APPENDIX F - NOISE

Ambient Air Quality and Noise Consulting. *Noise Impact Assessment*. February 2009

NOISE IMPACT ASSESSMENT

FOR

FERRINI RANCH SUBDIVISION

TORO PLANNING AREA
MONTEREY COUNTY, CA

FEBRUARY 11, 2009

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NOISE

INTRODUCTION

This section includes a summary of applicable regulations, a description of ambient noise conditions, and an analysis of potential noise impacts of the proposed project. Mitigation measures are recommended, as necessary, to reduce significant noise impacts.

ACOUSTIC FUNDAMENTALS

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound is mechanical energy transmitted in the form of a wave because of a disturbance or vibration. Sound levels are described in terms of both amplitude and frequency.

AMPLITUDE

Amplitude is defined as the difference between ambient air pressure and the peak pressure of the sound wave. Amplitude is measured in decibels (dB) on a logarithmic scale. For example, a 65 dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). Amplitude is interpreted by the ear as corresponding to different degrees of loudness. Laboratory measurements correlate a 10 dB increase in amplitude with a perceived doubling of loudness and establish a 3 dB change in amplitude as the minimum audible difference perceptible to the average person.

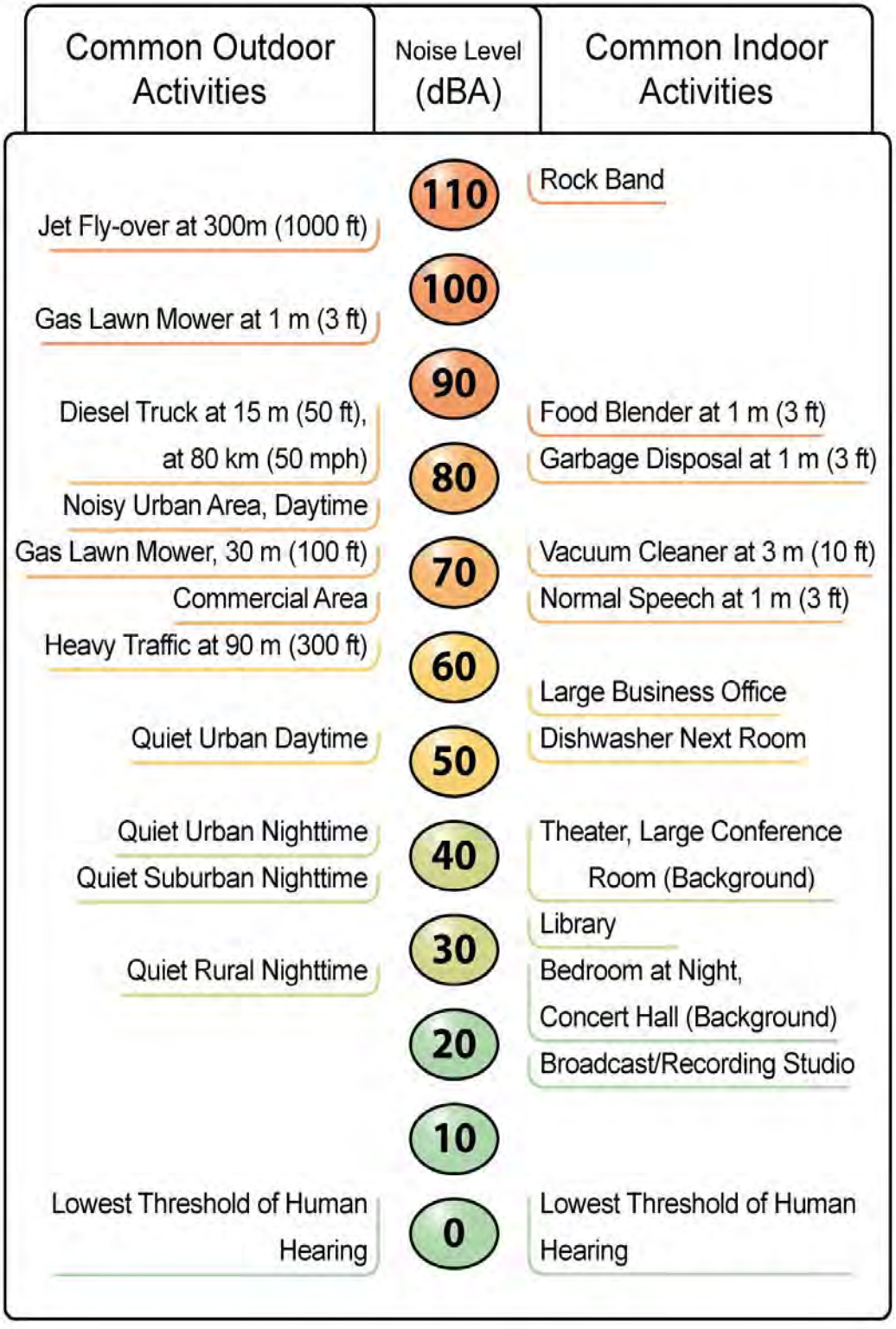
FREQUENCY

The frequency of a sound is defined as the number of fluctuations of the pressure wave per second. The unit of frequency is the Hertz (Hz). One Hz equals one cycle per second. The human ear is not equally sensitive to sound of different frequencies. For instance, the human ear is more sensitive to sound in the higher portion of this range than in the lower and sound waves below 16 Hz or above 20,000 Hz cannot be heard at all. To approximate the sensitivity of the human ear to changes in frequency, environmental sound is usually measured in what is referred to as "A-weighted decibels" (dBA). On this scale, the normal range of human hearing extends from about 10 dBA to about 140 dBA (U.S. EPA 1971). Common community noise sources and associated noise levels, in dBA, are depicted in **Figure 1**.

ADDITION OF DECIBELS

Because decibels are logarithmic units, sound levels cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces a sound level of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB; rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together would produce an increase of 5 dB.

Figure 1
Common Noise Levels



Source: Caltrans 2008

SOUND PROPAGATION & ATTENUATION

Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level decreases (attenuates) at a rate of approximately 6 decibels for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and, hence, can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 decibels for each doubling of distance from a line source, depending on ground surface characteristics. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water,), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 decibels per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation for soft surfaces results in an overall attenuation rate of 4.5 decibels per doubling of distance from the source.

Atmospheric Effects

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) from the highway due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also affect traffic noise levels.

Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in minimum 5 dB of noise reduction. Taller barriers provide increased noise reduction.

NOISE DESCRIPTORS

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. 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 in the range of audible frequencies as well as in the way it perceives the sound-pressure level in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz, and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those

frequencies, which is referred to as the "A-weighted" sound level (expressed in units of dBA). The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of 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 problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with environmental noise.

The intensity of environmental noise fluctuates over time, and several descriptors of time-averaged noise levels are typically used. For the evaluation of environmental noise, the most commonly used descriptors are L_{eq}, L_{dn}, CNEL and SEL. The energy-equivalent noise level, L_{eq}, is a measure of the average energy content (intensity) of noise over any given period. Many communities use 24-hour descriptors of noise levels to regulate noise. The day-night average noise level, L_{dn}, is the 24-hour average of the noise intensity, with a 10-dBA "penalty" added for nighttime noise (10 p.m. to 7 a.m.) to account for the greater sensitivity to noise during this period. CNEL, the community equivalent noise level, is similar to L_{dn} but adds an additional 5-dBA penalty for evening noise (7 p.m. to 10 p.m.) Another descriptor that is commonly discussed is the single-event noise exposure level, also referred to as the sound-exposure level, expressed as SEL. The SEL describes a receiver's cumulative noise exposure from a single noise event, which is defined as an acoustical event of short duration (0.5 second), such as a backup beeper, the sound of an airplane traveling overhead, or a train whistle. Common noise level descriptors are summarized in **Table 1**.

Table 1
Common Acoustical Descriptors

Descriptor	Definition
Energy Equivalent Noise Level (L_{eq})	The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value (in dBA) is calculated.
Minimum Noise Level (L_{min})	The minimum instantaneous noise level during a specific period of time.
Maximum Noise Level (L_{max})	The maximum instantaneous noise level during a specific period of time.
Day-Night Average Noise Level (DNL or L_{dn})	The DNL was first recommended by the U.S. EPA in 1974 as a "simple, uniform and appropriate way" of measuring long term environmental noise. DNL takes into account both the frequency of occurrence and duration of all noise events during a 24-hour period with a 10 dBA "penalty" for noise events that occur between the more noise-sensitive hours of 10:00 p.m. and 7:00 a.m. In other words, 10 dBA is "added" to noise events that occur in the nighttime hours to account for increases sensitivity to noise during these hours.
Community Noise Equivalent Level (CNEL)	The CNEL is similar to the Ldn described above, but with an additional 5 dBA "penalty" added to noise events that occur between the hours of 7:00 p.m. to 10:00 p.m. The calculated CNEL is typically approximately 0.5 dBA higher than the calculated Ldn.
Single Event Level (SEL)	The level of sound accumulated over a given time interval or event. Technically, the sound exposure level is the level of the time-integrated mean square A-weighted sound for a stated time interval or event, with a reference time of one second.

HUMAN RESPONSE TO NOISE

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases. The acceptability of noise and the threat to public well-being are the basis for land use planning policies preventing exposure to excessive community noise levels.

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise over differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted: the so-called "ambient" environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged. Regarding increases in A-weighted noise levels, knowledge of the following relationships will be helpful in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived by humans;
- Outside of the laboratory, a 3-dB change is considered a just-perceivable difference;
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected. An increase of 5 dB is typically considered substantial;
- A 10-dB change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

A limitation of using a single noise-level increase value to evaluate noise impacts, as discussed above, is that it fails to account for pre-project noise conditions. With this in mind, the Federal Interagency Committee on Noise (FICON) developed guidance to be used for the assessment of project-generated increases in noise levels that take into account the ambient noise level. The FICON recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (i.e., CNEL, L_{dn}). FICON-recommended noise evaluation criteria are summarized in **Table 2** (FICON 2000).

Table 2 Federal Interagency Committee on Noise Recommended Criteria for Evaluation of Increases in Ambient Noise Levels	
Ambient Noise Level Without Project	**Increase Required for Significant Impact**
< 60 dB	5.0 dB, or greater
60-65 dB	3.0 dB, or greater
> 65 dB	1.5 dB, or greater
Source: FICON 2000	

As depicted in **Table 2**, an increase in the traffic noise level of 5.0, or greater, would typically be considered to result in increased levels of annoyance where existing ambient noise levels are less than 60 dB. Within areas where the ambient noise level ranges from 60 to 65 dB, increased levels of annoyance would be anticipated at increases of 3 dB, or greater. Increases of 1.5 dB, or greater, could result in increased levels of annoyance in areas where the ambient noise level exceeds 65 dB. The rationale for the FICON-recommended criteria is that as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause significant increases in annoyance (FICON 2000).

EFFECTS OF NOISE ON HUMAN ACTIVITIES

The extent to which environmental noise is deemed to result in increased levels of annoyance, activity interference, and sleep disruption varies greatly from individual to individual depending on various factors, including the loudness or suddenness of the noise, the information value of the noise (e.g., aircraft overflights, child crying, fire alarm), and an individual's sleep state and sleep habits. Over time, adaptation to noise events and increased levels of noise may also occur. In terms of land use compatibility, environmental noise is often evaluated in terms of the potential for noise events to result in increased levels of annoyance, sleep disruption, or interference with speech communication, activities, and learning.

SPEECH COMMUNICATION

For most noise-sensitive land uses, an interior noise level of 45 dBA L_{eq} is typically identified for the protection of speech communication in order to provide for 100-percent intelligibility of speech sounds. Assuming an average 20-dB reduction in sound level between outdoors and indoors (which is an average amount of sound attenuation that assumes windows are closed), this interior noise level would equates to an exterior noise level of 65 dBA L_{eq}. For outdoor voice communication, an exterior noise level of 60 dBA L_{eq} allows normal conversation at distances up to 2 meters with 95 percent sentence intelligibility (U.S. EPA 1974.) Based on this information, speech interference begins to become a problem when steady noise levels reach approximately 60 to 65 dBA (Caltrans 2002(a.)

LEARNING

Closely related to speech interference are the effects of noise on learning and, more broadly, on cognitive tasks. Recent studies have shown a strong relationship between noise and children's reading ability. Children's attention spans also appear to be adversely affected by noise. Adults are affected as well. Some studies indicate that, in a noisy environment, adults have increased difficulty accomplishing complex tasks. One of the issues associated with assessment of these effects is which noise metric correlates most closely with the impacts. For

example, DNL, with its nighttime weighting, may not be the best measure of noise impacts on schools given that operational activities are often limited to the daytime hours (Caltrans 2002(a.)

As discussed above, an interior noise level of 45 dBA L_{eq} would typically provide for 100-percent speech intelligibility. The acceptability of interior noise levels are also source dependent, depending on the perceived intrusiveness of the source. For instance, traffic noise is generally considered to be less intrusive than noise generated by construction activities. With regard to transportation sources, the California Department of Transportation has adopted abatement criteria that limit the maximum interior average-hourly noise level within classrooms, as well as other noise-sensitive interior uses, to 52 dBA L_{eq} (Caltrans 2006.)

ANNOYANCE & SLEEP DISRUPTION

With regard to potential increases in annoyance, activity interference, and sleep disruption, land use compatibility determinations are typically based on the use of the cumulative noise exposure metrics (i.e., CNEL or L_{dn}). Perhaps the most comprehensive and widely accepted evaluation of the relationship between noise exposure and the extent of annoyance was one originally developed by Theodore J. Schultz in 1978. In 1978 the research findings of Theodore J. Schultz provided support for Ldn as the descriptor for environmental noise. Research conducted by Schultz identified a correlation between the cumulative noise exposure metric and individuals who were highly annoyed by transportation noise. The Schultz curve, expressing this correlation, became a basis for noise standards. When expressed graphically, this relationship is typically referred to as the Schultz curve. The Schultz curve indicates that approximately 13 percent of the population is highly annoyed at a noise level of 65 dBA L_{dn}. It also indicates that the percent of people describing themselves as being highly annoyed accelerates smoothly between 55 and 70 dBA L_{dn}. A noise level of 65 dBA L_{dn} is a commonly referenced dividing point between lower and higher rates of people describing themselves as being highly annoyed.

The Schultz curve and associated research became the basis for many of the noise criteria subsequently established for federal, state, and local entities. Most federal and state of California regulations and policies related to transportation noise sources establish a noise level of 65 dBA CNEL/L_{dn} as the basic limit of acceptable noise exposure for residential and other noise-sensitive land uses. For instance, with respect to aircraft noise, both the Federal Aviation Administration (FAA) and the State of California have identified a noise level of 65 dBA L_{dn} as the dividing point between normally compatible and normally incompatible residential land use generally applied for determination of land use compatibility. For noise-sensitive land uses exposed to aircraft noise, noise levels in excess of 65 dBA CNEL/L_{dn} are typically considered to result in a potentially significant increase in levels of annoyance (Caltrans 2002(a.)

Allowing for an average exterior-to-interior noise reduction of 20 dB, an exterior noise level of 65 dBA CNEL/Ldn would equate to an interior noise level of 45 dBA CNEL/L_{dn}. An interior noise level of 45 dB CNEL/L_{dn} is generally considered sufficient to protect against activity interference at most noise-sensitive land uses, including residential dwellings, and would also be sufficient to protect against sleep interference (U.S. EPA, 1974.) Within California, the California Building Code establishes a noise level of 45 dBA CNEL as the maximum acceptable interior noise level for residential uses (other than detached single-family dwellings). Use of the 45 dBA CNEL/L_{dn} threshold is further supported by recommendations provided in the State of California Office of Planning and Research's *General Plan Guidelines* (2002), which recommend an interior noise level of 45 dB CNEL/L_{dn} as the maximum allowable interior noise level sufficient to permit "normal residential activity" (OPR 2002.)

The cumulative noise exposure metric is currently the only noise metric for which there is a substantial body of research data and regulatory guidance defining the relationship between noise exposure, people's reactions, and land use compatibility. However, when evaluating environmental noise impacts involving intermittent noise events, such as aircraft overflights and train passbys, the use of cumulative noise metrics may not provide a thorough understanding of the resultant impact. The general public often finds it difficult to understand the relationship between intermittent noise events and cumulative noise exposure metrics. In such instances, supplemental use of single-event noise metrics, such as the SEL descriptor, may be helpful as a means of increasing public understanding regarding the relationship between these metrics and the extent of the resultant noise impact (Caltrans 2002(a.)

Although the use of supplemental noise descriptors can provide increased understanding of intermittent noise events and relationship to the cumulative noise metrics, current environmental regulations do not identify quantitative criteria, metrics, or computation methods pertaining to single-event noise exposure for determination of land use compatibility. However, with regard to aircraft noise exposure, FICAN has provided non-regulatory guidance for estimating the expected percent of awakenings that may result from single aircraft noise events. For example, at an indoor sound exposure of SEL 80 dBA, the FICAN data indicates that approximately 10 percent of exposed individuals would be awakened. Although some estimates of the percentage of people expected to be awakened when exposed to specific single-event noise levels inside a home have been provided, no quantitative determination as to what frequency of awakening would be acceptable has been made by Federal, State or local entities. Although no quantitative thresholds have yet been identified with regard to single-event noise exposure, the indication from several studies is that the noise threshold for significant occurrence of sleep disruption is higher than for speech interference (Caltrans 2002(a.)

EXISTING ENVIRONMENT

NOISE-SENSITIVE LAND USES

Noise-sensitive land uses generally include those uses where exposure to noise would result in adverse effects, as well as uses where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Other noise-sensitive land uses include hospitals, convalescent facilities, parks, hotels, churches, libraries, and other uses where low interior noise levels are essential.

Noise-sensitive land uses located near the project site consist primarily of residential dwellings. The nearest residential dwellings are located approximately 80 feet from the western property line, across San Benancio Road. Residential dwellings are also located approximately 190 feet north of the project site, across SR 68. Additional noise-sensitive land uses located in the project area include the San Benancio Middle School, which is located adjacent to the western boundary of the project site, and the Toro Park Elementary School, which is located approximately 600 feet north of the project site, across SR 68.

AMBIENT NOISE LEVELS

An ambient noise survey was conducted on May 22, 2007 to document the existing noise environment at various locations within the project area. Measurements were conducted in accordance with the American National Standards Institute (ANSI) acoustical standards using a Larson Davis model 820 sound-level meter. Ambient noise measurement locations and corresponding measured values (i.e., L_{eq}, L_{max}, and L_{min}) are summarized in **Table 3**. Based on the

monitoring conducted, daytime average-hourly noise levels in the project vicinity averaged approximately 55 to 75 dBA L_{eq}. The dominant noise source identified during the survey was vehicle traffic on area roadways. Existing traffic noise levels (in dBA CNEL) along area roadways and distance to existing roadway noise contours are summarized in **Table 4**.

Table 3
Ambient Noise Levels

Location	Primary Noise Sources	Measured Noise Level (dBA)		
		L_{eq}	L_{min}	L_{max}
SR 68 at Torero Dr	Vehicular Traffic	74.8	49.6	85.6
SR 68 at San Benancio Rd	Vehicular Traffic	73.9	48.7	87.2
River Rd at Las Palmas Rd	Vehicular Traffic	70.5	45.2	79.8
San Benancio Rd at San Benancio School	Vehicular Traffic	54.8	43.1	77.6

Noise measurements were conducted on May 22, 2007 using a Larson Davis Model 820 Type I sound-level meter. Based on short-term (i.e., 10-minute) measurements conducted during the daytime hours at approximately 25 feet from the near-travel-lane centerline.

Table 4
Existing Traffic Noise Levels

Roadway Segment	Predicted Noise Level (dBA L_{dn}/CNEL)			
	50 ft from Centerline of Near Travel Lane	Distance to Contours (feet)		
		55	60	65
SR 68, West of Josselyn Canyon Road	73.02	912	424	197
SR 68, Josselyn Canyon Road to Olmsted Road	72.77	879	408	190
SR 68, Olmsted Road to SR 218	73.09	923	429	199
SR 68, SR 218 to Laureles Grade Road	73.60	998	463	215
SR 68, Laureles Grade Road to San Benancio Drive	73.27	949	441	205
SR 68, San Benancio Drive to Torero Drive	73.42	971	451	209
SR 68, East of Torero Drive	72.68	866	402	187
SR 218, North of SR 68	66.02	356	166	79
Josselyn Canyon Road, South of SR 68	55.84	64	WR	WR
Olmsted Road, South of SR 68	62.98	189	88	WR
Laureles Grade Road, South of SR 68	67.08	356	165	WR
San Benancio Drive, South of SR 68	59.33	108	51	WR
Torero Drive, North of SR 68	56.56	71	WR	WR
River Road, South of SR 68	59.34	109	51	WR

Traffic noise levels were predicted using the FHWA roadway noise prediction model based on traffic information obtained from the traffic analysis prepared for this project. Modeled traffic noise levels and contour distances do not take into account intervening terrain or natural/man-made features (e.g., berms, walls, buildings).

GROUND-BORNE VIBRATION

No major existing sources of ground-borne vibration were identified in the project area. Vehicle traffic on area roadways, particularly heavy-duty trucks, can result in increased groundborne vibration. However, groundborne vibration levels associated with vehicle traffic is typically considered minor and would not exceed applicable criteria at the project site boundaries.

REGULATORY SETTING

NOISE

Monterey County General Plan

The 1982 *Monterey County General Plan* Noise Element contains policies designed to protect the community from the harmful and annoying effects of exposure to excessive noise. The County's General Plan also identifies noise criteria for the determination of compatibility of proposed land uses within various noise environments. The County's General Plan policies related to noise are summarized in **Table 5**. The County's land use compatibility noise criteria are summarized in **Table 6**.

As depicted in **Table 6**, new residential land uses and schools are considered "normally acceptable" within exterior noise environments of 55 dB CNEL/L_{dn} or less. This "normally acceptable" exterior noise level is considered the minimum exterior noise level that would ensure an acceptable interior noise level of 45 dBA CNEL/L_{dn}. Residential land uses within ambient noise environments of up to 70 dBA CNEL/L_{dn} are considered "conditionally acceptable" provided noise insulation features are included in the design to ensure that an acceptable interior noise environment (i.e., 45 dBA CNEL/L_{dn}) is maintained. For newer residential construction, incorporation of central heating and air conditioning (HVAC) systems to allow windows to remain closed will normally suffice. For schools, an exterior noise level of 60 dBA CNEL/L_{dn} would be considered "normally acceptable" (Monterey County 1982). It is important to note that the County's General Plan noise criteria and policies are intended to apply to proposed new development.

TABLE 5
MONTEREY COUNTY GENERAL PLAN
NOISE-RELATED POLICIES

Goal 22	To maintain an overall healthy and quiet environment by trying to achieve living and working conditions free from annoying and harmful sounds.
22.2.1	The County shall require new development to conform to the established noise parameters.
22.2.2	The County shall required the appropriate standards of soundproofing construction in all multiple-residential structures as specified in the Building Code.
22.2.3	The County shall required environmental review of all proposed new development, expansion of industrial facilities, and quarry excavation and processing activities which may increase the noise level in surrounding areas or generate noise levels greater than those specified in **Table 3.**
22.2.5	The County should require ambient sound levels to be less at night (10 P.M. to 7 A.M.) than during the day.
22.2.6	The County shall make available to the public methods and existing noise data, which can be employed to reduce unwanted noise from the environment.
22.3.1	The County shall develop cooperative working relationships between those uses that produce noise and those that are sensitive to noise to mitigate existing noise problems.

TABLE 5 MONTEREY COUNTY GENERAL PLAN NOISE-RELATED POLICIES	
22.3.3	The County shall work with the California Department of Transportation to mitigate the effects of existing highway noise and to avoid future noise problems through careful analysis at the design stage of all new highway improvements.

Source: Monterey County 1982

Table 6
Monterey County General Plan
Land Use Compatibility Noise Criteria

Land Use Category	Noise Exposure Zones (L_{dn} or CNEL) dBA			
	I	II	III	IV
Passively used open spaces	<50	50-55	55-70	>70
Auditoriums, concert halls, amphitheaters	<50	50-65	65-70	>70
Residential – low density, Single family, duplex, mobile homes	<55	55-70	70-75	>75
Residential – multi-family	<60	60-70	70-75	>75
Transient lodging - motels, hotels	<60	60-70	70-80	>80
Schools, libraries, churches, hospitals, nursing homes	<60	60-70	70-80	>80
Actively used open spaces-playgrounds, neighborhood parks	<67	--	67-73	>73
Golf courses, riding stables, water recreation, cemeteries	<70	--	70-80	>80
Office buildings, business commercial and professional	<67	67-75	>75	--
Industrial, manufacturing, utilities, agriculture	<70	70-75	>75	--

Noise Zone I	Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
Noise Zone II	Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction but with closed windows and fresh air supply systems or air conditioning will normally suffice.
Noise Zone III	Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation feature included in the design.
Noise Zone IV	Clearly Unacceptable: New construction or development should generally not be undertaken.

Source: Monterey County 1982

Monterey County Noise Ordinance

The Monterey County Noise Ordinance is codified in Chapter 10.60 "Noise Control" of the County Code. The ordinance applies to "any machine, mechanism, device, or contrivance" within 2,500 feet of any occupied dwelling unit. Whereas the County's General Plan noise

criteria apply to new proposed land uses, the noise ordinance is typically used for the control of noise from existing land uses. In accordance with the County's noise ordinance, stationary sources are limited to 85 dBA at a distance of 50 feet from the noise source.

GROUNDBORNE VIBRATION

There are no federal, state, or local regulatory standards for ground-borne vibration. However, various criteria have been established to assist in the evaluation of vibration impacts. For instance, the California Department of Transportation (Caltrans) has developed vibration criteria based on potential structural damage risks and human annoyance. Caltrans-recommended criteria for the evaluation of groundborne vibration levels, with regard to structural damage and human annoyance, are summarized in **Table 7** and **Table 8**, respectively. The criteria differentiate between transient and continuous/frequent sources. Transient sources of ground-borne vibration include intermittent events, such as blasting; whereas, continuous and frequent events would include vehicle traffic on roadways (Caltrans 2002(b), 2004).

Table 7
Damage Potential to Buildings at Various Groundborne Vibration Levels

Structure and Condition	Vibration Level (in/sec ppv)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely Fragile Historic Buildings, Ruins, Ancient Monuments	0.12	0.08
Fragile Buildings	0.2	0.1
Historic and Some Old Buildings	0.5	0.25
Older Residential Structures	0.5	0.3
New Residential Structures	1.0	0.5
Modern Industrial/Commercial Buildings	2.0	0.5

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
Source: Caltrans 2004

Table 8
Annoyance Potential to People at Various Groundborne Vibration Levels

Human Response	Vibration Level (in/sec ppv)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely Perceptible	0.04	0.01
Distinctly Perceptible	0.25	0.04
Strongly Perceptible	0.9	0.10
Severe	2.0	0.4

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
Source: Caltrans 2004

The ground-borne vibration criteria recommended by Caltrans for evaluation of potential structural damage is based on building classifications, which take into account the age and condition of the building. For residential structures and newer buildings, Caltrans considers a minimum peak-particle velocity (ppv) threshold of 0.25 inches per second (in/sec) for transient sources and 0.04 in/sec for continuous/frequent sources to be sufficient to protect against building damage. Continuous ground-borne vibration levels below approximately 0.02 in/sec ppv are unlikely to cause damage to any structure. In terms of human annoyance, continuous vibrations in excess of 0.04 in/sec ppv and transient sources in excess of 0.25 in/sec ppv are identified by Caltrans as the minimum perceptible level for ground vibration. Short periods of ground vibration in excess of 2.0 in/sec ppv can be expected to result in severe annoyance to people. Short periods of ground vibration in excess of 0.1 in/sec ppv (0.2 in/sec ppv within buildings) can be expected to result in increased levels of annoyance (Caltrans 2002(b), 2004).

PROJECT IMPACTS

THRESHOLDS OF SIGNIFICANCE

Criteria for determining the significance of noise impacts were developed based on information contained in the California Environmental Quality Act Guidelines (CEQA Guidelines, Appendix G). According to those guidelines, a project may have a significant effect on the environment if it would result in the following conditions:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

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

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

Temporary noise impacts would be associated with short-term construction-related activities. Long-term permanent increases in noise levels would occur associated with onsite operational activities, as well as, potential increases in traffic noise levels along area roadways. Potential increases in groundborne vibration levels would be primarily associated with short-term construction-related activities. For purposes of this analysis and where applicable, the County of Monterey noise standards were used for evaluation of project-related noise impacts.

The following significance thresholds used for the assessment of noise-related impacts are based on the California Environmental Quality Act (CEQA) Guidelines, County noise standards, and commonly applied environmental noise criteria, as discussed earlier in this report.

- **Short-term Noise Impacts**. Short-term construction noise impacts would be considered significant if construction activities would result in a substantial increase in ambient noise

levels during the more noise-sensitive evening and nighttime hours (i.e., 7:00 p.m. to 7:00 a.m.). In addition, noise-generating construction activities would be considered to have a significant impact if predicted interior noise levels at nearby schools would exceed 45 dBA L_{eq}, which is the generally considered to be the level necessary to maintain speech communication within an interior environment. For school uses, the 45 dBA L_{eq} noise standard, which represents the hourly-average noise level, is considered more protective than the 45 dBA CNEL noise level, which is based on a 24-hour average.

- **Exposure of Noise-Sensitive Receptors to Stationary-Source Noise**. Long-term stationary-source noise impacts would be considered significant if the proposed project would result in a substantial increase in ambient noise levels at nearby noise-sensitive land uses or if the proposed project would result in operational noise levels that would exceed the County's noise ordinance standard of 85 dBA at 50 feet from the source. At the present time, the County has not yet adopted stationary-source noise standards based on land use designations. Therefore, for purposes of this analysis, stationary-source noise impacts would also be considered to have a significant impact if predicted noise levels would exceed commonly applied noise criteria for the maintenance of speech communication within exterior and interior environments (i.e., 60 dBA L_{eq} and 45 dBA $L_{eq,}$ respectively).

- **Exposure of Noise-Sensitive Receptors to Transportation Noise**. Long-term transportation noise impacts would be considered significant if the proposed project would result in a substantial increase in ambient noise levels (**Table 2**) or if predicted traffic noise levels at proposed residential dwellings would exceed the County's land use compatibility noise standards (**Table 6**).
- **Exposure to Groundborne Vibration**. Groundborne vibration levels would be considered significant if predicted short-term construction or long-term operational groundborne vibration levels attributable to the proposed project would exceed recommended criteria (**Tables 7** and **8**) at nearby existing or proposed onsite structures.

- **Contribution to Cumulative Noise Levels**. Implementation of the proposed project would be considered significant if the proposed project would result in a substantial contribution to projected future cumulative noise levels at either existing or proposed noise-sensitive receptors.

For purposes of this analysis, significant increases in ambient noise levels were based on FICON-recommended criterion (**Table 2**). Accordingly, significant increases in ambient noise levels would be defined as an increase of 5 dBA, or greater, where the ambient noise environment is less than 60 dBA; 3.0 dBA, or greater, where the ambient noise environment is between 60 and 65 dBA; and an increase of 1.5 dBA, or greater, where the ambient noise environment exceeds 65 dBA. The rationale for these criteria is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause significant annoyance (FICON 2000).

IMPACTS AND MITIGATION MEASURES

IMPACT 1 **Short-term Increases in Construction Noise.**

Construction noise in any one particular area would be temporary and would include noise from activities such as excavations, demolition, truck hauling of material, pouring of concrete, and use of power hand tools. Construction noise typically occurs intermittently and varies depending on the nature of the construction activities being performed. Noise generated by construction

equipment, including excavation equipment, material handlers, and portable generators, can reach high levels for brief periods. The United States Environmental Protection Agency (US EPA) has found that intermittent individual equipment noise levels range from approximately 74 dBA to more than 89 dBA for brief periods. **Table 9** lists typical uncontrolled noise levels generated by individual pieces of construction equipment at a distance of 50 feet. The highest noise levels would occur during activities involving the use of heavy-duty off-road equipment, including grading and excavation activities. Exterior building construction and finishing activities would be anticipated to generate slightly lower noise levels of approximately 74-75 dBA L_{eq} at 50 feet.

TABLE 9
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Typical Noise Level (dBA L_{max}) 50 feet from Source
Backhoe	80
Compactor	82
Dozer	85
Grader	85
Loader	85
Truck	88
Air Compressor	81
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Mobile	83
Generator	81
Impact Wrench	85
Jack Hammer	88
Paver	89
Pneumatic Tool	85
Pump	76
Roller	74
Saw	76

Sources: Federal Transit Administration 2006

As discussed earlier in this report, noise-sensitive land uses located near the project site consist primarily of residential dwellings. The nearest residential dwellings are located approximately 80 feet from the western property line, across San Benancio Road, and approximately 190 feet north of the project site, across SR 68. San Benancio Middle School is located adjacent to the western boundary of the project site. The Toro Park Elementary School is located approximately 600 feet north of the project site, across SR 68. Nearby residential dwellings and the San Benancio Middle School would be located within line of sight of proposed onsite construction activities. Toro Park Elementary School would be largely shielded from direct line-of-sight by

surrounding residential development. Predicted construction-related noise impacts to these nearest noise-sensitive receptors are discussed in more detail, as follows:

Residential Dwellings

Predicted construction noise levels at the nearest residential dwellings were calculated assuming a maximum average-hourly construction noise level of 84 dBA L_{eq} and an average noise attenuation rate of 6 dBA per doubling of distance from the nearest areas of proposed onsite construction. Based on these assumptions, predicted noise levels at the nearest residential dwellings located along San Benancio Road could reach levels of approximately 80 dBA L_{eq}. Predicted construction-generated noise levels at residential dwellings located north of the project site, across SR 68, could reach levels of approximately 72 dBA L_{eq}. When noise levels generated by construction operations near residential land uses are being evaluated, activities occurring during the more noise-sensitive nighttime hours (i.e., 10 p.m. to 7 a.m.) are of increased concern. Because exterior ambient noise levels typically decrease during the nighttime hours as community activities (e.g., commercial activities, vehicle traffic) decrease, construction activities performed during these more noise-sensitive periods of the day can result in increased annoyance and potential sleep disruption for occupants of nearby residential dwellings.

San Benancio Middle School

Based on the above noise levels and assuming an average noise-attenuation rate of 6 dB per doubling of distance from the source, predicted exterior noise levels San Benancio Middle School could reach levels of up to approximately 68 along the northern exterior facades of existing classrooms and approximately 64 dBA L_{eq} along the eastern building facades. Predicted interior noise level can be estimated by subtracting the combined noise transmission loss (i.e., noise reduction) for building facade components (i.e., walls, doors, windows) from the predicted exterior noise level. The transmission loss of the building components is dependent on the materials and construction methods used. For instance, double-glazed windows typically provided greater noise reduction than single-glazed windows and stuccoed walls typically provide greater noise reduction than wood siding. Additional building construction methods, such as the use of insulation within wall cavities, increased wall thickness, decreased stud spacing, as well as measures designed to decrease air infiltration, such as baffled vents, also contribute to increased exterior-to-interior noise reductions. Buildings constructed in accordance with current building and energy-efficiency standards typically achieve minimum exterior-to-interior noise reductions of 25-30 dBA, with windows closed. Older buildings typically achieve average noise reductions of approximately 20 dBA, with windows closed. The absorptive characteristics of interior rooms, such as carpeted floors, draperies and furniture, can result in further reductions in interior noise. Assuming a minimum average exterior-to-interior noise reduction of 20 dBA, with windows closed, predicted interior noise levels along the northern and eastern building façades would be approximately 48 and 44 dBA L_{eq}, respectively.

Toro Park Elementary School

The nearest proposed onsite construction activities would occur at a distance of approximately 850 feet from Toro Park Elementary School. Based on this distance and the assumptions discussed above, predicted maximum exterior noise levels at Toro Park Elementary School would be approximately 54 dBA L_{eq}. Assuming a minimum average exterior-to-interior noise reduction of 20 dBA, with windows closed, predicted interior noise levels along the southern building façades would be approximately 34 dBA L_{eq}. In comparison to ambient noise levels, construction-generated noise levels at Toro Park Elementary School would be largely masked by vehicle traffic noise emanating from SR 68. Predicted interior noise levels would not exceed

Impact Summary

The proposed project does not include restrictions on the hours during which construction activities would occur. As a result, construction activities occurring during the more noise-sensitive nighttime hours could result in increased levels of annoyance and potential sleep disruption for occupants of nearby noise-sensitive land uses. Given that the project area would likely be developed in multiple phases over a period of years, there is also the potential for construction activities to occur in close proximity to proposed onsite residential land uses. In addition, predicted interior noise levels at San Benancio Middle School could exceed 45 dBA L_{eq} when construction activities occur within approximately 450 feet of the school buildings. In such instances, construction activities could interfere with instructional activities at San Benancio Middle School. For these reasons, noise-generating construction and demolition activities would be considered to have a **significant** short-term impact.

Mitigation Measure 1: Short-term Increases in Construction Noise

a) Noise-generating construction operations (excluding activities that would result in a safety concern to the public or construction workers) shall be limited to the hours between 7 a.m. to 7 p.m. Monday through Friday.

b) Construction equipment and equipment staging areas shall be located at the furthest distance possible from nearby noise-sensitive land uses.

c) Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.

d) When not in use, motorized construction equipment shall not be left idling.

e) In the event that construction of Road D or Lots 6-12 and Lots 18-22 were to occur during periods when San Benancio Middle School is in session, temporary barriers shall be constructed along the nearest boundary of the school site sufficient to interrupt the line of sight between heavy-duty equipment operating at the construction site and San Benancio Middle School. The barriers shall be constructed to a minimum height of eight feet above ground surface. Barrier construction materials may consist of, but are not necessarily limited to, the use of sound-rated curtains and/or wood panels and shall be constructed with no visible air gaps between construction panels or at the ground surface.

f) Prior to issuance of a building permit, the applicant shall provide the County with the name and telephone number of the individual empowered to manage construction noise from the project. An information sign shall be posted at the construction site entrance that identifies the permitted construction hours and provides a telephone number to call and receive information about the construction project or to report complaints regarding excessive noise levels. The designated construction contact shall record all noise complaints received and actions taken in response, and submit this record to the project planner upon request.

g) Written notification shall be provided to San Benancio Middle School a minimum of one week prior to commencing onsite construction activities so that any necessary precautions (such as rescheduling or relocation of interior noise-sensitive activities) can be implemented. The written notice shall include the name and telephone number of the individual empowered to manage construction noise from the project.

Significance After Mitigation

The use of exhaust mufflers and engine shrouds would reduce individual equipment noise levels by approximately 10 dBA. The proposed sound barriers would reduce construction-generated noise levels by a minimum of approximately 5 dBA. With implementation of the above mitigation measures predicted interior noise levels at San Benancio Middle School would be reduced to approximately 43 dBA L_{eq}, or less. Implementation of the above mitigation measures would reduce short-term noise impacts to nearby residential land uses to a **less-than-significant** level.

IMPACT 2 **Increased Exposure of Noise-Sensitive Receptors to Stationary-Source Noise.**

The proposed project includes planned development of residential and commercial land uses, including wine-tasting and office land uses. The proposed project would also include the installation of three booster water-pump stations. Noise levels commonly associated with these uses and impacts to nearby noise-sensitive land uses are discussed in more detail, as follows:

Residential Land Uses

Stationary-source noise associated with residential development is primarily associated with the operation of central air conditioning units. Noise levels associated with residential-use air conditioners typically average approximately 60 dBA, or less, at 5 feet. To a lesser extent, noise from people talking, amplified music, and use of landscape maintenance equipment, may also contribute to intermittent increases in ambient noise levels. However, increases in ambient noise levels from such sources are often sporatic and are typically limited to the less noise-sensitive daytime hours. Implementation of the proposed project would not result in the operation of any major onsite stationary noise sources that would exceed the County's noise ordinance standard of 85 dBA at 50 feet. Noise generated by the proposed residential dwellings would not result in an increase in ambient noise levels at nearby noise-sensitive land uses. No existing stationary sources of noise were identified in the project area that would affect proposed residential land uses. As a result, increased exposure of sensitive land uses to stationary-source noise would be considered **less than significant**.

Proposed Onsite Commercial Uses

The proposed project includes development of approximately commercial land uses, including office and wine-tasting facilities, near the eastern portion of the project site, along River Road. Noise sources commonly associated with such uses can include occasional parking lot activities (e.g., opening and closing of vehicle doors, people talking), material delivery and truck unloading activities (e.g., use of forklifts, hydraulic lifts), trash compactors, and air compressors. Noise commonly associated with commercial land uses, such as idling trucks, vehicle backup alarms, decompression of trailer truck brakes, forklifts, and other material loading and unloading activities, can generate intermittent noise levels of approximately 90 dBA L_{max} at 10 feet. Average-hourly noise levels associated with commercial sources typically range from approximately 60 dBA L_{eq} at 50 feet. Noise-generating activities associated with these uses would typically occur during the daytime hours of operation.

The nearest existing noise-sensitive land uses in the vicinity of proposed onsite commercial land uses include residential dwellings located approximately 850 feet to the south, along River Road. Based on the noise levels identified above and assuming that the proposed commercial uses were to include truck unloading activities, predicted average-hourly noise levels at the nearest

existing residential land uses would be approximately 35 dBA L_{eq}, or less. Intermittent noise levels would be approximately 51 dBA L_{max} at these same receptors. Assuming an average exterior-to-interior noise reduction of 20 dB, predicted interior project-generated noise levels at the nearest existing residential dwellings would be approximately 15 dBA L_{eq}, or less.

The nearest proposed residential land uses are located adjacent to and south of the proposed commercial development, across the proposed River Terrace Drive. Depending on final site design and assuming that truck loading/unloading activities would be associated with the proposed wine-tasting facilities, predicted noise levels at these nearest proposed residential land uses could reach levels of approximately 54 dBA L_{eq} and 70 dBA L_{max} when activities occur within 100 feet of the residential property line. Assuming an average exterior-to-interior noise reduction of 20 dB, predicted interior project-generated noise levels at the nearest proposed residential dwellings would be approximately 34 dBA L_{eq}, or less.

Operational noise levels associated with the proposed office and commercial land uses would not exceed the County's noise standard of 85 dBA at 50 feet. In addition, predicted noise levels at nearby existing and proposed residential land uses would not exceed an exterior noise level of 60 dBA L_{eq}, which is the level commonly identified for the maintenance of speech communication within an exterior environment. Predicted interior noise levels at nearby existing and proposed residential dwellings would not exceed 45 dBA L_{eq}, which is the level commonly identified for the maintenance of speech communication within an interior environment. Because noise-generating activities from such sources would be intermittent and would not occur on a continuous hourly basis over a 24-hour period, predicted average-daily interior noise levels at nearby existing and proposed residential land uses would not be anticipated to exceed 45 CNEL/L_{dn}, which is the noise levels commonly recommended for the protection of activity interference within an interior environment. For these reasons, noise generated by the proposed commercial land uses would be considered **less than significant**.

Proposed Pump Stations

The proposed project includes construction of three pump stations located within the boundaries of the project site. Specific design and equipment requirements have not yet been identified for these facilities. However, noise-producing equipment typically associated with these types of facilities includes electrical pump motors, transformers, and emergency-power generators. Depending on the type and size of the equipment required, operational noise levels associated with large pumps can reach levels of approximately 65 L_{eq} at 10 feet. However, larger pumps often used at pump stations are often located below the ground surface, which substantially reduces detectable operational noise levels at the surface. In such instances, operational noise levels can be reduced by approximately 10 dBA, or more. Operational noise levels associated with emergency-power generators can reach levels of approximately 90 dBA L_{eq} at 10 feet.

The proposed pump stations would be located within approximately 100 feet of proposed residential land uses. Assuming that water pumps would be located at the surface, predicted pump operational noise levels at the nearest residential land uses would be approximately 45 dBA L_{eq}. In the event that emergency-power generators would also be operating, combined operational noise levels would be approximately 70 dBA L_{eq} at the nearest residential land use. Based on this noise level and assuming an average exterior-to-interior noise reduction of 20 dB, predicted interior noise levels of nearby residential dwelling would be approximately 50 dBA L_{eq}. Operation of the emergency stand-by generator would occur on an intermittent, as-needed basis during power outages and routine maintenance operations. However, these facilities and related operational characteristics have not been sufficiently defined at this time. Assuming that

emergency power generators were to be included, predicted average-daily interior noise levels could potentially exceed 45 dBA CNEL/L_{dn}. Given that predicted noise levels could potentially exceed exterior and interior noise criteria for the maintenance of speech communication and activity interference, stationary source noise impacts associated with the proposed pump stations would be considered **potentially significant**.

Mitigation Measure 2:

An acoustical analysis shall be prepared for proposed pump stations. Mitigation measures shall be identified to reduce operational noise levels, sufficient to achieve applicable County noise standards, which are currently identified as 85 dBA at 50 feet. In the event that County noise standards specific to the receiving land use have not been identified at the time the acoustical analysis is to be prepared, an operational noise standard of 55 dBA L_{eq} for the daytime hours (i.e., 7 a.m. to 10 p.m.) and 50 dBA L_{eq} for the nighttime hours (i.e., 10 p.m. to 7 a.m.) shall be used. These recommended noise criteria shall be applied at the property line of the nearest noise-sensitive land use. The recommended noise criteria are intended to ensure that operational noise levels would not exceed commonly applied noise levels for the maintenance of speech communication within exterior/interior environments of receiving land uses and, in the event that operations would occur continuously over a 24-hour period, would not exceed the commonly applied exterior and interior noise criteria for the protection of activity interference (i.e., 60 and 45 dBA CNEL/L_{dn}, respectively). Measures may include, but are not necessarily limited to, the use of sound barriers, equipment enclosures, and incorporation of noise-reduction site/facility design features.

Timing/Implementation: *Prior to construction.*

Enforcement/Monitoring: *Monterey County.*

Significance After Mitigation

With implementation of recommended mitigation measure, predicted noise levels at the nearest noise-sensitive land uses would not exceed Monterey County noise standard of 50 dBA at 50 feet or commonly identified noise criteria for the maintenance of speech communication and protection from activity interference. With mitigation, this impact would be considered **less than significant**.

IMPACT 3 **Increases in Ambient Noise Levels at Noise-Sensitive Land Uses.**

Ambient noise levels in the project area are influenced by vehicular traffic on area roadways, particularly SR 68. The FHWA roadway noise prediction model was used to predict traffic noise levels along primarily affected roadway segments. Predicted noise levels were calculated for both baseline conditions, with and without implementation of the proposed project, based on traffic volumes obtained from the traffic analysis prepared for this project (Higgins Associates 2007). Predicted traffic noise levels for background conditions, with and without implementation of the proposed project, are summarized in **Tables 10**.

As noted in **Table 10**, implementation of the proposed project would not result in a substantial increase in ambient traffic noise levels along area roadways. Based on the modeling conducted, development of the proposed project would result in predicted increases in traffic noise levels of approximately 0.1 dBA, or less, along SR 68. Predicted increase in traffic noise levels along other area roadways, including Torero Drive and San Benancio Road, would be

approximately 0.1 dBA CNEL. Predicted increases in traffic noise levels along River Road, south of SR 68, would be approximately 0.9 dBA CNEL. Implementation of the proposed project would not result in a significant increase in traffic noise levels along area roadways. As a result, increases in ambient noise levels attributable to the proposed project would be considered ***less-than-significant***.

Table 10
Predicted Traffic Noise Levels
Background Conditions

Roadway Segment	Predicted Noise Level at 50 ft from Centerline of Near Travel Lane (dBA L_{dn}/CNEL)			
	Background Without Project	Background With Project	Increase	Significant?
SR 68, West of Josselyn Canyon Road	73.48	73.52	0.04	No
SR 68, Josselyn Canyon Road to Olmsted Road	73.26	73.30	0.04	No
SR 68, Olmsted Road to SR 218	73.65	73.69	0.04	No
SR 68, SR 218 to Laureles Grade Road	74.03	74.09	0.06	No
SR 68, Laureles Grade Road to San Benancio Drive	73.69	73.76	0.07	No
SR 68, San Benancio Drive to Torero Drive	73.85	73.93	0.08	No
SR 68, East of Torero Drive	73.18	73.29	0.11	No
SR 218, North of SR 68	66.43	66.47	0.04	No
Josselyn Canyon Road, South of SR 68	55.84	55.84	0	No
Olmsted Road, South of SR 68	63.15	63.15	0	No
Laureles Grade Road, South of SR 68	67.19	67.23	0.04	No
San Benancio Drive, South of SR 68	59.78	59.91	0.13	No
Torero Drive, North of SR 68	56.56	56.57	0.01	No
River Road, South of SR 68	59.96	60.86	0.9	No

1. *Traffic noise levels were predicted using the FHWA roadway noise prediction model based on traffic information obtained from the traffic analysis prepared for this project. Modeled estimates assume no natural or man-made shielding (e.g., vegetation, berms, walls, buildings).*

2. *Significant increase is defined as an increase of 5 dBA in areas where ambient noise levels are less than 60 dBA CNEL/Ldn; an increase of 3 dBA where ambient noise levels range from 60 to 65 dBA L_{dn}/CNEL; and an increase of 1.5 dBA where ambient noise levels at noise-sensitive receptors exceed 65 dBA L_{dn}/CNEL*

IMPACT 4 **Compatibility of Proposed Land Uses with Projected Ambient Noise Levels.**

As noted in **Table 6**, the County's "normally acceptable" exterior noise standard for residential land uses is 55 dBA L_{dn}/CNEL. Residential land uses are considered "conditionally acceptable" within areas of up to 70 dBA L_{dn}/CNEL, provided sufficient mitigation measures are incorporated to ensure that interior noise levels are reduced to within acceptable levels (i.e., 45 dBA L_{dn}/CNEL). Residential land uses are considered "normally unacceptable" within areas where the ambient noise level would exceed 70 dBA L_{dn}/CNEL. Commercial and office land uses are

considered "normally acceptable" at levels below 67 dBA L_{dn}/CNEL, "conditionally acceptable" between 67 and 75 dBA L_{dn}/CNEL, and "normally unacceptable" at levels above 75 dBA L_{dn}/CNEL.

Major nearby noise sources potentially affecting the proposed development include vehicle traffic on are roadways, the Laguna Seca Raceway, as well as the Monterey and Salinas Municipal Airports. Noise levels associated with these sources and impacts to proposed onsite receptors are discussed separately, as follows:

Roadway Traffic Noise

Proposed residential land uses would be primarily affected by traffic noise from SR 68, located along the northern boundary of the project site, as well as River Road, which is located along the eastern boundary of the project site. Predicted traffic noise contours for adjacent roadways are summarized in **Table 11** and depicted in **Figures 2-5**. As shown, the predicted 55 dBA CNEL noise contour for SR 68 would extend onto the project site at distances of approximately 1,295 feet from the roadway centerline near the western boundary of the project site and to approximately 1,193 feet near the eastern boundary. The predicted 55 dBA CNEL noise contour for River Road and San Benancio Road would extend to distances of approximately 186 and 130 feet, respectively, from the roadway centerline. It is important to note that the predicted noise contours identified in **Table 11** do not take into account shielding that may occur due to intervening terrain or structures.

Table 11
Predicted Future Cumulative-Plus-Project Traffic Noise Levels and Contours

Roadway Segment	Predicted Noise Level (dBA L_{dn}/CNEL)				
	50 ft from Centerline of Near Travel Lane	Distance to Contours (feet)			
		55	60	65	70
SR 68, San Benancio Drive to Torero Drive	75.30	1,295	601	279	130
SR 68, Torero Drive to River Road	74.77	1,193	554	257	120
San Benancio Road, South of SR 68	60.53	130	61	WR	WR
River Road, South of SR 68	62.85	186	87	WR	WR

Traffic noise levels were predicted using the FHWA roadway noise prediction model based on traffic information obtained from the traffic analysis prepared for this project. Modeled estimates assume no natural or man-made shielding (e.g., vegetation, berms, walls, buildings).
WR=Within Roadway Right-of-Way

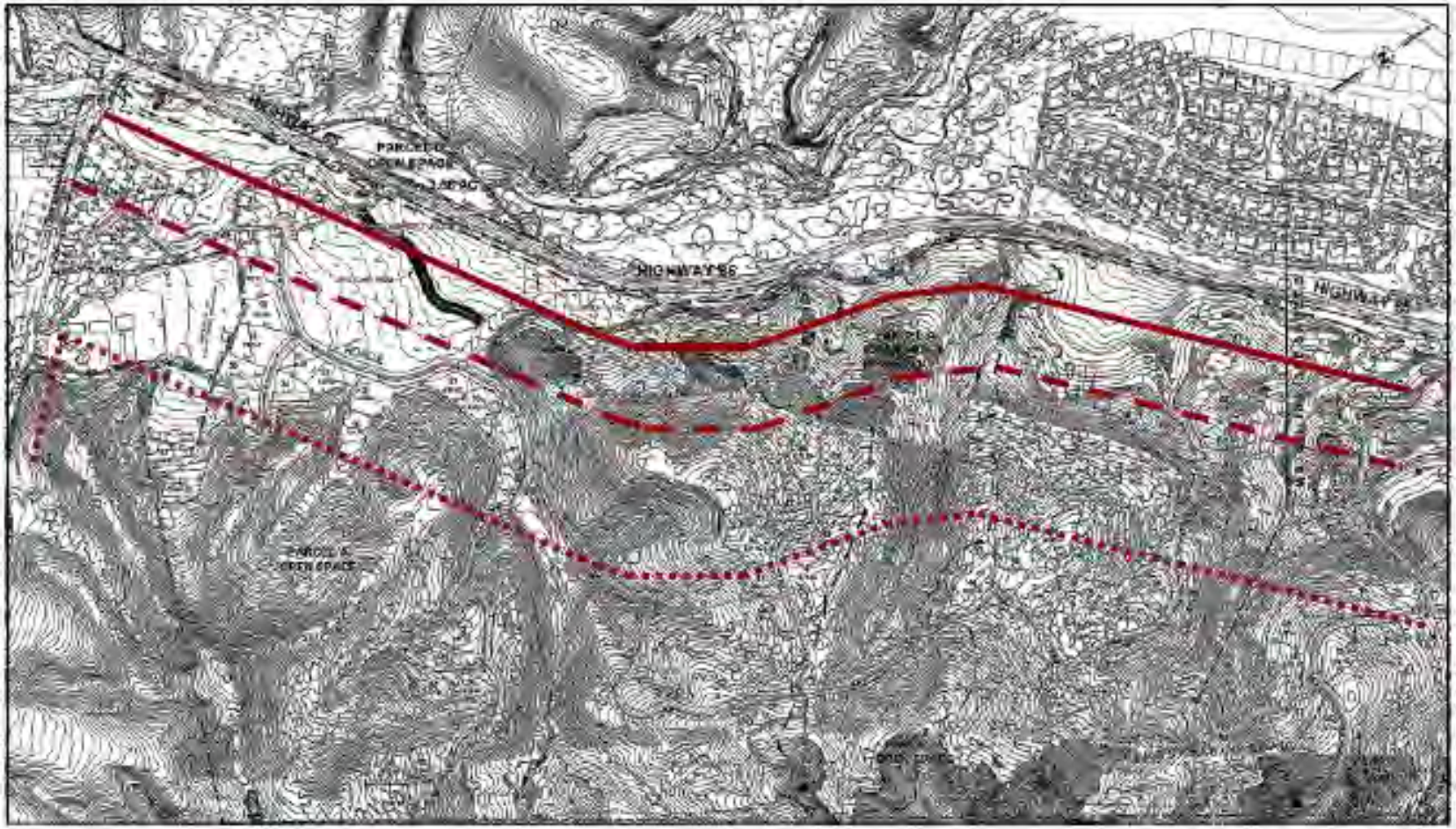


FIGURE 2: PREDICTED FUTURE CUMULATIVE-PLUS-PROJECT TRAFFIC NOISE LEVELS (1 of 4)

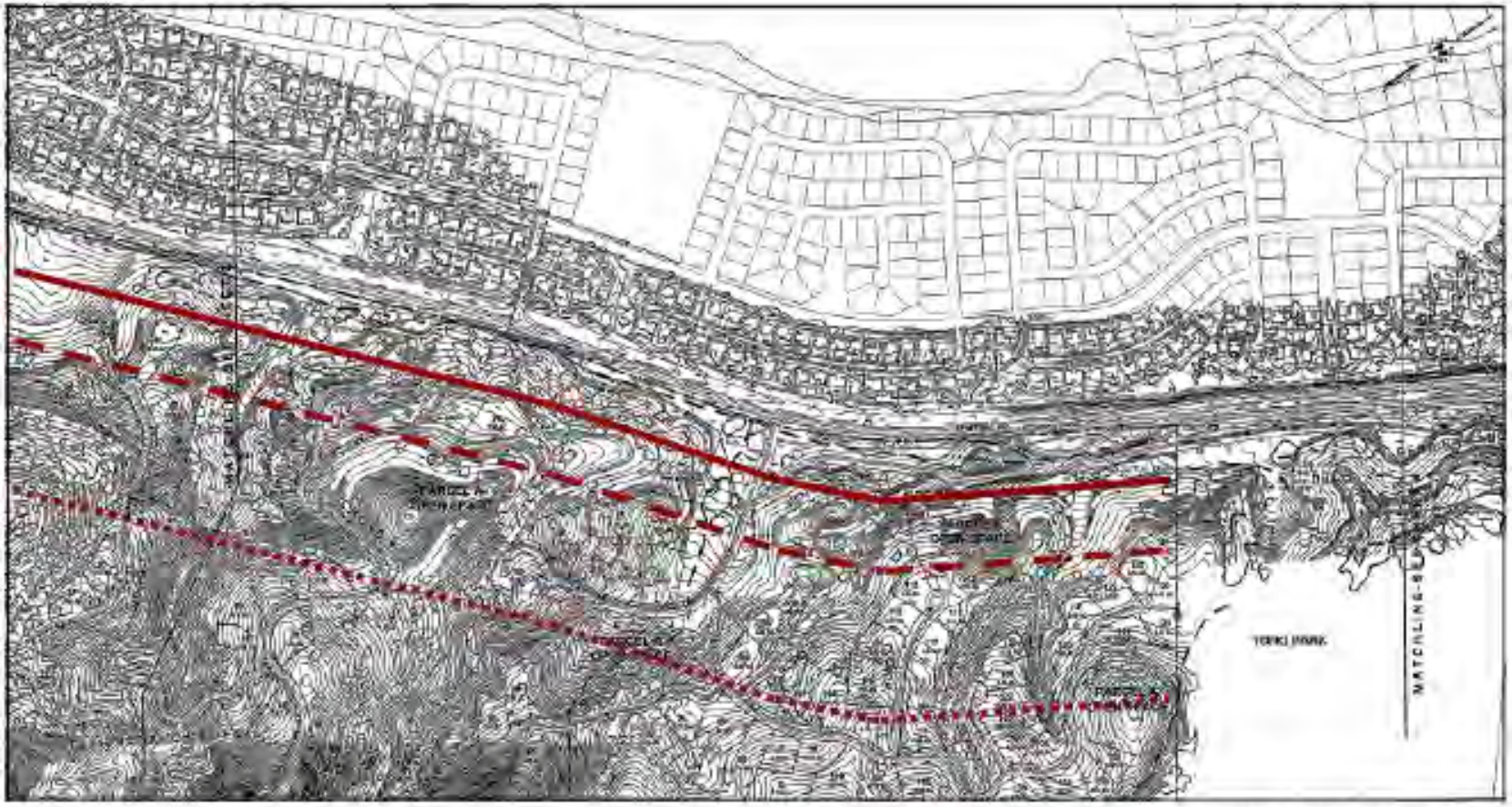


FIGURE 3: PREDICTED FUTURE CUMULATIVE-PLUS-PROJECT TRAFFIC NOISE LEVELS (2 of 4)

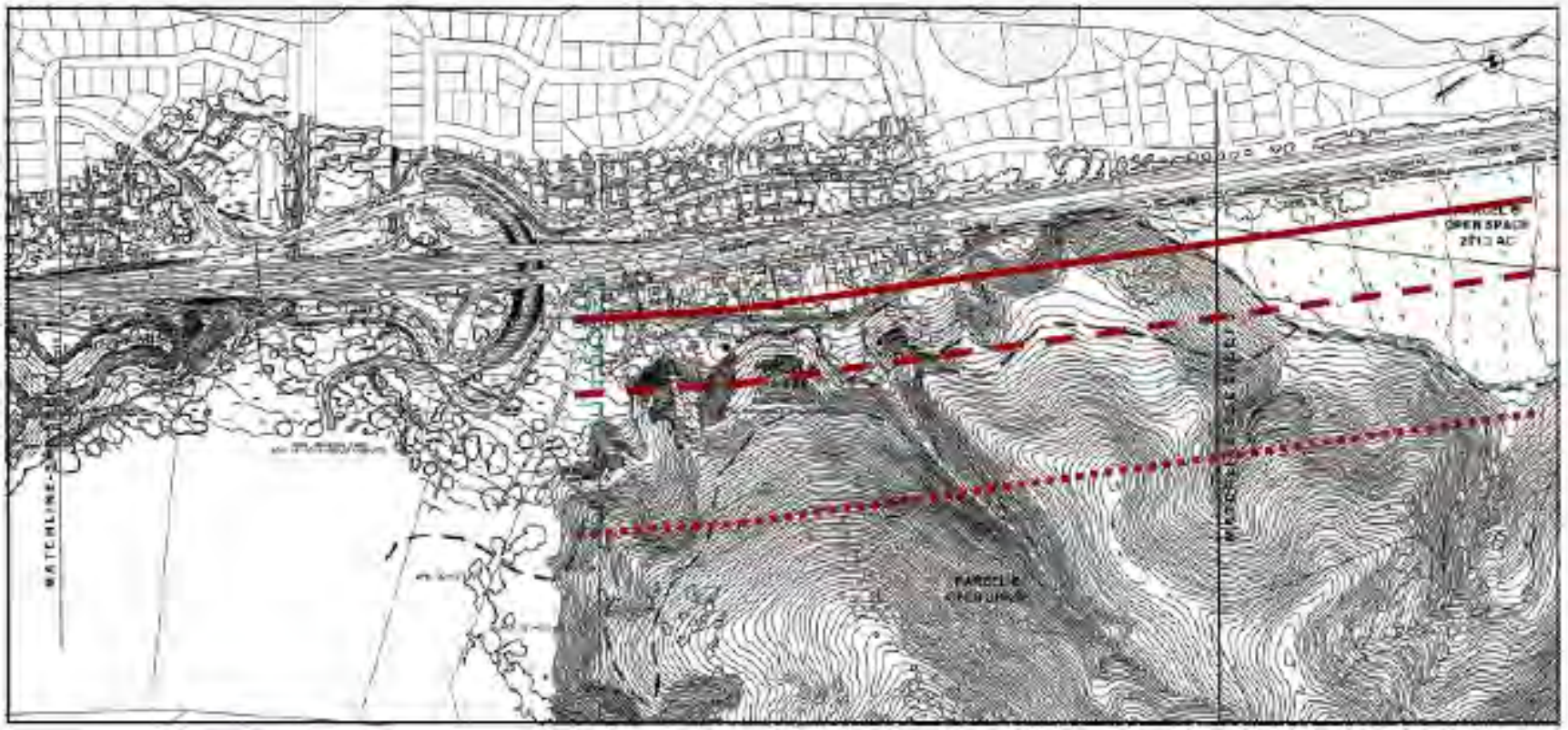


Image Source: Whitson Engineers 2005

PREDICTED TRAFFIC NOISE CONTOURS

65 dBA CNEL/L_{dn}

60 dBA CNEL/L_{dn}

55 dBA CNEL/L_{dn}

Notes: Based on forecasted year 2030 cumulative-plus-project traffic conditions. Predicted noise contours are approximate and may not fully account for shielding provided by intervening terrain or structures. Predicted noise contours should be interpreted as bands of similar noise exposure, rather than lines of absolute demarcation.

FIGURE 4: PREDICTED FUTURE CUMULATIVE-PLUS-PROJECT TRAFFIC NOISE LEVELS (3 of 4)

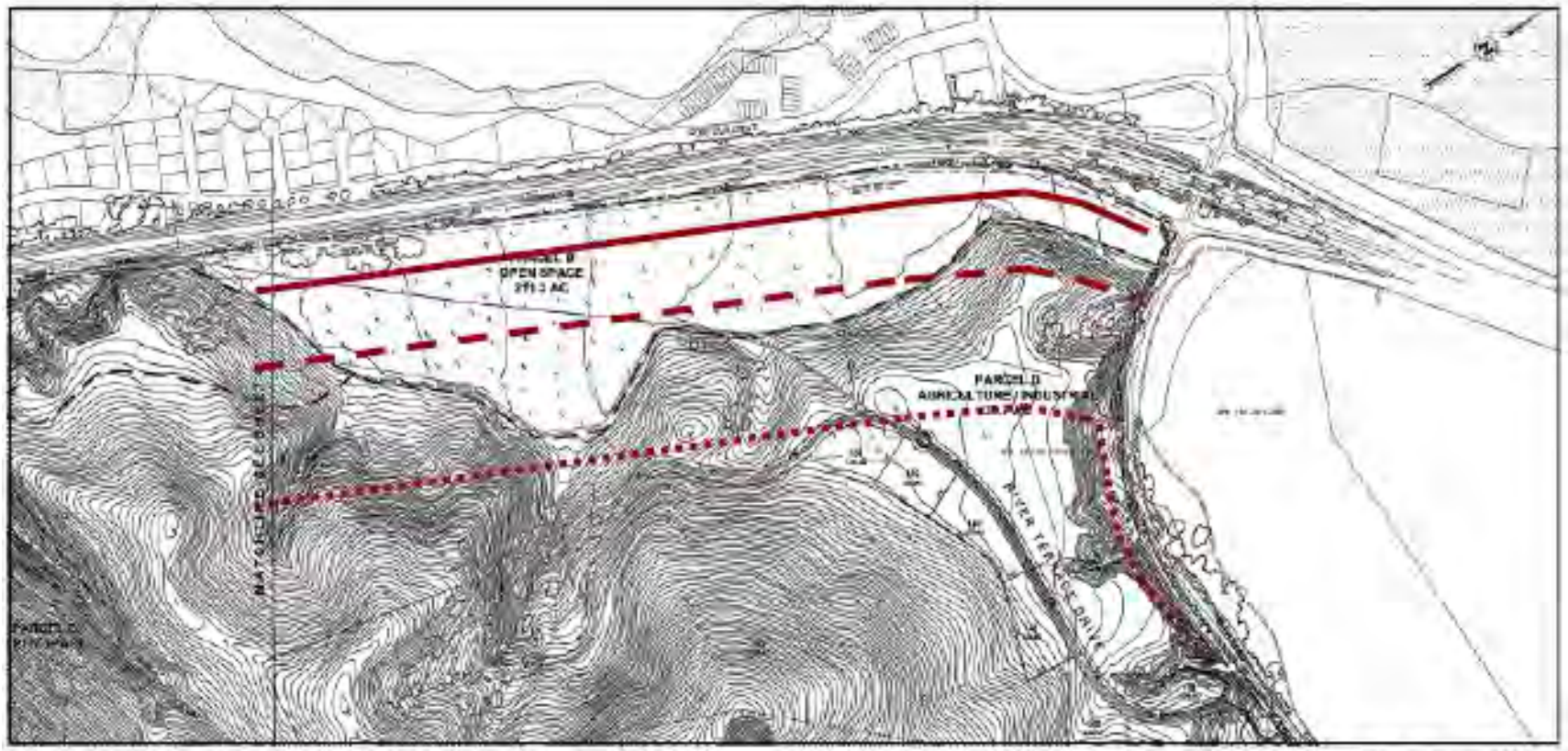


FIGURE 5: PREDICTED FUTURE CUMULATIVE-PLUS-PROJECT TRAFFIC NOISE LEVELS (4 of 4)

Based on the traffic noise modeling conducted, onsite residential-use lots could be located within the projected future 55 dBA CNEL noise contours of adjacent roadways, which would exceed the County's "normally acceptable" exterior noise level. These include proposed residential lots 1-21, 24-30, 41-47, 50, 59-65, 71-83, 103-119, 126-137, 138, and 146. Proposed residential lots located within the projected future 60-65 dBA CNEL traffic noise contour include lots 1-6, 13-17, 59-62, 75, 76, 84, 85, and 132-134. Proposed lot 146, which is located adjacent to SR 68, is located within the projected 70 dBA CNEL noise contour. Predicted maximum exterior traffic noise levels at the property line of this nearest lot (i.e., lot 146) would be approximately 74 dBA CNEL. With the exception of proposed residential lot 146, predicted future cumulative traffic noise levels at proposed onsite residential land uses would not exceed the County's "normally unacceptable" exterior noise standard of 70 dBA CNEL.

Based on the modeling conducted and assuming an average exterior-to-interior noise reduction of 15 dB (with windows open) predicted interior noise levels at these proposed residential land uses located within the projected 55 dBA CNEL traffic noise contours could exceed the County's interior noise standard of 45 dBA CNEL. In most instances, the inclusion of central heating and air conditioning units, which would allow windows to remain closed, would be sufficient to reduce interior noise levels to within acceptable levels. However, even with windows closed, residential land uses located within the projected 60 dBA CNEL, or greater, noise contour could still exceed the County's interior noise standard. In such instances, additional noise-reduction measures would be required to reduce predicted interior noise levels to within the County's interior noise standard of 45 dBA CNEL, or less. Exterior noise-reduction measures would also be required for proposed lot 146 to reduce exterior noise levels to within the County's "conditionally acceptable" noise standards (i.e., below 70 dBA CNEL).

Predicted traffic noise levels at proposed commercial and office land uses would not exceed the County's "normally acceptable" noise level of 67 dBA L_{dn}/CNEL. However, because predicted exterior traffic noise levels at proposed residential land uses would exceed the County's "normally acceptable" noise standard of 55 dBA CNEL, the compatibility of proposed residential land uses with projected future onsite traffic noise levels would be considered **potentially significant**.

Mazda Raceway Laguna Seca

The Mazda Raceway Laguna Seca (Laguna Seca Raceway) is located approximately 0.8 miles northwest of the project site. Noise levels at the raceway are dependent on the type of event, vehicle type, and number of vehicles participating in onsite venues. Depending on the venue conducted, activities on the raceway are generally limited to maximum noise levels of 85 dB to 105 dB at a distance of 50 feet from the track centerline (Varley 2007). However some events are unrestricted in terms of noise level generation, and raceway staff has indicated that noise levels of up to 113 dB have been observed (Varley 2007).

The proposed project site is not located within the projected 60 dBA CNEL noise contour of the Laguna Seca Raceway (Monterey County 2007). However, maximum intermittent noise levels associated with racing events could be perceptible at the proposed project site. Based on a maximum intermittent noise level 113 dB at 50 feet from the track centerline, predicted maximum noise levels at the western boundary of the project site could reach levels of approximately 75 dBA Lmax. It is important to note that this predicted noise levels does not account for shielding due to intervening terrain or structures. Although racing events would be limited to between the daytime hours, maximum intermittent noise levels may be detectable within the outdoor activity areas of onsite dwelling units. Being subjected to unknown or

unplanned noise events can result in increased levels of annoyance and potential activity interference. As a result, this impact is considered to be **potentially significant**.

Public and Private Airports

The nearest airports are the Carmel Valley Airport, which is located approximately 5.75 miles south of the project site, the Salinas Municipal Airport, located approximately 6 miles northeast of the project site and the Monterey Municipal Airport located approximately 6 miles west of the project site. The proposed project is not located within the predicted 60 dBA CNEL noise contours of these airports (Monterey County 2007). There are no existing private airstrips within two miles of the project site. Implementation of the proposed project would not affect airport operations, nor would implementation of the proposed project result in the development or relocation of any noise-sensitive land uses within two miles of any airport or airstrip. As a result, implementation of the proposed project would not result in increased exposure of individuals to excessive aircraft noise levels associated with the existing airport. For these reasons, exposure to airport noise levels would be considered **less than significant**.

Mitigation Measure 4: Compatibility of Proposed Land Uses with Projected Ambient Noise Levels.

Roadway Traffic

a) Mechanical ventilation and air conditioning (i.e.,HVAC) systems shall be installed in all residential dwelling units so that windows can remain closed during inclement weather conditions.

b) Proposed residential dwellings located on lots 1-6, 13-17, 59-62, 75, 76, 84, 85, 132-134, and 146 shall be designed to include the following:

   (1) The perimeter of window and door frames shall be sealed airtight to the exterior wall construction.

   (2) At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked or filled with insulation or mortar.

   (3) Window and/or through-the-wall ventilation units shall be prohibited.

   (4) Interior surfaces of exterior walls shall be of gypsum board, plaster, or equivalent, at least one-half inch thick, installed on studs.

   (5) Sheathing panels should be butted tightly and covered on the exterior with overlapping building paper/plastic. The top and bottom edges of the sheathing shall be sealed with caulk.

   (6) Insulation material at least two inches thick shall be installed continuously throughout the cavity space behind the exterior sheeting and between wall studs of exterior walls.

   (7) Gravity vent openings in attic shall not exceed code minimum in number and size. Transfer ducts connecting to exterior openings shall have a 90-degree (right-angle) bend in the duct such that there is no direct line-of-sight from the exterior through the duct to the interior spaces.

   (8) Domestic range exhaust ducts to the outside shall be prohibited, or ducted to building facades not exposed to noise sources, or designed such that there is no direct line-of-sight from the exterior through the duct to the interior spaces.

(9) Attic vents should be soffit type protected by an eave at least 12 inches wide, or should be designed to prevent line-of-sight from the exterior to the interior spaces. If gable end vents are used, a baffle or plywood backplate to prevent clear line-of-sight from exterior to interior spaces shall be installed.

c) Proposed residential dwellings located on lots 1-6, 13-17, 59-62, 75, 76, 84, 85, and 132-134 shall be designed to include the following additional features:

(1) Exterior walls shall have a sound-transmission-class rating of STC-39, or better.

(2) Windows and exterior doors shall have a sound-transmission-class rating of at least STC 32 for stucco or brick homes, and STC 38 for siding homes.

d) Proposed residential dwelling located on lot 146 shall be designed to include the following additional features:

(1) Exterior walls shall have a sound-transmission-class rating of STC-44, or better.

(2) Windows and exterior doors shall have a sound-transmission-class rating of at least STC 36 for stucco or brick homes, and STC 40 for siding homes.

e) Proposed residential dwellings located on lots 1-6, 13-17, 59-62, 75, 76, 84, 85, 132-134 and 146 shall be designed so that exterior activity areas are shielded from line-of-sight of SR 68. Shielding may include, but is not limited to, the placement of buildings, terrain features, walls, or solid fencing between the source and the receptor. If walls or fences are proposed, these barriers shall be constructed to a minimum height of six feet. Barriers shall be constructed of a solid material (e.g., earthen berm, wood, concrete, masonry, or combination thereof) with no visible air gaps at the base or between construction materials. If wood materials are used, materials shall be overlapped or tightly fitted (e.g., tongue and groove) to ensure that visible air gaps do not occur due to material shrinkage resulting from changes in ambient temperature/moisture content of the material.

f) Proposed residential dwellings located on lots 1, 11, and 10 shall be designed so that exterior activity areas are shielded from line-of-sight of San Benancio Road, in accordance with the requirements stipulated in Mitigation Measure 4.c, above.

Mazda Raceway Laguna Seca

g) The Monterey County Planning Department shall ensure that the project applicant provides disclosure statements to future residents at the project site informing them of the presence of the Mazda Raceway Laguna Seca and the potential for elevated noise levels during events at the raceway. The project applicant shall prepare and record the notification agreement prior to or concurrent with recordation of the final map of the first phase of the proposed project. All future residents shall be notified of the noise exposure prior to entering into an agreement to purchase a residential lot within the project site.

Timing/Implementation: *Mitigation Measures 2,a-f shall be complied with prior to issuance of building permits and during construction of proposed residential dwelling units. Mitigation Measure 2,g shall be implemented prior to the sale of proposed residential dwelling units.*

Enforcement/Monitoring: *Monterey County.*

Significance After Mitigation

The installation of mechanical ventilation and air conditioning systems would allow occupants of proposed residential dwelling units to keep windows closed. Newer construction techniques for residential dwellings, with windows closed, typically provides an exterior-to-interior noise reduction of approximately 20-25 dBA. Interruption of line-of-sight associated with the construction of proposed barriers would reduce exterior traffic noise levels within outdoor activity areas by a minimum of approximately 5 dBA. With implementation of recommended mitigation measures, predicted interior noise levels of proposed residential dwellings would not exceed the County's "normally unacceptable" exterior noise standards of 70 dBA CNEL and predicted interior noise levels would be reduced to below 45 dBA CNEL. In addition, the issuance of disclosure statements would ensure that occupants of proposed dwelling units are made aware of potential increases in noise levels associated with nearby racing events prior to purchase. This impact is considered **less than significant**, with mitigation incorporated.

IMPACT 5 **Exposure to Ground Vibration.**

Ground vibration spreads through the ground and diminishes in strength with distance. The effects of ground vibration can vary from no perceptible effects at the lowest levels, low rumbling sounds and detectable vibrations at moderate levels, and slight damage to nearby structures at the highest levels. At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely result in structural damage.

Long-term operational activities associated with the proposed project would not involve the use of any equipment or processes that would result in potentially significant levels of ground vibration. Increases in groundborne vibration levels attributable to the proposed project would be primarily associated with short-term construction-related activities. Groundborne vibration levels associated with construction equipment are summarized in **Table 12**. Construction activities associated with the proposed development would likely require the use of various tractors, trucks, and jackhammers.

Table 12
Representative Vibration Source Levels for Construction Equipment

Equipment	Peak Particle Velocity at 25 Feet (in/sec ppv)
Large Tractors	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small Tractors	0.003
Source: Caltrans 2002, FTA 2006	

Based on the vibration levels presented in **Table 12**, ground vibration generated by construction equipment would be less than 0.09 inches per second ppv at 25 feet. Therefore, because

ground vibration levels diminish in strength with increased distance from the source, predicted vibration levels would not exceed recommended criteria for structural damage and human annoyance (0.2 and 0.1 in/sec ppv, respectively) at nearby land uses. Short-term groundborne vibration impacts would be considered **less than significant**.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

CUMULATIVE SETTING

The geographic extent of the cumulative setting for consists of the County of Monterey, as well as consideration of regional activities and attributes (e.g., regional traffic volumes and patterns). This setting includes consideration of existing, planned and future land use development, traffic volumes and buildout of the project. The primary factor for cumulative noise impact analysis is the consideration of future traffic volumes.

IMPACT 6 **Contribution to Future Cumulative Ambient Noise Levels.**

Noise generated by the proposed residential land uses, as perceived at nearby land uses, would be primarily associated with increases in vehicle traffic on area roadways. As discussed in **Impact 3**, predicted near-term increases in traffic noise levels attributable to the proposed project would be approximately 0.2 dBA, or less. As future development within the region and corresponding traffic volumes along area roadways increases, the project's contribution to cumulative increases in traffic noise levels would be anticipated to decline. As a result, the project's contribution to cumulative traffic noise levels would be considered ***less than significant***.

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APPENDIX A
TRAFFIC NOISE PREDICTION MODELING

SR 68

REF NOISE LEVELS: CALVENO
TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.00	11.78	9.31
M-TRUCKS	1.91	0.50	0.20
H-TRUCKS	0.80	0.40	0.10

EXISTING CONDITIONS

WEST OF JOSSELYN CYN RD
ADT: 21420 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.02
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
91.6	196.7	423.5	912.1

JOSSELYN CYN RD TO OLMSTED
ADT: 20250 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 72.77
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
88.3	189.5	407.9	878.6

OLMSTED TO 218
ADT: 21805 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.09
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
92.7	199.1	428.6	923.0

218 TO L GRADE
ADT: 24500 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.60
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
100.1	215.1	463.2	997.6

L GRADE TO SAN BENANCIO
ADT: 22725 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.27
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
95.3	204.6	440.5	948.8

SAN BENANCIO TO TORERO
ADT: 23510 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.42
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL

------- ------- ------- -------
97.4 209.3 450.6 970.5

EAST OF TORERO
ADT: 19820 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 72.68
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
87.0 186.8 402.2 866.1

BACKGROUND

WEST OF JOSSELYN CYN RD
ADT: 23840 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.48
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
98.3 211.3 454.8 979.6

JOSSELYN CYN RD TO OLMSTED
ADT: 22675 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.26
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
95.1 204.3 439.9 947.4

OLMSTED TO 218
ADT: 24760 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.65
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
100.8 216.7 466.4 1004.6

218 TO L GRADE
ADT: 27030 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 74.03
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
106.9 229.7 494.5 1065.1

L GRADE TO SAN BENANCIO
ADT: 24990 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.69
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
101.5 218.0 469.3 1010.8

SAN BENANCIO TO TORERO
ADT: 25935 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.85
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------

104.0 223.5 481.1 1036.1

EAST OF TORERO
ADT: 22240 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.18
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
93.9 201.7 434.2 935.2

BACKGROUND PLUS PROJECT

WEST OF JOSSELYN CYN RD
ADT: 24050 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.52
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
98.9 212.5 457.5 985.3

JOSSELYN CYN RD TO OLMSTED
ADT: 22885 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.30
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
95.7 205.6 442.6 953.2

OLMSTED TO 218
ADT: 25010 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.69
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
101.5 218.1 469.6 1011.4

218 TO L GRADE
ADT: 27405 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 74.09
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
107.9 231.8 499.1 1074.9

L GRADE TO SAN BENANCIO
ADT: 25440 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.76
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
102.7 220.6 474.9 1022.9

SAN BENANCIO TO TORERO
ADT: 26445 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.93
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
105.3 226.4 487.4 1049.7

EAST OF TORERO
ADT: 22820 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.29
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
95.5 205.2 441.8 951.4

CUMULATIVE PLUS PROJECT

WEST OF JOSSELYN CYN RD
ADT: 33430 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 74.95
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
123.1 264.6 569.8 1227.2

JOSSELYN CYN RD TO OLMSTED
ADT: 32200 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 74.79
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
120.0 258.1 555.7 1196.9

OLMSTED TO 218
ADT: 34800 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 75.12
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
126.4 271.8 585.2 1260.5

218 TO L GRADE
ADT: 35555 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 75.22
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
128.2 275.7 593.7 1278.7

L GRADE TO SAN BENANCIO
ADT: 34705 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 75.11
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
126.1 271.3 584.2 1258.2

SAN BENANCIO TO TORERO
ADT: 36230 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 75.30
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
129.8 279.2 601.1 1294.8

EAST OF TORERO
ADT: 32050 SPEED: 55 ACTIVE HALF WIDTH (FT): 8
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 74.77
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
119.7 257.3 554.0 1193.2

218 N OF SR68

REF NOISE LEVELS: CALVENO
TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

EXISTING
ADT: 10490 SPEED: 45 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 66.02
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 78.7 166.1 356.1

BACKGROUND
ADT: 11530 SPEED: 45 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 66.43
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 83.6 176.7 379.2

BACKGROUND PLUS PROJECT
ADT: 11640 SPEED: 45 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 66.47
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 84.1 177.9 381.6

CUMULATIVE PLUS PROJECT
ADT: 13410 SPEED: 45 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 67.08
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 92.1 195.3 419.2

JOSSELYN CANYON S OF SR68

EXISTING
ADT: 3250 SPEED: 25 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 55.84

* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 0.0 63.6

BACKGROUND
ADT: 3250 SPEED: 25 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 55.84
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 0.0 63.6

BACKGROUND PLUS PROJECT
ADT: 3250 SPEED: 25 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 55.84
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 0.0 63.6

CUMULATIVE PLUS PROJECT
ADT: 3430 SPEED: 25 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 56.08
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 0.0 66.0

OLMSTED S OF SR68

EXISTING
ADT: 3120 SPEED: 50 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 62.98
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 88.1 189.4

BACKGROUND
ADT: 3250 SPEED: 50 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 63.15
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 90.5 194.7

BACKGROUND PLUS PROJECT
ADT: 3250 SPEED: 50 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 63.15
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 90.5 194.7

CUMULATIVE PLUS PROJECT
ADT: 3620 SPEED: 50 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 63.62
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
  0.0   0.0   97.2   209.1

LAUR GRADE S OF SR68

EXISTING
ADT: 8030   SPEED: 50   ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT   GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 67.08
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
  0.0   76.9   165.2   355.6

BACKGROUND
ADT: 8240   SPEED: 50   ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT   GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 67.19
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
  0.0   78.2   168.0   361.7

BACKGROUND PLUS PROJECT
ADT: 8300   SPEED: 50   ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT   GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 67.23
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
  0.0   78.6   168.8   363.5

CUMULATIVE PLUS PROJECT
ADT: 10310   SPEED: 50   ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT   GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 68.17
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
  0.0   90.7   195.1   420.0

SAN BEN S OF SR 68

EXISTING
ADT: 3260   SPEED: 35   ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT   GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 59.33
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
  0.0   0.0   50.5   108.3

BACKGROUND
ADT: 3620   SPEED: 35   ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT   GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 59.78
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
  0.0   0.0   54.2   116.1

BACKGROUND PLUS PROJECT
ADT: 3730   SPEED: 35   ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT   GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 59.91

* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 55.2 118.4

CUMULATIVE PLUS PROJECT
ADT: 4300 SPEED: 35 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 60.53
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 60.7 130.2

TORERO N OF SR68

EXISTING
ADT: 3830 SPEED: 25 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 56.56
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 0.0 70.9

BACKGROUND
ADT: 3830 SPEED: 25 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 56.56
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 0.0 70.9

BACKGROUND PLUS PROJECT
ADT: 3840 SPEED: 25 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 56.57
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 0.0 71.1

CUMULATIVE PLUS PROJECT
ADT: 4380 SPEED: 25 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 57.14
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 0.0 77.5

RIVER S OF SR68

EXISTING
ADT: 1760 SPEED: 45 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 59.34
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 50.7 108.5

BACKGROUND
ADT: 2030 SPEED: 45 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 59.96
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 55.6 119.3

BACKGROUND PLUS PROJECT
ADT: 2500 SPEED: 45 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 60.86
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 63.8 137.0

CUMULATIVE PLUS PROJECT
ADT: 3950 SPEED: 45 ACTIVE HALF WIDTH (FT): 6
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 62.85
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *
70 CNEL 65 CNEL 60 CNEL 55 CNEL
------- ------- ------- -------
0.0 0.0 86.4 185.8