VISTA
ENVIRONMENTAL

December 15, 2023

Mr. Steven Berzansky
Steven Walker Communities
7111 Indiana Avenue, Suite 300
Riverside, CA 92504

Subject: **County of Riverside – Proposed All Residential Development for Highgrove Tentative Tract Map 37743 Project Noise Technical Memorandum.**

Dear Mr. Berzansky:

The *Noise Impact Analysis Highgrove Residential/Commercial Project* (Original Noise Report), prepared by Vista Environmental, July 17, 2022, analyzed a project that included 52 single-family homes and a commercial component on the western side of the project site, adjacent to Mt Vernon Avenue (Prior Project). This analysis has quantified the noise impacts created by the proposed all residential development with 72 single-family homes (Revised Project) and then compares the impacts calculated for the Prior Project as well as to the thresholds utilized in the Original Noise Report. This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.).

Revised Project Description

The Revised Project consists of an all residential project with 72 single-family homes on the 9.17-acre project site. The Landscape Plan for the Revised Project shows that a 6-foot high concrete masonry unit (CMU) wall will be constructed around the perimeter of the project site.

Noise Related Project Design Features

The Original Noise Report included Project Design Features 1 – 4 that are shown below. Project Design Feature 4 was specific to the Prior Project, since it is specific to the prior commercial use. As such, Project Design Feature 4 is shown in redline strike through, since it is not applicable to the Revised Project. In order to ensure that the 6-foot high CMU wall shown in the Landscape Plan is constructed adjacent to Mt. Vernon Avenue, where it is needed for noise reduction for the Revised Project, a new Project Design Feature 5 has been added.

Project Design Feature 1:
The project applicant shall utilize standard dual pane windows for all conditioned rooms of the proposed homes that have a minimum Sound Transmission Class (STC) rating of 26 STC.

Project Design Feature 2:
The project applicant shall provide a "windows closed" condition for each proposed single-family home. A "window closed" condition requires a means of mechanical ventilation per Chapter 12, Section 1205 of the Uniform Building Code. This shall be achieved with a standard forced air conditioning and heating system with a filtered outside air intake vent for each residential unit.

Project Design Feature 3:
Prior to the issuance of the grading permit, the project applicant shall submit a construction-related noise mitigation plan to the County for review and approval. The plan shall depict the locations of where construction equipment will operate on the project site and how the noise from the construction equipment will be mitigated during construction of the project, through use of such methods as:

1. Temporary noise attenuation fences;
2. Preferential location of equipment; and
3. Use of current noise suppression technology and equipment.

~~**Project Design Feature 4:**~~
~~The project applicant shall construct the combination retaining wall and 6-foot high free-standing wall located between the commercial and residential portions of the project that is depicted on both the grading and wall and fence plans. The free-standing portion of the wall shall be constructed of concrete masonry units (CMUs) and shall be free of any decorative cutouts or openings.~~

Project Design Feature 5:
The project applicant shall construct the 6-foot high concrete masonry unit (CMU) wall depicted on the Landscape Plan that is located on the east side of Mt. Vernon Avenue. The CMU wall shall be free of any decorative cutouts or openings.

Noise Related Mitigation Measure

The Original Noise Report included the following Mitigation Measure 1 that is shown below and is no longer required for the Revised Project has incorporated a 6 foot high CMU wall adjacent to Mt. Vernon Avenue in the Landscape Plan and a new Project Design Feature 5 has been included above to ensure construction of this wall. As such, Mitigation Measure 1 is shown in redline strike through, since it is not applicable to the Revised Project.

~~**Mitigation Measure 1:**~~
~~The project applicant shall construct a minimum 5.0 foot high solid wall on the west side of the Lot for Building 15 that is adjacent to Mt Vernon Avenue (see Figure 3). The wall shall be constructed of concrete masonry units (CMUs) and shall be free of any decorative cutouts or openings.~~

Impact Analysis

Short-Term Construction-Related Noise Impacts
Noise impacts from construction activities associated with the Revised Project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. The nearest sensitive receptors to the project site are single-family homes located adjacent to the north and east sides of the project site. There are also single-family homes located as near as 80 feet to the west of the project site that are on the west side of Mt Vernon Avenue. No changes have occurred to the nearby sensitive receptors since the Original Noise Report was prepared.

General Plan Policy N 13.1 requires that construction noise impacts to be minimized on adjacent uses through acceptable practices. General Plan Policy N 13.2 requires that construction activities are limited to established hours of operation in order to mitigate the generation of excessive or adverse noise impacts on the surrounding community. Section 9.52.020(I) of the Municipal Code provides the established hours of construction operations, and details that construction activities that occurs between 6:00 a.m. and 6:00 p.m. during the months of June through September and between 7:00 a.m. and 6:00 p.m. during the months of October through May are exempt from the Noise Ordinance. General Plan Policy N 13.3 requires construction of subdivisions that are adjacent to occupied noise sensitive land uses to submit a construction-related noise mitigation plan to the County that depicts how construction noise will be mitigated through use of temporary noise fences, preferred location of equipment and use of current noise suppression technology and equipment. Project Design Feature 3 has been included in this analysis to ensure compliance with General Plan Policy N 13.3 that requires the County to review and approve a construction-related noise mitigation plan, prior to issuance of the grading permit for the proposed project. General Plan Policy 13.4 requires that all construction equipment utilize noise reduction features (e.g. mufflers and engine shrouds) that are no less effectively than what was originally installed by the manufacturer. As detailed above, through implementation of Project Design Feature 3, construction of the Revised Project would not exceed the applicable standards in the General Plan and Municipal Code.

The Original Noise Report calculated the anticipated noise levels from each phase of construction activities for the Prior Project based on the equipment list provided in the CalEEMod model run for the Prior Project. No changes have occurred to the default equipment list between the CalEEMod model runs for the Prior Project and Revised Project. As such, no changes to the construction noise levels at the nearby homes would occur between the Prior Project and Revised Project, and therefore the findings provided in the Original Noise Report would apply to the Revised Project as well. The Original Noise Report found that the calculated construction noise levels at the nearby homes would be within the applicable construction noise standards and through adherence to the allowable construction times detailed in Section 9.52.020(I) of the Municipal Code and through implementation of Project Design Feature 3, that requires the preparation of a construction-related noise mitigation plan, prior to the issuance of the grading plan for the Revised Project, the Revised Project would not create a substantial temporary increase in ambient noise levels from construction of the Revised Project. Impacts would be less than significant.

Operations-Related Noise

The Revised Project would consist of an all residential development in an infill lot that is surrounded by existing residential uses. The Revised Project would not introduce any new noise sources onsite that does not already occur in the adjacent residential communities, as such no onsite noise impacts are anticipated to occur from operation of the Revised Project and this operations-related noise analysis is limited to analyzing the roadway noise impacts created by the additional vehicle generated trips by the proposed project and the roadway noise impacts to the proposed homes.

Project Generated Roadway Noise Impacts to Nearby Existing Homes

The Original Noise Report calculated the potential offsite traffic noise impacts created by the on-going operations of the Prior Project through entering the without and with project traffic volumes for the existing year, existing plus ambient year 2022, and existing plus ambient year 2022 plus cumulative projects scenarios that were obtained from the *TTM 37743 – Highgrove Traffic Impact Analysis* (Traffic Impact Analysis), prepared by Trames Solutions, Inc., June 4, 2020, into the FHWA RD-77-108 model. The Original Noise Report found that for all scenarios analyzed, that the roadway noise increases created by

the Prior Project would not exceed the applicable roadway noise increase thresholds and project generated roadway noise would not result in a substantial permanent increase in ambient noise levels.

The *Tentative Tract Map 37743 VMT Evaluation*, prepared by Trames Solutions, Inc., December 12, 2023 found that the Revised Project would generate 679 daily Trips and the Prior Project would have generated 2,154 daily trips, which results in a reduction of 1,475 daily trips, when compared to the Prior Project. As such, since the Original Noise Report found that the Prior Project would create a less than significant impact to roadway noise and the Revised Project would generate 1,475 less daily trips than the Prior Project, it can be reasonably concluded that the Revised Project would also create a less than significant impact to roadway noise and would not result in a substantial permanent increase in ambient noise levels at the nearby homes.

Roadway Vehicular Noise Impacts to Proposed Homes

The Original Noise Report calculated the roadway noise impacts from Mt Vernon Avenue and Center Street to the proposed homes and compared the noise levels to the County General Plan residential noise standards that the interior noise levels in new residential dwellings shall not exceed 45 dB Ldn and that the exterior backyard area noise levels shall not exceed 65 dB Ldn. This analysis has included the same homes analyzed in the Original Noise Report for the Prior Project, where each home's inputs were verified plus analyzed representative homes that will now be located on the commercial portion of the Prior Project, through use of the FHWA-RD-77-108 model and the output files are attached to this Memo. The exterior and interior noise impacts to the proposed homes have been analyzed separately below.

Roadway Noise impacts to the Proposed Homes Backyards

The anticipated noise levels have been calculated for the backyards that are adjacent to Center Street and Mt Vernon Avenue and the results are shown below in Table A. It should be noted that Project Design Feature 5 requires the construction of a 6 foot high wall adjacent to Mt. Vernon Avenue as depicted on the Landscape Plan, which has been incorporated into the backyard noise calculations.

Table A – Proposed Homes Exterior Backyard Noise Levels from Nearby Roads

Building Number	Roadway	Exterior Backyard Noise Levels (dBA Ldn)		County Exterior Noise Standard	Exceed Standard?
		Without Sound Wall	With Sound Wall		
1	Center Street	65	58	65 dBA Ldn	No
2	Center Street	65	57	65 dBA Ldn	No
3	Center Street	65	58	65 dBA Ldn	No
4	Center Street	65	58	65 dBA Ldn	No
5	Center Street	65	57	65 dBA Ldn	No
15	Mt Vernon Avenue	**67**	58	65 dBA Ldn	No
36	Center Street	65	58	65 dBA Ldn	No
62	Mt Vernon Avenue	**67**	58	65 dBA Ldn	No
65	Mt Vernon Avenue	**67**	58	65 dBA Ldn	No
68	Mt Vernon Avenue	**67**	58	65 dBA Ldn	No
71	Mt Vernon Avenue	**67**	58	65 dBA Ldn	No

Notes:
Exceedance of County's 65 dBA Ldn residential exterior noise standard shown in **bold**.
Source: FHWA RD-77-108 Model.

Table A shows that with construction of the 6-foot high wall adjacent to Mt. Vernon Avenue as depicted on the Landscape Plan that exterior backyard noise levels of all analyzed homes would be below the County's 65 dBA Ldn noise standard. Therefore, with implementation of Project Design Feature 5 that requires construction of the sound walls depicted on the Landscape Plan, the exterior noise impacts to the proposed homes would be within the County's residential exterior noise standards.

Roadway Noise impacts to the Proposed Homes Interior Areas

To assess the interior noise levels related to compliance with the dBA Ldn interior noise standard, the same proposed homes analyzed for the exterior private backyard analysis were also analyzed for their interior noise levels. The exterior noise level at the façade of the first and second floors were calculated through use of the same methodology detailed above for the outdoor noise calculations and in Section 6.2 above and the results are shown below in Table B. Per County of Riverside guidelines, the interior noise levels were calculated based on 20 dB of attenuation, which has been determined as the noise attenuation provided by standard residential architecture as defined in the County of Riverside guidelines. Table B also show the interior noise levels calculated based on 30 dB of attenuation, which is the minimum attenuation rate that was calculated in the Original Noise Report.

Table B – Proposed Homes Interior Noise Levels from Nearby Roads

Building Number	Roadway	Floor	Exterior Noise Level at Building Façade (dBA Ldn)	Interior Noise Levels (dBA Ldn)	
				Standard Design[1]	Proposed Design[2]
1	Center Street	1	59	39	29
		2	65	45	35
2	Center Street	1	58	38	28
		2	65	45	35
3	Center Street	1	59	39	29
		2	65	45	35
4	Center Street	1	59	39	29
		2	65	45	35
5	Center Street	1	58	38	28
		2	65	45	35
15	Mt Vernon Avenue	1	59	39	29
		2	67	**47**	37
36	Center Street	1	59	39	29
		2	65	**45**	35
62	Mt Vernon Avenue	1	60	40	30
		2	67	**47**	37
65	Mt Vernon Avenue	1	60	40	30
		2	67	**47**	37
68	Mt Vernon Avenue	1	60	40	30
		2	67	**47**	37
71	Mt Vernon Avenue	1	60	40	30
		2	67	**47**	37

Notes:
[1] Standard Design is based on 20 dBA of noise reduction per County of Riverside General Plan.
[2] Proposed Design is based on.30 dBA of noise reduction (see Section Original Noise Report for calculations).
Exceedance of County 45 dBA Ldn noise standard shown in **bold**.
Source: FHWA RD-77-108 Model.

Table B shows that based on the County of Riverside guidelines for standard residential design of 20 dB of noise attenuation, that all buildings adjacent to Mt Vernon Avenue would exceed the County's 45 dBA Ldn interior noise standard. The County of Riverside guidelines also details that noise analyses may utilize higher exterior to interior attenuation rates if the proposed homes are calculated through modeling, which has been provided in the Original Noise Report, which found that the proposed homes will provide a minimum of 30 STC of noise reduction. Table B shows with utilization of the calculated noise reduction rates for the proposed homes (Proposed Design) that the interior noise level would be within the County's 45 dBA Ldn interior noise standard. Impacts would be less than significant.

Please call me at (949) 510-5355 if you have any questions related to the above analysis.

Sincerely,

Greg Tonkovich, INCE
Vista Environmental
949 510 5355

Encl.: FHWA-RD-77-108 Model Printouts

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Road Name: Center Street
Building: 1
Project Name: Highgrove TTM 37743
Job Number: 19125

NOISE MODEL INPUTS

Highway Data

Average Daily Traffic:	10,400	vehicles
Peak Hour Volume:	1,040	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	12	feet

Vehicle Mix

	Day	Evening	Night	Daily
Autos:	73.6%	13.6%	10.2%	97.4%
Medium Trucks:	0.9%	0.0%	0.9%	1.8%
Heavy Trucks:	0.4%	0.0%	0.4%	0.7%

Site Data

Barrier Height:	**6**	**feet**
Barrier Type(Wall/Berm):	Wall	
Site Conditions(Hard/Soft):	Hard	
Centerline (C.L.) Dist. to Barrier:	50	feet
C.L. Dist. To Observer (Backyard):	60	feet
Barrier Dist. To Observer (Backyard):	10	feet
C.L. Dist. To Observer (Structure):	60	feet
Barrier Dist. To Observer (Structure):	10	feet
Road Grade:	3.05	%
Left View:	-90	degrees
Right View:	90	degrees

Elevations

Barrier Base Elevation:	1,116.7	feet
Road Elevation:	1,117.5	feet
Noise Source Elevation above Road		
Autos:	0	feet
Med Trucks:	2.3	feet
Hvy Trucks:	8	feet
Pad Elevation:	1,116.7	feet
Observer Heights Above Pad Elevation		
Exterior:	5	feet
First Floor:	5.5	feet
Second Floor:	14	feet

FHWA NOISE MODEL CALCULATIONS

	REMEL	Traffic Flow	Distance	Finite Road	Grade	Barrier Attenuation Exterior	1st Flr	2nd Flr
Autos:	67.36	-1.27	-0.85	0.00	1.00	-7.65	-6.72	0
Med Trucks:	76.31	-18.51	-0.85	0.00	1.00	-7.15	-6.16	0
Hvy Trucks:	81.16	-22.46	-0.85	0.00	1.00	-5.1	-4.9	0

UNMITIGATED NOISE LEVELS (Backyard with topographical attenuation)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.2	64.1	62.8	56.8	65.2	65.8
Med Trucks:	58.0	36.7	29.2	38.0	44.1	44.2
Hvy Trucks:	58.8	33.5	30.1	34.7	40.9	41.0
Traffic Noise:	**67.5**	**64.1**	**62.8**	**56.9**	**65.3**	**65.9**

MITIGATED NOISE LEVELS (Backyard with sound wall)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.6	56.5	55.2	49.1	57.6	58.2
Med Trucks:	50.8	29.6	22.1	30.8	37.0	37.0
Hvy Trucks:	53.7	28.4	25.0	29.6	35.8	35.9
Traffic Noise:	**60.3**	**56.5**	**55.2**	**49.3**	**57.6**	**58.2**

MITIGATED NOISE LEVELS (First Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.5	57.4	56.1	50.1	58.5	59.1
Med Trucks:	51.8	30.5	23.0	31.8	38.0	38.0
Hvy Trucks:	53.9	28.6	25.2	29.8	36.0	36.1
Traffic Noise:	**61.1**	**57.4**	**56.1**	**50.2**	**58.6**	**59.2**

MITIGATED NOISE LEVELS (Second Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.0	62.7	56.7	65.1	65.7
Med Trucks:	57.9	36.6	29.1	37.9	44.0	44.1
Hvy Trucks:	58.7	33.4	30.0	34.6	40.8	40.9
Traffic Noise:	**67.4**	**64.0**	**62.7**	**56.8**	**65.2**	**65.8**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Road Name: Center Street
Building: 2

Project Name: Highgrove TTM 37743
Job Number: 19125

NOISE MODEL INPUTS

Highway Data

Average Daily Traffic:	10,400	vehicles
Peak Hour Volume:	1,040	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	12	feet

Vehicle Mix

	Day	Evening	Night	Daily
Autos:	73.6%	13.6%	10.2%	97.4%
Medium Trucks:	0.9%	0.0%	0.9%	1.8%
Heavy Trucks:	0.4%	0.0%	0.4%	0.7%

Site Data

Barrier Height:	**6**	**feet**
Barrier Type(Wall/Berm):	Wall	
Site Conditions(Hard/Soft):	Hard	
Centerline (C.L.) Dist. to Barrier:	50	feet
C.L. Dist. To Observer (Backyard):	60	feet
Barrier Dist. To Observer (Backyard):	10	feet
C.L. Dist. To Observer (Structure):	60	feet
Barrier Dist. To Observer (Structure):	10	feet
Road Grade:	3.05	%
Left View:	-90	degrees
Right View:	90	degrees

Elevations

Barrier Base Elevation:	1,115.6	feet
Road Elevation:	1,116.0	feet
Noise Source Elevation above Road		
Autos:	0	feet
Med Trucks:	2.3	feet
Hvy Trucks:	8	feet
Pad Elevation:	1,115.6	feet
Observer Heights Above Pad Elevation		
Exterior:	5	feet
First Floor:	5.5	feet
Second Floor:	14	feet

FHWA NOISE MODEL CALCULATIONS

	REMEL	Traffic Flow	Distance	Finite Road	Grade	Barrier Attenuation Exterior	1st Flr	2nd Flr
Autos:	67.36	-1.27	-0.85	0.00	1.00	-7.8	-6.87	0
Med Trucks:	76.31	-18.51	-0.85	0.00	1.00	-7.36	-6.24	0
Hvy Trucks:	81.16	-22.46	-0.85	0.00	1.00	-5.2	-4.9	0

UNMITIGATED NOISE LEVELS (Backyard with topographical attenuation)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.0	62.7	56.7	65.1	65.7
Med Trucks:	58.0	36.7	29.2	38.0	44.1	44.2
Hvy Trucks:	58.8	33.5	30.1	34.7	40.9	41.0
Traffic Noise:	**67.4**	**64.0**	**62.7**	**56.8**	**65.2**	**65.8**

MITIGATED NOISE LEVELS (Backyard with sound wall)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.4	56.3	55.0	49.0	57.4	58.0
Med Trucks:	50.6	29.3	21.8	30.6	36.8	36.8
Hvy Trucks:	53.6	28.3	24.9	29.5	35.7	35.8
Traffic Noise:	**60.2**	**56.3**	**55.0**	**49.1**	**57.5**	**58.1**

MITIGATED NOISE LEVELS (First Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.4	57.2	55.9	49.9	58.3	59.0
Med Trucks:	51.7	30.5	23.0	31.7	37.9	37.9
Hvy Trucks:	53.9	28.6	25.2	29.8	36.0	36.1
Traffic Noise:	**61.0**	**57.3**	**55.9**	**50.0**	**58.4**	**59.0**

MITIGATED NOISE LEVELS (Second Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.0	62.7	56.7	65.1	65.7
Med Trucks:	57.8	36.6	29.1	37.8	44.0	44.1
Hvy Trucks:	58.7	33.4	30.0	34.6	40.8	40.9
Traffic Noise:	**67.4**	**64.0**	**62.7**	**56.8**	**65.2**	**65.8**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Road Name: Center Street
Building: 3
Project Name: Highgrove TTM 37743
Job Number: 19125

NOISE MODEL INPUTS

Highway Data

Average Daily Traffic:	10,400	vehicles
Peak Hour Volume:	1,040	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	12	feet

Vehicle Mix

	Day	Evening	Night	Daily
Autos:	73.6%	13.6%	10.2%	97.4%
Medium Trucks:	0.9%	0.0%	0.9%	1.8%
Heavy Trucks:	0.4%	0.0%	0.4%	0.7%

Site Data

Barrier Height:	**6**	**feet**
Barrier Type(Wall/Berm):	Wall	
Site Conditions(Hard/Soft):	Hard	
Centerline (C.L.) Dist. to Barrier:	50	feet
C.L. Dist. To Observer (Backyard):	60	feet
Barrier Dist. To Observer (Backyard):	10	feet
C.L. Dist. To Observer (Structure):	60	feet
Barrier Dist. To Observer (Structure):	10	feet
Road Grade:	3.11	%
Left View:	-90	degrees
Right View:	90	degrees

Elevations

Barrier Base Elevation:	1,111.7	feet
Road Elevation:	1,113.0	feet
Noise Source Elevation above Road		
Autos:	0	feet
Med Trucks:	2.3	feet
Hvy Trucks:	8	feet
Pad Elevation:	1,111.7	feet
Observer Heights Above Pad Elevation		
Exterior:	5	feet
First Floor:	5.5	feet
Second Floor:	14	feet

FHWA NOISE MODEL CALCULATIONS

	REMEL	Traffic Flow	Distance	Finite Road	Grade	Barrier Attenuation Exterior	1st Flr	2nd Flr
Autos:	67.36	-1.27	-0.85	0.00	1.00	-7.5	-6.48	0
Med Trucks:	76.31	-18.51	-0.85	0.00	1.00	-6.94	-5.9	0
Hvy Trucks:	81.16	-22.46	-0.85	0.00	1.00	-5.1	-4.9	0

UNMITIGATED NOISE LEVELS (Backyard with topographical attenuation)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.2	64.1	62.8	56.8	65.2	65.8
Med Trucks:	58.0	36.7	29.2	38.0	44.1	44.2
Hvy Trucks:	58.8	33.5	30.1	34.7	40.9	41.0
Traffic Noise:	**67.5**	**64.1**	**62.8**	**56.9**	**65.3**	**65.9**

MITIGATED NOISE LEVELS (Backyard with sound wall)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.7	56.6	55.3	49.3	57.7	58.3
Med Trucks:	51.0	29.8	22.3	31.0	37.2	37.2
Hvy Trucks:	53.7	28.4	25.0	29.6	35.8	35.9
Traffic Noise:	**60.5**	**56.6**	**55.3**	**49.4**	**57.8**	**58.4**

MITIGATED NOISE LEVELS (First Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.8	57.6	56.3	50.3	58.7	59.4
Med Trucks:	52.1	30.8	23.3	32.1	38.2	38.3
Hvy Trucks:	53.9	28.6	25.2	29.8	36.0	36.1
Traffic Noise:	**61.3**	**57.7**	**56.3**	**50.4**	**58.8**	**59.4**

MITIGATED NOISE LEVELS (Second Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.0	62.7	56.7	65.1	65.7
Med Trucks:	57.9	36.6	29.1	37.9	44.0	44.1
Hvy Trucks:	58.8	33.4	30.0	34.7	40.9	40.9
Traffic Noise:	**67.4**	**64.0**	**62.7**	**56.8**	**65.2**	**65.8**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Road Name: Center Street
Lot Number: 4

Project Name: Highgrove TTM 37743
Job Number: 19125

NOISE MODEL INPUTS

Highway Data

Average Daily Traffic:	10,400	vehicles
Peak Hour Volume:	1,040	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	12	feet

Vehicle Mix

	Day	Evening	Night	Daily
Autos:	73.6%	13.6%	10.2%	97.4%
Medium Trucks:	0.9%	0.0%	0.9%	1.8%
Heavy Trucks:	0.4%	0.0%	0.4%	0.7%

Site Data

Barrier Height:	**6**	**feet**
Barrier Type(Wall/Berm):	Wall	
Site Conditions(Hard/Soft):	Hard	
Centerline (C.L.) Dist. to Barrier:	50	feet
C.L. Dist. To Observer (Backyard):	60	feet
Barrier Dist. To Observer (Backyard):	10	feet
C.L. Dist. To Observer (Structure):	60	feet
Barrier Dist. To Observer (Structure):	10	feet
Road Grade:	3.11	%
Left View:	-90	degrees
Right View:	90	degrees

Elevations

Barrier Base Elevation:	1,110.0	feet
Road Elevation:	1,111.0	feet
Noise Source Elevation above Road		
Autos:	0	feet
Med Trucks:	2.3	feet
Hvy Trucks:	8	feet
Pad Elevation:	1,110.0	feet
Observer Heights Above Pad Elevation		
Exterior:	5	feet
First Floor:	5.5	feet
Second Floor:	14	feet

FHWA NOISE MODEL CALCULATIONS

	REMEL	Traffic Flow	Distance	Finite Road	Grade	Barrier Attenuation Exterior	1st Flr	2nd Flr
Autos:	67.36	-1.27	-0.85	0.00	1.00	-7.6	-6.64	0
Med Trucks:	76.31	-18.51	-0.85	0.00	1.00	-7.08	-6.08	0
Hvy Trucks:	81.16	-22.46	-0.85	0.00	1.00	-5.1	-4.9	0

UNMITIGATED NOISE LEVELS (Backyard with topographical attenuation)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.2	64.1	62.8	56.8	65.2	65.8
Med Trucks:	58.0	36.7	29.2	38.0	44.1	44.2
Hvy Trucks:	58.8	33.5	30.1	34.7	40.9	41.0
Traffic Noise:	**67.5**	**64.1**	**62.8**	**56.9**	**65.3**	**65.9**

MITIGATED NOISE LEVELS (Backyard with sound wall)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.6	56.5	55.2	49.2	57.6	58.2
Med Trucks:	50.9	29.6	22.1	30.9	37.0	37.1
Hvy Trucks:	53.7	28.4	25.0	29.6	35.8	35.9
Traffic Noise:	**60.4**	**56.5**	**55.2**	**49.3**	**57.7**	**58.3**

MITIGATED NOISE LEVELS (First Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.6	57.5	56.2	50.2	58.6	59.2
Med Trucks:	51.9	30.6	23.1	31.9	38.0	38.1
Hvy Trucks:	53.9	28.6	25.2	29.8	36.0	36.1
Traffic Noise:	**61.2**	**57.5**	**56.2**	**50.3**	**58.6**	**59.3**

MITIGATED NOISE LEVELS (Second Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.0	62.7	56.7	65.1	65.7
Med Trucks:	57.9	36.6	29.1	37.9	44.0	44.1
Hvy Trucks:	58.7	33.4	30.0	34.6	40.8	40.9
Traffic Noise:	**67.4**	**64.0**	**62.7**	**56.8**	**65.2**	**65.8**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Road Name: Center Street
Lot Number: 5

Project Name: Highgrove TTM 37743
Job Number: 19125

NOISE MODEL INPUTS

Highway Data

Average Daily Traffic:	10,400	vehicles
Peak Hour Volume:	1,040	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	12	feet

Vehicle Mix

	Day	Evening	Night	Daily
Autos:	73.6%	13.6%	10.2%	97.4%
Medium Trucks:	0.9%	0.0%	0.9%	1.8%
Heavy Trucks:	0.4%	0.0%	0.4%	0.7%

Site Data

Barrier Height:	**6**	**feet**
Barrier Type(Wall/Berm):	Wall	
Site Conditions(Hard/Soft):	Hard	
Centerline (C.L.) Dist. to Barrier:	50	feet
C.L. Dist. To Observer (Backyard):	60	feet
Barrier Dist. To Observer (Backyard):	10	feet
C.L. Dist. To Observer (Structure):	60	feet
Barrier Dist. To Observer (Structure):	10	feet
Road Grade:	3.11	%
Left View:	-90	degrees
Right View:	90	degrees

Elevations

Barrier Base Elevation:	1,109.5	feet
Road Elevation:	1,108.0	feet
Noise Source Elevation above Road		
Autos:	0	feet
Med Trucks:	2.3	feet
Hvy Trucks:	8	feet
Pad Elevation:	1,109.5	feet
Observer Heights Above Pad Elevation		
Exterior:	5	feet
First Floor:	5.5	feet
Second Floor:	14	feet

FHWA NOISE MODEL CALCULATIONS

	REMEL	Traffic Flow	Distance	Finite Road	Grade	Barrier Attenuation Exterior	1st Flr	2nd Flr
Autos:	67.36	-1.27	-0.86	0.00	1.00	-8.5	-7.6	0
Med Trucks:	76.31	-18.51	-0.86	0.00	1.00	-8.1	-7.08	0
Hvy Trucks:	81.16	-22.46	-0.86	0.00	1.00	-5.8	-5.1	0

UNMITIGATED NOISE LEVELS (Backyard with topographical attenuation)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.0	62.7	56.6	65.1	65.7
Med Trucks:	57.9	36.7	29.2	37.9	44.1	44.2
Hvy Trucks:	58.8	33.5	30.1	34.7	40.9	41.0
Traffic Noise:	**67.4**	**64.0**	**62.7**	**56.7**	**65.1**	**65.7**

MITIGATED NOISE LEVELS (Backyard with sound wall)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.7	55.6	54.3	48.3	56.7	57.3
Med Trucks:	49.8	28.6	21.1	29.8	36.0	36.1
Hvy Trucks:	53.0	27.7	24.3	28.9	35.1	35.2
Traffic Noise:	**59.5**	**55.6**	**54.3**	**48.4**	**56.8**	**57.4**

MITIGATED NOISE LEVELS (First Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.6	56.5	55.2	49.2	57.6	58.2
Med Trucks:	50.9	29.6	22.1	30.9	37.0	37.1
Hvy Trucks:	53.7	28.4	25.0	29.6	35.8	35.9
Traffic Noise:	**60.4**	**56.5**	**55.2**	**49.3**	**57.7**	**58.3**

MITIGATED NOISE LEVELS (Second Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	64.0	62.7	56.7	65.1	65.7
Med Trucks:	57.8	36.6	29.1	37.8	44.0	44.0
Hvy Trucks:	58.7	33.4	30.0	34.6	40.8	40.9
Traffic Noise:	**67.3**	**64.0**	**62.7**	**56.7**	**65.1**	**65.7**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Road Name: Mt Vernon Avenue | Project Name: Highgrove TTM 37743
Lot Number: 15 | Job Number: 19125

NOISE MODEL INPUTS

Highway Data

Average Daily Traffic:	20,700	vehicles
Peak Hour Volume:	2,070	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Vehicle Mix

	Day	Evening	Night	Daily
Autos:	63.8%	13.1%	15.3%	92.1%
Medium Trucks:	3.5%	0.6%	1.8%	6.0%
Heavy Trucks:	1.1%	0.1%	0.8%	1.9%

Site Data

Barrier Height:	**6**	**feet**
Barrier Type(Wall/Berm):	Wall	
Site Conditions(Hard/Soft):	Hard	
Centerline (C.L.) Dist. to Barrier:	70	feet
C.L. Dist. To Observer (Backyard):	80	feet
Barrier Dist. To Observer (Backyard):	10	feet
C.L. Dist. To Observer (Structure):	75	feet
Barrier Dist. To Observer (Structure):	5	feet
Road Grade:	0.90	%
Left View:	-90	degrees
Right View:	90	degrees

Elevations

Barrier Base Elevation:	1,102.3	feet
Road Elevation:	1,095.5	feet
Noise Source Elevation above Road		
Autos:	0	feet
Med Trucks:	2.3	feet
Hvy Trucks:	8	feet
Pad Elevation:	1,102.3	feet
Observer Heights Above Pad Elevation		
Exterior:	5	feet
First Floor:	5.5	feet
Second Floor:	14	feet

FHWA NOISE MODEL CALCULATIONS

	REMEL	Traffic Flow	Distance	Finite Road	Grade	Barrier Attenuation Exterior	1st Flr	2nd Flr
Autos:	67.36	1.48	-2.05	0.00	0.00	-9.21	-7.75	0
Med Trucks:	76.31	-10.41	-2.05	0.00	0.00	-9.21	-7.75	0
Hvy Trucks:	81.16	-15.30	-2.05	0.00	0.00	-7.5	-6.48	0

UNMITIGATED NOISE LEVELS (Backyard with topographical attenuation)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.6	63.9	63.0	58.9	66.4	66.9
Med Trucks:	63.7	48.4	47.0	46.7	53.4	53.6
Hvy Trucks:	63.8	43.3	39.1	43.2	49.5	49.6
Traffic Noise:	**69.7**	**64.0**	**63.1**	**59.3**	**66.7**	**67.2**

MITIGATED NOISE LEVELS (Backyard with sound wall)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.6	54.8	54.0	49.9	57.4	57.9
Med Trucks:	54.6	39.3	37.9	37.6	44.3	44.5
Hvy Trucks:	56.3	35.8	31.6	35.7	42.0	42.1
Traffic Noise:	**61.1**	**55.0**	**54.1**	**50.3**	**57.7**	**58.2**

MITIGATED NOISE LEVELS (First Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.3	56.6	55.7	51.6	59.1	59.6
Med Trucks:	56.4	41.1	39.7	39.4	46.0	46.3
Hvy Trucks:	57.6	37.1	32.9	37.0	43.3	43.4
Traffic Noise:	**62.7**	**56.7**	**55.8**	**52.0**	**59.4**	**59.9**

MITIGATED NOISE LEVELS (Second Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.0	64.2	63.3	59.3	66.8	67.3
Med Trucks:	64.0	48.7	47.3	47.0	53.7	53.9
Hvy Trucks:	64.0	43.4	39.3	43.3	49.7	49.8
Traffic Noise:	**70.0**	**64.4**	**63.5**	**59.6**	**67.1**	**67.5**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Road Name: Center Street
Lot Number: 36

Project Name: Highgrove TTM 37743
Job Number: 19125

NOISE MODEL INPUTS

Highway Data

Average Daily Traffic:	10,400	vehicles
Peak Hour Volume:	1,040	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	12	feet

Vehicle Mix

	Day	Evening	Night	Daily
Autos:	73.6%	13.6%	10.2%	97.4%
Medium Trucks:	0.9%	0.0%	0.9%	1.8%
Heavy Trucks:	0.4%	0.0%	0.4%	0.7%

Site Data

Barrier Height:	**6**	**feet**
Barrier Type(Wall/Berm):	Wall	
Site Conditions(Hard/Soft):	Hard	
Centerline (C.L.) Dist. to Barrier:	50	feet
C.L. Dist. To Observer (Backyard):	60	feet
Barrier Dist. To Observer (Backyard):	10	feet
C.L. Dist. To Observer (Structure):	60	feet
Barrier Dist. To Observer (Structure):	10	feet
Road Grade:	3.05	%
Left View:	-90	degrees
Right View:	90	degrees

Elevations

Barrier Base Elevation:	1,117.2	feet
Road Elevation:	1,120.0	feet
Noise Source Elevation above Road		
Autos:	0	feet
Med Trucks:	2.3	feet
Hvy Trucks:	8	feet
Pad Elevation:	1,117.2	feet
Observer Heights Above Pad Elevation		
Exterior:	5	feet
First Floor:	5.5	feet
Second Floor:	14	feet

FHWA NOISE MODEL CALCULATIONS

	REMEL	Traffic Flow	Distance	Finite Road	Grade	Barrier Attenuation Exterior	1st Flr	2nd Flr
Autos:	67.36	-1.27	-0.84	0.00	1.00	-6.87	-6	0
Med Trucks:	76.31	-18.51	-0.84	0.00	1.00	-6.32	-5.4	0
Hvy Trucks:	81.16	-22.46	-0.84	0.00	1.00	-4.9	-4.6	0

UNMITIGATED NOISE LEVELS (Backyard with topographical attenuation)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.2	64.1	62.8	56.8	65.2	65.8
Med Trucks:	58.0	36.7	29.2	38.0	44.1	44.2
Hvy Trucks:	58.9	33.5	30.1	34.8	41.0	41.0
Traffic Noise:	**67.5**	**64.1**	**62.8**	**56.9**	**65.3**	**65.9**

MITIGATED NOISE LEVELS (Backyard with sound wall)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.4	57.3	55.9	49.9	58.4	59.0
Med Trucks:	51.6	30.4	22.9	31.6	37.8	37.9
Hvy Trucks:	54.0	28.6	25.2	29.9	36.1	36.1
Traffic Noise:	**61.0**	**57.3**	**55.9**	**50.0**	**58.4**	**59.0**

MITIGATED NOISE LEVELS (First Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.2	58.1	56.8	50.8	59.2	59.8
Med Trucks:	52.6	31.3	23.8	32.6	38.7	38.8
Hvy Trucks:	54.3	28.9	25.5	30.2	36.4	36.4
Traffic Noise:	**61.8**	**58.1**	**56.8**	**50.9**	**59.3**	**59.9**

MITIGATED NOISE LEVELS (Second Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.2	64.0	62.7	56.7	65.1	65.8
Med Trucks:	57.9	36.6	29.1	37.9	44.1	44.1
Hvy Trucks:	58.8	33.4	30.0	34.7	40.9	41.0
Traffic Noise:	**67.4**	**64.1**	**62.7**	**56.8**	**65.2**	**65.8**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Road Name: Mt Vernon Avenue | Project Name: Highgrove TTM 37743
Lot Number: 62 | Job Number: 19125

NOISE MODEL INPUTS

Highway Data

Average Daily Traffic:	20,700	vehicles
Peak Hour Volume:	2,070	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Vehicle Mix

	Day	Evening	Night	Daily
Autos:	63.8%	13.1%	15.3%	92.1%
Medium Trucks:	3.5%	0.6%	1.8%	6.0%
Heavy Trucks:	1.1%	0.1%	0.8%	1.9%

Site Data

Barrier Height:	**6**	**feet**
Barrier Type(Wall/Berm):	Wall	
Site Conditions(Hard/Soft):	Hard	
Centerline (C.L.) Dist. to Barrier:	70	feet
C.L. Dist. To Observer (Backyard):	80	feet
Barrier Dist. To Observer (Backyard):	10	feet
C.L. Dist. To Observer (Structure):	75	feet
Barrier Dist. To Observer (Structure):	5	feet
Road Grade:	1.00	%
Left View:	-90	degrees
Right View:	90	degrees

Elevations

Barrier Base Elevation:	1,102.4	feet
Road Elevation:	1,096.5	feet
Noise Source Elevation above Road		
Autos:	0	feet
Med Trucks:	2.3	feet
Hvy Trucks:	8	feet
Pad Elevation:	1,102.4	feet
Observer Heights Above Pad Elevation		
Exterior:	5	feet
First Floor:	5.5	feet
Second Floor:	14	feet

FHWA NOISE MODEL CALCULATIONS

	REMEL	Traffic Flow	Distance	Finite Road	Grade	Barrier Attenuation Exterior	1st Flr	2nd Flr
Autos:	67.36	1.48	-2.04	0.00	0.00	-9.03	-7.6	0
Med Trucks:	76.31	-10.41	-2.04	0.00	0.00	-9	-7.6	0
Hvy Trucks:	81.16	-15.30	-2.04	0.00	0.00	-7.22	-6.32	0

UNMITIGATED NOISE LEVELS (Backyard with topographical attenuation)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.6	63.9	63.0	58.9	66.4	66.9
Med Trucks:	63.9	48.6	47.2	46.8	53.5	53.8
Hvy Trucks:	63.8	43.3	39.1	43.2	49.5	49.6
Traffic Noise:	**69.8**	**64.0**	**63.2**	**59.3**	**66.7**	**67.2**

MITIGATED NOISE LEVELS (Backyard with sound wall)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.8	55.0	54.2	50.1	57.6	58.1
Med Trucks:	54.9	39.6	38.2	37.8	44.5	44.8
Hvy Trucks:	56.6	36.1	31.9	35.9	42.3	42.4
Traffic Noise:	**61.3**	**55.2**	**54.3**	**50.5**	**57.9**	**58.4**

MITIGATED NOISE LEVELS (First Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.5	56.7	55.9	51.8	59.3	59.8
Med Trucks:	56.5	41.2	39.8	39.5	46.2	46.4
Hvy Trucks:	57.8	37.2	33.1	37.1	43.5	43.6
Traffic Noise:	**62.9**	**56.9**	**56.0**	**52.2**	**59.6**	**60.1**

MITIGATED NOISE LEVELS (Second Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.0	64.2	63.4	59.3	66.8	67.3
Med Trucks:	64.0	48.7	47.3	47.0	53.7	53.9
Hvy Trucks:	64.0	43.5	39.3	43.3	49.7	49.8
Traffic Noise:	**70.0**	**64.4**	**63.5**	**59.6**	**67.1**	**67.6**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Road Name: Mt Vernon Avenue | Project Name: Highgrove TTM 37743
Lot Number: 65 | Job Number: 19125

NOISE MODEL INPUTS

Highway Data

Average Daily Traffic:	20,700	vehicles
Peak Hour Volume:	2,070	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Vehicle Mix

	Day	Evening	Night	Daily
Autos:	63.8%	13.1%	15.3%	92.1%
Medium Trucks:	3.5%	0.6%	1.8%	6.0%
Heavy Trucks:	1.1%	0.1%	0.8%	1.9%

Site Data

Barrier Height:	**6**	**feet**
Barrier Type(Wall/Berm):	Wall	
Site Conditions(Hard/Soft):	Hard	
Centerline (C.L.) Dist. to Barrier:	70	feet
C.L. Dist. To Observer (Backyard):	80	feet
Barrier Dist. To Observer (Backyard):	10	feet
C.L. Dist. To Observer (Structure):	75	feet
Barrier Dist. To Observer (Structure):	5	feet
Road Grade:	1.00	%
Left View:	-90	degrees
Right View:	90	degrees

Elevations

Barrier Base Elevation:	1,103.4	feet
Road Elevation:	1,097.1	feet
Noise Source Elevation above Road		
Autos:	0	feet
Med Trucks:	2.3	feet
Hvy Trucks:	8	feet
Pad Elevation:	1,103.4	feet
Observer Heights Above Pad Elevation		
Exterior:	5	feet
First Floor:	5.5	feet
Second Floor:	14	feet

FHWA NOISE MODEL CALCULATIONS

	REMEL	Traffic Flow	Distance	Finite Road	Grade	Barrier Attenuation Exterior	1st Flr	2nd Flr
Autos:	67.36	1.48	-2.04	0.00	0.00	-9.12	-7.7	0
Med Trucks:	76.31	-10.41	-2.04	0.00	0.00	-9.09	-7.65	0
Hvy Trucks:	81.16	-15.30	-2.04	0.00	0.00	-7.36	-6.4	0

UNMITIGATED NOISE LEVELS (Backyard with topographical attenuation)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.6	63.9	63.0	58.9	66.4	66.9
Med Trucks:	63.8	48.4	47.1	46.7	53.4	53.7
Hvy Trucks:	63.8	43.3	39.1	43.2	49.5	49.6
Traffic Noise:	**69.7**	**64.0**	**63.1**	**59.3**	**66.7**	**67.2**

MITIGATED NOISE LEVELS (Backyard with sound wall)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.7	54.9	54.1	50.0	57.5	58.0
Med Trucks:	54.8	39.5	38.1	37.8	44.4	44.7
Hvy Trucks:	56.5	35.9	31.8	35.8	42.2	42.3
Traffic Noise:	**61.2**	**55.1**	**54.2**	**50.4**	**57.8**	**58.3**

MITIGATED NOISE LEVELS (First Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.4	56.6	55.8	51.7	59.2	59.7
Med Trucks:	56.5	41.2	39.8	39.5	46.1	46.4
Hvy Trucks:	57.7	37.2	33.0	37.0	43.4	43.5
Traffic Noise:	**62.8**	**56.8**	**55.9**	**52.1**	**59.5**	**60.0**

MITIGATED NOISE LEVELS (Second Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.0	64.2	63.4	59.3	66.8	67.3
Med Trucks:	64.0	48.7	47.3	47.0	53.7	53.9
Hvy Trucks:	64.0	43.4	39.3	43.3	49.7	49.8
Traffic Noise:	**70.0**	**64.4**	**63.5**	**59.6**	**67.1**	**67.5**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Road Name: Mt Vernon Avenue | Project Name: Highgrove TTM 37743
Lot Number: 68 | Job Number: 19125

NOISE MODEL INPUTS

Highway Data

Average Daily Traffic:	20,700	vehicles
Peak Hour Volume:	2,070	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Vehicle Mix

	Day	Evening	Night	Daily
Autos:	63.8%	13.1%	15.3%	92.1%
Medium Trucks:	3.5%	0.6%	1.8%	6.0%
Heavy Trucks:	1.1%	0.1%	0.8%	1.9%

Site Data

Barrier Height:	**6**	**feet**
Barrier Type(Wall/Berm):	Wall	
Site Conditions(Hard/Soft):	Hard	
Centerline (C.L.) Dist. to Barrier:	70	feet
C.L. Dist. To Observer (Backyard):	80	feet
Barrier Dist. To Observer (Backyard):	10	feet
C.L. Dist. To Observer (Structure):	75	feet
Barrier Dist. To Observer (Structure):	5	feet
Road Grade:	1.00	%
Left View:	-90	degrees
Right View:	90	degrees

Elevations

Barrier Base Elevation:	1,104.5	feet
Road Elevation:	1,098.5	feet
Noise Source Elevation above Road		
Autos:	0	feet
Med Trucks:	2.3	feet
Hvy Trucks:	8	feet
Pad Elevation:	1,104.5	feet
Observer Heights Above Pad Elevation		
Exterior:	5	feet
First Floor:	5.5	feet
Second Floor:	14	feet

FHWA NOISE MODEL CALCULATIONS

	REMEL	Traffic Flow	Distance	Finite Road	Grade	Barrier Attenuation Exterior	1st Flr	2nd Flr
Autos:	67.36	1.48	-2.04	0.00	0.00	-9.06	-7.65	0
Med Trucks:	76.31	-10.41	-2.04	0.00	0.00	-9.03	-7.6	0
Hvy Trucks:	81.16	-15.30	-2.04	0.00	0.00	-7.22	-6.32	0

UNMITIGATED NOISE LEVELS (Backyard with topographical attenuation)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.6	63.9	63.0	58.9	66.4	66.9
Med Trucks:	63.9	48.6	47.2	46.8	53.5	53.8
Hvy Trucks:	63.8	43.3	39.1	43.2	49.5	49.6
Traffic Noise:	**69.8**	**64.0**	**63.1**	**59.3**	**66.7**	**67.2**

MITIGATED NOISE LEVELS (Backyard with sound wall)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.7	55.0	54.1	50.0	57.5	58.0
Med Trucks:	54.8	39.5	38.1	37.8	44.5	44.7
Hvy Trucks:	56.6	36.1	31.9	35.9	42.3	42.4
Traffic Noise:	**61.3**	**55.2**	**54.3**	**50.4**	**57.9**	**58.4**

MITIGATED NOISE LEVELS (First Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.4	56.7	55.8	51.7	59.2	59.7
Med Trucks:	56.5	41.2	39.8	39.5	46.2	46.4
Hvy Trucks:	57.8	37.2	33.1	37.1	43.5	43.6
Traffic Noise:	**62.9**	**56.9**	**56.0**	**52.1**	**59.6**	**60.0**

MITIGATED NOISE LEVELS (Second Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.0	64.2	63.4	59.3	66.8	67.3
Med Trucks:	64.0	48.7	47.3	47.0	53.7	53.9
Hvy Trucks:	64.0	43.5	39.3	43.3	49.7	49.8
Traffic Noise:	**70.0**	**64.4**	**63.5**	**59.6**	**67.1**	**67.6**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Road Name: Mt Vernon Avenue | Project Name: Highgrove TTM 37743
Lot Number: 71 | Job Number: 19125

NOISE MODEL INPUTS

Highway Data

Average Daily Traffic:	20,700	vehicles
Peak Hour Volume:	2,070	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Vehicle Mix

	Day	Evening	Night	Daily
Autos:	63.8%	13.1%	15.3%	92.1%
Medium Trucks:	3.5%	0.6%	1.8%	6.0%
Heavy Trucks:	1.1%	0.1%	0.8%	1.9%

Site Data

Barrier Height:	**6**	**feet**
Barrier Type(Wall/Berm):	Wall	
Site Conditions(Hard/Soft):	Hard	
Centerline (C.L.) Dist. to Barrier:	70	feet
C.L. Dist. To Observer (Backyard):	80	feet
Barrier Dist. To Observer (Backyard):	10	feet
C.L. Dist. To Observer (Structure):	75	feet
Barrier Dist. To Observer (Structure):	5	feet
Road Grade:	1.00	%
Left View:	-90	degrees
Right View:	90	degrees

Elevations

Barrier Base Elevation:	1,106.0	feet
Road Elevation:	1,100.3	feet
Noise Source Elevation above Road		
Autos:	0	feet
Med Trucks:	2.3	feet
Hvy Trucks:	8	feet
Pad Elevation:	1,106.0	feet
Observer Heights Above Pad Elevation		
Exterior:	5	feet
First Floor:	5.5	feet
Second Floor:	14	feet

FHWA NOISE MODEL CALCULATIONS

	REMEL	Traffic Flow	Distance	Finite Road	Grade	Barrier Attenuation Exterior	1st Flr	2nd Flr
Autos:	67.36	1.48	-2.04	0.00	0.00	-9	-7.6	0
Med Trucks:	76.31	-10.41	-2.04	0.00	0.00	-8.95	-7.55	0
Hvy Trucks:	81.16	-15.30	-2.04	0.00	0.00	-7.15	-6.24	0

UNMITIGATED NOISE LEVELS (Backyard with topographical attenuation)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.6	63.9	63.0	58.9	66.4	66.9
Med Trucks:	63.9	48.6	47.2	46.8	53.5	53.8
Hvy Trucks:	63.8	43.3	39.1	43.2	49.5	49.6
Traffic Noise:	**69.8**	**64.1**	**63.2**	**59.3**	**66.7**	**67.2**

MITIGATED NOISE LEVELS (Backyard with sound wall)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.8	55.1	54.2	50.1	57.6	58.1
Med Trucks:	54.9	39.6	38.2	37.9	44.5	44.8
Hvy Trucks:	56.7	36.1	32.0	36.0	42.4	42.5
Traffic Noise:	**61.4**	**55.2**	**54.3**	**50.5**	**57.9**	**58.4**

MITIGATED NOISE LEVELS (First Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.5	56.7	55.9	51.8	59.3	59.8
Med Trucks:	56.6	41.3	39.9	39.6	46.2	46.5
Hvy Trucks:	57.9	37.3	33.2	37.2	43.6	43.7
Traffic Noise:	**62.9**	**56.9**	**56.0**	**52.2**	**59.6**	**60.1**

MITIGATED NOISE LEVELS (Second Floor)

	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.0	64.2	63.4	59.3	66.8	67.3
Med Trucks:	64.0	48.7	47.3	47.0	53.7	53.9
Hvy Trucks:	64.0	43.5	39.3	43.3	49.7	49.8
Traffic Noise:	**70.0**	**64.4**	**63.5**	**59.6**	**67.1**	**67.6**