

Noise Feasibility Study

River Mill Phases 4 & 5 Residential Development

Speedsville Road & Maple Grove Road

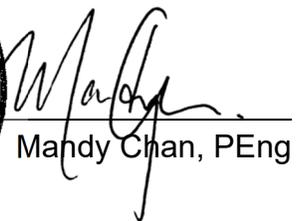
Cambridge, Ontario

Prepared for:

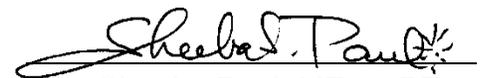
River Mill Development Corporation
2000 Garth Street, Suite 201
Hamilton, ON L9B 0C1

Prepared by:




Mandy Chan, PEng

Reviewed by:


Sheeba Paul, MEng, PEng

July 27, 2020

HGC Project No.02000006

Table of Contents

1	INTRODUCTION AND SUMMARY	1
2	SITE DESCRIPTION AND NOISE SOURCES.....	2
3	TRAFFIC NOISE ASSESSMENT.....	2
3.1	Road Traffic Noise Criteria	2
3.2	Road Traffic Data	4
3.3	Traffic Noise Predictions.....	4
3.4	Discussion and Recommendations	5
3.4.1	Outdoor Living Areas.....	5
3.4.2	Ventilation Requirements.....	6
3.4.3	Building Facade Constructions	6
3.4.4	Warning Clauses	7
4	STATIONARY SOURCE ASSESSMENT.....	9
4.1	Discussion of Nearby Industrial and Commercial Facilities.....	9
5	SUMMARY OF RECOMMENDATIONS	11
6	RECOMMENDATIONS FOR IMPLEMENTATION	12

Figure 1: Key Plan

Figure 2: Overall Concept Plan Showing Prediction and Measurement Locations

Figure 3: Aerial Photo

Appendix A – Road Traffic Volume Data

Appendix B – Sample STAMSON 5.04 Output

Appendix C – Consultant Declaration

1 INTRODUCTION AND SUMMARY

Howe Gastmeier Chapnik Limited (HGC Engineering) was retained by River Mill Development Corporation to conduct a noise feasibility study for a proposed residential development located east of Speedsville Road and south of Maple Grove Road in Cambridge, Ontario. The study follows Ministry of the Environment, Conservation and Parks (MECP) guidelines with regards to the impact of noise.

Road traffic data for both Speedsville Road and Maple Grove Road was obtained from the Regional Municipality of Waterloo (RMOW). The traffic sound level predictions indicate that noise control measures should be incorporated into the building envelope design such that indoor sound levels can comply with the MECP noise criteria. The recommended noise control measures include appropriate wall and window glazing assemblies, warning clauses and suitable ventilation systems for units close to the roadways so that windows can remain closed. Noise barriers may be required for units located adjacent to Speedsville Road and Maple Grove Road depending on lot orientation. For dwellings that are located away from the roadways, any glazing and wall constructions and ventilation meeting the requirements of the Ontario Building Code will provide adequate sound insulation for the indoor spaces.

There are existing and future residential lands to the east, north and southwest of the site. To the south is Arriscraft facility and yard. HGC Engineering has been working for developments surrounding the Arriscraft facility since 2008 and is familiar with the operations of Arriscraft. Information regarding the industrial facility to the south was obtained through observations, sound level measurements taken during the site visits and past experience. The Arriscraft facility has a valid Environmental Compliance Approval from MECP. It is noted that there are existing residential uses surrounding the Arriscraft facility which are located closer to the facility than the proposed development. Traffic on Speedsville Road and Maple Grove Road as well as distant traffic (Highway 401) were found to be the dominant noise sources on the subject site. Sounds from the facility were not observed on site during the site visits. Significant noise impact from the Arriscraft facility is not expected at the proposed site. An additional noise warning clause is recommended to inform future residents of the presence of Arriscraft facility and the Boxwood Business Campus and that sounds



from these facilities may be audible on occasions.

Detailed noise studies should be performed for all blocks adjacent to Speedsville Road and Maple Grove Road to determine the acoustic requirements in accordance with NPC-300.

2 SITE DESCRIPTION AND NOISE SOURCES

Figure 1 is a key plan of the site. The site is to be located east of Speedsville Road and south of Maple Grove Road in Cambridge, Ontario. The conceptual block plan dated May 1, 2020 prepared by T. Johns Consulting Group which shows the proposed subdivision and block usage is attached as Figure 2. Traffic noise prediction locations and measurement locations are also shown on Figure 2.

HGC Engineering personnel visited the site in February and July 2020 to investigate the acoustic and topographic environment of the site and to conduct sound level measurements. The acoustical environment surrounding the site is urban in nature. There are existing and future residential land uses surrounding the site. Construction of new residential subdivisions was observed to the east and southeast. Further south of the site is the Arriscraft facility. The subject site is elevated relative to the grade of the Arriscraft facility and Highway 401. An investigation of the potential noise impact from Arriscraft is provided in Section 4.1.

3 TRAFFIC NOISE ASSESSMENT

3.1 Road Traffic Noise Criteria

Guidelines for acceptable levels of road traffic noise impacting residential developments are given in the MECP publication NPC-300, “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning”, release date October 21, 2013, and are listed in Table I below. The values in Table I are energy equivalent (average) sound levels [L_{EQ}] in units of A-weighted decibels [dBA].

Table I: MECP Road Traffic Noise Criteria (dBA)

Area	Daytime L_{EQ} (16 hour) Road	Nighttime L_{EQ} (8 hour) Road
Outdoor Living Area	55 dBA	--
Inside Living/Dining Room	45 dBA	45 dBA
Inside Bedroom	45 dBA	40 dBA

Daytime refers to the period between 07:00 and 23:00, while nighttime refers to the period between 23:00 and 07:00. The term "Outdoor Living Area" (OLA) is used in reference to an outdoor patio, a backyard, a terrace or other area where passive recreation is expected to occur. Balconies that are less than 4 m in depth are not considered to be outdoor living areas under MECP guidelines.

The MECP guidelines allow the daytime sound levels in an Outdoor Living Area to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in the purchase and tenancy agreements to the property. Where OLA sound levels exceed 60 dBA, physical mitigation is recommended to reduce the OLA sound level to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible.

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where nighttime sound levels outside bedroom or living/dining room windows exceed 60 dBA or daytime sound levels outside bedroom or living/dining room windows exceed 65 dBA. Forced-air ventilation with ducts sized to accommodate the future installation of air conditioning is required when nighttime sound levels at bedroom or living/dining room windows are in the range of 51 to 60 dBA or when daytime sound levels at bedroom or living/dining room windows are in the range of 56 to 65 dBA.

Building components such as walls, windows and doors must be designed to achieve indoor sound level criteria when the plane of window nighttime sound level is greater than 60 dBA or the daytime sound level is greater than 65 dBA due to road traffic noise.

Warning clauses to notify future residents of possible excesses are also required when nighttime sound levels exceed 50 dBA at the plane of the bedroom or living/dining room window and daytime sound levels exceed 55 dBA in the outdoor living area and at the plane of the bedroom or

living/dining room window due to road traffic.

3.2 Road Traffic Data

Projected traffic data for Speedsville Road and Maple Grove Road were obtained from the Regional Municipality of Waterloo. The data is in the form of forecasted Average Annual Daily Traffic (AADT) values, and is provided in Appendix A. A forecasted AADT of 16,100 vehicles per day to the year 2030 was applied to Speedsville Road, along with commercial vehicle percentages of 1.0% for medium trucks and 5.0% for heavy trucks were used. A forecasted AADT of 23,000 vehicles per day was applied to Maple Grove Road, along with commercial vehicle percentages of 2.7% for medium trucks and 9.2% for heavy trucks were used. The posted speed limit of 70 km/h was in the analysis in conjunction with a 90/10 day/night volume split for both roadways. The traffic volumes used in the analysis are provided in Table II.

Table II: Forecasted Road Traffic

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
Speedsville Road	Daytime	13 331	435	725	14 490
	Nighttime	1 481	48	81	1 610
	Total	14 812	483	805	16 100
Maple Grove Road	Daytime	19 458	207	1 035	20 700
	Nighttime	2 162	23	115	2 300
	Total	21 620	230	1 150	23 000

3.3 Traffic Noise Predictions

Prediction locations were chosen around the residential subdivision to obtain a good representation of the future sound levels at the development. The predictions were made using STAMSON version 5.04, a computer algorithm developed by the MECP. Sample STAMSON output is included in Appendix B. The results of the predictions are presented in Table III.

Sound levels were predicted at the upper storey of the proposed residential buildings during the daytime and nighttime hours to investigate ventilation requirements. Sound levels were also predicted in potential outdoor living areas at the worst-case locations to determine noise barrier requirements. Detailed lot layouts are currently not available. The 1st row of dwelling units is

assumed to be located 20 m from the centerline of Speedsville Road and 25 m from the centerline of Maple Grove Road.

Table III: Predicted Traffic Sound Levels, Without Mitigation, [dBA]

Prediction Location	Block No.	Description	OLA LEQ-16 hr	Daytime LEQ-16 hr	Nighttime LEQ-8 hr
A	28	1 st row of units to Maple Grove Rd, 3-storey	67	69	63
B	2	2 nd Row of units to Maple Grove Rd, 3-storey	58	59	53
C	1	8-Storey Building	--	72	66
D	9	1 st Row of units to Speedsville Road, 4-storey	67	69	63
E	10	1 st Row of units to Speedsville Road, 6-storey	58	59	53
F	21	6-Storey Building	--	69	63
G	22	6-Storey Building	--	69	63
H	12	Interior Block	<55	<55	<50
I	28	3 rd Row of units to Maple Grove	<55	<55	<50

3.4 Discussion and Recommendations

The sound level predictions indicate that traffic sound levels are expected to exceed MECP criteria during the daytime and nighttime at lots closest to the roadways. Recommendations are provided below.

3.4.1 Outdoor Living Areas

Reverse Frontage & Flanking Units

The predicted daytime sound levels in the rear yards of the 1st row of units adjacent Speedsville Road and Maple Grove road will be up 67 dBA (Prediction locations [A] and D). Physical mitigation will be required. Calculations indicated that a minimum 2.4 m high noise barrier along rear lots lines will be required to reduce sounds levels to 59 dBA if rear yards are flanking or directly adjacent to the roadways. A warning clause is also required to inform future residents of the traffic noise impact. To minimize noise barrier requirements, the outdoor living areas should be located on the shield side of the buildings, away from the roadways.

Remaining Units in the Subdivision

The predicted daytime sound levels in the OLA's of the remainder of the subdivision are less than 60 dBA and physical mitigation will not be required.

For the multi-storey buildings, balconies and terraces which are less than 4 m in depth are not considered outdoor living areas and not subjected to assessment per MECP Guidelines.

3.4.2 Ventilation Requirements

Central Air Conditioning

The predicted daytime and nighttime sound levels for units immediately adjacent to the roadways will be between greater 65 dBA during the daytime and 60 dBA during the nighttime hours, central air conditioning will be required for these units.

Forced Air Ventilation

The predicted nighttime sound levels at units with exposure the roadways (2nd row of units) will be between 50 and 60 dBA, and between 55 dBA and 65 dBA during the daytime. These dwelling units will require forced air ventilation systems with ductwork sized for the provision for the future installation of central air conditioning systems by the occupant.

For units which are located away from the two roadways or shielded from the roadways by two rows of dwellings, specific ventilation systems are not required.

3.4.3 Building Facade Constructions

Future sound levels at the dwellings closest to Speedsville Road and Maple Grove Road will exceed 65 dBA during daytime hours and 60 dBA during nighttime hours. MECP guidelines recommend that the windows, walls and doors be designed so that the interior sound levels comply with MECP noise criteria.

The required building components are selected based on the Acoustical Insulation Factor (AIF) value for road traffic. To do so, calculations were performed to determine the acoustical insulation factors to maintain indoor sound levels within MECP guidelines. The calculation methods were developed

by the National Research Council (NRC) and are based on the anticipated window to floor area ratios.

First Row of Units Adjacent to Speedsville Road and Maple Grove Road (Medium Density Blocks)

The minimum necessary specification for the windows for dwellings adjacent to Speedsville Road and Maple Grove Road is AIF-32 for the living/dining/family room and AIF-31 for bedrooms based on the possibility of sound entering the building through windows and walls. As a general guideline Any well-sealed thermopane unit having a Sound Transmission Class (STC) rating of 31, such as a standard glazing construction with two 3 mm panes and a 13 mm inter-pane gap will provide sufficient noise insulation as long as the window to floor area is less than 20% for the living/dining rooms and 25% for bedrooms. Any exterior wall construction meeting OBC will also provide sufficient sound insulation for the indoor spaces.

When detailed building plans including siting information, elevations and floor plans are available, the acoustical requirements for these blocks shall be refined.

High Density Blocks

Since the details of the density and height of the buildings are not known, a detailed noise study will be required for the blocks to determine the acoustic requirements (acoustic barriers, ventilation and building façade construction) when siting, grading, elevations and floor plans are available.

Remaining Blocks in the Development

Since future road traffic sound levels at the plane of window for all remaining blocks will be less than 65 dBA during the daytime and 60 dBA during the nighttime, any exterior wall, and double glazed window construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation for all dwelling units in this development.

3.4.4 Warning Clauses

The MECP guidelines recommend that warning clauses be included in the property and tenancy agreements and offers of purchase and sale for all lots with anticipated traffic sound level excesses. The actual wording of the warning clauses will depend on the nature of the excess. The following warning clauses may be needed individually or in combination. Examples are provided below from

the MECP guideline document.

Type A:

Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling unit occupants as the sound levels exceed the Municipality's and the Ministry of the Environment, Conservation and Parks noise criteria.

A suggested wording for future dwellings for which physical mitigation has been provided is given below.

Type B:

Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may on occasion interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks.

Suitable wording for future dwellings requiring forced air ventilation systems is given below.

Type C:

Purchasers/tenants are advised that this dwelling unit has been fitted with a forced air heating system and the ducting etc., was sized to accommodate central air conditioning. Installation of central air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the criteria of the Municipality and the Ministry of the Environment, Conservation and Parks.

A suitable wording for future dwellings requiring central air conditioning systems is given below.

Type D:

Purchasers/tenants are advised that this dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of Environment, Conservation and Parks.

These sample clauses are provided by the MECP as examples and can be modified by the Municipality as required.

4 STATIONARY SOURCE ASSESSMENT

4.1 Discussion of Nearby Industrial Facility

HGC Engineering personnel observed the acoustical environment and conducted sound level measurements in February 2020 at the proposed development. An aerial photo showing the site and surrounding land uses are attached as Figure 3. One industrial facility located to the south of the site was found to have the potential to impact the residential development and additional discussion is provided below.

Arriscraft

Arriscraft is manufacturer of precast concrete products and operates 24 hours per day. The facility is located approximately 300 m to the south of the proposed subdivision. There are existing berms located to the north and east of the Arriscraft site. It is understood that Arriscraft is operating under a valid Environmental Compliance Approval. There are existing residential uses which are located closer to the facility than the proposed development that represents a greater noise constraint for the facility. Additional investigation was conducted with respect to the operations of Arriscraft at the proposed development.

During the site visits, trucking and yard activities were observed at the Arriscraft facility. Short term LEQ sound level measurements were conducted at four locations as shown on Figure 2 during the daytime and nighttime hours and summarized in Table IV.

Boxwood Business Campus

To the west of Speedsville Road is a business park with light industrial facilities and offices. Significant noise impact from these facilities is not expected at the proposed development. Sounds from these facilities were generally not audible during the site visits.

When detailed plans are available for High Density Blocks 1, 9, 10, 21 and 22, a further review should be conducted to determine any noise impact from the Business Campus at these blocks.

Table IV – Attended Sound Level Measurements

Measurement Location	Date	Time	L _{EQ20min} [dBA]	L ₉₀ [dBA]	Comments
M1	February 4, 2020	15:03	53	49	Traffic noise dominant, Arriscraft not audible
	February 25, 2020	2:30	46	41	Traffic noise dominant, Arriscraft not audible
	February 25, 2020	4:32	48	44	Traffic noise dominant, Increased Highway 401 traffic noise, Arriscraft not audible
M2	February 4, 2020	13:31	50	43	Traffic noise dominant, Arriscraft not audible
	February 25, 2020	1:49	41	39	Road traffic on Highway 401 audible, Arriscraft not audible
	February 25, 2020	4:03	41	38	Road traffic on Highway 401 audible, Arriscraft not audible
M3	February 4, 2020	14:32	50	47	Traffic noise dominant, Arriscraft not audible
M4	February 4, 2020	14:03	50	46	Traffic noise dominant, Arriscraft not audible
	February 25, 2020	1:51	42	40	Distant traffic noise dominant, Arriscraft not audible
	February 25, 2020	3:56	41	38	Distant traffic noise dominant, Arriscraft not audible

The measurements results indicate that traffic on Speedsville Road and Maple Grove Road were found to be the dominant noise sources. Road traffic from Highway 401 was found to be a secondary source of noise and was noticeably audible during the nighttime measurements. Sounds from the Arriscraft facility was not observed while on site during both daytime and nighttime measurements. Based on distance, site observations and high background sound levels, significant noise impact from the Arriscraft facility at the proposed Phase 4 and 5 development is not expected.

A warning clause is recommended to inform all future residents that noise from the industrial facilities (Arriscraft facility and the Boxwood Business Campus) may be audible on occasions.

Type E:

Purchasers/tenants are advised that due to the proximity of existing industrial, facilities, noise from these facilities may at times be audible.

5 SUMMARY OF RECOMMENDATIONS

The results of the study indicate that the proposed development is feasible. Sound levels due to road traffic will exceed MECP guidelines, but feasible means of mitigation exist.

1. Acoustic barriers will be required for the rear yards of lots adjacent to and with exposure to Speedsville Road and Maple Grove Road.
2. Central air conditioning is required for the future dwellings closest and with exposure to Speedsville Road and Maple Grove Road. Forced air ventilation systems with ductwork sized for the future installation of central air conditioning by the occupant is required for blocks with exposure to Speedsville Road and Maple Grove Road.
3. Upgraded building constructions are required for all blocks adjacent and with exposure to Speedsville Road and Maple Grove Road.
4. For Blocks that are located further away from Speedsville Road and Maple Grove, any building façade constructions and ventilation requirements meeting the requirements of the Ontario Building Code will provide adequate sound insulation for the indoor space.
5. Noise warning clauses to inform the occupants of the sound level excesses should be placed in the property and tenancy agreements and offers of purchase and sale. The affected lots and appropriate warning clause are shown in Table V.
6. When the siting information and building layouts are available for the blocks adjacent to Speedsville Road and Maple Grove Road (Blocks 1, 2, 9, 10, 28 and 29), a noise study should be performed to refine the acoustic requirements for each block as required.
7. When the siting information for high density mixed-use blocks (Blocks 21 and 22) are available, a detailed noise study should be performed to determine the acoustic requirements for the sites to determine the impact of road traffic noise on the proposed buildings and to determine the impact of any stationary sources of noise on the adjacent residential dwellings in accordance with NPC-300.



Table V lists the recommendations provided in the report. The reader is referred to previous sections of the report where these recommendations are discussed in more detail.

Table V – Summary of Noise Control Requirements and Noise Warning Clauses

Associated Block No.	Acoustic Barrier	Ventilation Requirements	Type of Warning Clause	Building Façade Constructions
1	--	Central A/C / Forced Air	A, C/D, E	○
2, 28	+	Central A/C / Forced Air	A, B, C/D, E	○
9, 10	--	Central A/C / Forced Air	A, C/D, E	○
21, 22	○	○	○	○
29		Forced Air	A, C	OBC
Remaining Blocks	--	--	E	OBC

Notes:

+ if rear yards are flanking or backing onto Speedsville Road and Maple Grove Road

-- no specific requirement

OBC – meeting the minimum requirements of the Ontario Building Code

○ The need for central air conditioning and the specification of building façade components should be determined in detailed noise studies for this block when the siting, grading, elevation and floor plans are available.

6 RECOMMENDATIONS FOR IMPLEMENTATION

To ensure that noise control recommendations outlined above are fully implemented, it is recommended:

- 1) A detailed noise study is required for all blocks adjacent to Speedsville Road and Maple Grove Road (Blocks 1, 2, 9, 10, 28 and 29) when building siting and grading information is available to investigate the potential environmental noise impact on the buildings and acoustic requirements including acoustic barrier, ventilation and building constructions.
- 2) A noise study is required for the high density mixed-used blocks (Blocks 21 and 22), when siting information is available to investigate its potential noise impact on the buildings and the impact of the buildings on the surrounding residential land uses

- 3) Prior to an application for a building permit, the Municipality's Building Department or a Professional Engineer qualified to provide acoustical engineering services in the Province of Ontario shall review the unit plans for future dwellings on lots directly adjacent to Speedsville Road and Maple Grove Road to ensure that the windows and building constructions are adequately designed to ensure acceptable indoor noise levels.
- 4) Prior to subdivision approval, the municipality requires a Professional Engineer qualified to provide acoustical engineering services in the Province of Ontario to review the grading plans to certify that the noise control barriers as approved have been incorporated.
- 5) Prior to an application for occupancy permits for this development, the Municipality's building inspector or a Professional Engineer qualified to provide acoustical engineering services in the Province of Ontario shall certify that the noise control measures for the dwellings units have been properly installed and constructed.



ACOUSTICS



NOISE



VIBRATION

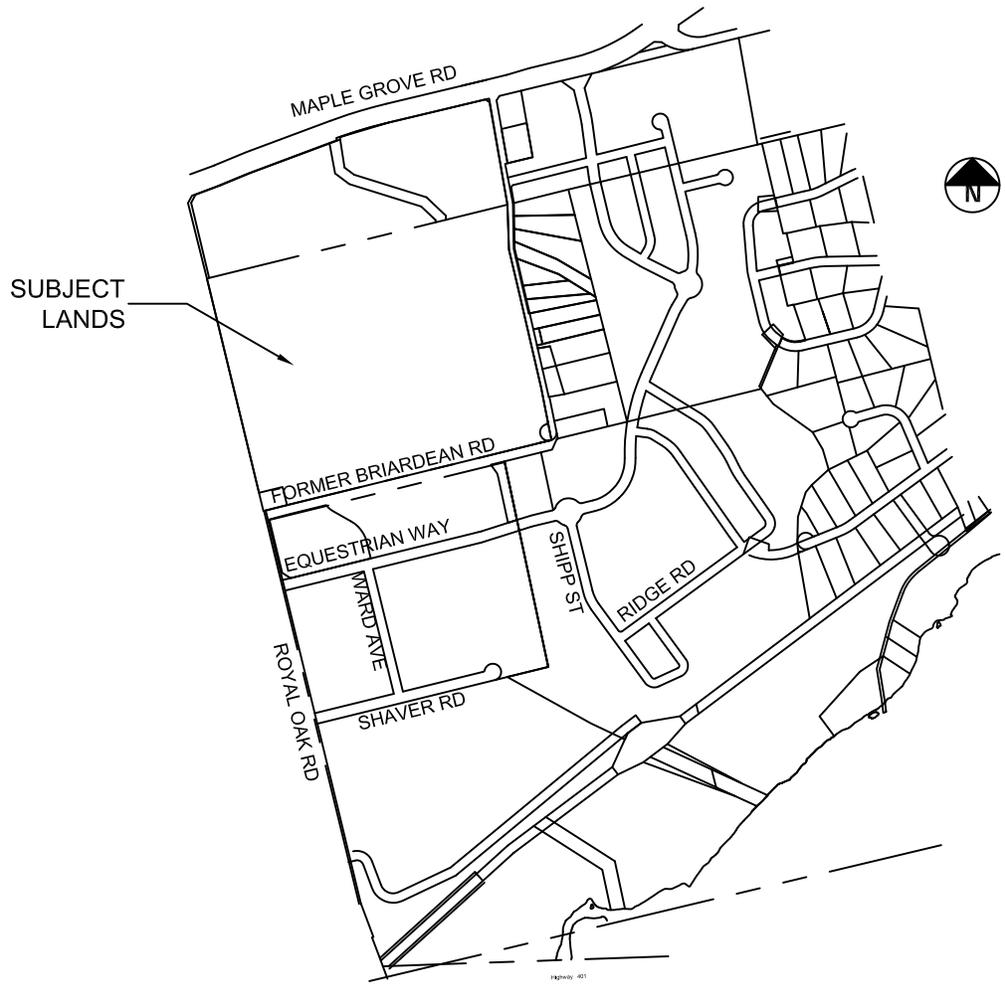


Figure 1: Key Plan



SURVEYOR'S CERTIFICATE
 I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE: _____ SURVEYOR NAME: G.L.S. SURVEYOR COMPANY: _____

OWNER'S CERTIFICATE
 I HEREBY AUTHORIZE T. JOHNS CONSULTING GROUP LTD. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF _____ TO THE CITY OF _____ FOR APPROVAL.

DATE: _____ CLIENT NAME: _____ CLIENT COMPANY: _____

LAND USE SCHEDULE

BLK	DESCRIPTION	AREA (ha)	PERCENT (%)
1	RESIDENTIAL	1.45	2.92
2	RESIDENTIAL	3.80	7.65
3	RESIDENTIAL	0.51	1.03
4	S.W.M. POND	1.34	2.70
5	RESIDENTIAL	1.02	2.06
6	PARK	0.51	1.03
7	RESIDENTIAL	0.25	0.51
8	RESIDENTIAL	0.64	1.29
9	RESIDENTIAL	2.59	5.21
10	RESIDENTIAL	1.19	2.40
11	RESIDENTIAL	0.18	0.35
12	RESIDENTIAL	0.23	0.47
13	RESIDENTIAL	0.23	0.47
14	RESIDENTIAL	0.18	0.36
15	RESIDENTIAL	0.52	1.05
16	RESIDENTIAL	0.38	0.76
17	RESIDENTIAL	0.48	0.96
18	RESIDENTIAL	0.48	0.96
19	RESIDENTIAL	0.81	1.63
20	OPEN SPACE	1.58	3.13
21	RESIDENTIAL	3.91	7.87
22	RESIDENTIAL	1.95	3.93
23	RESIDENTIAL	0.10	0.21
24	OPEN SPACE	10.39	20.91
25	RESIDENTIAL	0.67	1.36
26	RESIDENTIAL	4.58	9.21
27	OPEN SPACE	10.39	20.91
28	RESIDENTIAL	3.46	6.97
29	RESIDENTIAL	0.41	0.82
30	R.O.W.	0.17	0.34
31	R.O.W.	0.10	0.20
32	R.O.W.	0.17	0.33
33	R.O.W.	0.31	0.63
34	R.O.W.	3.86	7.77
35	R.O.W. WIDENING	0.42	0.84
36	R.O.W. WIDENING	0.16	0.31
TOTAL		49.70	100.00

PLANNING ACT
 ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT, OF ONTARIO RSO 1990

a) SEE PLAN
 b) SEE PLAN
 c) SEE PLAN AND KEY PLAN
 d) SEE PLAN AND LAND USE SCHEDULE
 e) SEE PLAN
 f) SEE PLAN
 g) SEE PLAN
 h) SEE PLAN
 i) SOIL TYPE "NOT MAPPED"
 j) SEE PLAN
 k) MUNICIPAL SERVICE
 l) SEE PLAN

METRIC NOTE
 DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

- LEGEND**
- APPLICATION AREA NEW COMMUNITY
 - APPLICATION AREA THE ANNEX
 - POTENTIAL ADDITIONAL AREA FOR THE ANNEX
 - LOW/MEDIUM DENSITY FREEHOLD
 - MEDIUM DENSITY
 - MEDIUM/HIGH DENSITY
 - HIGH DENSITY
 - HIGH DENSITY MIXED USE
 - OPEN SPACE
 - STORMWATER MANAGEMENT
 - LANDS CURRENTLY IN CITY OWNERSHIP
 - OPEN SPACE LANDS TO BE REGISTERED AND DEDICATED THROUGH PHASE 3 ARRISCRAFT
 - LANDS TO BE DEVELOPED APART FROM NEW COMMUNITY (REGISTERED THROUGH PHASE 2)
 - LANDS TO BE DEVELOPED APART FROM NEW COMMUNITY (REGISTERED THROUGH PHASE 3 ARRISCRAFT)
 - FUTURE PUBLIC RIGHT-OF-WAY (R.O.W.)
 - FUTURE TRAIL
 - FUTURE TRAIL CONNECTION

LEGAL DESCRIPTION

LEGEND

REVISIONS

NO.	DESCRIPTION	DATE	BY
1	WETLAND UPDATE PER WALK	21-MAY-2020	JR
2	FOR DISCUSSION	24-FEB-2020	JR
3	FOR DISCUSSION	08-JAN-2020	JR
4	FOR DISCUSSION	02-OCT-2019	JR
5	FOR DISCUSSION	09-OCT-2019	JR
6	REVIEW	15-MAY-2019	JR
7	REVIEW	10-DEC-2018	JR
8	REVIEW	03-DEC-2018	JR
9	REVIEW	03-DEC-2018	JR
10	REVIEW	03-DEC-2018	JR

river mill cambridge

T. JOHNS CONSULTING GROUP

310 LAMBERTON ROAD WEST, SUITE # 100
 HAMILTON, ONTARIO, L8C 2V2
 P: 905-574-1893
 F: 905-527-8255

PROJECT TITLE: RIVER MILL

CAMBRIDGE, ONTARIO

NEW COMMUNITY CONCEPTUAL BLOCK PLAN

DRAWING TITLE: NEW COMMUNITY CONCEPTUAL BLOCK PLAN

DRAWN BY: JBAW DESIGNED BY: JW
 PRINT DATE: 14-MAY-2020 PROJECT NUMBER: 0796
 REVISION: 1 DRAWING NUMBER: CBP1-2
 SCALE: 1:1250

Figure 2: Concept Plan Showing Prediction and Measurement Locations



Figure 3: Aerial Photo



ACOUSTICS



NOISE



VIBRATION

APPENDIX A
ROAD TRAFFIC DATA



ACOUSTICS



NOISE



VIBRATION

Region of Waterloo AADT Forecast for Noise Studies

1. Development/Location

Maple Grove Road &Speedsville Road-SE corner

2. Current AADT (2020)

Maple Grove/East Leg	Speedsville/South Leg
18,100	8,400

3. Forecast AADT (2030)

Maple Grove/East Leg	Speedsville/South Leg
23,000	16,100

4. Commercial Vehicle Rates

	Maple Grove/East Leg	Speedsville/South
% Medium Trucks	1.0%	3%
% Heavy Trucks	5%	5%

5. Posted Speed Limit

Maple Grove/East Leg	Speedsville/South Leg
70 km/h	70 KM/h

6. Day/Night Splits

Regional Standard 90/10 Day/Night Split

7. Expiry

31-Dec-2023

8. Notes

This forecast is intended for the purpose of carrying out a noise study only. The above AADTs represent the traffic volumes on Maple Grove Road east of Speedsville Road and traffic volumes on Speedsville Road south of Maple Grove Road in Cambridge, ON. This forecast remains valid up to the date indicated above. The data related to Speedsville Road should be verified with the City of Cambridge staff as this road falls under the jurisdiction of City of Cambridge. The Region of Waterloo should be contacted for an updated forecast if there are plans to use this forecast beyond the above validity period.

APPENDIX B
SAMPLE STAMSON OUTPUT



ACOUSTICS



NOISE



VIBRATION

STAMSON 5.0 NORMAL REPORT Date: 29-07-2020 11:30:57
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: a.te Time Period: Day/Night 16/8 hours
Description: Predicted daytime and nighttime sound levels at the upper story windows at Location [A], Block 28

Road data, segment # 1: MapleGrove (day/night)

Car traffic volume : 19458/2162 veh/TimePeriod *
Medium truck volume : 207/23 veh/TimePeriod *
Heavy truck volume : 1035/115 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 23000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: MapleGrove (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 20.00 / 20.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: MapleGrove (day)

Source height = 1.50 m

ROAD (0.00 + 69.19 + 0.00) = 69.19 dBA
Table with columns: Angle1, Angle2, Alpha, RefLeq, P.Adj, D.Adj, F.Adj, W.Adj, H.Adj, B.Adj, SubLeq

Segment Leq : 69.19 dBA

Total Leq All Segments: 69.19 dBA

Results segment # 1: MapleGrove (night)

Source height = 1.50 m

ROAD (0.00 + 62.66 + 0.00) = 62.66 dBA
Table with columns: Angle1, Angle2, Alpha, RefLeq, P.Adj, D.Adj, F.Adj, W.Adj, H.Adj, B.Adj, SubLeq

Segment Leq : 62.66 dBA

Total Leq All Segments: 62.66 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.19
(NIGHT): 62.66

STAMSON 5.0 NORMAL REPORT Date: 29-07-2020 11:31:21
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: c.te Time Period: Day/Night 16/8 hours
 Description: Predicted daytime and nighttime sound levels at the upper story windows
 at Location [C], Block 1

Road data, segment # 1: MapleGrove (day/night)

```
-----
Car traffic volume   : 19458/2162  veh/TimePeriod  *
Medium truck volume :   207/23    veh/TimePeriod  *
Heavy truck volume  :  1035/115   veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement      :     1 (Typical asphalt or concrete)
```

* Refers to calculated road volumes based on the following input:

```
24 hr Traffic Volume (AADT or SADT): 23000
Percentage of Annual Growth       : 0.00
Number of Years of Growth         : 0.00
Medium Truck % of Total Volume    : 1.00
Heavy Truck % of Total Volume     : 5.00
Day (16 hrs) % of Total Volume    : 90.00
```

Data for Segment # 1: MapleGrove (day/night)

```
-----
Angle1  Angle2      : -90.00 deg   90.00 deg
Wood depth      : 0 (No woods.)
No of house rows : 0 / 0
Surface        : 1 (Absorptive ground surface)
Receiver source distance : 25.00 / 25.00 m
Receiver height : 22.50 / 22.50 m
Topography     : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Road data, segment # 2: Speedsville (day/night)

```
-----
Car traffic volume   : 13331/1481  veh/TimePeriod  *
Medium truck volume :   435/48    veh/TimePeriod  *
Heavy truck volume  :   725/81   veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement      :     1 (Typical asphalt or concrete)
```

* Refers to calculated road volumes based on the following input:

```
24 hr Traffic Volume (AADT or SADT): 16100
Percentage of Annual Growth       : 0.00
Number of Years of Growth         : 0.00
Medium Truck % of Total Volume    : 3.00
Heavy Truck % of Total Volume     : 5.00
Day (16 hrs) % of Total Volume    : 90.00
```

Data for Segment # 2: Speedsville (day/night)

```
-----
Angle1  Angle2      : -90.00 deg   90.00 deg
Wood depth      : 0 (No woods.)
No of house rows : 0 / 0
Surface        : 1 (Absorptive ground surface)
Receiver source distance : 25.00 / 25.00 m
Receiver height : 22.50 / 22.50 m
Topography     : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```



Results segment # 1: MapleGrove (day)

Source height = 1.50 m

ROAD (0.00 + 69.80 + 0.00) = 69.80 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.03	72.18	0.00	-2.29	-0.09	0.00	0.00	0.00	69.80

Segment Leq : 69.80 dBA

Results segment # 2: Speedsville (day)

Source height = 1.50 m

ROAD (0.00 + 68.58 + 0.00) = 68.58 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.03	70.95	0.00	-2.29	-0.09	0.00	0.00	0.00	68.58

Segment Leq : 68.58 dBA

Total Leq All Segments: 72.24 dBA

Results segment # 1: MapleGrove (night)

Source height = 1.50 m

ROAD (0.00 + 63.27 + 0.00) = 63.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.03	65.64	0.00	-2.29	-0.09	0.00	0.00	0.00	63.27

Segment Leq : 63.27 dBA

Results segment # 2: Speedsville (night)

Source height = 1.50 m

ROAD (0.00 + 62.06 + 0.00) = 62.06 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.03	64.43	0.00	-2.29	-0.09	0.00	0.00	0.00	62.06

Segment Leq : 62.06 dBA

Total Leq All Segments: 65.72 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 72.24
(NIGHT): 65.72

APPENDIX C
CONSULTANT STATUTORY
DECLARATION



ACOUSTICS



NOISE



VIBRATION

CONSULTANT STATUTORY DECLARATION

CANADA) In the Matter of the
) Environmental Protection
PROVINCE OF ONTARIO) Act and the Planning Act
)
) And in the Matter of a
) proposed residential development
) at Speedsville Road & Maple Grove Road
) in the City of Cambridge in the
) Regional Municipality of
) Waterloo

I, Mandy Chan, of the City of Toronto, SOLEMNLY DECLARE THAT:

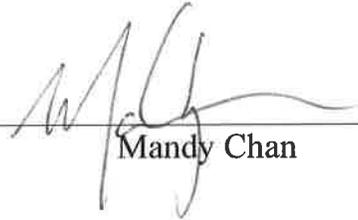
1. I am a Professional Engineer employed by HGC Engineering which holds a Certificate of Authorization and have personal knowledge of the matters set out below.
2. I was retained or employed as the principal consultant to undertake the assessment of noise impacts and recommendation of noise mitigation measures for the property described as River Mill Phases 4 & 5, Speedsville Road & Maple Grove Road, Cambridge, Regional Municipality of Waterloo.
3. I had the expertise required to perform these services. Any assessment activities or recommendations requiring the application of engineering principles have been undertaken or supervised by an engineer qualified to perform such services.
4. The information used in the study entitled 'Noise Feasibility Study, River Mill Phases 4 & 5 Residential Development, Speedsville Road & Maple Grove Road, Cambridge, Ontario' dated July 27, 2020 is the best available information as of the date of the study.
5. The sound level calculations, the interpretation of noise attenuation requirements, and the recommended measures are in accordance with Ministry of Environment Guidelines, Region of Waterloo policies, any applicable policy of guidelines or the Area Municipality, and any other applicable policy or guideline.
6. The physical noise attenuation measures proposed in this study are feasible to implement and will provide the level of attenuation indicated in the study.

- 7. I acknowledge that this study may be subject to a peer review at my cost.
- 8. I acknowledge that public authorities and future owners, occupants and others may rely on this statement.

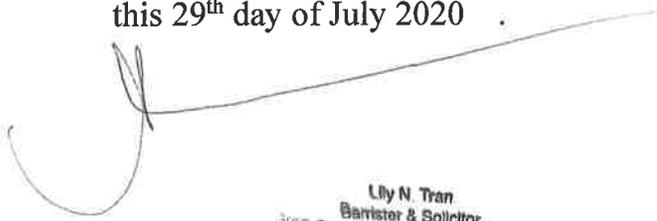
AND I make this solemn Declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath.

DECLARED before me at the City
of Mississauga, in the Region of Peel
this 29th day of July 2020 .

)
)
)



Mandy Chan



Lily N. Tran
Barrister & Solicitor
Greg G. Gzik Professional Corporation
82 Queen Street South
Mississauga, ON L5M 1K6