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TOWN OF CALEDON
PLANNING
RECEIVED
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NOISE IMPACT STUDY

**PROPOSED RESIDENTIAL DEVELOPMENT
0 NICHOLAS STREET
TOWN OF CALEDON
(ALTON VILLAGE)**

PREPARED FOR:

MT. NICHOLAS HOLDINGS INC.

April 2022
Y2128

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1.0 INTRODUCTION

PURPOSE

A residential subdivision has been proposed by Mt. Nicholas Holdings Inc. in the Town of Caledon (Alton Village). 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 The Biglieri Group Ltd. dated April 2022.

SITE DESCRIPTION AND LOCATION

The proposed development will be comprised of 15 detached dwelling units, conservation easement and local internal roads. This development is located approximately 50m west of Main Street and approximately 250m north of Queen Street West in the Town of Caledon (Alton Village).

The surrounding land uses are existing and proposed residential developments, a conservation easement to the west and commercial developments further south.

KEY PLAN

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

KEY PLAN:

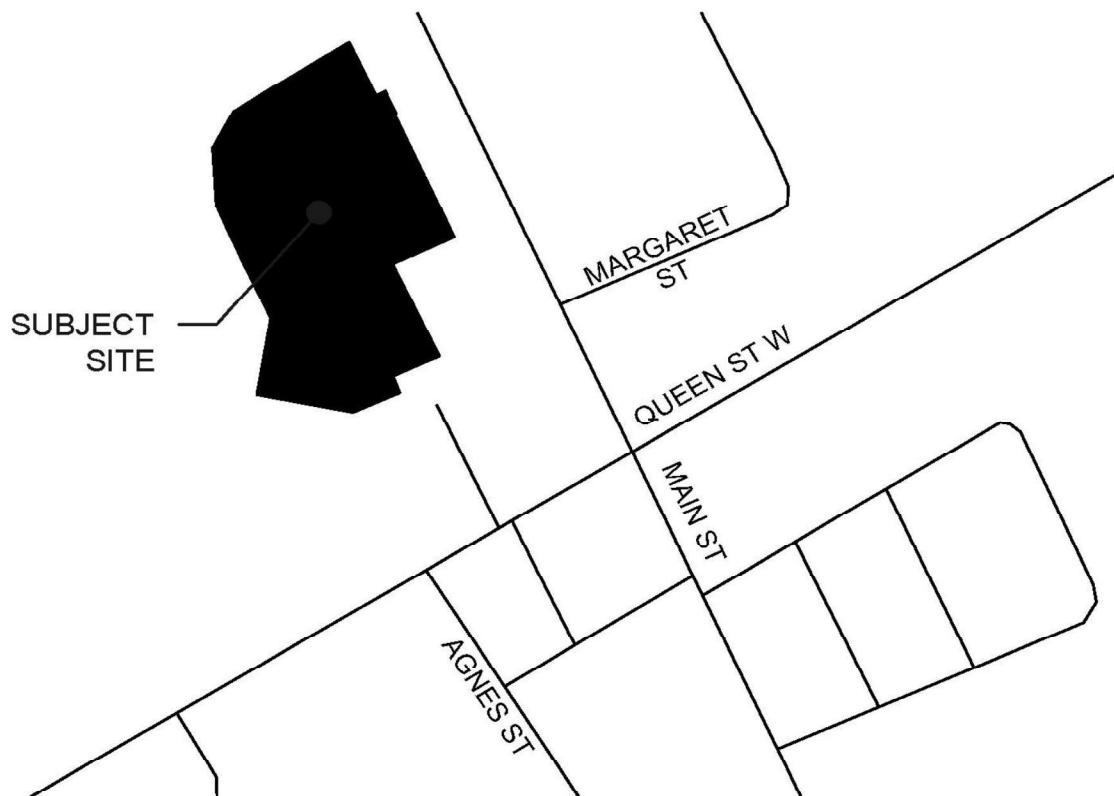


FIGURE 1

2.0 SOUND LEVEL CRITERIA

TRANSPORTATION:

The sound level descriptors (L_{eq} in dBA) are for 16 hours (daytime) and 8 hours (night-time) based on MECP Guideline NPC-300.

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.

Living and Dining Area and Bedroom (7 a.m.–11 p.m.) = 45 dBA Roads

Living and Dining Area (11 p.m.–7 a.m.) = 45 dBA Roads

Bedrooms (11 p.m. – 7 a.m.) = 40 dBA Roads

Appropriate building components such as walls, doors and windows are chosen with reference to the following. Building facade requirements apply for both day and night at the bedrooms and living/dining rooms. 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 60 dBA or greater, 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 SOURCES:

As per the MECP guidelines (Publication NPC-300), the subject site is considered to be a Class 2 area. The sound level limits for a Class 2 area due to stationary sources for an Outdoor Point of Reception is sound level (L_{EQ}), 50 dBA during daytime (0700-1900) and 45 dBA during evenings (1900-2300). The sound level limits for a Class 2 area due to stationary sources for Plane of Window of Noise Sensitive Spaces is sound level (L_{EQ}), 50 dBA during daytime (0700-1900), 50 dBA during evenings (1900-2300) and 45 dBA during night-time (2300-0700). The L_{eq} descriptor for stationary noise sources used are for a One Hour Time period.

3.0 NOISE SOURCES

ROAD TRAFFIC

As indicated on the Key Plan (Figure 1), the proposed development will be located west of Main Street and approximately 250m north of Queen Street West in the Town of Caledon (Alton Village).

The traffic from Main Street and Queen Street has the potential to impact the proposed residential development. The traffic from all other road noise sources is insignificant due to distance separation and low traffic volumes.

The traffic data for Main Street and Queen Street were obtained by the Traffic Impact Study report prepared by JD Northcote Engineering Inc. and projected to the year 2024. For noise analysis purposes, the traffic volume was projected 20 years in the future to the year 2042 at a growth rate of 3% per year. The future truck percentages were assumed to be 8% as the truck data was not included in the TIS report. Some of the data were increased to match similar type of roads in the area. The traffic data taken into account for noise analysis purposes are summarized in Tables 1 and 2 below.

TABLE 1: MAIN STREET TRAFFIC DATA	
Forecasted Annual Average Daily Traffic *	3,500
Percent Trucks	8%
Ratio of Heavy and Medium trucks	50:50
Speed (km/hr)	50 (60**)
Number of Lanes	2

TABLE 2: QUEEN STREET WEST TRAFFIC DATA	
Forecasted Annual Average Daily Traffic *	7,500
Percent Trucks	8%
Ratio of Heavy and Medium trucks	50:50
Speed (km/hr)	50 (60**)
Number of Lanes	2

* See Appendix 1 for correspondence.

** 10km/hr added to the posted speed as per the Town of Caledon's requirements.

RAIL TRAFFIC

The railway tracks to the east are located at 400m or more from the proposed development. Therefore, due to distance separation and shielding from the existing developments to the east, the noise impact from the railway is considered acoustically insignificant and warning clauses are not required.

STATIONARY NOISE SOURCES

The existing commercial developments are located along Queen Street West at more than 200m to the south. Due to the nature of the commercial activities and distance separation, these commercial developments are considered acoustically insignificant.

4.0 NOISE ASSESSMENT

ROAD TRAFFIC NOISE ASSESSMENT

Figure 3 is based on the latest Draft Plan prepared by The Biglieri Group Ltd. dated April 2022 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 recommended by the Ministry of Environment. The noise criteria are listed in Appendix 3. Table 3 lists the unattenuated sound levels at various locations.

TABLE 3: UNATTENUATED SOUND LEVELS - UNMITIGATED					
LOTS/ BLOCKS		SOURCE DISTANCE* (m)	SOUND LEVELS (dBA)		
			OUTDOOR LIVING AREA (16 hr) Leq	DAYTIME (16 hr) Leq	NIGHT-TIME (8 hr) Leq
Lot 1	Rear Wall	55.0 ¹ 272.0 ²	-	53.10 46.12 (53.89)	46.57 39.59 (47.36)
	Rear Yard	52.0 ¹ 270.0 ²	52.19 43.63 (52.76)	-	-
Lot 5	Side Wall	56.0 ¹ 450.0 ²	-	52.99 42.88 (53.39)	46.45 36.35 (46.85)
	Rear Yard	58.0 ¹ 470.0 ²	50.87 34.23 (50.96)	-	-
Lot 12	Front Wall	110.0 ¹ 250.0 ²	-	48.64 45.36 (50.31)	42.11 38.83 (43.78)
	Rear Yard	130.0 ¹ 252.0 ²	<55	-	-
Lot 15	Front Wall	110.0 ¹ 182.0 ²	-	48.64 48.71 (51.69)	42.11 42.17 (45.15)
	Rear Yard	130.0 ¹ 180.0 ²	<55	-	-

- 1 Main Street
2 Queen Street

Note: The receiver locations at the outdoor living areas/rear yards are taken to be 1.5m off ground, located 3m from the rear wall of the dwelling units.

5.0 RECOMMENDED NOISE MITIGATION MEASURES

5.1 OUTDOOR MEASURES

The receiver locations at the outdoor living areas/rear yards are taken to be 1.5m off ground, located 3m from the rear wall of the dwelling units.

Table 3 indicates that daytime rear yard sound levels at the following locations is expected to be below 55 dBA in the absence of mitigative measures.

Therefore, outdoor noise mitigation measures are not required.

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 the information in Table 3, all the proposed residential units are expected to be below 65dBA during the daytime and/or below 60dBA during the nighttime due to road traffic. Therefore, mandatory air conditioning is not required for the proposed residential development.

PROVISION FOR CENTRAL AIR CONDITIONERS

Based on the information in Table 3, all the proposed residential units are expected to be below 55dBA during the daytime and/or below 50dBA during the nighttime due to road traffic. Therefore, provision for air conditioning is not required for the proposed residential development.

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 1), dwelling wall sound level of 54 dBA was calculated. To ensure acceptable daytime indoor sound levels of 45dBA from road noise sources, the overall building components must provide an STC rating of 18 for windows and STC 24 for exterior wall construction.

NIGHT-TIME SOUND LEVELS

For the worst-case location during night-time (Lot 1), dwelling wall sound level of 47 dBA was calculated. To ensure acceptable night-time indoor sound levels of 40dBA from road noise sources, the overall building components must provide an STC rating of 14 for windows and STC 20 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, for all residential units, standard Ontario Building Construction will be acoustically acceptable for the exterior wall and window constructions.

WINDOWS

The following are some window configurations meeting an STC rating of 30 or less:

- 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.

Sample window configurations are included in Appendix 4 for additional options.

EXTERIOR WALLS

The following exterior wall constructions EW1 meet the STC 38 rating or less:

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

Sample exterior wall configurations are included in Appendix 4 for additional options.

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	BARRIERS	WARNING CLAUSES
All lots within this development	No Requirements	Windows: OBC* Walls: OBC	No	No

* OBC: Ontario Building Code Standard.

7.0 SUMMARY AND CONCLUSION

SUMMARY

1. Ventilation will not be required as noise mitigation measures for Lots 1 to 15.
2. For all residential units, standard Ontario Building Construction will be acoustically acceptable for the exterior wall and window constructions.
3. Outdoor noise mitigation measures are not required as the sound levels at all outdoor amenity areas are expected to be below the sound level limit of 55 dBA.
4. Warning clauses are not required as the sound levels are expected to be below the sound level limits due to road and rail traffic, and stationary noise sources.

CONCLUSION

This report has determined that sound levels acceptable to the Town of Caledon and the Ministry of Environment, Conservation and Parks are expected to be achieved. These are described in the preceding sections of this report.

Respectfully submitted,

YCA ENGINEERING Limited

Hava Jouharchi, P.Eng.
Senior Project Engineer



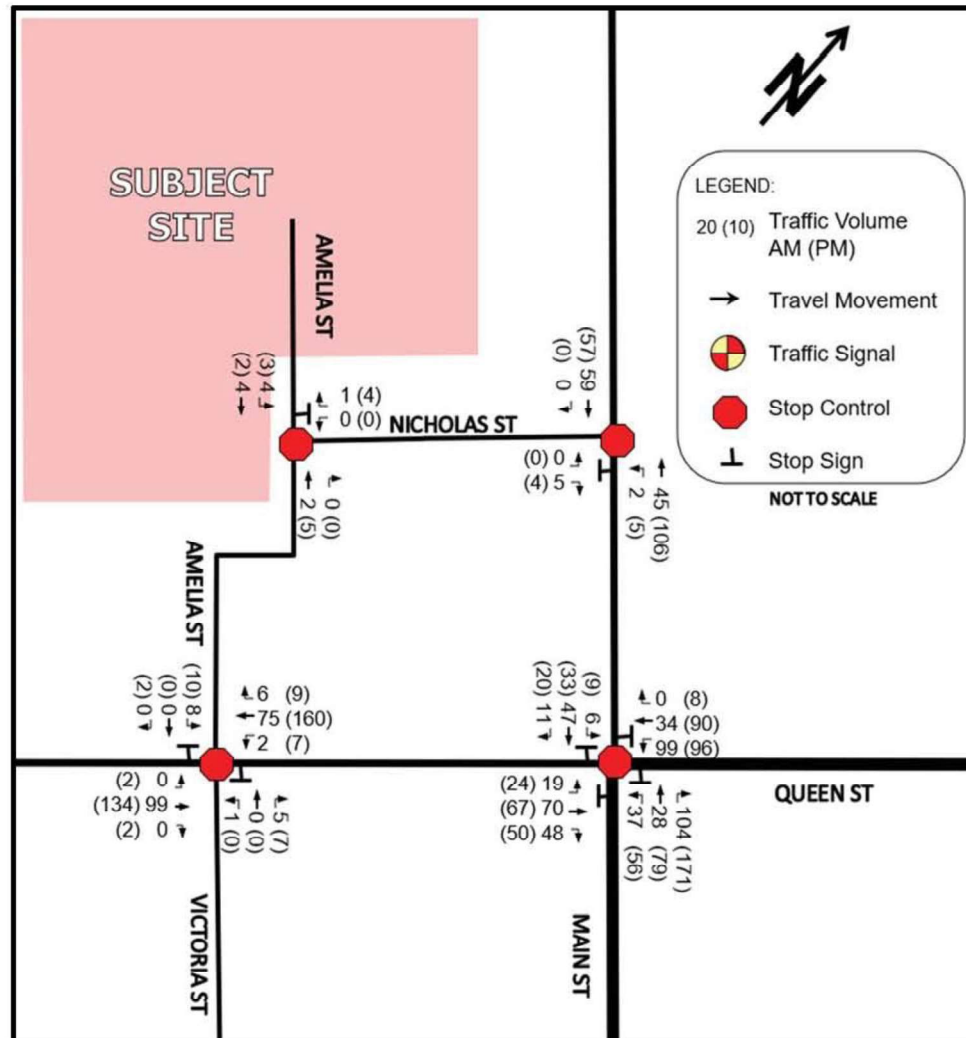


FIGURE 2
AERIAL PHOTO SHOWING SURROUNDING AREAS
0 NICHOLAS STREET

APPENDIX 1

TRAFFIC DATA

Figure 11 – Total (2024) Traffic Volumes



APPENDIX 2

SOUND LEVEL CALCULATIONS

STAMSON 5.0 SUMMARY REPORT Date: 04-01-2022 16:25:36
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
 Filename: lrw.te Time Period: Day/Night 16/8 hours
 Description: Lot 1, Rear Wall

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

Car traffic volume : 2898/322 veh/TimePeriod *
 Medium truck volume : 126/14 veh/TimePeriod *
 Heavy truck volume : 126/14 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): 3500
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 4.00
 Heavy Truck % of Total Volume : 4.00
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Main St (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 : 55.00 / 55.00 m
 Receiver height : 7.50 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)

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

Car traffic volume : 6210/690 veh/TimePeriod *
 Medium truck volume : 270/30 veh/TimePeriod *
 Heavy truck volume : 270/30 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): 7500
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 4.00
 Heavy Truck % of Total Volume : 4.00
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Queen St (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 : 272.00 / 272.00 m
 Receiver height : 7.50 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)

Result summary (day)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.Main St	! 1.41 !	53.10 !	53.10
2.Queen St	! 1.41 !	46.12 !	46.12

Total 53.89 dBA

Result summary (night)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.Main St	! 1.41 !	46.57 !	46.57
2.Queen St	! 1.41 !	39.59 !	39.59

Total 47.36 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.89
 (NIGHT): 47.36

STAMSON 5.0 SUMMARY REPORT Date: 04-01-2022 16:25:57
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
 Filename: lry.te Time Period: Day/Night 16/8 hours
 Description: Lot 1, Rear Yard

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

```
-----
Car traffic volume : 2898/322 veh/TimePeriod *
Medium truck volume : 126/14 veh/TimePeriod *
Heavy truck volume : 126/14 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): 3500
  Percentage of Annual Growth : 0.00
  Number of Years of Growth : 0.00
  Medium Truck % of Total Volume : 4.00
  Heavy Truck % of Total Volume : 4.00
  Day (16 hrs) % of Total Volume : 90.00
Data for Segment # 1: Main St (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 : 52.00 / 55.00 m
Receiver height : 1.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Road data, segment # 2: Queen St (day/night)
-----
```

```
Car traffic volume : 6210/690 veh/TimePeriod *
Medium truck volume : 270/30 veh/TimePeriod *
Heavy truck volume : 270/30 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): 7500
  Percentage of Annual Growth : 0.00
  Number of Years of Growth : 0.00
  Medium Truck % of Total Volume : 4.00
  Heavy Truck % of Total Volume : 4.00
  Day (16 hrs) % of Total Volume : 90.00
Data for Segment # 2: Queen St (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 : 270.00 / 272.00 m
Receiver height : 1.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
```

Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Main St ! 1.41 ! 52.19 ! 52.19
2.Queen St ! 1.41 ! 43.63 ! 43.63
-----+-----+-----+-----
Total 52.76 dBA
```

STAMSON 5.0 SUMMARY REPORT Date: 04-01-2022 16:26:47
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
 Filename: 5sw.te Time Period: Day/Night 16/8 hours
 Description: Lot 5, Side Wall

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

Car traffic volume : 2898/322 veh/TimePeriod *
 Medium truck volume : 126/14 veh/TimePeriod *
 Heavy truck volume : 126/14 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): 3500
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 4.00
 Heavy Truck % of Total Volume : 4.00
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Main St (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 : 56.00 / 56.00 m
 Receiver height : 7.50 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)

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

Car traffic volume : 6210/690 veh/TimePeriod *
 Medium truck volume : 270/30 veh/TimePeriod *
 Heavy truck volume : 270/30 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): 7500
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 4.00
 Heavy Truck % of Total Volume : 4.00
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Queen St (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 : 450.00 / 450.00 m
 Receiver height : 7.50 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)

Result summary (day)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.Main St	! 1.41 !	52.99 !	52.99
2.Queen St	! 1.41 !	42.88 !	42.88
Total			53.39 dBA

Result summary (night)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.Main St	! 1.41 !	46.45 !	46.45
2.Queen St	! 1.41 !	36.35 !	36.35
Total			46.85 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.39
 (NIGHT): 46.85

STAMSON 5.0 SUMMARY REPORT Date: 04-01-2022 16:26:17
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
 Filename: 5ry.te Time Period: Day/Night 16/8 hours
 Description: Lot 5, Rear Yard

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

 Car traffic volume : 2898/322 veh/TimePeriod *
 Medium truck volume : 126/14 veh/TimePeriod *
 Heavy truck volume : 126/14 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): 3500
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 4.00
 Heavy Truck % of Total Volume : 4.00
 Day (16 hrs) % of Total Volume : 90.00
 Data for Segment # 1: Main St (day/night)

 Angle1 Angle2 : -90.00 deg 55.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 58.00 / 58.00 m
 Receiver height : 1.50 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Road data, segment # 2: Queen St (day/night)

 Car traffic volume : 6210/690 veh/TimePeriod *
 Medium truck volume : 270/30 veh/TimePeriod *
 Heavy truck volume : 270/30 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): 7500
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 4.00
 Heavy Truck % of Total Volume : 4.00
 Day (16 hrs) % of Total Volume : 90.00
 Data for Segment # 2: Queen St (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 3 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 470.00 / 272.00 m
 Receiver height : 1.50 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Result summary (day)

	!	source	!	Road	!	Total
	!	height	!	Leq	!	Leq
	!	(m)	!	(dBA)	!	(dBA)
1.Main St	!	1.41	!	50.87	!	50.87
2.Queen St	!	1.41	!	34.23	!	34.23
Total						50.96 dBA

Filename: 15sw.te Time Period: Day/Night 16/8 hours
 Description: Lot 15, Side Wall

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

 Car traffic volume : 2898/322 veh/TimePeriod *
 Medium truck volume : 126/14 veh/TimePeriod *
 Heavy truck volume : 126/14 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): 3500
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 4.00
 Heavy Truck % of Total Volume : 4.00
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Main St (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 : 110.00 / 110.00 m
 Receiver height : 7.50 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Road data, segment # 2: Queen St (day/night)

 Car traffic volume : 6210/690 veh/TimePeriod *
 Medium truck volume : 270/30 veh/TimePeriod *
 Heavy truck volume : 270/30 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): 7500
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 4.00
 Heavy Truck % of Total Volume : 4.00
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Queen St (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 : 182.00 / 182.00 m
 Receiver height : 7.50 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Result summary (day)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.Main St	! 1.41 !	48.64 !	48.64
2.Queen St	! 1.41 !	48.71 !	48.71
Total			51.69 dBA

Result summary (night)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.Main St	! 1.41 !	42.11 !	42.11
2.Queen St	! 1.41 !	42.17 !	42.17
Total			45.15 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 51.69
 (NIGHT): 45.15

STAMSON 5.0 SUMMARY REPORT Date: 04-01-2022 16:31:37
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
 Filename: 15ry.te Time Period: Day/Night 16/8 hours
 Description: Lot 15, Rear Yard

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

 Car traffic volume : 2898/322 veh/TimePeriod *
 Medium truck volume : 126/14 veh/TimePeriod *
 Heavy truck volume : 126/14 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): 3500
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 4.00
 Heavy Truck % of Total Volume : 4.00
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Main St (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 1 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 130.00 / 130.00 m
 Receiver height : 1.50 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)

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

 Car traffic volume : 6210/690 veh/TimePeriod *
 Medium truck volume : 270/30 veh/TimePeriod *
 Heavy truck volume : 270/30 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): 7500
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 4.00
 Heavy Truck % of Total Volume : 4.00
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Queen St (day/night)

 Angle1 Angle2 : -55.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 180.00 / 180.00 m
 Receiver height : 1.50 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)

Result summary (day)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.Main St	! 1.41 !	42.99 !	42.99
2.Queen St	! 1.41 !	46.01 !	46.01
Total			47.77 dBA

APPENDIX 3

SOUND LEVEL CRITERIA

MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS

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	R	Less than or equal to 65 dBA	Building compliant with the Ontario Building Code
	O		
	A	Greater than 65 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
	D		
	R	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
	A		
	I	Greater than 60 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
	L		

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	R	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
	O		
	A	Greater than 65 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
	D		
	R	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
	A		
	I	Greater than 60 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
	L		

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 (L_{eq} dBA)
Outdoor Points of Reception

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

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

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

APPENDIX 4

SAMPLE WINDOW AND EXTERIOR WALL CONFIGURATIONS

WINDOW STC RATINGS

STC	Double Glazing of indicated glass thickness					Triple Glazing	
	2mm and 2mm glass	3mm and 3mm glass	4mm and 4mm glass	3mm and 6mm glass	6mm and 6mm glass	3mm 3mm and 3mm glass	3mm 3mm and 6mm glass
	Interpane Spacing (mm)					Interpane Spacing (mm)	
27	6						
28	13						
29	15	6					
30	18	13	6				
31	22	16	13	6	6	6,6	
32	28	20	16	13	13	6,10	6,6
33	35	25	20	16	16	6,15	6,10
34	42	32	25	20	20	6,20	6,15
35	50	40	32	25	24	6,30	6,20
36	63	50	40	32	30	6,40	6,30
37	80	63	50	40	37	6,50	6,40
38	100	80	63	55	50	6,65	6,50
39	125	100	80	75	70	6,80	6,65
40	150	125	100	95	90	6,100	6,80
41		150	125	110	100		6,100
42			150	135	125		

Source: National Research Council, Division of Building Research

EXPLANATORY NOTES:

1. STC data listed in the table are for the well-fitted weather-stripped units that can be opened. The STC values apply only when the windows are closed. For windows fixed and sealed to the frame, add three to the STC given in the table.
2. If the interpane spacing or glass thickness for a specific double-glazed window is not listed in the table, the nearest listed values should be used.
3. If the interpane spacing for a specific triple-glazed window are not listed in the table, use the listed case whose combined spacing are nearest the actual combined spacing.
4. The STC data listed in the table are for typical windows, but details of glass mounting, window seals, etc., may result in slightly different performance for some manufacturer's products. If the laboratory sound transmission loss data (conforming to ASTM test method E-90) are available, these should be used.

EXTERIOR WALL STC RATINGS

Wall Configuration	EW1	EW2	EW3	EW4	EW1R	EW2R	EW3R	EW5	EW4R	EW6	EW7 EW5R	EW8
STC Rating	38	40	43	46	47	48	49	54	55	57	58	62

Source: National Research Council, Division of Building Research

NOTES:

- 1 The common structure of walls EW1 to EW5 is composed of 12.7mm gypsum board, vapour barrier and 38x89 mm studs with 50 mm (or thicker) mineral wool or glass fibre batts in inter-stud cavities.
 - EW1 denotes the common structure, plus sheathing, plus wood siding or metal siding and fibre backer board
 - EW2 denotes the common structure, plus rigid insulation (25 to 30 mm), and wood siding or metal siding and fibre backer board.
 - EW3 denotes simulated mansard with the common structure, plus sheathing, 28 X89 mm framing, sheathing and asphalt roofing material
 - EW4 denotes the common structure, plus sheathing and 20 mm stucco.
 - EW5 denotes the common structure, plus sheathing, 25 mm air space, 100mm brick veneer.
 - EW6 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 100 mm back-up block 100 mm face brick.
 - EW7 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 140mm back-up block, 100 mm face brick.
 - EW8 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 200 mm concrete.
- 2 R signifies the mounting of the interior gypsum board on resilient clips.
- 3 An exterior wall conforming to rainscreen design principles and composed of 12.7 mm gypsum board, 100 mm concrete block, rigid insulation (25 to 50 mm), 25 mm air space, and 100 mm brick veneer has the same STC as EW6.
- 4 An exterior wall described in EW1 with the addition of rigid insulation (25 to 50 mm) between the sheathing and the external finish has the same STC as EW2.