

NOISE ANALYSIS REPORT

Hine Project

Stanton – EastBANC LLC

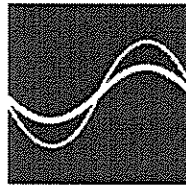
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Executive Summary

Acoustical Design Collaborative, Ltd has completed a noise analysis for the Hine Project at 8th Street, SE in Washington, DC. The Hine Project is a multi-use (residential, office and retail) development of four to seven stories at the existing Hine School site in Washington, DC.

Traffic noise measurements at the existing Hine School were performed. The measured traffic noise levels were used to calibrate a computer noise model created for the current Hine School and future Hine Project. Different scenarios for vehicular traffic volumes and building configurations were created within the computer model to calculate noise levels at the west facades of the 8th Street, SE residential buildings. Calculations were based on the most recent 2009 Annual Average Daily Traffic (AADT) volume from the District of Columbia Government, future 8th Street, SE traffic volume provided by Symmetra Design, dimensions of the 8th Street, SE road, the 8th Street, SE residential buildings, the existing Hine School, and the future Hine Project buildings.

Five computer scenarios were created to calculate the existing and future noise levels in terms of the Day Night Level (DNL) at the 8th Street, SE residential buildings.

Scenario 1 (Existing Conditions) was based on the existing Hine School building and the 2009 AADT volume (10,700 vehicles southbound on 8th Street, SE and 11,900 vehicles northbound on 8th Street, SE). This scenario provides a baseline to compare the existing noise levels. The results indicate the DNL levels at the 8th Street, SE residential building façades range between 72.8 and 75.9 dBA; the average DNL level is 74.4 dBA.

Scenario 2 (Future Build-Out with Future Traffic) was based on the future Hine Project buildings and the estimated future AADT volume (11,170 vehicles southbound on 8th Street, SE and 12,900 vehicles northbound on 8th Street, SE) due to the Hine Project. This scenario provides the change in noise environment due to the future Hine Project buildings and increased vehicular traffic due to the development. The future AADT volume was derived from the projected Hine Project residents/tenants (470 daily trips southbound on 8th Street, SE and 1,000 daily trips northbound on 8th Street, SE) and the 2009 AADT volume. The results indicate the DNL levels at the 8th Street, SE residential building façades range between 73.3 and 76.3 dBA; the average DNL level is 74.8 dBA.

Scenario 3 (Future Build-Out with Existing Traffic) was based on the future Hine Project buildings and the existing AADT volume (10,700 vehicles southbound on 8th Street, SE and 11,900 vehicles northbound on 8th Street, SE). This scenario provides a change in the noise environment due only to the future Hine Project buildings. The results indicate the DNL levels at the 8th Street, SE residential building façades range between 73.1 and 75.9 dBA; the average DNL level is 74.6 dBA.

Scenario 4 (Rooftop Swimming Pool) was based on the future Hine Project buildings and the estimated swimming pool noise from the 8th Street Component building. This scenario provides a change in the noise environment due to the swimming pool at the Hine Project buildings. Traffic noise was omitted from this model. The results indicate the DNL levels at the 8th Street, SE residential building façades range between 48.3 and 57.6 dBA; the average DNL level is 54.2 dBA.

Scenario 5 (Rooftop Mechanical Equipment) was based on the future Hine Project buildings and the estimated mechanical equipment noise from the Hine Project (cooling towers at 8th Street Component, Plaza Component, and South Buildings and condensing units and rooftop units at the North Building). This scenario provides a change in the noise environment due to the mechanical equipment at the Hine Project buildings. Traffic noise was omitted from this model. The results indicate the DNL levels at the 8th Street, SE residential building façades range between 49.5 and 54.0 dBA; the average DNL level is 51.8 dBA.

The change in the noise environment at the 8th Street, SE residential buildings due to the Hine Project are summarized below:

- Difference in future Hine Project buildings and future traffic volume compared to existing Hine School buildings and existing traffic volume – 0.40 dBA average noise level increase for 8th Street, SE residential buildings (Scenario 1 compared to Scenario 2);
- Difference in future Hine Project buildings compared to the existing Hine School buildings – 0.20 dBA average noise level increase for 8th Street, SE residential buildings (Scenario 1 compared to Scenario 3);
- Difference in future Hine Project traffic volume and existing traffic volume along 8th Street, SE – 0.20 dBA average noise level increase for all 8th Street, SE residential buildings (Scenario 2 compared to Scenario 3);
- Swimming pool noise will be less than the current and future traffic noise levels;
- Mechanical equipment noise will be less than the current and future traffic noise levels. Noise levels do not include planned screen walls that will further reduce noise emissions.

Noise levels at the 8th Street, SE residences from the future 8th Street, SE traffic volume, swimming pool, and mechanical equipment will be controlled by the vehicular traffic. Noise from the swimming pool and mechanical equipment will be considerably less than the traffic noise. The swimming pool and mechanical equipment sources will contribute very little to the total future noise level at the 8th Street, SE residences.

The change in noise levels at the 8th Street, SE residential buildings will be less than the threshold for noise level change humans can perceive, when considering the total noise levels due to the Hine Project buildings, future traffic volume, swimming pool, and mechanical equipment. It is anticipated the Hine Project will have a negligible noise impact on the 8th Street, SE residential buildings.

Additional information on the acoustic analysis is summarized below.

Objective

The objective of this study was to determine effect of the Hine Project buildings, to include the future façades, rooftop noise sources, and increased traffic volume on the noise exposure at the 8th Street, SE residential buildings.

The environmental noise analysis software CADNA-A has been used to analyze and determine the noise levels at the 8th Street, SE residential buildings due to the Hine Project. CADNA-A is an internationally recognized program for environmental noise prediction that has been in continuous development since 2003.

Analysis Concepts

Five different scenarios of possible buildings and noise sources were considered in the acoustic analysis to determine the change in noise levels at the 8th Street, SE residential buildings. A key concept in the analysis is the change in noise level is expressed as a differential between the existing and future site conditions.

Scenario 1 analyzed the current traffic noise at the 8th Street, SE residential buildings due to the existing Hine School building dimensions and the 2009 AADT traffic volume. This result was used to calibrate the computer model and served as a baseline to compare with other acoustic analysis scenarios.

Scenario 2 analyzed the future traffic noise at the 8th Street, SE residential buildings due to the dimensions of the future Hine Project buildings and the future traffic volume. The 2009 AADT traffic volume and the future vehicle count attributable to the Hine Project travelling both North and South on 8th Street, SE were used to define the future traffic volume. This result provides a potentially worst-case noise scenario for both future building dimensions and traffic.

Scenario 3 analyzed the traffic noise at the 8th Street, SE residential buildings due to the future Hine Project building dimensions and the 2009 AADT traffic volume. This result provides the noise contribution due to the future Hine Project buildings.

Scenario 4 and Scenario 5, respectively, analyzed the swimming pool and mechanical equipment noise from the Hine Project.

The site noise levels calculated by the CADNA-A program are reported in terms of A-weighted, single value, DNL noise levels, which is the standard noise metric for environmental noise evaluation.

Computer Model Assumptions

Assumptions have been made to create the computer models for the different analysis scenarios, which are described below.

Existing 8th Street, SE Residential Buildings

The majority of the existing 8th Street, SE residential buildings are 2-stories high with an English basement and sit on raised landscaped berms. From the site inspection, Google Earth topographical data, and the Hine Project Drawings (dated 23 November 2011), building blocks were created in the computer model to represent the 8th Street, SE residential buildings. Each building block is assigned a 33 ft elevation height above curb level.

Existing Hine School Buildings

The existing Hine School has three main buildings, a connecting building, and a parking lot at C Street, SE. The building on the corner of 8th and D Streets, SE is a 2-story brick building. The height of the building is 33 ft at the parapet. The building on 8th Street, SE south of the parking lot is a 4-story brick building. The height at the building parapet is 51 ft. The building on the corner of 7th Street, SE and Pennsylvania Avenue, SE is a 4-story, 59 ft high brick building. The one story connecting building is located between the 2-story and 4-story buildings on 8th Street, SE. The parking lot is North of these buildings at C Street, SE.

Future Hine Project Buildings

The future Hine Project consists of two main building blocks comprising South and North Buildings. The South Building includes the 8th Street Component, Plaza Component, and Office Component. The 8th Street Component is a 4 and 5-story brick residential building with a partial 6th floor level. The height of the 4th story parapet is 45 ft and the height of the 5th story parapet is 56 ft. The Plaza Component and North Building includes residential and retail units. The Plaza Component is a 5-story 59 ft high building. The North Building is a 4-story 50 ft high building. The Office Component includes office and retail and is a 7-story building with a parapet height 80 ft at the property line and 102 ft high at the penthouse parapet. The Office Component parking is located under the South building with the entrance on C Street, SE.

Traffic Noise

The predominant noise at the 8th Street, SE residential buildings is vehicular traffic from 8th Street, SE travelling between D Street, SE and North of C Street, SE that defines the Hine Project boundary. The 2009 AADT traffic volume of 10,700 vehicles southbound and 11,900 vehicles northbound for this road segment was published in February 2011 by the District of Columbia Department of Transportation. The mix of automobiles, medium trucks/buses, and heavy trucks is, respectively, 90 percent, 6 percent, and 4 percent.

Based on data provided by Symmetra Design (project Traffic Engineers), the Hine Project is estimated to generate 470 daily trips southbound on 8th Street, SE and 1,000 daily trips northbound on 8th Street, SE. The estimated future AADT volume due to the Hine Project development will be 11,170 vehicles southbound and 12,900 vehicles northbound per day traveling along 8th Street, SE.

Other Noise Sources

The swimming pool and rooftop mechanical equipment are other noise sources at the Hine Project. The swimming pool is located on the roof at the Northeast corner of the 8th Street Component building. To determine the swimming pool noise levels, activity noise levels were measured at an outdoor swimming pool and adjusted to account for 10 children and adults assumed to be playing in the 8th Street Component building swimming pool. A noise level of 100 dBA was used at the center of the rooftop swimming pool based on the swimming pool noise measurements and adjustment for 10 children and adults.

Forty-four condensing units, three air handler units, and two exhaust fans are located on the roof of the North Building. The typical A-weighted sound power level of each condensing

unit is 65 dBA and 85 dBA for each air handler unit and exhaust fan. Cooling towers are located on the roof of the 8th Street Component, Plaza Component, and Office Component buildings. The typical sound power level for each cooling tower is 105 dBA.

Acoustic Calculations and Results

Five CADNA-A noise model scenarios were created to include different combinations of buildings, traffic volumes, swimming pool, and mechanical equipment noise sources.

Scenario 1 - Existing AADT Traffic Volume and Hine School Building

Scenario 1 analyzes the current traffic noise levels at the 8th Street, SE residential buildings due to the existing Hine School building and the 2009 AADT traffic volume (10,700 vehicles southbound on 8th Street, SE and 11,900 vehicles northbound on 8th Street, SE).

Table 1 summarizes the calculated noise levels at the 8th Street, SE residential buildings. The noise levels range from DNL 72.8 to 75.9 dBA at the center of the building depending on location. The average for all buildings is DNL 74.4 dBA. The calculated DNL noise contours for this scenario are shown in Figures A1 and A2 in Appendix A.

Table 1. Noise Levels at 8th Street, SE Residential Buildings (Existing AADT Traffic Volume and Hine School Building)		
Building Location		DNL, dBA
South of C Street, SE	340 8th Street, SE	73.7
	338 8th Street, SE	74.3
	336 8th Street, SE	74.3
	334 8th Street, SE	74.2
	332 8th Street, SE	73.1
	330 8th Street, SE	72.8
	328 8th Street, SE	73.6
	326 8th Street, SE	73.4
	324 8th Street, SE	73.3
	322 8th Street, SE	73.5
	320 8th Street, SE	74.5
	318 8th Street, SE	74.3
	316 8th Street, SE	74.3
	314 8th Street, SE	74.6
	312 8th Street, SE	74.3
310 8th Street, SE	75.2	
801 C Street, SE	75.6	
North of C Street, SE	258 8th Street, SE	75.6
	256 8th Street, SE	75.1
	254 8th Street, SE	75.3
	252 8th Street, SE	75.3
	250 8th Street, SE	75.9
Average		74.4

Scenario 2 - Future AADT Traffic Volume and Hine Project Buildings

Scenario 2 analyzes the future traffic noise level at the 8th Street, SE residential buildings due to the future AADT traffic volume along 8th Street, SE and the Hine Project buildings. The future AADT volume (11,170 vehicles southbound on 8th Street, SE and 12,900 vehicles northbound on 8th Street, SE) includes projected trips by Hine Project residents/tenants (470 daily trips southbound on 8th Street, SE and 1,000 daily trips northbound on 8th Street, SE) and the 2009 AADT volume (10,700 vehicles southbound on 8th Street, SE, and 11,900 vehicles northbound on 8th Street, SE).

Table 2 summarizes the calculated noise levels at the 8th Street SE residential buildings. The noise levels range from DNL 73.3 to 76.3 dBA at the center of the building depending on location. The average for all buildings is DNL 74.8 dBA. The calculated DNL noise contours for this scenario are shown in Figures B1 and B2 in Appendix B.

Building Location	DNL, dBA	
South of C Street, SE	340 8th Street, SE	74.2
	338 8th Street, SE	74.7
	336 8th Street, SE	74.8
	334 8th Street, SE	74.7
	332 8th Street, SE	73.5
	330 8th Street, SE	73.3
	328 8th Street, SE	74.1
	326 8th Street, SE	73.9
	324 8th Street, SE	73.7
	322 8th Street, SE	73.9
	320 8th Street, SE	74.9
	318 8th Street, SE	74.7
	316 8th Street, SE	74.6
	314 8th Street, SE	75.0
	312 8th Street, SE	74.7
	310 8th Street, SE	75.6
	801 C Street, SE	76.0
North of C Street, SE	258 8th Street, SE	76.0
	256 8th Street, SE	75.6
	254 8th Street, SE	75.8
	252 8th Street, SE	75.7
	250 8th Street, SE	76.3
Average	74.8	

Comparing Scenario 1 to Scenario 2 indicates the maximum noise level increases 0.40 dBA at the 8th Street, SE residential buildings due to the future Hine Project buildings and traffic volume attributable to the Hine Project. The noise level increase is insignificant.

Scenario 3 - Existing AADT Traffic Volume and Hine Project Buildings

Scenario 3 analyzes the traffic noise at the 8th Street, SE residential buildings due to the future Hine Project buildings and the 2009 AADT volume (10,700 vehicles southbound on 8th Street, SE and 11,900 vehicles northbound on 8th Street, SE) along 8th Street, SE.

Table 3 summarizes the calculated noise levels at the 8th Street, SE residential buildings. The noise levels at the 8th Street, SE residential buildings range from DNL 73.1 to 75.9 dBA at the center of the building depending on location. The average for all buildings is DNL 74.6 dBA. The calculated DNL noise contours for this scenario are shown in Figures C1 and C2 in Appendix C.

Building Location	DNL, dBA	
South of C Street, SE	340 8th Street, SE	74.1
	338 8th Street, SE	74.5
	336 8th Street, SE	74.6
	334 8th Street, SE	74.5
	332 8th Street, SE	73.4
	330 8th Street, SE	73.1
	328 8th Street, SE	73.9
	326 8th Street, SE	73.7
	324 8th Street, SE	73.5
	322 8th Street, SE	73.7
	320 8th Street, SE	74.7
	318 8th Street, SE	74.5
	316 8th Street, SE	74.5
	314 8th Street, SE	74.8
	312 8th Street, SE	74.5
310 8th Street, SE	75.4	
801 C Street, SE	75.8	
North of C Street, SE	258 8th Street, SE	75.7
	256 8th Street, SE	75.2
	254 8th Street, SE	75.4
	252 8th Street, SE	75.4
	250 8th Street, SE	75.9
Average	74.6	

Comparing Scenario 1 to Scenario 3 indicates the maximum noise level increases 0.20 dBA at the 8th Street, SE residential buildings due to the future Hine Project buildings. The noise level increase is insignificant.

Comparing Scenario 2 to Scenario 3 indicates the maximum noise level increases 0.20 dBA due to the increase in traffic volume attributable to the Hine Project. The noise level increase is insignificant.

Scenario 4 - Swimming Pool and Hine Project Buildings

Scenario 4 analyzes the future swimming pool noise at the 8th Street, SE residential buildings (8th Street Component).

Table 4 summarizes the calculated noise levels at the 8th Street, SE residential buildings. The noise levels at the 8th Street, SE residential buildings range from DNL 48.3 to 57.6 dBA at the center of the building depending on location. The average for all buildings is DNL 54.2 dBA. The calculated DNL noise contours for this scenario are shown in Figures D1 and D2 in Appendix D.

Building Location	DNL, dBA	
South of C Street, SE	340 8th Street, SE	51.0
	338 8th Street, SE	48.3
	336 8th Street, SE	49.9
	334 8th Street, SE	51.4
	332 8th Street, SE	52.2
	330 8th Street, SE	49.1
	328 8th Street, SE	52.0
	326 8th Street, SE	54.6
	324 8th Street, SE	55.1
	322 8th Street, SE	57.6
	320 8th Street, SE	56.3
	318 8th Street, SE	55.5
	316 8th Street, SE	55.7
	314 8th Street, SE	55.9
	312 8th Street, SE	56.1
310 8th Street, SE	56.2	
801 C Street, SE	56.9	
North of C Street, SE	258 8th Street, SE	57.3
	256 8th Street, SE	55.8
	254 8th Street, SE	55.4
	252 8th Street, SE	54.1
	250 8th Street, SE	54.8
Average	54.2	

Comparing Scenario 4 to Scenario 1, the average noise levels due to the swimming pool at the 8th Street, SE residences will be 20 dBA less than the traffic noise levels for all 8th Street, SE residential buildings. Thus, the swimming pool noise will be an insignificant contributor to the total noise levels at the 8th Street, SE residences.

Scenario 5 - Mechanical Equipment and Hine Project Buildings

Scenario 5 analyzes the future mechanical equipment noise from the South and North Buildings at the 8th Street, SE residential buildings.

Table 5 summarizes the calculated noise levels at the 8th Street, SE residential buildings. The noise levels at the 8th Street, SE residential buildings range from DNL 49.5 to 54.0 dBA at

the center of the building depending on location. The average for all buildings is DNL 51.8 dBA. The calculated DNL noise contours for this scenario are shown in Figures E1 and E2 in Appendix E.

Building Location		DNL, dBA
South of C Street, SE	340 8th Street, SE	49.9
	338 8th Street, SE	49.5
	336 8th Street, SE	50.1
	334 8th Street, SE	50.5
	332 8th Street, SE	50.8
	330 8th Street, SE	51.8
	328 8th Street, SE	52.5
	326 8th Street, SE	52.1
	324 8th Street, SE	53.2
	322 8th Street, SE	54.0
	320 8th Street, SE	53.2
	318 8th Street, SE	52.9
	316 8th Street, SE	52.1
	314 8th Street, SE	52.9
	312 8th Street, SE	52.8
310 8th Street, SE	52.3	
801 C Street, SE	52.3	
North of C Street, SE	258 8th Street, SE	52.0
	256 8th Street, SE	51.0
	254 8th Street, SE	50.9
	252 8th Street, SE	51.7
	250 8th Street, SE	51.9
Average		51.8

Comparing Scenario 5 to Scenario 1, the average noise levels due to the mechanical equipment at the 8th Street, SE residences will be a minimum 22 dBA less than the traffic noise levels for all 8th Street, SE residential buildings. The calculated noise levels do not include the effect of screen walls around the mechanical equipment that will further reduce noise emission levels. Thus, the mechanical equipment noise will be an insignificant contributor to the total noise levels at the 8th Street, SE residences.

Conclusions

Acoustical Design Collaborative, Ltd has completed a noise analysis for the residences along 8th Street, SE adjacent to the Hine Project in Washington, DC.

Five computer model scenarios were created to calculate the change in noise levels due to the Hine Project. The computer model scenarios included the existing conditions, change in traffic volume, Hine Project building dimensions, rooftop swimming pool, and rooftop mechanical equipment affecting noise levels at the 8th Street, SE residences.

The calculations indicate small changes in the noise levels at the 8th Street, SE residences due to the Hine Project. Noise levels are calculated to increase 0.20 dBA due to the future Hine

Project buildings and 0.20 dBA due to the increased traffic volume from the Hine Project travelling on 8th Street, SE. The combined noise level increase is 0.40 dBA, a negligible change.

Noise from the rooftop swimming pool and mechanical equipment will be less than the current and future traffic noise levels at the 8th Street, SE residences and will not significantly add to the total noise exposure at the residences.

The change in noise levels at the 8th Street, SE residential buildings will be less than the threshold for noise level change humans can perceive, when considering the total noise levels due to the Hine Project buildings, future traffic volume, swimming pool, and mechanical equipment. It is anticipated the Hine Project will have a negligible noise impact on the 8th Street, SE residential buildings.

Please contact me at 410.821.5930 or email at nts@akustx.com if you have any questions regarding the results of this analysis or our conclusions.