



September 15, 2020

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Re: Environmental Noise Survey

**Elan Keller**

Keller, Texas

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## TECHNICAL MEMORANDUM

This Technical Memorandum addresses the work performed to date by SLR International Corporation (SLR) for Greystar at the site of Elan Keller in Keller, Texas. The results of the environmental noise survey conducted at this site are presented in this Technical Memorandum along with an analysis of glazing acoustical performance requirements.

### ENVIRONMENTAL NOISE STUDY

#### General

Sound level measurements were taken at the project site over a 48-hour period starting on August 30, 2020 by Jeffrey Bregar of SLR. The purpose of the measurements was to document train noise, traffic noise, and other ambient noise around the project site.

#### Rail Activity Near Site

The Elan Keller project site is located off North Main Street / Denton Highway, between Ridge Point Parkway and Mt. Gilead Road. A freight rail line runs parallel with North Main Street / Denton Highway and has crossing located on the North and South ends of the site where the rail line crosses Ridge Point Parkway and Mt. Gilead Road. Data collected by the Department of Transportation (DOT) and the Federal Railroad Administration (FRA) shows that both the Ridge Point Parkway (Keller Haslet Rd) and Mt. Gilead Road (Timberland Blvd) crossings average between 20 to 24 trains pass-by events within a 24-hour period with trains passing by the crossing at speeds between 25 and 60 mile per hour. The crossing inventory form for the Ridge Point Parkway (Keller Haslet Rd) crossing shows that the crossing is a 24-hour quiet zone while the Mt. Gilead Road (Timberland Blvd) crossings is not a quiet zone. U.S. DOT Crossing Inventory Forms for both crossings are attached.

#### Measurement Locations

Long-term sound level measurements were taken at three locations around the project site. The first monitor was placed on the North fence line of the property, roughly 40 feet South of Ridge Point Parkway and 190 feet East of North Main Street / Denton Highway and the rail line. The second and third monitors were placed along the West fence line of the property, roughly 730 and 1,350 feet South of Ridge Point Parkway and 10 and 50 feet East of North Main Street / Denton Highway and the rail line respectively. An aerial photo (**Figure 1**) showing the project site and the monitor locations is attached.



Measurement Instrumentation

Three Larson Davis Model 824 Type 1 sound level meters were used (serial numbers A0976, A3253, and A3269). The meters recorded 1/3-octave band and full-octave band sound levels as well as statistical parameters. The meters collected levels in terms of ten-second sound level averages and recorded statistical parameters on a fifteen-minute basis. The meters hold factory calibration certification traceable to NIST standards. The meters were field calibrated before and after the measurement period using a Brüel & Kjær Type 4230 94 dB 1000 Hz Sound Level calibrator (serial number 523033). Microphone windscreens were used for all measurements.

Weather

The temperature ranged from approximately 70 to 99°F during the measurement survey. The skies were partly cloudy with wind speed ranging from 7 to 18 mph from primarily the south and east. Relative humidity ranged from approximately 67 to 75% with dry ground conditions at the site.

**MEASUREMENT RESULTS**

Day-Night Equivalent Sound Level ( $L_{dn}$ )

The ten-second sound level averages measured at each position were used to calculate the daytime average level ( $L_d$ ), the nighttime average level ( $L_n$ ), and the day-night equivalent sound level ( $L_{dn}$ ) for each measurement location. The  $L_{dn}$  is an average of sound levels over a 24-hour period where for the hours between 10:00 p.m. and 7:00 a.m., ten decibels are added to the measured levels. The  $L_{dn}$  may be thought of as a 24-hour time average with a nighttime penalty of 10 dB(A) added to account for the increased sensitivity to noise of an average listener during the evening and night. Results from this survey are as follows:

Measurement Location	Description	Daytime Average ( $L_d$ )	Nighttime Average ( $L_n$ )	Day-Night Equivalent Level ( $L_{dn}$ )
#1	40 feet South of Ridge Point Parkway and 190 feet East of North Main Street / Denton Highway and the rail line	61.5	59.4	<b>66.2</b>
#2	730 feet South of Ridge Point Parkway and 10 feet East of North Main Street / Denton Highway and the rail line	72.5	69.0	<b>76.1</b>
#3	1,350 feet South of Ridge Point Parkway and 50 feet East of North Main Street / Denton Highway and the rail line	68.7	65.7	<b>72.7</b>

The attached **Graphs 1 through 3** show the ten-second average A-weighted sound levels during the measurement period for the three monitor locations. All levels are A-weighted, or dB(A). The bottom portions of the graphs show the frequency information from the monitors which allows us to help determine noise sources. Levels recorded on all three monitors were primarily dominated by local traffic and train events.

### Train Pass-By Events

A total of 38 train pass-by events occurred during the measurement period. Noises caused by passing trains are inconsistent and can differ in both frequency and overall sound level from one train to another due to numerous factors. To help determine the loudest sound levels experienced during a train pass-by event, the  $L_1$  statistical noise level parameter was used. The  $L_1$  describes the sound level that was exceeded 1% of the time and was recorded for every 15-minute interval during the measurement period. The  $L_1$  sound levels for each 15-minute interval affected by train pass-by events were averaged together to determine the average loudest sound level experienced during a train pass-by event. Results from this analysis are as follows:

Measurement Location	Average Loudest Sound Level during Train Pass-by Event $L_1$ (dBA)
#1	74.6
#2	81.9
#3	81.0

## EXTERIOR CONSTRUCTION PRELIMINARY RECOMMENDATIONS

### Criteria

There are no known building code requirements or goals relating to maximum interior sound levels applicable to this development. The U.S. Department of Housing and Urban Development (HUD) guidelines<sup>1</sup> are based on a goal of a 45 dB(A) day-night average sound level ( $L_{dn}$ ) inside the living unit and is an appropriate criterion level for this project.

However, due to the project site's location in proximity to the rail line, train pass-by events cause a temporary but significant increase to the noise level in the surrounding area. These noise levels are well above the measured  $L_{dn}$  and may be an annoyance to those living in units nearest the rail line.

To mitigate these disturbances, a criterion level of 55 dB(A)  $L_1$  collected over a 15-minute period is recommended for inside the living units during train pass-by events.

### Modeling Results

A computer based model was created to help determine the noise impact on the proposed apartment complex. Incorporating the architectural site plan, the model was developed using Cadna/A, version 2020 MR1 (32-bit) (build 177.5010), a commercial noise modeling package developed by DataKustik GmbH. The software takes into account spreading losses, ground and atmospheric effects, shielding from barriers and buildings, and reflections from surfaces. The software is based on published engineering standards. The ISO 9613<sup>2</sup> standard was used for air absorption and other noise propagation calculations. The model was "calibrated" utilizing the sound level measurements taken on the project site. Attached to this document are **Figures 2-9** which show the exterior sound levels on the building façades as calculated by the computer model. Elevation drawings for buildings 1 and 4 were not available at the time of this report. For clarity within the figures, façade images from buildings 2 and 3 were placed on buildings 1 and 4.

<sup>1</sup> 24 CFR Section 51.102 (HUD).

<sup>2</sup> ISO 9613, "Acoustics – Attenuation of sound during propagation outdoors," 1996.



The data from our measurement survey and analysis was used in calculating the expected interior noise levels within the proposed apartment complex. Typical living room and bedroom sizes, likely interior absorption characteristics, and areas of the façade elements were collected from the drawing set, dated August 7, 2020, and used in our calculations. Calculation results for differing window glazing are shown in **Table 1** below. Per client request, only three window glazing selections were chosen for modeling; A standard construction STC 28 / OITC 23 window, an upgraded STC 33 / OITC 29 window, and an upgraded STC 35 / OITC 30 window.

**Table 1: Expected Interior L<sub>1</sub> with Scheduled Windows at Expected Exterior Sound Levels**

Exterior Sound Level (dBA)	Expected L1 (dBA) inside Bedroom with STC 28 / OITC 23 Windows	Expected L1 (dBA) inside Bedroom with STC 33 / OITC 29 Windows	Expected L1 (dBA) inside Bedroom with STC 35 / OITC 30 Windows
82	61.7	56.1	54.3
80	59.4	53.9	52.1
78	58.2	52.6	50.8
76	55.8	50.2	48.4
74	54.1	48.5	46.7
72	53.5	48.0	46.0
70	50.0	44.6	42.6

Window Recommendations

As shown in **Table 1**, the calculated interior L<sub>1</sub> in typical units within each building during train pass-by events will not meet the 55 dB(A) L<sub>1</sub> criterion with STC 28 / OITC 23 windows when the exterior sound level is greater than 74 dB(A). Therefore, it is recommended that:

1. Operable windows rated at STC/OITC 28/23, for example 1/8" annealed - 1/2" AS - 1/8" annealed, are recommended for:
  - a. Living rooms and Bedrooms in all units on all façades which experience 74 dB(A) or less during a train pass-by event
  - b. All patio doors in the living rooms of all units that fall under this category must also be rated at STC/OITC 28/23 or greater.
2. Operable windows rated at STC/OITC 33/29, for example 1/4" annealed – 3/4" AS - 1/8" annealed, are recommended for:
  - a. Living rooms and Bedrooms in all units on all façades which experience greater than 74 dB(A) but less than 80 dB(A) during a train pass-by event
  - b. All patio doors in the living rooms of all units that fall under this category must also be rated at STC/OITC 33/29 or greater.

3. Operable windows rated at STC/OITC 35/30, for example 3/16" laminated annealed - 3/8" AS - 1/8" double strength, are recommended for:
  - a. Living rooms and Bedrooms in all units on all façades which experience greater than 80 dB(A) during a train pass-by event
  - b. All patio doors in the living rooms of all units that fall under this category must also be rated at STC/OITC 35/30 or greater.
4. Operable windows rated at STC/OITC 35/32, for example 1/4" laminated - 11/16" AS – 3/16", are recommended for all Unit Type C1 and C1A corner bedrooms.

**Figures 10 through 13** attached show the locations of each window glazing recommendation necessary to meet the project criterion.

#### Exterior Wall STC/OITC

Based upon the email from Trevor Meeks, the exterior wall assembly consists of (interior to exterior):

- 1 Layer of 5/8" F.C. gypsum board
- 2x4 or 2x6 studs with full thick insulation (R-19 or R-20)
- WRB over typical exterior sheathing
- Either exterior brick, stucco, or siding depending on location

**Graphs 4 and 5** attached show comparisons between exterior wall constructions relative to their STC/OITC performance. **Graph 4** shows the relative acoustical performance for the exterior wall assembly noted above. The sound transmission loss at lower frequencies for exterior walls performs worse than the recommended window.

To improve the acoustic performance, we recommend:

- Resilient channel on exterior wall assemblies between the stud and interior gypsum board

**This upgrade is only needed in the exterior walls that have STC/OITC 35/30 windows.**

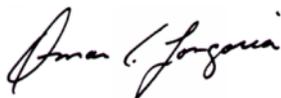
**Graph 5** shows the improvement in the exterior wall sound transmission loss with the addition of the resilient channel.

## CONCLUSION

Sound level measurements were taken over a 48-hour period at the site of Elan Keller in Keller, Texas. The day-night average sound levels were determined to be 66.2, 76.1, and 72.7 dB(A)  $L_{dn}$  at each respective measurement location. Using the  $L_1$  statistical parameter, the average loudest sound levels during a train pass-by event were determined to be 74.6, 81.9, and 81.0 dB(A) at each respective measurement location. The train pass-by interior  $L_1$  criterion is met in all units following the recommendations given herein. **Figures 10 through 13** attached show the location of the window glazing recommendations. Resilient channel is also recommended for all exterior wall assemblies between the stud and interior gypsum board. Graphs comparing the exterior wall constructions relative to their STC/OITC performance are shown in the attached **Graphs 4 and 5**.

This concludes this Technical Memorandum. Please call if you have any questions or comments.

Sincerely,  
**SLR International Corporation**



Omar C. Longoria, P.E.  
Principal Engineer



Jeffrey Bregar  
Staff Consultant

OCL/jcb

SLR DRAFT Technical Memo - Greystar - Elan Keller - Environmental Noise Survey 09-15-2020 v3.docx

**Attachments: Figures 1-13, Graphs 1-5, Attachments 1-2**

# Figure 1: Measurement Locations



**Legend**

- Measurement Location
- ▭ Project Site

Measurement Location 1

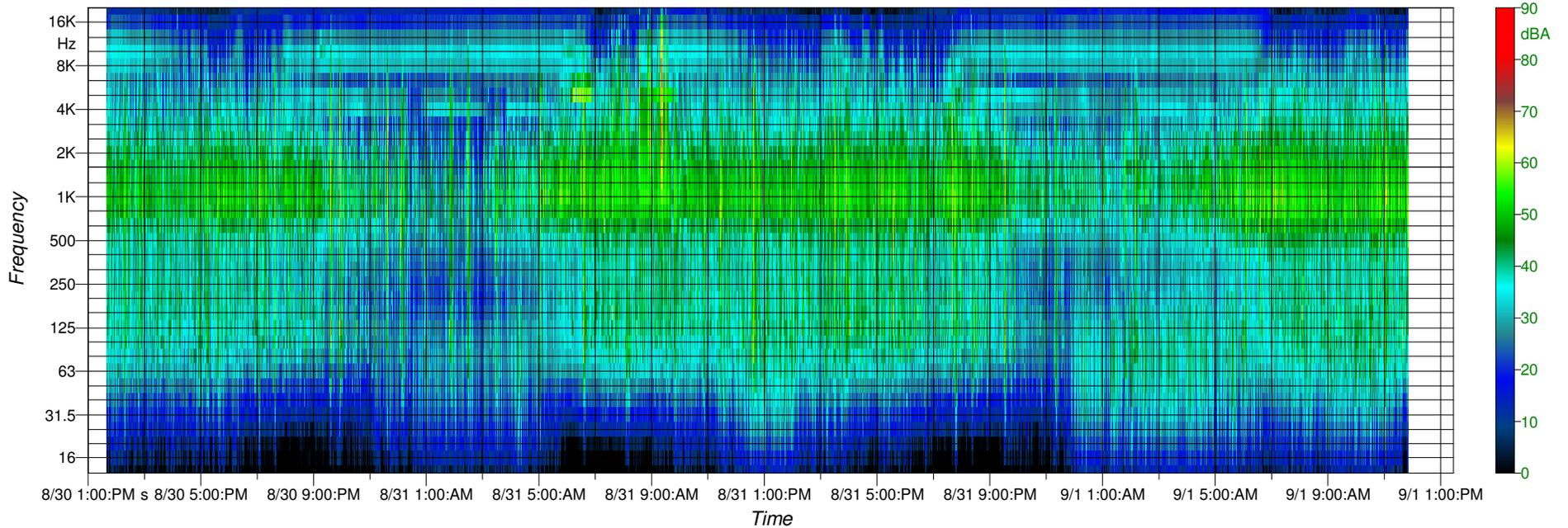
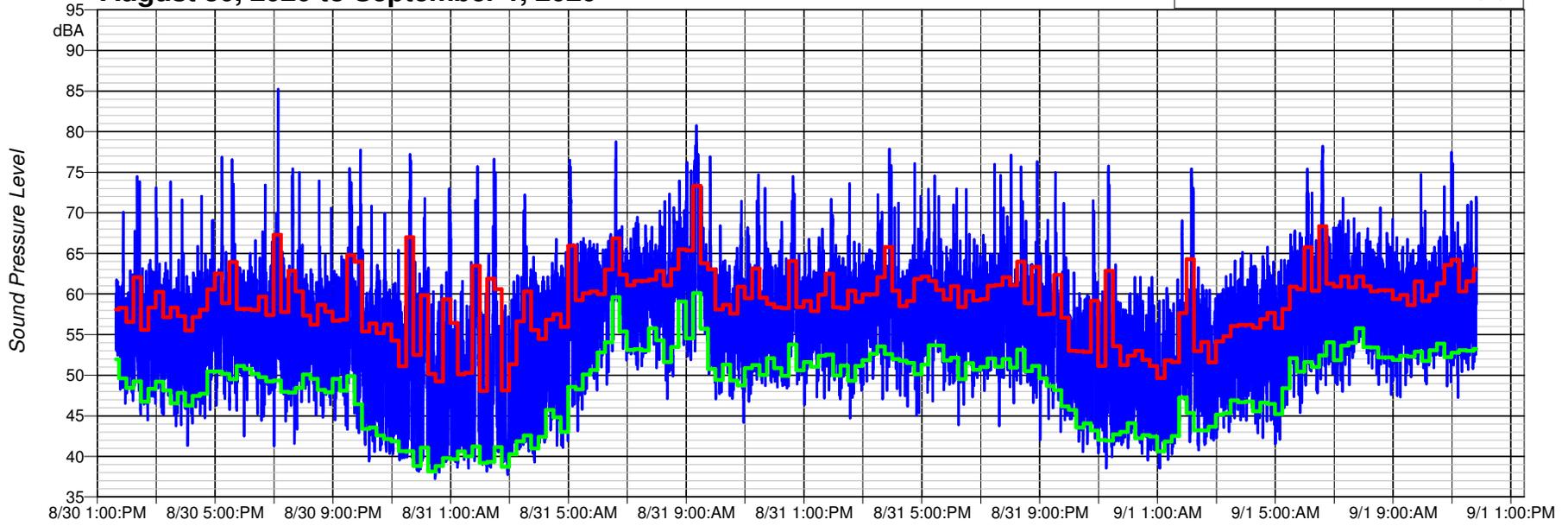
Measurement Location 2

Measurement Location 3

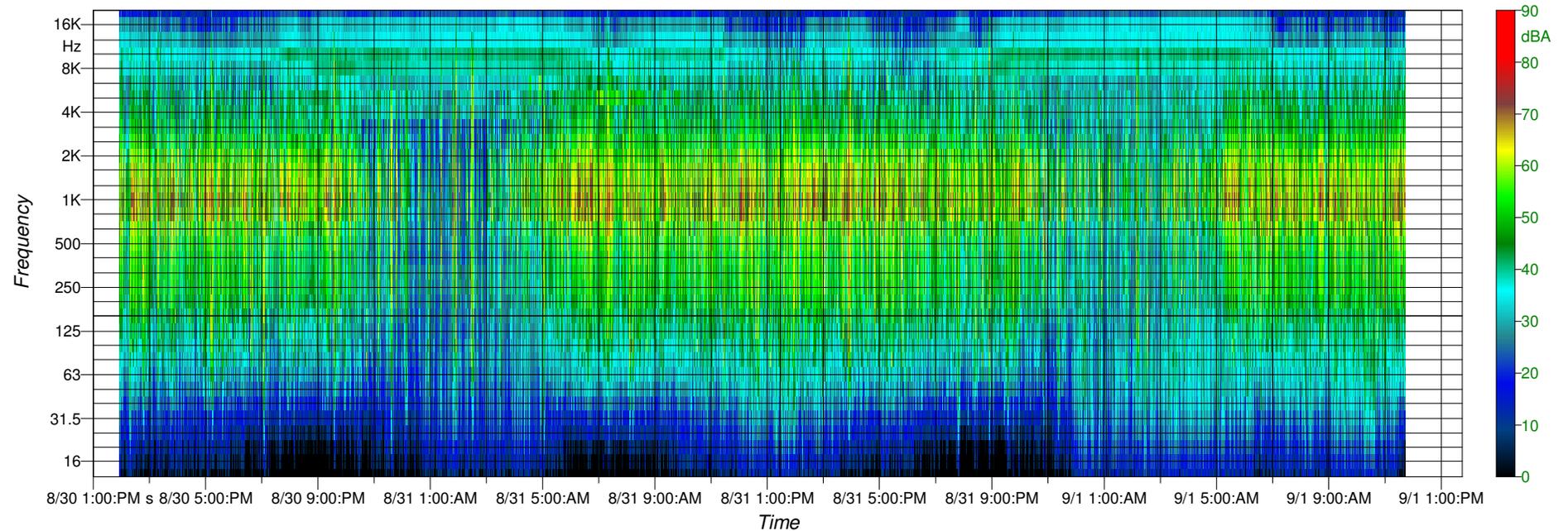
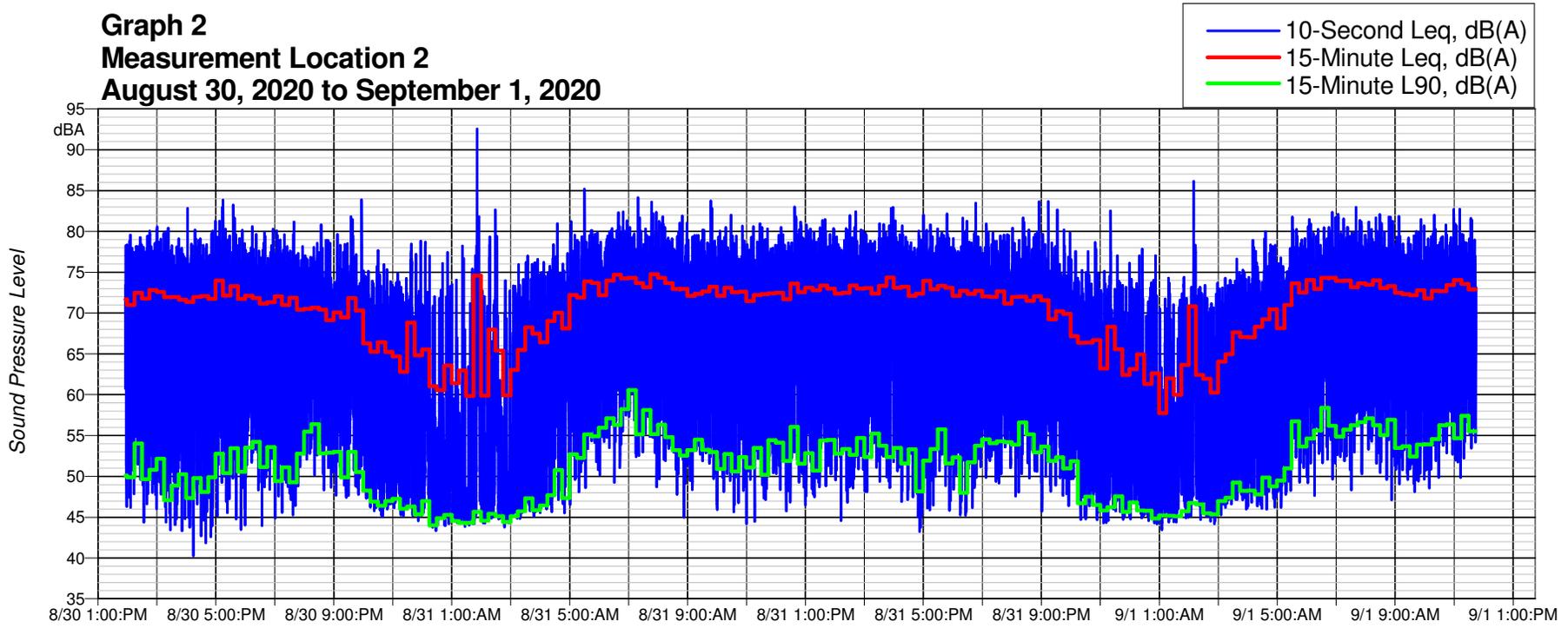


**Graph 1**  
**Measurement Location 1**  
**August 30, 2020 to September 1, 2020**

— 10-Second Leq, dB(A)  
— 15-Minute Leq, dB(A)  
— 15-Minute L90, dB(A)

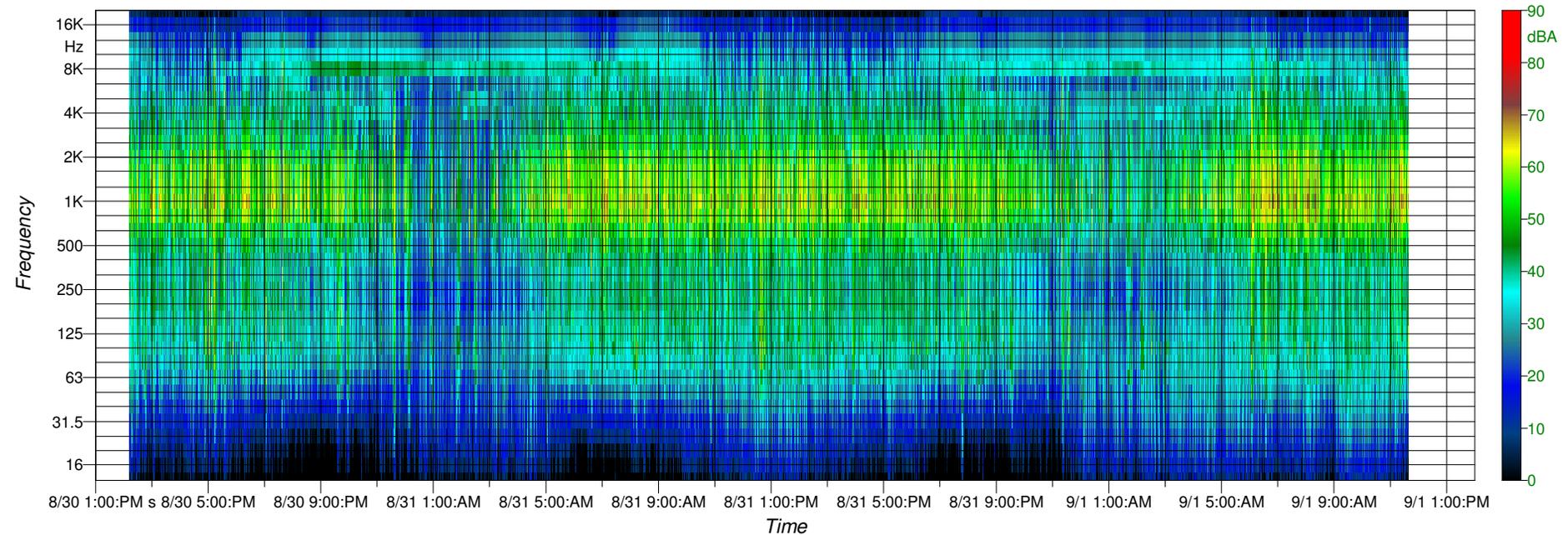
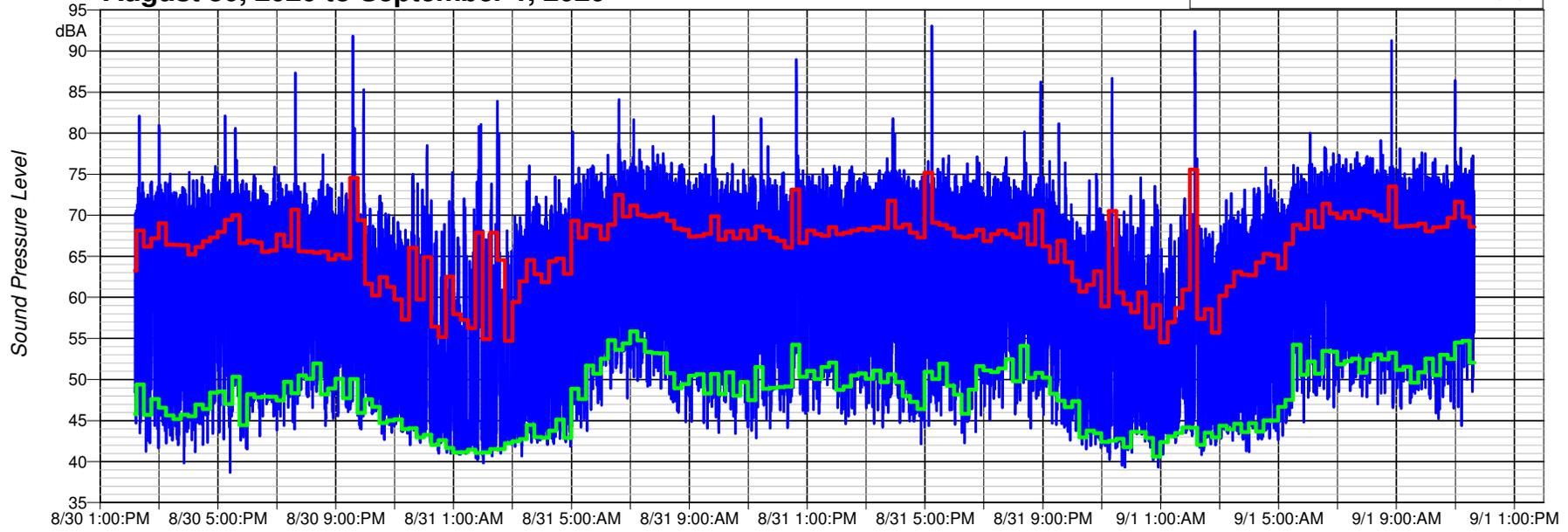


**Graph 2**  
**Measurement Location 2**  
**August 30, 2020 to September 1, 2020**

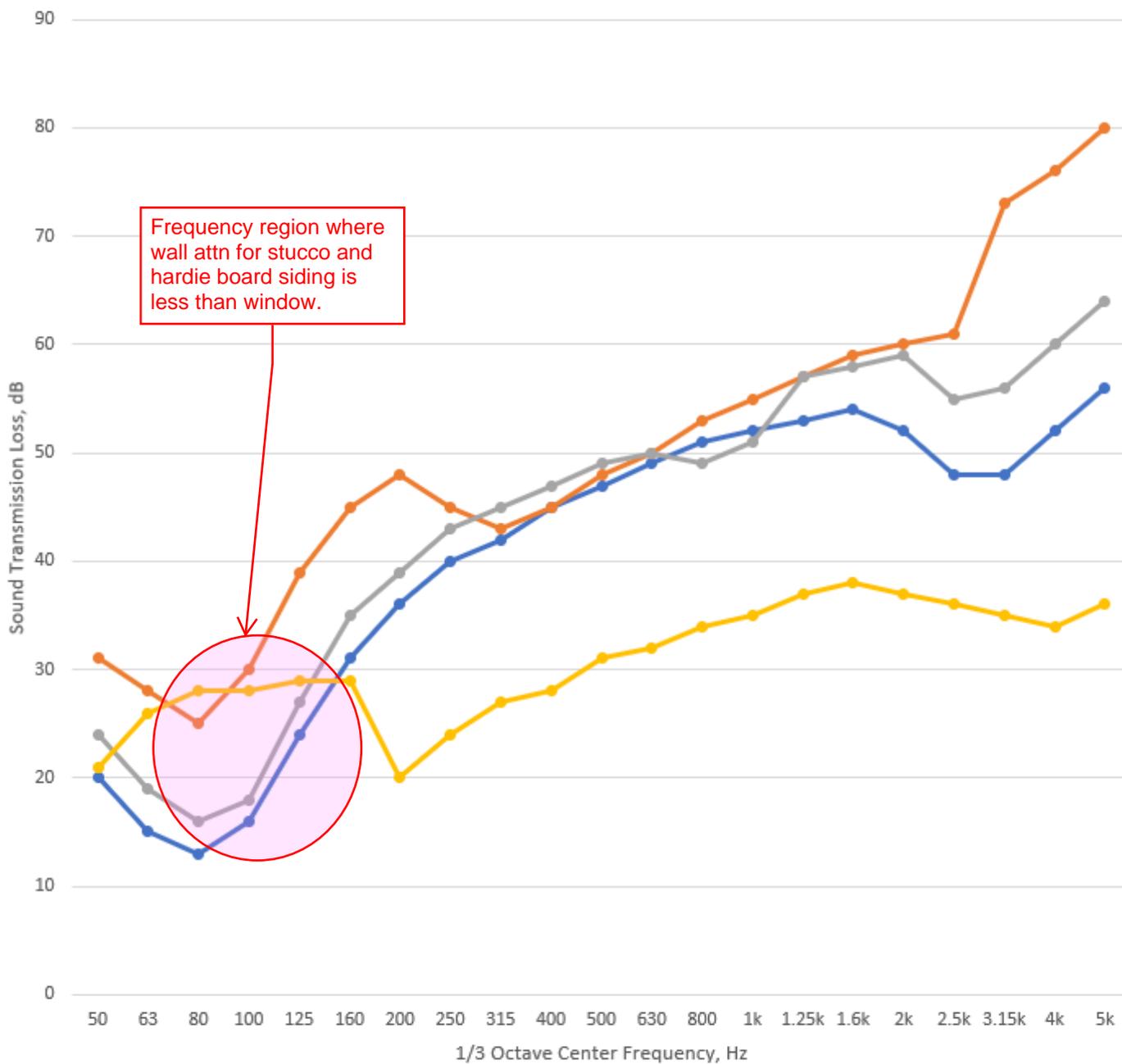


**Graph 3**  
**Measurement Location 3**  
**August 30, 2020 to September 1, 2020**

- 10-Second Leq, dB(A)
- 15-Minute Leq, dB(A)
- 15-Minute L90, dB(A)

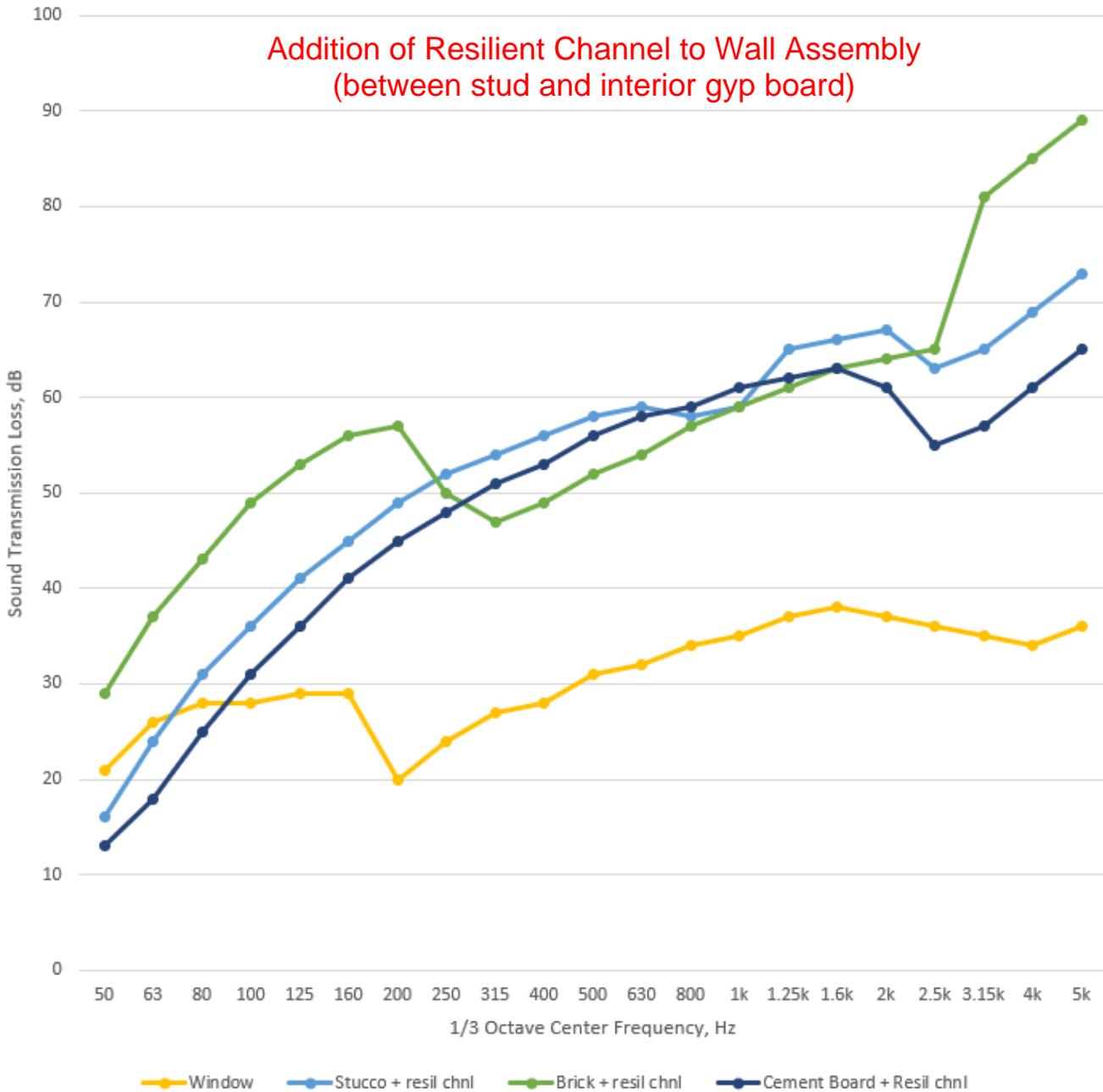


Graph 4  
 Sound Transmission Loss  
 Comparison of Different Ext Wall Assemblies



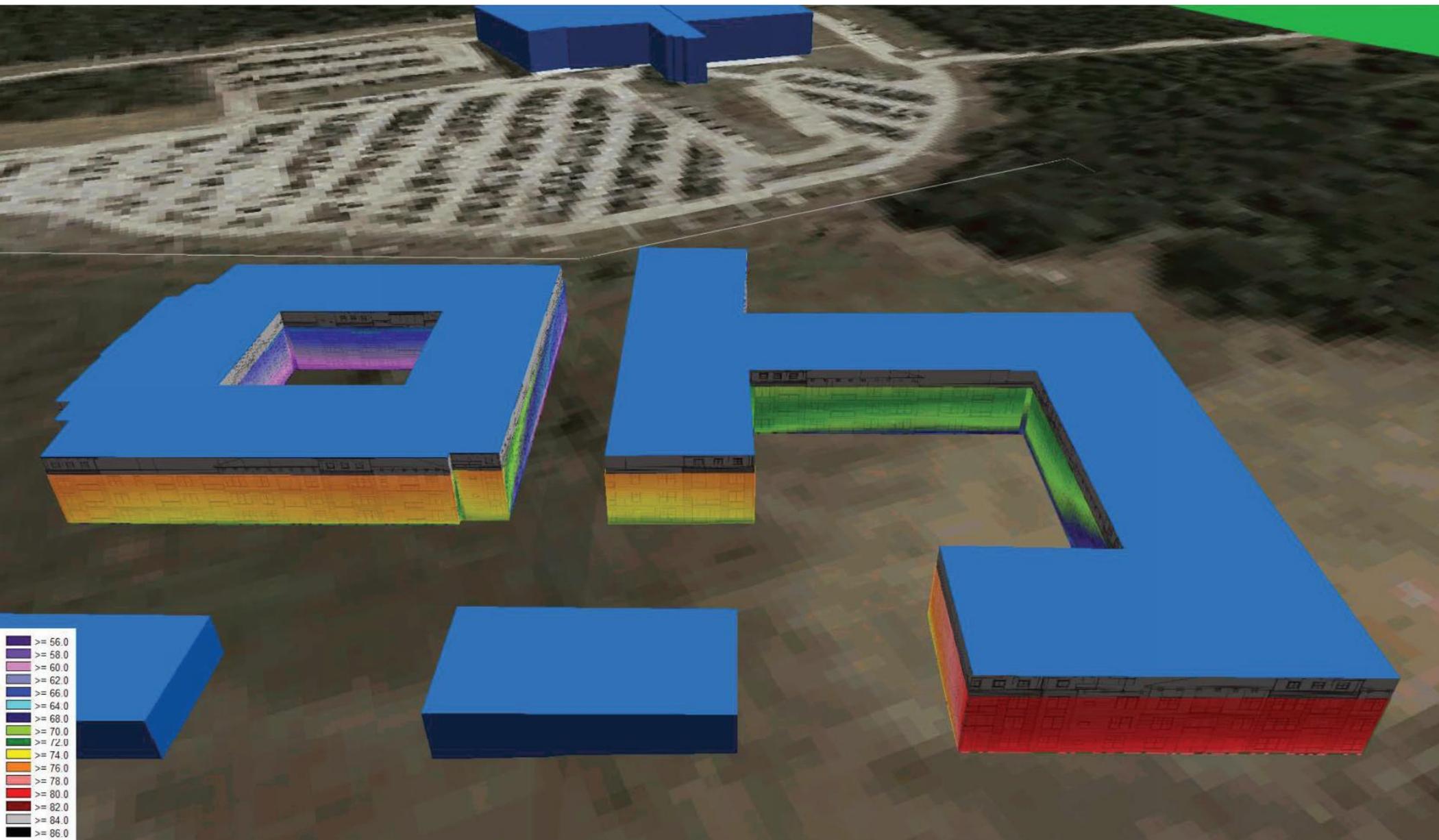
	Cement Board	Brick	Stucco	Window
<b>STC</b>	48	53	51	33
<b>OITC</b>	29	42	32	29

Graph 5  
 Sound Transmission Loss  
 Comparison of Different Ext Wall Assemblies



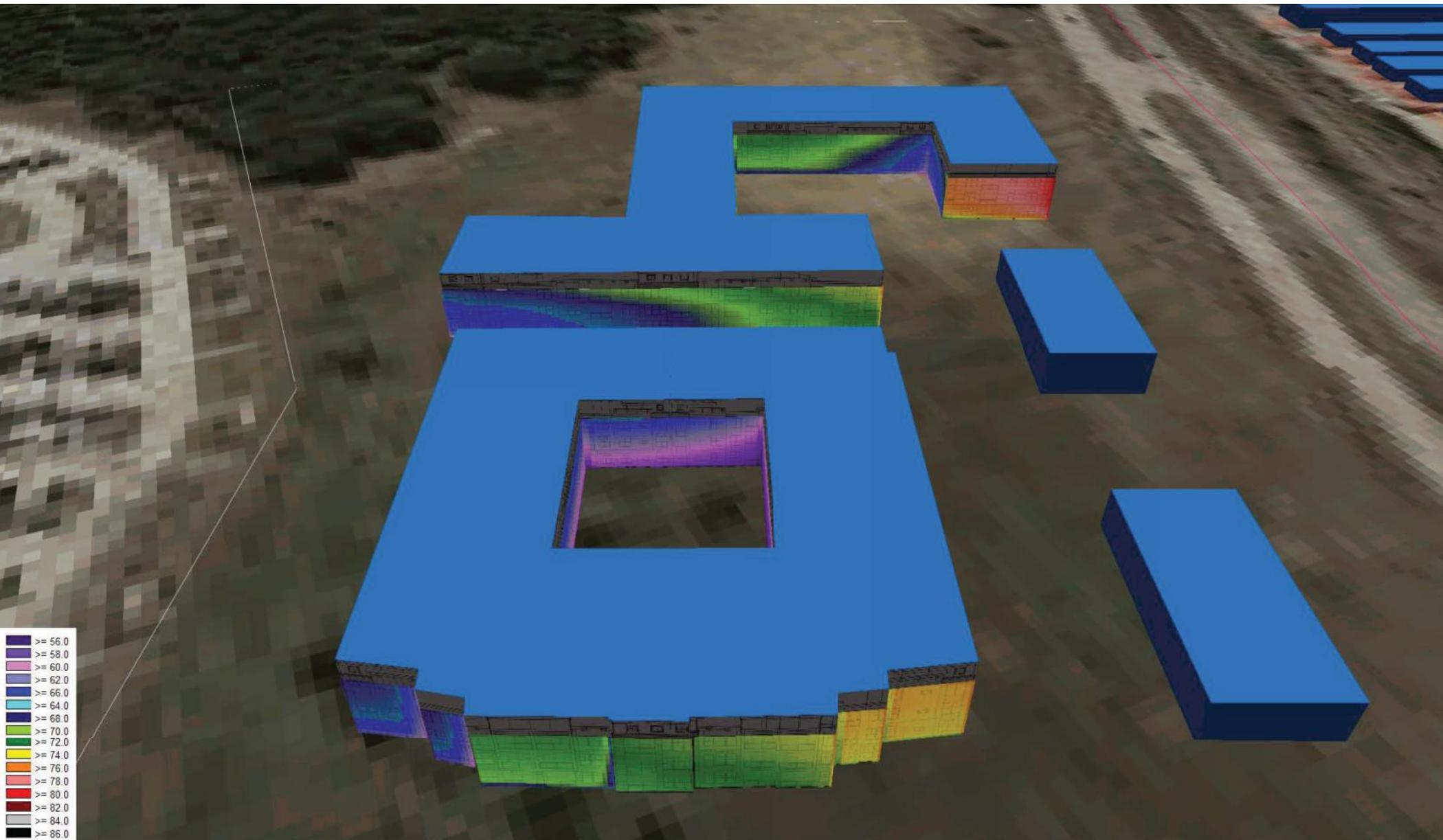
	Window	Stucco + resil chnl	Brick + resil chnl	Cement Board + Resil chnl
<b>STC</b>	33	60	57	57
<b>OITC</b>	29	47	53	42

Figure 2: Computer Generated Noise Map - Plan North Façade Buildings 1 and 2 - Train Pass-by Event



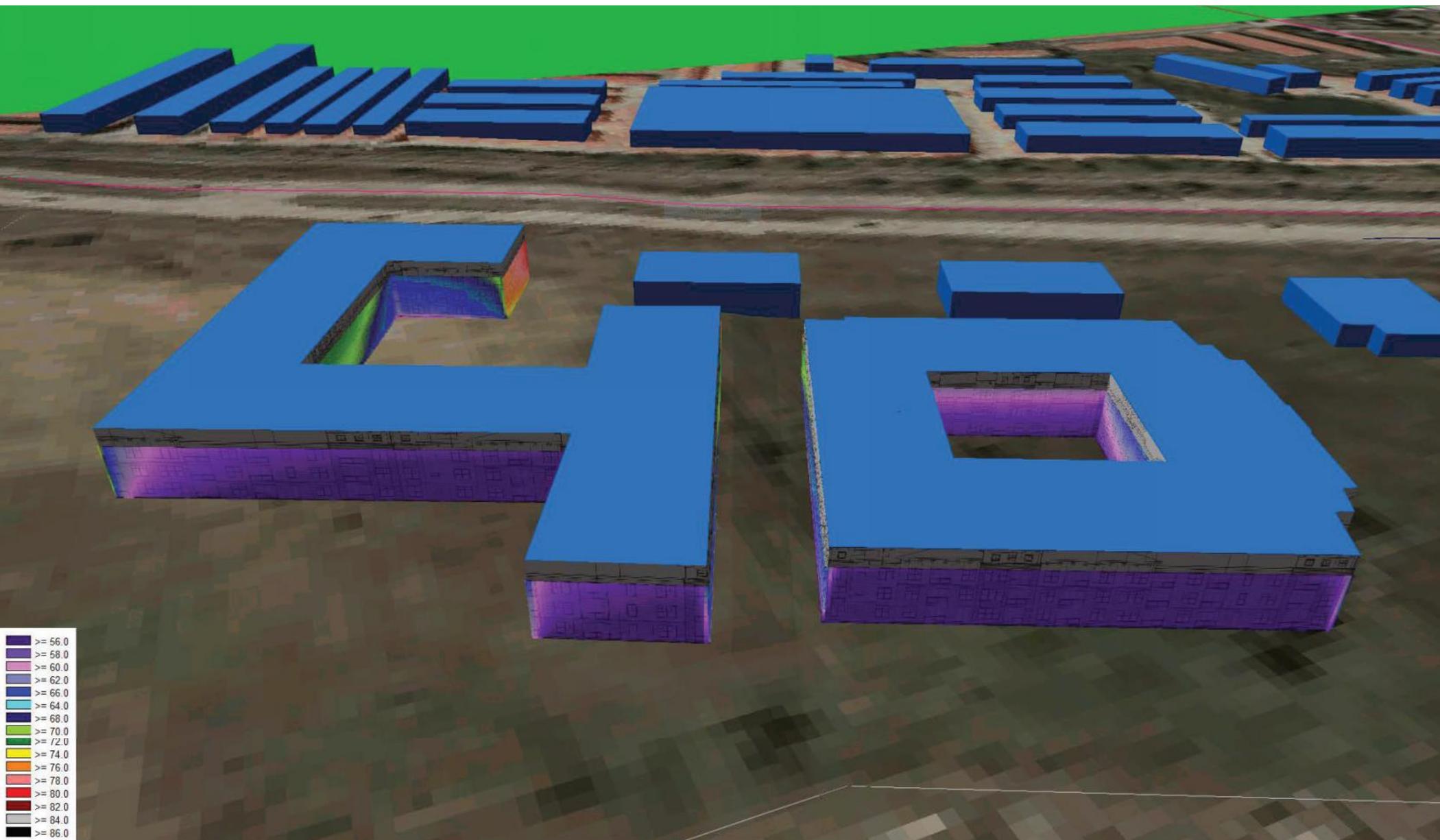
Greystar - Elan Keller

Figure 3: Computer Generated Noise Map - Plan East Façade Buildings 1 and 2 - Train Pass-by Event



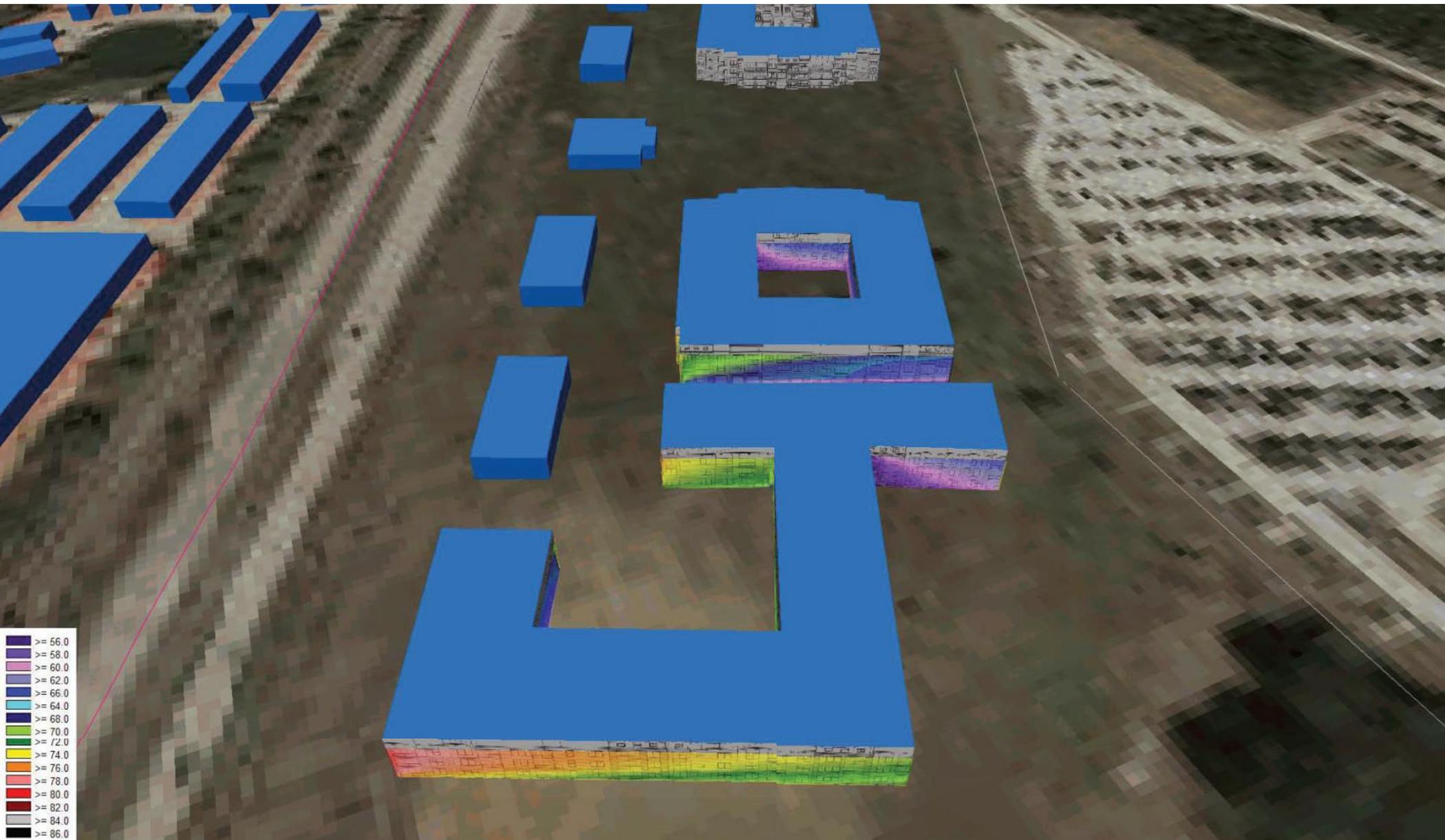
Greystar - Elan Keller

Figure 4: Computer Generated Noise Map - Plan South Façade Buildings 1 and 2 - Train Pass-by Event



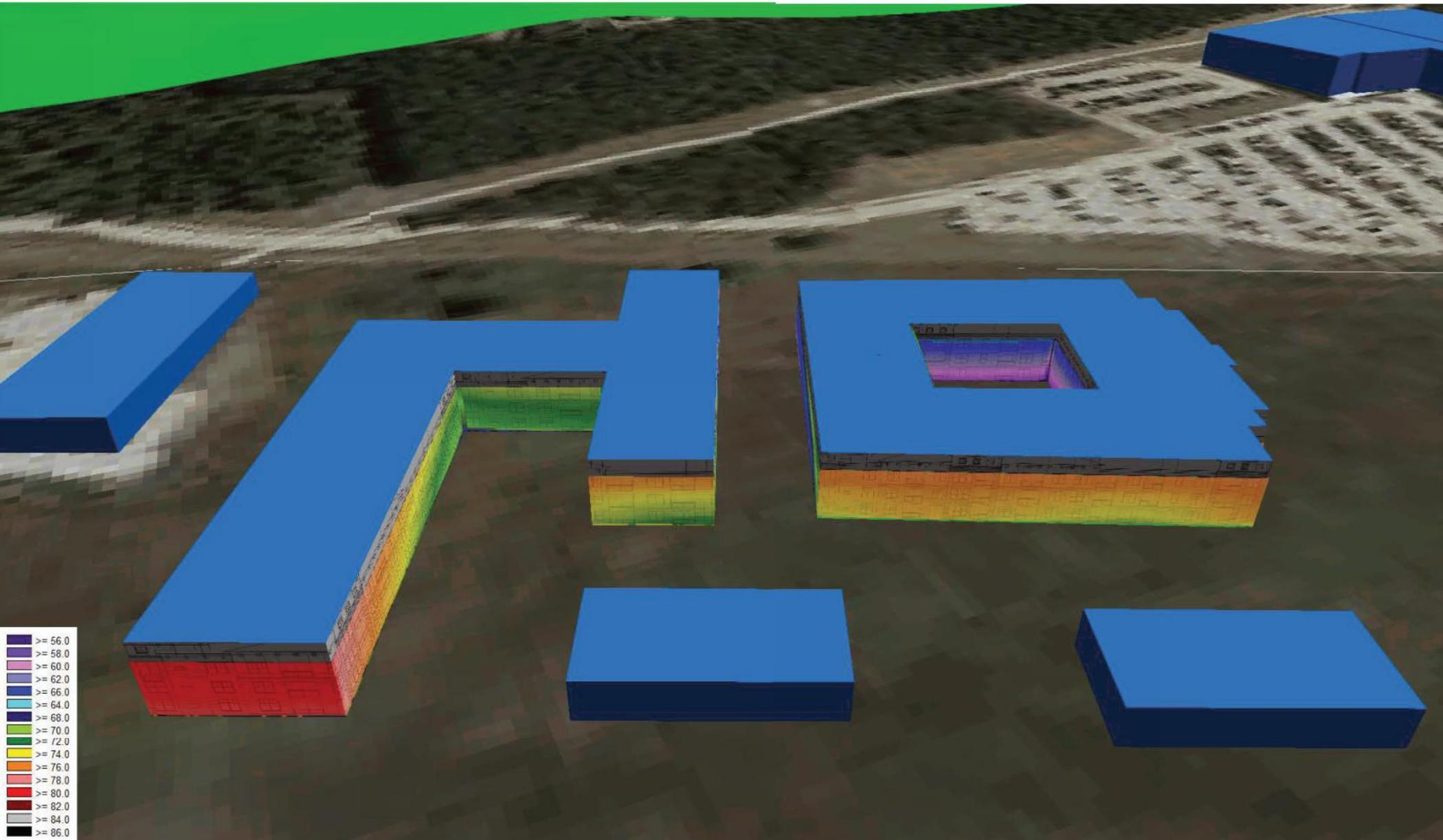
Greystar - Elan Keller

Figure 5: Computer Generated Noise Map - Plan West Façade Buildings 1 and 2 - Train Pass-by Event



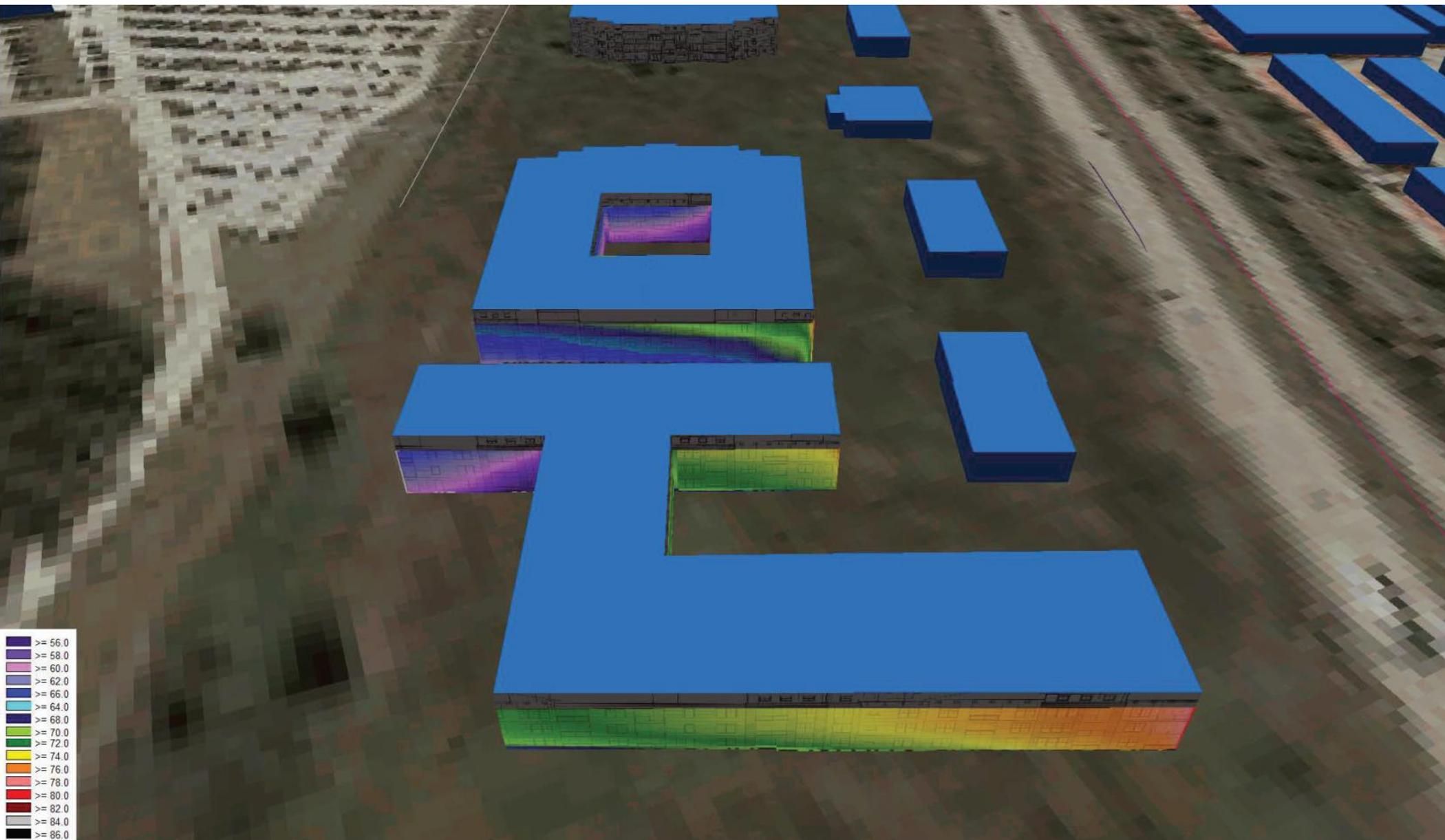
Greystar - Elan Keller

Figure 6: Computer Generated Noise Map - Plan North Façade Buildings 3 and 4 - Train Pass-by Event



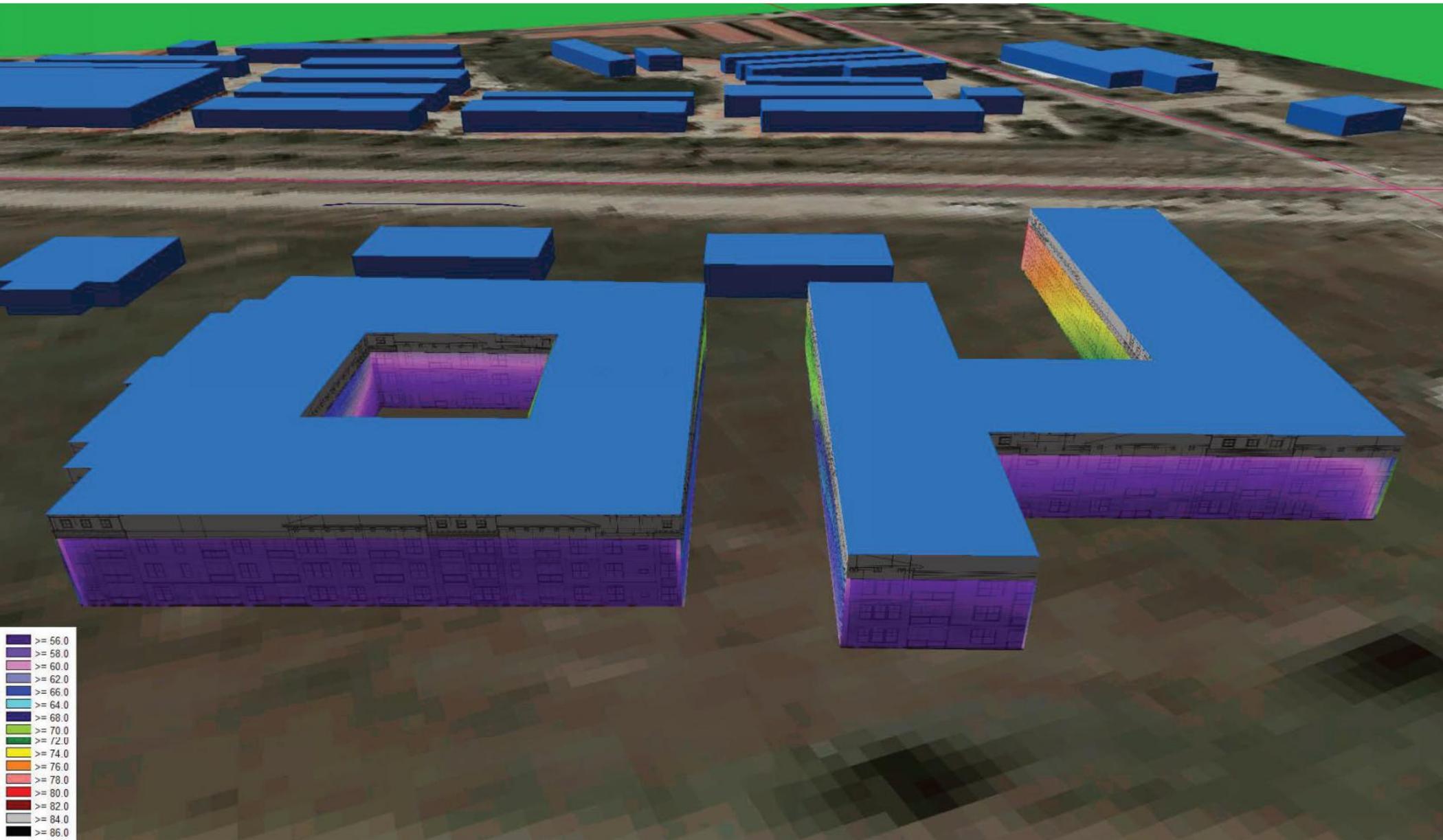
Greystar - Elan Keller

Figure 7: Computer Generated Noise Map - Plan East Façade Buildings 3 and 4 - Train Pass-by Event



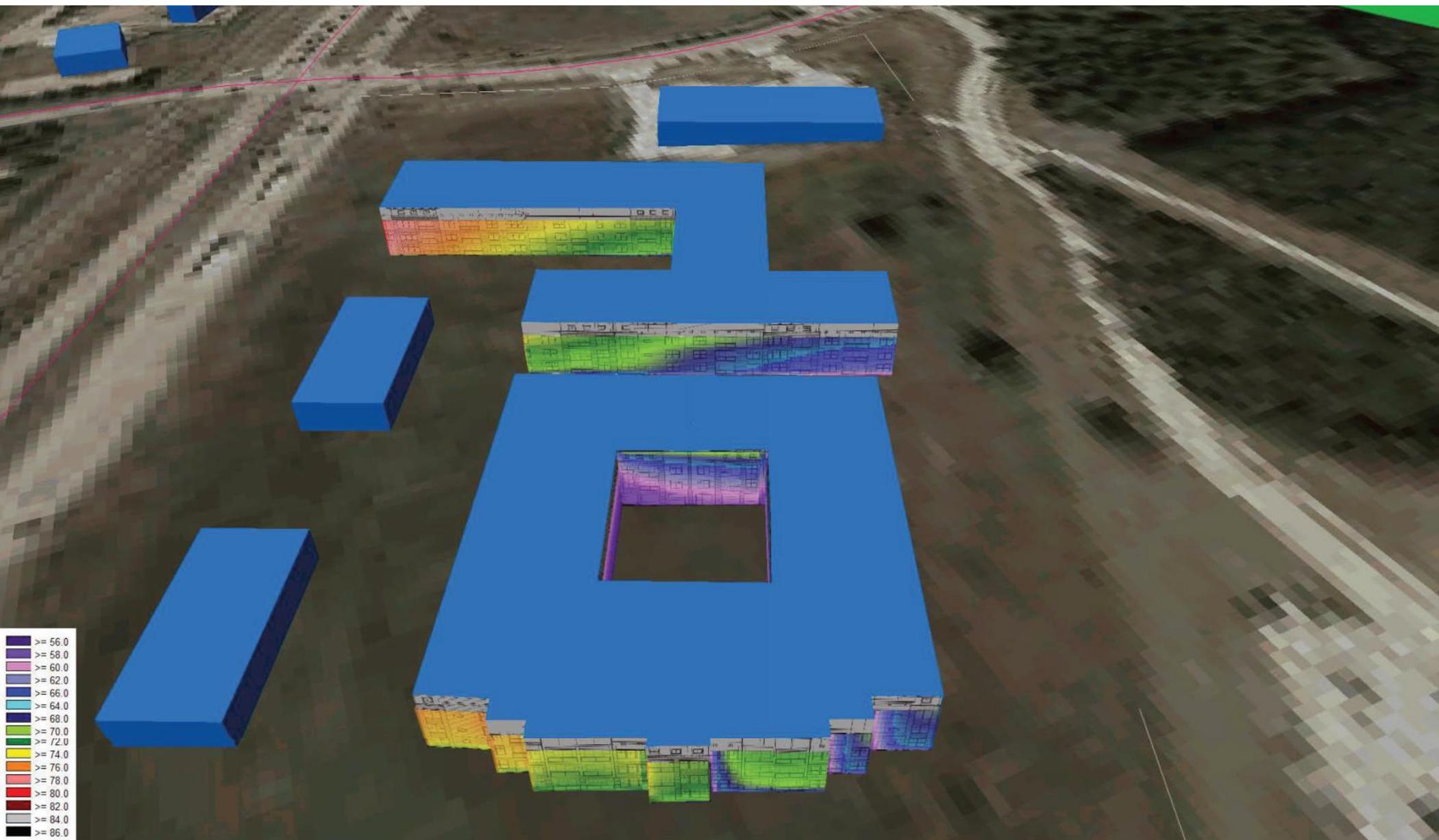
Greystar - Elan Keller

Figure 8: Computer Generated Noise Map - Plan South Façade Buildings 3 and 4 - Train Pass-by Event



Greystar - Elan Keller

Figure 9: Computer Generated Noise Map - Plan West Façade Buildings 3 and 4 - Train Pass-by Event



Greystar - Elan Keller

**Figure 10: Recommended Window Glazing Locations  
Building #1**

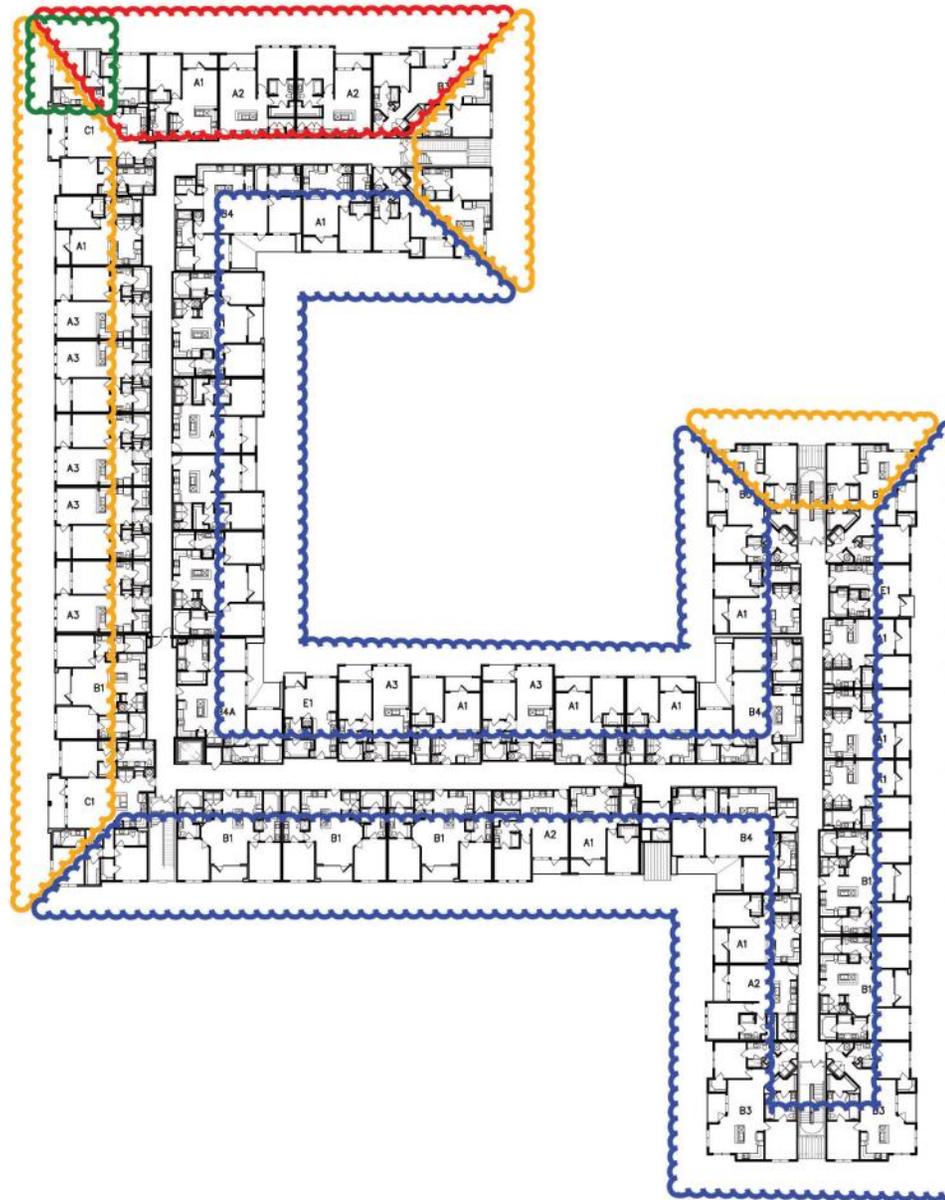
**Legend**

Standard Window STC 28 / OITC 23

Upgraded Window STC 33 / OITC 29

Upgraded Window STC 35 / OITC 30

Upgraded Window STC 35 / OITC 32



**Figure 11: Recommended Window Glazing Locations  
Building #2**

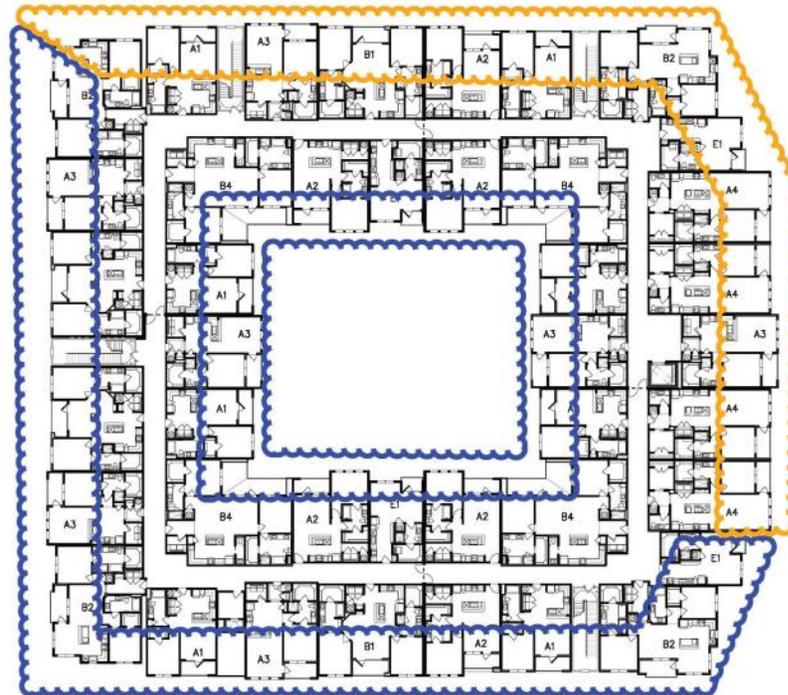
**Legend**

Standard Window STC 28 / OITC 23

Upgraded Window STC 33 / OITC 29

Upgraded Window STC 35 / OITC 30

Upgraded Window STC 35 / OITC 32

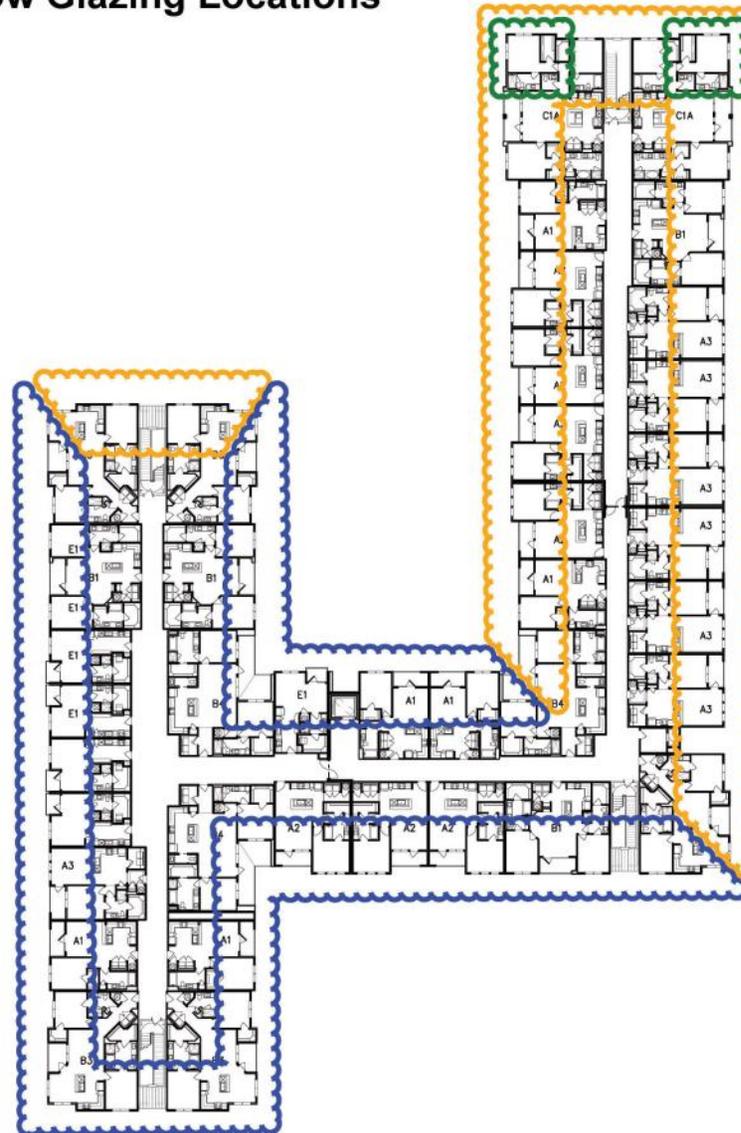




**Figure 13: Recommended Window Glazing Locations  
Building #4**

**Legend**

- Standard Window STC 28 / OITC 23
- Upgraded Window STC 33 / OITC 29
- Upgraded Window STC 35 / OITC 30
- Upgraded Window STC 35 / OITC 32



# U. S. DOT CROSSING INVENTORY FORM

**DEPARTMENT OF TRANSPORTATION**  
FEDERAL RAILROAD ADMINISTRATION

OMB No. 2130-0017

Instructions for the initial reporting of the following types of new or previously unreported crossings: For public highway-rail grade crossings, complete the entire inventory Form. For private highway-rail grade crossings, complete the Header, Parts I and II, and the Submission Information section. For public pathway grade crossings (including pedestrian station grade crossings), complete the Header, Parts I and II, and the Submission Information section. For Private pathway grade crossings, complete the Header, Parts I and II, and the Submission Information section. For grade-separated highway-rail or pathway crossings (including pedestrian station crossings), complete the Header, Part I, and the Submission Information section. For changes to existing data, complete the Header, Part I Items 1-3, and the Submission Information section, in addition to the updated data fields. Note: For private crossings only, Part I Item 20 and Part III Item 2.K. are required unless otherwise noted. An asterisk \* denotes an optional field.

<b>A. Revision Date</b> (MM/DD/YYYY) 06 / 16 / 2020	<b>B. Reporting Agency</b> <input checked="" type="checkbox"/> Railroad <input type="checkbox"/> Transit <input type="checkbox"/> State <input type="checkbox"/> Other	<b>C. Reason for Update (Select only one)</b> <input type="checkbox"/> Change in Data <input type="checkbox"/> New Crossing <input type="checkbox"/> Closed <input type="checkbox"/> Re-Open <input checked="" type="checkbox"/> Date Change Only <input type="checkbox"/> Change in Primary Operating RR <input type="checkbox"/> No Train Traffic <input type="checkbox"/> Quiet Zone Update <input type="checkbox"/> Admin. Correction	<b>D. DOT Crossing Inventory Number</b> 795349T
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## Part I: Location and Classification Information

<b>1. Primary Operating Railroad</b> Union Pacific Railroad Company [UP]		<b>2. State</b> TEXAS		<b>3. County</b> TARRANT	
<b>4. City / Municipality</b> <input type="checkbox"/> In <input checked="" type="checkbox"/> Near FORT WORTH		<b>5. Street/Road Name &amp; Block Number</b> Keller Haslet Road (Street/Road Name)    * (Block Number)		<b>6. Highway Type &amp; No.</b> CR 4042	
<b>7. Do Other Railroads Operate a Separate Track at Crossing?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Specify RR			<b>8. Do Other Railroads Operate Over Your Track at Crossing?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Specify RR BNSF		
<b>9. Railroad Division or Region</b> <input type="checkbox"/> None    Texoma		<b>10. Railroad Subdivision or District</b> <input type="checkbox"/> None    Choctaw Sub		<b>11. Branch or Line Name</b> <input checked="" type="checkbox"/> None	
<b>12. RR Milepost</b> 0738.100 (prefix)   (nnnn.nnn)   (suffix)		<b>13. Line Segment</b> *		<b>14. Nearest RR Timetable Station</b> *	
<b>15. Parent RR (if applicable)</b> <input checked="" type="checkbox"/> N/A		<b>16. Crossing Owner (if applicable)</b> <input type="checkbox"/> N/A    UP		<b>17. Crossing Type</b> <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private	
<b>18. Crossing Purpose</b> <input checked="" type="checkbox"/> Highway <input type="checkbox"/> Pathway, Ped. <input type="checkbox"/> Station, Ped.		<b>19. Crossing Position</b> <input checked="" type="checkbox"/> At Grade <input type="checkbox"/> RR Under <input type="checkbox"/> RR Over		<b>20. Public Access (if Private Crossing)</b> <input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>21. Type of Train</b> <input checked="" type="checkbox"/> Freight <input type="checkbox"/> Intercity Passenger <input type="checkbox"/> Commuter		<input type="checkbox"/> Transit <input type="checkbox"/> Shared Use Transit <input type="checkbox"/> Tourist/Other		<b>22. Average Passenger Train Count Per Day</b> <input type="checkbox"/> Less Than One Per Day <input type="checkbox"/> Number Per Day 0	
<b>23. Type of Land Use</b> <input checked="" type="checkbox"/> Open Space <input type="checkbox"/> Farm <input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Institutional <input type="checkbox"/> Recreational <input type="checkbox"/> RR Yard					
<b>24. Is there an Adjacent Crossing with a Separate Number?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    If Yes, Provide Crossing Number			<b>25. Quiet Zone (FRA provided)</b> <input type="checkbox"/> No <input checked="" type="checkbox"/> 24 Hr <input type="checkbox"/> Partial <input type="checkbox"/> Chicago Excused    Date Established 5/21/2015 12:00:0		
<b>26. HSR Corridor ID</b> <input checked="" type="checkbox"/> N/A		<b>27. Latitude in decimal degrees</b> (WGS84 std: nn.nnnnnnn) 32.9635003		<b>28. Longitude in decimal degrees</b> (WGS84 std: -nnn.nnnnnnn) -97.2506514	
<b>29. Lat/Long Source</b> <input checked="" type="checkbox"/> Actual <input type="checkbox"/> Estimated		<b>30.A. Railroad Use *</b>			
<b>30.B. Railroad Use *</b>		<b>31.A. State Use *</b>			
<b>30.C. Railroad Use *</b>		<b>31.B. State Use *</b>			
<b>30.D. Railroad Use *</b>		<b>31.C. State Use *</b> State Phone# updated - date updated: 2018-08-16			
<b>30.E. Railroad Use *</b>		<b>31.D. State Use *</b>			
<b>32.A. Narrative (Railroad Use) *</b>			<b>32.B. Narrative (State Use) *</b>		
<b>33. Emergency Notification Telephone No. (posted)</b> 800-848-8715		<b>34. Railroad Contact (Telephone No.)</b> 402-544-3721		<b>35. State Contact (Telephone No.)</b> 512-416-2635	

## Part II: Railroad Information

<b>1. Estimated Number of Daily Train Movements</b>				
<b>1.A. Total Day Thru Trains (6 AM to 6 PM)</b> 10	<b>1.B. Total Night Thru Trains (6 PM to 6 AM)</b> 10	<b>1.C. Total Switching Trains</b> 0	<b>1.D. Total Transit Trains</b> 0	<b>1.E. Check if Less Than One Movement Per Day</b> <input type="checkbox"/> How many trains per week? _____
<b>2. Year of Train Count Data (YYYY)</b> 2016		<b>3. Speed of Train at Crossing</b> 3.A. Maximum Timetable Speed (mph) 60 3.B. Typical Speed Range Over Crossing (mph) From 30 to 60		
<b>4. Type and Count of Tracks</b> Main 1    Siding 0    Yard 0    Transit 0    Industry 0				
<b>5. Train Detection (Main Track only)</b> <input checked="" type="checkbox"/> Constant Warning Time <input type="checkbox"/> Motion Detection <input type="checkbox"/> AFO <input type="checkbox"/> PTC <input type="checkbox"/> DC <input type="checkbox"/> Other <input type="checkbox"/> None				
<b>6. Is Track Signaled?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<b>7.A. Event Recorder</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<b>7.B. Remote Health Monitoring</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

# U. S. DOT CROSSING INVENTORY FORM

A. Revision Date (MM/DD/YYYY) 06/16/2020		PAGE 2		D. Crossing Inventory Number (7 char.) 7953491	
<b>Part III: Highway or Pathway Traffic Control Device Information</b>					
1. Are there Signs or Signals? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		2. Types of Passive Traffic Control Devices associated with the Crossing			
2.A. Crossbuck Assemblies (count) 0		2.B. STOP Signs (R1-1) (count) 0	2.C. YIELD Signs (R1-2) (count) 0	2.D. Advance Warning Signs (Check all that apply; include count) <input type="checkbox"/> None <input checked="" type="checkbox"/> W10-1 2 <input type="checkbox"/> W10-3 _____ <input type="checkbox"/> W10-11 _____ <input checked="" type="checkbox"/> W10-2 2 <input type="checkbox"/> W10-4 _____ <input type="checkbox"/> W10-12 _____	
2.E. Low Ground Clearance Sign (W10-5) <input type="checkbox"/> Yes (count 0) <input checked="" type="checkbox"/> No		2.F. Pavement Markings <input checked="" type="checkbox"/> Stop Lines <input type="checkbox"/> Dynamic Envelope <input checked="" type="checkbox"/> RR Xing Symbols <input type="checkbox"/> None		2.G. Channelization Devices/Medians <input checked="" type="checkbox"/> All Approaches <input checked="" type="checkbox"/> Median <input type="checkbox"/> One Approach <input type="checkbox"/> None	2.H. EXEMPT Sign (R15-3) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2.I. ENS Sign (I-13) Displayed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		2.J. Other MUTCD Signs <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Specify Type R8-8 Count 1 Specify Type W10-9P Count 4 Specify Type _____ Count _____		2.K. Private Crossing Signs (if private) <input type="checkbox"/> Yes <input type="checkbox"/> No	2.L. LED Enhanced Signs (List types)
<b>3. Types of Train Activated Warning Devices at the Grade Crossing (specify count of each device for all that apply)</b>					
3.A. Gate Arms (count) Roadway 2 Pedestrian 0	3.B. Gate Configuration <input checked="" type="checkbox"/> 2 Quad <input type="checkbox"/> Full (Barrier) Resistance <input type="checkbox"/> 3 Quad <input type="checkbox"/> Median Gates	3.C. Cantilevered (or Bridged) Flashing Light Structures (count) Over Traffic Lane 0 <input type="checkbox"/> Incandescent Not Over Traffic Lane 0 <input type="checkbox"/> LED		3.D. Mast Mounted Flashing Lights (count of masts) 2 <input type="checkbox"/> Incandescent <input checked="" type="checkbox"/> LED <input checked="" type="checkbox"/> Back Lights Included <input checked="" type="checkbox"/> Side Lights Included	3.E. Total Count of Flashing Light Pairs 5
3.F. Installation Date of Current Active Warning Devices: (MM/YYYY) ____/____/____ <input checked="" type="checkbox"/> Not Required		3.G. Wayside Horn <input type="checkbox"/> Yes Installed on (MM/YYYY) ____/____/____ <input checked="" type="checkbox"/> No		3.H. Highway Traffic Signals Controlling Crossing <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	3.I. Bells (count) 2
3.J. Non-Train Active Warning <input type="checkbox"/> Flagging/Flagman <input type="checkbox"/> Manually Operated Signals <input type="checkbox"/> Watchman <input type="checkbox"/> Floodlighting <input type="checkbox"/> None				3.K. Other Flashing Lights or Warning Devices Count 0 Specify type _____	
4.A. Does nearby Hwy Intersection have Traffic Signals? <input type="checkbox"/> Yes <input type="checkbox"/> No	4.B. Hwy Traffic Signal Interconnection <input type="checkbox"/> Not Interconnected <input type="checkbox"/> For Traffic Signals <input type="checkbox"/> For Warning Signs	4.C. Hwy Traffic Signal Preemption <input type="checkbox"/> Simultaneous <input type="checkbox"/> Advance	5. Highway Traffic Pre-Signals <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Storage Distance * _____ Stop Line Distance * _____	6. Highway Monitoring Devices (Check all that apply) <input type="checkbox"/> Yes - Photo/Video Recording <input type="checkbox"/> Yes - Vehicle Presence Detection <input type="checkbox"/> None	
<b>Part IV: Physical Characteristics</b>					
1. Traffic Lanes Crossing Railroad Number of Lanes 2 <input type="checkbox"/> One-way Traffic <input checked="" type="checkbox"/> Two-way Traffic <input type="checkbox"/> Divided Traffic		2. Is Roadway/Pathway Paved? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3. Does Track Run Down a Street? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	4. Is Crossing Illuminated? (Street lights within approx. 50 feet from nearest rail) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Crossing Surface (on Main Track, multiple types allowed) Installation Date * (MM/YYYY) ____/____/____ Width * _____ Length * 32 <input type="checkbox"/> 1 Timber <input type="checkbox"/> 2 Asphalt <input type="checkbox"/> 3 Asphalt and Timber <input checked="" type="checkbox"/> 4 Concrete <input type="checkbox"/> 5 Concrete and Rubber <input type="checkbox"/> 6 Rubber <input type="checkbox"/> 7 Metal <input type="checkbox"/> 8 Unconsolidated <input type="checkbox"/> 9 Composite <input type="checkbox"/> 10 Other (specify) _____					
6. Intersecting Roadway within 500 feet? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Approximate Distance (feet) 70			7. Smallest Crossing Angle <input type="checkbox"/> 0° - 29° <input type="checkbox"/> 30° - 59° <input checked="" type="checkbox"/> 60° - 90°		8. Is Commercial Power Available? * <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Part V: Public Highway Information</b>					
1. Highway System <input type="checkbox"/> (01) Interstate Highway System <input type="checkbox"/> (02) Other Nat Hwy System (NHS) <input type="checkbox"/> (03) Federal AID, Not NHS <input checked="" type="checkbox"/> (08) Non-Federal AID		2. Functional Classification of Road at Crossing <input type="checkbox"/> (0) Rural <input checked="" type="checkbox"/> (1) Urban <input type="checkbox"/> (1) Interstate <input type="checkbox"/> (5) Major Collector <input type="checkbox"/> (2) Other Freeways and Expressways <input type="checkbox"/> (3) Other Principal Arterial <input type="checkbox"/> (6) Minor Collector <input type="checkbox"/> (4) Minor Arterial <input checked="" type="checkbox"/> (7) Local		3. Is Crossing on State Highway System? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	4. Highway Speed Limit 30 _____ MPH <input type="checkbox"/> Posted <input checked="" type="checkbox"/> Statutory
5. Linear Referencing System (LRS Route ID) *					
6. LRS Milepost *					
7. Annual Average Daily Traffic (AADT) Year 2016 AADT 7865		8. Estimated Percent Trucks 03 _____ %	9. Regularly Used by School Buses? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Average Number per Day 0		10. Emergency Services Route <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Submission Information - This information is used for administrative purposes and is not available on the public website.</b>					
Submitted by _____ Organization _____ Phone _____ Date _____					
Public reporting burden for this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed and completing and reviewing the collection of information. According to the Paperwork Reduction Act of 1995, a federal agency may not conduct or sponsor, and a person is not required to, nor shall a person be subject to a penalty for failure to comply with, a collection of information unless it displays a currently valid OMB control number. The valid OMB control number for information collection is 2130-0017. Send comments regarding this burden estimate or any other aspect of this collection, including for reducing this burden to: Information Collection Officer, Federal Railroad Administration, 1200 New Jersey Ave. SE, MS-25 Washington, DC 20590.					

# U. S. DOT CROSSING INVENTORY FORM

**DEPARTMENT OF TRANSPORTATION**  
FEDERAL RAILROAD ADMINISTRATION

OMB No. 2130-0017

Instructions for the initial reporting of the following types of new or previously unreported crossings: For public highway-rail grade crossings, complete the entire inventory Form. For private highway-rail grade crossings, complete the Header, Parts I and II, and the Submission Information section. For public pathway grade crossings (including pedestrian station grade crossings), complete the Header, Parts I and II, and the Submission Information section. For Private pathway grade crossings, complete the Header, Parts I and II, and the Submission Information section. For grade-separated highway-rail or pathway crossings (including pedestrian station crossings), complete the Header, Part I, and the Submission Information section. For changes to existing data, complete the Header, Part I Items 1-3, and the Submission Information section, in addition to the updated data fields. Note: For private crossings only, Part I Item 20 and Part III Item 2.K. are required unless otherwise noted. An asterisk \* denotes an optional field.

<b>A. Revision Date</b> (MM/DD/YYYY) 04 / 22 / 2020	<b>B. Reporting Agency</b> <input checked="" type="checkbox"/> Railroad <input type="checkbox"/> Transit <input type="checkbox"/> State <input type="checkbox"/> Other	<b>C. Reason for Update (Select only one)</b> <input checked="" type="checkbox"/> Change in Data <input type="checkbox"/> Re-Open <input type="checkbox"/> New Crossing <input type="checkbox"/> Date Change Only <input type="checkbox"/> Closed <input type="checkbox"/> Change in Primary Operating RR <input type="checkbox"/> No Train Traffic <input type="checkbox"/> Quiet Zone Update <input type="checkbox"/> Admin. Correction	<b>D. DOT Crossing Inventory Number</b> 795350M
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## Part I: Location and Classification Information

<b>1. Primary Operating Railroad</b> Union Pacific Railroad Company [UP]		<b>2. State</b> TEXAS		<b>3. County</b> TARRANT	
<b>4. City / Municipality</b> <input type="checkbox"/> In <input checked="" type="checkbox"/> Near FORT WORTH		<b>5. Street/Road Name &amp; Block Number</b> TIMBERLAND BOULEVARD (Street/Road Name)   * (Block Number)		<b>6. Highway Type &amp; No.</b> ST 0000	
<b>7. Do Other Railroads Operate a Separate Track at Crossing?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Specify RR			<b>8. Do Other Railroads Operate Over Your Track at Crossing?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Specify RR BNSF		
<b>9. Railroad Division or Region</b> <input type="checkbox"/> None TEXOMA		<b>10. Railroad Subdivision or District</b> <input type="checkbox"/> None Choctaw Sub		<b>11. Branch or Line Name</b> <input checked="" type="checkbox"/> None	
<b>12. RR Milepost</b> 0738.630 (prefix)   (nnnn.nnn)   (suffix)		<b>13. Line Segment</b> *		<b>14. Nearest RR Timetable Station</b> *	
<b>15. Parent RR (if applicable)</b> <input checked="" type="checkbox"/> N/A		<b>16. Crossing Owner (if applicable)</b> <input type="checkbox"/> N/A UP			
<b>17. Crossing Type</b> <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private		<b>18. Crossing Purpose</b> <input checked="" type="checkbox"/> Highway <input type="checkbox"/> Pathway, Ped. <input type="checkbox"/> Station, Ped.		<b>19. Crossing Position</b> <input checked="" type="checkbox"/> At Grade <input type="checkbox"/> RR Under <input type="checkbox"/> RR Over	
<b>20. Public Access (if Private Crossing)</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<b>21. Type of Train</b> <input checked="" type="checkbox"/> Freight <input type="checkbox"/> Intercity Passenger <input type="checkbox"/> Commuter		<b>22. Average Passenger Train Count Per Day</b> <input type="checkbox"/> Transit <input type="checkbox"/> Shared Use Transit <input type="checkbox"/> Tourist/Other <input type="checkbox"/> Less Than One Per Day <input type="checkbox"/> Number Per Day 0	
<b>23. Type of Land Use</b> <input type="checkbox"/> Open Space <input type="checkbox"/> Farm <input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Institutional <input type="checkbox"/> Recreational <input type="checkbox"/> RR Yard					
<b>24. Is there an Adjacent Crossing with a Separate Number?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Provide Crossing Number			<b>25. Quiet Zone (FRA provided)</b> <input checked="" type="checkbox"/> No <input type="checkbox"/> 24 Hr <input type="checkbox"/> Partial <input type="checkbox"/> Chicago Excused Date Established		
<b>26. HSR Corridor ID</b> <input checked="" type="checkbox"/> N/A		<b>27. Latitude in decimal degrees</b> (WGS84 std: nn.nnnnnnn) 32.9565300		<b>28. Longitude in decimal degrees</b> (WGS84 std: -nnn.nnnnnnn) -97.2545180	
<b>29. Lat/Long Source</b> <input checked="" type="checkbox"/> Actual <input type="checkbox"/> Estimated		<b>30.A. Railroad Use *</b>			
<b>30.B. Railroad Use *</b>		<b>31.A. State Use *</b>			
<b>30.C. Railroad Use *</b>		<b>31.B. State Use *</b>			
<b>30.D. Railroad Use *</b>		<b>31.C. State Use *</b> State Phone# updated - date updated: 2018-08-16			
<b>30.E. Railroad Use *</b>		<b>31.D. State Use *</b>			
<b>32.A. Narrative (Railroad Use) *</b>			<b>32.B. Narrative (State Use) *</b>		
<b>33. Emergency Notification Telephone No. (posted)</b> 800-848-8715		<b>34. Railroad Contact (Telephone No.)</b> 402-544-3721		<b>35. State Contact (Telephone No.)</b> 512-416-2635	

## Part II: Railroad Information

<b>1. Estimated Number of Daily Train Movements</b>				
<b>1.A. Total Day Thru Trains (6 AM to 6 PM)</b> 12	<b>1.B. Total Night Thru Trains (6 PM to 6 AM)</b> 12	<b>1.C. Total Switching Trains</b> 0	<b>1.D. Total Transit Trains</b> 0	<b>1.E. Check if Less Than One Movement Per Day</b> <input type="checkbox"/> How many trains per week? _____
<b>2. Year of Train Count Data (YYYY)</b> 2016		<b>3. Speed of Train at Crossing</b> 3.A. Maximum Timetable Speed (mph) 50 3.B. Typical Speed Range Over Crossing (mph) From 25 to 50		
<b>4. Type and Count of Tracks</b> Main 1 Siding 0 Yard 0 Transit 0 Industry 0				
<b>5. Train Detection (Main Track only)</b> <input checked="" type="checkbox"/> Constant Warning Time <input type="checkbox"/> Motion Detection <input type="checkbox"/> AFO <input type="checkbox"/> PTC <input type="checkbox"/> DC <input type="checkbox"/> Other <input type="checkbox"/> None				
<b>6. Is Track Signaled?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<b>7.A. Event Recorder</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<b>7.B. Remote Health Monitoring</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

# U. S. DOT CROSSING INVENTORY FORM

A. Revision Date (MM/DD/YYYY) 04/22/2020		PAGE 2		D. Crossing Inventory Number (7 char.) 795350M	
<b>Part III: Highway or Pathway Traffic Control Device Information</b>					
1. Are there Signs or Signals? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		2. Types of Passive Traffic Control Devices associated with the Crossing			
2.A. Crossbuck Assemblies (count) 0		2.B. STOP Signs (R1-1) (count) 0	2.C. YIELD Signs (R1-2) (count)	2.D. Advance Warning Signs (Check all that apply; include count) <input type="checkbox"/> None <input checked="" type="checkbox"/> W10-1 2 <input type="checkbox"/> W10-3 1 <input type="checkbox"/> W10-11 _____ <input type="checkbox"/> W10-2 _____ <input type="checkbox"/> W10-4 _____ <input type="checkbox"/> W10-12 _____	
2.E. Low Ground Clearance Sign (W10-5) <input type="checkbox"/> Yes (count 0) <input checked="" type="checkbox"/> No		2.F. Pavement Markings <input checked="" type="checkbox"/> Stop Lines <input type="checkbox"/> Dynamic Envelope <input checked="" type="checkbox"/> RR Xing Symbols <input type="checkbox"/> None		2.G. Channelization Devices/Medians <input checked="" type="checkbox"/> All Approaches <input checked="" type="checkbox"/> Median <input type="checkbox"/> One Approach <input type="checkbox"/> None	2.H. EXEMPT Sign (R15-3) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2.I. ENS Sign (I-13) Displayed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		2.J. Other MUTCD Signs <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Specify Type R8-8 Count 4 Specify Type W10-9P Count 2 Specify Type W10-11b Count 2		2.K. Private Crossing Signs (if private) <input type="checkbox"/> Yes <input type="checkbox"/> No	
2.L. LED Enhanced Signs (List types)		3. Types of Train Activated Warning Devices at the Grade Crossing (specify count of each device for all that apply)			
3.A. Gate Arms (count) Roadway 4 Pedestrian 0	3.B. Gate Configuration <input checked="" type="checkbox"/> 2 Quad <input type="checkbox"/> Full (Barrier) Resistance <input type="checkbox"/> 3 Quad <input type="checkbox"/> Median Gates	3.C. Cantilevered (or Bridged) Flashing Light Structures (count) Over Traffic Lane 1 <input type="checkbox"/> Incandescent Not Over Traffic Lane 0 <input checked="" type="checkbox"/> LED		3.D. Mast Mounted Flashing Lights (count of masts) 4 <input type="checkbox"/> Incandescent <input checked="" type="checkbox"/> LED <input checked="" type="checkbox"/> Back Lights Included <input type="checkbox"/> Side Lights Included	3.E. Total Count of Flashing Light Pairs 10
3.F. Installation Date of Current Active Warning Devices: (MM/YYYY) ____/____/____ <input checked="" type="checkbox"/> Not Required		3.G. Wayside Horn <input type="checkbox"/> Yes Installed on (MM/YYYY) ____/____/____ <input checked="" type="checkbox"/> No		3.H. Highway Traffic Signals Controlling Crossing <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	3.I. Bells (count) 2
3.J. Non-Train Active Warning <input type="checkbox"/> Flagging/Flagman <input type="checkbox"/> Manually Operated Signals <input type="checkbox"/> Watchman <input type="checkbox"/> Floodlighting <input type="checkbox"/> None				3.K. Other Flashing Lights or Warning Devices Count 0 Specify type _____	
4.A. Does nearby Hwy Intersection have Traffic Signals? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.B. Hwy Traffic Signal Interconnection <input type="checkbox"/> Not Interconnected <input checked="" type="checkbox"/> For Traffic Signals <input type="checkbox"/> For Warning Signs	4.C. Hwy Traffic Signal Preemption <input type="checkbox"/> Simultaneous <input checked="" type="checkbox"/> Advance	5. Highway Traffic Pre-Signals <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Storage Distance * _____ Stop Line Distance * _____	6. Highway Monitoring Devices (Check all that apply) <input type="checkbox"/> Yes - Photo/Video Recording <input type="checkbox"/> Yes - Vehicle Presence Detection <input type="checkbox"/> None	
<b>Part IV: Physical Characteristics</b>					
1. Traffic Lanes Crossing Railroad Number of Lanes 6 <input type="checkbox"/> One-way Traffic <input checked="" type="checkbox"/> Two-way Traffic <input type="checkbox"/> Divided Traffic		2. Is Roadway/Pathway Paved? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3. Does Track Run Down a Street? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	4. Is Crossing Illuminated? (Street lights within approx. 50 feet from nearest rail) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Crossing Surface (on Main Track, multiple types allowed) Installation Date * (MM/YYYY) ____/____/____ Width * _____ Length * 112 <input type="checkbox"/> 1 Timber <input type="checkbox"/> 2 Asphalt <input type="checkbox"/> 3 Asphalt and Timber <input checked="" type="checkbox"/> 4 Concrete <input type="checkbox"/> 5 Concrete and Rubber <input type="checkbox"/> 6 Rubber <input type="checkbox"/> 7 Metal <input type="checkbox"/> 8 Unconsolidated <input type="checkbox"/> 9 Composite <input type="checkbox"/> 10 Other (specify) _____					
6. Intersecting Roadway within 500 feet? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Approximate Distance (feet) 75			7. Smallest Crossing Angle <input type="checkbox"/> 0° - 29° <input type="checkbox"/> 30° - 59° <input checked="" type="checkbox"/> 60° - 90°		8. Is Commercial Power Available? * <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Part V: Public Highway Information</b>					
1. Highway System <input type="checkbox"/> (01) Interstate Highway System <input type="checkbox"/> (02) Other Nat Hwy System (NHS) <input type="checkbox"/> (03) Federal AID, Not NHS <input checked="" type="checkbox"/> (08) Non-Federal AID		2. Functional Classification of Road at Crossing <input type="checkbox"/> (0) Rural <input checked="" type="checkbox"/> (1) Urban <input type="checkbox"/> (1) Interstate <input checked="" type="checkbox"/> (5) Major Collector <input type="checkbox"/> (2) Other Freeways and Expressways <input type="checkbox"/> (3) Other Principal Arterial <input type="checkbox"/> (6) Minor Collector <input type="checkbox"/> (4) Minor Arterial <input type="checkbox"/> (7) Local		3. Is Crossing on State Highway System? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	4. Highway Speed Limit System ____ MPH <input type="checkbox"/> Posted <input type="checkbox"/> Statutory
5. Linear Referencing System (LRS Route ID) *					
6. LRS Milepost *					
7. Annual Average Daily Traffic (AADT) Year 2009 AADT 2620		8. Estimated Percent Trucks 03 %	9. Regularly Used by School Buses? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Average Number per Day 0		10. Emergency Services Route <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Submission Information - This information is used for administrative purposes and is not available on the public website.</b>					
Submitted by _____ Organization _____ Phone _____ Date _____					
Public reporting burden for this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed and completing and reviewing the collection of information. According to the Paperwork Reduction Act of 1995, a federal agency may not conduct or sponsor, and a person is not required to, nor shall a person be subject to a penalty for failure to comply with, a collection of information unless it displays a currently valid OMB control number. The valid OMB control number for information collection is 2130-0017. Send comments regarding this burden estimate or any other aspect of this collection, including for reducing this burden to: Information Collection Officer, Federal Railroad Administration, 1200 New Jersey Ave. SE, MS-25 Washington, DC 20590.					