

August 4, 2017

ESG Architects

500 Washington Avenue South, Suite 1080
Minneapolis, Minnesota 55415

Attention: **Gretchen Camp, AIA, LEED AP**

Subject: **Glenview Active Adult Apartments, Glenview, IL**
Site Noise and Vibration
VA Project No. 3912-063

Dear Gretchen:

Veneklasen Associates (VA) has reviewed the project Glenview Active Adult Apartments related to increased acoustical impact from the train to nearby residents.

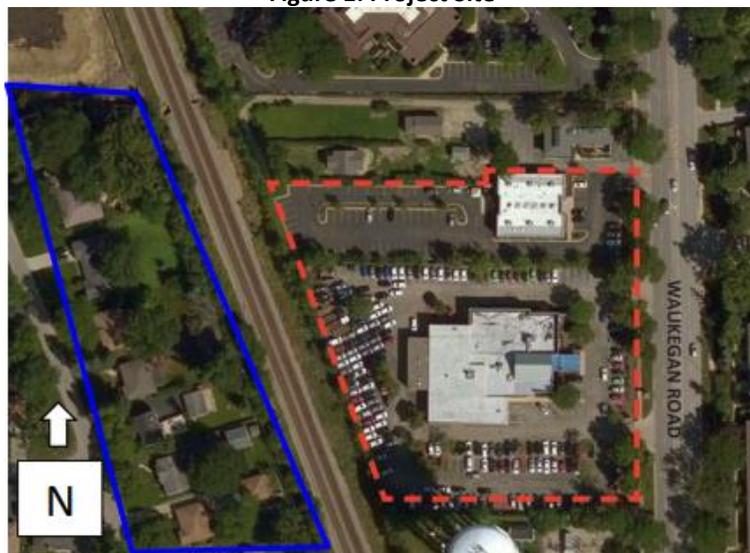
Environment

The project site is located on Waukegan Road. Its western boundary is approximately 50 feet from the existing train tracks and is currently occupied by two commercial properties. Single-family home lots are located immediately west of the train tracks, along the 25-foot rail easement on the opposite side of the tracks. The double track is elevated approximately 6 feet from the surrounding terrain.

The figure below shows the project site. The future project site is outlined in a dotted orange line; the existing single-family residential neighborhood is shown with the solid blue outline. The rail line is located between the two outlined areas.

Per the Department of Transportation crossing inventory, the number of train events per day is approximately 80. The crossing inventory is included at the end of this document.

Figure 1: Project Site



Measurements

VA conducted noise and vibration measurements at a similar site, located approximately one mile away from this site on the same rail line in September 2013. Measurements included Amtrak, Metra, and freight trains. Since freight trains represent the worst case (loudest and longest source), they were the primary reference for the comparative analysis provided herein.

Train horns are not included in this analysis since they are only sounded at this site in emergency situations.

Train Noise Reflection

Analysis was performed using Bruel & Kjaer's Predictor version 11.0. VA calculated noise propagation from a freight train equal to the length of the site, which is shown in the figures below. This model also includes noise from the train engine. In the figures, buildings within the model are shown as gray boxes. The colors on the image represent the sound level at each location and the legend on each graph indicates predicted sound level.

Figure 2 shows the predicted sound propagation from the train source to the single-family residences at a first-floor elevation. Figure 3 shows the same propagation at a second-floor elevation. The first image in the figures shows the current condition and the second image the future condition. Both properties' 6 foot fences are included in the current condition. The future condition only includes the neighborhood fencing (to the west). The contours change color every 3 decibels. This threshold was selected because that is the smallest change for which humans can discern an increase in sound level.

From the figures, it can be seen that the sound level at the single-family residences increases by 0-1 decibels (dB) at a first-floor elevation and 1-2 dB at a second-floor elevation. Since a 3 dB increase is the smallest change a human can detect, this increase represents a negligible impact on the residential site to the west. Since impact is negligible, mitigation is not required.

Figure 2: 1st Floor Noise Propagation

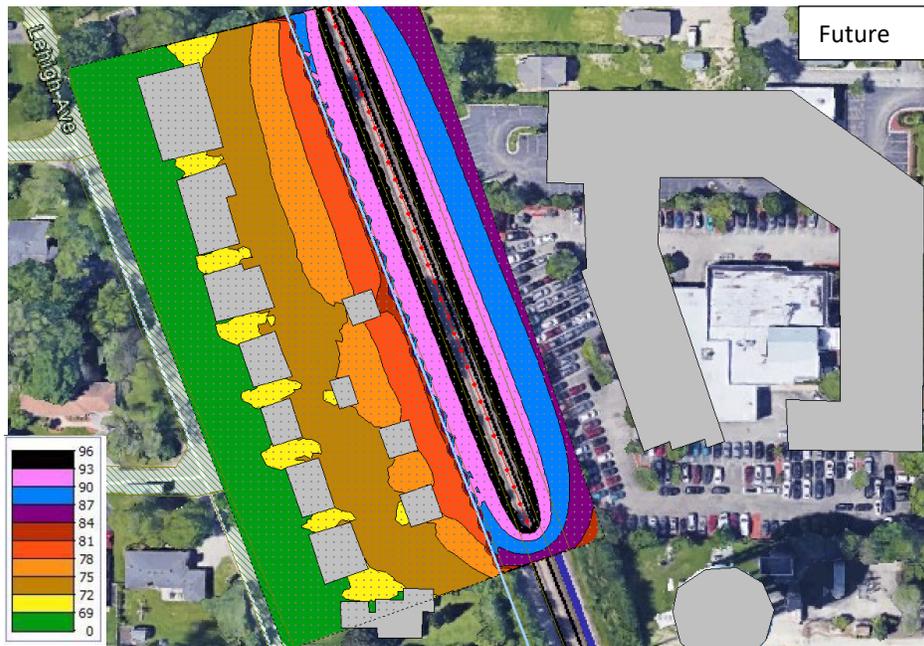
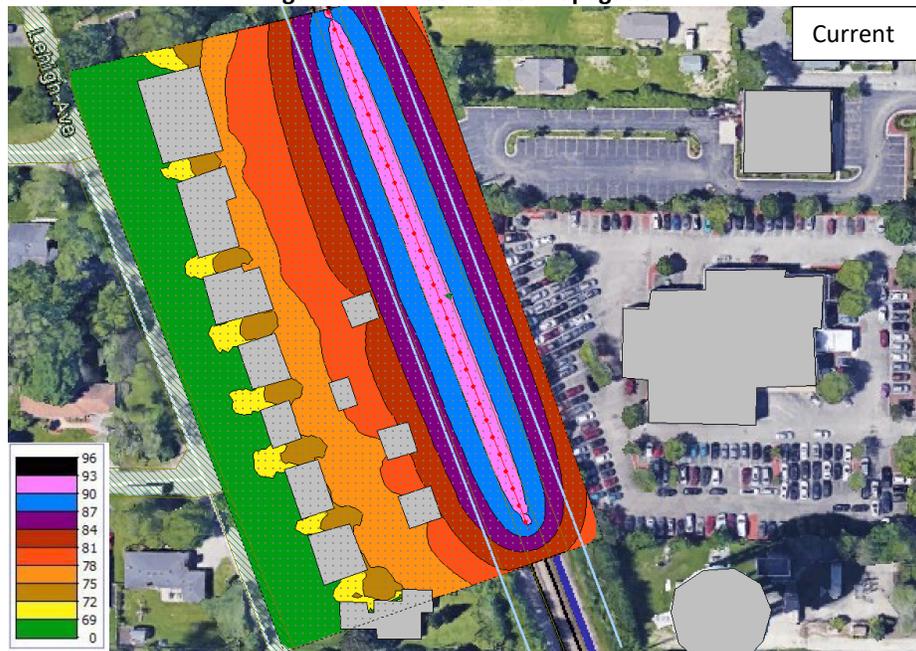


Figure 3: 2nd Floor Noise Propagation



Train Vibration

VA also predicted vibration levels from the train activity at the future project site. Extrapolating from the measurements taken at the nearby site, the vibration levels at the closest point of the future building are predicted to be within the range of 65-75 VdB (dB re 10^{-6} μ in/s).

There are no regulatory requirements for requirements related to vibration levels for this project. For train sources, the criteria from the “Transit Noise and Vibration Impact Assessment” report from the Federal Transit Administration, U.S. Department of Transportation, dated May 2006 (“FTA Report”) are commonly used for assessment. The criterion presented in Table 8-1 of that report for frequent events (defined as more than 70 events per day) in residences is that the vibration levels not exceed 72 VdB. Note that the threshold of perceptibility is usually understood to be around 65–72 VdB. Therefore, even if FTA’s recommended criteria are met, the vibration from train pass-by’s could be perceptible. This primarily affects areas of the building close to the tracks.

Further assessment and mitigation of vibration will be undertaken during the design of the project to ensure that any vibration perceived within the building as a result of rail activity would be within an acceptable range and be consistent with other residential projects located within close vicinity of a rail line.

Summary

VA conducted a preliminary review of the impact of the proposed subject project related to noise and vibration from the train line to the west of the property.

VA’s study indicates that inclusion of the proposed project does not have a significant impact on the sound levels within the back yards of the single-family housing to the west. Therefore, no mitigation is required.

Additionally, VA’s initial study indicates that the vibration levels at the project site may be perceptible within the building. Potential mitigation strategies will be evaluated during the course of design to ensure any perceptible vibration levels within the building are within an acceptable range.

If you have any questions, do not hesitate to contact the undersigned.

Sincerely,

Veneklasen Associates, Inc.



Cathleen Novak
Associate



Samantha Rawlings, *LEED AP BD+C*
Associate Principal

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.

A. Revision Date (MM/DD/YYYY) 05 / 10 / 2017		B. Reporting Agency <input type="checkbox"/> Railroad <input type="checkbox"/> Transit <input checked="" type="checkbox"/> State <input type="checkbox"/> Other		C. Reason for Update (Select only one) <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			D. DOT Crossing Inventory Number 386408P
Part I: Location and Classification Information							
1. Primary Operating Railroad Northeast IL Regional Commuter Rail Corp.(METRA) (NIR)		2. State ILLINOIS		3. County COOK			
4. City / Municipality <input checked="" type="checkbox"/> In <u>GLENVIEW</u> <input type="checkbox"/> Near <u>GLENVIEW</u>		5. Street/Road Name & Block Number <u>GLENVIEW ROAD</u> (Street/Road Name) * (Block Number)		6. Highway Type & No. <u>FAU1297</u>			
7. Do Other Railroads Operate a Separate Track at Crossing? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Specify RR _____			8. Do Other Railroads Operate Over Your Track at Crossing? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Specify RR <u>CP</u> <u>CN</u>				
9. Railroad Division or Region <input type="checkbox"/> None <u>MILWAUKEE NORT</u>		10. Railroad Subdivision or District <input type="checkbox"/> None <u>C&M SUB</u>		11. Branch or Line Name <input type="checkbox"/> None <u>FOX LAKE</u>		12. RR Milepost <u>0017.18</u> (prefix) (nnnn.nnn) (suffix)	
13. Line Segment * <u>M17.18A</u>		14. Nearest RR Timetable Station * <u>GLENVIEW</u>		15. Parent RR (if applicable) <input type="checkbox"/> N/A		16. Crossing Owner (if applicable) <input type="checkbox"/> N/A <u>CCRZ</u>	
17. Crossing Type <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private		18. Crossing Purpose <input checked="" type="checkbox"/> Highway <input type="checkbox"/> Pathway, Ped. <input type="checkbox"/> Station, Ped.		19. Crossing Position <input checked="" type="checkbox"/> At Grade <input type="checkbox"/> RR Under <input type="checkbox"/> RR Over		20. Public Access (if Private Crossing) <input type="checkbox"/> Yes <input type="checkbox"/> No	
21. Type of Train <input type="checkbox"/> Freight <input type="checkbox"/> Intercity Passenger <input checked="" type="checkbox"/> Commuter <input type="checkbox"/> Transit <input type="checkbox"/> Shared Use Transit <input type="checkbox"/> Tourist/Other		22. Average Passenger Train Count Per Day <input type="checkbox"/> Less Than One Per Day <input checked="" type="checkbox"/> Number Per Day <u>78</u>		23. Type of Land Use <input type="checkbox"/> Open Space <input type="checkbox"/> Farm <input type="checkbox"/> Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Institutional <input type="checkbox"/> Recreational <input type="checkbox"/> RR Yard			
24. Is there an Adjacent Crossing with a Separate Number? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Provide Crossing Number _____				25. Quiet Zone (FRA provided) <input type="checkbox"/> No <input type="checkbox"/> 24 Hr <input type="checkbox"/> Partial <input checked="" type="checkbox"/> Chicago Excused Date Established _____			
26. HSR Corridor ID <input type="checkbox"/> N/A		27. Latitude in decimal degrees (WGS84 std: nn.nnnnnn) <u>42.07283</u>		28. Longitude in decimal degrees (WGS84 std: -nnn.nnnnnn) <u>-87.804726</u>		29. Lat/Long Source <input checked="" type="checkbox"/> Actual <input type="checkbox"/> Estimated	
30.A. Railroad Use * <u>28856</u>			31.A. State Use *				
30.B. Railroad Use * <u>VILLAGE</u>			31.B. State Use * <u>LAT/LONG PER ICC-SL</u>				
30.C. Railroad Use * <u>17.18</u>			31.C. State Use *				
30.D. Railroad Use *			31.D. State Use *				
32.A. Narrative (Railroad Use) *			32.B. Narrative (State Use) * <u>IDOT Hwy Data Update for 2017 @ 5/9/2017</u>				
33. Emergency Notification Telephone No. (posted) <u>800-349-4283</u>		34. Railroad Contact (Telephone No.) <u>312-322-6934</u>		35. State Contact (Telephone No.) <u>217-782-0378</u>			
Part II: Railroad Information							
1. Estimated Number of Daily Train Movements							
1.A. Total Day Thru Trains (6 AM to 6 PM) <u>39</u>		1.B. Total Night Thru Trains (6 PM to 6 AM) <u>43</u>		1.C. Total Switching Trains <u>0</u>		1.D. Total Transit Trains _____	
1.E. Check if Less Than One Movement Per Day <input type="checkbox"/>		How many trains per week? _____					
2. Year of Train Count Data (YYYY) _____			3. Speed of Train at Crossing 3.A. Maximum Timetable Speed (mph) <u>79</u> 3.B. Typical Speed Range Over Crossing (mph) From <u>10</u> to <u>79</u>				
4. Type and Count of Tracks Main <u>2</u> Siding _____ Yard _____ Transit _____ Industry _____							
5. Train Detection (Main Track only) <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							
6. Is Track Signaled? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			7.A. Event Recorder <input type="checkbox"/> Yes <input type="checkbox"/> No		7.B. Remote Health Monitoring <input type="checkbox"/> Yes <input type="checkbox"/> No		