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December 9, 2008

Mr. Tim MacLean
Sharrah Dunlap Sawyer, Inc.
6590 Lockheed Drive
Redding, CA 96002

Subject: Highland Park Subdivision Revised Noise Analysis – Response to City Comments

Dear Mr. MacLean:

j.c. brennan & associates, Inc. has received the comment letter dated December 4, 2008 from the City of Redding Development Services Department regarding the above-referenced project.

Response to Comment #2

Recently j.c. brennan & associates, Inc. made the recommendation that a significant portion of sound wall along the Interstate 5 right-of-way be eliminated from the project design. This recommendation was made only after careful study of the project site plan and discussions with the project engineers. The primary reason is that sound walls for freeways are more effective when placed close to the sensitive receptors.

For Lots 1, 67, and 68, placement of the sound wall at the right-of-way was never the most acoustically affective location of the barrier, especially considering the project topography. At the beginning of this project, it was thought that it would be best to keep the barrier at the I-5 right-of way, for the sake of uniformity. However, with the inclusion of the earthen berm along the park site, this concept no longer holds true. Therefore, placement of the noise barriers at Lots 1, 67, and 68 is the most effective means of mitigating the noise impacts for the project.

Appendix A of this letter shows the line-of-site graphics for Locations 4, 5, 6, 7, 8, 9, and 10. The line-of-site graphics were prepared with barrier heights of 6 feet at locations 4 and 5 (Lots 1 and 67-68) and top-of-berm heights for each of the other locations. The graphics show how the proposed berming and minimum wall heights will break line of site to I-5 at first-row sensitive areas of the project. Lots further from I-5 will benefit from intervening building façade shielding, partial views, site topography, and/or grading features such as roadway berming.

Revised Interior Noise Levels:

Standard residential construction (wood siding or stucco, STC-26 windows, door weatherstripping, exterior wall insulation, composition plywood roof, etc.), results in an exterior to interior noise reduction of 25 dB with windows closed and approximately 15 dB with windows open. Generally, second floor facades will be exposed to traffic noise levels approximately 2-3 dB higher than first floor facades. This is due to the lack of excess ground attenuation. Also, second floor receivers would not benefit from shielding due to sound walls.

Table 1 shows the predicted 2nd floor exterior noise exposure for the first row of residential uses adjacent to I-5.

Table 1 Predicted Future Interior Noise Levels Highland Park Residential Project – City of Redding, California					
#	Lot Grouping	Distance to Roadway Centerline	2 nd Floor Façade Noise Level, Ldn	Predicted Interior Noise Level, Ldn ¹	Additional Noise Reduction Needed to Achieve 45 dB Ldn
1	Townhomes Building D Patio	470'	72 dB	47 dB	2 dB
2	Townhomes Building A Patio	225'	77 dB	52 dB	7 dB
3	Townhomes Building B Patio	220'	77 dB	52 dB	7 dB
4	Lot 1	420'	73 dB	48 dB	3 dB
5	Lots 67/68	335'	74 dB	49 dB	4 dB
6	Park	245'	76 dB	51 dB	6 dB
7	Lots 112/113	430'	73 dB	48 dB	3 dB
8	Park	275'	70 dB	45 dB	0 dB
9	Park	275'	76 dB	51 dB	6 dB
10	Lot 131	620'	70 dB	45 dB	0 dB
11	Townhomes Building A Patio	270'	76 dB	51 dB	6 dB
12	Townhomes Building A Patio	270'	76 dB	51 dB	6 dB
13	Townhomes Building A Patio	260'	76 dB	51 dB	6 dB
14	Townhomes Building A Patio	260'	76 dB	51 dB	6 dB
15	Townhomes Building A Patio	260'	76 dB	51 dB	6 dB
16	Townhomes Building A Patio	270'	76 dB	51 dB	6 dB
17	Lots 251-254	550'	71 dB	46 dB	1 dB

¹ Assuming standard construction practices.
Source: j.c. brennan & associates, Inc. 2008.

Based upon the Table 1 data, exterior-to-interior noise level reductions of 26-32 dB would be required to achieve compliance with an interior noise level standard of 45 dB Ldn. In order to achieve these noise level reductions, a detailed analysis of interior noise levels will need to be conducted when building plans are available for the proposed project. The analysis should specify the methods required to achieve an interior noise level not exceeding 45 dB Ldn.


It is anticipated that windows with a sound transmission class (STC) rating of 40-42 may be required to achieve noise level reductions of up to 32 dB in the units most affected by I-5 traffic noise. Additionally, the use of resilient channels or other façade improvements may be required for façades adjacent to I-5.

Also, for multi-family residential units, Title 24 requires that if the interior noise level standard is met by requiring that windows be kept closed, the design for the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment.

If you or the City of Redding staff have any questions, please contact me at (530) 823-0960 or lsaxelby@jcbrennanassoc.com.

Respectfully submitted,

j.c. brennan & associates, Inc.



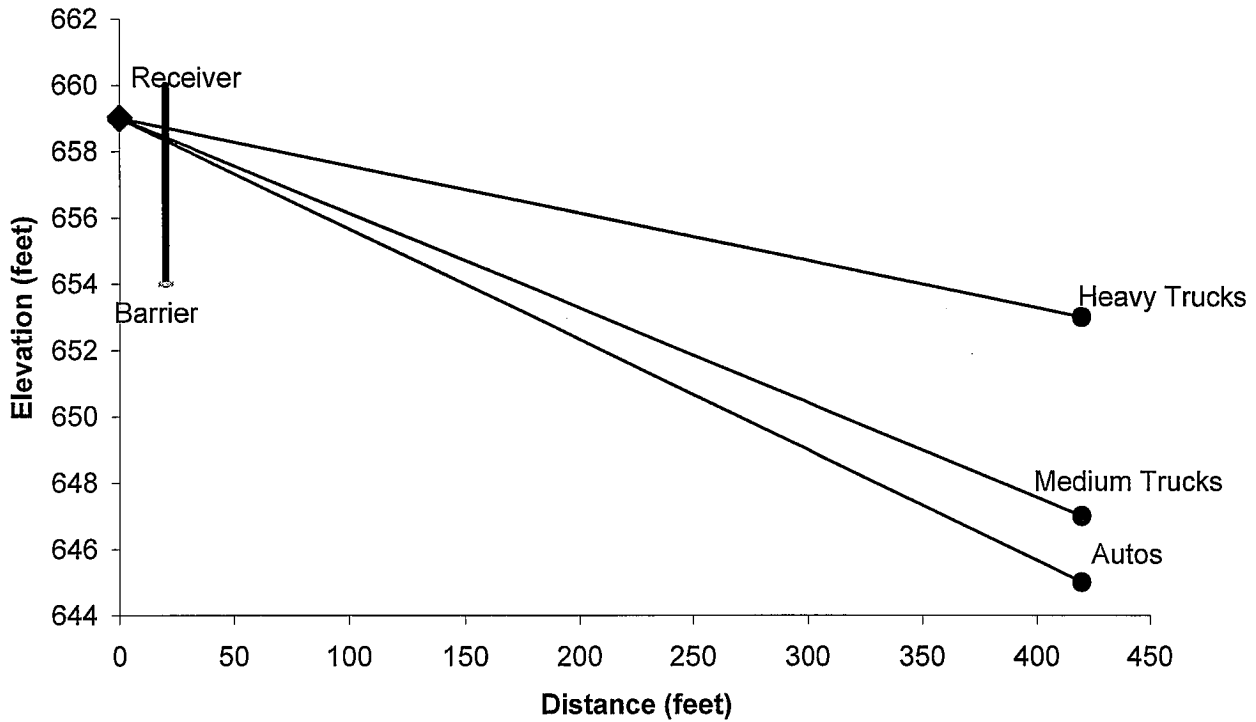
Luke Saxelby, INCE

Senior Consultant

Member: Institute of Noise Control Engineering

**Appendix A
Barrier Insertion Graphic**

Job Number: 2008-214
 Project Name: Highland Park
 Roadway Name: Interstate 5
 Location(s): 4

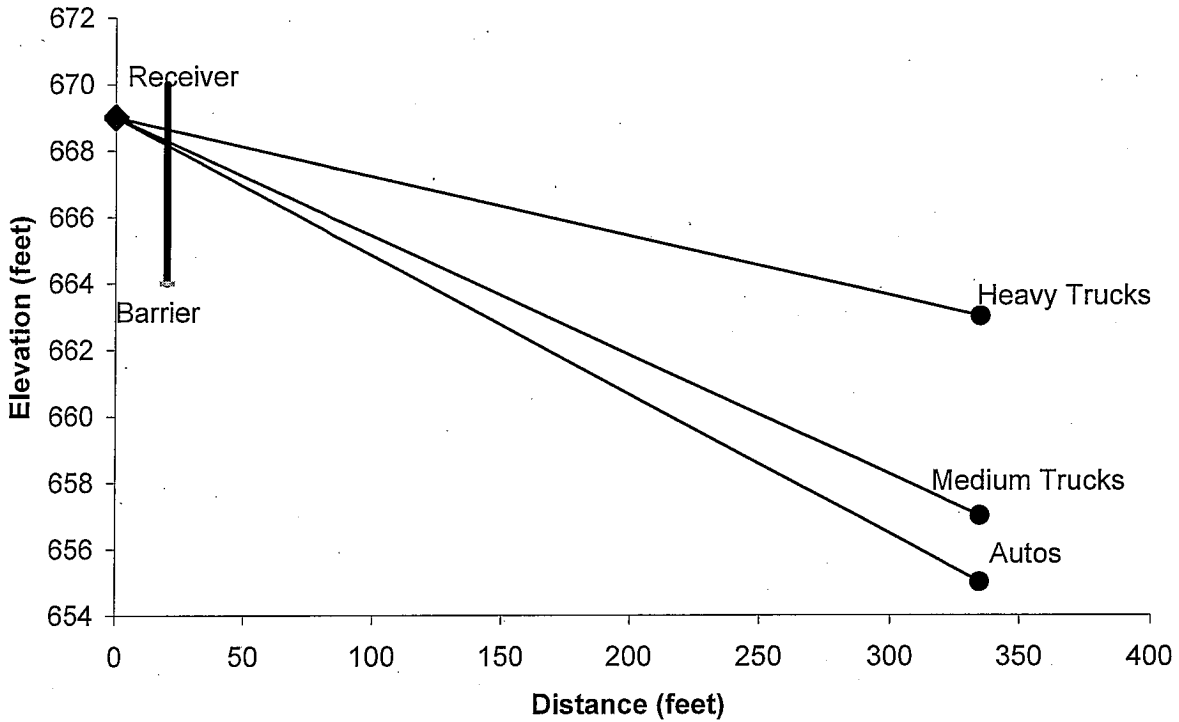


Centerline to Barrier Distance (C ₁):	400
Barrier to Receiver Distance (C ₂):	20
Automobile Elevation:	645
Medium Truck Elevation:	647
Heavy Truck Elevation:	653
Pad/Ground Elevation at Receiver:	654
Receiver Elevation ¹ :	659
Base of Barrier Elevation:	654
Barrier Height ² :	6

Notes: 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

**Appendix A
Barrier Insertion Graphic**

Job Number: 2008-214
 Project Name: Highland Park
 Roadway Name: Interstate 5
 Location(s): 5

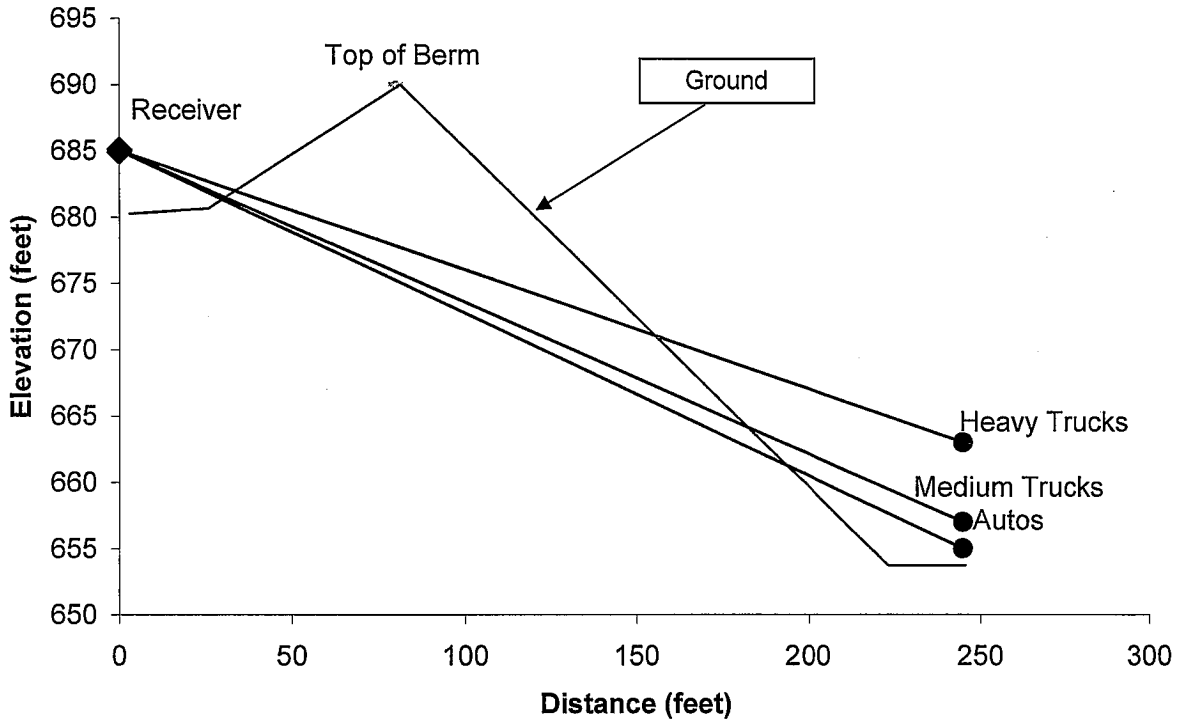


Centerline to Barrier Distance (C_1):	315
Barrier to Receiver Distance (C_2):	20
Automobile Elevation:	655
Medium Truck Elevation:	657
Heavy Truck Elevation:	663
Pad/Ground Elevation at Receiver:	664
Receiver Elevation ¹ :	669
Base of Barrier Elevation:	664
Barrier Height ² :	6

Notes: 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

**Appendix A
Barrier Insertion Graphic**

Job Number: 2008-214
 Project Name: Highland Park
 Roadway Name: Interstate 5
 Location(s): 6

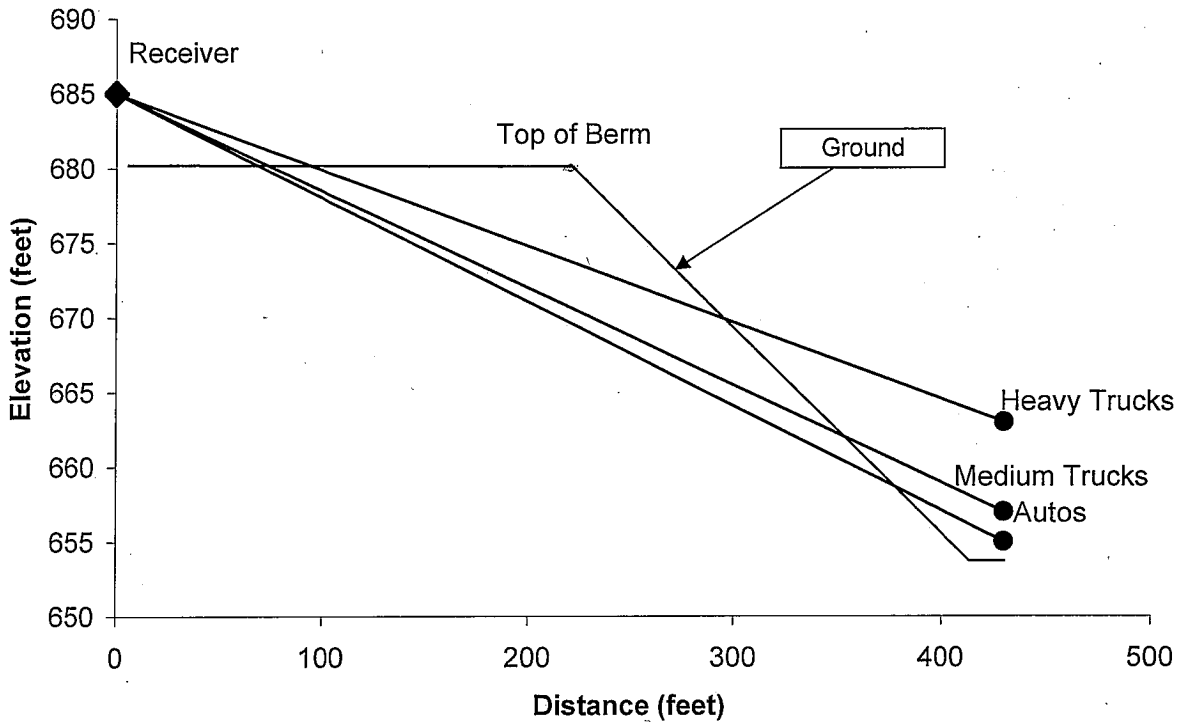


Centerline to Barrier Distance (C ₁):	165
Barrier to Receiver Distance (C ₂):	80
Automobile Elevation:	655
Medium Truck Elevation:	657
Heavy Truck Elevation:	663
Pad/Ground Elevation at Receiver:	680
Receiver Elevation ¹ :	685
Base of Barrier Elevation:	690
Barrier Height ² :	0

Notes: 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

**Appendix A
Barrier Insertion Graphic**

Job Number: 2008-214
 Project Name: Highland Park
 Roadway Name: Interstate 5
 Location(s): 7

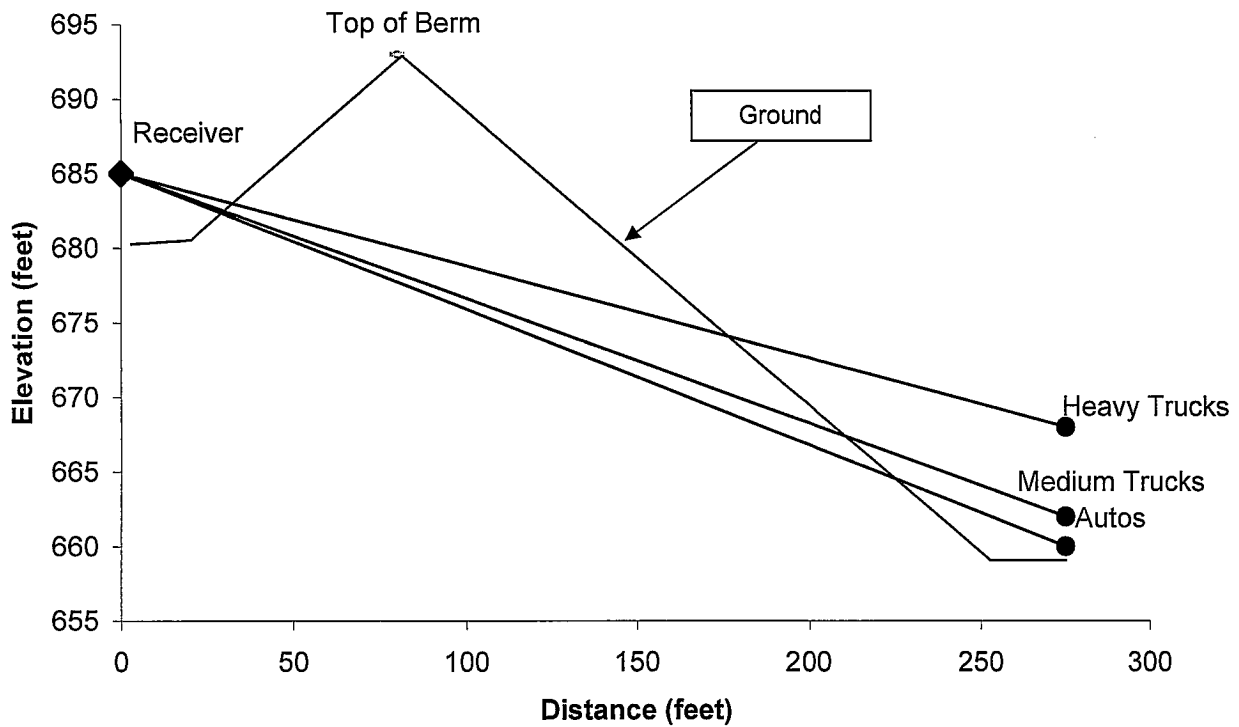


Centerline to Barrier Distance (C_1):	210
Barrier to Receiver Distance (C_2):	220
Automobile Elevation:	655
Medium Truck Elevation:	657
Heavy Truck Elevation:	663
Pad/Ground Elevation at Receiver:	680
Receiver Elevation ¹ :	685
Base of Barrier Elevation:	680
Barrier Height ² :	0

Notes: 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

**Appendix A
Barrier Insertion Graphic**

Job Number: 2008-214
 Project Name: Highland Park
 Roadway Name: Interstate 5
 Location(s): 8

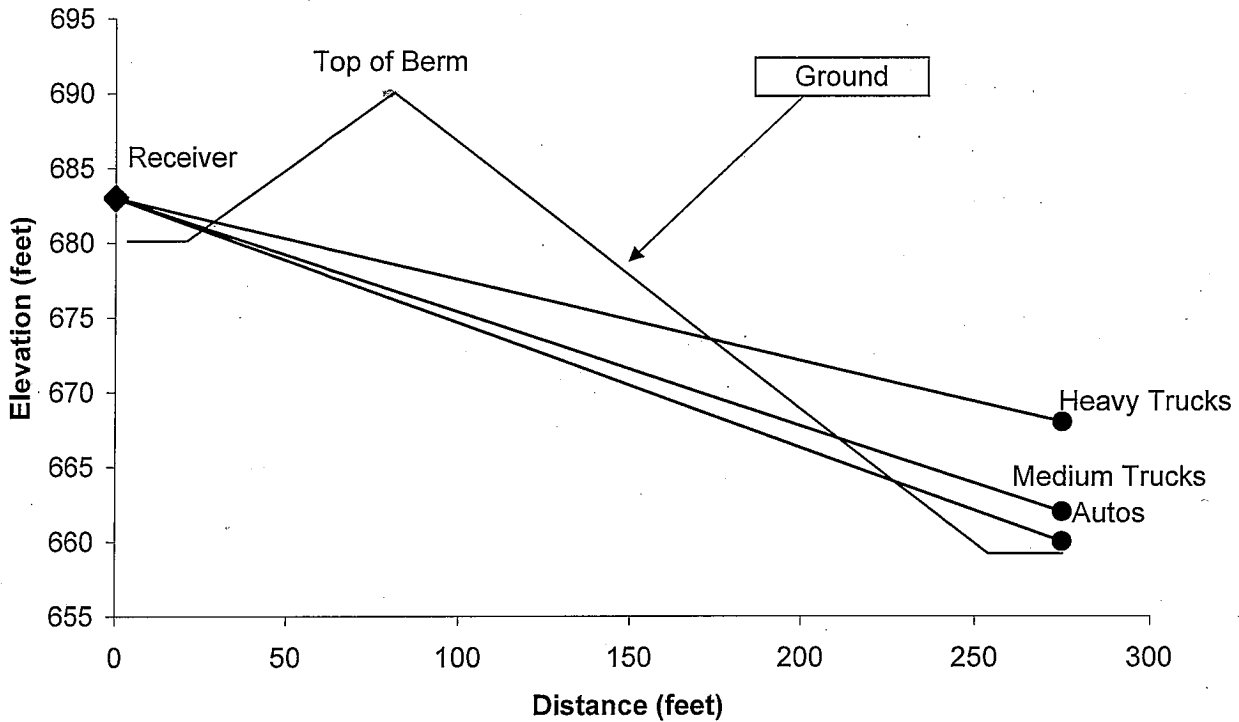


Centerline to Barrier Distance (C ₁):	195
Barrier to Receiver Distance (C ₂):	80
Automobile Elevation:	660
Medium Truck Elevation:	662
Heavy Truck Elevation:	668
Pad/Ground Elevation at Receiver:	680
Receiver Elevation ¹ :	685
Base of Barrier Elevation:	693
Barrier Height ² :	0

Notes: 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

**Appendix A
Barrier Insertion Graphic**

Job Number: 2008-214
 Project Name: Highland Park
 Roadway Name: Interstate 5
 Location(s): 9

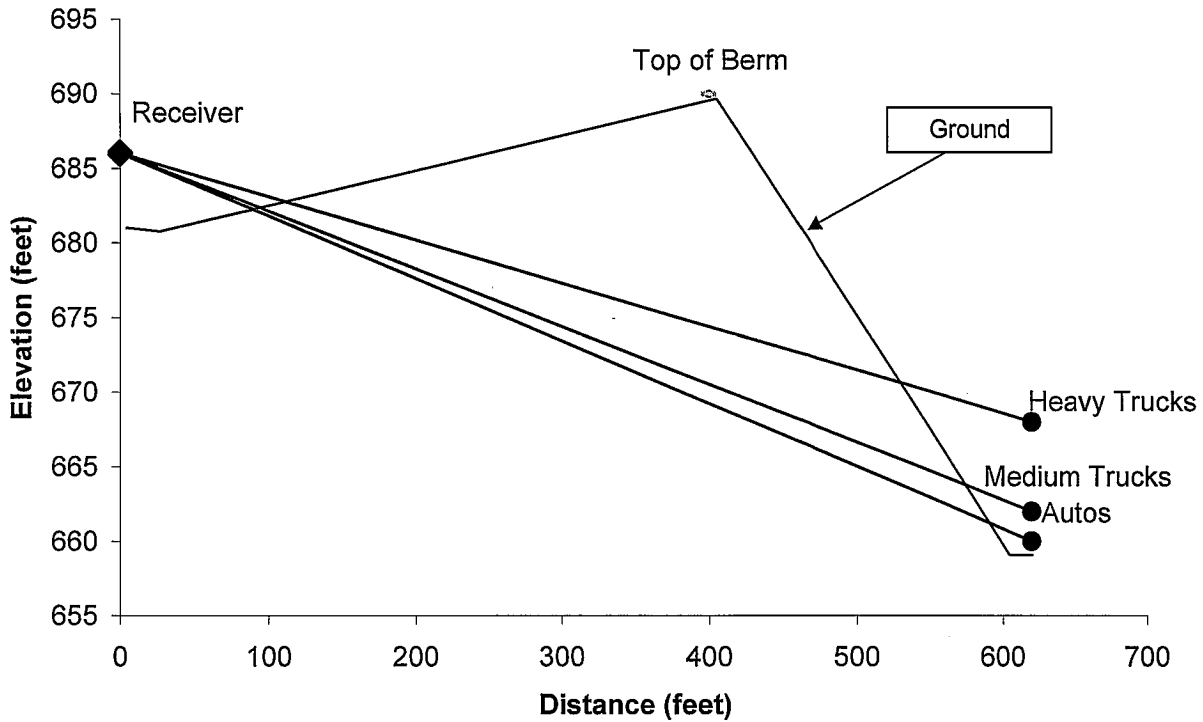


Centerline to Barrier Distance (C_1):	195
Barrier to Receiver Distance (C_2):	80
Automobile Elevation:	660
Medium Truck Elevation:	662
Heavy Truck Elevation:	668
Pad/Ground Elevation at Receiver:	678
Receiver Elevation ¹ :	683
Base of Barrier Elevation:	690
Barrier Height ² :	0

Notes: 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

**Appendix A
Barrier Insertion Graphic**

Job Number: 2008-214
 Project Name: Highland Park
 Roadway Name: Interstate 5
 Location(s): 10



Centerline to Barrier Distance (C_1):	220
Barrier to Receiver Distance (C_2):	400
Automobile Elevation:	660
Medium Truck Elevation:	662
Heavy Truck Elevation:	668
Pad/Ground Elevation at Receiver:	681
Receiver Elevation ¹ :	686
Base of Barrier Elevation:	690
Barrier Height ² :	0

Notes: 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)