

ENVIRONMENTAL NOISE REPORT

PROPOSED COMMERCIAL/
INDUSTRIAL DEVELOPMENT
15123 WOODBINE AVENUE – PHASE 2
TOWN OF WHITCHURCH – STOUFFVILLE



Prepared for
Limen Group Const. (2019) Ltd. and
SCAL Properties Inc.

April 10, 2023
File: 21-178-02

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SUMMARY

The proposed commercial/industrial development is to be located within the western portion of the lands located at 15123 Woodbine Avenue in the Town of Whitchurch-Stouffville. The proposed development consists of two (2) office buildings, an indoor storage building and associated outdoor storage areas and at-grade parking areas.

The noise sources associated with the proposed development are rooftop mechanical equipment associated with the proposed buildings, tractor trailer/truck passbys and idling, as well as impulses associated with the trailer loading/unloading and equipment unloading operations.

The environmental noise guidelines of the Town of Whitchurch-Stouffville and the Ministry of the Environment, Conservation and Parks (MOE) set a sound level limit due to the stationary sources based on the existing ambient sound level without the source in operation with the lower limits of 50 dBA/dBAI during daytime and evening hours and 45 dBA/dBAI during nighttime hours. As per the MOE guidelines, the area surrounding the site is classified as a Class 1 area.

Based on the analysis, the sound levels predicted at the existing residential dwellings near the proposed site will be within the exclusion sound level limits in all assessed operating scenarios; therefore, physical acoustic mitigation measures are not required.

Should any changes occur to the ultimate site plan, equipment information, or site operation details used in the preparation of this report, additional analysis should be conducted to ensure/confirm that the applicable noise guidelines are met.

1.0 INTRODUCTION

Jade Acoustics Inc. was retained by Limen Group Const. (2019) Ltd. on behalf of the SCAL owner to prepare an Environmental Noise Report in order to assess the noise emissions from the proposed Phase 2 office buildings and contractor yard/storage building to the satisfaction of the Town of Whitchurch-Stouffville.

The subject Phase 2 site is located within the west portion of the lands municipally known as 15123 Woodbine Avenue in the Town of Whitchurch-Stouffville. The overall site is currently agricultural lands, and the east portion of the site with frontage to Fortecon Drive will consist of the Phase 1 development. An Environmental Noise Report in support of the Phase 1 development has been separately prepared by Jade Acoustics Inc.

Surrounding land uses include existing rural agricultural lands to the south with existing residential dwellings, future and existing industrial lands to the north and east (including the Phase 1 site). There are existing residential developments located to the west and northwest of the subject site, as generally shown on Figures 1 to 4.

Figure 1 shows the Key Plan. Figure 2 is a site plan of the subject site. Figures 3 and 4 show receptor locations and predicted sound levels for predictable worst case continuous and impulsive noise source operations without acoustic mitigation measures.

As shown on Figure 2, the subject Phase 2 site consists of two (2) portions. The 1.57 ha portion of the site includes a proposed office building, identified as Building 2A; the 2.45 ha portion includes Building 2B and the contractor yard (storage building and outdoor storage areas). At this time, plans and information regarding Building 2B and the contractor yard are not known. In preparation of this report, it has been assumed that Building 2B will be generally similar to Building 2A. Information for the contractor yard is based on known information from the Phase 1 development as well as information from Jade Acoustics Inc. files for similar developments.

In preparing this report, the following information has been used:

- Site visit conducted by Jade Acoustics Inc. staff on March 27, 2023;
- Site Grading Plan prepared by Schaeffers Consulting Engineers dated April 3, 2023, received April 4, 2023;
- Phase 2 Site Plan prepared by KNYMH Inc. dated March 31, 2023, received April 4, 2023;
- Architectural plans and elevations for Building 2A prepared by KNYMH Inc. dated October 24, 2022, received March 27, 2023;

- Draft Transportation Mobility Plan prepared by BA Group dated February 23, 2023, received March 21, 2023; and
- Development details in the Memorandum prepared by Alcorn and Associated Limited dated and received March 21, 2023.

2.0 NOISE SOURCES

Noise sources associated with the subject development include rooftop mechanical equipment associated with the proposed office buildings and indoor storage building, as well as tractor trailer/truck passbys/idling, and impulses associated with the trailer loading/unloading operations all within the contractor yard.

As the subject site does not include noise sensitive uses as per NPC-300, consideration of external transportation and stationary noise on the development has not been considered. Should the development contemplate noise sensitive uses, this report may need to be updated to ensure the applicable sound levels limits are met.

Details regarding the mechanical equipment associated with the proposed buildings are not available at this time. Assumed representative equipment has been used in this analysis. Any additional rooftop/at-grade mechanical equipment is not expected to be significant and does not affect the feasibility of the project; however, once final mechanical equipment information is available, additional analysis may need be conducted to ensure compliance with the guidelines at the residential receptors. If needed, quieter equipment can be used, equipment can be relocated, or rooftop acoustic screens can be proposed at that time.

Details regarding the equipment, machinery, and operations applicable to the contractor yard are not known at this time. A representative analysis has therefore been considered based on known information from the Phase 1 development to the east and information from Jade Acoustics Inc. files for similar developments.

For the purpose of this analysis, a total of five (5) tractor trailers/trucks entering or leaving the site during the worst-case hour was assumed. This is based on information in the draft traffic study outlined in Section 1.0. The tractor trailers/trucks will access the site to and from Woodbine Avenue to access the contractor yard and storage building, as shown on Figures 3 and 4. There are five (5) at-grade entry doors along the south side of the building to access the indoor storage. A speed of 10 km/h was assumed in the analysis for the trucks using the on-site truck route.

Yard impulses associated with the trailer/truck loading/unloading operations are a noise source that requires further investigation through development and understanding of the anticipated yard operations. These impulsive operations could potentially occur both in the outdoor yard and inside the building. Uncertainty exists over the frequency of these impulsive noises and if they will occur at the site. In the absence of detailed measurements of these operations at the site, we have assumed conventional tractor trailer loading/unloading impulsive sound level information in the modelling. Based on the large variety of impulses that can occur at this site, this is considered a representative approach.

As noted above, at the time of completion of this report, mechanical and electrical designs have not been completed. For the purpose of this analysis, some rooftop mechanical equipment has been assumed. Sound power levels have been assumed for representative equipment based on other Jade Acoustics files. The proposed tractor trailer passbys and idling, as well as typical impulses associated with the tractor trailer loading/unloading operations were based on other Jade Acoustics Inc. files prepared for similar facilities.

Back-up beepers associated with trucks and equipment on-site are exempt from MOE noise guidelines as they are safety devices and have not been included in the analysis.

A list of the analyzed noise sources used in the present scenarios and overall sound power levels are given in Table A, below.

TABLE A
SUMMARY OF NOISE SOURCE INFORMATION

Noise Source	Make/Model	Overall Sound Power Level (PWL) dBA/dBAI
Rooftop Heat/Cool Units (Office Buildings)	York Predator ZH/ZJ/ZR Series (5-ton)	84
Rooftop Heat/Cool Units (Storage Building)	Daikin MPS026G	95
Tractor Trailer Passbys and Idling ⁽¹⁾	Jade Acoustics Inc. Files	99
Tractor Trailer Impulses (Loading/Unloading) ⁽²⁾	Jade Acoustic Inc. Files	104 (dBAI)

⁽¹⁾ Sound power level of one (1) truck.

⁽²⁾ Logarithmic average.

3.0 ENVIRONMENTAL NOISE GUIDELINES

The guidelines of the Ministry of the Environment, Conservation and Parks (MOE) for proposed stationary sources are to be used to address the potential impact of noise associated with the proposed development. These guidelines are summarized in NPC-300 “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning, Publication NPC-300”, dated August, 2013, released October 21, 2013 (updated final version # 22). See Appendix A.

For the purpose of this analysis, the area of the subject site was considered to be a Class 1 Area.

With respect to stationary sources of noise in urban areas, the MOE guidelines require that the sound level due to the stationary source not exceed the ambient sound level due to road traffic in any hour of operation, or the values of 50 dBA/dBAI between 7:00 a.m. and 11:00 p.m. applicable to any location on the premises of a person including outdoor areas and the plane of any window and 45 dBA/dBAI between 11:00 p.m. and 7:00 a.m. applicable to the plane of any open window but not to outdoor areas, whichever is higher. Tables C-5, C-6, C-7 and C-8 of NPC-300 included in Appendix A provide the exclusion limit values of one-hour equivalent sound level (Leq,dBA) and impulsive sound level (LIm,dBAI).

The most critical hour is usually the quietest hour of road traffic in which the stationary source is also operating. If the guidelines are exceeded, the MOE requires mitigation measures, preferably at the source. The sounds from the stationary source are measured in terms of Leq, the energy equivalent continuous sound level over a defined time period (in this case, one hour) and LIm, the logarithmic average of sound levels (impulses) measured using the impulsive settings of sound level meters.

The MOE recognizes the need for back-up beepers/alarms as safety devices and, as such, does not have any guidelines or criteria to address these sources.

It should be noted that the MOE guidelines do not require that the source be inaudible but rather that specific sound level limits be achieved.

For all identified sensitive receptors, the Class 1 Area exclusion sound level limits have been used for the assessment although a higher ambient sound level is expected during many of the daytime operating hours of the site.

Town of Whitchurch-Stouffville Noise and Nuisance By-laws

The Town of Whitchurch-Stouffville has two by-laws to regulate noise likely to disturb the inhabitants of the Town, By-law No. 2019-092-RE (noise) and By-law No. 2003-71-RE (nuisance). The nuisance By-law is noted as having been amended November 3, 2020; the

noise By-law is noted to have been amended on July 20, 2022. The By-laws do not provide specific sound level limits but rather provide qualitative information with respect to sources and prohibitions by time and place.

4.0 NOISE RECEPTORS AND APPLICABLE SOUND LEVEL LIMITS

The critical receptors are the existing residential dwellings to the general west and south of the site. Bungalow/raised bungalow and two-storey dwellings were modelled at the height of 2.5 m and 4.5 m above ground level, respectively. The outdoor living areas associated with the residential dwellings were modelled at the height of 1.5 m above ground level. The worst-case residential receptors and outdoor living areas are labelled R1 to R8 and OLA1 and OLA2 on Figures 3 and 4.

The surrounding lands in close proximity of the subject site are classified as Rural/Environmental Zones and Development Reserve Zones as per Town of Whitchurch-Stouffville's Zoning By-law. For this assessment the permitted uses applicable to these zones are not considered to be noise sensitive receptors. Based on discussions with Alcorn and Associates Limited on this zoning, sensitive receptors are not permitted in these properties. As such, these lands were not considered to be a point of reception and were therefore, not included in the analysis.

The proposed office and storage building uses are not considered to be noise sensitive per NPC-300. The proposed buildings were therefore not considered as receptors in the analysis of the subject site. Should a noise sensitive use be introduced into the development, this report may need to be updated to ensure the applicable guidelines are met.

The MOE noise guidelines require that the sounds from the proposed development not exceed the existing ambient Leq due to road traffic in any hour of operation or the exclusion limits previously discussed in Section 3.0.

For the purpose of this noise assessment, the MOE exclusion sound limits were considered to be the applicable sound level limits. An elevated ambient sound level is expected at many of the receptors during the operating hours of the site. Due to the timing of the preparation of this report, collection of road traffic counts to support the anticipated elevated ambient sound level could not be completed; therefore, the exclusion sound level limits of the MOE have been used. Table B below summarizes the sound level limits used in the analysis.

TABLE B

SUMMARY OF SOUND LEVEL LIMITS AT WORST CASE RECEPTOR LOCATIONS

Receptor	Sound Level Limit, Leq/Lim 1 hour (dBA/dBAI)*		
	Daytime (7:00 a.m. to 7:00 p.m.)	Evening (7:00 p.m. to 11:00 p.m.)	Nighttime (11:00 p.m. to 7:00 a.m.)
R1 to R8**	50	50	45
OLA1 and OLA2***	50	50	N/A [#]

* MOE exclusion limits for Class 1 area.

** R2 to R8 – 2.5 m high receptors.
R1 – 4.5 m high receptor.

*** 1.5 m high receptors.

There is no nighttime sound level limit for outdoor area receptors.

5.0 NOISE IMPACT ASSESSMENT

As discussed in Section 2.0, the analyzed noise sources associated with the proposed commercial (office buildings) and industrial (contractor yard and storage building) development are:

- Tractor trailer/truck passbys, manoeuvring and idling;
- Impulses associated with the tractor trailer/truck loading/unloading operations; and
- Rooftop mechanical equipment.

Based on discussions with Alcorn and Associates Limited, a 2.6 m high precast concrete barrier is proposed to be constructed along the entire east property limit of the 1.57 ha site area (Building 2A portion of the overall site) and extend beyond the truck route to the southern property line of the Phase 2 site. The proposed 2.6 m high barrier has been included in the analysis and is shown on Figures 2 to 4.

A rooftop parapet on the office buildings has been assumed to be a minimum 1.2 m high, which is consistent with the height shown on the provided architectural plans.

For the rooftop HVAC units, duty cycles of 100% (daytime), 70% (evening) and 40% (nighttime) were accounted for in the analysis.

Based on information from the draft traffic study, a total of five (5) tractor trailers/trucks per hour during the peak hour entering or leaving the proposed site will occur. It is noted in the traffic study that truck access to the contractor yard may occur as early as 6:00 a.m.; therefore, the assessment has included daytime, evening, and nighttime time periods. All trucks will enter the site from Woodbine Avenue and access the contractor yard and storage building via the truck route shown on Figures 3 and 4. The analysis has accounted for all five (5) trucks idling for thirty (30) minutes. The location of the idling noise source has been assumed at a representative location within the main yard area. This assumed location has also been used to model impulses associated with yard loading operations.

Any future planned buildings associated with the Phase 1 development of this site have not been included in this assessment.

The sound levels in terms of L_{eq} (one hour) for the continuous noise sources, and in terms of logarithmic average impulsive sound level (L_{Lm}), were determined at the critical noise sensitive receptors. The CadnaA computer program Version 2023 which uses International Standard Analytical Code ISO 9613-2 was used for the analysis.

Table A in Section 2.0 shows the sound power levels for noise sources used in the analysis.

As per the MOE guidelines, impulsive noise sources were analyzed separately in the report. The impulsive noise was evaluated at the main outdoor storage area of the proposed yard. This is considered the acoustically worst-case location.

Tables 1 and 2 and Figures 3 and 4 show the results of the analysis without the addition of mitigation measures.

As can be seen from Tables 1 and 2 and Figures 3 and 4, the unmitigated sound levels are predicted to meet the MOE guidelines at the critical residential receptors; therefore, noise mitigation measures are not required.

6.0 PROPOSED NOISE ABATEMENT MEASURES

As discussed in Section 5.0, no physical noise mitigation measures are predicted to be required in order to meet the MOE guidelines at the nearest noise sensitive receptor locations.

As shown in Tables 1 and 2 and Figures 3 and 4, the unmitigated sound levels are predicted to meet the Class 1 area sound level limits of the MOE in all time periods, accounting for the proposed 2.6 m high pre-cast concrete barrier as shown on Figures 2 to 4 and rooftop parapets included on the architectural designs.

As per NPC-300, parking lots for private passenger vehicles are not considered to be sources of noise; therefore, based on the MOE guidelines, they do not need to be analyzed and noise mitigation measures are not required. A private passenger vehicle parking area is proposed at the western portion of the site.

Although noise sources associated with private vehicle traffic in parking lots are exempt from the numerical sound level limits of NPC-300, these activities have the potential to be of annoyance to the neighbouring existing residential homeowners.

Regulation of noise within the proposed parking lot would be controlled by the Municipal Noise By-law. Also, noise associated with the construction activities are governed in the Municipal Noise By-law, as are snow removal activities in the parking lot.

7.0 CONCLUSION

Based on the preliminary analysis, the applicable sound level limits are predicted to be met at the existing residential receptors without the incorporation of any additional physical mitigation measures.

Should there be significant changes to the site design or assumptions related to the analysis, or should a noise sensitive use be introduced to the development, this report will need to be updated to ensure the applicable sound level limits are met at all noise sensitive receptors.

Prior to issuance of building permits, an acoustical consultant should review the plans and mechanical equipment to ensure compliance with the MOE guidelines.

Prior to final occupancy, an acoustical consultant should inspect the installed equipment and mitigation measures.

Respectfully submitted,

JADE ACOUSTICS INC.

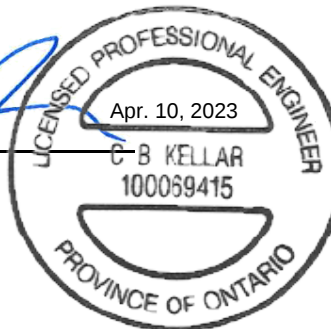
Per:


Michael Bechbach, P.Eng.



Per:


Chris B Kellar, P.Eng.



8.0 REFERENCES

1. "Model Municipal Noise Control By-Law", Final Report, by the Ontario Ministry of the Environment, August, 1978.
2. "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning", Ontario Ministry of the Environment, Publication NPC-300, August, 2013, released October 21, 2013 (updated final version # 22).
3. "Impulse Vibration in Residential Buildings", Ontario Ministry of Environment Publication NPC-207 (Draft), November, 1983.
4. Town of Whitchurch-Stouffville By-law Numbers 2019-092-RE, as amended (dated August 27, 2019 and amended July 20, 2022) and 2003-71-RE, as amended (dated May 20, 2003 and amended November 3, 2020).

TABLE 1

PROPOSED COMMERCIAL/INDUSTRIAL DEVELOPMENT

LIMEN GROUP CONST. (2019) LTD.

15123 WOODBINE AVENUE – PHASE 2

TOWN OF WHITCHURCH-STOUFFVILLE

**SUMMARY OF PREDICTED SOUND LEVELS DUE TO CONTINUOUS NOISE
SOURCES WITHOUT MITIGATION MEASURES**

Receptor Location*	Daytime Sound Level Leq 1 hour (dBA) (7:00 a.m. to 7:00 p.m.)			Evening Sound Level Leq 1 hour (dBA) (7:00 p.m. to 11:00 p.m.)			Nighttime Sound Level Leq 1 hour (dBA) (11:00 p.m. to 7:00 a.m.)		
	Predicted	Limit*	Exceedance	Predicted	Limit*	Exceedance	Predicted	Limit*	Exceedance
R1	44	50	No	43	50	No	43	45	No
R2	43	50	No	43	50	No	42	45	No
R3	45	50	No	44	50	No	44	45	No
R4	44	50	No	44	50	No	44	45	No
R5	45	50	No	44	50	No	44	45	No
R6	43	50	No	42	50	No	41	45	No
R7	42	50	No	41	50	No	40	45	No
R8	42	50	No	41	50	No	40	45	No
OLA1	44	50	No	44	50	No	N/A	N/A	N/A
OLA2	43	50	No	43	50	No	N/A	N/A	N/A

* Class 1 area exclusion sound level limits.

TABLE 2

PROPOSED COMMERCIAL/INDUSTRIAL DEVELOPMENT

LIMEN GROUP CONST. (2019) LTD.

15123 WOODBINE AVENUE – PHASE 2

TOWN OF WHITCHURCH-STOUFFVILLE

SUMMARY OF PREDICTED SOUND LEVELS DUE TO IMPULSIVE NOISE

SOURCES WITHOUT MITIGATION MEASURES

Receptor Location*	Daytime Sound Level L _{im} 1 hour (dBAI) (7:00 a.m. to 7:00 p.m.)			Evening Sound Level L _{im} 1 hour (dBAI) (7:00 p.m. to 11:00 p.m.)			Nighttime Sound Level L _{im} 1 hour (dBAI) (11:00 p.m. to 7:00 a.m.)		
	Predicted	Limit*	Exceedance	Predicted	Limit*	Exceedance	Predicted	Limit*	Exceedance
R1	43	50	No	43	50	No	43	45	No
R2	43	50	No	43	50	No	43	45	No
R3	42	50	No	42	50	No	42	45	No
R4	40	50	No	40	50	No	40	45	No
R5	40	50	No	40	50	No	40	45	No
R6	28	50	No	28	50	No	28	45	No
R7	29	50	No	29	50	No	29	45	No
R8	36	50	No	36	50	No	36	45	No
OLA1	44	50	No	44	50	No	N/A	N/A	N/A
OLA2	40	50	No	40	50	No	N/A	N/A	N/A

* Class 1 area exclusion sound level limits.



N.T.S.

**Proposed Commercial/Industrial Development
15123 Woodbine Avenue – Phase 2
Town of Whitchurch-Stouffville**

Date: April 2023

File: 21-178-02

KEY PLAN

FIGURE 1



EXISTING RESIDENTIAL

EXISTING COMMERCIAL/INDUSTRIAL

PROPOSED 2.6 M HIGH MASONRY BARRIER



EXISTING COMMERCIAL

SWM WATER POND

FILTER
BED

INDUSTRIAL STORAGE BUILDING

WOODBINE AVENUE

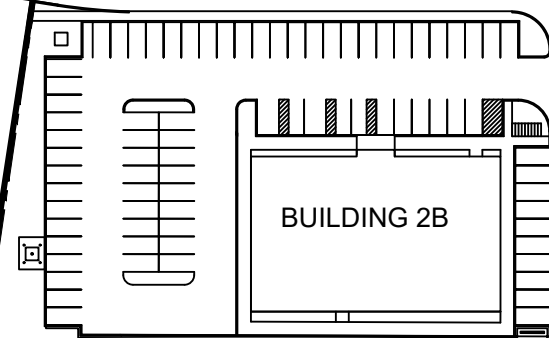
BUILDING 2A

TILE BED

CONTRACTORS
YARD SCREENED
OPEN STORAGE

EXISTING RESIDENTIAL

STAGE 1
DEVELOPMENT



TILE BED

YARD STORAGE

BUILDING 2B

FUTURE INDUSTRIAL

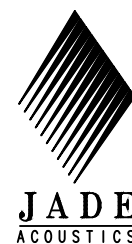
PROPOSED 2.6 M HIGH MASONRY BARRIER

N.T.S.

Proposed Commercial/Industrial Development
15123 Woodbine Avenue
Phase 2
Town of Whitchurch-Stouffville

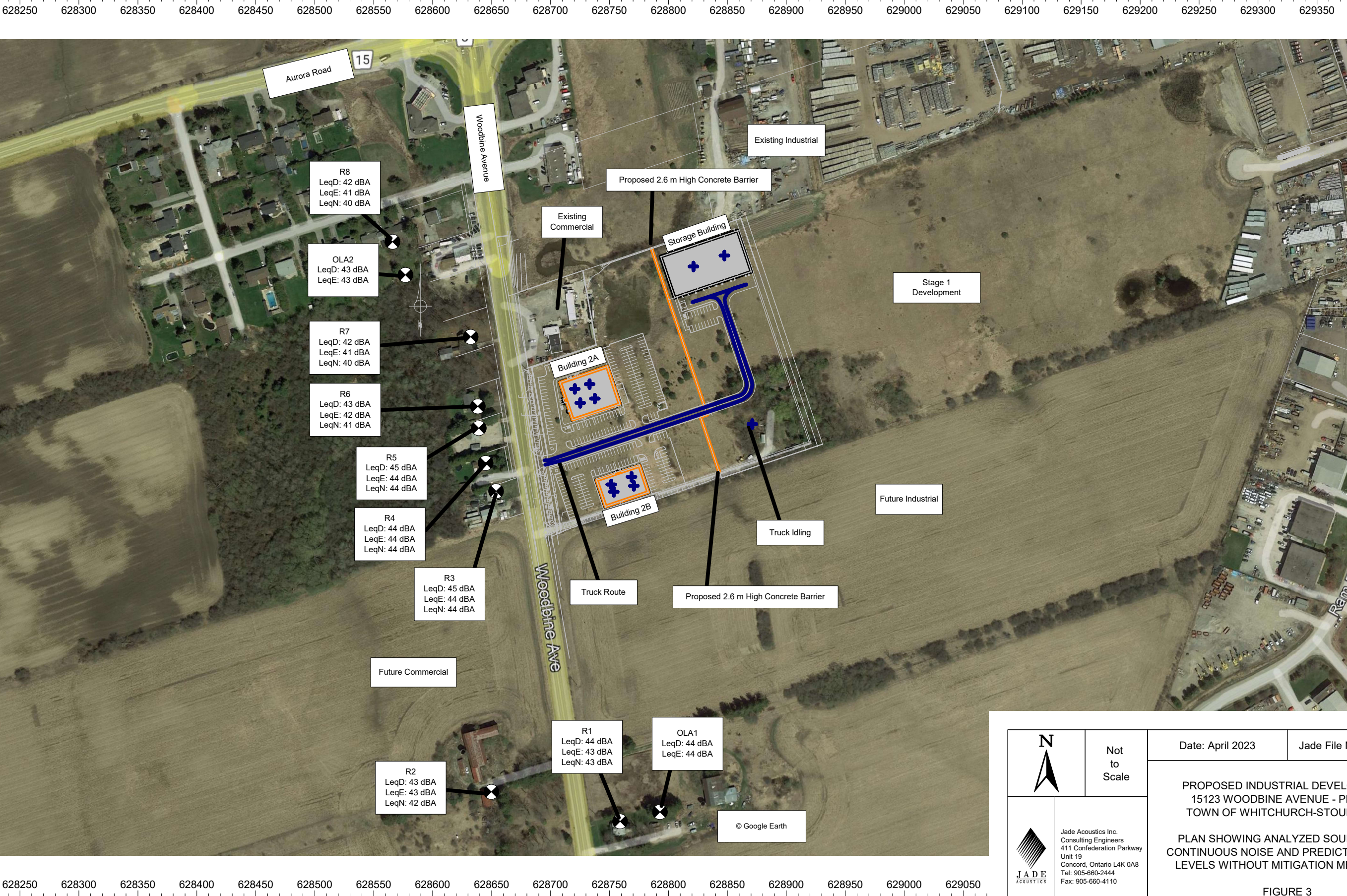
Date: April 2023

Our File: 21-178-02



SITE PLAN

FIGURE 2



Not
to
Scale



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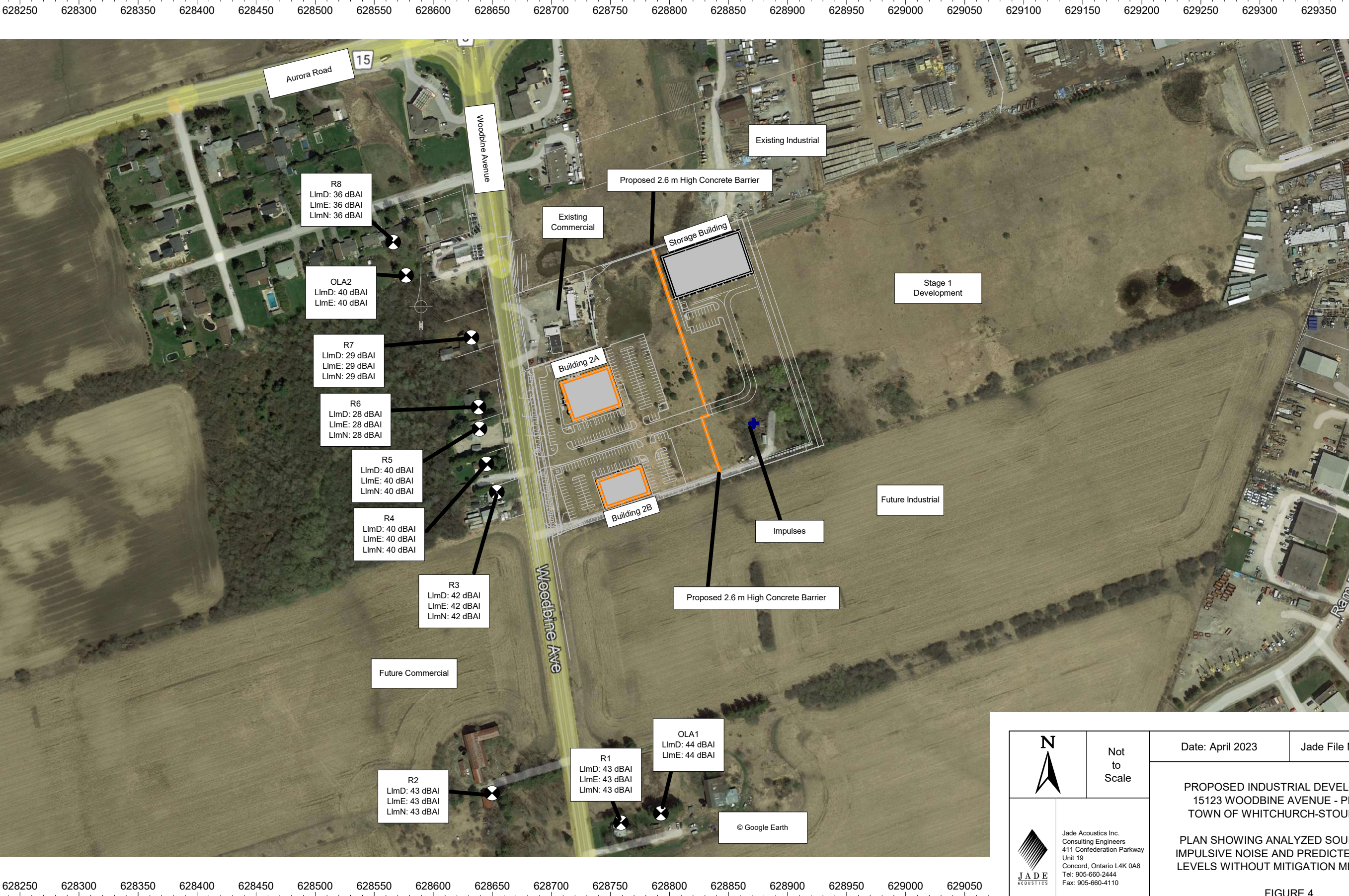
Date: April 2023

Jade File No.: 21-178-02

PROPOSED INDUSTRIAL DEVELOPMENT
15123 WOODBINE AVENUE - PHASE 2
TOWN OF WHITCHURCH-STOUFFVILLE

PLAN SHOWING ANALYZED SOURCES OF
CONTINUOUS NOISE AND PREDICTED SOUND
LEVELS WITHOUT MITIGATION MEASURES

FIGURE 3



Not
to
Scale

Date: April 2023

Jade File No.: 21-178-02

PROPOSED INDUSTRIAL DEVELOPMENT
15123 WOODBINE AVENUE - PHASE 2
TOWN OF WHITCHURCH-STOUFFVILLE

PLAN SHOWING ANALYZED SOURCES OF
IMPULSIVE NOISE AND PREDICTED SOUND
LEVELS WITHOUT MITIGATION MEASURES

FIGURE 4



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APPENDIX A

ENVIRONMENTAL NOISE CRITERIA

ONTARIO MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS (MOE)

Reference: "Environmental Noise Guidelines Stationary and Transportation Sources – Approval and Planning", Publication NPC-300, August, 2013, released October 21, 2013 (updated final version # 22).

SOUND LEVEL CRITERIA FOR STATIONARY SOURCES

TABLE C-5

**Exclusion Limit Values of One-Hour Equivalent Sound Level (L_{eq} , dBA)
Outdoor Points of Reception**

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	55
19:00 – 23:00	50	45	40	55

TABLE C-6

**Exclusion Limit Values of One-Hour Equivalent Sound Level (L_{eq} , dBA)
Plane of Window of Noise Sensitive Spaces**

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	60
19:00 – 23:00	50	50	40	60
23:00 – 07:00	45	45	40	55

TABLE C-7

**Exclusion Limit Values for Impulsive Sound Level (L_{LM} , dBAI)
Outdoor Points of Reception**

Time of Day	Actual Number of Impulses in Period of One-Hour	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 23:00	9 or more	50	50	45	55
	7 to 8	55	55	50	60
	5 to 6	60	60	55	65
	4	65	65	60	70
	3	70	70	65	75
	2	75	75	70	80
	1	80	80	75	85

TABLE C-8

**Exclusion Limit Values of Impulsive Sound Level (L_{LM} , dBAI)
Plane of Window - Noise Sensitive Spaces (Day/Night)**

Actual Number of Impulses in Period Of One-Hour	Class 1 Area (07:00-23:00)/ (23:00-07:00)	Class 2 Area (07:00-23:00)/ (23:00-07:00)	Class 3 Area (07:00-19:00)/ (19:00-07:00)	Class 4 Area (07:00-23:00)/ (23:00-07:00)
9 or more	50/45	50/45	45/40	60/55
7 to 8	55/50	55/50	50/45	65/60
5 to 6	60/55	60/55	55/50	70/65
4	65/60	65/60	60/55	75/70
3	70/65	70/65	65/60	80/75
2	75/70	75/70	70/65	85/80
1	80/75	80/75	75/70	90/85

APPENDIX B

SAMPLE CADNAA CALCULATIONS

Point sources

Name	Sel.	M.	ID	Result: PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			R0	Freq.	Direct.	Height	Coordinates		
				Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night	(dB)	(Hz)		(m)	X	Y	Z
				(dBA)	(dBA)	(dBA)				(dB(A)	(dB(A)	(dB(A)		(m²)		(min)	(min)	(min)					(m)	(m)	(m)
Truck idling			0000000001	105.9	105.9	105.9	Lw	TTPI+10°LD (5100)		0	0	0				30	30	30	0		(none)	2.4	628871.19	4874576.84	303.7
Impulses			0000000001	104	104	104	Lw	TTImp		0	0	0							0		(none)	2.4	628871.22	4874578.11	303.7
Building 2A RTU			0000000001	83.7	83.7	83.7	Lw	YorkS		0	0	0				60	42	24	0		(none)	1.5	628720.62	4874606.71	311.35
Building 2A RTU			0000000001	83.7	83.7	83.7	Lw	YorkS		0	0	0				60	42	24	0		(none)	1.5	628725.12	4874594.83	311.35
Building 2A RTU			0000000001	83.7	83.7	83.7	Lw	YorkS		0	0	0				60	42	24	0		(none)	1.5	628733.16	4874610.65	311.35
Building 2A RTU			0000000001	83.7	83.7	83.7	Lw	YorkS		0	0	0				60	42	24	0		(none)	1.5	628737.61	4874598.41	311.35
Building 2B RTU			0000000001	83.7	83.7	83.7	Lw	YorkS		0	0	0				60	42	24	0		(none)	1.5	628751.4	4874525.55	311.73
Building 2B RTU			0000000001	83.7	83.7	83.7	Lw	YorkS		0	0	0				60	42	24	0		(none)	1.5	628753.63	4874519.39	311.73
Building 2B RTU			0000000001	83.7	83.7	83.7	Lw	YorkS		0	0	0				60	42	24	0		(none)	1.5	628768.06	4874532.06	311.73
Building 2B RTU			0000000001	83.7	83.7	83.7	Lw	YorkS		0	0	0				60	42	24	0		(none)	1.5	628770.71	4874524.5	311.73
Phase 2 Storage RTU			0000000001	95.1	95.1	95.1	Lw	DAKRN_ZST _A		0	0	0				60	42	24	0		(none)	1.5	628821.17	4874710.41	309.89
Phase 2 Storage RTU			0000000001	95.1	95.1	95.1	Lw	DAKRN_ZST _A		0	0	0				60	42	24	0		(none)	1.5	628847.37	4874719.76	309.89

Line sources

Name	Sel.	M.	ID	Result: PWL			Result: PWL'			Lw / Li		Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src					
				Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night	(dB)	(Hz)		Number	Speed			
				(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(dB(A)	(dB(A)	(dB(A)		(m²)		(min)	(min)	(min)				Day	Evening	Night	(km/h)	
Truck Route			0000000011	93.8	93.8	93.8	65.9	65.9	65.9	PWL-PL	TTPI		0	0	0	0							0		(none)	5	5	5	10

Receivers

Name	Sel.	M.	ID	Level Lr	Day	Night	Evening	Limit Value	Day	Night	Evening	Land Use	Auto	Noise Type	Height	Coordinates	X	Y	Z
					Day (dBA)	Night (dBA)	Evening (dBA)		Day (dBA)	Night (dBA)	Evening (dBA)	Type			(m)		(m)	(m)	(m)
R1			021		43.7	43.1	43.4	50	43	43	50				4.5	r	628759.01	4874239.83	312.39
R2			021		42.8	42.4	42.6	50	43	43	50				2.5	r	628649.74	4874264.94	309.69
R3			021		44.5	44.1	44.3	50	43	43	50				2.5	r	628653.81	4874519.98	301.17
R4			021		44.2	43.7	44	50	43	43	50				2.5	r	628644.99	4874543.84	302.85
R5			021		44.7	43.6	44.2	50	43	43	50				2.5	r	628639.12	4874573.4	302.51
R6			021		43.1	43.3	42.3	50	43	43	50				2.5	r	628638.27	4874591.85	302.3
R7			021		42.5	40.2	41.5	50	43	43	50				2.5	r	628632.22	4874550.9	302.49
R8			021		41.8	39.6	40.9	50	43	43	50				2.5	r	628566.05	4874731.51	304.06
OLA1			021		43.8	43.4	43.6	50	43	43	50				1.5	f	628792.79	4874247.86	309.17
OLA2			021		43.4	41.9	42.7	50	43	43	50				1.5	r	628576.9	4874703.29	302.7

Screens

Name	Sel.	M.	ID	Absorption	Z-Ext.	Cantilever	Height	Begin	End
				left	right	horz.	vert.	(m)	(m)
Proposed 2.6 m High Concrete Barrier			03001	0.21	0.21			2.6	r
Low Rooftop Parapet			03001	0.21	0.21			1.2	t
Low Rooftop Parapet			03001	0.21	0.21			1.2	t
Proposed 2.6 m High Concrete Barrier			03001	0.21	0.21			2.6	r