

Noise Feasibility Study

Proposed Townhouse Development

1300, 1316, 1326, 1342, 1350 Bronte Road

Oakville, Ontario

Prepared for:

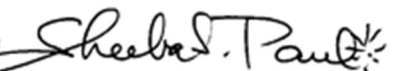
Bronte River Limited Partnership
4900 Palladium Way, Suite 105
Burlington, Ontario
L7M 0W7

Prepared by



PER Matthew Lorimer, BEng

Reviewed by



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November 28, 2021

HGC Project No. 02100463



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1 Introduction and Summary

HGC Engineering was retained by Bronte River Limited Partnership and Argo Development Corp. to conduct a noise feasibility study for a proposed residential townhouse development in Oakville, Ontario. The location of the proposed development site is at 1300, 1306, 1326, 1342, 1350 Bronte Road, south of Upper Middle Road. The purpose of this study is to determine the impact of future environmental noise from the surrounding roadways on the proposed site and to determine the required acoustic requirements in accordance with the Ministry of Environment, Conservation, and Parks (MECP) guidelines, The Region of Halton and the Town of Oakville. This study has been prepared as part of the approval process by the municipality.

The primary noise source of noise was determined to be the road traffic on Bronte Road. Road traffic data was obtained from the Region of Halton and the Town of Oakville. The data was used to predict sound levels at the future dwelling facades and in potential outdoor living areas. All road traffic noise predictions were compared with the guidelines detailed by the MECP.

The results of the study indicate that it is feasible to achieve the MECP sound level guidelines at the proposed residential development. The sound level predictions indicate that the future traffic sound levels will exceed MECP guidelines at the dwelling units adjacent to and with some exposure to Bronte Road. The dwellings adjacent to Bronte Road will require central air conditioning and upgraded building constructions. The second row of dwellings from Bronte Road and the row of back-to-back townhouses will require forced air systems with suitable duct work for future installation of a central air conditioning by the occupant. The MECP guidelines recommend that noise warning clauses be used to inform future residents of the traffic noise impacts and sound level excesses. The remaining dwellings in the development require any building construction meeting the minimum requirements of the Ontario Building Code.



2 Site Description and Noise Sources

The key plan for the site is attached as Figure 1. The site is located on the west side of Bronte Road and south of Upper Middle Road. A draft plan prepared by Korsiak Urban Planning November 22, 2021 is provided as Figure 2 and also includes prediction locations. The proposed development is composed of 3-storey townhomes with a row of dwellings fronting onto Bronte Road. Parallel rows of 3-storey townhomes parallel to Bronte Road are developed south of the fronting homes. Back-to-back and conventional rear yard townhouses are also part of the development. A heritage house is to be relocated at the corner of Bronte Road and Street A.

HGC Engineering personnel visited the site during the month of August 2021. The environment surrounding the site is natural woodland. There is a proposed development directly across Bronte Road from the site. There is an existing cat motel to the west. Bronte Road is the primary noise source in the area. There are no significant stationary sources of noise within 500 m of this site.

3 Sound Level Criteria

Guidelines for acceptable levels of road traffic noise impacting residential developments are given in the MECP 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)

Space	Daytime L_{EQ} (16 hour)	Nighttime L_{EQ} (8 hour)
	Road	Road
Outdoor Living Areas	55 dBA	--
Inside Living/Dining Rooms	45 dBA	45 dBA
Inside Bedrooms	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 and terraces that are less than 4 m in depth are not considered to be outdoor living areas under MECP



guidelines.

The guidelines in the MECP publication 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 rental agreements to the property. Where OLA sound levels exceed 60 dBA, physical mitigation is required to reduce the OLA sound level to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible. The Region of Halton's minimum noise barrier height is 2.4 m. The Town of Oakville maximum acoustic fence height is 2.4 m.

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where nighttime sound levels outside bedroom/living/dining room windows exceed 60 dBA or daytime sound levels outside bedroom/living/dining room windows exceed 65 dBA. Forced air ventilation with ducts sized to accommodate the future installation of air conditioning by the occupant is required when nighttime sound levels at bedroom/living/dining room windows are in the range of 51 to 60 dBA or when daytime sound levels at bedroom/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 bedroom/living/dining room 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 are required to notify future residents of possible excesses when nighttime sound levels exceed 50 dBA at the plane of the bedroom/living/dining room window and daytime sound levels exceed 55 dBA in the outdoor living area and at the plane of the bedroom/living/dining room window due to road traffic.



4 Traffic Noise Assessment

4.1 Road Traffic Data

Traffic data was obtained from the Region of Halton in the form of ultimate volumes and the existing commercial percentages were obtained from the Town of Oakville.

Future annual average daily traffic (AADT) of 50 000 vehicles per day was applied for Bronte Road. For Bronte Road, a commercial vehicles percentage of 0.6% for medium trucks and 2% for heavy trucks was used. Commercial vehicles percentages were calculated from the traffic data obtained from Region of Halton. A posted speed of 60 kph was used for Bronte Road. Day/night split of 90%/10% was applied.

Table II summarizes the traffic volume data used in this study.

Table II: Ultimate Road Traffic Data

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
Bronte Road	Daytime	43 830	270	900	45 000
	Nighttime	4 870	30	100	5 000
	Total	48 700	300	1000	50 000

4.2 Road Traffic Prediction

Future traffic sound levels were predicted using STAMSON version 5.04, a computer algorithm developed by the MECP. Sample STAMSON output is included in Appendix B.

Predictions of the traffic sound levels were made at the window on the 3rd storey of the townhouses.

Table III summarizes the predicted sound levels.



Table III: Predicted Traffic Sound Levels [dBA]

Prediction Location	Description	OLA LEQ	Daytime LEQ (16 hour) dBA	Nighttime LEQ (8 hour) dBA
[A]	North Façade Frontage of Townhouse adjacent to Bronte Road	--	68	62
[B_OLA]	Rear yard of 3-storey traditional townhouse nearest Bronte Road	56	--	--
[C]	East Façade of Townhouse with exposure to Bronte Road	--	60	53
[D]	North Façade of second row of Townhouses parallel to Bronte Road	--	61	54
[E_N]	Northern Façade of back-to-back townhouses	--	56	51
[E_W]	Western Façade of back-to-back townhouses	--	56	<50
[F]	Northern Façade of furthest row of townhouses from Bronte Road	--	<55	<50
[G]	Townhouse with exposure to Bronte Road	--	61	54
[H]	Single Detached Dwelling south of Condo Block	<55	<55	<50

5 Discussion and Recommendations

The predictions indicate that the future traffic sound levels will exceed MECP guidelines at the dwelling units adjacent to and with exposure to Bronte Road. Recommendations to address these excesses are discussed below.

5.1 Outdoor Living Areas

The rear yard of the closest traditional townhouse with exposure to Bronte Road (prediction location [B_OLA]) has a predicted sound level of 56 dBA which is 1 dBA in excess of the MECP's limit of 55 dBA. The one dBA excess is considered to be imperceptible and an acoustic barrier is not recommended. A noise warning clause is also required.



5.2 Indoor Living Areas and Ventilation Requirements

Installation of Air Conditioning

For all dwellings adjacent to Bronte Road (prediction location [A]), the predicted sound levels exceed 60 dBA during the night and exceed 65 dBA during the day, 62 and 68 dBA respectively. To address these excesses, the MECP guidelines recommend that these dwelling units be equipped with a central air conditioning system. The guidelines also recommend warning clauses for these blocks and lots. Window or through-the-wall air conditioning units are not recommended for any residential units because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall noise insulating properties of the envelope. The location, installation and sound ratings of the outdoor air conditioning devices should minimize noise impacts and comply with criteria of MECP publication NPC-300.

Provision for the Future Installation of Air Conditioning by the Occupant

For the townhomes with some exposure to Bronte Road, at the north and south of the site, (prediction locations[C], [D], [E_N], [E_W]), sound levels are between 56 and 60 dBA during the day and 51 and 55 dBA during the nighttime. Therefore, forced air ventilation systems with ductwork sized for the future installation of central air conditioning by the occupant are required along with a noise warning clause.

Remaining dwellings to the further west on the site will not require any specific ventilation systems. Figure 3 indicates the ventilation requirements.

5.3 Building Façade Constructions

The future road traffic sound levels outside the dwelling units adjacent to Bronte Road are greater than 60 dBA during nighttime and / or 65 dBA during daytime. MECP guidelines recommend that the windows, walls and doors be designed so that the indoor 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). They are based on the predicted future sound levels at the building facades, and the anticipated area ratios of the facade components (windows and walls) and the floor area of the adjacent room.

The minimum necessary specification for the building envelope is AIF-28 for living/dining/family rooms and AIF-27 for bedrooms at prediction locations [A], based on the possibility of sound entering the buildings through windows and walls. Any well sealed thermopane unit having a Sound Transmission Class (STC) rating of 30, will provide sufficient acoustic insulation as long as the window to floor area ratio is less than 40% for living/dining rooms and less than 45% for bedrooms.

For the remaining blocks further away from Bronte Road and the interior of the development, any exterior wall construction and glazing construction meeting the Ontario Building Code (OBC) will be acceptable.

Further Analysis

When detailed floor plans and building elevations are available for the dwellings adjacent to Bronte Road, an acoustical consultant shall refine the glazing constructions based on actual window to floor area ratios.

5.4 Warning Clauses

The MECP guidelines recommend that warning clauses be included in the property and tenancy agreements for all lots and blocks with anticipated traffic sound level excesses. Examples are provided below.

Suggested wording for future dwellings with minor sound level excesses is given below:

Type A:

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



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

Type B:

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 Municipality's and the Ministry of the Environment, Conservation and Parks noise criteria. (Note: The location and installation of the outdoor air conditioning device should be done so as to minimize the noise impacts and comply with criteria of MECP publication NPC-216, Residential Air Conditioning Devices.)

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

Type C:

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 the Environment, Conservation and Parks.

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

6 Summary of Recommendations

The results of the study indicate that the proposed residential development is feasible. Future road traffic sound levels in some areas will exceed MECP guidelines, but feasible means exist to reduce the impact to within acceptable limits.

The following list and Table IV summarize the recommendations made in this report.

1. Air conditioning system will be required for the blocks adjacent to and fronting onto Bronte Road
2. Forced air ventilation with ductwork sized for the future installation of central air conditioning by the occupant is required for the dwelling units with exposure to Bronte Road.



3. Dwellings with exposure to Bronte Road will require noise warning clauses. When block numbering and lot numbering is available, the acoustic recommendations should be refined.

Table IV: Summary of Noise Control Requirements and Noise Warning Clauses

Prediction Location	Acoustic Barrier	Ventilation Requirements	Type of Warning Clause	Building Constructions
A	--	Central A/C	A, C	AIF-30 / AIF-28*
B ola	--	Forced Air	A, B	OBC
E W	--	Forced Air	A, B	OBC
E N	--	Forced Air	A, B	OBC
F	--	--	--	OBC
G	--	--	--	OBC
H	--	--	--	OBC

Notes:

All other lots and blocks have no specific acoustic requirements.

-- no specific requirement

OBC – meeting the minimum requirements of the Ontario Building Code

*When detailed floor plans and building elevations are available for Buildings C and D, adjacent to Bronte Road, an acoustical consultant shall refine the glazing constructions based on actual window to floor area ratios.

6.1 Implementation

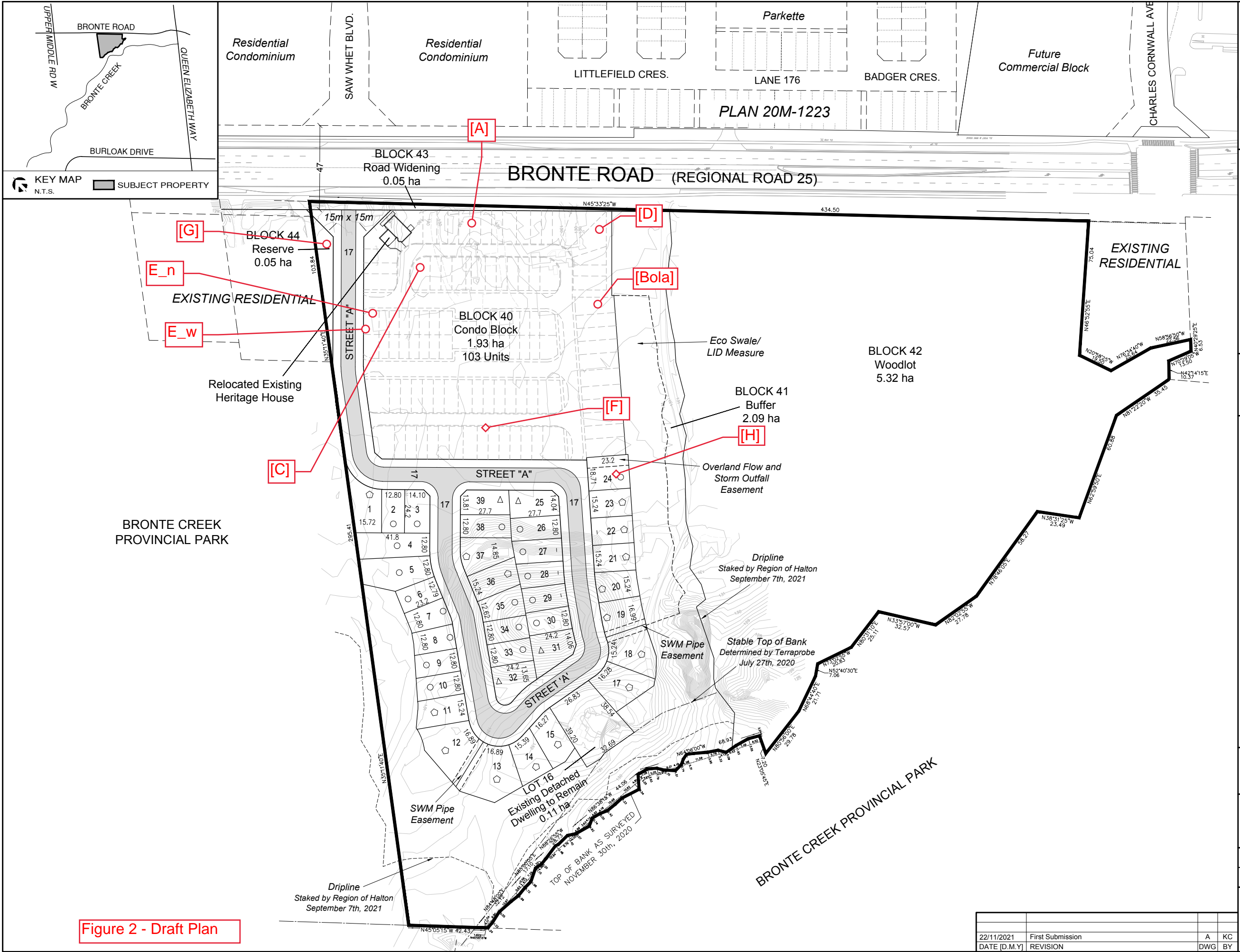
To ensure that the noise control recommendations outlined above are fully implemented, it is recommended that:

- 1) Prior to the issuance of occupancy permits for this development, a Professional Engineer qualified to perform acoustical services in the province of Ontario or the town building department shall certify that the sound control measures have been properly installed and constructed.





Figure 1 – Key Plan



DRAFT PLAN OF SUBDIVISION


24T-Bronte River, LP

1300, 1316, 1326, 1342, and 1350 Bronte Road
PART OF LOT 31
CONCESSION 2, SOUTH OF DUNDAS STREET

GEOGRAPHIC TOWNSHIP OF TRAFALGAR
NOW IN THE
TOWN OF OAKVILLE
REGIONAL MUNICIPALITY OF HALTON

OWNER'S AUTHORIZATION


I HEREBY AUTHORIZE KORSIAK URBAN PLANNING TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE TOWN OF OAKVILLE FOR APPROVAL.

SIGNED:  DATE: September 2, 2021

Gord Buck
Bronte River, LP
4900 Palladium Way, Suite 105
Burlington, Ontario L7M 0W7

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE CORRECTLY AND ACCURATELY SHOWN.

SIGNED:  DATE: September 2, 2021

Thomas J. Salb, OLS, OLIP
J.D. BARNES
LAND INFORMATION SYSTEMS
401 WHEELABRATOR WAY, SUITE A, MILTON, ON L9T 3C1
T: (905) 875-9955 F: (905) 875-9956 www.jdbarnes.com

ADDITIONAL INFORMATION (UNDER SECTION 51 (17) OF THE PLANNING ACT)


A) SHOWN ON PLAN	G) SHOWN ON PLAN
B) SHOWN ON PLAN	H) MUNICIPAL AND PIPED WATER TO BE PROVIDED
C) SHOWN ON PLAN	I) SANDY LOAM
D) SHOWN ON PLAN	J) SHOWN ON PLAN
E) SHOWN ON PLAN	K) SANITARY AND STORM SEWERS TO BE PROVIDED
F) SHOWN ON PLAN	L) SHOWN ON PLAN

LAND USE SCHEDULE

Land Use	Lots/Blocks	Lot / Block Total	Area (ha)	Units
Single Detached (15.24 m)	1, 11-15, 17-23, 36, 37	15	0.72	15
Single Detached (12.80 m)	2-10, 24, 26-30, 33-35, 38	19	0.69	19
Single Detached (12.50 m)	25, 31, 32, 39	4	0.16	4
Existing Detached Dwelling to Remain	16	1	0.11	1
Condo Block	40	1	1.93	103
Buffer	41	1	2.09	
Woodlot	42	1	5.32	
Road Widening	43	1	0.05	
Reserve	44	1	0.05	
17 m ROW (573 m)			1.00	
Total	44	44	12.12	142


NOTES:

- Pavement illustration is diagrammatic
- Local to Regional Road daylight triangle = 15 m
- Local to Local daylight triangle = 3.5 m



SCALE 1:2000 November 22, 2021

DRAWN BY: KC CHECKED BY: SE



206-277 Lakeshore Road East
Oakville, Ontario L6J 1H9
T: 905-257-0227
info@korsiak.com

22/11/2021	First Submission	A	KC
DATE [D.M.Y]	REVISION	DWG	BY

Figure 2 - Draft Plan

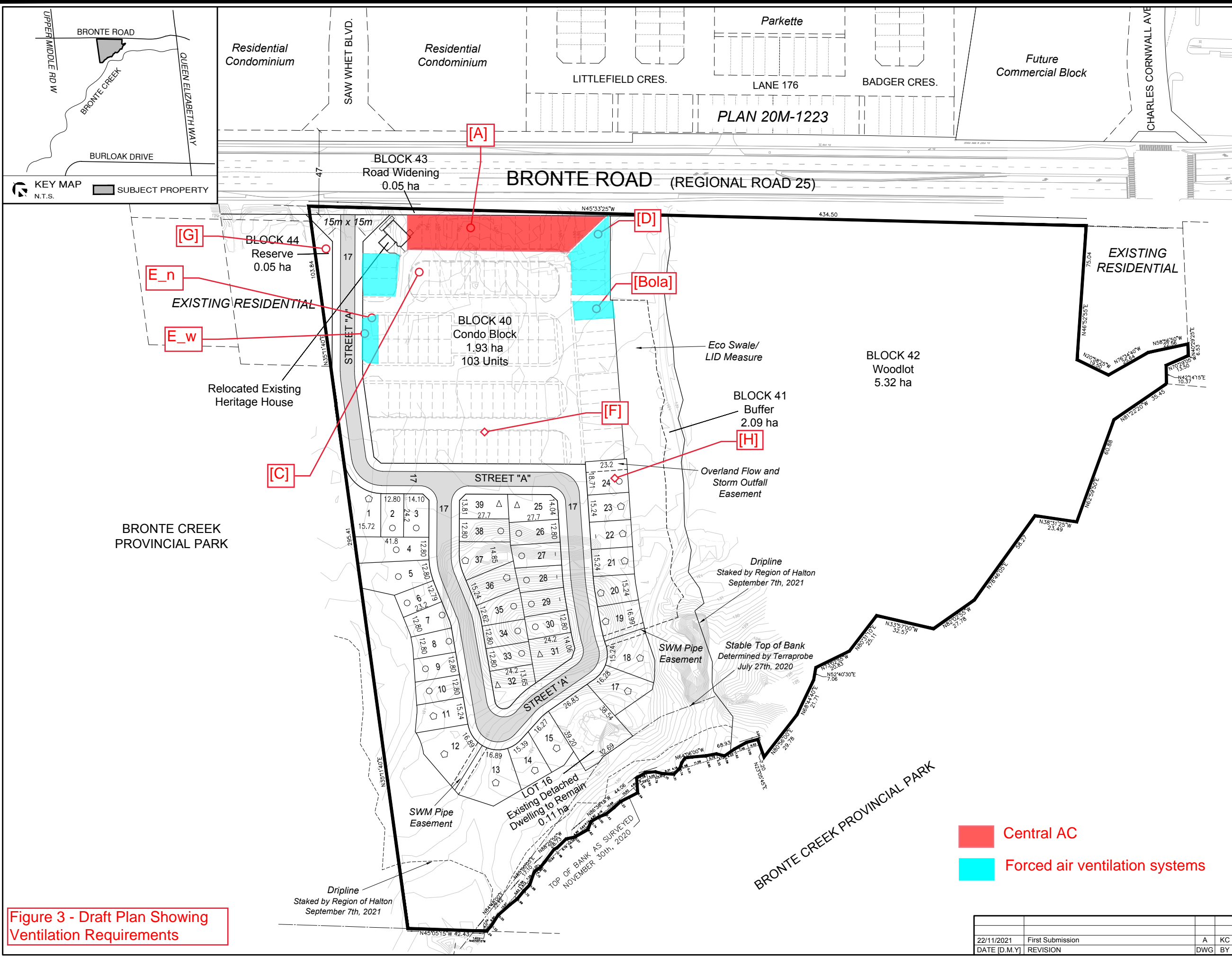


Figure 3 - Draft Plan Showing Ventilation Requirements


DRAFT PLAN OF SUBDIVISION 24T-Bronte River, LP

1300, 1316, 1326, 1342, and 1350 Bronte Road
PART OF LOT 31
CONCESSION 2, SOUTH OF DUNDAS STREET

GEOGRAPHIC TOWNSHIP OF TRAFALGAR
NOW IN THE
TOWN OF OAKVILLE
REGIONAL MUNICIPALITY OF HALTON



OWNER'S AUTHORIZATION

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SIGNED:  DATE: September 2, 2021
Gord Buck
Bronte River, LP
4900 Palladium Way, Suite 105
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SIGNED:  DATE: September 2, 2021
Thomas J. Salb, OLS, OLIP
 **J.D. BARNES**
SURVEYING
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GIS
401 WHEELABRATOR WAY, SUITE A, MILTON, ON L9T 3C1
T: (905) 875-9955 F: (905) 875-9956 www.jdbarnes.com

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B) SHOWN ON PLAN	H) MUNICIPAL AND PIPED WATER TO BE PROVIDED
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Total	44	44	12.12	142


NOTES:

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- Local to Regional Road daylight triangle = 15 m
- Local to Local daylight triangle = 3.5 m

**ARGO**
DEVELOPMENT CORP

SCALE 1:2000 November 22, 2021

DRAWN BY: KC CHECKED BY: SE

**KORSIAK** Urban Planning
206-277 Lakeshore Road East
Oakville, Ontario L6J 1H9
T: 905-257-0227
info@korsiak.com

22/11/2021	First Submission	A	KC
DATE [D.M.Y]	REVISION	DWG	BY

APPENDIX A

Road Traffic Data

Yvonne Lo

From: Krusto, Matt <Matt.Krusto@halton.ca>
Sent: March 15, 2021 11:15 AM
To: Yvonne Lo
Subject: RE: Road Traffic Data Request - Bronte Road/Upper Middle Road W

Hi Yvonne,

Good to hear from you. Yes all is well, hope al is well with you too!

Please use the following for the ultimate assumptions:

Bronte Road – 50,000 AADT, 6 lanes, truck percentages must be based on existing counts

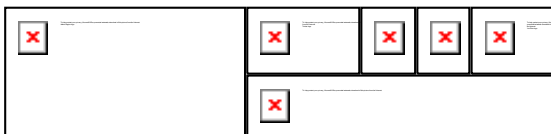
Upper Middle Road – 45,000 AADT, 6 lanes, truck percentages must be based on existing counts

For the existing counts (turning movement at Bronte/Upper Middle) to determine existing truck percentages, please send your request to trafficdatarequests@halton.ca

Take care.

Matt

Matt Krusto
Project Manager II, Transportation Planning Coordination
Infrastructure Planning & Policy
Public Works
Halton Region
905-825-6000, ext. 7225 | 1-866-442-5866



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From: Yvonne Lo <ylo@hgcengineering.com>
Sent: Monday, March 15, 2021 11:06 AM
To: Krusto, Matt <Matt.Krusto@halton.ca>
Subject: Road Traffic Data Request - Bronte Road/Upper Middle Road W

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe. If you are unsure or need assistance please contact the IT Service Desk.

Hi Matt,

Hope you're continuing to stay well. We are currently conducting a noise feasibility study for a proposed development located at the east side of Bronte Road, south of Upper Middle Road West as shown in the link below.

<https://goo.gl/maps/vgNQ4om1k8CbWYwW8>

Can you please provide AADT volumes for Bronte Road and Upper Middle Road West in the vicinity of the site?

Thank you!

Best,

Yvonne Lo, MEng, PEng
Project Consultant

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Howe Gastmeier Chapnik Limited

2000 Argentia Road, Plaza One, Suite 203, Mississauga, Ontario, Canada L5N 1P7

t: 905.826.4044 ext.232 e: ylo@hgcengineering.com

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APPENDIX B

Sample STAMSON 5.04 Output

STAMSON 5.0 NORMAL REPORT Date: 28-11-2021 13:36:39
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: a.te Time Period: Day/Night 16/8 hours
 Description: **Daytime and nighttime sound levels at prediction location [A], North Façade Frontage of Townhouse adjacent to Bronte Road**

Road data, segment # 1: Bronte Rd E (day/night)

```
-----
Car traffic volume   : 21915/2435   veh/TimePeriod   *
Medium truck volume :   135/15     veh/TimePeriod   *
Heavy truck volume  :   450/50     veh/TimePeriod   *
Posted speed limit  :    60 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): 25000
Percentage of Annual Growth       : 0.00
Number of Years of Growth         : 10.00
Medium Truck % of Total Volume    : 0.60
Heavy Truck % of Total Volume     : 2.00
Day (16 hrs) % of Total Volume    : 90.00
```

Data for Segment # 1: Bronte Rd E (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 : 29.00 / 29.00 m
Receiver height  : 7.50 / 7.50 m
Topography      : 1           (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

Road data, segment # 2: Bronte Rd W (day/night)

```
-----
Car traffic volume   : 21915/2435   veh/TimePeriod   *
Medium truck volume :   135/15     veh/TimePeriod   *
Heavy truck volume  :   450/50     veh/TimePeriod   *
Posted speed limit  :    60 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): 25000
Percentage of Annual Growth       : 0.00
Number of Years of Growth         : 10.00
Medium Truck % of Total Volume    : 0.60
Heavy Truck % of Total Volume     : 2.00
Day (16 hrs) % of Total Volume    : 90.00
```



Data for Segment # 2: Bronte Rd W (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 : 18.00 / 18.00 m
Receiver height       :    7.50 / 7.50 m
Topography           :      1           (Flat/gentle slope; no barrier)
Reference angle       :    0.00
  
```

Results segment # 1: Bronte Rd E (day)

Source height = 1.19 m

ROAD (0.00 + 63.47 + 0.00) = 63.47 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-90	90	0.49	68.89	0.00	-4.26	-1.15	0.00	0.00	0.00

SubLeq

Segment Leq : 63.47 dBA

Results segment # 2: Bronte Rd W (day)

Source height = 1.19 m

ROAD (0.00 + 66.56 + 0.00) = 66.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-90	90	0.49	68.89	0.00	-1.18	-1.15	0.00	0.00	0.00

SubLeq

Segment Leq : 66.56 dBA

Total Leq All Segments: 68.29 dBA



Results segment # 1: Bronte Rd E (night)

Source height = 1.19 m

ROAD (0.00 + 56.94 + 0.00) = 56.94 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.49	62.36	0.00	-4.26	-1.15	0.00	0.00	0.00
56.94									

Segment Leq : 56.94 dBA

Results segment # 2: Bronte Rd W (night)

Source height = 1.19 m

ROAD (0.00 + 60.02 + 0.00) = 60.02 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.49	62.36	0.00	-1.18	-1.15	0.00	0.00	0.00
60.02									

Segment Leq : 60.02 dBA

Total Leq All Segments: 61.76 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.29
(NIGHT): 61.76



STAMSON 5.0 NORMAL REPORT Date: 28-11-2021 13:37:34
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b_ola1.te Time Period: 16 hours
 Description: **Daytime sound level at [B_OLA], Rear yard of 3-storey traditional townhouse nearest Bronte Road**

Road data, segment # 1: Bronte Rd E

 Car traffic volume : 21915 veh/TimePeriod *
 Medium truck volume : 135 veh/TimePeriod *
 Heavy truck volume : 450 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Bronte Rd E

 Angle1 Angle2 : -10.00 deg 45.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 71.00 m
 Receiver height : 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 2: Bronte Rd W

 Car traffic volume : 21915 veh/TimePeriod *
 Medium truck volume : 135 veh/TimePeriod *
 Heavy truck volume : 450 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Bronte Rd W

 Angle1 Angle2 : -10.00 deg 45.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 61.00 m
 Receiver height : 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 3: Bronte Rd E

 Car traffic volume : 21915 veh/TimePeriod *
 Medium truck volume : 135 veh/TimePeriod *
 Heavy truck volume : 450 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 0 %



Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: Bronte Rd E

```

-----
Angle1  Angle2      : 45.00 deg  90.00 deg
Wood depth      :      2      (Wood depth 60 metres or more)
No of house rows :      0
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 71.00 m
Receiver height  : 1.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  : 0.00
  
```

Road data, segment # 4: Bronte Rd W

```

-----
Car traffic volume : 21915 veh/TimePeriod *
Medium truck volume : 135 veh/TimePeriod *
Heavy truck volume : 450 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient      : 0 %
Road pavement      : 1 (Typical asphalt or concrete)
  
```

Data for Segment # 4: Bronte Rd W

```

-----
Angle1  Angle2      : 45.00 deg  90.00 deg
Wood depth      :      2      (Wood depth 60 metres or more)
No of house rows :      0
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 61.00 m
Receiver height  : 1.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  : 0.00
  
```

Results segment # 1: Bronte Rd E

Source height = 1.19 m

ROAD (0.00 + 52.28 + 0.00) = 52.28 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

```

-----
---
-10    45    0.66  68.89    0.00 -11.21  -5.40    0.00    0.00    0.00
52.28
-----
---
  
```

Segment Leq : 52.28 dBA



Results segment # 2: Bronte Rd W

Source height = 1.19 m

ROAD (0.00 + 53.38 + 0.00) = 53.38 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-10	45	0.66	68.89	0.00	-10.11	-5.40	0.00	0.00	0.00
53.38									

Segment Leq : 53.38 dBA

Results segment # 3: Bronte Rd E

Source height = 1.19 m

ROAD (0.00 + 41.81 + 0.00) = 41.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

45	90	0.37	68.89	0.00	-9.25	-7.84	-10.00	0.00	0.00
41.81									

Segment Leq : 41.81 dBA

Results segment # 4: Bronte Rd W

Source height = 1.19 m

ROAD (0.00 + 42.71 + 0.00) = 42.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

45	90	0.37	68.89	0.00	-8.34	-7.84	-10.00	0.00	0.00
42.71									

Segment Leq : 42.71 dBA

Total Leq All Segments: 56.24 dBA

TOTAL Leq FROM ALL SOURCES: 56.24

