

Noise Feasibility Study

Proposed Residential Building

5160-5170 Ninth Line

Mississauga, Ontario

Prepared for:

Branthaven Development
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Reviewed by:



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HGC Project No.: 02100663

August 17, 2022



ACOUSTICS



NOISE



VIBRATION

VERSION CONTROL

Noise Feasibility Study,
5160-5170 Ninth Line,
Mississauga, Ontario.

Ver.	Date	Version Description / Changelog	Prepared By
0	December 15, 2021	Noise and Vibration Feasibility Study in support of the approvals process.	A. Rogers/ M. Chan
1	August 17, 2022	Updates to address comments from the City of Mississauga and revised plans.	A. Rogers/ M. Chan

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1 Introduction and Summary

HGC Engineering was retained by Branthaven Development to conduct a noise feasibility study for a proposed residential development to be located at 5160-5170 Ninth Line, in the City of Mississauga, Ontario. 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. The development includes a 6-storey residential building with one level of underground parking. This study has been prepared as part of the approval process by the municipality.

This study has been updated to include a review of the updated rooftop amenity plan drawings prepared by ZO1 Architects dated August 3, 2022, included in Appendix C, and include responses to comments from the City of Mississauga in Appendix D.

The primary noise sources at the proposed development site were determined to be the road traffic on Highway 407 and Ninth Line. 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 that with suitable noise control measures integrated into the design of the buildings, it is feasible to achieve MECP guideline sound levels. Central air conditioning systems and upgrade glazing constructions will be required for the buildings. Noise barriers will be required for the rooftop amenity space. Associated acoustical requirements are specified in this report. 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 southwest side of Ninth Line, northwest of Eglinton Avenue West, in Mississauga. A site plan prepared by ZO1 Architects dated August 3, 2022, is provided as Figure 2. Sound level predictions are also shown on Figure 2. The proposed development will include a 6-storey residential building with one level of underground parking.

HGC Engineering personnel visited the site during the month of July 2021 to observe the acoustical environment and note the significant noise sources. The acoustical environment surrounding the site is urban in nature. Highway 407 and Ninth Line are the dominant sources of traffic noise. Highway 407 is a 6-lane highway (three lanes in each direction), and Ninth Line is a 2-lane highway (one lane in each direction) and is proposed to be widened to four lanes. There are existing residences northeast of the site, across Ninth Line. There are no significant stationary sources of noise observed 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 Ninth Line was obtained from the City of Mississauga, in the form of an ultimate traffic volume, provided in Appendix A. An ultimate volume of 26 500 vehicles per day at a posted speed limit of 60 km/h was applied for the analysis for Ninth Line. A commercial vehicle percentage of 4% split into 2.2% medium trucks and 1.8% heavy trucks was applied for Ninth Line. A day/night split of 90% / 10 % was used for Ninth Line.

Traffic data for Highway 407 was obtained from the Mattamy Homes development to the southwest. The data was presented as AADT for the year 2031. The 2031 data was projected to the year 2032



using a conservative estimate of 2.5% growth per year. A posted speed limit of 100 km/h was applied for the analysis. A commercial vehicle percentage of 13% split into 5% medium trucks and 8% heavy trucks was applied, although this estimate is likely conservative given the nature of this toll highway. A day/night split of 85% and 15% was used, as this is representative of the typical usage of Highway 407 based on sound measurements conducted by HGC Engineering for past projects near Highway 407. Table II summarizes the traffic volume data used in this study.

Table II: Ultimate and 2032 Projected Road Traffic Data

Street	Time	Cars	Medium Trucks	Heavy Trucks	Total
Ninth Line (Ultimate)	Daytime	22 896	525	429	23 850
	Nighttime	2 544	58	48	2 650
	Total	25 440	583	477	26 500
Highway 407 (2032 Projected)	Daytime	38 961	2 239	3 583	44 783
	Nighttime	6 875	395	632	7 902
	Total	45 836	2 634	4 215	52 685

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 residential buildings 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 the OLA 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. The direction used in the Tables is based on project north shown on Figure 2.

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.

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

Prediction Location	Description	Daytime – L _{EQ-16 hr}	Nighttime – L _{EQ-8 hr}
[A]	East Façade	68	62
[B]	South Façade	68	62
[C]	West Façade	68	63
[D]	Interior West Façade	63	58
[E]	Interior North Facade	65	60
[F]	At-grade OLA	55	--
[G]	Rooftop OLA	58 ⁺	

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 all façades of the proposed building. 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 an outdoor amenity area on the west side of the building at-grade. The amenity area will be well shielded from Highway 407 by the Mattamy townhouse development to the west which has begun construction. The predicted sound level in this area (Prediction Location [F]) is within the MECP limit of 55 dBA. No additional noise abatement is required for this amenity space.

The predicted daytime sound level in the rooftop amenity area (Prediction Location [G]) is 58 dBA, greater than the MECP limit of 55 dBA but less than 60 dBA (not exceeding the limit by more than 5 dBA) with a minimum 1.07 m high solid parapet around the southwest corner of the area. There are no specific noise barrier requirements for the remaining perimeter, and they can consist of typical railings. According to MECP guidelines, this excess may be addressed by including a warning clause

in sale and lease agreements for the development. No additional noise abatement is required for this space to comply with the MECP criteria outlined in Section 3.

As required by the City, a table of barrier heights is provided below to show barrier heights required to further reduce the sound level to 57 dBA, 56 dBA, and 55 dBA. Note that the barrier heights in the table below represent the required height of the barrier for the southwest portion of the OLA, between the mechanical penthouse and the elevator access, and includes a 1.2 m high barrier along the north portion of the OLA, as shown in Figure 3.

Table IV: Acoustic Barrier Heights Required to Achieve Various Sound Levels for the Southwest Corner, [m]

Receiver	55 dBA	56 dBA	57 dBA	58 dBA	59 dBA	60 dBA
Rooftop OLA ¹	3.0	2.3	1.2	--	--	--

Note: ¹ Includes a 1.2 m high acoustic barrier along the north portion of the OLA.

The wall component of the barrier should be of a solid construction with a surface density of no less than 20 kg/m². The walls may be constructed from a variety of materials such as glass, wood, brick, pre-cast concrete or other concrete/wood composite systems provided that it is free of gaps or cracks. The heights and extents of the barriers should be chosen to reduce the sound levels in the OLA's to below 60 dBA and as close to 55 dBA as is technically, administratively and economically feasible, subject to the approval of the municipality respecting any applicable fence height by-laws. Since a common amenity space has been provided which meets 55 dBA, the City may consider allowing 58 dBA at the rooftop amenity space without requiring higher noise barriers.

5.2 Indoor Living Areas and Ventilation Requirements

Central Air Conditioning

As per the results summarized in Table III, the predicted future sound level at most façades of the proposed building will be greater than 65 dBA during the daytime hours, and/or 60 dBA during the nighttime hours. To address these excesses, the MECP guidelines recommend that the building be equipped with central air conditioning systems, so that the windows can be kept closed.

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. For the proposed 6-storey building, suitable units are those housed in their own 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.

5.3 Building Façade Constructions

Predicted sound levels at the building facades were used to determine sound insulation requirements of the building envelope. The required acoustic insulation of the wall and window components was determined using methods developed by the National Research Council (NRC).

Detailed glazing requirements for different facades and spaces could be considered in value engineering, if required, when detailed floor plans and building elevations are available.

Exterior Wall Constructions

The exterior walls of the proposed building may include precast/masonry panel portions, as well as spandrel glass panels within an aluminum window system. In this analysis, it has been assumed that sound transmitted through elements other than the glazing elements is negligible in comparison. For this assumption to be true, spandrel or metal panel sections must have an insulated drywall partition on separate framing behind.

Exterior Doors

There may be swing doors and some glazed sliding patio doors for entry onto the balconies from living/dining/bedrooms. The glazing areas on the doors are to be counted as part of the total window glazing area. If exterior swing doors are to be used, they shall be insulated metal doors equipped with head, jamb and threshold weather seals.

Acoustical Requirements for Glazing

At the time of this report, detailed floor plans and elevations are under development. Assuming a typical window to floor area of 50% (30% fixed and 20% operable) for the living/dining rooms and 40% (30% fixed and 10% operable) for the bedrooms in the building, the minimum acoustical requirement for the basic window glazing, including glass in fixed sections, swing or sliding doors, and operable windows, is provided in Table IV and shown on Figure 4.



**Table V: Preliminary Minimum Glazing STC Requirements
for Specific Building Façades**

Façade	Space	Glazing STC ^{1, 2}
North, East, South, and West Façades	Living/Dining	STC-30
	Bedroom	OBC
Interior North, South, and West Façades	Living/Dining	OBC
	Bedroom	

Note: [X] Prediction location

¹ Based on 50% window to floor area ratio for living/dining rooms and 40% for the bedrooms.

² STC requirement refers to fixed glazing. Small leaks through operable doors and windows are assumed, however, tight weather seals should be provided to reduce such leakage to the extent feasible.
OBC – Ontario Building Code

Note that acoustic performance varies with manufacturer's construction details, and these are only guidelines to provide some indication of the type of glazing likely to be required. Acoustical test data for the selected assemblies should be requested from the suppliers, to ensure that the stated acoustic performance levels will be achieved by their assemblies.

Further Work

When detailed floor plans and building elevations are available for the suites, the glazing requirements should be refined based on actual window to floor area ratios.

5.4 Warning Clauses

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

Suggested wording for future dwellings with 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 central air conditioning systems is given below.

Type B:

This dwelling unit has been supplied with a central air conditioning system which allows windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the noise criteria of the Municipality and the Ministry of the Environment, Conservation and Parks.

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

6 Impact of the Development on Itself

Section 5.8.1.1 of the Ontario Building Code (OBC), released on January 1, 2020, specifies the minimum required sound insulation characteristics for demising partitions, in terms of Sound Transmission Class (STC) or Apparent Sound Transmission Class (ASTC) values. In order to maintain adequate acoustical privacy between separate suites in a multi-tenant building, inter-suite walls must meet or exceed STC-50 or ASTC-47. Suite separation from a refuse chute or elevator shaft must meet or exceed STC-55. In addition, it is recommended that the floor/ceiling constructions separating suites from any amenity or commercial spaces also meet or exceed STC-55. Tables 1 and 2 in Section SB-3 of the Supplementary Guideline to the OBC provide a comprehensive list of constructions that will meet the above requirements.

Tarion's Builder Bulletin B19R requires the internal design of condominium projects to integrate suitable acoustic features to insulate the suites from noise from each other and amenities in accordance with the OBC, and limit the potential intrusions of mechanical and electrical services of the buildings on its residents. If B19R certification is needed, an acoustical consultant is required to review the mechanical and electrical drawings and details of demising construction and mechanical/electrical equipment, when available, to help ensure that the noise impact of the redevelopment on itself is maintained within acceptable levels.



7 Impact of the Development on the Environment

Sound levels from noise sources such as rooftop air-conditioners, cooling towers, exhaust fans, etc. should not exceed the minimum one-hour L_{EQ} ambient (background) sound level from road traffic, at any potentially impacted residential point of reception. Based on the levels observed during our site visit, the typical minimum ambient sound levels in the area are expected to be in the range of 50 dBA or more during the day and 45 dBA or more at night. Thus, any electro-mechanical equipment associated with this development (e.g., emergency generator testing, fresh-air handling equipment, etc.) should be designed such that they do not result in noise impact beyond these ranges.

8 Summary of Recommendations

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

1. Central air conditioning is required for the proposed 6-storey building. The location, installation and sound ratings of the air conditioning devices should comply with NPC-300.
2. Upgraded exterior building façade and glazing constructions are required for some façades of the building as shown on Figure 4. When detailed floor plans and building elevations are available, the glazing requirements should be refined based on window to floor area ratios.
3. A noise barrier is required around the perimeter of the rooftop amenity space as shown on Figure 3.
4. The use of warning clauses in the property and tenancy agreements is recommended to inform future residents of traffic noise issues.
5. A detailed noise study should be performed when detailed floor plans and building elevations are available to refine glazing requirements based on actual window to floor area ratios and confirm noise barrier requirements.
6. Tarion Builders Bulletin B19R requires that the internal design of condominium projects integrates suitable acoustic features to insulate the suites from noise from each other and amenities in accordance with the OBC, and limit the potential intrusions of mechanical and electrical services of the building on its residents. If B19R certification is to be sought, an



acoustical consultant is required to review the mechanical and electrical drawings and details of demising constructions and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself are maintained within acceptable levels.

The following table summarizes the noise control recommendations and noise warning clauses for the dwellings in the proposed building.

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

Description	Acoustic Barrier	Ventilation Requirements*	Type of Warning Clause	Preliminary Glazing STC Requirements+
North, East, South, and West Façades	--	Central A/C	A, B	LRDR: STC-30 BR: OBC
Interior North, South, and West Façades	--			LRDR/BR: OBC
Outdoor Amenity Area (GF)	--	--	--	--
Outdoor Amenity Area (Roof)	√1	--	--	--

Notes:

-- no specific requirement

OBC – meeting the minimum requirements of the Ontario Building Code

LRDR – Living Room/Dining Room

BR – Bedroom

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

1- Barrier heights as approved by the City

+ With assumed window to floor area ratios of 50% for LRDR and 40% for BR. Refer to Figure 4 for STC requirements for all building façades. When detailed floor plans and building elevations are available, an acoustical consultant should review the drawings to refine the window glazing constructions based on actual window to floor area ratios, and to verify exterior wall construction.

8.1 Implementation

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

1. When architectural plans are available for the building, an acoustical consultant should review the window and room floor areas to refine glazing construction requirements and confirm noise barrier requirements.
2. Prior to the issuance of building permits for this development, a Professional Engineer qualified to perform acoustical engineer services in the Province of Ontario should review the exterior wall constructions, architectural plans and building elevations to ensure the building façade and glazing constructions will provide sufficient sound insulation for the indoor spaces and provide additional recommendations, as required.
3. Prior to the issuance of occupancy permits for this development, the City's building inspector or a Professional Engineer qualified to perform acoustical engineer services in the province of Ontario should certify that the noise control measures have been properly incorporated, installed, and constructed.



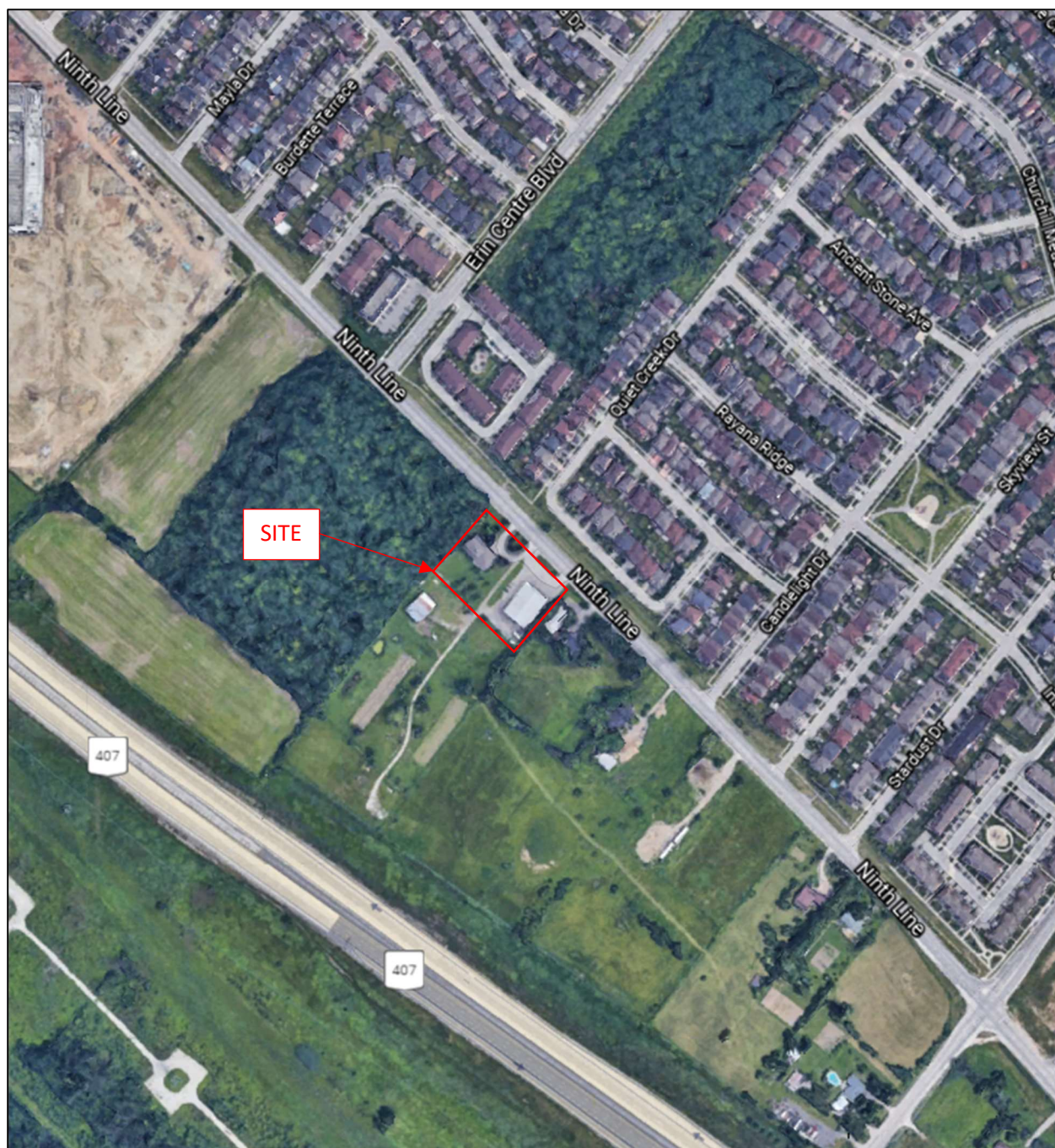


Figure 1: Key Plan

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TEL:
www.website.com

NAME: KORSIAK URBAN PLANNING
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BRANT **HAVEN**

Drawing Title:

Site Plan

Scale:	1 : 250	Drawn by:	J.C.
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B.C.	No.: 21014

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Appendix A

Road Traffic Data



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Date: 30-Jun-21

NOISE REPORT FOR PROPOSED DEVELOPMENT

REQUESTED BY:

Name: Andrew Rogers

Company: HGC Engineering

PREPARED BY:

Nam: Steven Guan

Tel#: 905-615-3200 ext. 5933

Location:

Ninth Line - Eglinton Avenue West to Erin Centre Boulevard
Eglinton Avenue West - Ninth Line to City West Limits



ID

514

ON SITE TRAFFIC DATA

Specific	Street Names				
	Ninth Line	Eglinton Ave W			
AADT:	26,500	17,000			
# of Lanes:	4 Lanes*	2 Lanes			
% Trucks:	4%	3%			
Medium/Heavy Trucks Ratio:	55/45	55/45			
Day/Night Split:	90/10	90/10			
Posted Speed Limit:	60 km/h**	60 km/h			
Gradient Of Road:	<2%	<2%			
Ultimate R.O.W:	35 m	30 m			

Comments:

Ultimate traffic data only (2041).

*Note: Ninth Line is proposed to be widened (between Derry Road West to Eglinton Avenue West) from two lanes to four lanes (tentatively scheduled to begin 2023).

**Note: As part of the Ninth Line road widening project, the speed limit is proposed to be reduced from 70 km/h to 60 km/h.

Table 3-2: 2006 and 2031 SADT Forecasts

		AADT		%	SADT	
		2006	2031	Growth AADT	2006	2031
Niagara to GTA Study Area						
Hwy 403 Hamilton	Hwy 24 to Hwy 52	40,800	64,300	58%	45,300	71,400
	Hamilton 52 to Hwy 6 (Fiddlers Green)	57,800	83,300	44%	61,100	88,100
	Hwy 6 W to Hwy 6 E (York Blvd.)	113,100	146,500	30%	119,600	154,900
	Hwy 6 to QEW (Waterdown Road)	140,400	158,400	13%	156,000	176,000
QEW Halton	Hwy 403/QEW to Guelph Line (Brant St.)	182,000	244,600	34%	202,200	271,700
	Guelph Line to Burloak Dr. (Walkers Ln)	175,800	194,200	10%	195,300	215,700
	Burloak Dr. to Third Line (Bronte Rd.)	171,300	224,600	31%	190,300	249,500
	Third Line to Hwy 403 (Trafalgar Rd.)	175,600	210,100	20%	185,800	222,300
QEW Niagara	Fort Erie to Hwy 420 (McLeod Rd.)	35,000	61,800	77%	37,000	65,300
	Hwy 420 to Hwy 405 (Mountain Rd.)	90,000	95,900	7%	111,400	118,700
	Garden City Skyway Bridge	82,500	98,900	20%	99,500	119,300
	GC Skyway to Hwy 406 (Ontario St.)	90,600	120,900	33%	112,200	149,700
	Hwy 406 to Niagara Bdy (Casablanca)	91,000	140,500	54%	112,700	174,000
	Niagara Bndy to Eastport (Burlington St)	143,100	186,700	30%	159,000	207,400
Hwy 406	QEW to Hwy 58 (Glendale Ave.)	54,200	69,000	27%	57,300	72,900
	Hwy 58 to RR 20 (N. of RR 20)	29,500	43,700	48%	31,200	46,200
	RR 20 to East Main (Port Robinson Rd.)	21,100	39,000	85%	22,300	41,200
Hwy 405	QEW to Queenston-Lewiston Bridge	13,300	29,700	123%	16,500	36,800
Hwy 3	Fort Erie to Hwy 130 (Ridge Rd.)	11,700	21,100	80%	14,500	26,100
	Hwy 130 to Chambers Corners (Townline)	5,000	9,900	98%	6,050	12,000
Hwy 6	Hwy 403 to Hwy 5 (Dundas St.)	44,900	62,300	39%	54,200	75,200
	Hwy 5 to Campbellville Rd	31,400	49,400	57%	34,900	54,900
	Campbellville Rd to Hwy 401	24,900	28,000	12%	27,700	31,100
407 ETR	QEW to Dundas St		57,900	94%		66,100
NGTA	Dundas St to Bronte Rd		61,700	58%		67,200
	Bronte Rd to Hwy 403		51,600	21%		56,100
GTA-West Study Area						
407 ETR GTAWest	Hwy 403 to Hwy 401		47,800	14%		51,400
	Hwy 401 to Hwy 410		85,600	30%		91,900
	Hwy 410 to Hwy 427		151,400	69%		160,400
	Hwy 427 to Hwy 400		162,000	33%		170,600
Hwy 400	Hwy 9 to King Road (Aurora Rd.)	89,100	195,200	119%	110,300	241,600
	King Road to Hwy 407 (Langstaff Rd.)	135,400	176,200	30%	164,200	213,700
	Hwy 407 to Hwy 401 (Finch Ave.)	194,500	216,000	11%	205,700	228,400
Hwy 401	Hwy 24 to Hwy 6	126,100	175,600	39%	140,100	195,100
	Hwy 6 to Hwy 25 (Milton WL)	104,400	168,500	61%	116,000	187,200
	Hwy 25 to Hwy 407 (Trafalgar Rd.)	129,300	212,200	64%	143,700	235,800
	Hwy 407 to Hwy 410 (Mavis Rd.)	167,500	227,100	36%	186,100	252,300
	Hwy 410 to Hwy 427 (Renforth Ave.)	351,200	379,000	8%	390,200	421,100
	Hwy 427 to Hwy 400	408,000	442,100	8%	431,500	467,600
Hwy 410	Hwy 401 to Hwy 407 (Courtney Park Dr.)	170,600	187,800	10%	180,400	198,600
	Hwy 407 to Hwy 7 (Clark Blvd.)	135,400	170,300	26%	164,200	206,500
	North of Hwy 7 (Williams Parkway)	111,000	115,100	4%	123,000	127,500
Hwy 427	Hwy 401 to Hwy 409 (Dixon Rd.)	186,300	200,200	7%	207,000	222,400
	Hwy 409 to Hwy 407 (Rexdale Blvd.)	123,400	186,300	51%	130,600	197,200
Hwy 403 Mississauga	Hwy 407 to Hurontario St	165,700	190,500	15%	175,200	201,400
	Hurontario St to Hwy 401 (Eglinton Ave.)	180,100	208,100	16%	190,500	220,100
Hwy 6	Hwy 401 to Guelph Limits	27,100	39,400	45%	28,700	41,700
	Guelph Limits to Hwy 7	39,200	50,600	29%	41,500	53,600
Hwy 7	Hwy 6 to Hwy 25 (Wellington Rd. 27)	7,600	15,800	108%	7,450	15,500
	Hwy 25 to WC Blvd (Trafalgar Rd.)	18,200	27,600	52%	20,200	30,600

Appendix B

Sample Stamson Output



ACOUSTICS



NOISE



VIBRATION

STAMSON 5.0 NORMAL REPORT Date: 17-08-2022 10:25:16
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: n.te Time Period: Day/Night 16/8 hours
 Description: **East Facade.**

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

 Car traffic volume : 22896/2544 veh/TimePeriod
 Medium truck volume : 525/58 veh/TimePeriod
 Heavy truck volume : 429/48 veh/TimePeriod
 Posted speed limit : 60 km/h
 Road gradient : 2 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Ninth (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 20.70 / 20.70 m
 Receiver height : 17.50 / 17.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Ninth (day)

 Source height = 1.16 m

ROAD (0.00 + 68.39 + 0.00) = 68.39 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	69.79	0.00	-1.40	0.00	0.00	0.00	0.00	68.39

Segment Leq : 68.39 dBA

Total Leq All Segments: 68.39 dBA

Results segment # 1: Ninth (night)

 Source height = 1.16 m

ROAD (0.00 + 61.87 + 0.00) = 61.87 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.27	0.00	-1.40	0.00	0.00	0.00	0.00	61.87

Segment Leq : 61.87 dBA

Total Leq All Segments: 61.87 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.39
 (NIGHT): 61.87



STAMSON 5.0 NORMAL REPORT Date: 17-08-2022 10:25:53
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: e.te Time Period: Day/Night 16/8 hours
 Description: **South Facade.**

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

 Car traffic volume : 22896/2544 veh/TimePeriod
 Medium truck volume : 525/58 veh/TimePeriod
 Heavy truck volume : 429/48 veh/TimePeriod
 Posted speed limit : 60 km/h
 Road gradient : 2 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Ninth (day/night)

 Angle1 Angle2 : 0.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 20.70 / 20.70 m
 Receiver height : 17.50 / 17.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 2: 407N (day/night)

 Car traffic volume : 19481/3438 veh/TimePeriod
 Medium truck volume : 1120/198 veh/TimePeriod
 Heavy truck volume : 1792/316 veh/TimePeriod
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: 407N (day/night)

 Angle1 Angle2 : -90.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 321.50 / 321.50 m
 Receiver height : 17.50 / 17.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 3: 407S (day/night)

 Car traffic volume : 19481/3438 veh/TimePeriod
 Medium truck volume : 1120/198 veh/TimePeriod
 Heavy truck volume : 1792/316 veh/TimePeriod
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: 407S (day/night)

 Angle1 Angle2 : -90.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 351.50 / 351.50 m
 Receiver height : 17.50 / 17.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Ninth (day)

 Source height = 1.16 m



ACOUSTICS



NOISE



VIBRATION

ROAD (0.00 + 65.38 + 0.00) = 65.38 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	69.79	0.00	-1.40	-3.01	0.00	0.00	0.00	65.38

Segment Leq : 65.38 dBA

Results segment # 2: 407N (day)

Source height = 1.68 m

ROAD (0.00 + 60.99 + 0.00) = 60.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	77.31	0.00	-13.31	-3.01	0.00	0.00	0.00	60.99

Segment Leq : 60.99 dBA

Results segment # 3: 407S (day)

Source height = 1.68 m

ROAD (0.00 + 60.60 + 0.00) = 60.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	77.31	0.00	-13.70	-3.01	0.00	0.00	0.00	60.60

Segment Leq : 60.60 dBA

Total Leq All Segments: 67.68 dBA

Results segment # 1: Ninth (night)

Source height = 1.16 m

ROAD (0.00 + 58.86 + 0.00) = 58.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	63.27	0.00	-1.40	-3.01	0.00	0.00	0.00	58.86

Segment Leq : 58.86 dBA

Results segment # 2: 407N (night)

Source height = 1.68 m

ROAD (0.00 + 56.47 + 0.00) = 56.47 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	72.79	0.00	-13.31	-3.01	0.00	0.00	0.00	56.47

Segment Leq : 56.47 dBA

Results segment # 3: 407S (night)

Source height = 1.68 m

ROAD (0.00 + 56.08 + 0.00) = 56.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	72.79	0.00	-13.31	-3.01	0.00	0.00	0.00	56.08



-90	0	0.00	72.79	0.00	-13.70	-3.01	0.00	0.00	0.00	56.08
-----	---	------	-------	------	--------	-------	------	------	------	-------

Segment Leq : 56.08 dBA

Total Leq All Segments: 62.09 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.68
(NIGHT): 62.09



STAMSON 5.0 NORMAL REPORT Date: 17-08-2022 10:26:51
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: s.te Time Period: Day/Night 16/8 hours
 Description: **West Facade.**

Road data, segment # 1: 407S (day/night)

 Car traffic volume : 19481/3438 veh/TimePeriod
 Medium truck volume : 1120/198 veh/TimePeriod
 Heavy truck volume : 1792/316 veh/TimePeriod
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: 407S (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 297.50 / 297.50 m
 Receiver height : 17.50 / 17.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 2: 407N (day/night)

 Car traffic volume : 19481/3438 veh/TimePeriod
 Medium truck volume : 1120/198 veh/TimePeriod
 Heavy truck volume : 1792/316 veh/TimePeriod
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: 407N (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 267.50 / 267.50 m
 Receiver height : 17.50 / 17.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: 407S (day)

 Source height = 1.68 m

ROAD (0.00 + 64.34 + 0.00) = 64.34 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	77.31	0.00	-12.97	0.00	0.00	0.00	0.00	64.34

Segment Leq : 64.34 dBA

Results segment # 2: 407N (day)

 Source height = 1.68 m

ROAD (0.00 + 64.80 + 0.00) = 64.80 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	77.31	0.00	-12.51	0.00	0.00	0.00	0.00	64.80



Segment Leq : 64.80 dBA

Total Leq All Segments: 67.59 dBA

Results segment # 1: 407S (night)

Source height = 1.68 m

ROAD (0.00 + 59.82 + 0.00) = 59.82 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	72.79	0.00	-12.97	0.00	0.00	0.00	0.00	59.82

Segment Leq : 59.82 dBA

Results segment # 2: 407N (night)

Source height = 1.68 m

ROAD (0.00 + 60.28 + 0.00) = 60.28 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	72.79	0.00	-12.51	0.00	0.00	0.00	0.00	60.28

Segment Leq : 60.28 dBA

Total Leq All Segments: 63.07 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.59
(NIGHT): 63.07



STAMSON 5.0 NORMAL REPORT Date: 17-08-2022 10:28:00
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: s_int.te Time Period: Day/Night 16/8 hours
 Description: **Interior West Facade.**

Road data, segment # 1: 407N (day/night)

 Car traffic volume : 19481/3438 veh/TimePeriod
 Medium truck volume : 1120/198 veh/TimePeriod
 Heavy truck volume : 1792/316 veh/TimePeriod
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: 407N (day/night)

 Angle1 Angle2 : -28.00 deg 16.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 301.50 / 301.50 m
 Receiver height : 17.50 / 17.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 2: 407S (day/night)

 Car traffic volume : 19481/3438 veh/TimePeriod
 Medium truck volume : 1120/198 veh/TimePeriod
 Heavy truck volume : 1792/316 veh/TimePeriod
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: 407S (day/night)

 Angle1 Angle2 : -28.00 deg 16.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 331.50 / 331.50 m
 Receiver height : 17.50 / 17.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 3: 407N.B.E (day/night)

 Car traffic volume : 19481/3438 veh/TimePeriod
 Medium truck volume : 1120/198 veh/TimePeriod
 Heavy truck volume : 1792/316 veh/TimePeriod
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: 407N.B.E (day/night)

 Angle1 Angle2 : -90.00 deg -28.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 301.50 / 301.50 m
 Receiver height : 17.50 / 17.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -90.00 deg Angle2 : -28.00 deg
 Barrier height : 19.00 m
 Barrier receiver distance : 20.00 / 20.00 m
 Source elevation : 0.00 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m



Reference angle : 0.00

Road data, segment # 4: 407S.B.E (day/night)

```
-----
Car traffic volume : 19481/3438 veh/TimePeriod
Medium truck volume : 1120/198 veh/TimePeriod
Heavy truck volume : 1792/316 veh/TimePeriod
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 4: 407S.B.E (day/night)

```
-----
Angle1 Angle2 : -90.00 deg -28.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 331.50 / 331.50 m
Receiver height : 17.50 / 17.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -28.00 deg
Barrier height : 19.00 m
Barrier receiver distance : 20.00 / 20.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00
```

Road data, segment # 5: 407N.B.W (day/night)

```
-----
Car traffic volume : 19481/3438 veh/TimePeriod
Medium truck volume : 1120/198 veh/TimePeriod
Heavy truck volume : 1792/316 veh/TimePeriod
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 5: 407N.B.W (day/night)

```
-----
Angle1 Angle2 : 16.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 301.50 / 301.50 m
Receiver height : 17.50 / 17.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 16.00 deg Angle2 : 90.00 deg
Barrier height : 19.00 m
Barrier receiver distance : 20.00 / 20.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00
```

Road data, segment # 6: 407S.B.W (day/night)

```
-----
Car traffic volume : 19481/3438 veh/TimePeriod
Medium truck volume : 1120/198 veh/TimePeriod
Heavy truck volume : 1792/316 veh/TimePeriod
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 6: 407S.B.W (day/night)

```
-----
Angle1 Angle2 : 16.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 331.50 / 331.50 m
Receiver height : 17.50 / 17.50 m
```



```

Topography          :      2      (Flat/gentle slope; with barrier)
Barrier angle1      :  16.00 deg  Angle2 : 90.00 deg
Barrier height       :  19.00 m
Barrier receiver distance : 20.00 / 20.00 m
Source elevation     :   0.00 m
Receiver elevation   :   0.00 m
Barrier elevation     :   0.00 m
Reference angle      :   0.00

```

Results segment # 1: 407N (day)

Source height = 1.68 m

```

ROAD (0.00 + 58.16 + 0.00) = 58.16 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-28      16   0.00  77.31   0.00 -13.03 -6.12   0.00   0.00   0.00  58.16
-----

```

Segment Leq : 58.16 dBA

Results segment # 2: 407S (day)

Source height = 1.68 m

```

ROAD (0.00 + 57.75 + 0.00) = 57.75 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-28      16   0.00  77.31   0.00 -13.44 -6.12   0.00   0.00   0.00  57.75
-----

```

Segment Leq : 57.75 dBA

Results segment # 3: 407N.B.E (day)

Source height = 1.68 m

Barrier height for grazing incidence

```

Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----
1.68 !      17.50 !      16.45 !      16.45
-----

```

```

ROAD (0.00 + 51.72 + 0.00) = 51.72 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-90     -28   0.00  77.31   0.00 -13.03 -4.63   0.00   0.00  -7.93  51.72
-----

```

Segment Leq : 51.72 dBA

Results segment # 4: 407S.B.E (day)

Source height = 1.68 m

Barrier height for grazing incidence

```

Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----
1.68 !      17.50 !      16.55 !      16.55
-----

```

```

ROAD (0.00 + 51.47 + 0.00) = 51.47 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-90     -28   0.00  77.31   0.00 -13.44 -4.63   0.00   0.00  -7.77  51.47
-----

```



Segment Leq : 51.47 dBA

Results segment # 5: 407N.B.W (day)

Source height = 1.68 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.68 !	17.50 !	16.45 !	16.45

ROAD (0.00 + 52.19 + 0.00) = 52.19 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
16	90	0.00	77.31	0.00	-13.03	-3.86	0.00	0.00	-8.23	52.19

Segment Leq : 52.19 dBA

Results segment # 6: 407S.B.W (day)

Source height = 1.68 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.68 !	17.50 !	16.55 !	16.55

ROAD (0.00 + 51.95 + 0.00) = 51.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
16	90	0.00	77.31	0.00	-13.44	-3.86	0.00	0.00	-8.06	51.95

Segment Leq : 51.95 dBA

Total Leq All Segments: 62.70 dBA

Results segment # 1: 407N (night)

Source height = 1.68 m

ROAD (0.00 + 53.64 + 0.00) = 53.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-28	16	0.00	72.79	0.00	-13.03	-6.12	0.00	0.00	0.00	53.64

Segment Leq : 53.64 dBA

Results segment # 2: 407S (night)

Source height = 1.68 m

ROAD (0.00 + 53.23 + 0.00) = 53.23 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-28	16	0.00	72.79	0.00	-13.44	-6.12	0.00	0.00	0.00	53.23

Segment Leq : 53.23 dBA



Results segment # 3: 407N.B.E (night)

Source height = 1.68 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.68	!	17.50	!
		16.45	!
			16.45

ROAD (0.00 + 47.20 + 0.00) = 47.20 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-28	0.00	72.79	0.00	-13.03	-4.63	0.00	0.00	-7.93	47.20

Segment Leq : 47.20 dBA

Results segment # 4: 407S.B.E (night)

Source height = 1.68 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.68	!	17.50	!
		16.55	!
			16.55

ROAD (0.00 + 46.95 + 0.00) = 46.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-28	0.00	72.79	0.00	-13.44	-4.63	0.00	0.00	-7.77	46.95

Segment Leq : 46.95 dBA

Results segment # 5: 407N.B.W (night)

Source height = 1.68 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.68	!	17.50	!
		16.45	!
			16.45

ROAD (0.00 + 47.67 + 0.00) = 47.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
16	90	0.00	72.79	0.00	-13.03	-3.86	0.00	0.00	-8.23	47.67

Segment Leq : 47.67 dBA

Results segment # 6: 407S.B.W (night)

Source height = 1.68 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.68	!	17.50	!
		16.55	!
			16.55



ROAD (0.00 + 47.43 + 0.00) = 47.43 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
16	90	0.00	72.79	0.00	-13.44	-3.86	0.00	0.00	-8.06	47.43

Segment Leq : 47.43 dBA

Total Leq All Segments: 58.18 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.70
(NIGHT): 58.18



ACOUSTICS



NOISE



VIBRATION

STAMSON 5.0 NORMAL REPORT Date: 17-08-2022 10:28:46
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: e_int.te Time Period: Day/Night 16/8 hours
 Description: **Interior North Facade.**

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

 Car traffic volume : 22896/2544 veh/TimePeriod
 Medium truck volume : 525/58 veh/TimePeriod
 Heavy truck volume : 429/48 veh/TimePeriod
 Posted speed limit : 60 km/h
 Road gradient : 2 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Ninth (day/night)

 Angle1 Angle2 : 0.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 74.70 / 74.70 m
 Receiver height : 17.50 / 17.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : 0.00 deg Angle2 : 90.00 deg
 Barrier height : 19.00 m
 Barrier receiver distance : 34.00 / 34.00 m
 Source elevation : 0.00 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m
 Reference angle : 0.00

Road data, segment # 2: 407N (day/night)

 Car traffic volume : 19481/3438 veh/TimePeriod
 Medium truck volume : 1120/198 veh/TimePeriod
 Heavy truck volume : 1792/316 veh/TimePeriod
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: 407N (day/night)

 Angle1 Angle2 : -90.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 267.50 / 267.50 m
 Receiver height : 17.50 / 17.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 3: 407S (day/night)

 Car traffic volume : 19481/3438 veh/TimePeriod
 Medium truck volume : 1120/198 veh/TimePeriod
 Heavy truck volume : 1792/316 veh/TimePeriod
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: 407S (day/night)

 Angle1 Angle2 : -90.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 297.50 / 297.50 m
 Receiver height : 17.50 / 17.50 m
 Topography : 1 (Flat/gentle slope; no barrier)



Reference angle : 0.00

Results segment # 1: Ninth (day)

Source height = 1.16 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.16 !	17.50 !	10.06 !	10.06

ROAD (0.00 + 43.97 + 0.00) = 43.97 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	69.79	0.00	-6.97	-3.01	0.00	0.00	-15.83	43.97

Segment Leq : 43.97 dBA

Results segment # 2: 407N (day)

Source height = 1.68 m

ROAD (0.00 + 61.79 + 0.00) = 61.79 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	77.31	0.00	-12.51	-3.01	0.00	0.00	0.00	61.79

Segment Leq : 61.79 dBA

Results segment # 3: 407S (day)

Source height = 1.68 m

ROAD (0.00 + 61.33 + 0.00) = 61.33 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	77.31	0.00	-12.97	-3.01	0.00	0.00	0.00	61.33

Segment Leq : 61.33 dBA

Total Leq All Segments: 64.61 dBA

Results segment # 1: Ninth (night)

Source height = 1.16 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.16 !	17.50 !	10.06 !	10.06

ROAD (0.00 + 37.45 + 0.00) = 37.45 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	63.27	0.00	-6.97	-3.01	0.00	0.00	-15.83	37.45

Segment Leq : 37.45 dBA



Results segment # 2: 407N (night)

Source height = 1.68 m

ROAD (0.00 + 57.27 + 0.00) = 57.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	72.79	0.00	-12.51	-3.01	0.00	0.00	0.00	57.27

Segment Leq : 57.27 dBA

Results segment # 3: 407S (night)

Source height = 1.68 m

ROAD (0.00 + 56.81 + 0.00) = 56.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	72.79	0.00	-12.97	-3.01	0.00	0.00	0.00	56.81

Segment Leq : 56.81 dBA

Total Leq All Segments: 60.08 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.61
(NIGHT): 60.08



STAMSON 5.0 NORMAL REPORT Date: 17-08-2022 10:30:26
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: olagr.te Time Period: 16 hours
 Description: **At Grade OLA.**

Road data, segment # 1: 407N

 Car traffic volume : 19481 veh/TimePeriod
 Medium truck volume : 1120 veh/TimePeriod
 Heavy truck volume : 1792 veh/TimePeriod
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: 407N

 Angle1 Angle2 : -53.00 deg 30.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 4
 House density : 70 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 345.00 m
 Receiver height : 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 2: 407S

 Car traffic volume : 19481 veh/TimePeriod
 Medium truck volume : 1120 veh/TimePeriod
 Heavy truck volume : 1792 veh/TimePeriod
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: 407S

 Angle1 Angle2 : -53.00 deg 30.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 4
 House density : 70 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 373.00 m
 Receiver height : 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: 407N

 Source height = 1.68 m

ROAD (0.00 + 51.87 + 0.00) = 51.87 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 -53 30 0.00 77.31 0.00 -13.62 -3.36 0.00 -8.47 0.00 51.87

Segment Leq : 51.87 dBA

Results segment # 2: 407S

 Source height = 1.68 m

ROAD (0.00 + 51.56 + 0.00) = 51.56 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 -53 30 0.00 77.31 0.00 -13.96 -3.36 0.00 -8.43 0.00 51.56



Segment Leq : 51.56 dBA

Total Leq All Segments: 54.73 dBA

TOTAL Leq FROM ALL SOURCES: 54.73



ACOUSTICS



NOISE



VIBRATION

STAMSON 5.0 NORMAL REPORT Date: 17-08-2022 10:33:08
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rfolar4.te Time Period: 16 hours
 Description: **Rooftop OLA.**

Road data, segment # 1: 407S.S

 Car traffic volume : 19481 veh/TimePeriod
 Medium truck volume : 1120 veh/TimePeriod
 Heavy truck volume : 1792 veh/TimePeriod
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: 407S.S

 Angle1 Angle2 : -74.00 deg -35.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 348.00 m
 Receiver height : 1.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -74.00 deg Angle2 : -35.00 deg
 Barrier height : 1.07 m
 Barrier receiver distance : 13.00 m
 Source elevation : 0.00 m
 Receiver elevation : 19.35 m
 Barrier elevation : 19.35 m
 Reference angle : 0.00

Road data, segment # 2: 407N.S

 Car traffic volume : 19481 veh/TimePeriod
 Medium truck volume : 1120 veh/TimePeriod
 Heavy truck volume : 1792 veh/TimePeriod
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: 407N.S

 Angle1 Angle2 : -74.00 deg -35.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 320.00 m
 Receiver height : 1.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -74.00 deg Angle2 : -35.00 deg
 Barrier height : 1.07 m
 Barrier receiver distance : 13.00 m
 Source elevation : 0.00 m
 Receiver elevation : 19.35 m
 Barrier elevation : 19.35 m
 Reference angle : 0.00

Road data, segment # 3: 407S.W

 Car traffic volume : 19481 veh/TimePeriod
 Medium truck volume : 1120 veh/TimePeriod
 Heavy truck volume : 1792 veh/TimePeriod
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: 407S.W

 Angle1 Angle2 : -35.00 deg 19.00 deg



```

Wood depth          :      0      (No woods.)
No of house rows    :      0
Surface             :      2      (Reflective ground surface)
Receiver source distance : 348.00 m
Receiver height     :      1.50 m
Topography          :      2      (Flat/gentle slope; with barrier)
Barrier angle1      : -35.00 deg  Angle2 : 19.00 deg
Barrier height      :      4.00 m
Barrier receiver distance : 11.00 m
Source elevation    :      0.00 m
Receiver elevation  :      19.35 m
Barrier elevation    :      19.35 m
Reference angle     :      0.00

```

Road data, segment # 4: 407N.W

```

-----
Car traffic volume  : 19481 veh/TimePeriod
Medium truck volume : 1120 veh/TimePeriod
Heavy truck volume  : 1792 veh/TimePeriod
Posted speed limit  : 100 km/h
Road gradient       :      0 %
Road pavement       :      1 (Typical asphalt or concrete)

```

Data for Segment # 4: 407N.W

```

-----
Angle1  Angle2      : -35.00 deg  19.00 deg
Wood depth          :      0      (No woods.)
No of house rows    :      0
Surface             :      2      (Reflective ground surface)
Receiver source distance : 320.00 m
Receiver height     :      1.50 m
Topography          :      2      (Flat/gentle slope; with barrier)
Barrier angle1      : -35.00 deg  Angle2 : 19.00 deg
Barrier height      :      4.00 m
Barrier receiver distance : 11.00 m
Source elevation    :      0.00 m
Receiver elevation  :      19.35 m
Barrier elevation    :      19.35 m
Reference angle     :      0.00

```

Road data, segment # 5: 407S.N

```

-----
Car traffic volume  : 19481 veh/TimePeriod
Medium truck volume : 1120 veh/TimePeriod
Heavy truck volume  : 1792 veh/TimePeriod
Posted speed limit  : 100 km/h
Road gradient       :      0 %
Road pavement       :      1 (Typical asphalt or concrete)

```

Data for Segment # 5: 407S.N

```

-----
Angle1  Angle2      : 19.00 deg  90.00 deg
Wood depth          :      0      (No woods.)
No of house rows    :      0
Surface             :      1      (Absorptive ground surface)
Receiver source distance : 348.00 m
Receiver height     :      1.50 m
Topography          :      2      (Flat/gentle slope; with barrier)
Barrier angle1      : 19.00 deg  Angle2 : 90.00 deg
Barrier height      :      1.07 m
Barrier receiver distance : 7.00 m
Source elevation    :      0.00 m
Receiver elevation  :      19.35 m
Barrier elevation    :      19.35 m
Reference angle     :      0.00

```

Road data, segment # 6: 407N.N

```

-----
Car traffic volume  : 19481 veh/TimePeriod
Medium truck volume : 1120 veh/TimePeriod
Heavy truck volume  : 1792 veh/TimePeriod

```



Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 6: 407N.N

```

-----
Angle1  Angle2      : 19.00 deg   90.00 deg
Wood depth      : 0             (No woods.)
No of house rows : 0
Surface         : 1             (Absorptive ground surface)
Receiver source distance : 320.00 m
Receiver height  : 1.50 m
Topography      : 2             (Flat/gentle slope; with barrier)
Barrier angle1   : 19.00 deg   Angle2 : 90.00 deg
Barrier height   : 1.07 m
Barrier receiver distance : 7.00 m
Source elevation : 0.00 m
Receiver elevation : 19.35 m
Barrier elevation : 19.35 m
Reference angle  : 0.00
  
```

Road data, segment # 7: 407S.MPH

```

-----
Car traffic volume : 19481 veh/TimePeriod
Medium truck volume : 1120 veh/TimePeriod
Heavy truck volume : 1792 veh/TimePeriod
Posted speed limit : 100 km/h
Road gradient      : 0 %
Road pavement      : 1 (Typical asphalt or concrete)
  
```

Data for Segment # 7: 407S.MPH

```

-----
Angle1  Angle2      : -90.00 deg  -74.00 deg
Wood depth      : 0             (No woods.)
No of house rows : 0
Surface         : 2             (Reflective ground surface)
Receiver source distance : 348.00 m
Receiver height  : 1.50 m
Topography      : 2             (Flat/gentle slope; with barrier)
Barrier angle1   : -90.00 deg  Angle2 : -74.00 deg
Barrier height   : 4.00 m
Barrier receiver distance : 6.00 m
Source elevation : 0.00 m
Receiver elevation : 19.35 m
Barrier elevation : 19.35 m
Reference angle  : 0.00
  
```

Road data, segment # 8: Ninth.E

```

-----
Car traffic volume : 22896 veh/TimePeriod
Medium truck volume : 525 veh/TimePeriod
Heavy truck volume : 429 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient      : 2 %
Road pavement      : 1 (Typical asphalt or concrete)
  
```

Data for Segment # 8: Ninth.E

```

-----
Angle1  Angle2      : -23.00 deg  50.00 deg
Wood depth      : 0             (No woods.)
No of house rows : 0
Surface         : 2             (Reflective ground surface)
Receiver source distance : 40.00 m
Receiver height  : 1.50 m
Topography      : 2             (Flat/gentle slope; with barrier)
Barrier angle1   : -23.00 deg  Angle2 : 50.00 deg
Barrier height   : 1.07 m
Barrier receiver distance : 11.00 m
Source elevation : 0.00 m
Receiver elevation : 19.35 m
Barrier elevation : 19.35 m
  
```



Reference angle : 0.00

Road data, segment # 9: Ninth.MPH

```
-----
Car traffic volume : 22896 veh/TimePeriod
Medium truck volume : 525 veh/TimePeriod
Heavy truck volume : 429 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 2 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 9: Ninth.MPH

```
-----
Angle1 Angle2 : 50.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 40.00 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 50.00 deg Angle2 : 90.00 deg
Barrier height : 4.00 m
Barrier receiver distance : 6.00 m
Source elevation : 0.00 m
Receiver elevation : 19.35 m
Barrier elevation : 19.35 m
Reference angle : 0.00
```

Road data, segment # 10: 407N.MPH

```
-----
Car traffic volume : 19481 veh/TimePeriod
Medium truck volume : 1120 veh/TimePeriod
Heavy truck volume : 1792 veh/TimePeriod
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 10: 407N.MPH

```
-----
Angle1 Angle2 : -90.00 deg -74.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 320.00 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -74.00 deg
Barrier height : 4.00 m
Barrier receiver distance : 6.00 m
Source elevation : 0.00 m
Receiver elevation : 19.35 m
Barrier elevation : 19.35 m
Reference angle : 0.00
```

Results segment # 1: 407S.S

Source height = 1.68 m

Barrier height for grazing incidence

```
-----
Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
1.68 ! 1.50 ! 0.78 ! 20.13
```

ROAD (0.00 + 51.92 + 0.00) = 51.92 dBA

```
-----
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
-74 -35 0.00 77.31 0.00 -13.65 -6.64 0.00 0.00 -5.10 51.92
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
```



Segment Leq : 51.92 dBA

Results segment # 2: 407N.S

Source height = 1.68 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.68 !	1.50 !	0.72 !	20.07

ROAD (0.00 + 52.24 + 0.00) = 52.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	-35	0.00	77.31	0.00	-13.29	-6.64	0.00	0.00	-5.14	52.24

Segment Leq : 52.24 dBA

Results segment # 3: 407S.W

Source height = 1.68 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.68 !	1.50 !	0.89 !	20.24

ROAD (0.00 + 44.43 + 0.00) = 44.43 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	19	0.00	77.31	0.00	-13.65	-5.23	0.00	0.00	-14.00	44.43

Segment Leq : 44.43 dBA

Results segment # 4: 407N.W

Source height = 1.68 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.68 !	1.50 !	0.84 !	20.19

ROAD (0.00 + 44.64 + 0.00) = 44.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	19	0.00	77.31	0.00	-13.29	-5.23	0.00	0.00	-14.15	44.64

Segment Leq : 44.64 dBA

Results segment # 5: 407S.N

Source height = 1.68 m

Barrier height for grazing incidence

Source	! Receiver	! Barrier	! Elevation of
--------	------------	-----------	----------------



Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
1.68	!	1.50	!	1.11	!	20.46

ROAD (0.00 + 48.77 + 0.00) = 48.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
19	90	0.59	77.31	0.00	-21.72	-5.80	0.00	0.00	-5.00	44.80*
19	90	0.65	77.31	0.00	-22.59	-5.95	0.00	0.00	0.00	48.77

* Bright Zone !

Segment Leq : 48.77 dBA

Results segment # 6: 407N.N

Source height = 1.68 m

Barrier height for grazing incidence

Source	!	Receiver	!	Barrier	!	Elevation of
Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
1.68	!	1.50	!	1.08	!	20.43

ROAD (0.00 + 49.37 + 0.00) = 49.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
19	90	0.59	77.31	0.00	-21.14	-5.80	0.00	0.00	-5.00	45.38*
19	90	0.65	77.31	0.00	-21.99	-5.95	0.00	0.00	0.00	49.37

* Bright Zone !

Segment Leq : 49.37 dBA

Results segment # 7: 407S.MPH

Source height = 1.68 m

Barrier height for grazing incidence

Source	!	Receiver	!	Barrier	!	Elevation of
Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
1.68	!	1.50	!	1.17	!	20.52

ROAD (0.00 + 45.13 + 0.00) = 45.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-74	0.00	77.31	0.00	-13.65	-10.51	0.00	0.00	-8.02	45.13

Segment Leq : 45.13 dBA

Results segment # 8: Ninth.E

Source height = 1.16 m

Barrier height for grazing incidence

Source	!	Receiver	!	Barrier	!	Elevation of
Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
1.16	!	1.50	!	-3.92	!	15.43

ROAD (0.00 + 43.53 + 0.00) = 43.53 dBA



Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-23	50	0.00	69.79	0.00	-4.26	-3.92	0.00	0.00	-18.08	43.53

Segment Leq : 43.53 dBA

Results segment # 9: Ninth.MPH

Source height = 1.16 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.16	1.50	-1.45	17.90

ROAD (0.00 + 44.86 + 0.00) = 44.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
50	90	0.00	69.79	0.00	-4.26	-6.53	0.00	0.00	-14.14	44.86

Segment Leq : 44.86 dBA

Results segment # 10: 407N.MPH

Source height = 1.68 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.68	1.50	1.14	20.49

ROAD (0.00 + 45.45 + 0.00) = 45.45 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-74	0.00	77.31	0.00	-13.29	-10.51	0.00	0.00	-8.06	45.45

Segment Leq : 45.45 dBA

Total Leq All Segments: 58.21 dBA

TOTAL Leq FROM ALL SOURCES: 58.21



Appendix C

Supporting Drawings



ACOUSTICS



NOISE



VIBRATION

PROPOSED RESIDENTIAL DEVELOPMENT

5160 - 5170 NINTH LINE, MISSISSAUGA, ON



02	2022-07-15	Rezoning Submission
01	2021-11-05	Rezoning Submission
No.:	Date:	Description:

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Architects:

Z01

Seal:	
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Client:

BRANT**HAVEN**

Project:
Proposed Residential
Development - 5160-5170
Ninth Line, Mississauga
Enter address

Drawing Title:

Cover Sheet

Scale:	Drawn by: J.C.
Checked by: B.C. & D.L.	Project No.: 21014
Date: 2022-08-03	Drawing No. A001

DRAWING LIST

Sheet Number	Sheet Name	Issue #1 for Reviewing (Nov. 05, 2021)	Issue #2 for Reviewing (Jul. 15, 2022)	Issue #3 (Add Dates)	Issue #4 (Add Dates)

10 CONCEPT DESIGN

Reviewing	AM01	AM02	AM03	AM04	AM05	AM06	AM07	AM08	AM09	AM10	AM11	AM12	AM13	AM14	AM15	AM16	AM17	AM18	AM19	AM20
AM01	Concept Sheet	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM02	Statistics & Drawing List	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM03	Site Context	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM04	Site Plan	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM05	P1 Floor Plan	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM06	Level 1 Floor Plan	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM07	Level 2 and 3 Floor Plan	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM08	Level 4 and 5 Floor Plan	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM09	Level 6 and MPD Floor Plan	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM10	Elevation	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM11	Context Elevation	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM12	Building Elevation	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM13	Shadow Study - Jan	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM14	Shadow Study - May	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM15	Shadow Study - Sep	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM16	Shadow Study - March / September	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM17	Shadow Study - March / September	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM18	Shadow Study - December	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM19	Perspective View	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM20	Render Perspective Views	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM21	Render Elevation	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
AM22	Render Elevation	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Drawing List **3**
NTS **A002**

15.0	MINIMUM LANDSCAPED AREA, LANDSCAPED BUFFER AND AMENITY AREA	
15.1	Minimum landscaped area	40% of the lot area
15.2	Minimum depth of a landscaped buffer abutting a lot line that is a street line and/or abutting lands with an Open Space, Greenlands and/or a Residential Zone with the exception of an Apartment Zone (B174-2017)	4.5 m ⁽⁵⁰⁾
15.3	Minimum depth of a landscaped buffer along any other lot line	3.0 m ⁽⁵⁰⁾
15.4	Minimum amenity area	The greater of 5.6 m ² per dwelling unit or 10% of the site area
15.5	Minimum percentage of total required amenity area to be provided in one contiguous area	50%
15.6	Minimum amenity area to be provided outside at grade	55.0 m ²

Landscape & Amenity Area **4**
NTS **A002**

Ontario Building Code - Site Plan Approval

Name of Project: Residential Development, 5160 - 5170 Ninth Line, Mississauga, ON, L5M 0B5

Location: 5160 - 5170 Ninth Line, Mississauga.

Item	Ontario's 2012 Building Code in effect Jan 1, 2014	OBC Reference
1	Project Information: <input type="checkbox"/> Change of Use <input type="checkbox"/> New <input type="checkbox"/> Addition <input type="checkbox"/> Alteration	11.1 to 11.4 11.2.1 (1) 11.2.1 (2) 11.2.1 (3) 11.2.1 (4) 11.2.1 (5) 11.2.1 (6) 11.2.1 (7) 11.2.1 (8) 11.2.1 (9) 11.2.1 (10) 11.2.1 (11) 11.2.1 (12) 11.2.1 (13) 11.2.1 (14) 11.2.1 (15) 11.2.1 (16) 11.2.1 (17) 11.2.1 (18) 11.2.1 (19) 11.2.1 (20) 11.2.1 (21) 11.2.1 (22) 11.2.1 (23) 11.2.1 (24) 11.2.1 (25) 11.2.1 (26) 11.2.1 (27) 11.2.1 (28) 11.2.1 (29) 11.2.1 (30) 11.2.1 (31) 11.2.1 (32) 11.2.1 (33) 11.2.1 (34) 11.2.1 (35) 11.2.1 (36) 11.2.1 (37) 11.2.1 (38) 11.2.1 (39) 11.2.1 (40) 11.2.1 (41) 11.2.1 (42) 11.2.1 (43) 11.2.1 (44) 11.2.1 (45) 11.2.1 (46) 11.2.1 (47) 11.2.1 (48) 11.2.1 (49) 11.2.1 (50) 11.2.1 (51) 11.2.1 (52) 11.2.1 (53) 11.2.1 (54) 11.2.1 (55) 11.2.1 (56) 11.2.1 (57) 11.2.1 (58) 11.2.1 (59) 11.2.1 (60) 11.2.1 (61) 11.2.1 (62) 11.2.1 (63) 11.2.1 (64) 11.2.1 (65) 11.2.1 (66) 11.2.1 (67) 11.2.1 (68) 11.2.1 (69) 11.2.1 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- FOR SURVEY INFORMATION, PLEASE REFER TO
JD BARNES DRAWINGS

- FOR SITE SERVICING AND GRADING
INFORMATION, PLEASE REFER TO URBANTECH
DRAWINGS

- FOR TRAFFIC SIGNAGE PLAN, TRUCK TURNING
PAT & OTHER TRAFFIC INFORMATION, PLEASE
REFER TO CROZIER DRAWINGS

-FOR LANDSCAPE INFORMATION AND DETAILS,
PLEASE REFER TO ADESSO DESIGN DRAWING

- SNOW WILL BE REMOVED FROM SITE

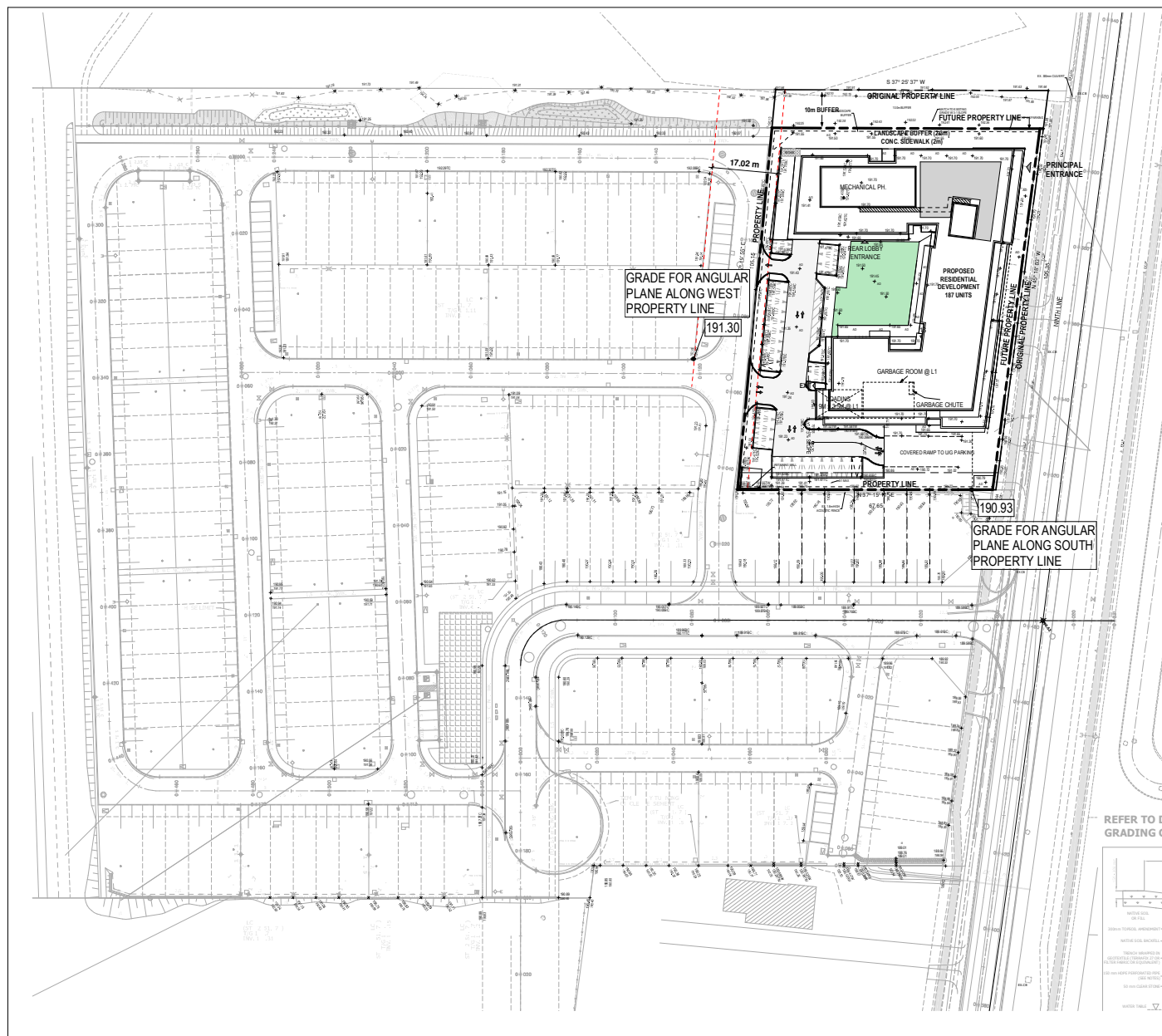
PLAN OF SURVEY OF
LOTS 5160 AND 5170
BLOCK 211 REGISTERED PLAN 43M-1664 &
BLOCK 210 (ROAD WIDENING) REGISTERED PLAN
43M-1664

RESIDENTIAL F.F.E. @ L1 = 191.70

NTS

2

A100



REFER TO D
GRADING C

Architects:

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INFRINGEMENT UNDER THE COPYRIGHT ACT.

07-15	Rezoning Submission
1-11-05	Rezoning Submission
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2-07-15	Rezoning Submission
1-11-05	Rezoning Submission
Re:	Description:

	Scale
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Client:

BRANT **HAVEN**

Project:
Proposed Residential
Development - 5160-5170
Ninth Line, Mississauga
Enter address

Drawing Title:

Site Context

Scale: 1 : 500	Drawn by: J.C.
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Checked by: B.C. & D.L.	Project No.: 21014
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Date:	Drawing
2022-08-03	A10

Site Context Plan
1 : 500

1 : 500

COFINI - 5160-5170 NINTH LINE, MISSISSAUGA, ON. L5M 0R5
PROJECT NUMBER 21014

NAME: BRANTHAVEN
ADDRESS: 720 OVAL COURT. BURLINGTON, ON. L7L 6A9
TEL: 905-333-8364
www.branthaven.com

NAME: ZO1
ADDRESS: 85 SCARSDALE RD. NORTH YORK, ON. M3B 2R2
TEL: 647-636-8771
www.zo1.ca

NAME: FBDEV CONSULTING INC.
ADDRESS
TEL:
www.website.com

NAME: KORSIAK URBAN PLANNING
ADDRESS: 277 LAKESHORE RD E #206, OAKVILLE, ON. L6J 1H9
TEL: 905-257-0227
www.korsiak.com

NAME: JD BARNES
ADDRESS: 140 RENFREW DR. Ste. 100. MARKHAM, ON. L3R 6B3
TEL: 905-477-3600
www.jdbarnes.com

NAME: URBAN TECH
ADDRESS: 3760 14TH AVENUE, Ste. 301, MARKHAM, ON. L3R 3T7
TEL: 905-946-9461
www.urbantech.com

NAME ADESSO DESIGN INC.
ADDRESS: 218 LOCKE ST. S, HAMILTON, ON. L8P 4B4
TEL: 905-526-8876
www.adessoDesigninc.ca

NAME: GRADIENT WIND ENGINEERING INC.
ADDRESS: 127 WALGREEN RD. CARR, ON. K0A 1L0
TEL: 613-836-0934
www.gradientwind.com

NAME: DS CONSULTANTS LTD.
ADDRESS: 6221 HWY 7 UNIT 16, WOODBRIDGE, ON. L4H 0K8
TEL: 905-264-9393
www.dsconsultants.ca

NAME: HGC ENGINEERING
ADDRESS: 2000 ARGENTIA RD 1, Ste. 203, MISSISSAUGA, ON.
L5N 1P7
TEL: 905-826-4044
www.acoustical-consultants.com

NAME: CROZIER CONSULTING ENGINEERS
ADDRESS: 211 YONGE ST. Ste. 301. TORONTO, ON. M5B 1M4
TEL: 416-477-3392
www.cfcrozier.ca

NAME: SAVANTA
ADDRESS: 75 TIVERTON COURT, UNIT 100. MARKHAM, ON. L3R 4M8
TEL: 1-800-810-3281
www.savanta.ca

NAME: JABLONSKY, AST AND PARTNERS
ADDRESS: 1131 LESLIE ST, TORONTO ON M3C 3L8
TEL: 416-447-7405
www.astint.on.ca

NAME: NEMETZ (S/A) & ASSOCIATES LTD.
ADDRESS: 214 KING ST W, TORONTO ON M5H 3S6
TEL: 647-253-2080
www.nemetz.com

Site Plan 1
1 : 250 A101

02	2022-07-15	Rezoning Submission
01	2021-11-05	Rezoning Submission
No.:	Date:	Description:

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Architects:

Z01



Seal:

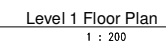
Client:

BRANTHAVEN

Project:
Proposed Residential
Development - 5160-5170
Ninth Line, Mississauga
Enter address

Site Plan

Scale: 1 : 250	Drawn by: J.C.
Checked by: B.C.	Project No.: 21014
Date: 2022-08-03	Drawing No. A101



2022-08-03



Level 3 Floor Plan
1 : 200



Level 2 Floor Plan
1 : 200

No.	Date	Description
01	2022-07-15	Revising Submission
02	2022-11-05	Revising Submission

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Architects:

ZO1

Scale:



Client:

BRANTHAVEN

Project:
Proposed Residential
Development - 5160-5170
Ninth Line, Mississauga

Enter address
Drawing Title:
Level 2 and 3 Floor Plan

Scale: 1 : 200	Drawn by: J.C.
Checked by: B.C. & D.L.	Project No.: 21014
Date: 2022-08-03	Drawing No.: A202



No.	Date	Description
01	2021-11-05	Reasoning Submission
02	2022-07-15	Reasoning Submission

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Architects:

ZOI

Seal:



Client:

BRANTHAVEN

Project:
Proposed Residential
Development - 5160-5170
Ninth Line, Mississauga

Enter address

Drawing Title:

Level 4 and 5 Floor Plan

Scale: 1 : 200

Checked by: B.C. & D.L.

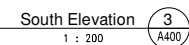
Date: 2022-08-03

Project No.: 21014

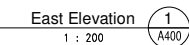
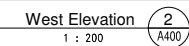
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Checked by: B.C. & D.L.	Project No.: 21014
Date: 2022-08-03	Drawing No.: A20.



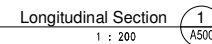
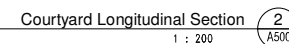
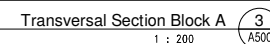
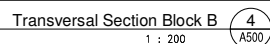
Exterior Finish Legend



Client:

BRANTHAVEN

2022-08-03	A400
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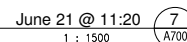
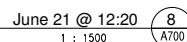
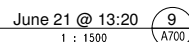
Client: _____

NE

Checked by:	Project No.:
B.C. & D.I.	21014

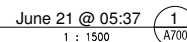
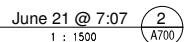
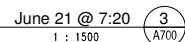
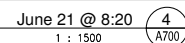
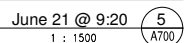
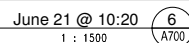
B.C. & D.L.	21014
Date:	Drawing No

2022-08-03	A500
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Shadow Study on June 21
Sun Shadow Timing: June 21
 from 1.5 hours after sunrise to 1.5 hours before sunset.

LOCAL TIME EDT	COMMENTS
05:37	Rise
07:07	Rise +1.5 hours
07:20	SN -6 hours
08:20	SN -5 hours
09:20	SN -4 hours
10:20	SN -3 hours
11:20	SN -2 hours
12:20	SN -1 hour
13:20	Solar Noon (SN)
14:20	SN +1 hour
15:20	SN +2 hours
16:20	SN +3 hours
17:20	SN +4 hours
18:20	SN +5 hours
19:20	SN +6 hours
19:33	Set -1.5 hours
21:03	Set



02	2022-07-15	Rezoning Submission
01	2021-11-05	Rezoning Submission
No.:	Date:	Description:

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Architects:

ZO

	Scale
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Client:

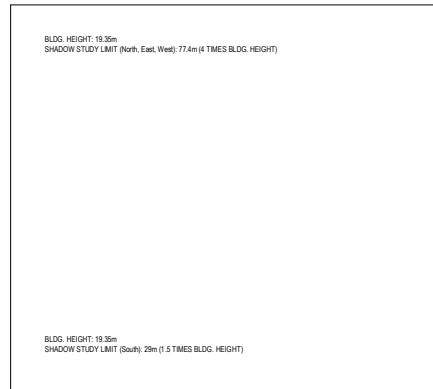
BRANTHAVEN

Project:
Proposed Residential
Development - 5160-5170
Ninth Line, Mississauga
Enter address

Drawing Title:

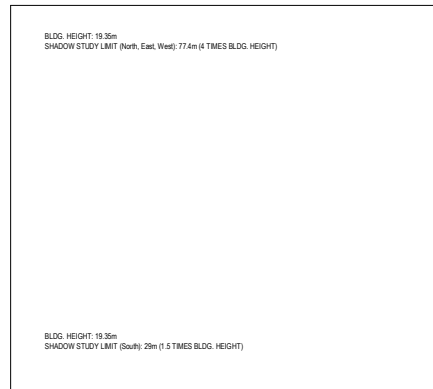
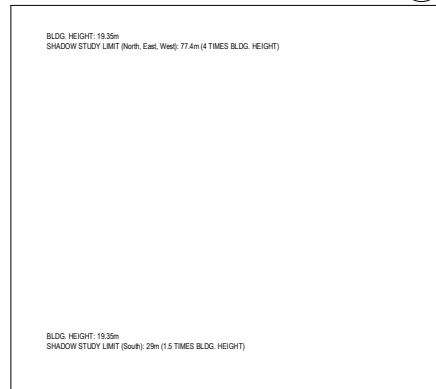
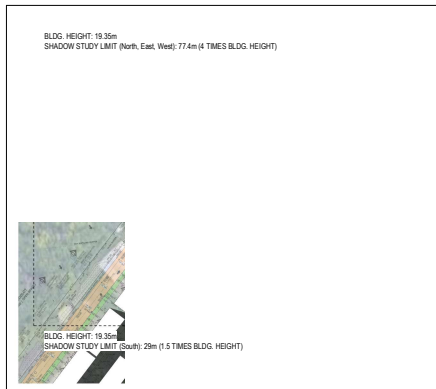
Shadow Study - June

Scale: 1 : 1500	Drawn by: L.B.
Checked by: B.C. & D.L.	Project No.: 21014
Date: 2022-08-03	Drawing No. A700



June 21 @ 21:03 6
1 : 1500 A701

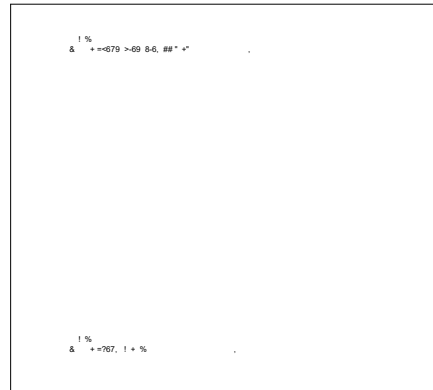
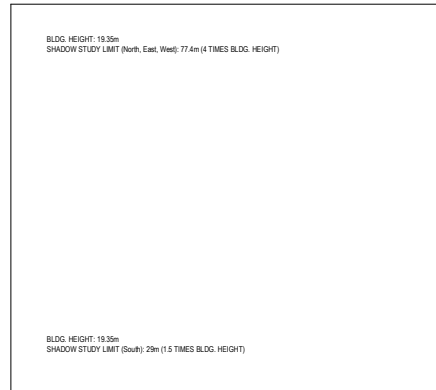
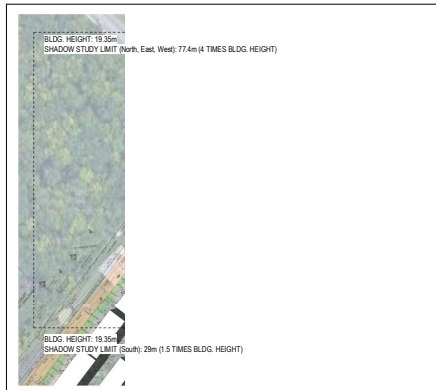
June 21 @ 19:33 8
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June 21 @ 19:20 5
1 : 1500 A701

June 21 @ 18:20 4
1 : 1500 A701

June 21 @ 17:20 7
1 : 1500 A701



June 21 @ 16:20 3
1 : 1500 A701

June 21 @ 15:20 2
1 : 1500 A701

June 21 @ 14:20 1
1 : 1500 A701

SUN ANGLES:

Sun Angles are based on the latitude and longitude of Mississauga, Ontario, Canada as defined in the software.

Latitude: 43°35' 20"N
Longitude: 79°38' 40"W

Time Zone: Eastern Standard Time (EST)
Standard Time: UT -5 hours
Daylight Time: UT -4 hours

UT denotes Universal Time (i.e. Greenwich Mean Time)

Software Used:
Autodesk Revit 2021

Shadow Study on June 21
Sun Shadow Timing: June 21
 from 1.5 hours after sunrise to 1.5 hours before sunset.

LOCAL TIME EDT:

05:37
07:07
07:20
08:20
09:20
10:20
11:20
12:20
13:20
14:20
15:20
16:20
17:20
18:20
19:20
19:33
21:03

COMMENTS:

Rise
Rise +1.5 hours
SN -6 hours
SN -5 hours
SN -4 hours
SN -3 hours
SN -2 hours
SN -1 hour
Solar Noon (SN)
SN +1 hour
SN +2 hours
SN +3 hours
SN +4 hours
SN +5 hours
SN +6 hours
Set -1.5 hours
Set

02	2022-07-15	Rezoning Submission
01	2021-11-05	Rezoning Submission
No.:	Date:	Description:

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Architects:

Z01

Seal:

Client:

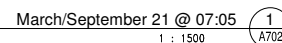
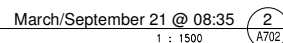
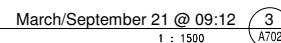
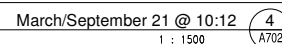
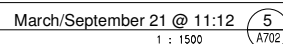
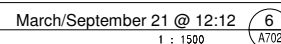
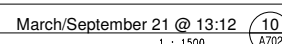
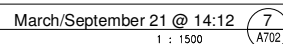
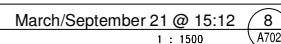
DRAIN | PAVEN

Project:
Proposed Residential
Development - 5160-5170
Ninth Line, Mississauga
Enter address

Drawing Title:

Shadow Study - June

Scale: 1 : 1500	Drawn by: L.B.
Checked by: B.C. & D.L.	Project No.: 21014
Date: 2022-08-03	Drawing No.: A701



Print Date: 2022-08-03 12:57:30 PM

Sun Angles are based on the latitude and longitude of Mississauga, Ontario, Canada as defined in the software.

Latitude: 43°35' 20"N
Longitude: 79°38' 40"W

Time Zone: Eastern Standard Time (EST)
Standard Time: UT -5 hours
Daylight Time: UT -4 hours

UT denotes Universal Time (i.e. Greenwich Mean Time)

Software Used:
Autodesk Revit 2021

Shadow Study on **September 21**
Sun Shadow Timing: September 21
 from 1.5 hours after sunrise to 1.5 hours before sunset.

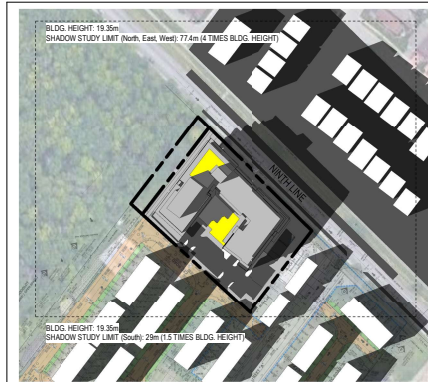
LOCAL TIME EDT:	COMMENTS:
07:05	Rise
08:35	Rise +1.5 hours
09:12	SN -4 hours
10:12	SN -3 hours
11:12	SN -2 hours
12:12	SN -1 hour
13:12	Solar Noon (SN)
14:12	SN +1 hour
15:12	SN +2 hours
16:12	SN +3 hours
17:12	SN +4 hours
17:48	Set -1.5 hours
19:18	Set



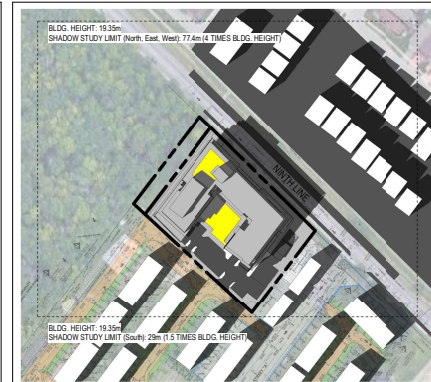
March/September 21 @ 19:18 2
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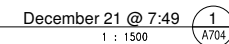
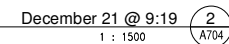
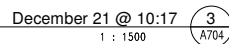
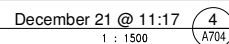
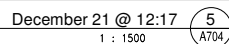
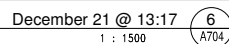
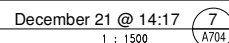
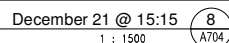
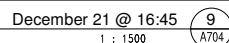
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March/September 21 @ 17:12 4
1 : 1500 A703



March/September 21 @ 16:12 3
1 : 1500 A703



Print Date: 2022-08-03 12:57:51 PM



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Architects:

Z01

Seal:

Client:

BRANT**HAVEN**

Project:
Proposed Residential
Development - 5160-5170
Ninth Line, Mississauga
Enter address

Drawing Title:

Perspective Views

Scale:	Drawn by:
	J.C.

Checked by:	Project No.:
B.C. & D.L.	21014

Date:	Drawing No.
2022-08-03	A800



North Elevation 2
NTS A901



East Elevation 1
NTS A901

02	2022-07-15	Rezoning Submission
01	2021-11-05	Rezoning Submission
No.:	Date:	Description:

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Architects:

Z01

Seal:

Client:

BRANT**HAVEN**

Project:
Proposed Residential
Development - 5160-5170
Ninth Line, Mississauga
Enter address

Drawing Title:

Render Elevations

Scale:	Drawn by:
Checked by: B.C. & D.L.	J.C. Project No.: 21014
Date: 2022-08-03	Drawing No. A901

Appendix D

Response to City of Mississauga Comments



ACOUSTICS



NOISE



VIBRATION

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Comments were received from the Urban Design Reviewer concerning our Report entitled “Noise Feasibility Study Proposed Residential Building, 5160-5170 Ninth Line, Mississauga, Ontario”, dated December 15, 2021. Our responses are provided below which includes the comments.

Noise Study Comments

Urban Design Reviewer

Comment #68

NOISE A Noise Feasibility Study Proposed Residential Development 5160 Ninth Line completed by HGC Engineering dated December 15 was received with this application and the following comments are provided:

(a) There is concern over the recommended acoustic wall for the at grade outdoor amenity area. The impacts of the recommended 2.8 m high acoustic barrier on the site design and quality of amenity space is of concern. The outdoor amenity space should be redesigned, relocated or the mass of the building should be changed to improve the acoustics to reduce the required noise mitigation.

As discussed in the revised report, there are development plans for the area west of the subject site, intervening between the subject site and the Highway 407 noise source. The client has confirmed that the adjacent development to the west will be completed prior to the subject development. Calculations have been updated to include the townhouse blocks to the west for the at-grade amenity space. These calculations showed that if the intervening buildings are included in the calculations, there are no noise barrier requirements.

(b) During the next submission a comprehensive design must be provided for the acoustic wall. The impacts on the site design, setbacks and layout must be demonstrated on the site concept plan, landscape plans, and grading plan in the next submission with technical details provided.

Noted. Based on the revised calculations, there are no noise barrier requirements for the at-grade amenity space.

(c) The warning clauses contained within Section 5.4 of the must be included in Schedule C of the development agreement as well as agreements of purchase and sale prior to final approval

Noted.

(d) All changes to the concept plan must be considered in subsequent submissions.

Noted.



ACOUSTICS



NOISE



VIBRATION

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(e) A detailed noise study and certification study will be required during the subsequent SPA and post construction.

Noted.

(f) Mississauga's Standard Noise Warning Clauses must be provided in the development agreement and agreements of purchase sale / lease.

Noted.

Please contact the Urban Designer for these clauses prior to final approval.

Comment #76

NOISE FEASIBILITY STUDY – A Noise Feasibility Study prepared by HGC Engineering dated December 2021 has been received and the following comments have been provided:

a.)The submitted Noise Feasibility Study has indicated a 4.2m acoustic barrier is required for the proposed rooftop amenity area to reduce noise levels to 60 dBA, which is not desirable. Based on the anticipated noise levels within the rooftop amenity area, the applicant is to investigate revisions to the site layout and building massing to provide more grade related outdoor amenity area to more feasibly mitigate sound levels and achieve a more desirable sound level of 55 dBA.

The Rooftop amenity area was relocated to the northeast portion of the building. The updated predictions presented in the revised report indicates the sound level in the rooftop OLA is now 58 dBA with the inclusion of a standard 1.07 m high solid parapet in the southwest corner and no specific barrier requirements for the remaining perimeter. In order to further reduce the sound level to 55 dBA, a 3.0 m high barrier to the southwest and a 1.2 m high barrier to the north would be required. Details can be found in the updated noise study report and as shown on Figure 3.

b.)The submitted Noise Feasibility Study has indicated a 2.8m acoustic barrier is required for the proposed grade related Amenity Area, which has not been illustrated in Figure 4. The Noise Feasibility Study is to be revised to include this information and investigate alternative measures to reduce the height of the acoustic barrier for the grade related Outdoor Amenity Area to not impact the programming potential for the space.

There are development plans for the area west of the subject site, intervening between the subject site and the Highway 407 noise source. The client has confirmed that the adjacent development to the west will be completed prior to the subject development. Calculations have been updated to include the townhouse blocks to the west for the at-grade amenity space. These calculations



ACOUSTICS



NOISE



VIBRATION

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showed that if the intervening buildings are included in the calculations, there are no noise barrier requirements.

c.)The submitted Noise Feasibility Study is to include a chart within Section 5.1 Outdoor Living Areas indicating the required acoustic barrier height to achieve the following: 55 dBA, 56 dBA, 57dBA, 58 dBA, 59 dBA, and 60 dBA for all proposed Outdoor Living Areas. Please note 55 dBA should be achieved within all proposed Outdoor Living Areas wherever feasible.

Revise the submitted Noise Feasibility and Concept Plan accordingly with the next formal submission.

Noted. A table of barrier heights has been provided in the revised report.



ACOUSTICS



NOISE



VIBRATION

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