Veneklasen Associates
Consultants in Acoustics | Noise | Vibration | AV | IT

January 31, 2022

McGough
2737 Fairview Avenue North
St. Paul, Minnesota 55113

Attention: **Joy Jayaram | Project Executive**

Subject: **Bloomington Central Station Phase 4**
Bloomington, Minnesota
Exterior Noise and Exterior Façade Analysis
Veneklasen Project No. 4135-003

Dear Joy:

Veneklasen Associates, Inc. (Veneklasen) has completed our review of the Bloomington Central Station Phase 4 project located in Bloomington, Minnesota. This report predicts the exterior noise level at the site using measurements and computer modeling. Using this information, interior noise levels were calculated based on the exterior noise exposure and the construction types proposed. From this, the exterior façade design was determined. This report represents the results of our findings.

1.0 INTRODUCTION

This study was conducted to determine the impact of the exterior noise sources on the Bloomington Central Station Phase 4 project in Bloomington, Minnesota. Veneklasen's scope of work included calculating the exterior noise levels impacting the site and determining the method, if any, required to reduce the interior and exterior sound levels to meet the applicable code requirements of the State of Minnesota and the City of Bloomington.

The project consists of a 6-level mixed-use development with ground floor grocery store and residential amenities. The project is bounded by 30th Avenue South to the west, existing hotel and park uses to the east, existing parking lot to the north, and the Blue Line light rail to the south.

2.0 NOISE CRITERIA

The following are a few acoustic terms and definitions that should be understood as these are referenced in the remainder of the report.

Decibel (dB) – The decibel is a measure, on a logarithmic scale, of the magnitude of a particular quantity (such as sound pressure level or sound power level) with respect to a standard reference value.

Equivalent Sound Level (Leq) – A steady noise level which over a period of time has the same sound energy as the time varying noise.

A-Weighted Sound Level – The ear does not respond equally to all frequencies but is less sensitive at low and high frequencies than it is a medium or speech range frequencies. Thus, to obtain a single number representing the sound level of a noise containing a wide range of frequencies in manner representative of the ear's response, it is necessary to reduce the effects of the low and high frequencies with respect to the medium frequencies. The resultant sound level is said to be A-weighted, and the units are dBA. The A-weighted sound level is also called the noise level.

DNL or LDN (Day-Night Noise Level) is the 24-hour equivalent sound pressure level in which the nighttime noise levels, occurring between the hours of 10 p.m. and 7 a.m., are weighted by adding 10 dB of sound level to the measured hourly average.

L10 – The sound level is exceeded 10 percent of the time. This is a measure of the louder sound levels during the measurement period. Example: During a 1-hour measurement, an L10 of 85 dBA means the sound level was at or above 85 dBA for 6 minutes.

L50 – The sound level is exceeded 50 percent of the time. This is a measure of the louder sound levels during the measurement period. Example: During a 1-hour measurement, an L50 of 67 dBA means the sound level was at or above 67 dBA for 30 minutes.

3.0 NOISE CRITERIA

3.1 Regional 2040 Transportation Policy Plan – Appendix L: Aviation Land Use Compatibility Guidelines

Below are the applicable tables presented in Appendix L of the Regional 2040 Transportation Policy Plan:

Figure 1 – Regional 2040 Transportation Policy Plan: Interior Noise Standards

Land Use	Interior Sound Level**
Residential	45dba
Educational/Medical	45dba
Cultural/Entertainment/Recreational	50dba***
Office/Commercial/Retail	50dba
Services	50dba
Industrial/Communications/Utility	60dba
Agricultural Land/Water Area/Resource Extraction	60dba

* Do not apply to buildings, accessory buildings, or portions of buildings that are not normally occupied by people.

** The federal DNL descriptor is used to delineate all the system airport noise policy zones.

*** Special attention is required for certain noise sensitive uses, for example, concert halls.

Figure 2 – Regional 2040 Transportation Policy Plan: Land Compatibility Standards

Land Use Category	New Development Major Redevelopment			
Noise Exposure Zones	1 DNL 75+	2 DNL 74-70	3 DNL 69-65	4 DNL 64-60
Residential	INCO	INCO	INCO	INCO
Single / Multiplex with Individual Entrance	INCO	INCO	COND	PROV
Multiplex / Apartment with Shared Entrance	INCO	INCO	INCO	COND
Mobile Home				

Based on the '2019 Annual Noise Contour Report' produced by the Metropolitan Airports Commission, the project is located in the 60 – 64 LDN range. Therefore, the project is considered 'PROV' or Provisional. This policy states that "structures built after December 1983 shall be acoustically constructed so as to achieve the interior sound levels described in Table L-4. Each local governmental unit having land within the airport noise zones is responsible for implementing and enforcing the structure performance standards in its jurisdiction." *Therefore, the applicable interior noise criterion according to this policy is 45 DNL.*

3.2 Minnesota Pollution Control Agency (MPCA) – A Guide to Noise Control in Minnesota

Section 7030, Noise Pollution Control, states that "any municipality having authority to regulate land use shall take all reasonable measures within its jurisdiction to prevent the establishment of land use activities listed in noise area classification (NAC) 1, 2, of 3 in any location where the standards established in part 7030.0040 will be violated immediately upon establishment of the land use."

Section 7030.0040, 'Noise Standards', establishes the limiting levels of sound based on the preservation of public health and welfare and is grouped according to land activities by the noise are classification (NAC) system. Noise standards are established for daytime and nighttime hours and use the L10 and L50 metrics. Below are the noise standards:

Figure 3 – MPCA Noise Standards Summary

Noise Area Classification	Daytime		Nighttime	
	L_{10}	L_{50}	L_{10}	L_{50}
1	65	60	55	50
2	70	65	70	65
3	80	75	80	75

The guide also states the noise area classification is based on the land use activity at the location of the receiver and determines the noise standards applicable to that land use activity unless an exception is applied under Section 7030.0050, subpart 3. This project is in NAC1 because it is residential.

Subpart 3, Exceptions, states the following: The noise area classification for a land use may be changed in the following ways if the applicable conditions are met.

A. The daytime standards for noise area classification one shall be applied to noise area classification one during the nighttime if the land use activity does not include overnight lodging.
B. The standards for a building in a noise area classification two shall be applied to a building in a noise area classification one if the following conditions are met:
    1. The building is constructed in such a way that the exterior to interior sound level attenuation is at least 30 dB(A);
    2. The building has year-round climate control; and
    3. The building has no areas or accommodations that are intended for outdoor activities.

Based on Veneklasen's noise measurements and calculations the project will require the noise mitigation listed above under Subpart 3.B.

If the windows must be closed to meet an interior level described, then a mechanical ventilating system or other means of natural ventilation shall be provided. The ventilation cannot compromise the acoustical isolation of the exterior façade.

3.3 City of Bloomington Municipal Code

Section 21.301.12 "NOISE ATTENUATION" of the City of Bloomington Municipal Code provides the following requirements for new construction within airport noise contour regions:

- *Airplane noise attenuation.*
    - *Applicability.* All new construction or change in use located at or above the 60 dB DNL [LDN] Contour must meet the standards of this section. The area at or above the 60 dB DNL [LDN] Contour is determined by combining all areas within the 60 dB DNL [LDN] noise exposure area on the Annual Contour Map with all areas forecast to have noise levels at or above 60 dB DNL [LDN] on the Future Contour Map at the time an application is made to the city.
        - *Interior noise performance standard.* New residential, place of assembly, hospital, or educational construction or uses must demonstrate building construction will yield an average interior sound level of 45 dBA or less with windows closed for living or sleeping areas or parts of schools that are used for educational instruction.
        - *Compliance.* Projects located at or above the 60 dB DNL [LDN] Contour must include installation of central air conditioning and mechanical ventilation throughout the habitable areas of the structure and must demonstrate compliance with the interior noise performance standard by either performing an acoustical analysis by a certified sound specialist to demonstrate the proposed building will meet the performance standard ~~or apply the materials standards set forward in the following table~~.

This report provides the acoustical analysis mentioned above that is required to show compliance with these criteria. Therefore, there is no need to follow prescribed assembly ratings provided in further sections of this code language.

3.4 Exterior Noise Levels

There is no regulatory requirement for noise levels on balconies in Bloomington. Industry standard practice is that an exterior noise level up to 65 LDN is acceptable for residential uses. Levels above 65 LDN may be considered intrusive to a percentage of the population in some uses. In many urban locations, it is not feasible to reduce exterior noise levels below 65 LDN. For small private balconies, in Veneklasen's opinion there is no feasible mitigation. Balcony barriers have been employed on some projects, but numerous studies have concluded that they provide little acoustical benefit. Balcony barriers mostly enclose the balcony, negating the purpose of including private balconies. For this reason, many municipalities exclude private balconies less than 6 feet in depth from their standards.

4.0 EXTERIOR NOISE ENVIRONMENT

4.1 Noise Measurements

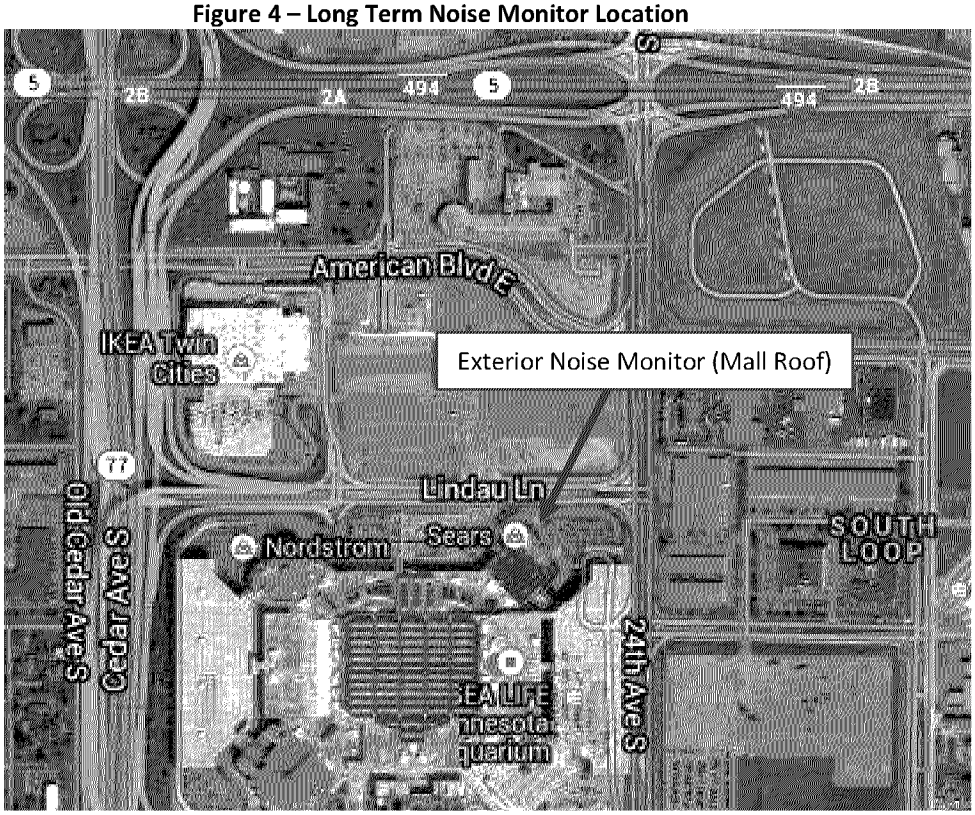
Aircraft

Veneklasen performed noise measurements from October 8-10, 2013, on the roof the Mall of America (Bloomington, MN). The measurement location has similar exposure to aircraft taking off from MSP airport. See Figure 4. Veneklasen used a Bruel & Kjaer type 2260 sound level meter (type I), which continuously logged the sound level during the measurement period. The height of the microphone was set to 5 feet above the roof. Data for all three days was analyzed. Aircraft takeoff events are clearly evident on the log, with the typical event having maximum noise level of approximately 80 dBA compared to a background level of about

62 dBA (daytime).

Depending on the prevailing winds and other factors, the flight path Runway 17 just west of the project site is used for takeoffs, landings, or not at all. The noise from arriving (landing) aircraft does not significantly affect the overall noise level at the site. Departing aircraft are much louder and potentially intrusive, so the required mitigation at the site is entirely controlled by the sound levels during times when the airplanes depart to the south (plane takeoffs to the south). According to the Metropolitan Airport Commission (MAC), almost 100% of the activity in the month of October on Runway 17 were departing aircraft events. MAC also states that Runway 17 had 683 departures of all operations during the nighttime hours (10:30pm to 6:00am) of 2012. This is an average of 2 nighttime events daily for the year 2012.

Figure 4 – Long Term Noise Monitor Location



The Flight Tracker feature on the macnoise.com website provides a record of every flight in and out of the airport. For example, Figure 5 shows the flight path (green lines indication departing aircraft) from 4pm – 10pm on October 8, 3012, during the measurement period. It is evident that there are a large number of aircraft events potentially impacting the project site.

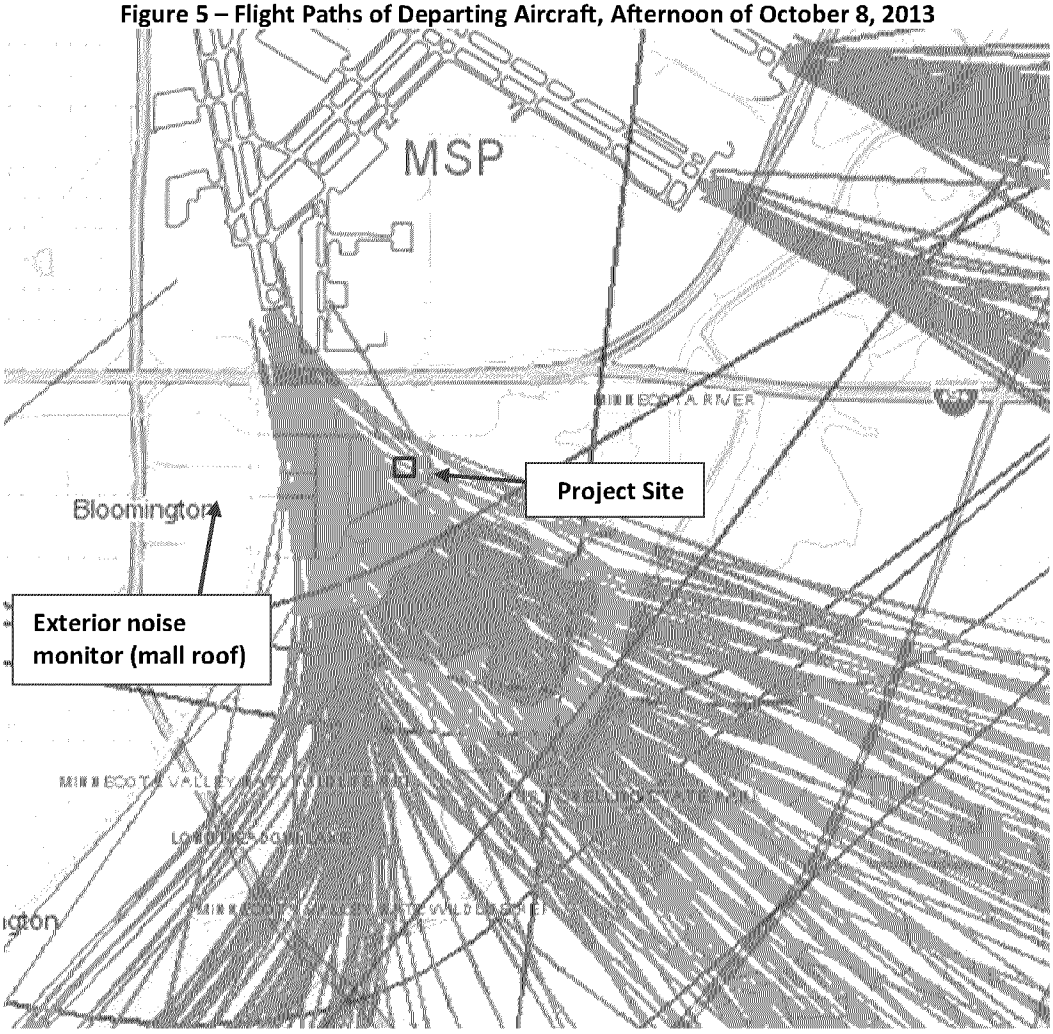
Comparison of the logged sound level with the Flight Tracker data confirms that the Flight Tracker data is accurate. Looking at historical Flight Tracker data, the measured day was one of the busiest days for this flight path. On some days, there are significantly fewer aircraft events; however, there are many days that had a similar number of flights as the day measured. Therefore, the measured levels provide a suitable basis for design.

During the 24-hour period, 414 aircraft take-offs were logged. The average maximum level during the aircraft flyover was 80 dBA; the 90th percentile level was 85 dBA. Table 1 below presents a summary of the measured noise levels in metrics found within the MPCA.

Table 1 – Summary of Measured Aircraft Noise Levels

Daytime, dBA		Nighttime, dBA	
L10	**L50**	**L10**	**L50**
71	64	65	58

Figure 5 – Flight Paths of Departing Aircraft, Afternoon of October 8, 2013



Light Rail Train

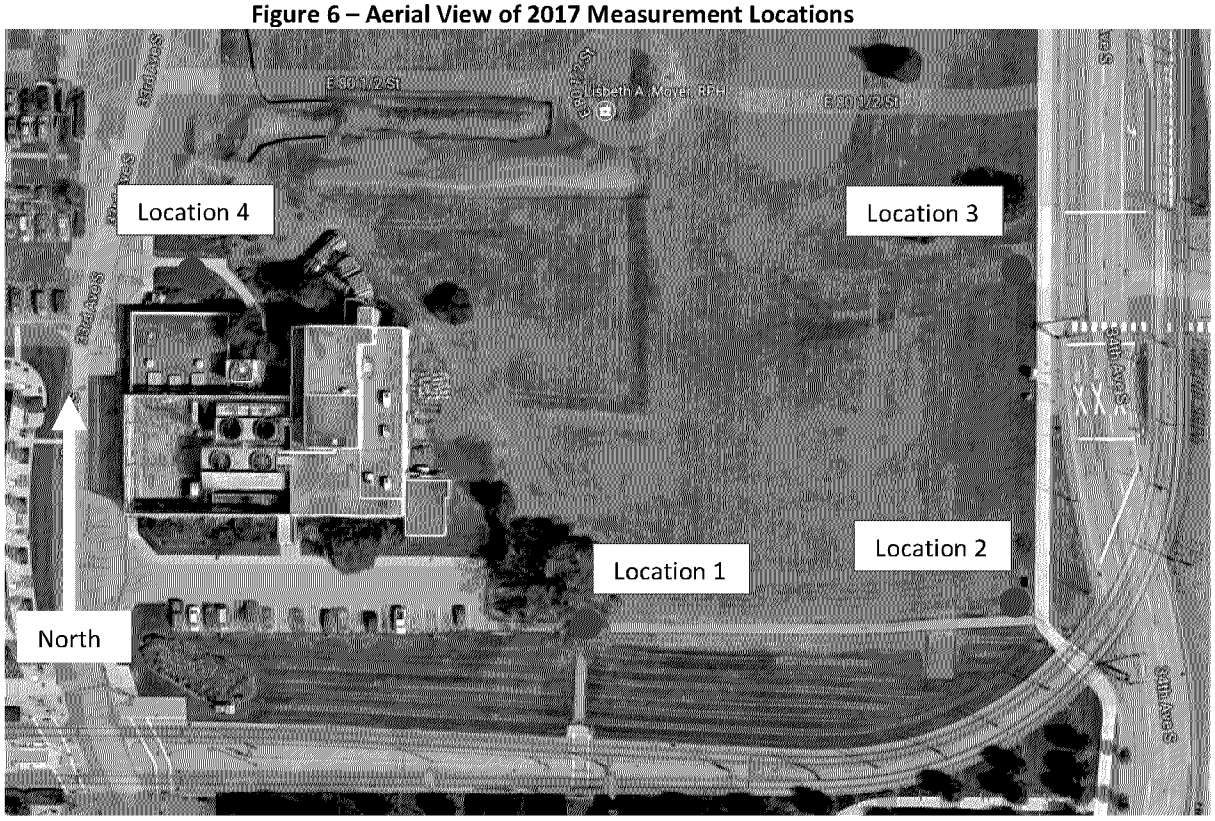
Veneklasen performed measurements of a Blue Line train arriving at Bloomington Central Station. The event included the noise from the train movement and warning bells. The measurement was taken at a distance of approximately 85 feet south of the station. The resultant noise level was 70 dBA Leq with a duration of approximately 25 seconds. Based on the train schedule presented at metrotransit.org for the American Boulevard Station, train activity begins during the 3am hour and ends during the 11pm hour. Considering northbound and southbound trains there are approximately 200 train events for a typical weekday with 9 events occurring during the nighttime hours from 10pm to 7am. Based on our measurements and the Blue Line train schedule, Veneklasen calculated the resultant noise level at the south façade of the project to be 64 LDN.

Veneklasen supplemented the earlier measurement programs with additional measurements, conducted on Tuesday, October 10, 2017. Table 2 and Figure 6 show the location and summary of the noise measurements.

Table 2 – Measured Sound Levels, 2017

Location	Leq, dBA	Daytime, dBA	
		L10	L50
Location 1	61	65	55
Location 2	60	62	58
Location 3	64	67	59
Location 4	60	62	58

Figure 6 – Aerial View of 2017 Measurement Locations



4.2 Computer Modeling – Traffic Noise

Veneklasen has utilized the Traffic Noise Model computer software program developed by the FHWA (Federal Highway Administration) in order to predict traffic noise levels at various locations. Current traffic counts for East American Boulevard were obtained from the Minnesota Department of Transportation website[1]. This roadway is not directly adjacent to the project site, however, there were no published traffic noise levels for 30th Avenue South. The published traffic count data for 2017 was 8,300 daily events. No future traffic counts were available and Veneklasen has estimated the future conditions for roadways using a 2% increase per year. Veneklasen understands that a traffic study has not been completed that would confirm these predictions. The increase in noise level due to traffic by 2030 is calculated to be approximately 1 dB. However, some of the façades will be exposed to less traffic noise due to shielding provided by the development of the site.

[1] http://www.dot.state.mn.us/traffic/data/

4.3 Overall Exterior Exposure

Based on our measurements, computer model, and the project site plan provided by the Client, Veneklasen calculated the existing and future noise levels at various locations within the project site. The calculated noise level for each zone is based on the contribution of the aircraft activity associated with Runway 17, vehicular noise, and light rail train noise associated with the Blue Line.

To simplify the presentation of the exterior noise levels, Veneklasen has separated the site into zones based on the sound exposure and required mitigation. The variance of sound level in the vertical dimension (upper levels) is negligible. The predicted sound levels at each zone, shown in Figure 7, are listed below in Table 3. The table shows the contribution of each noise source to the resultant LDN noise level for each zone. Table 3 shows that the future LDN is greater than the existing, so the calculations within this report are based on the future LDN.

Table 3 – Existing and Future Average Exterior Noise Levels by Location

Location	Traffic Noise, LDN	Aircraft Noise, LDN	Train Noise, LDN	Total Future, LDN
Zone A	54	64	61	66
Zone B	57	64	58	66
Zone C	51	64	64	67
Zone D	54	64	61	66

The south and west façades will experience the highest noise levels due to exposure to the light rail and the aircraft paths. The north and east façades will experience lesser noise levels due to shielding from the light rail and the distance from roadways. All project areas are within 60 LDN airport noise contours (or greater). Per City Code, discussed in Section 3.3, all units shall provide sufficient noise reduction so as not to exceed 45 dBA at interior living spaces.

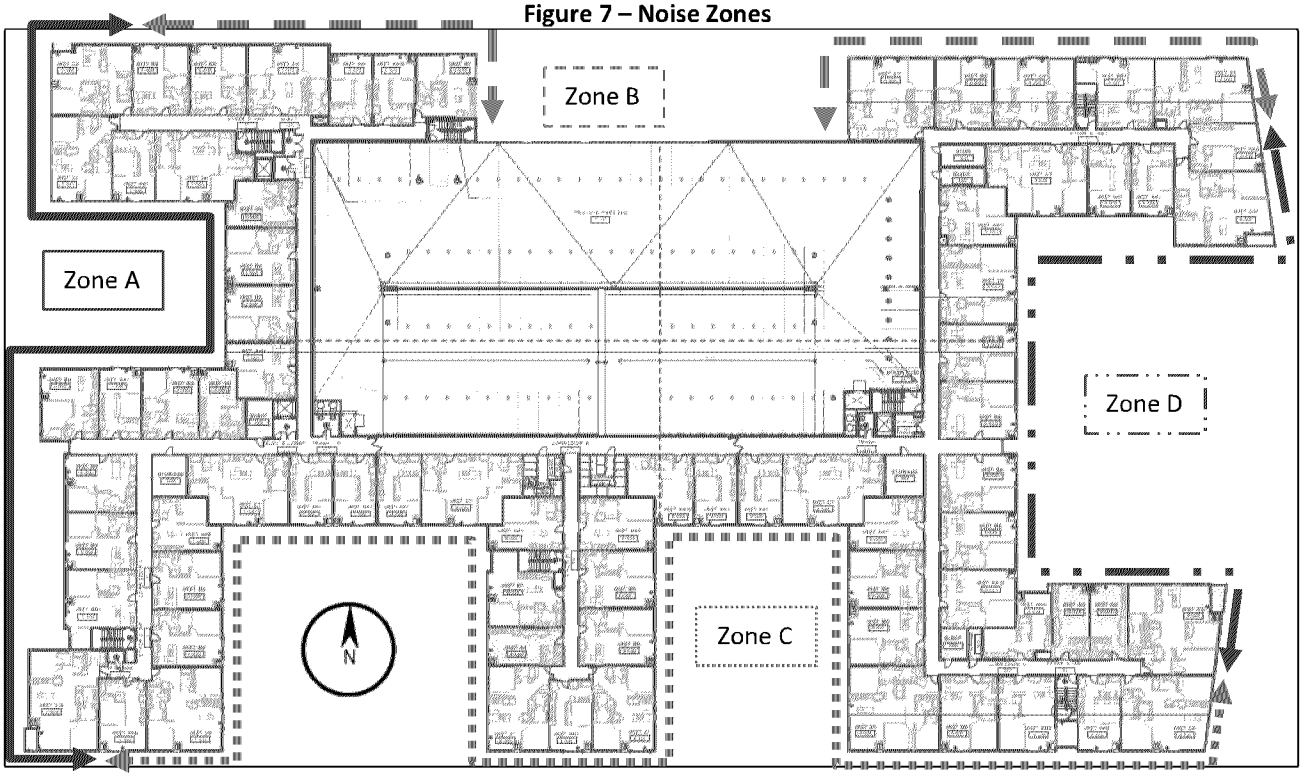
Table 4 below shows the L10 for each noise zone.

Table 4 – Calculated L10 Noise Levels

Location	Daytime L10	Nighttime L10
Zone A	71	65
Zone B	68	62
Zone C	69	63
Zone D	66	60

Based on the levels presented in Table 4, the site has noise levels in the NAC2 range per MPCA section 7030. To comply with the MPCA requirements in Section 3.B, the building's exterior envelope has to provide at least 30 dB of noise reduction. Because the L10 varies across the project, Veneklasen's interpretation is to satisfy the criteria in the loudest noise exposure Zone and maintain the resultant interior noise level throughout the remainder of the project. The loudest exposure is the daytime L10 in Zone A of 71 dBA; the resultant required interior L10 is 41 dBA. Therefore, an interior L10 from aircraft of 41 dBA is the criterion that satisfies the MPCA standards.

Figure 7 – Noise Zones



5.0 INTERIOR NOISE CALCULATION

5.1 Exterior Facade Construction

Veneklasen understands that the exterior wall will include either a corrugated metal panel or cement plaster finish over 5/8-inch fiberglass faced gypsum sheathing on 2x8 wood studs spaced 16 inches on center with 6 inches of batt insulation and a layer of gypsum board on the interior. Veneklasen's calculations include the exterior wall construction for the building but indicate that the interior noise levels are determined by the acoustical performance of the glazing system.

Bedrooms in Zone A will require an exterior wall upgrade to achieve acoustical design standards. Incorporate an extra layer of gypsum board at the interior side of the partition. This is shown in Detail EW2/A6.1, but should be called out in the plans where used.

Veneklasen's calculations also included the roof assembly, consisting of roof ballast (15 psf), 60 mil EPDM membrane, vapor retarder, 14-inch I-Joists, R-30 insulation, and one layer of gypsum board on the interior. For locations within 8 feet of roof drains, provide Pabco SoundBreak gypsum board in lieu of standard type x gypsum board.

5.2 Interior Noise Level Calculations

Veneklasen utilized the glazing ratings (glass, frame and seals) shown in Appendix I. Appendix I shall be the exterior window and door acoustical specification for the project. Veneklasen calculated the interior level within the residential units given the calculated noise environment and the exterior façade construction described above. Calculations were based on the plans dated June 24, 2021. This calculation included the exterior wall and roof construction described herein.

Table 5 shows the required STC ratings to satisfy both the TPP requirements and the City Code requirements, and Table 6 shows the STC ratings required to meet the MPCA standards. Note that to achieve the MPCA standards in Zone A, an extra layer of gypsum board is required at the interior of the exterior wall as discussed above in Section 5.1.

Table 5 – Calculated Future Interior and Exterior LDN Noise Levels

Location	Exterior LDN	Window/Door Rating	Interior LDN
Zone A	66	STC 28	< 45
Zone B	66	STC 28	< 45
Zone C	67	STC 28	< 45
Zone D	66	STC 28	< 45

Table 6 – Calculated Future Interior and Exterior L10 Levels

Location	Daytime Exterior L10	Room Types	Window/Door Rating	Interior L10
Zone A	71	Bedrooms*	STC 37	≤ 41
		Other Spaces	STC 34	≤ 41
Zone B	68	Bedrooms	STC 34	< 41
		Other Spaces	STC 32	< 41
Zone C	69	Bedrooms	STC 34	< 41
		Other Spaces	STC 32	< 41
Zone D	66	Bedrooms	STC 28	< 41
		Other Spaces	STC 28	< 41

*: Bedrooms in this zone will require the exterior wall upgrade discussed in Section 5.1.

The Agency also recommends the project have year-round climate control and no areas or accommodations that are intended for outdoor activities. The outdoor activity areas, such as the pool area, do not comply with the Agency's suggested mitigation measures. A variation of this would need to be pursued to allow these areas to be included in the design (if this criterion applies).

5.3 Mechanical Ventilation - Residential

Because the windows and doors must be kept closed to meet the noise requirements at some locations, mechanical ventilation is required in those areas. The architect should review and determine if this is a Code requirement. If so, all of the residential units will require mechanical ventilation. The mechanical ventilation shall meet all Code requirements, including the capability to provide sufficient fresh air exchanges, without depending on open windows or leakage through windows and doors. The ventilation system shall not compromise the sound insulation capability of the exterior façade assembly.

Veneklasen understands that a Magic Pak system located in a mechanical closet will provide ventilation for the units in the subject project. In discussions with the client, there are three primary penetrations in the exterior façade required for this system:

- Outside Combustion Air: Air intake louver flush up against the unit that is approximately 3.5ft by 2ft. Intake air is used for the gas combustion system of the unit.
- Outside Fresh Air: A small-diameter flexible ductwork penetration in the façade directly above the unit. Ductwork is routed through the joist system above the closet and then downward into the unit.
- Exhaust Air: Similar to the outside air, a small-diameter flexible duct work penetration in the façade. However, per code requirements, this will be a minimum of 10 feet away from the outside air intake. It will also be routed into the joist system, over to the closet, and downward into the unit.

Noise reduction calculations for each sound path listed above indicate that the system will provide a minimum of 30 dBA of exterior-to-interior noise reduction as currently designed. Inform Veneklasen of any other vents to the exterior from this system not listed above.

6.0 SUMMARY

The following summarizes the acoustical items required to satisfy the noise criteria as described in this report.

- According to the MPCA the outdoor activity and common use areas do not comply with Agency's criteria. A variance from this requirement would need to be pursued to allow these areas to remain.
- Exterior wall assembly and roof assembly are acceptable as described in Section 5.1.
- Exterior wall assembly at Zone A will require an extra layer of gypsum board to meet MPCA requirements.
- Roof assembly within 8 feet of roof drains will require upgraded gypsum board per Section 5.1.
- The exterior windows/doors are required to meet the STC ratings shown in Table 7 below to satisfy the MPCA's criteria, the Regional Transportation Policy requirements, and the City Code requirements for noise attenuation as documented in Section 21.301.12. The MPCA criteria is the most stringent criteria applicable for the project. The required STC ratings should be applied to sensitive living spaces, such as bedrooms. Appendix I shall be the exterior window and door acoustical specification for the project and the values of transmission loss and STC rating are required to be satisfied.
- Mechanical ventilation Magic Pak units maintain a minimum of 30 dBA noise reduction as currently designed. See Section 5.3.

Table 7 – Window/Door STC Rating Required to Satisfy Acoustical Criteria

Location	Room Type	Window/Door Rating	Mechanical Ventilation
Zone A	Bedrooms	STC 37	Required
	Other Spaces	STC 34	Required
Zone B	Bedrooms	STC 34	Required
	Other Spaces	STC 32	Required
Zone C	Bedrooms	STC 34	Required
	Other Spaces	STC 32	Required
Zone D	Bedrooms	STC 28	Required
	Other Spaces	STC 28	Required

Various noise mitigation methods may be utilized to satisfy the noise criteria described in this report. Alteration of mitigation methods, including, but not limited to, modifications to window size, frame material, window orientation, or mechanical systems, that deviate from descriptions herein should be reviewed by the acoustical consultant.

If you have any questions or comments regarding this report, please do not hesitate to contact us.

Sincerely,
Veneklasen Associates, Inc.

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

Kevin Patterson
Associate

APPENDIX I – GLAZING REQUIREMENTS

In order to meet the predicted interior noise levels described in Section 5.0, the glazing shall meet the following requirements:

Table 8 – Acoustical Glazing Requirements: Minimum Octave Band Transmission Loss and STC Rating

Nominal Thickness	Minimum Transmission Loss Octave Band Center Frequency (Hz)						Min. STC Rating
	125	250	500	1000	2000	4000	
1" dual	21	18	24	32	36	31	**28**
1" dual	21	18	27	34	37	32	**30**
1" dual	21	19	28	35	37	32	**31**
1" dual	22	21	30	36	37	36	**33**
1" dual	23	21	29	41	45	43	**34**
1" dual	24	27	35	39	40	42	**37**

The transmission loss values in the table above can likely be met with the following glazing assemblies:

1. STC 28: 1/8" monolithic – 3/4" airspace – 1/8" monolithic
2. STC 30: 1/8" monolithic – 3/4" airspace – 1/8" monolithic
3. STC 31: 1/8" monolithic – 3/4" airspace – 1/8" monolithic
4. STC 33: 3/16" monolithic – 11/16" airspace – 1/8" monolithic
5. STC 34: 1/4" monolithic – 1/2" airspace – 1/4" monolithic
6. STC 37: 7/16" laminated – 3/8" airspace – 3/16" monolithic

An assembly's frame and seals may limit the performance of the overall system. Therefore, the window and door systems selected for the project shall not be selected on the basis of the STC rating of the glass alone, but on the entire assembly including frame and seals. Additionally, the assemblies given above are provided as a basis of design, but regardless of construction, the octave band Transmission Loss (TL) and STC value of the system selected must meet the minimum values in Table 8 above.

Independent laboratory acoustical test reports should be submitted for review by the design team to ensure compliance with glazing acoustical performance requirements. Laboratories shall be accredited by the Department of Commerce National Voluntary Laboratory Accreditation Program (NVLAP). Labs shall be pre-approved by Veneklasen Associates. Tests shall be required to be performed in North America. Lab tests and lab reports shall be in compliance with ASTM standard E90 and be no more than 10 years old from the date of submission for this project.

If test reports are not available for a proposed assembly, the assembly, including frame, seals and hardware, shall be tested at an independent pre-approved NVLAP-accredited laboratory to demonstrate compliance with the requirements of this report. Veneklasen shall be invited to witness acoustical testing completed and reserves the right to exclude test reports from laboratories that are not pre-approved by Veneklasen.

Veneklasen Associates
Consultants in Acoustics | Noise | Vibration | AV | IT

February 1, 2022

McGough
2737 Fairview Avenue North
St. Paul, Minnesota 55113

Attention: **Joy Jayaram | Project Executive**

Subject: **Bloomington Central Station Phase 4, Bloomington, Minnesota**
Acoustical Conformance
Veneklasen Project No. 4135-003

Dear Joy:

Veneklasen Associates, Inc. (Veneklasen) has reviewed the Bloomington Central Station Phase 4 architectural drawings with reference to our latest acoustical report. Veneklasen reviewed the drawings for the incorporation of the noise mitigation recommendations described in our report that are required to meet the applicable City and State interior noise criteria.

Veneklasen has found that all of our acoustical recommendations have been incorporated into the architectural drawing set. If constructed, the interior noise criteria set forth by the City and State will be satisfied.

If you have any questions, please do not hesitate to call.

Sincerely,
Veneklasen Associates, Inc.

John LoVerde, *FASA*
Principal