

Noise Feasibility Study

Proposed Mixed-Use Development

Eighth Line and Dundas Street East

Town of Oakville, Ontario

Prepared for:

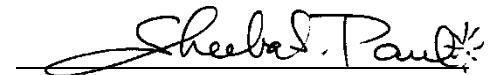
Capoak Inc. & Redoak G & A Inc.
3751 Victoria Park Ave
Toronto, Ontario, M1W 3Z4

Prepared by



Victor Garcia, PEng

Reviewed by



Sheeba Paul, MEng, PEng

April 20, 2021

HGC Project No. 01700845

Table of Contents

1	Introduction and Summary	1
2	Site Description and Sources of Sound.....	2
3	Criteria for Acceptable Sound Levels.....	2
3.1	Road Traffic Noise Criteria	2
4	Traffic Sound Level Assessment	4
4.1	Road Traffic Data	4
4.2	Road Traffic Noise Predictions	5
5	Traffic Noise Recommendations	5
5.1	Outdoor Living Areas.....	5
5.2	Indoor Living Areas.....	6
5.3	Building Façade Constructions.....	7
5.4	Warning Clauses.....	7
6	Summary and Recommendations	8
6.1	Implementation.....	9

Figure 1: Key Plan

Figure 2: Draft Plan Showing Prediction Locations

Figure 3: Draft Plan Showing Ventilation Requirements

Appendix A: Road Traffic Data

Appendix B: Sample STAMSON 5.04 Output

1 Introduction and Summary

HGC Engineering was retained by Capoak Inc. & Redoak G & A Inc. to perform a noise feasibility study for a proposed mixed-use development located at Eighth Line and Dundas Street East, in the Town of Oakville, Ontario. The proposed development will include single detached dwellings, townhouses, rear lane townhouses, live/work units, village squares, urban core space along with associated roadways. The study is required by the Town of Oakville as part of the approvals process.

This study is being updated to include an updated site plan prepared by Malone Given Parsons dated April 14, 2021.

Road traffic data was obtained through correspondence with the Region of Halton and the Town of Oakville. The data was used to predict future traffic sound levels at the proposed dwellings. The predicted sound levels were compared to the guidelines of the Ministry of the Environment, Conversation and Parks (MECP), the Region of Halton and the Town of Oakville.

The sound level predictions indicate that feasible means exist to reduce sound levels to ensure MECP guidelines are satisfied inside the proposed dwellings. Forced air ventilation systems with ducts sized for the future installation of air conditioning by the occupant is required for the dwellings with exposure to Dundas Street East or the collector roads. Any exterior building façade constructions meeting the minimum requirements of the Ontario Building Code will provide sufficient acoustical insulation for the remaining dwellings. Warning clauses are also recommended to inform future occupants of the traffic noise impacts.



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2 Site Description and Sources of Sound

Figure 1 shows a key plan which identifies the location of the proposed development. The residential development is located at the northeast corner of Eighth Line and Dundas Street East, in the Town of Oakville, Ontario. The proposed draft plan prepared by Malone Given Parsons dated April 14, 2021 is included as Figure 2, also showing the prediction locations. The proposed development will include single detached dwellings, townhouses, rear lane townhouses, live/work units, village squares, urban core space along with associated roadways.

HGC Engineering personnel visited the site in the month of November 2017. The surrounding lands are primarily residential/agricultural. The development land is fairly flat. The primary source of noise is road traffic noise from Dundas Street East. Secondary sources of noise include road traffic on Eighth Line, Street A, Street B, and Street C/F. Dundas Street East is a 6 lane roadway (3 lanes in each direction) in this area. Eighth Line is 4 lanes (2 lanes in each direction) south of Dundas Street East. There are no significant sources of stationary noise within 500 m of the subject site.

3 Criteria for Acceptable Sound Levels

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”, Part C release date October 21, 2013 and are listed in Table 1 below. The values in Table 1 are energy equivalent (average) sound levels [L_{EQ}] in units of A weighted decibels [dBA].



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Table 1: Road Traffic Noise Criteria

	Daytime LEQ(16 hour)	Nighttime LEQ(8 hour)
Outdoor Living Areas	50 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. Nighttime refers to the time period between 23:00 and 07:00. The term "Outdoor Living Area" (OLA) is used in reference to an outdoor patio, backyard, terrace, children's playground or other area where passive recreation is expected to occur.

The guidelines in the MECP publication allow the sound level limit in an OLA to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in the property agreements, offers of purchase and sale and rental agreements to the properties. Where future 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.

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where future nighttime sound levels outside bedroom windows will exceed 60 dBA or future daytime sound levels outside living/dining/bedroom windows will 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 windows will be in the range of 51 to 60 dBA or when daytime sound levels at living/dining/bedroom windows will be 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 nighttime plane of window sound level will be greater than 60 dBA or the daytime plane of window sound level will be greater than 65 dBA. The use of warning clauses to notify future residents of possible excesses is also required.

4 Traffic Sound Level Assessment

4.1 Road Traffic Data

Ultimate road traffic information for Dundas Street East was obtained from the Region of Halton personnel and is provided in Appendix A. A speed limit of 60 km/h was used for Dundas Street East. A commercial vehicle percentage of 3.3% was provided and used for Dundas Street East, split into 2.1% medium trucks and 1.2% heavy trucks, along with a day-night split of 90%/10%.

Road traffic information for Eighth Line was obtained from the Town of Oakville personnel and is provided in Appendix A. The data was projected to the year 2031 using a 2.5%/year growth rate. A speed limit of 50 km/h was used for Eighth Line. A commercial vehicle percentage of 6% was assumed and split into 3% medium trucks and 3% heavy trucks, along with a day-night split of 90%/10%.

Road traffic information for Street A, Street B, and Street C/F was not available at the time of this study. Road traffic data for a nearby development was used to approximate the traffic sound levels on the collector roads, and is included in Appendix A. The data was projected to the year 2031 using a 2.5%/year growth rate. A speed limit of 50 km/h was used for the collector roadways. A commercial vehicle percentage of 2% was split into 1% medium trucks and 1% heavy trucks, along with a day-night split of 90%/10% was assumed for the collector roads. Table 2 summarizes the traffic data used in the analysis.

Table 2: Ultimate and Projected Road Traffic Data

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
Dundas Street East <i>Ultimate</i>	Daytime	47 866	1 040	594	49 500
	Nighttime	5 318	116	66	5 500
	Total	53 184	1 156	660	55 000
Eighth Line <i>2031 Projected</i>	Daytime	7 491	239	239	7 969
	Nighttime	832	27	27	886
	Total	8 323	266	266	8 855
Street A, B, C/F <i>2031 Projected</i>	Daytime	4 863	50	50	4 963
	Nighttime	540	6	6	552
	Total	5 403	56	56	5 515

At the detailed noise study stage, the traffic volumes for the collector roads should be revised based on the traffic impact study.

4.2 Road Traffic Noise Predictions

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.

Sound levels were predicted at the plane of the living/dining room windows during the daytime and at the plane of the bedroom windows during nighttime hours to investigate ventilation requirements. The results of these predictions, without mitigation, are summarized in Table 3.

Table 3: Predicted Sound Levels, Without Mitigation, [dBA]

Prediction Location	Description	Daytime – in the OLA L _{EQ-16 hr}	Daytime – at the Façade L _{EQ-16 hr}	Night-time – at the Façade L _{EQ-8 hr}
[A]	Back-to-back townhouses fronting onto single loaded road, exposure to Dundas St E	--	60	54
[B]	Rear lane live/work units flanking onto Eighth Ln	--	63	57
[C]	Dwellings fronting onto Street A	<55	58	51
[D]	Dwellings flanking onto Street B	58	60	53

5 Traffic Noise Recommendations

The predictions indicate that the future traffic sound levels will exceed MECP guidelines at the facades with exposure to Dundas Street East, Eighth Line and the proposed collector roads.

Recommendations to address these excesses are discussed below.

5.1 Outdoor Living Areas

The predicted sound levels in the rear yards of the dwelling units adjacent to the roadway will be up to 58 dBA (prediction location [D]), 3 dBA in excess of the MECP limit of 55 dBA. The 3 dBA sound level excess is acceptable to the MECP with the use of a noise warning clause if it is acceptable to the municipality.

The predicted sound level in the rear yards of the remaining proposed dwelling units will be 55 dBA or less and physical mitigation is not required.

a) Urban Core

The siting information and details for the Urban Core lands are not known at this time. Any outdoor amenity areas for the units should be placed on the shielded side of the buildings to reduce the need for high noise barriers. When siting, lotting, and grading information is available, detailed noise studies should be conducted for the Urban Core lands to determine the specific barrier requirements, heights and extents, requirements for ventilation and building envelope construction. The development of the Urban Cores and requirements for noise mitigation will be reviewed in a future site plan approval application.

5.2 Indoor Living Areas

Provision for the Future Installation of Air Conditioning

The predicted future sound levels outside the top storey living room/bedroom windows of dwellings with exposure to Dundas Street East, Eighth Line, and/or the collector roads will be between 56 and 65 dBA during the daytime hours and/or 51 and 60 dBA during the night. To address these excesses, the MECP guidelines recommend that these dwellings be equipped with forced air ventilation systems with ducts sized to accommodate the future installation of air conditioning by the occupant.

Figure 3 shows the ventilation requirements for the development. 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, as applicable. The guidelines also recommend warning clauses for all units with ventilation requirements.

For the remaining dwelling units there are no specific ventilation requirements.



5.3 Building Façade Constructions

All of the proposed dwellings within the development will have daytime sound levels of 65 dBA or less and nighttime sound levels of 60 dBA or less respectively. Any exterior wall, and double-glazed window construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation for the dwelling units.

Urban Core

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

5.4 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 of the dwellings with anticipated traffic sound level excesses. Examples are provided below.

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

Type A:

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 occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the noise criteria of the Municipality and the Ministry of the Environment, Conversation and Parks.

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 noise criteria of the Municipality and the Ministry of the Environment, Conversation and Parks. (Note: The location and installation of the outdoor air conditioning



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device should be done so as to minimize the noise impacts and comply with criteria of MECP publication NPC-300, as applicable.)

This sample clause is provided by the MECP as examples and can be modified by the Municipality as required.

6 Summary and Recommendations

In summary, HGC Engineering has reviewed the preliminary development plan and performed calculations to determine the potential road traffic noise impact on the proposed residential buildings with respect to MECP guidelines. The sound level predictions indicate that feasible means exist to reduce sound levels to ensure MECP guidelines are satisfied inside the proposed dwellings. The following are the recommendations.

1. Forced air ventilation systems with ducts sized to accommodate the future installation of central air conditioning by the occupant is recommended for dwellings with exposure to Dundas Street East and/or the collector roads. The location, installation and sound ratings of the air conditioning devices should comply with NPC-300, as applicable.
2. Any exterior wall, and double-glazed window construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation for the dwelling units.
3. Warning clauses should be used to inform future residents of the traffic noise issues.
4. A detailed noise study should be performed when lotting information is available, when updated traffic information is available for the collect road and when siting information is available for the Urban Core blocks.

The following table summarizes the noise control recommendations and noise warning clauses for the lots in the proposed subdivision.

Table 4: Summary of Noise Control Requirements and Noise Warning Clauses

Prediction Location	Block No.	Acoustic Barrier	Ventilation Requirements	Type of Warning Clause	Building Façade Constructions
[A], [B], [C], [D]	124 – 130, 136 (western end unit), 138 (eastern end unit), 139 (eastern end unit), 142 (western end unit), 143 (eastern end unit), 145 (western end unit), 150 – 158, 159 (eastern end units and southern units), 160 (southern units), 161 (western end units and southern units), 162 (eastern end units and southern units), 163 (southern units), 164 (southern units), 165 (western end units and southern units), 166 (western end unit), 170 – 190, 196, 197	--	Forced Air	A, B	OBC
Remaining Dwellings		--	--	--	OBC

Notes:

-- no specific requirement

OBC – meeting the minimum requirements of the Ontario Building Code

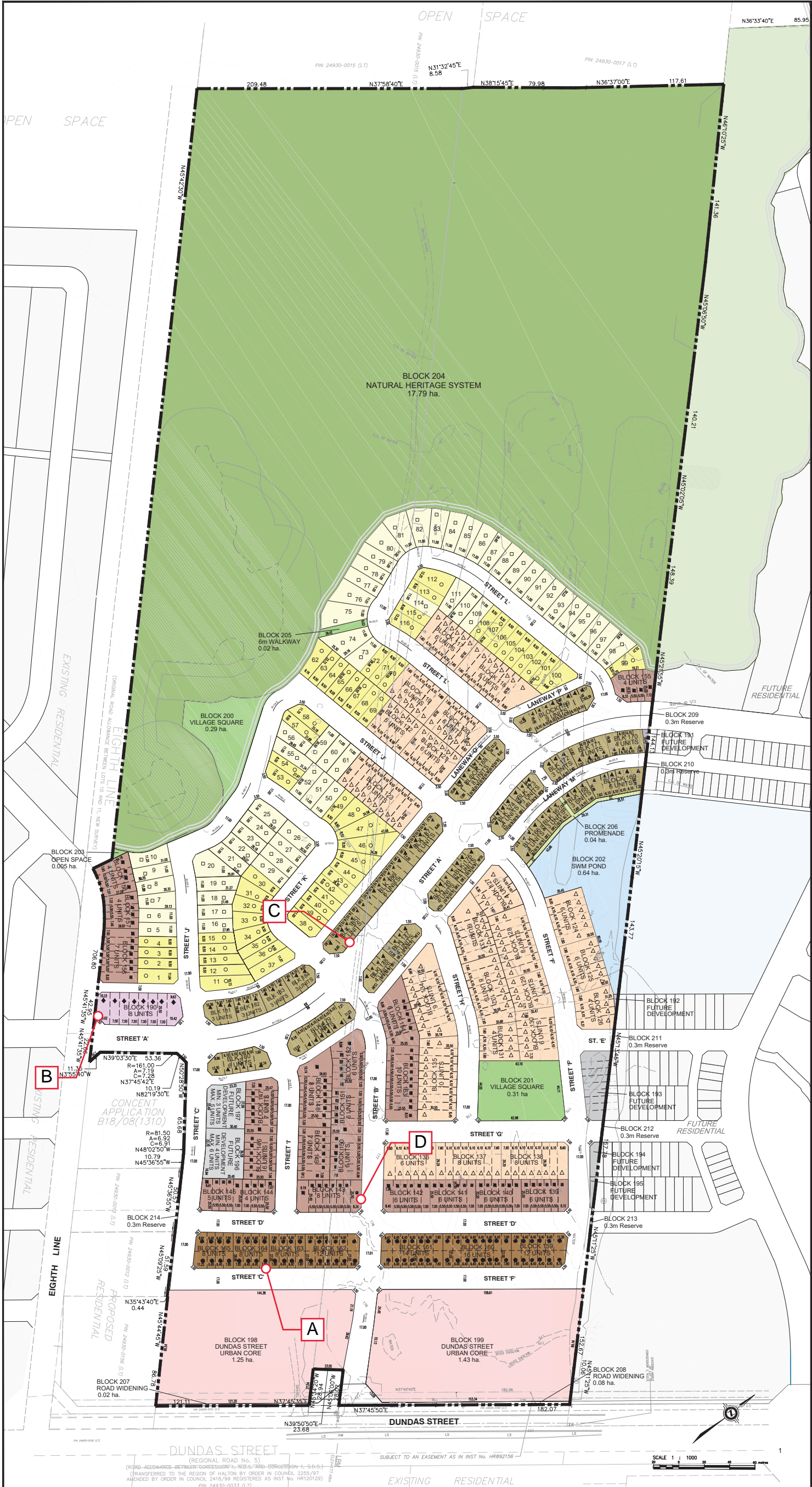
6.1 Implementation

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

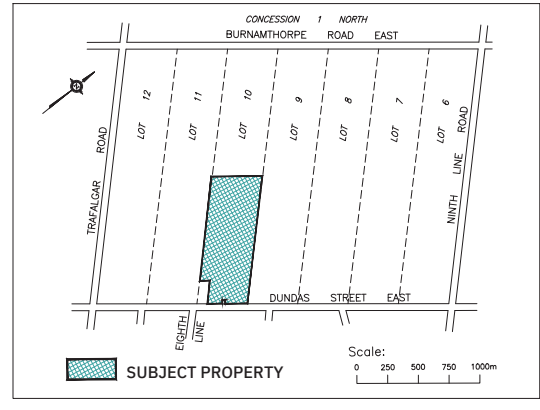
1. A detailed noise study should be conducted when lotting and detailed grading information is available to determine barrier heights, ventilation requirements and the building constructions for the Urban Core lands.



Figure 1 - Key Plan



KEY PLAN



SCHEDULE OF LAND USE

Lot/Block	Land Use	Units	Area(ha)
Lots 1-116	Single Detached 11.0m (36x100ft) min.	58	3.84
Blks 117-138	Single Detached 8.5m (28x100ft) min.	58	3.01
Blks 139-158	Street Townhouse 6.1m (20x100ft) min.	144	1.89
Blks 159-165	Street Townhouse 5.5m (18x83.7ft) min.	122	1.89
Blks 166-189	Back to Back S.T.H. 6.4m (21x44ft) min.	78	0.75
Block 190	Rear Lane S.T.H. 6.1m (20x56ft) min.	113	1.45
Block 191-195	Rear Lane Live Work 7.5m (24.6x83.7ft) min.	8	0.17
Blks 196,197	Future Development	11	0.23
Blks 198,199	Dundas Street Urban Core		2.68
Blks 200,201	Village Square		0.60
Block 202	Storm Water Management Facility		0.64
Block 203	Open Space		0.01
Block 204	Natural Heritage System		17.79
Block 205	6.0m Walkway		0.02
Blks 206	Promenade		0.04
Blks 207,208	Dundas Road Widening		0.10
Blks 209-214	0.3m Reserves		0.01
Public Roads	22.0m ROW (543m) 17.0m ROW (3,014m) 11.0m ROW (192m) 7.50m ROW (129m)		7.11
Total		592	40.61

OWNER'S AUTHORIZATION

We, Redoak G & A Inc. and Capoak Inc. hereby authorize Malone Given Parsons Ltd. to prepare and submit this Draft Plan of Subdivision to the Town of Oakville.

See Original March 25, 2020
 Kathleen Schofield A.S.O.
 NOTE: Town of Oakville owner authorization provided separately

SURVEYOR'S CERTIFICATE

I hereby certify that the boundaries of the lands to be subdivided as shown on this Plan and their relationship to the adjacent lands are accurately and correctly shown.

See Original March 26, 2020
 Ron Querubin, O.L.S., O.L.P.
 JD Barnes Limited

ADDITIONAL INFORMATION

- AS REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT, CHAPTER P.13(R.S.O. 1990).
- (a),(e),(f),(g),(j),(l) - As shown on the Draft Plan.
 - (b),(c) - As shown on the Draft and Key Plan.
 - (d) - Land to be used in accordance with the Schedule of Land Use.
 - (i) - Soil is Clay Loam.
 - (h),(k) - Full municipal services to be provided.

NOTE: Contours relate to Canadian Geodetic Datum. Contour interval is 1m with .25m interpolated.

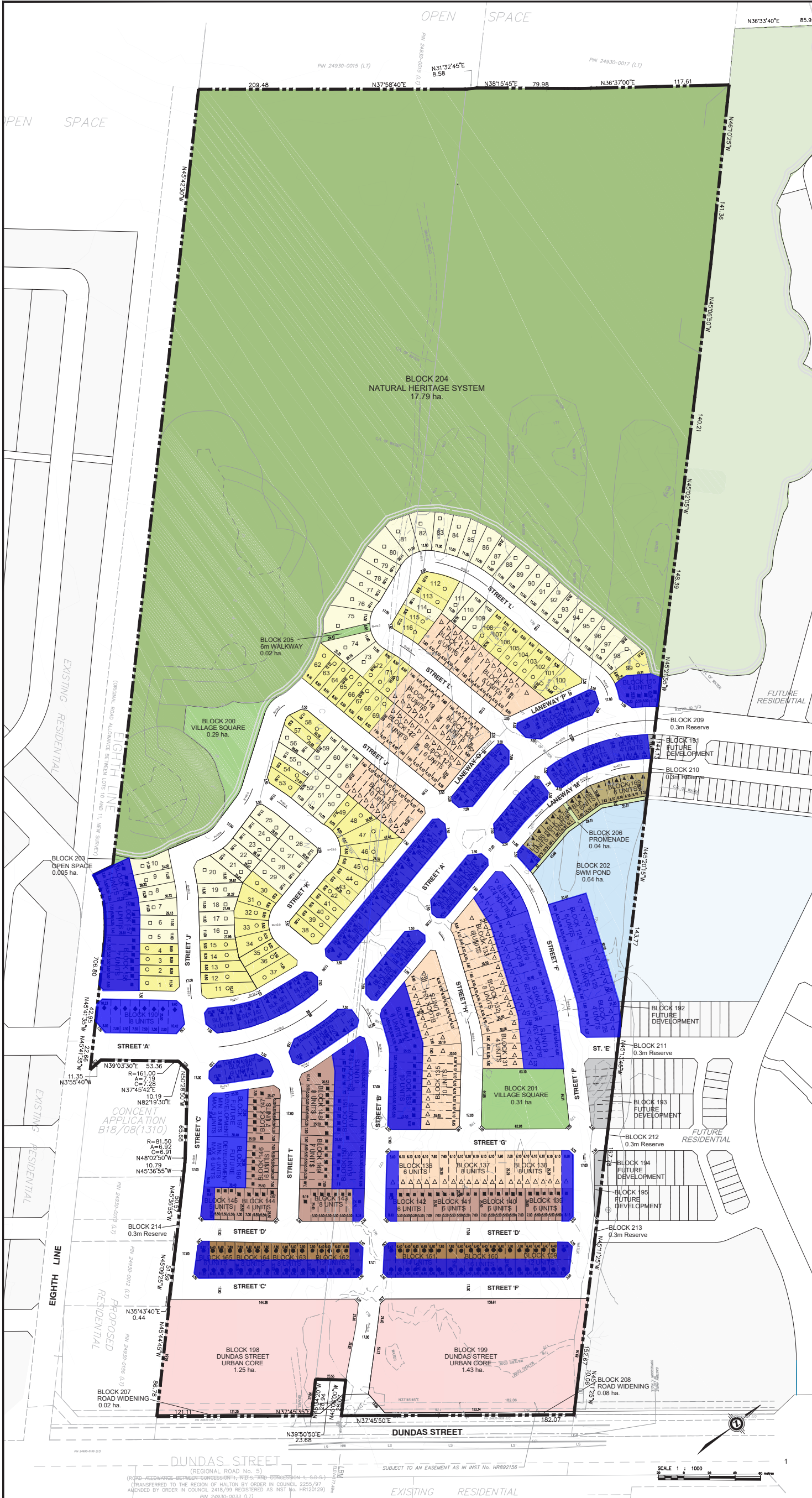
DRAFT PLAN OF SUBDIVISION 24T-18005

Part of Lot 10
 Concession 1
 North of Dundas Street
 (Geographic Township of Trafalgar)
 Town of Oakville
 Regional Municipality of Halton

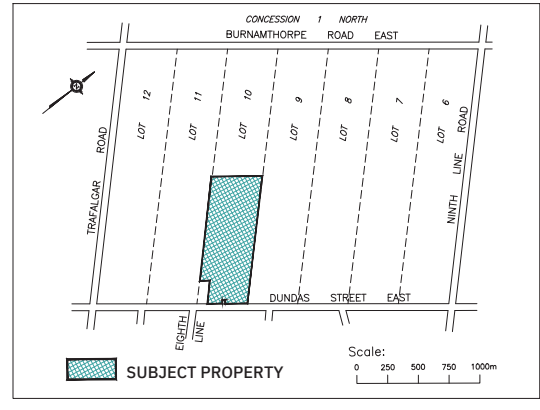
Prepared For:
Redoak G & A Inc.
Capoak Inc.

MGP Malone Given Parsons
 140 Renfrew Drive, Suite 201 | Markham, ON | L3R 6B3
 MGP File: 17-2651
 Date: April 14, 2021

Figure 2 - Proposed Draft Plan Showing Prediction Locations



KEY PLAN



SCHEDULE OF LAND USE

Lot/Block	Land Use	Units	Area(ha)
Lots 1-116	Single Detached 11.0m (36x100ft) min.	58	3.84
Blks 117-138	Single Detached 8.5m (28x100ft) min.	58	3.01
Blks 139-158	Street Townhouse 6.1m (20x100ft) min.	144	1.89
Blks 159-165	Street Townhouse 5.5m (18x83.7ft) min.	122	0.75
Blks 166-189	Back to Back S.T.H 6.4m (21x44ft) min.	78	1.45
Block 190	Rear Lane S.T.H. 6.1m (20x56ft) min.	113	0.17
Block 191-195	Rear Lane Live Work 7.5m (24.6x83.7ft) min.	8	0.27
Blks 196,197	Future Development	11	0.23
Blks 198,199	Dundas Street Urban Core		2.68
Blks 200,201	Village Square		0.60
Block 202	Storm Water Management Facility		0.64
Block 203	Open Space		0.01
Block 204	Natural Heritage System		17.79
Block 205	6.0m Walkway		0.02
Blks 206	Promenade		0.04
Blks 207,208	Dundas Road Widening		0.10
Blks 209-214	0.3m Reserves		0.01
Public Roads	22.0m ROW (543m) 17.0m ROW (3,014m) 11.0m ROW (192m) 7.50m ROW (129m)		7.11
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DRAFT PLAN OF SUBDIVISION 24T-18005

Part of Lot 10
Concession 1
North of Dundas Street
(Geographic Township of Trafalgar)
Town of Oakville
Regional Municipality of Halton

Prepared For:
Redoak G & A Inc.
Capoak Inc.

MGP Malone Given Parsons
140 Renfrew Drive, Suite 201 | Markham, ON | L3R 6B3
905 513 0170 | mgp.ca

MGP File: 17-2651
Date: April 14, 2021

Figure 3 - Proposed Draft Plan Showing Ventilation Requirements

APPENDIX A

Road Traffic Data



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Victor Garcia

From: Krusto, Matt <Matt.Krusto@halton.ca>
Sent: November-09-17 1:50 PM
To: Victor Garcia
Subject: RE: Road Traffic Data - Dundas Street East

Ok, just further east – thanks.

Yes the Dundas Street traffic data remains valid. 8th Line is under the jurisdiction of Oakville.

Thanks for clarifying the location.

Matt

From: Victor Garcia [mailto:vgarcia@hgcengineering.com]
Sent: Thursday, November 09, 2017 1:48 PM
To: Krusto, Matt
Subject: RE: Road Traffic Data - Dundas Street East

We did do one yes but is this is for another one, just wanted to make sure the data was still valid.

Victor Garcia, P.Eng
HGC Engineering **NOISE / VIBRATION / ACOUSTICS**
Howe Gastmeier Chapnik Limited
t: 905.826.4044

From: Krusto, Matt [mailto:Matt.Krusto@halton.ca]
Sent: November-09-17 1:47 PM
To: Victor Garcia <vgarcia@hgcengineering.com>
Subject: RE: Road Traffic Data - Dundas Street East

Didn't HGC do the initial Noise Study in 2016?

From: Victor Garcia [mailto:vgarcia@hgcengineering.com]
Sent: Thursday, November 09, 2017 1:46 PM
To: Krusto, Matt
Subject: RE: Road Traffic Data - Dundas Street East

Yes the development will be northeast of the intersection.

Victor Garcia, P.Eng
HGC Engineering **NOISE / VIBRATION / ACOUSTICS**
Howe Gastmeier Chapnik Limited
t: 905.826.4044

From: Krusto, Matt [mailto:Matt.Krusto@halton.ca]
Sent: November-09-17 1:45 PM
To: Victor Garcia <vgarcia@hgcengineering.com>
Subject: RE: Road Traffic Data - Dundas Street East

Victor Garcia

From: Papiez-Lopata, Brittany <Brittany.Papiez-Lopata@halton.ca>
Sent: November 21, 2019 8:52 AM
To: Victor Garcia
Subject: RE: Commercial Traffic Volumes - Dundas St E, east of Eighth Line

Hi Victor,
Perfect, the AADT 53,826. Let me know if you have any more questions.

# sml trk	# med trk/bus	# hvy trk
597	543	618
%sml trk	% med trk/bu	% hvy trk
1.1%	1.0%	1.2%

Brittany

From: Victor Garcia <vgarcia@hgcengineering.com>
Sent: Thursday, November 21, 2019 8:45 AM
To: Papiez-Lopata, Brittany <Brittany.Papiez-Lopata@halton.ca>
Subject: RE: Commercial Traffic Volumes - Dundas St E, east of Eighth Line

Hi Britany,

Yes that would work.

Thanks,

Victor Garcia, P.Eng
HGC Engineering **NOISE / VIBRATION / ACOUSTICS**
Howe Gastmeier Chapnik Limited
t: 905.826.4044

From: Papiez-Lopata, Brittany <Brittany.Papiez-Lopata@halton.ca>
Sent: November 21, 2019 8:40 AM
To: Victor Garcia <vgarcia@hgcengineering.com>
Subject: RE: Commercial Traffic Volumes - Dundas St E, east of Eighth Line

Good morning Victor,
Yes I can, the only issue is the closest ATR I have to that location is Dundas Street - between Prince Michael Drive and Meadowridge Drive. Let me know if that works!

Brittany

Brittany Papiez-Lopata
Traffic Ops & Safety Co-Op Student
Waste Management & Road Operations

Victor Garcia

From: Krusto, Matt <Matt.Krusto@halton.ca>
Sent: August-22-14 2:01 PM
To: Mandy Chan
Subject: RE: Traffic Data Request

Hi Mandy,

Please use the following:

Dundas Street:

-6 lanes
-60 km/h existing/future
-2031 AADT 55,000
-Truck % medium 8%, Heavy 5%

Trafalgar Road:

-6 lanes
-60 km/h existing/future
-2031 AADT 55,000
-Truck % medium 5%, Heavy 5%

Let me know if you need anything else.

Matt

From: Mandy Chan [mailto:machan@hgcengineering.com]
Sent: Friday, August 22, 2014 1:42 PM
To: Krusto, Matt
Subject: Traffic Data Request

Good afternoon Matt,

We've been asked to do the noise study for the development at 257 and 271 Dundas Street East and would like to request traffic data for Dundas and Trafalgar.

<http://goo.gl/maps/2GyTq>

Thanks!

Regards,

Mandy Chan, PEng
Project Engineer

CELEBRATING 20 YEARS | 1994-2014

HGC Engineering NOISE / VIBRATION / ACOUSTICS

Howe Gastmeier Chapnik Limited

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

t: 905.826.4044 e: machan@hgcengineering.com

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Volume Summary Details Report

Location..... EIGHTH LINE btwn NORTH RIDGE TRAIL & DUNDAS STREET EAST
Municipality..... OAKVILLE **GEO ID.....** 3145490

Date	EndTime	Northbound	Southbound	Grand Total
Wednesday, November 16, 2016	3:15 PM	57	58	115
	3:30 PM	44	68	112
	3:45 PM	57	63	120
	4:00 PM	47	64	111
	4:15 PM	56	72	128
	4:30 PM	81	59	140
	4:45 PM	82	92	174
	5:00 PM	62	67	129
	5:15 PM	73	84	157
	5:30 PM	77	91	168
	5:45 PM	48	100	148
	6:00 PM	55	89	144
	6:15 PM	58	101	159
	6:30 PM	52	80	132
	6:45 PM	41	67	108
	7:00 PM	45	72	117
7:15 PM	53	68	121	
7:30 PM	61	66	127	

	7:45 PM	46	46	92
	8:00 PM	21	49	70
	8:15 PM	36	47	83
	8:30 PM	65	57	122
	8:45 PM	40	48	88
	9:00 PM	20	34	54
	9:15 PM	24	47	71
	9:30 PM	14	48	62
	9:45 PM	15	27	42
	10:00 PM	14	27	41
	10:15 PM	27	25	52
	10:30 PM	11	18	29
	10:45 PM	13	26	39
	11:00 PM	3	25	28
	11:15 PM	7	20	27
	11:30 PM	5	13	18
	11:45 PM	5	7	12
	12:00 AM	4	8	12
Wednesday, November 16, 2016		1419	1933	3352
Thursday, November 17, 2016	12:15 AM	5	10	15
	12:30 AM	5	5	10
	12:45 AM	4	3	7
	1:00 AM	6	6	12

1:15 AM	1	3	4
1:30 AM	3	4	7
1:45 AM	0	5	5
2:00 AM	1	6	7
2:15 AM	0	1	1
2:30 AM	0	3	3
2:45 AM	3	3	6
3:00 AM	0	3	3
3:15 AM	1	0	1
3:30 AM	1	0	1
3:45 AM	0	5	5
4:00 AM	1	4	5
4:15 AM	3	1	4
4:30 AM	2	1	3
4:45 AM	6	1	7
5:00 AM	2	2	4
5:15 AM	3	5	8
5:30 AM	10	6	16
5:45 AM	16	4	20
6:00 AM	15	5	20
6:15 AM	12	5	17
6:30 AM	30	6	36
6:45 AM	29	13	42

7:00 AM	43	11	54
7:15 AM	39	17	56
7:30 AM	53	24	77
7:45 AM	59	27	86
8:00 AM	52	33	85
8:15 AM	68	53	121
8:30 AM	67	54	121
8:45 AM	70	63	133
9:00 AM	44	50	94
9:15 AM	40	25	65
9:30 AM	32	32	64
9:45 AM	37	38	75
10:00 AM	37	47	84
10:15 AM	35	19	54
10:30 AM	47	36	83
10:45 AM	41	36	77
11:00 AM	30	29	59
11:15 AM	37	31	68
11:30 AM	37	28	65
11:45 AM	38	43	81
12:00 PM	36	28	64
12:15 PM	49	44	93
12:30 PM	51	35	86

	12:45 PM	39	38	77
	1:00 PM	27	43	70
	1:15 PM	43	32	75
	1:30 PM	34	47	81
	1:45 PM	28	44	72
	2:00 PM	25	49	74
	2:15 PM	40	41	81
	2:30 PM	28	38	66
	2:45 PM	34	59	93
	3:00 PM	41	71	112
	3:15 PM	0	0	0
Thursday, November 17, 2016		1540	1375	2915
Grand Total		2959	3308	6267



Volume Hourly Summary Report

Location..... EIGHTH LINE btwn NORTH RIDGE TRAIL & DUNDAS STREET EAST

Municipality..... OAKVILLE

Date	StartTime	Northbound	Southbound	Grand Total
Wednesday, November 16, 2016	15	205	253	458
	16	281	290	571
	17	253	364	617
	18	196	320	516
	19	181	229	410
	20	161	186	347
	21	67	149	216
	22	54	94	148
	23	21	48	69
Wednesday, November 16, 2016		1419	1933	3352
Thursday, November 17, 2016	0	20	24	44
	1	5	18	23
	2	3	10	13
	3	3	9	12
	4	13	5	18
	5	44	20	64

	6	114	35	149
	7	203	101	304
	8	249	220	469
	9	146	142	288
	10	153	120	273
	11	148	130	278
	12	166	160	326
	13	130	172	302
	14	143	209	352
	15	0	0	0
Thursday, November 17, 2016		1540	1375	2915
Grand Total		2959	3308	6267

APPENDIX B

Sample STAMSON 5.04 Output



ACOUSTICS



NOISE



VIBRATION

A

24 hr Traffic Volume (AADT or SADT): 27500
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 2.10
 Heavy Truck % of Total Volume : 1.20
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Dundas (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 : 143.80 / 143.80 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 3: Street C (day/night)

Car traffic volume : 4863/540 veh/TimePeriod *
 Medium truck volume : 50/6 veh/TimePeriod *
 Heavy truck volume : 50/6 veh/TimePeriod *
 Posted speed limit : 50 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): 4000
 Percentage of Annual Growth : 2.50
 Number of Years of Growth : 13.00
 Medium Truck % of Total Volume : 1.00
 Heavy Truck % of Total Volume : 1.00
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 3: Street C (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 : 15.00 / 15.00 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Dundas (day)

A

Source height = 1.05 m

ROAD (0.00 + 52.94 + 0.00) = 52.94 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	68.87	0.00	-14.61	-1.33	0.00	0.00	0.00	52.94

Segment Leq : 52.94 dBA

Results segment # 2: Dundas (day)

Source height = 1.05 m

ROAD (0.00 + 52.00 + 0.00) = 52.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	68.87	0.00	-15.55	-1.33	0.00	0.00	0.00	52.00

Segment Leq : 52.00 dBA

Results segment # 3: Street C (day)

Source height = 1.00 m

ROAD (0.00 + 58.14 + 0.00) = 58.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	59.47	0.00	0.00	-1.33	0.00	0.00	0.00	58.14

Segment Leq : 58.14 dBA

Total Leq All Segments: 60.03 dBA

Results segment # 1: Dundas (night)

Source height = 1.05 m

ROAD (0.00 + 46.41 + 0.00) = 46.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
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Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	62.34	0.00	-14.61	-1.33	0.00	0.00	0.00	46.41

Segment Leq : 46.41 dBA

Results segment # 2: Dundas (night)

Source height = 1.05 m

ROAD (0.00 + 45.47 + 0.00) = 45.47 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	62.34	0.00	-15.55	-1.33	0.00	0.00	0.00	45.47

Segment Leq : 45.47 dBA

Results segment # 3: Street C (night)

Source height = 1.02 m

ROAD (0.00 + 51.76 + 0.00) = 51.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	53.09	0.00	0.00	-1.33	0.00	0.00	0.00	51.76

Segment Leq : 51.76 dBA

Total Leq All Segments: 53.60 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.03 dBA
 (NIGHT): 53.60 dBA