	
									point148	148	37,319,420.0	12,272,115.0	223.00	60.00	0.00	0	0	
									point149	149	37,319,372.0	12,272,037.0	223.00	60.00	0.00	0	0	
									point150	150	37,319,364.0	12,272,042.0	223.00	60.00	0.00	0	0	
									point151	151	37,319,356.0	12,272,034.0	223.00	60.00	0.00	0	0	
									point152	152	37,319,292.0	12,272,077.0	223.00	60.00	0.00	0	0	
									point153	153	37,319,296.0	12,272,086.0	223.00	60.00	0.00	0	0	
									point154	154	37,319,288.0	12,272,092.0	223.00	60.00	0.00	0	0	
									point155	155	37,319,372.0	12,272,233.0	223.00	60.00	0.00	0	0	
									point156	156	37,319,388.0	12,272,259.0	223.00	60.00	0.00	0	0	
									point157	157	37,319,372.0	12,272,270.0	223.00	60.00	0.00	0	0	
									point158	158	37,319,372.0	12,272,267.0	223.00	60.00	0.00	0	0	
									point159	159	37,319,364.0	12,272,273.0	223.00	60.00	0.00	0	0	
									point160	160	37,319,348.0	12,272,249.0	223.00	60.00	0.00	0	0	
									point161	161	37,319,344.0	12,272,242.0	223.00	60.00	0.00	0	0	
									point162	162	37,319,336.0	12,272,232.0	223.00	60.00	0.00	0	0	
									point163	163	37,319,332.0	12,272,234.0	223.00	60.00	0.00	0	0	
									point164	164	37,319,252.0	12,272,105.0	223.00	60.00	0.00	0	0	
									point165	165	37,319,280.0	12,272,088.0	223.00	60.00	0.00	0	0	
									point166	166	37,319,364.0	12,272,228.0	223.00	60.00	0.00	0	0	
Bldg A East - 2	W	0.00	100.00	0.00			0.00		point266	266	37,319,372.0	12,272,024.0	223.00	60.00	0.00	0	0	
									point130	130	37,319,388.0	12,272,049.0	223.00	60.00	0.00	0	0	
									point131	131	37,319,412.0	12,272,032.0	223.00	60.00	0.00	0	0	
									point132	132	37,319,404.0	12,272,018.0	223.00	60.00	0.00	0	0	
									point133	133	37,319,400.0	12,272,020.0	223.00	60.00	0.00	0	0	
									point134	134	37,319,392.0	12,272,010.0	223.00	60.00	0.00	0	0	
Parking Structure / Base	W	0.00	99.99	0.00			0.00		point267	267	37,319,476.0	12,272,133.0	192.00	31.00	0.00	0	0	
									point269	269	37,319,496.0	12,272,091.0	192.00	31.00	0.00	0	0	
									point270	270	37,319,464.0	12,272,073.0	192.00	31.00	0.00	0	0	
									point271	271	37,319,444.0	12,272,074.0	192.00	31.00	0.00	0	0	
									point272	272	37,319,444.0	12,272,072.0	192.00	31.00	0.00	0	0	
									point273	273	37,319,440.0	12,272,069.0	192.00	31.00	0.00	0	0	
									point274	274	37,319,440.0	12,272,067.0	192.00	31.00	0.00	0	0	
									point275	275	37,319,432.0	12,272,010.0	192.00	31.00	0.00	0	0	
									point276	276	37,319,424.0	12,272,001.0	192.00	31.00	0.00	0	0	
									point277	277	37,319,396.0	12,272,003.0	192.00	31.00	0.00	0	0	
									point278	278	37,319,384.0	12,272,012.0	192.00	31.00	0.00	0	0	

INPUT: BARRIERS

9641

									point279	279	37,319,368.0	12,271,984.0	192.00	31.00	0.00	0	0		
									point280	280	37,319,372.0	12,271,979.0	192.00	31.00					
Parking Structure / Base-2	W	0.00	99.99	0.00				0.00	point295	295	37,319,372.0	12,271,973.0	192.00	31.00	0.00	0	0		
									point281	281	37,319,080.0	12,272,149.0	192.00	31.00	0.00	0	0		
									point282	282	37,318,792.0	12,272,215.0	192.00	31.00	0.00	0	0		
									point283	283	37,318,804.0	12,272,280.0	192.00	31.00	0.00	0	0		
									point284	284	37,318,872.0	12,272,268.0	192.00	31.00	0.00	0	0		
									point285	285	37,318,876.0	12,272,298.0	192.00	31.00	0.00	0	0		
									point286	286	37,318,952.0	12,272,334.0	192.00	31.00	0.00	0	0		
									point287	287	37,319,040.0	12,272,314.0	192.00	31.00	0.00	0	0		
									point288	288	37,319,036.0	12,272,274.0	192.00	31.00	0.00	0	0		
									point289	289	37,319,068.0	12,272,267.0	192.00	31.00	0.00	0	0		
									point290	290	37,319,080.0	12,272,330.0	192.00	31.00	0.00	0	0		
									point291	291	37,319,216.0	12,272,321.0	192.00	31.00	0.00	0	0		
									point293	293	37,319,216.0	12,272,339.0	192.00	31.00	0.00	0	0		
									point294	294	37,319,368.0	12,272,330.0	192.00	31.00	0.00	0	0		
									point268	268	37,319,472.0	12,272,139.0	192.00	31.00					

**INPUT: TERRAIN LINES**

9641

<b>Dudek</b>		<b>4 August 2016</b>		
<b>M Greene / S Tang</b>		<b>TNM 2.5</b>		
<b>INPUT: TERRAIN LINES</b>				
<b>PROJECT/CONTRACT:</b>		<b>9641</b>		
<b>RUN:</b>		<b>Solana Torrance MF Resi - FWP 072716</b>		
<b>Terrain Line</b>	<b>Points</b>			
<b>Name</b>	<b>No.</b>	<b>Coordinates (ground)</b>		
		<b>X</b>	<b>Y</b>	<b>Z</b>
		ft	ft	ft
Terrain Line8	65	37,319,212.0	12,272,346.0	192.00
	67	37,319,372.0	12,272,336.0	192.00
	68	37,319,500.0	12,272,102.0	192.00
	69	37,319,512.0	12,272,073.0	192.00
Toe of Slope	126	37,319,624.0	12,271,954.0	192.00
	99	37,319,604.0	12,271,942.0	192.00
	100	37,319,588.0	12,271,941.0	192.00
	101	37,319,568.0	12,271,946.0	192.00
	102	37,319,544.0	12,271,960.0	192.00
	103	37,319,536.0	12,271,969.0	192.00
	104	37,319,468.0	12,271,962.0	192.00
	105	37,319,388.0	12,271,966.0	192.00
	106	37,319,236.0	12,272,060.0	192.00
	107	37,319,080.0	12,272,151.0	192.00
	108	37,318,792.0	12,272,215.0	192.00
Terrain Line	128	37,319,572.0	12,271,913.0	210.00
	110	37,319,528.0	12,271,913.0	220.00
	111	37,319,500.0	12,271,913.0	240.00
	112	37,319,476.0	12,271,909.0	260.00
	113	37,319,388.0	12,271,923.0	280.00
	114	37,319,312.0	12,271,955.0	300.00
	115	37,319,300.0	12,271,969.0	330.00
	116	37,319,208.0	12,272,017.0	360.00
	117	37,319,188.0	12,272,014.0	380.00
	118	37,319,108.0	12,272,062.0	380.00
	119	37,319,028.0	12,272,105.0	380.00

**INPUT: TERRAIN LINES**

**9641**

	120	37,318,964.0	12,272,105.0	380.00
	121	37,318,896.0	12,272,120.0	380.00
	122	37,318,864.0	12,272,126.0	380.00
	66	37,318,824.0	12,272,158.0	380.00



**RESULTS: SOUND LEVELS**

**9641**

R8 - P1	271	1	0.0	72.1	66	72.1	10	Snd Lvl	72.1	0.0	8	-8.0
R9 - 1st Level	272	1	0.0	63.6	66	63.6	10	----	63.6	0.0	8	-8.0
R10 - 1st Level	273	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
R11 - 1st Level	274	1	0.0	43.5	66	43.5	10	----	43.5	0.0	8	-8.0
R12 - 1st Level	275	1	0.0	44.7	66	44.7	10	----	44.7	0.0	8	-8.0
R13 - 1st Level	276	1	0.0	67.0	66	67.0	10	Snd Lvl	67.0	0.0	8	-8.0
R14 - 1st Level	277	1	0.0	71.4	66	71.4	10	Snd Lvl	71.4	0.0	8	-8.0
R15 - 1st Level	278	1	0.0	71.5	66	71.5	10	Snd Lvl	71.5	0.0	8	-8.0
R16 - 1st Level	279	1	0.0	56.6	66	56.6	10	----	56.6	0.0	8	-8.0
R17 - 1st Level	281	1	0.0	33.6	66	33.6	10	----	33.6	0.0	8	-8.0
R18 - 1st Level	282	1	0.0	39.6	66	39.6	10	----	39.6	0.0	8	-8.0
R19 - 1st Level	283	1	0.0	43.5	66	43.5	10	----	43.5	0.0	8	-8.0
R20 - 1st Level	284	1	0.0	42.0	66	42.0	10	----	42.0	0.0	8	-8.0
R21 - 1st Level	286	1	0.0	45.8	66	45.8	10	----	45.8	0.0	8	-8.0
R22 - 1st Level	287	1	0.0	58.7	66	58.7	10	----	58.7	0.0	8	-8.0
R23 - 1st Level	289	1	0.0	63.3	66	63.3	10	----	63.3	0.0	8	-8.0
R24 - 1st Level	290	1	0.0	47.8	66	47.8	10	----	47.8	0.0	8	-8.0
R25 - 1st Level	291	1	0.0	48.1	66	48.1	10	----	48.1	0.0	8	-8.0
R26 - 1st Level	292	1	0.0	34.1	66	34.1	10	----	34.1	0.0	8	-8.0
R27 - 1st Level	295	1	0.0	32.6	66	32.6	10	----	32.6	0.0	8	-8.0
R28 - 1st Level	298	1	0.0	33.1	66	33.1	10	----	33.1	0.0	8	-8.0
R29 - 1st Level	300	1	0.0	63.4	66	63.4	10	----	63.4	0.0	8	-8.0
R30 - 1st Level	301	1	0.0	52.5	66	52.5	10	----	52.5	0.0	8	-8.0
R31 - 1st Level	302	1	0.0	40.8	66	40.8	10	----	40.8	0.0	8	-8.0
R32 - 1st Level	303	1	0.0	43.8	66	43.8	10	----	43.8	0.0	8	-8.0
R33 - 1st Level	304	1	0.0	53.3	66	53.3	10	----	53.3	0.0	8	-8.0
R34 - 1st Level	305	1	0.0	62.5	66	62.5	10	----	62.5	0.0	8	-8.0
R35 - 1st Level	306	1	0.0	44.8	66	44.8	10	----	44.8	0.0	8	-8.0
R36 - 1st Level	307	1	0.0	54.5	66	54.5	10	----	54.5	0.0	8	-8.0
R37 - 1st Level	308	1	0.0	40.3	66	40.3	10	----	40.3	0.0	8	-8.0
R38 - 1st Level	309	1	0.0	39.1	66	39.1	10	----	39.1	0.0	8	-8.0
R9 - 2nd Level	310	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
R10 - 2nd Level	311	1	0.0	65.3	66	65.3	10	----	65.3	0.0	8	-8.0
R11 - 2nd Level	312	1	0.0	46.4	66	46.4	10	----	46.4	0.0	8	-8.0
R12 - 2nd Level	313	1	0.0	49.2	66	49.2	10	----	49.2	0.0	8	-8.0
R13 - 2nd Level	314	1	0.0	68.2	66	68.2	10	Snd Lvl	68.2	0.0	8	-8.0
R14 - 2nd Level	315	1	0.0	71.3	66	71.3	10	Snd Lvl	71.3	0.0	8	-8.0
R15 - 2nd Level	316	1	0.0	71.3	66	71.3	10	Snd Lvl	71.3	0.0	8	-8.0
R16 - 2nd Level	317	1	0.0	68.3	66	68.3	10	Snd Lvl	68.3	0.0	8	-8.0
R17 - 2nd Level	318	1	0.0	35.3	66	35.3	10	----	35.3	0.0	8	-8.0
R18 - 2nd Level	319	1	0.0	42.1	66	42.1	10	----	42.1	0.0	8	-8.0
R19 - 2nd Level	320	1	0.0	44.3	66	44.3	10	----	44.3	0.0	8	-8.0

**RESULTS: SOUND LEVELS**

**9641**

R20 - 2nd Level	321	1	0.0	41.7	66	41.7	10	----	41.7	0.0	8	-8.0
R21 - 2nd Level	322	1	0.0	47.1	66	47.1	10	----	47.1	0.0	8	-8.0
R22 - 2nd Level	323	1	0.0	69.1	66	69.1	10	Snd Lvl	69.1	0.0	8	-8.0
R23 - 2nd Level	324	1	0.0	70.3	66	70.3	10	Snd Lvl	70.3	0.0	8	-8.0
R24 - 2nd Level	325	1	0.0	48.1	66	48.1	10	----	48.1	0.0	8	-8.0
R25 - 2nd Level	326	1	0.0	50.0	66	50.0	10	----	50.0	0.0	8	-8.0
R26 - 2nd Level	327	1	0.0	36.2	66	36.2	10	----	36.2	0.0	8	-8.0
R27 - 2nd Level	328	1	0.0	34.5	66	34.5	10	----	34.5	0.0	8	-8.0
R28 - 2nd Level	329	1	0.0	36.3	66	36.3	10	----	36.3	0.0	8	-8.0
R29 - 2nd Level	330	1	0.0	70.6	66	70.6	10	Snd Lvl	70.6	0.0	8	-8.0
R30 - 2nd Level	331	1	0.0	59.9	66	59.9	10	----	59.9	0.0	8	-8.0
R31 - 2nd Level	332	1	0.0	41.8	66	41.8	10	----	41.8	0.0	8	-8.0
R32 - 2nd Level	333	1	0.0	43.6	66	43.6	10	----	43.6	0.0	8	-8.0
R33 - 2nd Level	334	1	0.0	61.4	66	61.4	10	----	61.4	0.0	8	-8.0
R34 - 2nd Level	335	1	0.0	65.5	66	65.5	10	----	65.5	0.0	8	-8.0
R35 - 2nd Level	336	1	0.0	47.1	66	47.1	10	----	47.1	0.0	8	-8.0
R36 - 2nd Level	337	1	0.0	59.6	66	59.6	10	----	59.6	0.0	8	-8.0
R37 - 2nd Level	338	1	0.0	43.0	66	43.0	10	----	43.0	0.0	8	-8.0
R38 - 2nd Level	339	1	0.0	41.9	66	41.9	10	----	41.9	0.0	8	-8.0
R9 - 3rd Level	340	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
R10 - 3rd Level	341	1	0.0	65.3	66	65.3	10	----	65.3	0.0	8	-8.0
R11 - 3rd Level	342	1	0.0	45.5	66	45.5	10	----	45.5	0.0	8	-8.0
R12 - 3rd Level	343	1	0.0	51.3	66	51.3	10	----	51.3	0.0	8	-8.0
R13 - 3rd Level	344	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	8	-8.0
R14 - 3rd Level	345	1	0.0	71.1	66	71.1	10	Snd Lvl	71.1	0.0	8	-8.0
R15 - 3rd Level	346	1	0.0	71.1	66	71.1	10	Snd Lvl	71.1	0.0	8	-8.0
R16 - 3rd Level	347	1	0.0	68.1	66	68.1	10	Snd Lvl	68.1	0.0	8	-8.0
R17 - 3rd Level	348	1	0.0	36.6	66	36.6	10	----	36.6	0.0	8	-8.0
R18 - 3rd Level	349	1	0.0	41.1	66	41.1	10	----	41.1	0.0	8	-8.0
R19 - 3rd Level	350	1	0.0	46.9	66	46.9	10	----	46.9	0.0	8	-8.0
R20 - 3rd Level	351	1	0.0	42.9	66	42.9	10	----	42.9	0.0	8	-8.0
R21 - 3rd Level	352	1	0.0	49.9	66	49.9	10	----	49.9	0.0	8	-8.0
R22 - 3rd Level	353	1	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	8	-8.0
R23 - 3rd Level	354	1	0.0	70.0	66	70.0	10	Snd Lvl	70.0	0.0	8	-8.0
R24 - 3rd Level	355	1	0.0	49.2	66	49.2	10	----	49.2	0.0	8	-8.0
R25 - 3rd Level	356	1	0.0	52.1	66	52.1	10	----	52.1	0.0	8	-8.0
R26 - 3rd Level	357	1	0.0	36.9	66	36.9	10	----	36.9	0.0	8	-8.0
R27 - 3rd Level	358	1	0.0	36.1	66	36.1	10	----	36.1	0.0	8	-8.0
R28 - 3rd Level	359	1	0.0	36.9	66	36.9	10	----	36.9	0.0	8	-8.0
R29 - 3rd Level	360	1	0.0	70.4	66	70.4	10	Snd Lvl	70.4	0.0	8	-8.0
R30 - 3rd Level	361	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
R31 - 3rd Level	362	1	0.0	42.0	66	42.0	10	----	42.0	0.0	8	-8.0

**RESULTS: SOUND LEVELS**

**9641**

R32 - 3rd Level	363	1	0.0	46.0	66	46.0	10	----	46.0	0.0	8	-8.0
R33 - 3rd Level	365	1	0.0	63.3	66	63.3	10	----	63.3	0.0	8	-8.0
R34 - 3rd Level	366	1	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	8	-8.0
R35 - 3rd Level	367	1	0.0	53.4	66	53.4	10	----	53.4	0.0	8	-8.0
R36 - 3rd Level	368	1	0.0	60.8	66	60.8	10	----	60.8	0.0	8	-8.0
R37 - 3rd Level	369	1	0.0	46.1	66	46.1	10	----	46.1	0.0	8	-8.0
R38 - 3rd Level	370	1	0.0	45.9	66	45.9	10	----	45.9	0.0	8	-8.0
R9 - 4th Level	371	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
R10 - 4th Level	372	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
R11 - 4th Level	373	1	0.0	47.6	66	47.6	10	----	47.6	0.0	8	-8.0
R12 - 4th Level	374	1	0.0	52.4	66	52.4	10	----	52.4	0.0	8	-8.0
R13 - 4th Level	375	1	0.0	67.7	66	67.7	10	Snd Lvl	67.7	0.0	8	-8.0
R14 - 4th Level	376	1	0.0	70.7	66	70.7	10	Snd Lvl	70.7	0.0	8	-8.0
R15 - 4th Level	377	1	0.0	70.9	66	70.9	10	Snd Lvl	70.9	0.0	8	-8.0
R16 - 4th Level	378	1	0.0	68.2	66	68.2	10	Snd Lvl	68.2	0.0	8	-8.0
R17 - 4th Level	379	1	0.0	37.4	66	37.4	10	----	37.4	0.0	8	-8.0
R18 - 4th Level	380	1	0.0	43.8	66	43.8	10	----	43.8	0.0	8	-8.0
R19 - 4th Level	381	1	0.0	52.7	66	52.7	10	----	52.7	0.0	8	-8.0
R20 - 4th Level	382	1	0.0	45.7	66	45.7	10	----	45.7	0.0	8	-8.0
R21 - 4th Level	383	1	0.0	54.9	66	54.9	10	----	54.9	0.0	8	-8.0
R22 - 4th Level	384	1	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	8	-8.0
R23 - 4th Level	385	1	0.0	69.8	66	69.8	10	Snd Lvl	69.8	0.0	8	-8.0
R24 - 4th Level	386	1	0.0	50.9	66	50.9	10	----	50.9	0.0	8	-8.0
R25 - 4th Level	387	1	0.0	52.4	66	52.4	10	----	52.4	0.0	8	-8.0
R26 - 4th Level	388	1	0.0	37.5	66	37.5	10	----	37.5	0.0	8	-8.0
R27 - 4th Level	389	1	0.0	36.6	66	36.6	10	----	36.6	0.0	8	-8.0
R28 - 4th Level	390	1	0.0	37.9	66	37.9	10	----	37.9	0.0	8	-8.0
R29 - 4th Level	391	1	0.0	70.5	66	70.5	10	Snd Lvl	70.5	0.0	8	-8.0
R30 - 4th Level	392	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
R31 - 4th Level	393	1	0.0	44.3	66	44.3	10	----	44.3	0.0	8	-8.0
R32 - 4th Level	394	1	0.0	53.2	66	53.2	10	----	53.2	0.0	8	-8.0
R33 - 4th Level	395	1	0.0	65.1	66	65.1	10	----	65.1	0.0	8	-8.0
R34 - 4th Level	396	1	0.0	67.3	66	67.3	10	Snd Lvl	67.3	0.0	8	-8.0
R35 - 4th Level	397	1	0.0	55.5	66	55.5	10	----	55.5	0.0	8	-8.0
R36 - 4th Level	398	1	0.0	60.9	66	60.9	10	----	60.9	0.0	8	-8.0
R37 - 4th Level	399	1	0.0	46.2	66	46.2	10	----	46.2	0.0	8	-8.0
R38 - 4th Level	400	1	0.0	46.7	66	46.7	10	----	46.7	0.0	8	-8.0
R17 - 5th Level	401	1	0.0	38.6	66	38.6	10	----	38.6	0.0	8	-8.0
R18 - 5th Level	402	1	0.0	43.9	66	43.9	10	----	43.9	0.0	8	-8.0
R19 - 5th Level	403	1	0.0	58.9	66	58.9	10	----	58.9	0.0	8	-8.0
R20 - 5th Level	404	1	0.0	50.1	66	50.1	10	----	50.1	0.0	8	-8.0
R21 - 5th Level	405	1	0.0	59.5	66	59.5	10	----	59.5	0.0	8	-8.0

**RESULTS: SOUND LEVELS**

**9641**

R24 - 5th Level	407	1	0.0	51.4	66	51.4	10	----	51.4	0.0	8	-8.0
R25 - 5th Level	408	1	0.0	53.4	66	53.4	10	----	53.4	0.0	8	-8.0
R26 - 5th Level	409	1	0.0	39.0	66	39.0	10	----	39.0	0.0	8	-8.0
R27 - 5th Level	410	1	0.0	38.5	66	38.5	10	----	38.5	0.0	8	-8.0
R28 - 5th Level	411	1	0.0	39.4	66	39.4	10	----	39.4	0.0	8	-8.0
R31 - 5th Level	412	1	0.0	47.6	66	47.6	10	----	47.6	0.0	8	-8.0
R32 - 5th Level	413	1	0.0	54.1	66	54.1	10	----	54.1	0.0	8	-8.0
R35 - 5th Level	414	1	0.0	56.4	66	56.4	10	----	56.4	0.0	8	-8.0
R36 - 5th Level	415	1	0.0	61.0	66	61.0	10	----	61.0	0.0	8	-8.0
R37 - 5th Level	416	1	0.0	46.4	66	46.4	10	----	46.4	0.0	8	-8.0
R38 - 5th Level	417	1	0.0	46.9	66	46.9	10	----	46.9	0.0	8	-8.0
R39 - Rec Area	418	1	0.0	47.9	66	47.9	10	----	47.9	0.0	8	-8.0
R40 - Rec Area	419	1	0.0	52.5	66	52.5	10	----	52.5	0.0	8	-8.0
R41 - Rec Area	420	1	0.0	58.0	66	58.0	10	----	58.0	0.0	8	-8.0
R42 - Rec Area	421	1	0.0	57.3	66	57.3	10	----	57.3	0.0	8	-8.0
R43 - Rec Area	423	1	0.0	52.6	66	52.6	10	----	52.6	0.0	8	-8.0
R44 - Rec Area	424	1	0.0	61.0	66	61.0	10	----	61.0	0.0	8	-8.0
R45 - Resi's northeast of Project	426	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
<b>Dwelling Units</b>		<b># DUs</b>	<b>Noise Reduction</b>									
			<b>Min</b>	<b>Avg</b>	<b>Max</b>							
			<b>dB</b>	<b>dB</b>	<b>dB</b>							
All Selected		169	0.0	0.0	0.0							
All Impacted		46	0.0	0.0	0.0							
All that meet NR Goal		0	0.0	0.0	0.0							

### RAY-TRACE PROGRAM (FOR A POINT-SOURCE)

Uses the Equation:  $(A_{e4})_{point} = 20 \cdot \log[(2 \cdot \pi \cdot N)^{1/2} / \tanh(2 \cdot \pi \cdot N)^{1/2}] + 5 \text{dB}$   
 (Ref. Pg.174, Noise and Vibration Control, L.L. Beranek Editor, 1971 Ed.)

Project: Solana Torrance Residential  
 Date: 8/3/16  
 By: MGG

Please Enter: Using English (E) units or Metric (M) units ? E

Ray Trace Number/Description	Source-Receiver Distance (ft. or m)	Source Base Elev. (ft. or m)	Source Height above Ground (ft. or m)	Receiver Base Elev. (ft. or m)	Receiver Height above Ground (ft. or m)	Horizontal Barrier Dist. (in ref. to source) (ft. or m)	Barrier Base Elev. (ft. or m)	Barrier Height (ft. or m)	Dominant Freq.(Hz)	Source-Rcvr Straight-Line Dist. (ft. or m)	Source-Top-of-Barrier Dist. (ft. or m)	Receiver-Top-of-Barrier Dist. (ft. or m)	Lambda	N <sub>max</sub>	AE <sub>(barriers)</sub> (dB)
1. Source -Traffic Noise, Hawthorne Blvd. Receiver: R4, P3	85.0	180.0	4.0	192.0	5.0	80.0	192.0	6.0	500.0	86.0	81.2	5.1	2.3	0.3	8.8
2. Source -Traffic Noise, Hawthorne Blvd. Receiver: R8, P1	85.0	185.0	4.0	212.0	5.0	80.0	212.0	6.0	500.0	89.5	85.1	5.1	2.3	0.6	11.2
3. Source -Traffic Noise, Hawthorne Blvd. Receiver: R14, 1st Floor	90.0	185.0	4.0	223.0	5.0	80.0	223.0	6.0	500.0	98.1	89.4	10.0	2.3	1.2	14.0
3. Source -Traffic Noise, Hawthorne Blvd. Receiver: R14, 4th Floor	90.0	185.0	4.0	253.0	5.0	80.0	253.0	6.0	500.0	113.4	106.3	10.0	2.3	2.6	17.2