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May 10, 2013

Ms. Gayle Ackerman, AICP
City of Lake Forest
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630

Subject: ***Update to the Environmental Noise Assessment for the Portola Center Project – Lake Forest, California***

Dear Ms. Ackerman:

Dudek has reviewed the Portola Center Tentative Maps dated April 2, 2013. The April 2013 Tentative Maps include the conversion of the ½-acre park to four additional single family lots near the eastern entrance to Portola South (TM 15353), minor adjustments to the lotting depths and road alignments in some of the single family neighborhoods on Portola South, and adjustments to the pad elevations and street alignment in the northeastern corner of Portola North (TM 17300). Neither the adjustments to the lotting depths and road alignments in the neighborhoods on Portola south nor the adjustments to pad elevations and street alignment in the northeastern corner of Portola North would change the findings of Dudek's Environmental Noise Assessment for the Portola Center Project (dated January 31, 2013). The conversion of the ½-acre park to four additional single family lots near the eastern entrance to Portola South (TM 15353) would not change the findings of the Environmental Noise Assessment, either. Those four single family lots would be subject to the interior noise mitigation measure outlined in Section 4.3, which requires an interior noise study for all homes adjacent to, and with a direct line-of-sight of, Glenn Ranch Road and Saddleback Ranch Road. The modeled exterior noise level at that location is below the 65 dB exterior noise threshold; therefore, no additional noise walls would be required.

If you have any questions regarding this update letter, please feel free to contact me at 760.479.4248, or bgrover@dudek.com.

Sincerely,

Brian Grover
Environmental Specialist/Project Manager

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January 31, 2013 6888-01

Mr. Stephen M. Haase
USA Portola Properties
610 West Ash Street, Suite 1500
San Diego, California 92101

Subject ***Environmental Noise Assessment for the Portola Center Project – Lake Forest, California***

Dear Mr. Haase:

Dudek has completed this environmental noise assessment for the Portola Center project located in the City of Lake Forest. In summary, short-term noise impacts would result from the construction of the project. Long-term noise impacts would result from increased traffic noise along Glenn Ranch Road and Saddleback Ranch Road, mechanical equipment noise associated with the mixed use site, and noise from athletic fields in the onsite 5-acre Public Neighborhood Park. The following summarizes the noise mitigation and best management practices (BMPs) for the project. With incorporation of these mitigation measures and BMPs, construction and operational noise impacts will be reduced to a less than significant level.

Mitigation Measures

1. Noise barriers such as sound walls or berms up to six feet in height would be required to mitigate the exterior traffic noise impacts on single family homes and multifamily buildings adjacent to portions of Glenn Ranch Road and Saddleback Ranch Road.
2. As a requirement of the building permit approval process, an interior noise study will be required for the single-family homes and multi-family buildings adjacent to Glenn Ranch Road and Saddleback Ranch Road to ensure that the interior CNEL would not exceed 45 dB. The residences would most likely require air-conditioning and/or mechanical ventilation systems to meet the City's interior noise standard. Sound-rated windows may also be required.
3. A noise assessment shall be prepared prior to the issuance of building permits for the commercial property outdoor mechanical equipment. The noise assessment shall identify any noise control measures necessary to comply with the City's Noise Ordinance requirements.

4. All stands and general spectator areas at any active athletic fields within the 5-acre Neighborhood Park shall be located a minimum of 150 feet from the closest residential property line. Alternatively, noise barriers such as sound walls or berms up to six feet in height shall be constructed along the lots within 150 feet of the spectator areas. Berms may be constructed outside the lot boundary in front of the lots whereas sound walls may be constructed inside or outside the lot boundary to satisfy this condition.
5. The parks shall not be used between the hours of 10:00 p.m. and 7:00 a.m.
6. Prior to Grading Permit issuance, the Applicant shall ensure that:

    - All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers.
    - Construction noise reduction methods such as shutting off idling equipment, installing temporary acoustic barriers around stationary construction noise sources, maximizing the distance between construction equipment staging areas and occupied residential areas, and use of electric air compressors and similar power tools, rather than diesel equipment, shall be used where feasible. Unattended construction equipment shall not idle for more than 5 minutes when located within 200 feet from residential properties.
    - Noise attenuation measures, which may include, but are not limited to, temporary noise barriers or noise blankets around stationary construction noise sources are implemented where feasible.
    - During construction, stationary construction equipment shall be placed such that emitted noise is directed away from or shielded from noise sensitive receptors where feasible.
    - During construction, stockpiling and vehicle staging areas shall be located as far as practical from noise sensitive receptors.
    - Grading activities shall not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a Federal holiday.
    - Construction hours, allowable workdays, and the phone number of the job superintendent shall be clearly posted at construction entrances to allow surrounding property owners and residents to contact the job superintendent if necessary. In the event the City receives a complaint, appropriate corrective actions shall be implemented.

- Two weeks prior to the commencement of construction, notification must be provided to surrounding land uses within 300 feet of a project site disclosing the construction schedule, including the various types of activities that would be occurring throughout the duration of the construction period. This notification shall give a contact phone number for any questions or complaints. All complaints shall be responded to in a method deemed satisfactory by the City of Lake Forest.

Best Management Practices

The project will use lighter-weight grading equipment and static compaction equipment (e.g., a sheep's foot) in any areas that are within 25 feet of existing homes or residential buildings immediately adjacent to the project site. Prior to commencement of grading activities within 25 feet of any existing residential buildings, the project will conduct a video survey of the building foundations of those buildings and install vibration monitoring equipment inside the property boundary for each building within 25 feet of grading activities.

1.0 BACKGROUND

Project Location and Description

The Portola Center project is located on an approximately 197-acre site in the City of Lake Forest, California (Figures 1 and 2). The Applicants are seeking approval of Tentative Tract Maps (TTMs) 17300 and 15353. The project entails development of a total of 930 residential units, consisting of 613 single-family homes, 260 multi-family homes, and 57 affordable multifamily homes. In addition, a total of 18 attached accessory/secondary dwelling units are proposed with TTM 17300, however by California law accessory dwellings are not counted as separate dwelling units. The 57 affordable homes and 10,000 square feet of commercial space would be located on a mixed use site within TTM 15353. The project also includes approximately 10.6 net acres of parkland and private recreational facilities, and nearly 2 miles of public trails.

City Noise Criteria

The City has established noise criteria, primarily for transportation noise sources, within the City's General Plan Noise Element. Noise standards for non-transportation noise sources are provided in the City's Noise Ordinance.

General Plan Noise Element

The City of Lake Forrest requires exterior noise levels at new residential developments not to exceed a Community Noise Equivalent Level (CNEL) of 65 dB at the outdoor living areas (City

of Lake Forest 1994). The outdoor living areas are limited to the rear yards of single family homes, multi-family patios and balconies (with a depth of 6 feet or more) and common recreation areas. Interior noise levels are not to exceed a CNEL of 45 dB. All sound levels discussed in this report are A-weighted.

Noise Ordinance

The City Noise Ordinance is designed to protect people from non-transportation noise sources such as music, construction activity, machinery and pumps, and air conditioners. Enforcement of the ordinance ensures adjacent properties are not exposed to excessive noise from stationary sources. Enforcing the Noise Ordinance includes requiring proposed development projects to show compliance with the ordinance, and requiring construction activity to comply with established work schedule limits. Table 1 depicts the City's noise standards that apply to all residential properties (City of Lake Forest 2010). Following this table are a summary of noise level adjustments that may be made to the noise level limits depending on the period of time the noise occurs during any hour.

Table 1
City of Lake Forest Exterior Noise Standards

Noise Level	Time Period
55 dB	7:00 a.m. to 10:00 p.m.
50 dB	10:00 p.m. to 7:00 a.m.

It shall be unlawful for any person at any location to create any noise, or to allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, when the foregoing causes the noise level:

1. The noise standard for a cumulative period of more than 30 minutes in any hour; or
2. The noise standard plus 4 dB for a cumulative period of more than 15 minutes in any hour; or
3. The noise standard plus 10 dB for a cumulative period of more than 5 minutes in any hour; or
4. The noise standard plus 15 dB for a cumulative period of more than 1 minute in any hour; or
5. The noise standard plus 20 dB for any period of time.

The City limits construction and grading activities to the hours of 7:00 a.m. and 8:00 p.m., Monday through Saturday (City of Lake Forest 2010). Construction is not allowed at any time on Sunday or a Federal holiday.

CEQA Significance Thresholds Guide

The City of Lake Forest has developed a guide for determining significant impacts under the California Environmental Quality Act (CEQA) for the internal review of discretionary projects. With regard to traffic-generated noise, the Guide states that "a proposed project would normally have a significant offsite traffic noise impact if both of the following criteria are met:

- Project traffic will cause a noise level increase of 3dB or more on a roadway segment adjacent to a noise sensitive land use. Noise sensitive land uses include the following: residential (single-family, multi-family, mobile home); hotels; motels; nursing homes; hospitals; parks, playgrounds and recreation areas; and schools.

- The resulting 'future with project' noise level exceeds the noise standard for sensitive land uses as identified in the City of Lake Forest General Plan."

With regard to stationary sources, the Guide states that "a project would normally have a significant noise impact if it would exceed the stationary noise criteria for the City of Lake Forest as specified by the Exterior noise standards set forth in the Noise Control Chapter of the Lake Forest Municipal Code" (City of Lake Forest 2009).

Methodology

The noise level associated with selected roadways was determined using the Federal Highway Administration's TNM 2.5 traffic noise prediction model (FHWA 2004). Input used in the noise model included the existing and future build-out traffic volumes along Glenn Ranch Road and Saddleback Ranch Road (Wilson & Company 2013). The future traffic speed was assumed to be 50 mph along Glen Ranch Road, 50 mph along Saddleback Ranch Road south of Malabar Road, and 40 mph north of Malabar Road, which are the existing posted traffic speed limits along these roads. Noise and vibration levels resulting from the proposed construction activities have been obtained from reports prepared by the Federal Transit Administration (FTA 2006), the California Department of Transportation (Caltrans 2004), and field data from files. The noise impact assessment utilized criteria established in the City of Lake Forest General Plan Safety and Noise Element (City of Lake Forest 1994), Noise Ordinance (City of Lake Forest 2010), and CEQA Significance Thresholds Guide (City of Lake Forest 2009).

2.0 EXISTING CONDITIONS

Traffic along Glenn Ranch Road and Saddleback Ranch Road are the primary noise sources in the immediate vicinity of the site. Background noise includes distant traffic and occasional distant aircraft noise.

Glenn Ranch Road and Saddleback Ranch Road are the primary noise sources at the site. Glenn Ranch Road has existing traffic volumes of 6,200 to 13,700 average daily traffic (ADT), and Saddleback Ranch Road has existing traffic volumes of 13,200 ADT. The existing noise level along Glenn Ranch Road ranges from approximately 68 dB to 71 dB at a distance of 50 feet from the center line of the road. The noise level depends on the ADT adjacent to the road segment. The noise level is approximately 67 dB CNEL at a distance of 50 feet from the center line of Saddleback Ranch Road.

Ambient Noise Measurements

Noise measurements were conducted at, and adjacent to, the site on September 25, 2012, between the hours of 11:00 a.m. and 11:54 a.m. to determine the existing noise levels. The noise measurements were made using a Larson-Davis Laboratories Model 700 integrating sound level meter. Sound level meter calibration documentation is included as Attachment 2 of this document. The sound level meter was calibrated before and after the measurements, and the measurements were conducted with the microphone positioned approximately 5 feet aboveground.

Two noise measurement locations were selected at the project site and are depicted as Sites 1 and 2 on Figure 3. Site 1 was at the north side of Glenn Ranch Road. Site 2 was along the west side of Saddleback Ranch Road. As shown in Table 2, the measured average noise levels were 69 dB at Site 1 and 67 dB at Site 2. The primary noise source at Sites 1 and 2 was the traffic along the adjacent roads.

Table 2
Measured Noise Levels and Traffic Volumes

Site	Description	Date/Time	Leq1	Lmin	Lmax	Cars	MT2	HT3
1	Along north side of Glenn Ranch Road, approximately 50 feet from the center line	9/25/2012 11:00 a.m. to 11:20 a.m.	69	34	84	151	1	0
2	Along west side of Saddleback Ranch Road, approximately 50 feet from the center line	9/25/2012 11:34 a.m. to 11:54 a.m.	67	37	75	193	1	0

Note: [1] Equivalent Continuous Sound Level

2.2 Noise Modeling

The FHWA TNM 2.5 traffic noise prediction model was used to model noise generated by traffic along Glenn Ranch Road and Saddleback Ranch Road. The TNM 2.5 traffic noise prediction model was calibrated first, using the measured average noise levels and the concurrently counted

traffic volumes shown in above Table 2. The same traffic volume and vehicle composition ratios (i.e., percentage of autos, medium trucks and heavy trucks) counted during the noise measurements were used to calibrate the model and verify the input used in the noise model. The modeled noise levels are within one dB of the measured noise levels. This result generally confirms the assumptions used in the noise model. The TNM 2.5 calibration output file is included in Attachment 3 of this document.

3.0 FUTURE CONDITIONS

On-site noise generating activities associated with the project would include short-term construction and long-term noise associated with active uses in the project's onsite parks. The project would generate off-site traffic noise along various roads in the area. In addition, the project site would be exposed to traffic noise along Glenn Ranch Road and Saddleback Ranch Road.

3.1 Short-Term Construction Noise and Vibration

Development activities for the project construction would generally involve the following activities: (1) site preparation, (2) building construction, and (3) paving. Specific project construction details and equipment fleet specifications are not available at this time. However, the following are typical examples of construction equipment that would be expected to be utilized onsite:

- Tractor/Backhoes
- Dozers
- Loaders
- Scrapers
- Graders
- Off-Highway Water Trucks
- Roller
- Cranes
- Forklifts
- Trenchers
- Paving Equipment
- Excavators

- Materials Delivery Trucks
- Concrete Trucks
- Asphalt Trucks
- Pneumatic Tools
- Air Compressors

As demonstrated by the summary above, construction equipment anticipated for project development includes only standard equipment that would be employed for any routine construction project of this scale; construction equipment with substantially higher noise and vibration generation characteristics (such as pile drivers, rock drills, blasting equipment, etc.) are not anticipated for development of the project. Construction noise is difficult to quantify because of the many variables involved including the size of equipment used, percentage of time and number of pieces of equipment which will actually operate on the site. However, maximum construction noise levels at 50 feet would typically range from approximately 75 to 85 dB for the type of equipment anticipated to be used for construction of the project. The range of maximum noise levels associated with various pieces of construction equipment is depicted in Table 3.

The closest existing residences to the construction area are located at the northern property boundary along Millwood Road and Malabar Road, Sorano Cove, Totila Way, and Sassetta Way. Grading and construction activities would occur approximately seven or more feet from the existing multifamily buildings along Sorano Cove, Totila Way and Sassetta Way. The construction of a manufactured slope and other improvements in the northeast corner of the site near the La Quinta stub street offsite would also involve grading and construction activities within approximately 15 feet of existing residences. In all other areas, grading activities would not occur any closer than approximately 40 feet from existing residences. Based on the types of grading equipment operating as close as seven feet to the nearest residences, the construction noise is anticipated to generate maximum noise levels of up to approximately 102 dB at the adjacent residences. This noise level could intermittently occur for a few days when construction equipment is operating immediately adjacent to the residential properties. The remainder of the time the construction noise level would be much less because the equipment would be working in a large area farther away from the existing residences. When the construction equipment is operating, the existing residences could be disturbed by the activities.

Construction activities associated with development of the project have the potential to adversely affect adjacent noise-sensitive uses. As such, these noise levels are considered to represent a potentially significant impact. The project would be required to limit construction hours, place mufflers on equipment engines, construct temporary noise barriers, and, to the extent possible,

orient stationary sources to direct noise away from sensitive uses. These measures are included as a part of the noise mitigation (See Section 4.1).

Table 3
Construction Equipment Noise Emission Levels

Equipment	Typical Sound Level (dB) 50 feet from Source
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pile-driver (Impact)	101
Pile-driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rail Saw	90
Rock Drill	98
Roller	74
Saw	76
Scraper	89
Truck	88

Source: Federal Transit Administration, May 2006, *Traffic Noise and Vibration Assessment*.

The heavier pieces of construction equipment used at this site could include bulldozers, graders, loaded trucks, water trucks and pavers. Ground-borne vibration information related to construction activities has been collected by Caltrans (Caltrans 2004). Information from Caltrans indicates that continuous vibrations with a peak particle velocity of approximately 0.1 inches/second begin to annoy people. However, according to the American Society of Civil Engineers (ASCE 1974), this annoyance threshold is approximately half of the magnitude which is typically used for protection of "fragile buildings". The ASCE recommends the use of a 0.2

inches/second particle velocity to ensure the avoidance of damage to older existing structures in the project vicinity.

Ground-borne vibration is typically attenuated over short distances. The closest residential buildings to the construction area would be the multifamily homes along Sorano Cove, Totila Way, and Sassetta Way located at the northern boundary of the site approximately 7 feet or more from the grading and construction area. Heavier pieces of construction equipment such as large bulldozers and loaded trucks would have peak particle velocities of approximately 0.60 or less at a distance of 7 feet (FTA 2006). At these distances, the peak particle velocity would be above 0.1 inches/second, the level of vibration which is considered to be perceivable by a sensitive receptor. The peak particle velocity at this distance would also be above the recommended 0.2 inches/second recommended by the ASCE to ensure the avoidance of damage to older existing structures. As a result, ground-borne vibration from grading activities would be considered a potentially significant impact.

As construction BMPs, the project will use lighter-weight grading equipment and static compaction equipment (e.g., a sheep's foot) in any areas that are within 25 feet or less of existing homes or residential buildings immediately adjacent to the project site. Prior to commencement of grading activities within 25 feet of these structures, the project will conduct a video survey of the building foundations and install vibration monitoring equipment inside the property boundary of the complex along the project site boundary.

With the incorporation of these construction BMPs, no buildings adjacent to the project site would be anticipated to be damaged from the ground-borne vibration created during site preparation activities and this vibration impact would be less than significant. As it relates to other construction activities that would create excessive vibration, the greatest sources of ground vibration from construction are associated with pile driving, rock drills, and blasting, none of which are proposed for project development. Therefore, other construction activities are not anticipated to result in continuous vibration levels that typically annoy people, and the vibration impact would be less than significant.

3.2 Exterior Traffic Noise Impact at Receptors

Glenn Ranch Road and Saddleback Ranch Road will be the primary noise sources in the future. Glenn Ranch Road is projected to have a Year 2030 traffic volume of 12,000 ADTs between Saddleback Back Ranch Road and El Toro Road and 30,000 ADTs between Portola Parkway and Saddleback Ranch Road. Saddleback Ranch Road is projected to have a Year 2030 traffic volume of 14,700 ADTs between Glenn Ranch Road and Millwood Road (Wilson and Company 2013). ADT volumes were divided by 10 to estimate hourly segment volumes along these

roadways, and these hourly segment volumes were utilized in the model. The locations of modeled receptors are shown in Figure 4. The conversion of hourly Leq to CNEL is based on the hourly traffic counts for the adjacent roads as provided in the project-specific traffic report (Wilson & Company 2013). The 24-hour traffic counts indicate that approximately 75% of the daily traffic volume occurs during the daytime hours, 15% during the evening hours and 10% during the nighttime hours.

The first floor unmitigated noise level would range from 62 to approximately 69 dB CNEL. Noise levels associated with each receptor are shown in Table 4. The noise level would exceed the City's noise guideline by up to 4 dB at some of the lots adjacent to both Glenn Ranch Road and Saddleback Ranch Road.

Table 4
Exterior Traffic Noise Levels at Modeled Receptors

Receptor	First Floor Noise Level (dB CNEL) Unmitigated	First Floor Noise Level (dB CNEL) Mitigated	Second Floor Noise Level (dB CNEL) Unmitigated
R1	62	51	–
R2	65	53	–
R3	66	54	–
R4	67	56	–
R5	68	56	–
R6	69	58	–
R7	69	57	–
R8	69	57	–
R9	69	57	–
R10	69	56	–
R11	69	54	–
R12	68	53	–
R13	63	49	–
R14	65	49	–
R15	65	51	–
R16	66	53	–
R17	66	54	–
R18	66	55	–
R19	67	55	–
R20	67	55	–
R21	68	58	–
R22	68	61	–
R23	65	63	–
R24	64	63	–
R25	65	63	–

Table 4
Exterior Traffic Noise Levels at Modeled Receptors

Receptor	First Floor Noise Level (dB CNEL) Unmitigated	First Floor Noise Level (dB CNEL) Mitigated	Second Floor Noise Level (dB CNEL) Unmitigated
R26	66	60	–
R27	65	60	–
R28	62	60	–
R29	59	56	–
R30	66	60	–
R31	67	60	–
R32	67	63	–
R33	64	64	–
R34	62	61	–
R35	62	60	–
R36	62	60	–
R37	61	60	–
R38	62	61	–
R39	64	63	–
R40	66	63	–
MF1	64	62	63
MF2	64	61	63
MF3	64	62	63
MF4	63	62	63
MF5	63	61	62
Park	63	62	–
Mixed Use	65	63	64

Source: TNM 2.5 model output. See Attachment 3 for complete results.

The City of Lake Forest General Plan Noise Element establishes that noise levels in excess of 65 dB CNEL would result in a significant noise impact if not mitigated. Exterior noise impacts could be mitigated by constructing 6-foot high noise barriers (i.e., sound walls or berms) at the homes adjacent to Glenn Ranch Road and Saddleback Ranch Road, as depicted in Figure 5. This mitigation is discussed in more detail in Section 4.2.

With inclusion of these sound walls, noise levels would be decreased to 65 dB CNEL or less at all first floor exterior receptors, as shown above in Table 4.

3.3 Interior Traffic Noise Impact at Receptors

The City requires that interior noise levels not exceed a CNEL of 45 dB. Typically, with the windows open, and using standard California construction materials and methods, building shells provide approximately 15 dB of noise reduction. Therefore, residences exposed to an exterior

CNEL greater than 60 dB could result in an interior CNEL greater than 45 dB. Interior noise levels associated with each receptor are shown in Table 5, based on the assumption that building shells provide 15 dB of noise reduction.

Table 5
Interior Traffic Noise Levels at Modeled Receptors

Receptor	First Floor Noise Level (dB CNEL) Unmitigated	First Floor Noise Level (dB CNEL) Mitigated*	Second Floor Noise Level (dB CNEL) Unmitigated
R1	47	36	43
R2	50	38	45
R3	51	39	47
R4	52	41	49
R5	53	41	48
R6	54	43	47
R7	54	42	44
R8	54	42	43
R9	54	42	46
R10	54	41	44
R11	54	39	41
R12	53	38	45
R13	48	34	35
R14	50	34	35
R15	50	36	37
R16	51	38	43
R17	51	39	47
R18	51	40	47
R19	52	40	45
R20	52	40	44
R21	53	43	45
R22	53	46	51
R23	50	48	50
R24	49	48	51
R25	50	48	51
R26	51	45	48
R27	50	45	49
R28	47	45	46
R29	44	41	41
R30	51	45	50
R31	52	45	51
R32	52	48	52
R33	49	49	50
R34	47	46	48

Table 5
Interior Traffic Noise Levels at Modeled Receptors

Receptor	First Floor Noise Level (dB CNEL) Unmitigated	First Floor Noise Level (dB CNEL) Mitigated*	Second Floor Noise Level (dB CNEL) Unmitigated
R35	47	45	46
R36	47	45	46
R37	46	45	46
R38	47	46	46
R39	49	48	50
R40	51	48	52
R41	49	47	48
R42	49	46	48
R43	49	47	48
R44	48	47	48
MF1	48	46	47
MF2	50	48	49
MF3	47	36	43
MF4	50	38	45
MF5	51	39	47
Mixed Use	52	41	49

Source: TNM 2.5 model output. See Attachment 3 for complete results.
* This "mitigated" scenario is only accounting for the reduced noise level achieved from the noise wall for exterior noise mitigation. It does not account for any interior noise reduction measures. Those have been identified as part of a future mitigation requirement – refer to Section 4.3 of this report.

The estimated interior noise level would exceed 45 dB CNEL at a majority of the single family lots and multi-family buildings adjacent to Glenn Ranch Road and Saddleback Ranch Road. Thus, single family lots and multi-family buildings adjacent to Glenn Ranch Road and Saddleback Ranch Road would require interior noise studies.

3.4 Off-Site Traffic Noise Impact

The project would generate a net increase of approximately 10,395 ADT (Wilson & Company 2013) and would increase traffic along several existing roads in the area including Glenn Ranch Road, Saddleback Ranch Road, El Toro Road and Portola Parkway. In accordance with the City of Lake Forest CEQA Significance Thresholds Guide, traffic-generated noise impacts along these roadways would be significant if they exceed a 3 dB CNEL increase above an already noisy existing condition (i.e., 65 dB CNEL) at existing residences or other noise-sensitive land uses. As identified in the City of Lake Forest General Plan Noise Element, the City's conditionally acceptable noise level for residences is 65 dB CNEL; therefore, this threshold is utilized. A 3 dB increase is generally considered to be the point of change in environmental noise that can just be detected by the human ear.

The noise level increases associated with the Year 2015 conditions are depicted in Table 6. With the project, the Year 2015 traffic noise would generate a noise level increase of 1 dB CNEL or less along Glen Ranch Road and less than 1 dB CNEL along the other nearby roads as compared to without the project. Therefore, the additional project traffic volume along the adjacent roads would not substantially increase the existing noise level in the project vicinity and the traffic noise level increase is considered less than significant.

Table 6
2015 Off-Site Traffic Noise Level Increase

Street (Segment)	Future Year 2015 ADT	Future Year 2015 w/ Project ADT	Noise Level Increase (CNEL)
Glenn Ranch Road			
West of Saddleback Ranch Rd.	22,000	27,000	1
East of Saddleback Ranch Rd.	8,000	9,000	1
Saddleback Ranch Road			
North of Glenn Ranch Rd.	14,000	15,500	<1
El Toro Road			
South of Glenn Ranch Rd.	16,000	17,000	<1
North of Portola Pkwy.	15,000	15,000	0
Portola Parkway			
Lake Forrest Dr. to Glenn Ranch Rd.	40,000	43,000	<1
Glenn Ranch Rd. to I-5	29,000	30,000	<1
I-5 to El Toro Rd.	41,000	42,000	<1
El Toro Rd. to Los Alisos Blvd.	38,000	39,000	<1

The noise level increases associated with the Year 2030 conditions are depicted in Table 7. With the project, the Year 2030 traffic noise would generate a noise level increase of 1 dB CNEL or less along Glen Ranch Road and less than 1 dB CNEL along the other nearby roads as compared to without the project. Therefore, the additional project traffic volume along the adjacent roads would not substantially increase the existing noise level in the project vicinity and the traffic noise level increase is considered less than significant.

Table 7
2030 Off-Site Traffic Noise Level Increase

Street (Segment)	Future Year 2030 ADT	Future Year 2030 w/ Project ADT	Noise Level Increase (CNEL)
Glenn Ranch Road			
West of Saddleback Ranch Rd.	25,000	30,000	1
East of Saddleback Ranch Rd.	11,000	12,000	<1

Table 7
2030 Off-Site Traffic Noise Level Increase

Street (Segment)	Future Year 2030 ADT	Future Year 2030 w/ Project ADT	Noise Level Increase (CNEL)
Saddleback Ranch Road			
North of Glenn Ranch Rd.	13,200	14,700	<1
El Toro Road			
South of Glenn Ranch Rd.	24,000	24,000	0
North of Portola Pkwy.	20,000	21,000	<1
Portola Parkway			
Lake Forrest Dr. to Glenn Ranch Rd.	47,000	50,000	<1
Glenn Ranch Rd. to I-5	35,000	36,000	<1
I-5 to El Toro Rd.	55,000	55,000	0
El Toro Rd. to Los Alisos Blvd.	47,000	47,000	0

3.5 Outdoor Recreation Areas

Neighborhood parks are intended for active recreational purposes. Each neighborhood park will include minimum improvements, as well as specific recreational components such as athletic fields and/or courts, spectator seating, picnic amenities, and play lots. The Portola Center Area Plan depicts conceptual amenities for each of the six planned neighborhood parks. One neighborhood park is located at the intersection of Glenn Ranch Road and the easterly-most access street to the south of the project site. Noise levels at this park would be 63 dB without mitigation and would, therefore, not exceed the 65 dB threshold established by the City for outdoor recreation areas such as parks.

Additionally, a 5.0-acre public Neighborhood Park is proposed at the southwestern portion of the site. The final design of the park will be reviewed under the City's park planning process and will be consistent with the requirements of the Portola Center Development Agreement.

At any one location, the hourly average sound level associated with recreational noise is difficult to predict due to many variables. These factors include the number of players and spectators, the location of people and the amount and level of conversation and cheering. However, to determine the approximate noise levels that would be generated at the ball fields and predict potential noise impacts, noise measurements that Dudek staff have conducted at several existing recreational parks including Stagecoach Park in Carlsbad, Cardiff Sports Park in Encinitas, and Vista National Little League in Vista were utilized. The proposed project would have similar ball fields as these facilities. The results of these measurements indicate that ball field activities

(including use of a PA system) generate a one-hour average noise level of approximately 55 to 65 dB at a distance of 50 feet from the stands and/or spectator areas.

The final locations of stands and spectator areas have not been determined. Therefore, as a worst-case assumption, the stands and spectator areas are assumed to be located adjacent to the closest residences to the athletic fields. Thus, the closest residences are assumed to be located approximately 35 feet from stand or spectator areas (see TTM 15353). The sports activities would generate a one-hour average noise level of approximately 68 dB at the closest residence. The noise level would be 68 dB CNEL at these residences assuming that games are played continuously on all the fields between the hours of 7:00 a.m. and 10:00 p.m. This noise level would exceed the City's General Plan Noise Element 65 dB CNEL noise criterion; therefore, the noise impact would be significant.

3.6 Commercial Property Outdoor Mechanical Equipment

Outdoor mechanical equipment such as heating, ventilating, and air conditioning (HVAC) equipment could be mounted on roofs or at the ground level of the commercial property building. Mechanical equipment plans are not currently available. The noise levels generated by this equipment would vary, but typically range from approximately 45 dB to 55 dB at a distance of 50 feet. A site plan for the commercial property has not been prepared, however, the multi-family land use would be located immediately east of the commercial property. If unmitigated, the mechanical equipment could generate noise levels in excess of the City's Noise Ordinance limits resulting in a significant noise impact.

3.7 Cumulative Noise

Construction noise impacts primarily affect the areas immediately adjacent to the construction site. Thus, because no other projects would be constructed within the vicinity of the project site or in the surrounding area, construction noise impacts would not be cumulatively considerable. Project traffic impacts would be 1 dB or less along adjacent roadways as previously discussed in Section 3.4. Therefore, the increase in noise associated with cumulative traffic would not be cumulatively considerable and is less than significant. As it relates to stationary sources, because no other project sites are located within the immediate vicinity of the proposed project that would involve stationary noise sources, the project would not contribute to a cumulative stationary noise impact and impacts would be less than significant.

4.0 MITIGATION

The following measures will be required to fully mitigate the noise impacts:

4.1 Construction Noise

Prior to Grading Permit issuance, the Applicant shall ensure that:

- All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers.
- Construction noise reduction methods such as shutting off idling equipment, maximizing the distance between construction equipment staging areas and occupied residential areas, and use of electric air compressors and similar power tools, rather than diesel equipment, shall be used where feasible. Unattended construction vehicles shall not idle for more than 5 minutes when located within 200 feet from residential properties.
- Noise attenuation measures, which may include, but are not limited to, temporary noise barriers or noise blankets around stationary construction noise sources, are implemented where feasible.
- During construction, stationary construction equipment shall be placed such that emitted noise is directed away from or shielded from sensitive noise receivers where feasible.
- During construction, stockpiling and vehicle staging areas shall be located as far as practical from noise sensitive receptors.
- The project shall be in compliance with the City's Municipal Code such that construction and grading activities are limited to the hours of 7:00 a.m. to 8:00 p.m. Monday through Saturday.
- Construction hours, allowable workdays, and the phone number of the job superintendent shall be clearly posted at all construction entrances to allow surrounding property owners and residents to contact the job superintendent if necessary. In the event the City receives a complaint, appropriate corrective actions shall be implemented.
- Two weeks prior to the commencement of construction, notification must be provided to surrounding land uses within 300 feet of a project site disclosing the construction schedule, including the various types of activities that would be occurring throughout the duration of the construction period. This notification shall give a contact phone number for any questions or complaints. All complaints shall be responded to in a method deemed satisfactory by the City of Lake Forest.

4.2 Exterior Noise

Exterior noise impacts could be mitigated by constructing noise barriers up to six feet in height (i.e., sound walls or berms) at the homes adjacent to Glenn Ranch Road and Saddleback Ranch Road, as depicted in Figure 5. Noise barriers must have a surface density of at least 3.5 pounds per square foot, and have no openings or cracks. The walls may be constructed of five-eighth-inch thick acrylic glass, any masonry material, an earthen berm or a combination of these materials.

4.3 Future Noise Studies

Interior Noise

An interior noise study will be required for the homes and multi-family buildings adjacent to, and with a direct line-of-sight of, Glenn Ranch Road and Saddleback Ranch Road to ensure that the interior CNEL would not exceed 45 dB. The interior acoustical analysis will be required prior to issuance of building permits. To mitigate the interior noise impact, the homes and multi-family buildings would most likely require air-conditioning and/or mechanical ventilation and possibly sound-rated windows.

Commercial Property Outdoor Mechanical Equipment Noise Study

Prior to issuance of building permits, a noise assessment shall be prepared for the commercial property outdoor mechanical equipment. The noise assessment shall identify any noise control measures necessary to comply with the City's Noise Ordinance requirements.

4.4 Outdoor Recreation Noise

All stands and general spectator areas shall be located a minimum of 150 feet from the closest residential property line. Alternatively, noise barriers (e.g., sound walls or berms) up to six feet in height shall be constructed along the western boundaries of all lots with a direct line-of-sight to the proposed 5-acre public Neighborhood Park.

The parks shall not be used between the hours of 10:00 p.m. and 7:00 a.m.

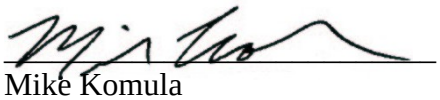
5.0 BEST MANAGEMENT PRACTICES

As discussed in Section 3.1, the project will use lighter-weight grading equipment and static compaction equipment (e.g., a sheep's foot) in any areas that are within 25 feet or less of the residential buildings immediately adjacent to the project site. Prior to commencement of grading activities within 25 feet of these buildings, the project will conduct a video survey of the building

foundations and install vibration monitoring equipment inside the property boundary for each building within 25 feet of grading activities.

This concludes our noise assessment. Please contact me at 760.479.4855 or mkomula@dudek.com if you have any questions.

Sincerely,



Mike Komula
Senior Acoustician

Att: Figures 1–5
Attachment 1, Definitions
Attachment 2, Sound Meter Calibration Documentation
Attachment 3, Traffic Noise Modeling Input/Output and Calibration
Attachment 4, Noise Measurement Field Data Sheets

REFERENCES

American Society of Civil Engineers (ASCE). 1974. Journal of Construction Division, *Vibrations During Construction Operations*, 100 No. CO3, pp. 239-246, September.

Caltrans (California Department of Transportation). 2004. *Transportation Related Earthborne Vibrations.* January 23.

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City of Lake Forest. 2009. CEQA Significance Thresholds Guide. Published November 20, 2001. Revised March 2009.

City of Lake Forest. 2010. *City of Lake Forest Municipal Code, Title 11 Peace and Safety, Division 2, Chapter 11.16 Noise Control.* June 1.

FHWA (Federal Highway Administration). 2004. *FHWA Traffic Noise Model Users Guide (Version 2.5 Addendum).* April.

FTA (Federal Transit Administration). 2006. *Transit Noise and Vibration Impact Assessment.*

Wilson & Company. 2013. *Portola Center Project Traffic Impact Study*. January.

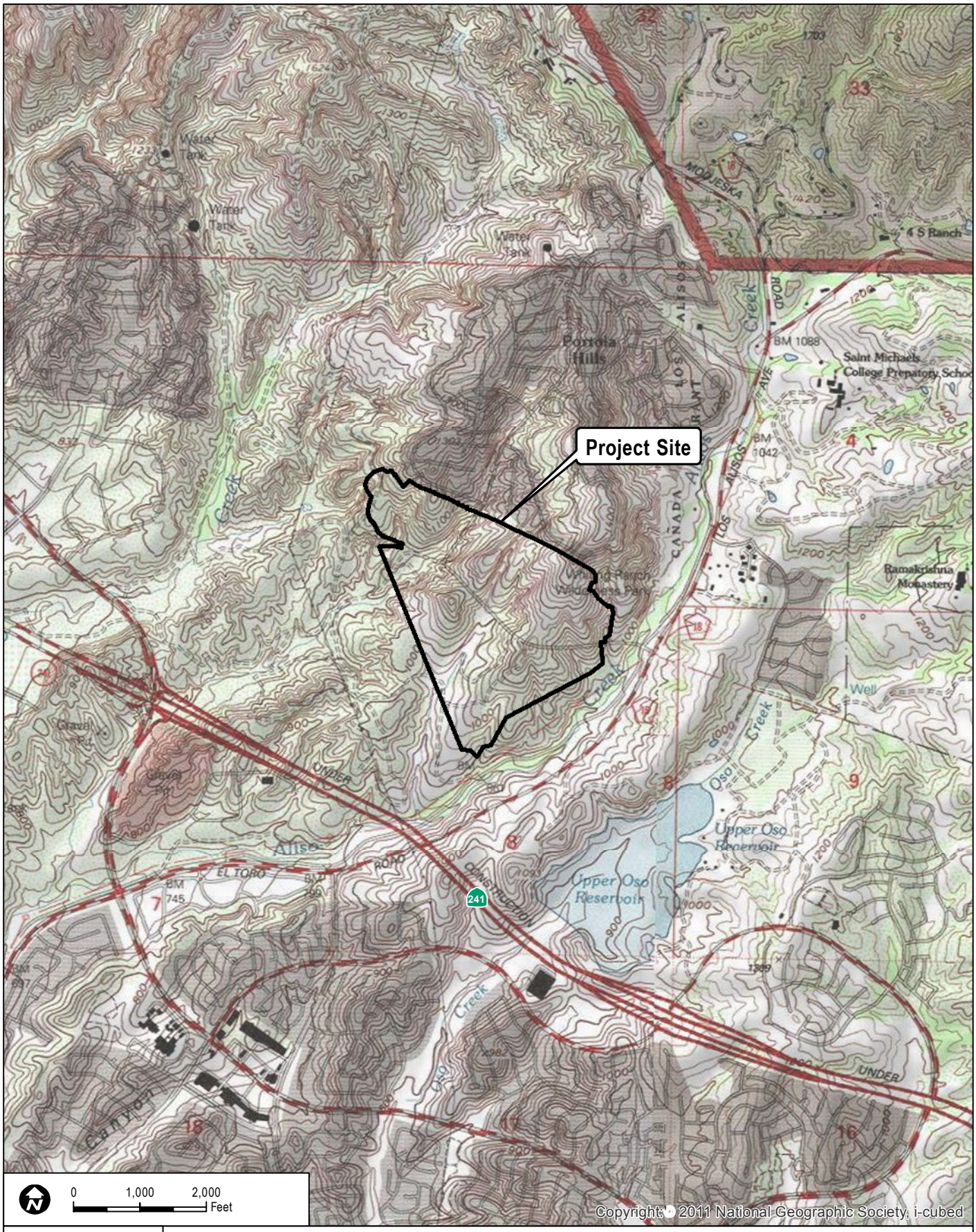
DUDEK

6888-01

FIGURE 1

Regional Map

Portola Center - Noise Study



DUDEK

6888-01

SOURCE: USGS 7.5-Minute Series Quadrangle, El Toro Quadrangle.

FIGURE 2
Vicinity Map

Portola Center - Noise Study

DUDEK

SOURCE: Hunsaker & Associates January 2013

FIGURE 3

Noise Monitoring Locations

6888-01

Portola Center - Noise Study

DUDEK

SOURCE: Hunsaker & Associates January 2013

FIGURE 4

Noise Modeling Receptors

6888-01

Portola Center - Noise Study

DUDEK

SOURCE: Hunsaker & Associates January 2013

FIGURE 5

Noise Barrier Heights and Locations

6888-01

Portola Center - Noise Study

ATTACHMENT 1

Definitions

ATTACHMENT 1
Definitions

Term	Definition
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Community Noise Equivalent Level	CNEL is the A-weighted equivalent continuous sound exposure level for a 24-hour period with a ten dB adjustment added to sound levels occurring during nighttime hours (10 pm to 7 am) and a five dB adjustment added to the sound levels occurring during the evening hours (7 pm to 10 pm).
Decibel, dB	A unit for measuring sound pressure level and is equal to 10 times the logarithm to the base 10 of the ratio of the measured sound pressure squared to a reference pressure, which is 20 micropascals.
Time-Average Sound Level	The sound level corresponding to a steady state sound level containing the same total energy as a time varying signal over a given sample period. It is designed to average all of the loud and quiet sound levels occurring over a time period.

ATTACHMENT 2

Sound Meter Calibration Documentation

Scantek, Inc.
CALIBRATION LABORATORY

ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC and APLAC signatory)

NVLAP®
NVLAP Lab Code: 200625-0

Calibration Certificate No.27212

Instrument:	**Sound Level Meter / Dosimeter**	*Date Calibrated:* **9/20/2012**	*Cal Due:*
Model:	**700**	*Status:*	**Received** / **Sent**
Manufacturer:	**Larson Davis**	*In tolerance:*	X / X
Serial number:	**4086B0724**	*Out of tolerance:*	
Tested with:	**Microphone**	*See comments:*	
		Contains non-accredited tests:	__Yes X No
Type (class):	**2**	*Calibration service:*	__ Basic X Standard
Customer:	**Dudek**	*Address:*	**605 Third Street**
Tel/Fax:	**760-942-5147 / -632-0164**		**Encinitas, CA 92024**

Tested in accordance with the following procedures and standards:
Calibration of Sound Level Meters, Scantek Inc., Rev. 6/22/2012
SLM & Dosimeters – Acoustical Tests, Scantek Inc., Rev. 7/6/2011

Instrumentation used for calibration: Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence Cal. Lab / Accreditation	Cal. Due
483B-Norsonic	SME Cal Unit	25747	Jul 2, 2012	Scantek, Inc./ NVLAP	Jul 2, 2013
DS-360-SRS	Function Generator	61646	Nov 16, 2011	ACR Env./ A2LA	Nov 16, 2013
34401A-Agilent Technologies	Digital Voltmeter	MY41022043	Dec 9, 2011	ACR Env. / A2LA	Dec 9, 2012
DPI 141-Druck	Pressure Indicator	790/00-04	Dec 13, 2010	ACR Env./ A2LA	Dec 13, 2012
HMP233-Vaisala Oyj	Humidity & Temp.	V3820001	Sep 6, 2012	ACR Env./ A2LA	Mar 6, 2014
PC Program 1019 Norsonic	Calibration software	v.5.2	Validated Mar 2011	Scantek, Inc.	-
1251-Norsonic	Calibrator	30878	Dec 13, 2011	Scantek, Inc./ NVLAP	Dec 13, 2012
4226-Brüel&Kjær	Multifunction calibrator	2305103	Jul 24, 2012	Scantek, Inc./ NVLAP	Jul 24, 2013

Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK).

Environmental conditions:

Temperature (°C)	Barometric pressure (kPa)	Relative Humidity (%)
23.5 °C	100.537 kPa	47.1 %RH

Calibrated by:	Valentin Buzduga	**Authorized signatory:**	Mariana Buzduga
Signature		Signature	
Date	9/20/2012	Date	9/20/2012

ATTACHMENT 3

Traffic Noise Modeling Input/Output and Calibration

Dudek
B. Grover

30 January 2013
TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: Portola Center
RUN: Calibration Run

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

Roadway		Points					Flow Control			Segment	
Name	Width	Name	No.	Coordinates (pavement) X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Glenn Ranch Road EB	24.0	point1	1	115.2	1,617.1	940.00				Average	
		point2	2	357.9	1,613.1	965.00				Average	
		point3	3	556.8	1,581.3	990.00				Average	
		point4	4	771.6	1,501.7	970.00				Average	
		point5	5	938.7	1,422.1	950.00					
Glenn Ranch Road WB	24.0	point6	6	954.6	1,457.9	950.00				Average	
		point7	7	791.5	1,541.5	970.00				Average	
		point8	8	564.7	1,625.0	990.00				Average	
		point9	9	357.9	1,660.8	965.00				Average	
		point10	10	107.3	1,660.8	940.00					
Saddleback Ranch Road NB	24.0	point35	35	1,042.1	1,414.2	975.00				Average	
		point36	36	1,085.9	1,477.8	945.00				Average	
		point37	37	1,304.7	1,788.1	1,000.00				Average	
		point38	38	1,439.9	1,979.1	984.00				Average	
		point39	39	1,567.2	2,158.1	1,020.00					
Saddleback Ranch Road SB	24.0	point40	40	1,539.4	2,174.0	1,020.00				Average	
		point41	41	1,412.1	1,991.0	984.00				Average	
		point42	42	1,280.8	1,804.0	1,000.00				Average	
		point43	43	1,062.0	1,501.7	945.00				Average	
		point44	44	1,010.3	1,434.1	975.00					

Dudek
B. Grover

30 January 2013
TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: Portola Center
RUN: Calibration Run

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Glenn Ranch Road EB	point1	1	227	50	2	50	0	0	0	0	0	0
	point2	2	227	50	2	50	0	0	0	0	0	0
	point3	3	227	50	2	50	0	0	0	0	0	0
	point4	4	227	50	2	50	0	0	0	0	0	0
	point5	5										
Glenn Ranch Road WB	point6	6	227	50	2	50	0	0	0	0	0	0
	point7	7	227	50	2	50	0	0	0	0	0	0
	point8	8	227	50	2	50	0	0	0	0	0	0
	point9	9	227	50	2	50	0	0	0	0	0	0
	point10	10										
Saddleback Ranch Road NB	point35	35	290	50	2	50	0	0	0	0	0	0
	point36	36	290	50	2	50	0	0	0	0	0	0
	point37	37	290	50	2	50	0	0	0	0	0	0
	point38	38	290	50	2	50	0	0	0	0	0	0
	point39	39										
Saddleback Ranch Road SB	point40	40	290	50	2	50	0	0	0	0	0	0
	point41	41	290	50	2	50	0	0	0	0	0	0
	point42	42	290	50	2	50	0	0	0	0	0	0
	point43	43	290	50	2	50	0	0	0	0	0	0
	point44	44										

Dudek
B. Grover

30 January 2013
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Portola Center
RUN: Calibration Run

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M1	55	1	347.5	1,675.0	1,000.00	4.92	0.00	66	10.0	8.0	Y
M2	56	1	1,240.0	1,830.0	1,100.00	4.92	0.00	66	10.0	8.0	Y

Dudek
B. Grover

30 January 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Portola Center
RUN: Calibration Run
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M1	55	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	8	-8.0
M2	56	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	2	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek 30 January 2013
B. Grover TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: Portola Center
RUN: 1st Floor Unmitigated

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

Roadway		Points									
Name	Width	Name	No.	Coordinates (pavement)			Flow Control			Segment	
				X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Glenn Ranch Road EB	24.0	point1	1	115.2	1,617.1	940.00				Average	
		point2	2	357.9	1,613.1	965.00				Average	
		point3	3	556.8	1,581.3	990.00				Average	
		point4	4	771.6	1,501.7	970.00				Average	
		point5	5	938.7	1,422.1	950.00					
Glenn Ranch Road WB	24.0	point6	6	954.6	1,457.9	950.00				Average	
		point7	7	791.5	1,541.5	970.00				Average	
		point8	8	564.7	1,625.0	990.00				Average	
		point9	9	357.9	1,660.8	965.00				Average	
		point10	10	107.3	1,660.8	940.00					
Glenn Ranch Road EB 2	12.0	point11	11	1,014.3	1,358.5	1,000.00				Average	
		point12	12	1,292.7	1,107.9	1,091.00				Average	
		point13	13	1,551.3	817.5	1,048.00				Average	
		point14	14	1,790.0	566.8	1,005.00				Average	
		point15	15	2,112.2	312.2	1,100.00				Average	
		point16	16	2,422.5	173.0	1,100.00				Average	
		point17	17	2,796.4	125.3	1,100.00				Average	
		point18	18	3,190.3	165.1	1,020.00				Average	
		point19	19	3,512.5	200.9	1,080.00				Average	
		point20	20	3,826.8	181.0	1,000.00					
Glenn Ranch Road WB 2	24.0	point21	21	3,826.8	220.8	1,000.00				Average	
		point22	22	3,496.6	240.6	1,080.00				Average	
		point23	23	3,170.4	204.8	1,020.00				Average	
		point24	24	2,796.4	169.0	1,100.00				Average	
		point25	25	2,438.4	212.8	1,100.00				Average	

		point26	26	2,136.1	344.1	1,100.00				Average	
		point27	27	1,825.8	590.7	1,005.00				Average	
		point28	28	1,587.1	837.4	1,048.00				Average	
		point29	29	1,320.6	1,127.8	1,091.00				Average	
		point30	30	1,038.1	1,390.3	1,000.00					
Saddleback Ranch Road NB	24.0	point35	35	1,042.1	1,414.2	975.00				Average	
		point36	36	1,085.9	1,477.8	945.00				Average	
		point37	37	1,304.7	1,788.1	1,000.00				Average	
		point38	38	1,439.9	1,979.1	984.00				Average	
		point39	39	1,567.2	2,158.1	1,020.00					
Saddleback Ranch Road SB	24.0	point40	40	1,539.4	2,174.0	1,020.00				Average	
		point41	41	1,412.1	1,991.0	984.00				Average	
		point42	42	1,280.8	1,804.0	1,000.00				Average	
		point43	43	1,062.0	1,501.7	945.00				Average	
		point44	44	1,010.3	1,434.1	975.00					

Dudek 30 January 2013
B. Grover TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: Portola Center
RUN: 1st Floor Unmitigated

Roadway Name	Points Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Glenn Ranch Road EB	point1	1	1440	50	30	50	30	50	0	0	0	0
	point2	2	1440	50	30	50	30	50	0	0	0	0
	point3	3	1440	50	30	50	30	50	0	0	0	0
	point4	4	1440	50	30	50	30	50	0	0	0	0
	point5	5										
Glenn Ranch Road WB	point6	6	1440	50	30	50	30	50	0	0	0	0
	point7	7	1440	50	30	50	30	50	0	0	0	0
	point8	8	1440	50	30	50	30	50	0	0	0	0
	point9	9	1440	50	30	50	30	50	0	0	0	0
	point10	10										
Glenn Ranch Road EB 2	point11	11	576	50	12	50	12	50	0	0	0	0
	point12	12	576	50	12	50	12	50	0	0	0	0
	point13	13	576	50	12	50	12	50	0	0	0	0
	point14	14	576	50	12	50	12	50	0	0	0	0
	point15	15	576	50	12	50	12	50	0	0	0	0
	point16	16	576	50	12	50	12	50	0	0	0	0
	point17	17	576	50	12	50	12	50	0	0	0	0
	point18	18	576	50	12	50	12	50	0	0	0	0
	point19	19	576	50	12	50	12	50	0	0	0	0
	point20	20										
Glenn Ranch Road WB 2	point21	21	576	50	12	50	12	50	0	0	0	0
	point22	22	576	50	12	50	12	50	0	0	0	0

	point23	23	576	50	12	50	12	50	0	0	0	0
	point24	24	576	50	12	50	12	50	0	0	0	0
	point25	25	576	50	12	50	12	50	0	0	0	0
	point26	26	576	50	12	50	12	50	0	0	0	0
	point27	27	576	50	12	50	12	50	0	0	0	0
	point28	28	576	50	12	50	12	50	0	0	0	0
	point29	29	576	50	12	50	12	50	0	0	0	0
	point30	30										
Saddleback Ranch Road NB	point35	35	706	50	15	50	15	50	0	0	0	0
	point36	36	706	50	15	50	15	50	0	0	0	0
	point37	37	706	50	15	50	15	50	0	0	0	0
	point38	38	706	50	15	50	15	50	0	0	0	0
	point39	39										
Saddleback Ranch Road SB	point40	40	706	50	15	50	15	50	0	0	0	0
	point41	41	706	50	15	50	15	50	0	0	0	0
	point42	42	706	50	15	50	15	50	0	0	0	0
	point43	43	706	50	15	50	15	50	0	0	0	0
	point44	44										

Dudek
B. Grover

30 January 2013
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Portola Center
RUN: 1st Floor Unmitigated

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
R1	3	1	83.4	1,983.0	1,058.00	4.92	0.00	66	10.0	8.0	Y
R2	4	1	214.7	1,887.6	1,052.00	4.92	0.00	66	10.0	8.0	Y
R3	5	1	338.0	1,851.8	1,050.00	4.92	0.00	66	10.0	8.0	Y
R4	6	1	572.7	1,788.1	1,047.50	4.92	0.00	66	10.0	8.0	Y
R5	7	1	787.5	1,692.6	1,045.00	4.92	0.00	66	10.0	8.0	Y
R6	8	1	962.6	1,593.2	1,046.00	4.92	0.00	66	10.0	8.0	Y
R7	9	1	1,058.0	1,652.9	1,046.00	4.92	0.00	66	10.0	8.0	Y
R8	10	1	1,141.6	1,736.4	1,050.00	4.92	0.00	66	10.0	8.0	Y
R9	11	1	1,177.4	1,784.1	1,055.00	4.92	0.00	66	10.0	8.0	Y
R10	12	1	1,292.7	1,927.3	1,065.00	4.92	0.00	66	10.0	8.0	Y
R11	13	1	1,368.3	2,034.8	1,073.00	4.92	0.00	66	10.0	8.0	Y
R12	14	1	1,404.1	2,110.3	1,074.00	4.92	0.00	66	10.0	8.0	Y
R13	15	1	1,662.7	2,006.9	1,150.00	4.92	0.00	66	10.0	8.0	Y
R14	16	1	1,551.3	1,879.6	1,125.00	4.92	0.00	66	10.0	8.0	Y
R15	17	1	1,432.0	1,676.7	1,121.00	4.92	0.00	66	10.0	8.0	Y
R16	18	1	1,332.5	1,513.6	1,114.00	4.92	0.00	66	10.0	8.0	Y
R17	19	1	1,380.2	1,298.8	1,107.00	4.92	0.00	66	10.0	8.0	Y
R18	20	1	1,527.4	1,084.0	1,092.00	4.92	0.00	66	10.0	8.0	Y
R19	21	1	1,634.8	932.8	1,085.00	4.92	0.00	66	10.0	8.0	Y
R20	22	1	1,722.4	825.4	1,082.00	4.92	0.00	66	10.0	8.0	Y
R21	23	1	1,877.5	650.4	1,085.00	4.92	0.00	66	10.0	8.0	Y
R22	24	1	2,068.5	475.3	1,087.00	4.92	0.00	66	10.0	8.0	Y

R23	25	1	2,275.3	360.0	1,083.00	4.92	0.00	66	10.0	8.0	Y
R24	26	1	2,474.2	296.3	1,083.00	4.92	0.00	66	10.0	8.0	Y
R25	27	1	2,716.9	284.4	1,087.00	4.92	0.00	66	10.0	8.0	Y
R26	28	1	2,963.5	312.2	1,091.00	4.92	0.00	66	10.0	8.0	Y
R27	29	1	3,202.2	356.0	1,094.00	4.92	0.00	66	10.0	8.0	Y
R28	30	1	3,417.0	495.2	1,102.00	4.92	0.00	66	10.0	8.0	Y
R29	31	1	3,516.5	682.2	1,105.00	4.92	0.00	66	10.0	8.0	Y
R30	32	1	3,293.7	73.6	1,044.50	4.92	0.00	66	10.0	8.0	Y
R31	33	1	3,162.4	81.5	1,044.00	4.92	0.00	66	10.0	8.0	Y
R32	34	1	3,090.8	85.5	1,043.50	4.92	0.00	66	10.0	8.0	Y
R33	35	1	2,975.5	73.6	1,047.00	4.92	0.00	66	10.0	8.0	Y
R34	36	1	2,804.4	61.6	1,045.00	4.92	0.00	66	10.0	8.0	Y
R35	37	1	2,708.9	53.7	1,046.00	4.92	0.00	66	10.0	8.0	Y
R36	38	1	2,625.4	53.7	1,049.00	4.92	0.00	66	10.0	8.0	Y
R37	39	1	2,525.9	65.6	1,050.00	4.92	0.00	66	10.0	8.0	Y
R38	40	1	2,426.5	89.5	1,056.00	4.92	0.00	66	10.0	8.0	Y
Park	41	1	2,199.7	204.8	1,072.00	4.92	0.00	66	10.0	8.0	Y
R39	42	1	2,112.2	236.7	1,070.50	4.92	0.00	66	10.0	8.0	Y
R40	43	1	1,984.9	304.3	1,071.00	4.92	0.00	66	10.0	8.0	Y
MF1	44	1	1,809.9	352.0	1,042.00	4.92	0.00	66	10.0	8.0	Y
MF2	45	1	1,714.4	427.6	1,040.00	4.92	0.00	66	10.0	8.0	Y
MF3	46	1	1,511.5	618.6	1,036.00	4.92	0.00	66	10.0	8.0	Y
MF4	47	1	1,400.1	773.7	1,034.00	4.92	0.00	66	10.0	8.0	Y
MF5	48	1	1,221.1	980.6	1,030.00	4.92	0.00	66	10.0	8.0	Y
MU1	49	1	1,133.6	1,127.8	1,028.00	4.92	0.00	66	10.0	8.0	Y

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B. Grover

30 January 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Portola Center
RUN: 1st Floor Unmitigated
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	3	1	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0
R2	4	1	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0
R3	5	1	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	8	-8.0
R4	6	1	0.0	67.4	66	67.4	10	Snd Lvl	67.4	0.0	8	-8.0
R5	7	1	0.0	68.3	66	68.3	10	Snd Lvl	68.3	0.0	8	-8.0
R6	8	1	0.0	69.2	66	69.2	10	Snd Lvl	69.2	0.0	8	-8.0
R7	9	1	0.0	68.8	66	68.8	10	Snd Lvl	68.8	0.0	8	-8.0
R8	10	1	0.0	69.2	66	69.2	10	Snd Lvl	69.2	0.0	8	-8.0
R9	11	1	0.0	69.1	66	69.1	10	Snd Lvl	69.1	0.0	8	-8.0
R10	12	1	0.0	69.3	66	69.3	10	Snd Lvl	69.3	0.0	8	-8.0
R11	13	1	0.0	69.0	66	69.0	10	Snd Lvl	69.0	0.0	8	-8.0
R12	14	1	0.0	67.9	66	67.9	10	Snd Lvl	67.9	0.0	8	-8.0
R13	15	1	0.0	63.4	66	63.4	10	----	63.4	0.0	8	-8.0
R14	16	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
R15	17	1	0.0	65.4	66	65.4	10	----	65.4	0.0	8	-8.0
R16	18	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
R17	19	1	0.0	65.7	66	65.7	10	----	65.7	0.0	8	-8.0
R18	20	1	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	8	-8.0
R19	21	1	0.0	66.5	66	66.5	10	Snd Lvl	66.5	0.0	8	-8.0
R20	22	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0
R21	23	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	8	-8.0
R22	24	1	0.0	68.4	66	68.4	10	Snd Lvl	68.4	0.0	8	-8.0
R23	25	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0

R24	26	1	0.0	63.9	66	63.9	10	----	63.9	0.0	8	-8.0
R25	27	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
R26	28	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0
R27	29	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
R28	30	1	0.0	61.9	66	61.9	10	----	61.9	0.0	8	-8.0
R29	31	1	0.0	58.5	66	58.5	10	----	58.5	0.0	8	-8.0
R30	32	1	0.0	65.5	66	65.5	10	----	65.5	0.0	8	-8.0
R31	33	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	8	-8.0
R32	34	1	0.0	67.0	66	67.0	10	Snd Lvl	67.0	0.0	8	-8.0
R33	35	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
R34	36	1	0.0	61.7	66	61.7	10	----	61.7	0.0	8	-8.0
R35	37	1	0.0	62.0	66	62.0	10	----	62.0	0.0	8	-8.0
R36	38	1	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0
R37	39	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0
R38	40	1	0.0	61.7	66	61.7	10	----	61.7	0.0	8	-8.0
Park	41	1	0.0	63.4	66	63.4	10	----	63.4	0.0	8	-8.0
R39	42	1	0.0	64.4	66	64.4	10	----	64.4	0.0	8	-8.0
R40	43	1	0.0	66.1	66	66.1	10	Snd Lvl	66.1	0.0	8	-8.0
MF1	44	1	0.0	63.9	66	63.9	10	----	63.9	0.0	8	-8.0
MF2	45	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
MF3	46	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
MF4	47	1	0.0	63.1	66	63.1	10	----	63.1	0.0	8	-8.0
MF5	48	1	0.0	62.6	66	62.6	10	----	62.6	0.0	8	-8.0
MU1	49	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	47	0.0	0.0	0.0
All Impacted	18	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

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30 January 2013
TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: Portola Center
RUN: 1st Floor Mitigated

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

Roadway		Points									
Name	Width	Name	No.	Coordinates (pavement)			Flow Control			Segment	
				X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Glenn Ranch Road EB	24.0	point1	1	115.2	1,617.1	940.00				Average	
		point2	2	357.9	1,613.1	965.00				Average	
		point3	3	556.8	1,581.3	990.00				Average	
		point4	4	771.6	1,501.7	970.00				Average	
		point5	5	938.7	1,422.1	950.00					
Glenn Ranch Road WB	24.0	point6	6	954.6	1,457.9	950.00				Average	
		point7	7	791.5	1,541.5	970.00				Average	
		point8	8	564.7	1,625.0	990.00				Average	
		point9	9	357.9	1,660.8	965.00				Average	
		point10	10	107.3	1,660.8	940.00					
Glenn Ranch Road EB 2	12.0	point11	11	1,014.3	1,358.5	1,000.00				Average	
		point12	12	1,292.7	1,107.9	1,091.00				Average	
		point13	13	1,551.3	817.5	1,048.00				Average	
		point14	14	1,790.0	566.8	1,005.00				Average	
		point15	15	2,112.2	312.2	1,100.00				Average	
		point16	16	2,422.5	173.0	1,100.00				Average	
		point17	17	2,796.4	125.3	1,100.00				Average	
		point18	18	3,190.3	165.1	1,020.00				Average	
		point19	19	3,512.5	200.9	1,080.00				Average	
		point20	20	3,826.8	181.0	1,000.00					
Glenn Ranch Road WB 2	24.0	point21	21	3,826.8	220.8	1,000.00				Average	
		point22	22	3,496.6	240.6	1,080.00				Average	
		point23	23	3,170.4	204.8	1,020.00				Average	
		point24	24	2,796.4	169.0	1,100.00				Average	
		point25	25	2,438.4	212.8	1,100.00				Average	

		point26	26	2,136.1	344.1	1,100.00				Average	
		point27	27	1,825.8	590.7	1,005.00				Average	
		point28	28	1,587.1	837.4	1,048.00				Average	
		point29	29	1,320.6	1,127.8	1,091.00				Average	
		point30	30	1,038.1	1,390.3	1,000.00					
Saddleback Ranch Road NB	24.0	point35	35	1,042.1	1,414.2	975.00				Average	
		point36	36	1,085.9	1,477.8	945.00				Average	
		point37	37	1,304.7	1,788.1	1,000.00				Average	
		point38	38	1,439.9	1,979.1	984.00				Average	
		point39	39	1,567.2	2,158.1	1,020.00					
Saddleback Ranch Road SB	24.0	point40	40	1,539.4	2,174.0	1,020.00				Average	
		point41	41	1,412.1	1,991.0	984.00				Average	
		point42	42	1,280.8	1,804.0	1,000.00				Average	
		point43	43	1,062.0	1,501.7	945.00				Average	
		point44	44	1,010.3	1,434.1	975.00					

Dudek 30 January 2013
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INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: Portola Center
RUN: 1st Floor Mitigated

Roadway Name	Points Name	No.	Segment Autos V veh/hr	Autos S mph	MTrucks V veh/hr	MTrucks S mph	HTrucks V veh/hr	HTrucks S mph	Buses V veh/hr	Buses S mph	Motorcycles V veh/hr	Motorcycles S mph
Glenn Ranch Road EB	point1	1	1440	50	30	50	30	50	0	0	0	0
	point2	2	1440	50	30	50	30	50	0	0	0	0
	point3	3	1440	50	30	50	30	50	0	0	0	0
	point4	4	1440	50	30	50	30	50	0	0	0	0
	point5	5										
Glenn Ranch Road WB	point6	6	1440	50	30	50	30	50	0	0	0	0
	point7	7	1440	50	30	50	30	50	0	0	0	0
	point8	8	1440	50	30	50	30	50	0	0	0	0
	point9	9	1440	50	30	50	30	50	0	0	0	0
	point10	10										
Glenn Ranch Road EB 2	point11	11	576	50	12	50	12	50	0	0	0	0
	point12	12	576	50	12	50	12	50	0	0	0	0
	point13	13	576	50	12	50	12	50	0	0	0	0
	point14	14	576	50	12	50	12	50	0	0	0	0
	point15	15	576	50	12	50	12	50	0	0	0	0
	point16	16	576	50	12	50	12	50	0	0	0	0
	point17	17	576	50	12	50	12	50	0	0	0	0
	point18	18	576	50	12	50	12	50	0	0	0	0
	point19	19	576	50	12	50	12	50	0	0	0	0
	point20	20										
Glenn Ranch Road WB 2	point21	21	576	50	12	50	12	50	0	0	0	0
	point22	22	576	50	12	50	12	50	0	0	0	0

	point23	23	576	50	12	50	12	50	0	0	0	0
	point24	24	576	50	12	50	12	50	0	0	0	0
	point25	25	576	50	12	50	12	50	0	0	0	0
	point26	26	576	50	12	50	12	50	0	0	0	0
	point27	27	576	50	12	50	12	50	0	0	0	0
	point28	28	576	50	12	50	12	50	0	0	0	0
	point29	29	576	50	12	50	12	50	0	0	0	0
	point30	30										
Saddleback Ranch Road NB	point35	35	706	50	15	50	15	50	0	0	0	0
	point36	36	706	50	15	50	15	50	0	0	0	0
	point37	37	706	50	15	50	15	50	0	0	0	0
	point38	38	706	50	15	50	15	50	0	0	0	0
	point39	39										
Saddleback Ranch Road SB	point40	40	706	50	15	50	15	50	0	0	0	0
	point41	41	706	50	15	50	15	50	0	0	0	0
	point42	42	706	50	15	50	15	50	0	0	0	0
	point43	43	706	50	15	50	15	50	0	0	0	0
	point44	44										

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30 January 2013
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Portola Center
RUN: 1st Floor Mitigated

Receiver

Name	No.	#DUs	Coordinates (ground)			Height above Ground	Input Sound Levels and Criteria				Active in Calc.
			X	Y	Z		Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	
			ft	ft	ft	ft	dBA	dBA	dB	dB	
R1	3	1	83.4	1,983.0	1,058.00	4.92	0.00	66	10.0	8.0	Y
R2	4	1	214.7	1,887.6	1,052.00	4.92	0.00	66	10.0	8.0	Y
R3	5	1	338.0	1,851.8	1,050.00	4.92	0.00	66	10.0	8.0	Y
R4	6	1	572.7	1,788.1	1,047.50	4.92	0.00	66	10.0	8.0	Y
R5	7	1	787.5	1,692.6	1,045.00	4.92	0.00	66	10.0	8.0	Y
R6	8	1	962.6	1,593.2	1,046.00	4.92	0.00	66	10.0	8.0	Y
R7	9	1	1,058.0	1,652.9	1,046.00	4.92	0.00	66	10.0	8.0	Y
R8	10	1	1,141.6	1,736.4	1,050.00	4.92	0.00	66	10.0	8.0	Y
R9	11	1	1,177.4	1,784.1	1,055.00	4.92	0.00	66	10.0	8.0	Y
R10	12	1	1,292.7	1,927.3	1,065.00	4.92	0.00	66	10.0	8.0	Y
R11	13	1	1,368.3	2,034.8	1,073.00	4.92	0.00	66	10.0	8.0	Y
R12	14	1	1,404.1	2,110.3	1,074.00	4.92	0.00	66	10.0	8.0	Y
R13	15	1	1,662.7	2,006.9	1,150.00	4.92	0.00	66	10.0	8.0	Y
R14	16	1	1,551.3	1,879.6	1,125.00	4.92	0.00	66	10.0	8.0	Y
R15	17	1	1,432.0	1,676.7	1,121.00	4.92	0.00	66	10.0	8.0	Y
R16	18	1	1,332.5	1,513.6	1,114.00	4.92	0.00	66	10.0	8.0	Y
R17	19	1	1,380.2	1,298.8	1,107.00	4.92	0.00	66	10.0	8.0	Y
R18	20	1	1,527.4	1,084.0	1,092.00	4.92	0.00	66	10.0	8.0	Y
R19	21	1	1,634.8	932.8	1,085.00	4.92	0.00	66	10.0	8.0	Y
R20	22	1	1,722.4	825.4	1,082.00	4.92	0.00	66	10.0	8.0	Y
R21	23	1	1,877.5	650.4	1,085.00	4.92	0.00	66	10.0	8.0	Y
R22	24	1	2,068.5	475.3	1,087.00	4.92	0.00	66	10.0	8.0	Y

R23	25	1	2,275.3	360.0	1,083.00	4.92	0.00	66	10.0	8.0	Y
R24	26	1	2,474.2	296.3	1,083.00	4.92	0.00	66	10.0	8.0	Y
R25	27	1	2,716.9	284.4	1,087.00	4.92	0.00	66	10.0	8.0	Y
R26	28	1	2,963.5	312.2	1,091.00	4.92	0.00	66	10.0	8.0	Y
R27	29	1	3,202.2	356.0	1,094.00	4.92	0.00	66	10.0	8.0	Y
R28	30	1	3,417.0	495.2	1,102.00	4.92	0.00	66	10.0	8.0	Y
R29	31	1	3,516.5	682.2	1,105.00	4.92	0.00	66	10.0	8.0	Y
R30	32	1	3,293.7	73.6	1,044.50	4.92	0.00	66	10.0	8.0	Y
R31	33	1	3,162.4	81.5	1,044.00	4.92	0.00	66	10.0	8.0	Y
R32	34	1	3,090.8	85.5	1,043.50	4.92	0.00	66	10.0	8.0	Y
R33	35	1	2,975.5	73.6	1,047.00	4.92	0.00	66	10.0	8.0	Y
R34	36	1	2,804.4	61.6	1,045.00	4.92	0.00	66	10.0	8.0	Y
R35	37	1	2,708.9	53.7	1,046.00	4.92	0.00	66	10.0	8.0	Y
R36	38	1	2,625.4	53.7	1,049.00	4.92	0.00	66	10.0	8.0	Y
R37	39	1	2,525.9	65.6	1,050.00	4.92	0.00	66	10.0	8.0	Y
R38	40	1	2,426.5	89.5	1,056.00	4.92	0.00	66	10.0	8.0	Y
Park	41	1	2,199.7	204.8	1,072.00	4.92	0.00	66	10.0	8.0	Y
R39	42	1	2,112.2	236.7	1,070.50	4.92	0.00	66	10.0	8.0	Y
R40	43	1	1,984.9	304.3	1,071.00	4.92	0.00	66	10.0	8.0	Y
MF1	44	1	1,809.9	352.0	1,042.00	4.92	0.00	66	10.0	8.0	Y
MF2	45	1	1,714.4	427.6	1,040.00	4.92	0.00	66	10.0	8.0	Y
MF3	46	1	1,511.5	618.6	1,036.00	4.92	0.00	66	10.0	8.0	Y
MF4	47	1	1,400.1	773.7	1,034.00	4.92	0.00	66	10.0	8.0	Y
MF5	48	1	1,221.1	980.6	1,030.00	4.92	0.00	66	10.0	8.0	Y
MU1	49	1	1,133.6	1,127.8	1,028.00	4.92	0.00	66	10.0	8.0	Y

Dudek 30 January 2013
B. Grover TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: Portola Center
RUN: 1st Floor Mitigated

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per Unit Area	$ per Unit Vol.	Top Width	Run:Rise	$ per Unit Length			X	Y	Z	at Point	Seg Ht Increment	Perturbs #Up	#Dn	On Struct?	Important Reflections?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
South Slope Along Glenn Ranch Road	W	0.00	99.99	0.00				0.00	point60	60	-0.1	2,070.6	1,058.00	0.00	0.00	0	0		
									point61	61	67.5	1,971.1	1,058.00	0.00	0.00	0	0		
									point62	62	190.8	1,855.7	1,052.00	0.00	0.00	0	0		
									point63	63	334.0	1,816.0	1,050.00	0.00	0.00	0	0		
									point64	64	556.8	1,756.3	1,047.00	0.00	0.00	0	0		
									point65	65	775.6	1,656.8	1,045.00	0.00	0.00	0	0		
									point66	66	962.6	1,553.4	1,046.00	0.00	0.00	0	0		
									point67	67	1,077.9	1,625.0	1,046.00	0.00	0.00	0	0		
									point68	68	1,157.5	1,708.5	1,050.00	0.00	0.00	0	0		
									point69	69	1,225.1	1,776.2	1,055.00	0.00	0.00	0	0		
									point70	70	1,133.6	1,871.7	1,055.00	0.00					
Slope NW of GRR and SRR	W	0.00	99.99	0.00				0.00	point71	71	1,197.3	1,919.4	1,065.00	0.00	0.00	0	0		
									point72	72	1,276.8	1,863.7	1,065.00	0.00	0.00	0	0		
									point73	73	1,312.6	1,923.4	1,065.00	0.00	0.00	0	0		
									point74	74	1,392.2	2,022.8	1,073.00	0.00	0.00	0	0		
									point75	75	1,447.9	2,098.4	1,074.00	0.00	0.00	0	0		
									point76	76	1,356.4	2,170.0	1,074.00	0.00					
Slope NE of GRR and SRR	W	0.00	99.99	0.00				0.00	point77	77	1,722.4	2,102.4	1,150.00	0.00	0.00	0	0		
									point78	78	1,626.9	2,014.9	1,150.00	6.00	0.00	0	0		
									point79	79	1,519.5	1,919.4	1,125.00	6.00	0.00	0	0		
									point80	80	1,392.2	1,692.6	1,121.00	6.00	0.00	0	0		
									point81	81	1,296.7	1,513.6	1,114.00	6.00	0.00	0	0		
									point82	82	1,344.4	1,282.9	1,107.00	6.00	0.00	0	0		
									point83	83	1,495.6	1,060.1	1,092.00	6.00	0.00	0	0		
									point84	84	1,607.0	909.0	1,085.00	6.00	0.00	0	0		
									point85	85	1,694.5	801.5	1,082.00	6.00	0.00	0	0		
									point86	86	1,869.6	618.6	1,085.00	6.00	0.00	0	0		
									point87	87	2,056.5	451.5	1,087.00	6.00	0.00	0	0		
									point88	88	2,287.2	316.2	1,083.00	6.00	0.00	0	0		
									point89	89	2,346.9	407.7	1,083.00	6.00					
Slope N GRR	W	0.00	99.99	0.00				0.00	point90	90	2,442.4	395.8	1,083.00	0.00	0.00	0	0		
									point91	91	2,454.3	256.6	1,083.00	6.00	0.00	0	0		
									point92	92	2,701.0	256.6	1,087.00	6.00	0.00	0	0		
									point93	93	2,975.5	276.4	1,091.00	6.00	0.00	0	0		
									point94	94	3,206.2	324.2	1,094.00	0.00	0.00	0	0		

									point95	95	3,432.9	471.4	1,102.00	0.00	0.00	0	0		
									point96	96	3,548.3	686.2	1,105.00	0.00	0.00	0	0		
									point97	97	3,488.6	761.8	1,105.00	0.00					
Slope S GRR	W	0.00	99.99	0.00				0.00	point98	98	3,337.5	29.8	1,044.50	6.00	0.00	0	0		
									point99	99	3,333.5	113.3	1,044.50	6.00	0.00	0	0		
									point100	100	3,162.4	105.4	1,044.00	6.00	0.00	0	0		
									point101	101	3,090.8	109.4	1,043.50	6.00	0.00	0	0		
									point102	102	2,971.5	109.4	1,047.00	0.00	0.00	0	0		
									point103	103	2,800.4	89.5	1,045.00	0.00	0.00	0	0		
									point104	104	2,701.0	85.5	1,046.00	0.00	0.00	0	0		
									point105	105	2,621.4	85.5	1,049.00	0.00	0.00	0	0		
									point106	106	2,529.9	101.4	1,050.00	0.00	0.00	0	0		
									point107	107	2,422.5	129.3	1,056.00	0.00	0.00	0	0		
									point108	108	2,323.1	21.8	1,056.00	0.00					
Slope SE GRR and SRR	W	0.00	99.99	0.00				0.00	point109	109	2,203.7	89.5	1,072.00	0.00	0.00	0	0		
									point110	110	2,235.5	216.8	1,072.00	0.00	0.00	0	0		
									point111	111	2,116.2	268.5	1,070.50	6.00	0.00	0	0		
									point112	112	1,988.9	344.1	1,071.00	6.00	0.00	0	0		
									point113	113	1,873.5	371.9	1,042.00	0.00	0.00	0	0		
									point114	114	1,782.0	455.5	1,040.00	0.00	0.00	0	0		
									point115	115	1,583.1	650.4	1,036.00	0.00	0.00	0	0		
									point116	116	1,471.7	797.6	1,034.00	0.00	0.00	0	0		
									point117	117	1,292.7	1,016.4	1,030.00	0.00	0.00	0	0		
									point118	118	1,173.4	1,159.6	1,028.00	0.00	0.00	0	0		
									point119	119	1,006.3	1,334.6	1,028.00	0.00	0.00	0	0		
									point120	120	950.6	1,247.1	1,028.00	0.00					

Dudek
B. Grover

30 January 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Portola Center
RUN: 1st Floor Mitigated
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	3	1	0.0	51.1	66	51.1	10	----	51.1	0.0	8	-8.0
R2	4	1	0.0	53.2	66	53.2	10	----	53.2	0.0	8	-8.0
R3	5	1	0.0	54.4	66	54.4	10	----	54.4	0.0	8	-8.0
R4	6	1	0.0	55.7	66	55.7	10	----	55.7	0.0	8	-8.0
R5	7	1	0.0	55.5	66	55.5	10	----	55.5	0.0	8	-8.0
R6	8	1	0.0	58.1	66	58.1	10	----	58.1	0.0	8	-8.0
R7	9	1	0.0	57.0	66	57.0	10	----	57.0	0.0	8	-8.0
R8	10	1	0.0	56.6	66	56.6	10	----	56.6	0.0	8	-8.0
R9	11	1	0.0	56.7	66	56.7	10	----	56.7	0.0	8	-8.0
R10	12	1	0.0	55.9	66	55.9	10	----	55.9	0.0	8	-8.0
R11	13	1	0.0	54.1	66	54.1	10	----	54.1	0.0	8	-8.0
R12	14	1	0.0	52.9	66	52.9	10	----	52.9	0.0	8	-8.0
R13	15	1	0.0	49.1	66	49.1	10	----	49.1	0.0	8	-8.0
R14	16	1	0.0	49.1	66	49.1	10	----	49.1	0.0	8	-8.0
R15	17	1	0.0	50.5	66	50.5	10	----	50.5	0.0	8	-8.0
R16	18	1	0.0	52.6	66	52.6	10	----	52.6	0.0	8	-8.0
R17	19	1	0.0	54.4	66	54.4	10	----	54.4	0.0	8	-8.0
R18	20	1	0.0	55.1	66	55.1	10	----	55.1	0.0	8	-8.0
R19	21	1	0.0	55.1	66	55.1	10	----	55.1	0.0	8	-8.0
R20	22	1	0.0	55.4	66	55.4	10	----	55.4	0.0	8	-8.0
R21	23	1	0.0	57.5	66	57.5	10	----	57.5	0.0	8	-8.0
R22	24	1	0.0	61.4	66	61.4	10	----	61.4	0.0	8	-8.0
R23	25	1	0.0	63.1	66	63.1	10	----	63.1	0.0	8	-8.0

R24	26	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
R25	27	1	0.0	63.3	66	63.3	10	----	63.3	0.0	8	-8.0
R26	28	1	0.0	60.1	66	60.1	10	----	60.1	0.0	8	-8.0
R27	29	1	0.0	60.1	66	60.1	10	----	60.1	0.0	8	-8.0
R28	30	1	0.0	60.1	66	60.1	10	----	60.1	0.0	8	-8.0
R29	31	1	0.0	56.2	66	56.2	10	----	56.2	0.0	8	-8.0
R30	32	1	0.0	60.3	66	60.3	10	----	60.3	0.0	8	-8.0
R31	33	1	0.0	60.2	66	60.2	10	----	60.2	0.0	8	-8.0
R32	34	1	0.0	62.5	66	62.5	10	----	62.5	0.0	8	-8.0
R33	35	1	0.0	63.5	66	63.5	10	----	63.5	0.0	8	-8.0
R34	36	1	0.0	60.5	66	60.5	10	----	60.5	0.0	8	-8.0
R35	37	1	0.0	60.1	66	60.1	10	----	60.1	0.0	8	-8.0
R36	38	1	0.0	60.1	66	60.1	10	----	60.1	0.0	8	-8.0
R37	39	1	0.0	60.1	66	60.1	10	----	60.1	0.0	8	-8.0
R38	40	1	0.0	60.8	66	60.8	10	----	60.8	0.0	8	-8.0
Park	41	1	0.0	62.4	66	62.4	10	----	62.4	0.0	8	-8.0
R39	42	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
R40	43	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
MF1	44	1	0.0	62.4	66	62.4	10	----	62.4	0.0	8	-8.0
MF2	45	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0
MF3	46	1	0.0	62.3	66	62.3	10	----	62.3	0.0	8	-8.0
MF4	47	1	0.0	61.8	66	61.8	10	----	61.8	0.0	8	-8.0
MF5	48	1	0.0	60.9	66	60.9	10	----	60.9	0.0	8	-8.0
MU1	49	1	0.0	62.5	66	62.5	10	----	62.5	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	47	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

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INPUT: ROADWAYS
PROJECT/CONTRACT: Portola Center
RUN: 2nd Floor Unmitigated

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

Roadway		Points									
Name	Width	Name	No.	Coordinates (pavement)			Flow Control			Segment	
				X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Glenn Ranch Road EB	24.0	point1	1	115.2	1,617.1	940.00				Average	
		point2	2	357.9	1,613.1	965.00				Average	
		point3	3	556.8	1,581.3	990.00				Average	
		point4	4	771.6	1,501.7	970.00				Average	
		point5	5	938.7	1,422.1	950.00					
Glenn Ranch Road WB	24.0	point6	6	954.6	1,457.9	950.00				Average	
		point7	7	791.5	1,541.5	970.00				Average	
		point8	8	564.7	1,625.0	990.00				Average	
		point9	9	357.9	1,660.8	965.00				Average	
		point10	10	107.3	1,660.8	940.00					
Glenn Ranch Road EB 2	12.0	point11	11	1,014.3	1,358.5	1,000.00				Average	
		point12	12	1,292.7	1,107.9	1,091.00				Average	
		point13	13	1,551.3	817.5	1,048.00				Average	
		point14	14	1,790.0	566.8	1,005.00				Average	
		point15	15	2,112.2	312.2	1,100.00				Average	
		point16	16	2,422.5	173.0	1,100.00				Average	
		point17	17	2,796.4	125.3	1,100.00				Average	
		point18	18	3,190.3	165.1	1,020.00				Average	
		point19	19	3,512.5	200.9	1,080.00				Average	
		point20	20	3,826.8	181.0	1,000.00					
Glenn Ranch Road WB 2	24.0	point21	21	3,826.8	220.8	1,000.00				Average	
		point22	22	3,496.6	240.6	1,080.00				Average	
		point23	23	3,170.4	204.8	1,020.00				Average	
		point24	24	2,796.4	169.0	1,100.00				Average	
		point25	25	2,438.4	212.8	1,100.00				Average	

		point26	26	2,136.1	344.1	1,100.00				Average	
		point27	27	1,825.8	590.7	1,005.00				Average	
		point28	28	1,587.1	837.4	1,048.00				Average	
		point29	29	1,320.6	1,127.8	1,091.00				Average	
		point30	30	1,038.1	1,390.3	1,000.00					
Saddleback Ranch Road NB	24.0	point35	35	1,042.1	1,414.2	975.00				Average	
		point36	36	1,085.9	1,477.8	945.00				Average	
		point37	37	1,304.7	1,788.1	1,000.00				Average	
		point38	38	1,439.9	1,979.1	984.00				Average	
		point39	39	1,567.2	2,158.1	1,020.00					
Saddleback Ranch Road SB	24.0	point40	40	1,539.4	2,174.0	1,020.00				Average	
		point41	41	1,412.1	1,991.0	984.00				Average	
		point42	42	1,280.8	1,804.0	1,000.00				Average	
		point43	43	1,062.0	1,501.7	945.00				Average	
		point44	44	1,010.3	1,434.1	975.00					

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INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: Portola Center
RUN: 2nd Floor Unmitigated

Roadway Name	Points Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Glenn Ranch Road EB	point1	1	1440	50	30	50	30	50	0	0	0	0
	point2	2	1440	50	30	50	30	50	0	0	0	0
	point3	3	1440	50	30	50	30	50	0	0	0	0
	point4	4	1440	50	30	50	30	50	0	0	0	0
	point5	5										
Glenn Ranch Road WB	point6	6	1440	50	30	50	30	50	0	0	0	0
	point7	7	1440	50	30	50	30	50	0	0	0	0
	point8	8	1440	50	30	50	30	50	0	0	0	0
	point9	9	1440	50	30	50	30	50	0	0	0	0
	point10	10										
Glenn Ranch Road EB 2	point11	11	576	50	12	50	12	50	0	0	0	0
	point12	12	576	50	12	50	12	50	0	0	0	0
	point13	13	576	50	12	50	12	50	0	0	0	0
	point14	14	576	50	12	50	12	50	0	0	0	0
	point15	15	576	50	12	50	12	50	0	0	0	0
	point16	16	576	50	12	50	12	50	0	0	0	0
	point17	17	576	50	12	50	12	50	0	0	0	0
	point18	18	576	50	12	50	12	50	0	0	0	0
	point19	19	576	50	12	50	12	50	0	0	0	0
	point20	20										
Glenn Ranch Road WB 2	point21	21	576	50	12	50	12	50	0	0	0	0
	point22	22	576	50	12	50	12	50	0	0	0	0

	point23	23	576	50	12	50	12	50	0	0	0	0
	point24	24	576	50	12	50	12	50	0	0	0	0
	point25	25	576	50	12	50	12	50	0	0	0	0
	point26	26	576	50	12	50	12	50	0	0	0	0
	point27	27	576	50	12	50	12	50	0	0	0	0
	point28	28	576	50	12	50	12	50	0	0	0	0
	point29	29	576	50	12	50	12	50	0	0	0	0
	point30	30										
Saddleback Ranch Road NB	point35	35	706	50	15	50	15	50	0	0	0	0
	point36	36	706	50	15	50	15	50	0	0	0	0
	point37	37	706	50	15	50	15	50	0	0	0	0
	point38	38	706	50	15	50	15	50	0	0	0	0
	point39	39										
Saddleback Ranch Road SB	point40	40	706	50	15	50	15	50	0	0	0	0
	point41	41	706	50	15	50	15	50	0	0	0	0
	point42	42	706	50	15	50	15	50	0	0	0	0
	point43	43	706	50	15	50	15	50	0	0	0	0
	point44	44										

Dudek
B. Grover

30 January 2013
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Portola Center
RUN: 2nd Floor Unmitigated

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
R1	3	1	83.4	1,983.0	1,058.00	15.00	0.00	66	10.0	8.0	Y
R2	4	1	214.7	1,887.6	1,052.00	15.00	0.00	66	10.0	8.0	Y
R3	5	1	338.0	1,851.8	1,050.00	15.00	0.00	66	10.0	8.0	Y
R4	6	1	572.7	1,788.1	1,047.50	15.00	0.00	66	10.0	8.0	Y
R5	7	1	787.5	1,692.6	1,045.00	15.00	0.00	66	10.0	8.0	Y
R6	8	1	962.6	1,593.2	1,046.00	15.00	0.00	66	10.0	8.0	Y
R7	9	1	1,058.0	1,652.9	1,046.00	15.00	0.00	66	10.0	8.0	Y
R8	10	1	1,141.6	1,736.4	1,050.00	15.00	0.00	66	10.0	8.0	Y
R9	11	1	1,177.4	1,784.1	1,055.00	15.00	0.00	66	10.0	8.0	Y
R10	12	1	1,292.7	1,927.3	1,065.00	15.00	0.00	66	10.0	8.0	Y
R11	13	1	1,368.3	2,034.8	1,073.00	15.00	0.00	66	10.0	8.0	Y
R12	14	1	1,404.1	2,110.3	1,074.00	15.00	0.00	66	10.0	8.0	Y
R13	15	1	1,662.7	2,006.9	1,150.00	15.00	0.00	66	10.0	8.0	Y
R14	16	1	1,551.3	1,879.6	1,125.00	15.00	0.00	66	10.0	8.0	Y
R15	17	1	1,432.0	1,676.7	1,121.00	15.00	0.00	66	10.0	8.0	Y
R16	18	1	1,332.5	1,513.6	1,114.00	15.00	0.00	66	10.0	8.0	Y
R17	19	1	1,380.2	1,298.8	1,107.00	15.00	0.00	66	10.0	8.0	Y
R18	20	1	1,527.4	1,084.0	1,092.00	15.00	0.00	66	10.0	8.0	Y
R19	21	1	1,634.8	932.8	1,085.00	15.00	0.00	66	10.0	8.0	Y
R20	22	1	1,722.4	825.4	1,082.00	15.00	0.00	66	10.0	8.0	Y
R21	23	1	1,877.5	650.4	1,085.00	15.00	0.00	66	10.0	8.0	Y
R22	24	1	2,068.5	475.3	1,087.00	15.00	0.00	66	10.0	8.0	Y

R23	25	1	2,275.3	360.0	1,083.00	15.00	0.00	66	10.0	8.0	Y
R24	26	1	2,474.2	296.3	1,083.00	15.00	0.00	66	10.0	8.0	Y
R25	27	1	2,716.9	284.4	1,087.00	15.00	0.00	66	10.0	8.0	Y
R26	28	1	2,963.5	312.2	1,091.00	15.00	0.00	66	10.0	8.0	Y
R27	29	1	3,202.2	356.0	1,094.00	15.00	0.00	66	10.0	8.0	Y
R28	30	1	3,417.0	495.2	1,102.00	15.00	0.00	66	10.0	8.0	Y
R29	31	1	3,516.5	682.2	1,105.00	15.00	0.00	66	10.0	8.0	Y
R30	32	1	3,293.7	73.6	1,044.50	15.00	0.00	66	10.0	8.0	Y
R31	33	1	3,162.4	81.5	1,044.00	15.00	0.00	66	10.0	8.0	Y
R32	34	1	3,090.8	85.5	1,043.50	15.00	0.00	66	10.0	8.0	Y
R33	35	1	2,975.5	73.6	1,047.00	15.00	0.00	66	10.0	8.0	Y
R34	36	1	2,804.4	61.6	1,045.00	15.00	0.00	66	10.0	8.0	Y
R35	37	1	2,708.9	53.7	1,046.00	15.00	0.00	66	10.0	8.0	Y
R36	38	1	2,625.4	53.7	1,049.00	15.00	0.00	66	10.0	8.0	Y
R37	39	1	2,525.9	65.6	1,050.00	15.00	0.00	66	10.0	8.0	Y
R38	40	1	2,426.5	89.5	1,056.00	15.00	0.00	66	10.0	8.0	Y
Park	41	1	2,199.7	204.8	1,072.00	15.00	0.00	66	10.0	8.0	Y
R39	42	1	2,112.2	236.7	1,070.50	15.00	0.00	66	10.0	8.0	Y
R40	43	1	1,984.9	304.3	1,071.00	15.00	0.00	66	10.0	8.0	Y
MF1	44	1	1,809.9	352.0	1,042.00	15.00	0.00	66	10.0	8.0	Y
MF2	45	1	1,714.4	427.6	1,040.00	15.00	0.00	66	10.0	8.0	Y
MF3	46	1	1,511.5	618.6	1,036.00	15.00	0.00	66	10.0	8.0	Y
MF4	47	1	1,400.1	773.7	1,034.00	15.00	0.00	66	10.0	8.0	Y
MF5	48	1	1,221.1	980.6	1,030.00	15.00	0.00	66	10.0	8.0	Y
MU1	49	1	1,133.6	1,127.8	1,028.00	15.00	0.00	66	10.0	8.0	Y

Dudek 30 January 2013
B. Grover TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: Portola Center
RUN: 2nd Floor Unmitigated

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per Unit Area	$ per Unit Vol.	Top Width	Run:Rise	$ per Unit Length			X	Y	Z	at Point	Seg Ht Increment	Perturbs #Up	Perturbs #Dn	On Struct?	Important Reflections?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
South Slope Along Glenn Ranch Road	W	0.00	99.99	0.00				0.00	point60	60	-0.1	2,070.6	1,058.00	0.00	0.00	0	0		
									point61	61	67.5	1,971.1	1,058.00	0.00	0.00	0	0		
									point62	62	190.8	1,855.7	1,052.00	0.00	0.00	0	0		
									point63	63	334.0	1,816.0	1,050.00	0.00	0.00	0	0		
									point64	64	556.8	1,756.3	1,047.00	0.00	0.00	0	0		
									point65	65	775.6	1,656.8	1,045.00	0.00	0.00	0	0		
									point66	66	962.6	1,553.4	1,046.00	0.00	0.00	0	0		
									point67	67	1,077.9	1,625.0	1,046.00	0.00	0.00	0	0		
									point68	68	1,157.5	1,708.5	1,050.00	0.00	0.00	0	0		
									point69	69	1,225.1	1,776.2	1,055.00	0.00	0.00	0	0		
									point70	70	1,133.6	1,871.7	1,055.00	0.00					
Slope NW of GRR and SRR	W	0.00	99.99	0.00				0.00	point71	71	1,197.3	1,919.4	1,065.00	0.00	0.00	0	0		
									point72	72	1,276.8	1,863.7	1,065.00	0.00	0.00	0	0		
									point73	73	1,312.6	1,923.4	1,065.00	0.00	0.00	0	0		
									point74	74	1,392.2	2,022.8	1,073.00	0.00	0.00	0	0		
									point75	75	1,447.9	2,098.4	1,074.00	0.00	0.00	0	0		
									point76	76	1,356.4	2,170.0	1,074.00	0.00					
Slope NE of GRR and SRR	W	0.00	99.99	0.00				0.00	point77	77	1,722.4	2,102.4	1,150.00	0.00	0.00	0	0		
									point78	78	1,626.9	2,014.9	1,150.00	6.00	0.00	0	0		
									point79	79	1,519.5	1,919.4	1,125.00	6.00	0.00	0	0		
									point80	80	1,392.2	1,692.6	1,121.00	6.00	0.00	0	0		
									point81	81	1,296.7	1,513.6	1,114.00	6.00	0.00	0	0		
									point82	82	1,344.4	1,282.9	1,107.00	6.00	0.00	0	0		
									point83	83	1,495.6	1,060.1	1,092.00	6.00	0.00	0	0		
									point84	84	1,607.0	909.0	1,085.00	6.00	0.00	0	0		
									point85	85	1,694.5	801.5	1,082.00	6.00	0.00	0	0		
									point86	86	1,869.6	618.6	1,085.00	6.00	0.00	0	0		
									point87	87	2,056.5	451.5	1,087.00	6.00	0.00	0	0		
									point88	88	2,287.2	316.2	1,083.00	6.00	0.00	0	0		
									point89	89	2,346.9	407.7	1,083.00	6.00					
Slope N GRR	W	0.00	99.99	0.00				0.00	point90	90	2,442.4	395.8	1,083.00	0.00	0.00	0	0		
									point91	91	2,454.3	256.6	1,083.00	6.00	0.00	0	0		
									point92	92	2,701.0	256.6	1,087.00	6.00	0.00	0	0		
									point93	93	2,975.5	276.4	1,091.00	6.00	0.00	0	0		
									point94	94	3,206.2	324.2	1,094.00	0.00	0.00	0	0		

									point95	95	3,432.9	471.4	1,102.00	0.00	0.00	0	0		
									point96	96	3,548.3	686.2	1,105.00	0.00	0.00	0	0		
									point97	97	3,488.6	761.8	1,105.00	0.00					
Slope S GRR	W	0.00	99.99	0.00				0.00	point98	98	3,337.5	29.8	1,044.50	6.00	0.00	0	0		
									point99	99	3,333.5	113.3	1,044.50	6.00	0.00	0	0		
									point100	100	3,162.4	105.4	1,044.00	6.00	0.00	0	0		
									point101	101	3,090.8	109.4	1,043.50	6.00	0.00	0	0		
									point102	102	2,971.5	109.4	1,047.00	0.00	0.00	0	0		
									point103	103	2,800.4	89.5	1,045.00	0.00	0.00	0	0		
									point104	104	2,701.0	85.5	1,046.00	0.00	0.00	0	0		
									point105	105	2,621.4	85.5	1,049.00	0.00	0.00	0	0		
									point106	106	2,529.9	101.4	1,050.00	0.00	0.00	0	0		
									point107	107	2,422.5	129.3	1,056.00	0.00	0.00	0	0		
									point108	108	2,323.1	21.8	1,056.00	0.00					
Slope SE GRR and SRR	W	0.00	99.99	0.00				0.00	point109	109	2,203.7	89.5	1,072.00	0.00	0.00	0	0		
									point110	110	2,235.5	216.8	1,072.00	0.00	0.00	0	0		
									point111	111	2,116.2	268.5	1,070.50	6.00	0.00	0	0		
									point112	112	1,988.9	344.1	1,071.00	6.00	0.00	0	0		
									point113	113	1,873.5	371.9	1,042.00	0.00	0.00	0	0		
									point114	114	1,782.0	455.5	1,040.00	0.00	0.00	0	0		
									point115	115	1,583.1	650.4	1,036.00	0.00	0.00	0	0		
									point116	116	1,471.7	797.6	1,034.00	0.00	0.00	0	0		
									point117	117	1,292.7	1,016.4	1,030.00	0.00	0.00	0	0		
									point118	118	1,173.4	1,159.6	1,028.00	0.00	0.00	0	0		
									point119	119	1,006.3	1,334.6	1,028.00	0.00	0.00	0	0		
									point120	120	950.6	1,247.1	1,028.00	0.00					

Dudek
B. Grover

30 January 2013
TNM 2.5
Calculated with TNM 2.5

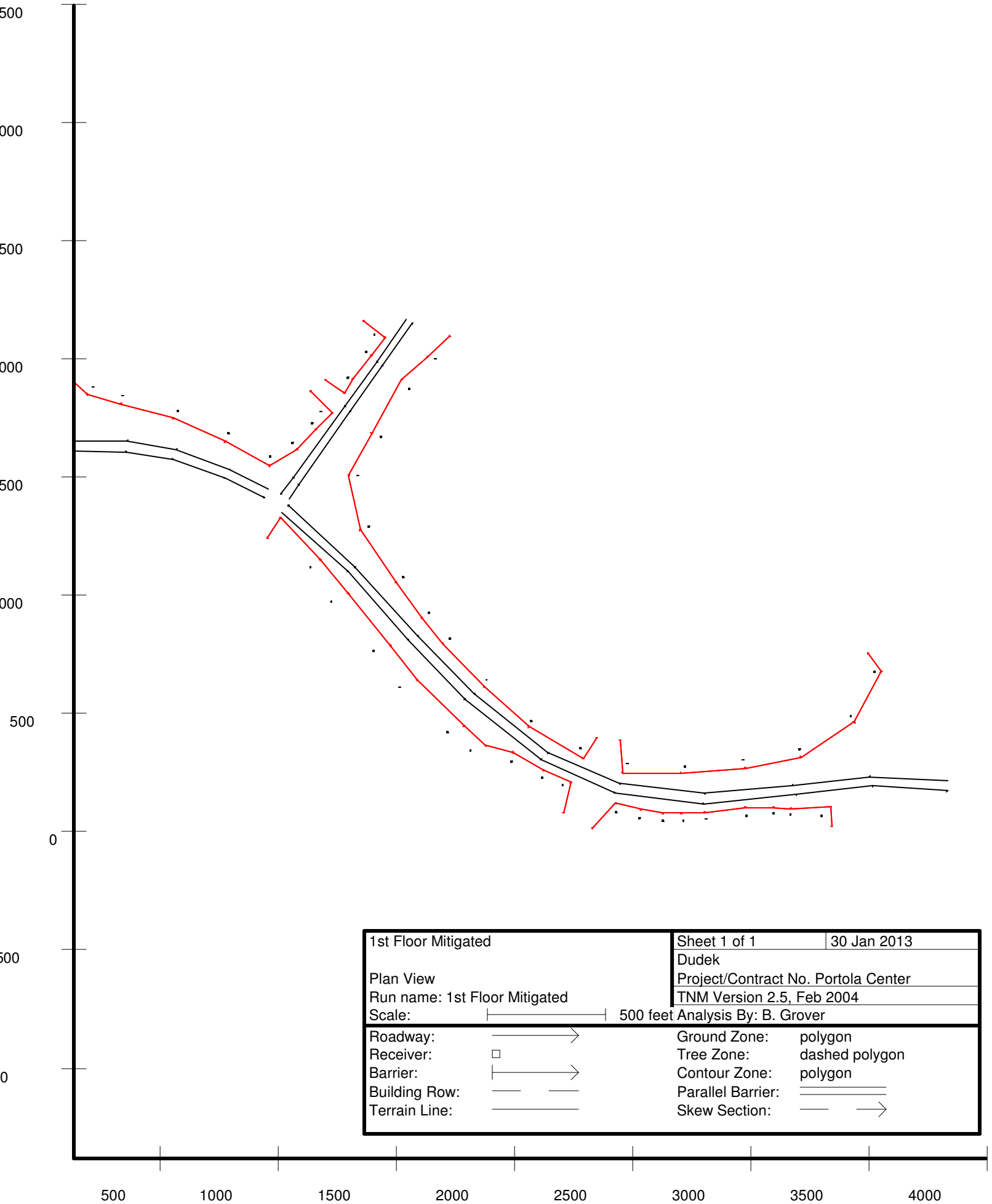
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Portola Center
RUN: 2nd Floor Unmitigated
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	3	1	0.0	57.7	66	57.7	10	----	57.7	0.0	8	-8.0
R2	4	1	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0
R3	5	1	0.0	62.2	66	62.2	10	----	62.2	0.0	8	-8.0
R4	6	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
R5	7	1	0.0	62.5	66	62.5	10	----	62.5	0.0	8	-8.0
R6	8	1	0.0	62.4	66	62.4	10	----	62.4	0.0	8	-8.0
R7	9	1	0.0	58.5	66	58.5	10	----	58.5	0.0	8	-8.0
R8	10	1	0.0	57.9	66	57.9	10	----	57.9	0.0	8	-8.0
R9	11	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0
R10	12	1	0.0	59.1	66	59.1	10	----	59.1	0.0	8	-8.0
R11	13	1	0.0	56.1	66	56.1	10	----	56.1	0.0	8	-8.0
R12	14	1	0.0	59.5	66	59.5	10	----	59.5	0.0	8	-8.0
R13	15	1	0.0	49.5	66	49.5	10	----	49.5	0.0	8	-8.0
R14	16	1	0.0	49.5	66	49.5	10	----	49.5	0.0	8	-8.0
R15	17	1	0.0	51.6	66	51.6	10	----	51.6	0.0	8	-8.0
R16	18	1	0.0	58.0	66	58.0	10	----	58.0	0.0	8	-8.0
R17	19	1	0.0	61.7	66	61.7	10	----	61.7	0.0	8	-8.0
R18	20	1	0.0	61.9	66	61.9	10	----	61.9	0.0	8	-8.0
R19	21	1	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0
R20	22	1	0.0	58.6	66	58.6	10	----	58.6	0.0	8	-8.0
R21	23	1	0.0	59.5	66	59.5	10	----	59.5	0.0	8	-8.0
R22	24	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
R23	25	1	0.0	65.4	66	65.4	10	----	65.4	0.0	8	-8.0

R24	26	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	8	-8.0
R25	27	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
R26	28	1	0.0	63.1	66	63.1	10	----	63.1	0.0	8	-8.0
R27	29	1	0.0	63.5	66	63.5	10	----	63.5	0.0	8	-8.0
R28	30	1	0.0	60.6	66	60.6	10	----	60.6	0.0	8	-8.0
R29	31	1	0.0	56.3	66	56.3	10	----	56.3	0.0	8	-8.0
R30	32	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
R31	33	1	0.0	66.2	66	66.2	10	Snd Lvl	66.2	0.0	8	-8.0
R32	34	1	0.0	67.0	66	67.0	10	Snd Lvl	67.0	0.0	8	-8.0
R33	35	1	0.0	65.4	66	65.4	10	----	65.4	0.0	8	-8.0
R34	36	1	0.0	62.7	66	62.7	10	----	62.7	0.0	8	-8.0
R35	37	1	0.0	61.4	66	61.4	10	----	61.4	0.0	8	-8.0
R36	38	1	0.0	61.4	66	61.4	10	----	61.4	0.0	8	-8.0
R37	39	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0
R38	40	1	0.0	61.2	66	61.2	10	----	61.2	0.0	8	-8.0
Park	41	1	0.0	64.1	66	64.1	10	----	64.1	0.0	8	-8.0
R39	42	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
R40	43	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	8	-8.0
MF1	44	1	0.0	63.2	66	63.2	10	----	63.2	0.0	8	-8.0
MF2	45	1	0.0	62.5	66	62.5	10	----	62.5	0.0	8	-8.0
MF3	46	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
MF4	47	1	0.0	62.8	66	62.8	10	----	62.8	0.0	8	-8.0
MF5	48	1	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0
MU1	49	1	0.0	63.9	66	63.9	10	----	63.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	47	0.0	0.0	0.0
All Impacted	4	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0



1st Floor Mitigated		Sheet 1 of 1	30 Jan 2013
		Dudek	
Plan View		Project/Contract No. Portola Center	
Run name: 1st Floor Mitigated		TNM Version 2.5, Feb 2004	
Scale:	500 feet	Analysis By: B. Grover	

Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	

ATTACHMENT 4

Noise Measurement Field Data Sheet

NOISE LEVEL MEASUREMENT

Project Name: Portola
Noise Source: Glenn Ranch Road
Distance to Source (C.L.): ~50
50 mph

Site 1

Date: 9/25/12
Start Time: 11:00 AM – 11:20 AM

Temperature: 77 Degrees
Wind (speed/direction): LtV
Cloud Cover: Cloudy P.Coudy (Clear)

Humidity: Humid (Normal) Dry

L_{eq} 69.1
L_{max} 84
L_{min} 34
L_1 74
L_{10} 74
L_{50} 64.5
L_{90} 46
Cpus 110

Running Average

$L_{eq}(5)$ 68.9
$L_{eq}(10)$ 69.1
$L_{eq}(15)$ 69.
$L_{eq}(20)$ 69.1
$L_{eq}(25)$ ____
$L_{eq}(30)$ ____
$L_{eq}(35)$ ____
$L_{eq}(40)$ ____
$L_{eq}(45)$ ____
$L_{eq}(50)$ ____
$L_{eq}(55)$ ____
$L_{eq}(60)$ ____

Cars (L_{max}) ~
MT (L_{max})
HT (L_{max})

					20 min	
Cars					(15)	
MT		1	12|V	0	(1+20)	
HT	0	0	0	0	(0)	

Median

Sadia bridge

NOISE LEVEL MEASUREMENT

Project Name: Portola
Noise Source: Saddleback Ranch Rd
Distance to Source (C.L.): 50 ft

site 2

Date: 9/25/12
Start Time: 11:34 - 11:54 AM

Temperature: 79 Degrees
Wind (speed/direction): calm
Cloud Cover: Cloudy P.Coudy (Clear)

Humidity: Humid (Normal) Dry

L_{eq} 66.9
L_{max} 85
L_{min} 37
L_1 75.5
L_{10} 71
L_{50} 60.5
L_{90} 41
upper 11

Running Average

$L_{eq}(5)$ 66.5	$L_{eq}(35)$ ____
$L_{eq}(10)$ 66.8	$L_{eq}(40)$ ____
$L_{eq}(15)$ 66.7	$L_{eq}(45)$ ____
$L_{eq}(20)$ 66.9	$L_{eq}(50)$ ____
$L_{eq}(25)$ ____	$L_{eq}(55)$ ____
$L_{eq}(30)$ ____	$L_{eq}(60)$ ____

Cars (L_{max}) ~
MT (L_{max})
HT (L_{max})

					20 min	
Cars						(193)	
MT	0	1	4 mi/hr		(0)	
HT	0	0	0		(0)	

(6)

median

(8)

Road