

Noise Feasibility Study

Proposed Residential Development

2935 & 2955 Mississauga Road

Mississauga, Ontario

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1 Introduction and Summary

HGC Engineering was retained by 5908160 Ontario Inc. to conduct a noise feasibility study for a proposed residential development in Mississauga, Ontario. The location of the proposed development site is at 2935 & 2955 Mississauga Road. The purpose of this study is to determine the impact of environmental noise from the surrounding area in accordance with the Ministry of Environment, Conservation, and Parks (MECP) guidelines. This study has been prepared as part of the approval process by the municipality.

The primary noise sources at the proposed development site were determined to be the road traffic on Dundas Street West and Mississauga Road. The road traffic data used for this study was obtained from the City of Mississauga. The predicted sound levels were evaluated with respect to the guidelines of the Ministry of the Environment, Conservation and Parks (MECP) and the City.

The results of the study indicate the building development is feasible from a noise perspective. The future daytime and nighttime sound levels at the facades facing Mississauga Road and Dundas Street West will exceed the MECP guidelines and will require noise control measures. To meet MECP guidelines, the proposed 12-storey building must be supplied with a forced air ventilation system with ducts sized to incorporate the future installation of a central air conditioning unit by the occupants. The inclusion of central air conditioning will meet and exceed the requirements. Any building construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation for the proposed dwellings. Noise warning clauses are also required to inform future occupants of the traffic noise impacts.



2 Site Description and Noise Sources

The key plan for the development is attached as Figure 1. The site is located on the southeast side corner of Dundas Street West and Mississauga Road. A site plan prepared by Caricari Lee Architects dated April 7, 2020 is provided as Figure 2. Sound level predictions are also shown on Figure 2. The proposed development includes a 12-storey condominium building and a stacked townhouse block along with underground parking.

HGC Engineering personnel visited the site during the month of December 2020 to observe the acoustical environment and note the significant noise sources. The acoustical environment surrounding the site is urban in nature. Mississauga Road and Dundas Street West are the dominant sources of traffic noise. Dundas Street West is a 4-lane road (two lanes in each direction) and Mississauga Road is a 2-lane road (one lane in each direction). There are existing residences surrounding the site. There are no significant stationary sources of noise within 500 m of this site.

3 Sound Level Criteria

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

Table I: MECP Road Traffic Noise Criteria (dBA)

Space	Daytime L _{EQ} (16 hour)	Nighttime L _{EQ} (8 hour)
Outdoor Living Areas	55 dBA	--
Inside Living/Dining Rooms	45 dBA	45 dBA
Inside Bedrooms	45 dBA	40 dBA

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

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

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where nighttime sound levels outside bedroom or living/dining room windows exceed 60 dBA (59 dBA in the Region of Peel) or daytime sound levels outside bedroom or living/dining room windows exceed 65 dBA. Forced air ventilation with ducts sized to accommodate the future installation of air conditioning is required when nighttime sound levels at bedroom or living/dining room windows are in the range of 51 to 60 dBA or when daytime sound levels at bedroom or living/dining room windows are in the range of 56 to 65 dBA.

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

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

4 Traffic Noise Assessment

4.1 Road Traffic Data

Traffic data for Dundas Street West and Mississauga Road were obtained from the City of Mississauga, in the form of ultimate traffic volumes, provided in Appendix A. An ultimate volume of 6 300 vehicles per day at a posted speed limit of 50 km/h was applied for the analysis for Mississauga Road. An ultimate volume of 48 300 vehicles per day at a posted speed limit of 60 km/h was applied for the analysis for Dundas Street. A commercial vehicle percentage of 2% split into 1.1% medium trucks and 0.9% heavy trucks was applied for Mississauga Road. A commercial

vehicle percentage of 4% split into 2.2% medium trucks and 1.8% heavy trucks was applied for Dundas Street. A day/night split of 90% / 10 % was used for both roadways. Table II summarizes the traffic volume data used in this study.

Table II: Ultimate Road Traffic Data

Street	Time	Cars	Medium Trucks	Heavy Trucks	Total
Dundas Street	Daytime	41 731	956	782	43 470
	Nighttime	4 637	106	87	4 830
	Total	46 368	1 063	869	48 300
Mississauga Road	Daytime	5 557	62	51	5 670
	Nighttime	617	7	6	630
	Total	6 174	69	57	6 300

4.2 Road Traffic Prediction

To assess the levels of road traffic noise which will impact the study area in the future, sound level predictions were made using STAMSON version 5.04, a computer algorithm developed by the MECP. Sample STAMSON output is included in Appendix B.

Predictions of the traffic sound levels were chosen around the proposed mixed-use building to obtain an appropriate representation of future sound levels at various façades. Sound levels were predicted at the plane of the top storey bedroom and/or living/dining room windows during daytime and nighttime hours to investigate ventilation and façade construction requirements. Sound levels were also predicted in possible OLA’s to investigate the need for noise barriers. Figure 2 shows the site plan with prediction locations. The results of these predictions are summarized in Table III.

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

Predictions of the traffic sound levels for [A], [B] and [C] were made at the top of the building (1.5 m above the 12th storey). Sound levels for [D] and [E] were made at the top of the building (1.5 m above the 6th storey) and sound levels for [J] was taken at a height of 7.5 m above grade. Table III summarizes the predicted sound levels at each of the sound level prediction locations.

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

Prediction Location	Description	Daytime – at the Façade L _{EQ-16 hr}	Nighttime – at the Façade L _{EQ-8 hr}
A	Façade Facing Mississauga Rd (12 th storey)	59	53
B	Façade Facing Dundas St (12 th storey)	63	56
C	Façade facing channel (12 th storey)	57	50
D	Façade facing channel (6 th storey)	<55	<50
E	Façade Facing Mississauga Rd (6 th storey)	<55	<50
F	Façade facing channel	<55	<50
G	OLA on 6 th floor+	<55	NA

Note: + with a minimum 1.07 m high solid parapet wall

5 Discussion and Recommendations

The sound level predictions indicate that the future traffic sound levels will exceed MECP guidelines at some facades of the proposed development. The following discussion outlines the recommendations for acoustic barrier requirements, ventilation requirements, upgraded building façade construction, and warning clauses to achieve the noise criteria stated in Table I.

5.1 Outdoor Living Areas

The dwelling units in the proposed development may have balconies that are less than 4 m in depth. These areas are not considered to be outdoor amenity areas under MECP guidelines, and therefore are exempt from traffic noise assessment.

There is a rooftop amenity area on the 6th floor roof. The predicted sound level in this area is less than 55 dBA with a minimum 1.07 m high solid parapet around the perimeter of the area. Further mitigation is not required.

The stacked townhouses may have rooftop amenity areas. The sound levels in these areas are less than 55 dBA due to road traffic noise and therefore no mitigation is required.

5.2 Indoor Living Areas and Ventilation Requirements

Provision for the Future Installation of Air Conditioning by the Occupant

As per the results summarized in Table III, prediction locations [A], [B] and [C] have predicted sound levels between 56 and 65 dBA during the daytime and between 51 and 60 dBA during the nighttime. As per the MECP guidelines, it is recommended that these dwelling units be equipped with forced air ventilation systems, with large enough ducts to allow future installation of air conditioning systems at the choice of the future occupants. Window or through-the-wall air conditioning units are not recommended because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall sound insulating properties of the envelope. Acceptable units are those housed in their own insulated closet with an access door for maintenance. 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. Inclusion of central air conditioning will meet and exceed the requirements. The remaining prediction sites have a simulated sound level less than the MECP limits, thus no noise control measures are required.

The stacked townhouse block has no specific ventilation requirements since sound levels due to traffic noise are less than the MECP criteria.

5.3 Building Façade Constructions

The predicted sound levels at all facades of the buildings will not exceed 65 dBA daytime and 60 dBA nighttime, thus will not require detailed building envelope design to conform to noise criteria. 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 interior spaces.



5.4 Warning Clauses

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

Suggested wording for future dwellings with minor sound level excesses.

Type A:

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

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

Type B:

This dwelling unit has been fitted with a forced air heating system and the ducting etc., was sized to accommodate central air conditioning. Installation of central air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the Municipality's and the Ministry of the Environment, Conservation and Parks' noise criteria. (Note: The location and installation of the outdoor air conditioning device should be done so as to minimize the noise impacts and comply with criteria of MECP publication NPC-300.)

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

6 Summary of Recommendations

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

1. Installation of forced air ventilations systems with ducts large enough to facilitate potential installation of central air conditioning units by the occupants. Inclusion of central air conditioning will meet and exceed the requirements.
2. Any building construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation for the proposed dwellings in the development.

3. The use of warning clauses in the property and tenancy agreements is recommended to inform future residents of traffic noise issues.

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

Building	Acoustic Barrier	Ventilation Requirements*	Type of Warning Clause	Building Constructions*
12-storey condo building	+	Forced Air	A, B	OBC
Stacked townhouse block	--	--	--	OBC

Notes:

+ a minimum 1.07 m high solid parapet around the perimeter of the 6th floor outdoor amenity area

* The location, installation and sound rating of the air conditioning condensers must be compliant with MECP Guideline NPC-300, as applicable.

OBC – Ontario Building Code

LR/DR – Living Room/Dining Room

BR – Bedroom





Figure 1: Key Plan

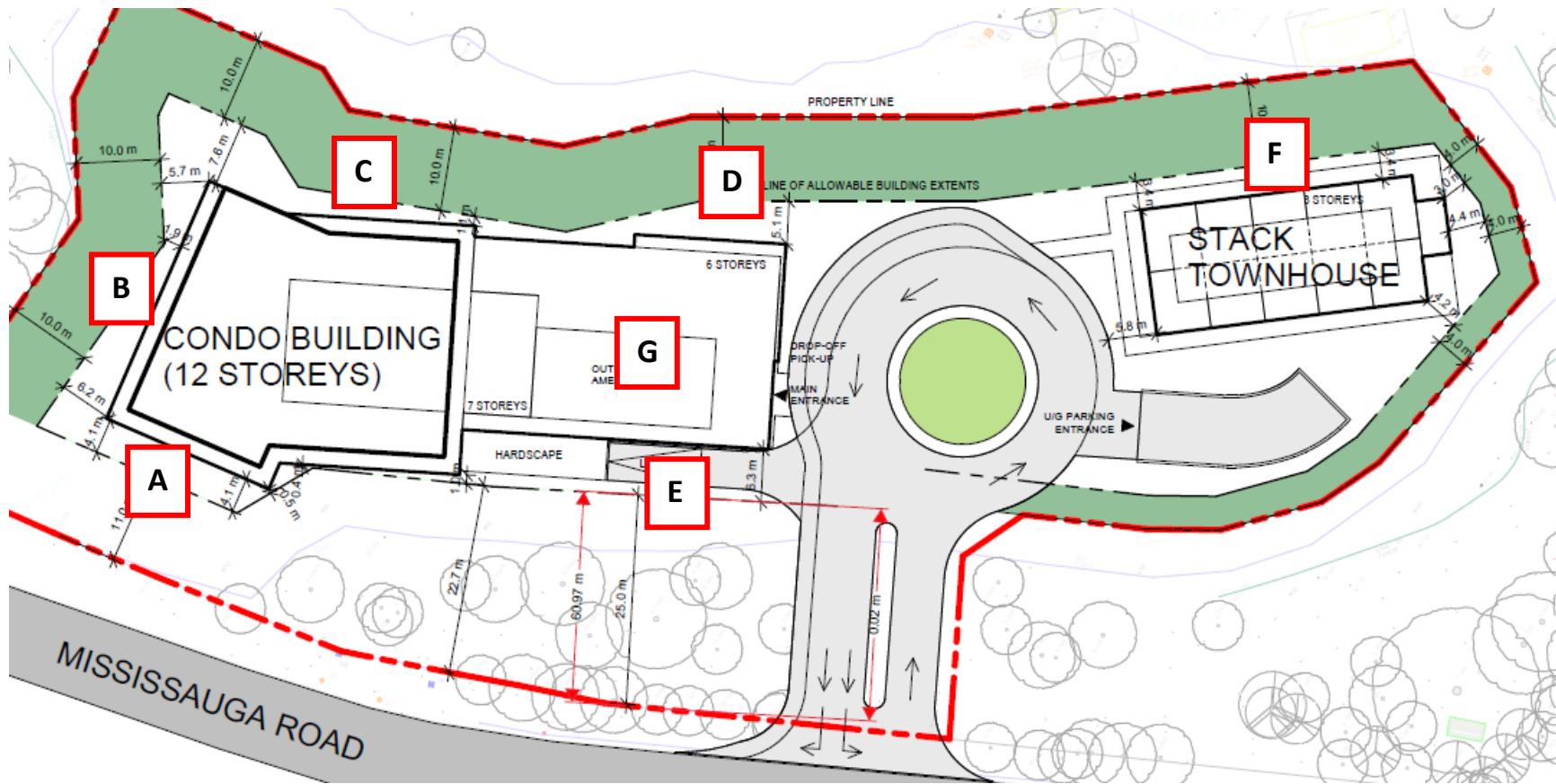


Figure2: Prediction Locations