YCA engineering Limited

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9251 Yonge Street, Suite 8557
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ENVIRONMENTAL NOISE ASSESSMENT

MOUNT HOPE ESTATES
OLD CHURCH ROAD AND MOUNT HOPE ROAD
DRAFT PLAN OF SUBDIVISION
PART OF EAST HALF LOT 20, CONCESSION 7
TOWN OF CALEDON

PREPARED FOR:

1693388 ONTARIO INC.

May 2016
Y1603

YCA ENGINEERING Limited

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May 26, 2016

Town of Caledon
Public Works and Engineering Department
6311 Old Church Road
Caledon, ON
L7C 1J6

Attention: Mr. Geoff Hebbert

Re: Environmental Noise Assessment
Mount Hope Estates
Old Church Road and Mount Hope Road
Draft Plan of Subdivision
Part of East Half Lot 20, Concession 7
Town of Caledon
Project No. Y1603

We are pleased to submit this Environmental Noise Assessment for the above noted residential development based on the latest Draft Plan dated May 2016 to achieve sound levels acceptable to the Ministry of Environment and the Town of Caledon.

The study addresses noise generated by vehicular traffic on Old Church Road to the north and Mount Hope Road to the east. The present report recommends noise abatement measures to meet the sound levels acceptable to the Town of Caledon and the Ministry of Environment.

Your assistance in reviewing and approving this report will be very much appreciated. Should you have any questions regarding its contents, please contact the undersigned.

Yours truly,

YCA ENGINEERING Limited

Hava Jouharchi, P.Eng.
Senior Project Engineer

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1.0 INTRODUCTION

PURPOSE

A residential subdivision has been proposed by 1693388 Ontario Inc. in the Town of Caledon. The purpose of this report is to present the analysis of anticipated future sound levels within the development using the latest draft plan prepared by Urban Watershed Group Ltd. dated May 2016.

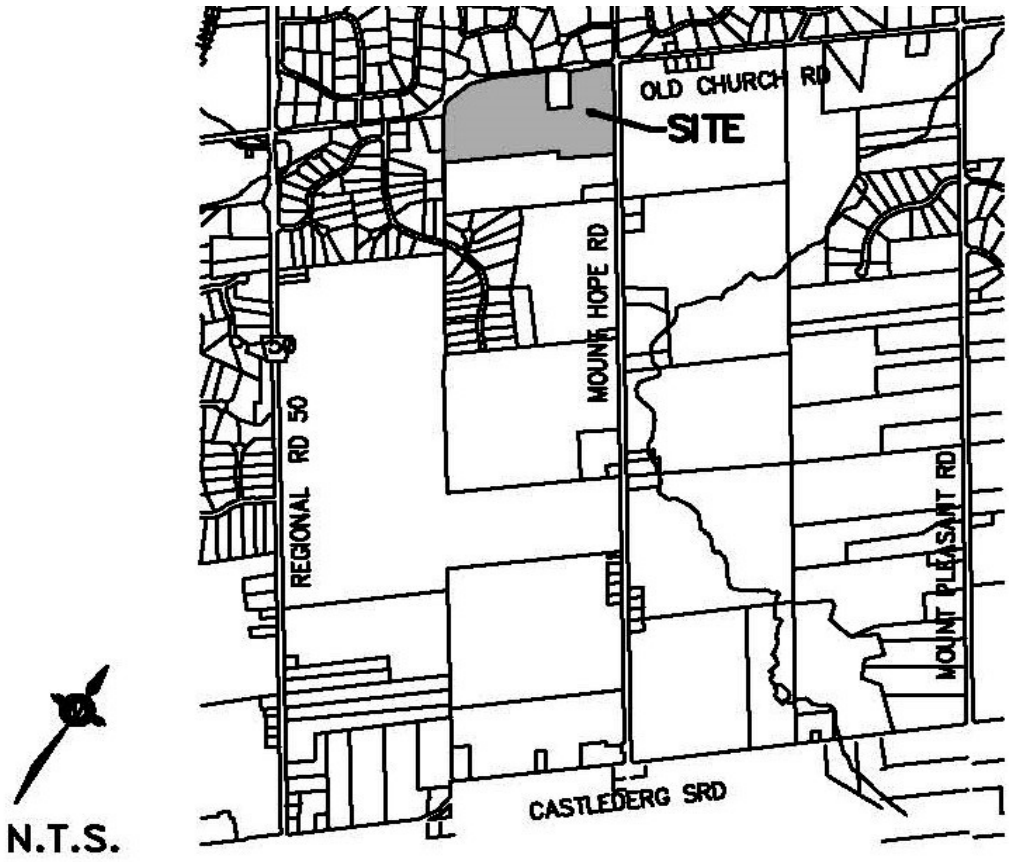
SITE DESCRIPTION AND LOCATION

The proposed development will be comprised of eleven detached dwelling units, wetlands and local internal roads. This development is located at the south of Old Church Road and west of Mount Hope Road in the Town of Caledon.

The surrounding land uses is an existing residential development to the north, south and west and existing farm land to the east.

KEY PLAN

The location of the proposed development is further indicated by the Key Plan below.



2.0 SOUND LEVEL CRITERIA

TRANSPORTATION NOISE SOURCES

OUTDOOR SOUND LEVEL CRITERIA:

Outdoor Activity Areas (7 a.m. – 11 p.m.) – 16 Hr. Leq. = 55 dBA

If daytime outdoor sound levels at the backyards (outdoor activity areas) of residential areas exceed 60 dBA, physical noise attenuation measures such as acoustical fences, increased building setbacks or reorientation of dwellings and lots must be employed to reduce the sound levels. In some cases, outdoor sound levels may be allowed to exceed the above criteria by a maximum of 5 dBA. If such excesses occur, purchasers must be informed of the existence of potentially annoying sound levels by means of warning clauses registered on title.

INDOOR SOUND LEVEL CRITERIA:

Living and Dining Area (7am–11pm) – 16 Hr. Leq. = 45 dBA Roads, 5 NEF/NEP Aircrafts
Bedrooms (11 p.m. – 7 a.m.) – 8 Hr. Leq. = 40 dBA Roads, 0 NEF/NEP Aircrafts

Appropriate building components such as walls, doors and windows are chosen with reference to the following. If daytime sound levels at the external dwelling walls are 65 dBA or less (roadways), and 60 dBA or less (railways), then the indoor sound level criteria described above will be achieved using standard (Ontario Building Code) construction methods and building components. If night-time sound levels are 60 dBA or less (roadways) and 55 dBA or less (railways), standard construction methods and building components can be utilized. If the external sound levels exceed the above criteria, then components having extra sound insulation properties may be required.

Ventilation requirements are determined with reference to the following. If night-time sound levels at the bedroom window of a dwelling unit are in the range of 50 to 60 dBA, the ventilation system must be designed to allow the optional installation of central air conditioning at the owner's discretion. If night-time sound levels are greater than 60 dBA, central air conditioning must be installed. If daytime sound levels at the living room/dining room windows are in the range of 55 to 65 dBA, the ventilation system must be designed to allow optional installation of central air conditioning. For daytime sound levels greater than 65 dBA, central air conditioning must be installed.

STATIONARY NOISE SOURCES

As per the M.O.E. guidelines (Publication NPC-300), this development is considered to be a Class 2 area. The noise produced by a stationary source at the plane of window for noise sensitive spaces is the energy equivalent sound level (L_{EQ}), 50 dBA during daytime and evening time (0700-2300) or 45 dBA during night-time (2300-0700). For outdoor receptors, the energy equivalent sound level (L_{EQ}) is 50 dBA during daytime (0700-1900) or 45 dBA during night-time (1900-0700).

3.0 NOISE SOURCES

ROAD TRAFFIC

As indicated on the Plan (Drawing Y1603), the proposed development will be located south of Old Church Road and west of Mount Hope Road in the Town of Caledon. Noise generated by these sources has the potential to affect future residents.

The 2014 traffic counts for Old Church Road and Mount Hope Road were provided by the Town of Caledon dated January 20, 2016. For noise analysis purposes, the traffic volume was projected to the year 2034 at 5% growth. The traffic data is summarized in Tables 1 and 2 below.

TABLE 1: OLD CHURCH ROAD TRAFFIC DATA

Ultimate Annual Average Daily Traffic *	6,500
Percent Trucks	2%
Ratio of Heavy and Medium trucks	50:50
Speed (km/hr)	60
Number of Lanes	2

TABLE 2: MOUNT HOPE ROAD TRAFFIC DATA

Ultimate Annual Average Daily Traffic *	4,200
Percent Trucks	6%
Ratio of Heavy and Medium trucks	50:50
Speed (km/hr)	60
Number of Lanes	2

* Traffic data provided by the Town of Caledon based on the 2014 ADT. Projected to year 2034 at an annual growth of 5%.See Appendix 1 for correspondence.

STATIONARY NOISE SOURCES

The existing Mount Kolb Farm is located at approximately 200m to the east of Mount Hope Road with daytime operation hours.

Based on the nature of the noise activities and distance separation the sound levels are not expected to negatively impact the proposed residential development as the dominant sound levels are expected to be the road traffic noise.

4.0 NOISE ASSESSMENT

Drawing DWG Y1603 is based on the latest grading plan prepared by Urban Watershed Group Ltd. dated May 2016 showing various noise analysis locations and noise mitigation measures within the proposed residential development.

Sound levels were calculated using the Ministry of Environment's Stamson 5.04 computer based noise prediction model and evaluated with the sound level criteria and warning clauses recommended by the Ministry of Environment. The noise criteria and warning clauses are listed in Appendix 3. Table 3 lists the unattenuated sound levels at various locations.

TABLE 3: UNATTENUATED SOUND LEVELS

LOTS		SOURCE DISTANCE(m)	SOUND LEVELS (dBA)		
			OUTDOOR LIVING AREA (16 hr) Leq	DAYTIME (16 hr) Leq	NIGHT-TIME (8 hr) Leq
3	(Front Wall)	32.0*	-	55.63	49.62
	(Rear Yard)	52.0*	45.49	-	-
6	(Rear Wall)	32.0* 80.0**	-	55.63 49.12 (56.51)	49.62 43.30 (50.55)
	(Rear Yard)	52.0* 85.0**	44.13 47.83 (50.13)	-	-
7	(Rear Wall)	118.0* 29.0**	-	43.21 56.44 (56.64)	37.68 46.64 (47.16)
	(Rear Yard)	120.0* 50.0**	46.10 46.11 (49.12)	-	-
8	(Rear Wall)	21.0**	-	58.76	52.61
	(Rear Yard)	40.0**	47.75	-	-
11	(Rear Wall)	115.0**	-	46.50	40.91
	(Rear Yard)	135.0**	45.35	-	-

* Mount Hope Road
** Old Church Road

5.0 RECOMMENDED NOISE MITIGATION MEASURES

5.1 OUTDOOR MEASURES

Table 3 indicates that daytime rear yard sound levels at all locations will be below 55dBA in the absence of mitigative measures.

Therefore, outdoor noise mitigation measures are not required for any of the residential lots within the proposed residential development

5.2 VENTILATION REQUIREMENTS

Ventilation requirements were determined using the sound levels at the building facades listed in Table 3.

MANDATORY CENTRAL AIR CONDITIONERS

Based on information in Table 3, there are no lots with the mandatory central air conditioning requirement, as the daytime sound levels are below 65 dBA and the night-time sound levels are below 60 dBA.

PROVISION FOR CENTRAL AIR CONDITIONERS

The following units must be constructed with a forced air heating system with ducting sized to accommodate a central air conditioning unit, in order to allow the homeowner the option of installing central air conditioning should he or she wish to do so in the future as per Table 3 sound level results:

- Lots 3, 4, 5, 6, 7 and 8

The following warning clause Type C must be incorporated into the Subdivision Agreement, which will be registered on title and should be included in all Offers of Purchase, Sale or Lease of the above dwelling units:

> Warning Clause Type C:
>
> *"This dwelling unit has been designated with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant 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 and climate change."*

5.3 BUILDING COMPONENTS

Building components within the proposed development were analyzed using the STC (Sound Transmission Class) method recommended by the M.O.E.

Detailed floor plans of the proposed dwelling units are required in order to best determine the required building components. Although this information is not yet available for the proposed development, the result is based on the assumption that a living, dining or recreation room is located at the side of the house closest to the roadway and contains three components (two exterior walls and a set of windows). The windows are assumed to be 25% of the floor area and the same side exterior walls are assumed to be 80% of the floor area.

DAYTIME SOUND LEVELS

For the worst case location during daytime (Lot 8), dwelling wall sound level of 58.76 dBA was calculated at the first storey living/dining room.

To ensure acceptable daytime indoor sound levels of 45dBA from road noise sources, the overall building components must provide an STC rating of 22 for windows and STC 29 for exterior wall construction.

NIGHT-TIME SOUND LEVELS

For the worst case location during night-time (Lot 8), dwelling wall sound level of 52.61 dBA was calculated at the second storey bedroom.

To ensure acceptable night-time indoor sound levels of 40dBA from road noise sources, the overall building components must provide an STC rating of 19 for windows and STC 26 for exterior wall construction.

BUILDING COMPONENT REQUIREMENTS

The minimum standard window and exterior wall construction of the Ontario Building Code meets STC 30 and STC 38, respectively.

Therefore, the building components for all residential units are expected to meet the indoor sound levels.

WINDOWS

The following are some window configurations meeting an STC rating of 22, assuming the ratio of window area to room floor area is 25%:

- double glazing 4mm x 4mm thickness with 6mm air space; or
- double glazing 3mm x 3mm thickness with 13mm air space; or
- any other window type yielding a similar or greater STC rating.

EXTERIOR WALLS

The following exterior wall construction EW1 meets the STC 29 rating, assuming a ratio of wall area to room floor area of 80%:

EW1 12.7mm gypsum board, vapour barrier and 38 x 89mm studs with 50mm (or thicker) mineral wool or fibreglass batts in interstud cavities, plus sheathing, wood or metal siding and fibre backer board; or

5.4 WARNING CLAUSES

In addition, a warning clause Type A must be incorporated into the Subdivision Agreement, which will be registered on title and included in all offers of purchase and sale or lease of the following dwelling units. The clause should state:

- Lots 3, 4, 5, 6, 7 and 8

  Warning Clause No. 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 sound level limits of the Municipality and the Ministry of Environment and climate change."

6.0 SUMMARY OF NOISE MITIGATION MEASURES

The summary of noise abatement measures are listed in Table 4 identifying acoustic fence, mandatory central air conditioners, provision for central air conditioners, building components and warning clauses.

TABLE 4: SUMMARY OF NOISE MITIGATIVE MEASURES

LOTS	VENTILATION REQUIREMENTS	BUILDING COMPONENTS	BARRIER REQUIREMENTS	WARNING CLAUSES
Lots 3, 4, 5, 6, 7 and 8	Optional air conditioning	OBC*	No	Type A and C
All other residential lots within this development	No Requirements			

* OBC: Ontario Building Code Standard.

7.0 RECOMMENDATIONS AND CONCLUSION

RECOMMENDATIONS

1. Provision for adding central air conditioning in the future for Lots 3, 4, 5, 6, 7 and 8.

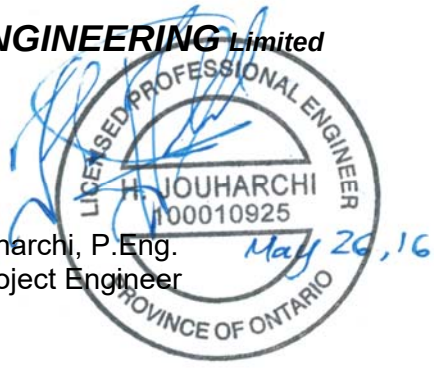
2. All applicable warning clauses shall be listed in the Town of Caledon's Subdivision Agreement and also be included in all Agreements of Purchase, Sale or Lease and registered on title.

CONCLUSION

This report has determined that sound levels acceptable to the Town of Caledon and Ministry of Environment will be achieved using commonly practiced abatement measures. These are described in the preceding sections of this report and are summarized on Drawing Y1603.

Respectfully submitted,

***YCA ENGINEERING** Limited*



Hava Jouharchi, P.Eng.
Senior Project Engineer

APPENDIX 1

TRAFFIC DATA

Hi Hava,

Please see attach traffic data as requested.

Locations	ADT	Percentages of Trucks	Posted Speed
Old Church road- Highway 50 & Mount Hope Road	2211	2%	60K
Mount Hope Road- Castlederg Road to Old Church Road	1411	6%	60K

Note: We don't calculate heavy to medium truck ratio

Regards,

Steve Mathew, Dipl.T
Traffic Technologist
Public Works Department

Town of Caledon
6311 Old Church Road
Caledon, ON L7C 1J6
1.888.225.3366
905.584.2272 x.4249

From: Hava Jouharchi [mailto:hava@ycaengineering.com]
Sent: Monday, January 18, 2016 2:19 PM
To: Ryan Grodecki
Subject: FW: Traffic Data Request, Caledon (Jan.18,16)

Good Afternoon Ryan,
Thank you for taking my call. I would appreciate if you can forward my request to the correct contact.

I have been requested to prepare a Noise Study for a site in the Town of Caledon. The location of the site is south of Old Church Road and west of Mount Hope .
Key Plan is attached.

Could you please provide any of the following traffic data at your earliest convenience for Old Church Road (west of Mount Hope Rd) and Mount Hope Road. (south of Old Church Road):

. traffic volume (ADT/counts)
. Percentage of trucks
. Heavy to medium truck ratio
. Posted Speed
. Number of lanes
. Road grades

Thanks in advance
Hava

Hava Jouharchi, P.Eng.
Senior Project Engineer

YCA Engineering Ltd.
9251 Yonge Street, Suite 8557
Richmond Hill, ON, L4C 9T3
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Email: hava@ycaengineering.com

APPENDIX 2

STAMSON 5.04
SOUND LEVEL CALCULATIONS

```
STAMSON 5.04        SUMMARY REPORT        Date: 29-01-2016 10:03:25
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: lot3fw.te            Time Period: Day/Night 16/8 hours
Description: Lot 3, Front Wall

Road data, segment # 1: Mount Hope R (day/night)
----------------------------------------------
Car traffic volume  :  3553/395   veh/TimePeriod  *
Medium truck volume :   113/13    veh/TimePeriod  *
Heavy truck volume  :   113/13    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     1 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):   4200
    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     :   3.00
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 1: Mount Hope R (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  :  32.00 / 32.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :  10.00 / 10.00  m
Source elevation          : 287.64 m
Receiver elevation        : 284.64 m
Barrier elevation         : 284.64 m

Result summary (day)
--------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Mount Hope R     !     1.31 !    55.63 !    55.63 *
--------------------+---------+---------+---------
                      Total                  55.63 dBA

  * Bright Zone  !Result summary (night)
----------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Mount Hope R     !     1.33 !    49.62 !    49.62 *
--------------------+---------+---------+---------
                      Total                  49.62 dBA

  * Bright Zone  !

TOTAL Leq FROM ALL SOURCES (DAY): 55.63
                           (NIGHT): 49.62
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```
STAMSON 5.04        SUMMARY REPORT        Date: 29-01-2016 10:03:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: lot3ry.te            Time Period: Day/Night 16/8 hours
Description: Lot 3, Rear Yard

Road data, segment # 1: Mount Hope R (day/night)
-----------------------------------------------
Car traffic volume  :  3553/395   veh/TimePeriod  *
Medium truck volume :   113/13    veh/TimePeriod  *
Heavy truck volume  :   113/13    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     1 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):   4200
    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     :   3.00
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 1: Mount Hope R (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   -60.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  52.00 / 52.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -60.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   3.00 / 3.00   m
Source elevation          : 287.64 m
Receiver elevation        : 284.64 m
Barrier elevation         : 284.64 m

Data for Segment # 2: Mount Hope R (day/night)
-----------------------------------------------
Angle1   Angle2           : -60.00 deg   70.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  52.00 / 52.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -60.00 deg   Angle2 : 70.00 deg
Barrier height            :   3.00 m
Barrier receiver distance :   3.00 / 3.00   m
Source elevation          : 287.64 m
Receiver elevation        : 284.64 m
Barrier elevation         : 284.64 m
Data for Segment # 3: Mount Hope R (day/night)
-----------------------------------------------
Angle1   Angle2           :  70.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  52.00 / 52.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  70.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
```

Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 287.64 m
Receiver elevation : 284.64 m
Barrier elevation : 284.64 m

Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)	
1.Mount Hope R	1.31	41.69	41.69	*
2.Mount Hope R	1.31	41.17	41.17	
3.Mount Hope R	1.31	38.80	38.80	*
Total			45.49 dBA	

* Bright Zone !

TOTAL Leq FROM ALL SOURCES (DAY): 45.49

```
STAMSON 5.04        SUMMARY REPORT        Date: 24-05-2016 09:55:09
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: lot6fw.te            Time Period: Day/Night 16/8 hours
Description: Lot 6, Front Wall

Road data, segment # 1: Old Church R (day/night)
----------------------------------------------
Car traffic volume  :  5733/637   veh/TimePeriod  *
Medium truck volume :    59/7     veh/TimePeriod  *
Heavy truck volume  :    59/7     veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     5 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):   6500
    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     :   1.00
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 1: Old Church R (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  :  80.00 / 80.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   3.00 / 3.00   m
Source elevation          : 293.30 m
Receiver elevation        : 294.95 m
Barrier elevation         : 294.95 m

Road data, segment # 2: Mount Hope R (day/night)
----------------------------------------------
Car traffic volume  :  3553/395   veh/TimePeriod  *
Medium truck volume :   113/13    veh/TimePeriod  *
Heavy truck volume  :   113/13    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     1 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):   4200
    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     :   3.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: Mount Hope R (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  :  32.00 / 32.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   3.00 / 3.00   m
```

Source elevation : 288.25 m
Receiver elevation : 294.95 m
Barrier elevation : 294.95 m

Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)	
1.Old Church R	1.00	49.12	49.12	*
2.Mount Hope R	1.31	55.63	55.63	*
Total			56.51	dBA

* Bright Zone !

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)	
1.Old Church R	1.02	43.40	43.40	*
2.Mount Hope R	1.33	49.62	49.62	*
Total			50.55	dBA

* Bright Zone !

TOTAL Leq FROM ALL SOURCES (DAY): 56.51
(NIGHT): 50.55

```
STAMSON 5.04        SUMMARY REPORT        Date: 24-05-2016 10:02:34
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: lot6ry.te            Time Period: Day/Night 16/8 hours
Description: Lot 6, Rear Yard

Road data, segment # 1: Old Church R (day/night)
----------------------------------------------
Car traffic volume  :  5733/637   veh/TimePeriod  *
Medium truck volume :    59/7     veh/TimePeriod  *
Heavy truck volume  :    59/7     veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     5 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):   6500
    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     :   1.00
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 1: Old Church R (day/night)
----------------------------------------------
Angle1   Angle2           : -90.00 deg   -30.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  85.00 / 85.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -30.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   3.00 / 3.00   m
Source elevation          : 291.50 m
Receiver elevation        : 292.50 m
Barrier elevation         : 292.50 m

Road data, segment # 2: Old Church R (day/night)
----------------------------------------------
Car traffic volume  :  5733/637   veh/TimePeriod  *
Medium truck volume :    59/7     veh/TimePeriod  *
Heavy truck volume  :    59/7     veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     5 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):   6500
    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     :   1.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: Old Church R (day/night)
----------------------------------------------
Angle1   Angle2           : -30.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  85.00 / 85.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -30.00 deg   Angle2 : 90.00 deg
```

```
Barrier height            :   3.00 m
Barrier receiver distance :   3.00 / 3.00   m
Source elevation          : 291.50 m
Receiver elevation        : 292.50 m
Barrier elevation         : 292.50 m

Data for Segment # 3: Mount Hope R (day/night)
------------------------------------------------
Angle1   Angle2           : -90.00 deg   10.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  52.00 / 52.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 10.00 deg
Barrier height            :   3.00 m
Barrier receiver distance :   3.00 / 3.00   m
Source elevation          : 287.80 m
Receiver elevation        : 292.50 m
Barrier elevation         : 292.50 m

Data for Segment # 4: Mount Hope R (day/night)
------------------------------------------------
Angle1   Angle2           :  10.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  52.00 / 52.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  10.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   3.00 / 3.00   m
Source elevation          : 287.80 m
Receiver elevation        : 292.50 m
Barrier elevation         : 292.50 m

Result summary (day)
--------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Old Church R     !     1.00 !    43.06 !    43.06 *
 2.Old Church R     !     1.00 !    37.51 !    37.51
 3.Mount Hope R     !     1.31 !    39.10 !    39.10
 4.Mount Hope R     !     1.31 !    48.39 !    48.39 *
--------------------+---------+---------+---------
                      Total                  50.13 dBA
```

```
STAMSON 5.04        SUMMARY REPORT        Date: 29-01-2016 10:04:51
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: lot8fw.te            Time Period: Day/Night 16/8 hours
Description: Lot 8, Front Wall

Road data, segment # 1: Old Church R (day/night)
----------------------------------------------
Car traffic volume  :  5733/637   veh/TimePeriod  *
Medium truck volume :    59/7     veh/TimePeriod  *
Heavy truck volume  :    59/7     veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     5 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):   6500
    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     :   1.00
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 1: Old Church R (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  :  21.00 / 21.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :  10.00 / 10.00  m
Source elevation          : 284.20 m
Receiver elevation        : 284.50 m
Barrier elevation         : 284.50 m

Result summary (day)
--------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Old Church R     !     1.00 !    58.76 !    58.76 *
--------------------+---------+---------+---------
                      Total                  58.76 dBA

  * Bright Zone  !

Result summary (night)
----------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Old Church R     !     1.02 !    52.61 !    52.61 *
--------------------+---------+---------+---------
                      Total                  52.61 dBA

  * Bright Zone  !

TOTAL Leq FROM ALL SOURCES (DAY): 58.76
                           (NIGHT): 52.61
```

```
STAMSON 5.04        SUMMARY REPORT        Date: 29-01-2016 10:05:25
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: lot8ry.te            Time Period: Day/Night 16/8 hours
Description: Lot 8, Rear Yard

Road data, segment # 1: Old Church R (day/night)
----------------------------------------------
Car traffic volume  :  5733/637   veh/TimePeriod  *
Medium truck volume :    59/7     veh/TimePeriod  *
Heavy truck volume  :    59/7     veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     5 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):   6500
    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     :   1.00
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 1: Old Church R (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   -60.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  40.00 / 40.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -60.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   3.00 / 3.00   m
Source elevation          : 284.20 m
Receiver elevation        : 284.50 m
Barrier elevation         : 284.50 m

Data for Segment # 2: Old Church R (day/night)
-------------------------------------------
Angle1   Angle2           : -60.00 deg   60.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  40.00 / 40.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -60.00 deg   Angle2 : 60.00 deg
Barrier height            :   3.00 m
Barrier receiver distance :   3.00 / 3.00   m
Source elevation          : 284.20 m
Receiver elevation        : 284.50 m
Barrier elevation         : 284.50 m

Data for Segment # 3: Old Church R (day/night)
-------------------------------------------
Angle1   Angle2           :  60.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  40.00 / 40.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  60.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
```

Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 284.20 m
Receiver elevation : 284.50 m
Barrier elevation : 284.50 m

Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)	
1.Old Church R	1.00	43.68	43.68	*
2.Old Church R	1.00	41.10	41.10	
3.Old Church R	1.00	43.68	43.68	*
Total			47.75	dBA

* Bright Zone !

TOTAL Leq FROM ALL SOURCES (DAY): 47.75

APPENDIX 3

SOUND LEVEL CRITERIA

MINISTRY OF THE ENVIRONMENT

ENVIRONMENTAL NOISE GUIDELINE
Stationary and Transportation Sources - Approval and Planning
Publication NPC-300

August 2013

Day-time Outdoor Sound Level Limit

Table C-1 gives the equivalent sound level (L_{eq}) limit for designated Outdoor Living Areas. The limit applies to the entire day-time period from 07:00 to 23:00.

TABLE C-1
Sound Level Limit for Outdoor Living Areas
Road and Rail

Time Period	*L_{eq}(16) (dBA)*
16 hr, 07:00 - 23:00	*55*

Indoor Sound Level Limit

Table C-2 gives the equivalent sound level (L_{eq}) limits and the applicable time periods for the indicated types of indoor space. The specified sound level criteria are minimum requirements and apply to the indicated indoor spaces with the windows and doors closed.

TABLE C- 2
Indoor Sound Level Limits (Road and Rail)

Type of Space	*Time Period*	*L_{eq} (Time Period) (dBA)*	
		Road	*Rail*
Living/dining, den areas of residences, nursing/retirement homes, hospitals, schools, day-care centers, etc.	*07:00-23:00*	*45*	*40*
Living/dining areas of residences, nursing/retirement homes, hospitals, etc. (except schools or daycare centres)	*23:00 - 07:00*	*45*	*40*
Sleeping quarters	*07:00-23:00*	*45*	*40*
Sleeping quarters	*23:00 - 07:00*	*40*	*35*

SUPPLEMENTARY NOISE LIMITS

Indoor limits for transportation sources applicable to noise sensitive land uses are specified in Table C-2 and Table C-9.

TABLE C-9

Indoor Sound Level Limits (Road and Rail)

Type of Space	*Time Period*	*L_{eq} (Time Period) (dBA)*	
		Road	*Rail*
General offices, reception areas, retail stores, etc.	*16 hours between 07:00-23:00*	*50*	*45*
Living/dining areas of residences, hospitals, schools, nursing/retirement, homes day-care centers, theatres, place of worship, libraries, individual or semi-private offices, conference rooms, reading rooms etc.	*16 hours between 07:00-23:00*	*45*	*40*
Sleeping quarters of hotels/motels	*8 hours between 23:00 - 07:00*	*45*	*40*
Sleeping quarters of residences, hospitals, nursing/retirement homes etc	*8 hours between 23:00 - 07:00*	*40*	*35*

SUMMARY OF MINIMUM NOISE CONTROL AND VENTILATION REQUIREMENTS FOR ROAD AND RAIL NOISE

TABLE 1

COMBINATION OF ROAD AND RAIL NOISE, DAY-TIME (0700 - 2300)
OUTDOOR, VENTILATION AND WARNING CLAUSE REQUIREMENTS

ASSESSMENT LOCATION	*L_{eq} (16 hr) (dBA)*	*VENTILATION REQUIREMENTS*	*OUTDOOR CONTROL MEASURES*	*WARNING CLAUSE*
OUTDOOR LIVING AREA (OLA)	*Less than or equal to 55 dBA*	*N/A*	*None required*	*Not required*
	Greater than 55 dBA to less than or equal to 60 dBA	*N/A*	*Control measures (barriers) not required but should be considered*	*Required if resultant L_{eq} exceeds 55 dBA Type A*
	Greater than 60 dBA	*N/A*	*Control measures (barriers) required to reduce the L_{eq} below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible*	*Required if resultant L_{eq} exceeds 55 dBA Type B*
PLANE OF LIVING ROOM WINDOW	*Greater than 50 dBA to less than or equal to 55 dBA*	*None required*	*N/A*	*Not required*
	Greater than 55 dBA to less than or equal to 65 dBA	*Forced air heating with provision for central air conditioning*	*N/A*	*Required Type C*
	Greater than 65 dBA	*Central air conditioning*	*N/A*	*Required Type D*

TABLE 2

COMBINATION OF ROAD AND RAIL NOISE, NIGHT-TIME (2300 - 0700)
VENTILATION AND WARNING CLAUSE REQUIREMENTS

ASSESSMENT LOCATION	*L_{eq}(8hr) (dBA)*	*VENTILATION REQUIREMENTS*	*WARNING CLAUSE*
PLANE OF BEDROOM WINDOW	*Greater than 50 dBA to less or equal to 60 dBA*	*Forced air heating with provision for central air conditioning*	*Required Type C*
	Greater than 60 dBA	*Central air conditioning*	*Required Type D*

TABLE 3
ROAD AND RAIL NOISE, DAY-TIME (0700 - 2300)
BUILDING COMPONENT REQUIREMENTS

ASSESSMENT LOCATION		*L_{eq} (16 hr)*	*BUILDING COMPONENT REQUIREMENTS*
PLANE OF LIVING ROOM WINDOW	*ROAD*	*Less than or equal to 65 dBA*	*Building compliant with the Ontario Building Code*
		Greater than 65 dBA	*Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria*
	RAIL	*Less than or equal to 60 dBA*	*Building compliant with the Ontario Building Code*
		Greater than 60 dBA	*Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria*

TABLE 4
ROAD AND RAIL NOISE, NIGHT-TIME (2300-0700)
BUILDING COMPONENT REQUIREMENTS

ASSESSMENT LOCATION		*L_{eq} (8 hr)*	*BUILDING COMPONENT REQUIREMENTS*
PLANE OF BEDROOM WINDOW	*ROAD*	*Less than or equal to 60 dBA*	*Building compliant with the Ontario Building Code*
		Greater than 65 dBA	*Building components (walls, windows, etc.) must bed designed to achieve indoor sound level criteria*
	RAIL	*Less than or equal to 60 dBA*	*Building compliant with the Ontario Building Code*
		Greater than 60 dBA	*Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria*

TABLE 5
FACADE REQUIREMENT FOR RAIL NOISE ONLY - 24 HOURS

ASSESSMENT LOCATION	*DISTANCE TO RAILWAY (m)*	*L_{eq} (24 hr) (dBA)*	*NOISE CONTROL REQUIREMENT*
PLANE OF BEDROOM WINDOW	*Less than 100 m*	*Less than or equal to 60 dBA*	*No additional requirement*
		Greater than 60 dBA	*Brick veneer or acoustically equivalent*
	Greater than 100 m	*Less than or equal to 60 dBA*	*No additional requirement*
		Greater than 60 dBA	*No additional requirement*

TABLE B- 1
Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq dBA)
Outdoor Points of Reception

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

TABLE B- 2
Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq dBA)
Plane of Window of Noise Sensitive Spaces

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

WARNING CLAUSES

The following warning clauses may be used individually or in combination:

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 sound level limits of the Municipality and the Ministry of Environment and climate change."

TYPE C:

"This dwelling unit has been designated with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant 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 and climate change."