Marriot Hotel Bolton

Environmental Noise Study
Bolton, ON

SLR Project No: 241.20139.00000
September 2020

ENVIRONMENTAL NOISE ASSESSMENT
Marriot Hotel Bolton
Bolton, Ontario
SLR Project No: 241.20139.00000

Submitted by:
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Prepared for:
Antrix Architects Inc.
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Mississauga, Ontario, L4W 3X1

September 11, 2020

This document has been prepared by SLR Canada. The material and data in this report were prepared under the supervision and direction of the undersigned.

Prepared by:

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1. INTRODUCTION

SLR Consulting (Canada) Ltd., now including Novus Environmental Inc. (SLR-Novus), was retained by Antrix Architects Inc. to conduct an Environmental Noise Assessment for the proposed Marriott Hotel located at 12476 Highway 50 in Bolton, Town of Caledon, Ontario..

1.1 FOCUS OF REPORT

In keeping with Town of Caledon and Region of Peel requirements, this report examines the potential for:

- Impacts of the environment on the proposed development;
- Impacts of the proposed development on the environment; and
- Impacts of the proposed development on itself.

1.2 NATURE OF THE SUBJECT LANDS

The proposed development is a 5-storey hotel, located on the north-west corner of Highway 50 and George Bolton Parkway in Caledon, Ontario.

Guest Rooms will be located in floors 1 through 5 facing east and west. Surface parking will be included in the development. The development does not include any private outdoor amenity spaces or individual terraces.

The site plan and architectural drawings of the proposed development are provided in Appendix A.

1.3 NATURE OF THE SURROUNDINGS

The surrounding lands primarily include commercial/retail/industrial facilities. The immediate lands to the north, east and south are primarily commercial/retail uses, including several car dealerships and auto repair shops. Industrial/commercial lands are located to the west of the development site. A church is located on the opposite side of Highway 50, approximately 150 m east from the proposed building. Further to the east, at approximately 300 m, is a residential area with townhouse blocks.

Transportation noise sources with the potential to impact the development include Highway 50 and George Bolton Parkway. The closest railway is located approximately 800 m from the development site and the development is located outside of the Pearson and Brampton Flying Club NEF 25 noise contours.

Noise sources with a potential to impact the proposed development includes roadway noise and surrounding commercial/industrial lands.

The surrounding topography is mainly flat with no significant variations.

A context plan can be found in Figure 1.

PART 1: IMPACTS OF THE ENVIRONMENT ON THE DEVELOPMENT

In assessing potential impacts of the environment on the proposed development, the focus of this report is to assess the potential for:

- Transportation noise impacts from surrounding roadways; and
- Stationary noise impacts from the surrounding commercial buildings/industries on the development.

2. TRANSPORTATION NOISE IMPACTS

2.1 TRANSPORTATION NOISE SOURCES

Transportation noise sources of interest with the potential to produce roadway noise at the proposed development include:

- Highway 50; and
- George Bolton Parkway.

Sound exposure levels at the proposed development have been predicted, and this information has been used to identify façade, ventilation, and warning clause requirements.

2.2 SURFACE TRANSPORTATION NOISE CRITERIA

2.2.1 MECP PUBLICATION NPC-300

Noise Sensitive Developments

Ministry of the Environment, Conservation and Parks (MECP) Publication NPC-300 provides sound level criteria for noise sensitive developments. The applicable portions of NPC-300 are Part C – Land Use Planning and the associated definitions outlined in Part A – Background. Tables 1 to 4 below summarizes the applicable surface transportation (road and rail) criteria limits.

Location Specific Criteria

Table 1 summarizes criteria in terms of energy equivalent sound exposure (L_{eq}) levels for specific noise-sensitive locations. Both outdoor and indoor locations are identified, with the focus of outdoor areas being amenity spaces. Indoor criteria vary with sensitivity of the space. As a result, sleep areas have more stringent criteria than Living / Dining room space.

Outdoor Amenity Areas

Table 2 summarizes the noise mitigation requirements for communal outdoor amenity areas ("Outdoor Living Areas" or "OLAs").

For the assessment of outdoor sound levels, the surface transportation noise impact is determined by combining road and rail traffic sound levels. Whistle noise due to railway trains is not included in the determination of levels.

Table 1: MECP Publication NPC-300 Sound Level Criteria for Road and Rail Noise

Type of Space	Time Period	Equivalent Sound Exposure Level - L_{eq} (dBA)		Assessment Location
		Road	Rail [1]	
Outdoor Living Area (OLA)	Daytime (0700-2300h)	55	55	Outdoors [2]
Sleeping Quarters of Hotels/Motels	Night-time (2300-0700h)	45	40	Indoors [3]

Notes: [1] Whistle noise is excluded for OLA noise assessments, and included for Living / Dining Room and Sleeping Quarter assessments.
[2] Road and Rail noise impacts are to be combined for assessment of OLA impacts.
[3] An assessment of indoor noise levels is required only if the criteria in **Table 4** are exceeded.

Table 2: MECP Publication NPC-300 Outdoor Living Area Mitigation Requirements

Time Period	Equivalent Sound Level in Outdoor Living Area (dBA)	Ventilation Requirements
Daytime (0700-2300h)	≤ 55	• None
	55 to 60 incl.	• Noise barrier **OR** Warning Clause A
	> 60	• Noise barrier to reduce noise to 55 dBA **OR** • Noise barrier to reduce noise to 60 dBA and Warning Clause B

Ventilation and Warning Clauses

Table 3 summarizes requirements for ventilation where windows potentially would have to remain closed as a means of noise control. Despite implementation of ventilation measures where required, if sound exposure levels exceed the guideline limits in Tables 1, warning clauses advising future occupants of the potential excesses are required. Warning clauses also apply to OLAs.

Table 3: MECP Publication NPC-300 Ventilation & Warning Clause Requirements

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - L_{eq} (dBA)		Ventilation and Warning Claus Requirements [2]
		Road	Rail [1]	
Outdoor Living Area	Daytime (0700-2300h)	56 to 60 incl.		Type A Warning Clause
Plane of Window	Daytime (0700-2300h)	≤ 55		None
		56 to 65 incl.		Forced Air Heating /provision to add air conditioning + Type C Warning Clause
		> 65		Central Air Conditioning + Type D Warning Clause
	Night-time (2300-0700h)	51 to 60 incl.		Forced Air Heating/ provision to add air conditioning + Type C Warning Clause
		> 60		Central Air Conditioning + Type D Warning Clause

Notes: [1] Rail whistle noise is excluded.
[2] Road and Rail noise is combined for determining Ventilation and Warning Clause requirements.

Building Shell Requirements

Table 4 provides sound level thresholds which if exceeded, require the building shell and components (i.e., wall, windows) to be designed and selected accordingly to ensure that the Table 3 and 4 indoor sound criteria are met.

Table 4: MECP Publication NPC-300 Building Component Requirements

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - L_{eq} (dBA)		Component Requirements
		Road	Rail [1]	
Plane of Window	Daytime (0700-2300h)	> 65	> 60	Designed/ Selected to Meet Indoor Requirements [2]
	Night-time (2300-0700h)	> 60	> 55	

Notes: [1] Including whistle noise.
[2] Building component requirements are assessed separately for Road and Railway noise. The resultant sound isolation parameter is required to be combined to determine and overall acoustic parameter.

2.2.2 REGION OF PEEL

The Region of Peel guidelines include the General Guidelines for the Preparation of Acoustical Reports in the Region of Peel, dated November 2012 (ROP Guidelines). In general, the Region of Peel guidelines are consistent with the MECP NPC-300 guidelines. Therefore, the guidelines have not been re-iterated again.

2.2.3 MARRIOT HOTEL BRAND STANDARD

Marriot Hotels guideline for acoustic control specifies a limit of 45 dBA for daytime and 40 dBA for nighttime in guestroom areas, based on hourly equivalent levels (L_{eq-1h}).

2.3 TRAFFIC DATA AND FUTURE PROJECTIONS

2.3.1 ROADWAY TRAFFIC DATA

Road traffic volumes for Highway 50 based on ultimate lane configuration were provided by Region of Peel transportation department , including AADT; day/night split; and commercial breakdown.

Traffic data for George Bolton Pkwy was sourced from a Traffic Impact Study performed by Crozier Consulting Engineer. Traffic data was grown using a 2.0% annual growth rate and projected to a 2041 future year, which is understood to be the typical mature-state-of-development for various municipalities.

Copies of all traffic data used can be found in Appendix B. The following table summarizes the road traffic volumes used in the analysis.

Table 5: Summary of Ultimate Road Traffic Data Used in the Transportation Analysis

Roadway Link	Future Traffic Volumes (AADT)	%Day/Night Volume Split		Commercial Traffic Breakdown		Modelled Speed (km/h)
		Daytime	Nighttime	% Med Trucks	% Hvy Trucks	
Highway 50	32,400	88[1]	12[1]	1.05/5.30[2]	0.94/6.96[2]	60
George Bolton Parkway	6,096	90[3]	10	0[4]	6.3[4]	50

Notes: [1] Day/Night spilt provided by Region of Peel
[2] Commercial traffic breakdown provided by Region of Peel
[3] Based on 2017 traffic data from Traffic Impact Study, with a 2.0% annual growth rate applied.
[4] Commercial traffic breakdown is based on the turning movement counts from Traffic Impact Study.

2.4 PROJECTED SOUND LEVELS

2.4.1 ROADWAY NOISE MODELLING

Future road traffic sound levels at the proposed development were predicted using Cadna/A, a commercially available noise propagation modelling software. Roadways were modelled as line sources of sound, with sound emission rates calculated using ORNAMENT algorithms, the road traffic noise model of the MECP. These predictions are equivalent to those made using the MECP's ORNAMENT, RT/Custom or STAMSON v5.04 road traffic noise models. Validation files are included in Appendix C.

Sound levels were predicted along the facades of the proposed development using the "building evaluation" feature of Cadna/A. This feature allows for noise levels to be predicted across the entire façade of a structure. Facades considered to be non-noise sensitive (e.g. mechanical penthouses, blank, etc.) were excluded from the analysis.

Predicted worst-case façade sound levels are presented in Table 6. The roadway façade sound levels are shown in Figure 2 and Figure 3, during the daytime and night-time periods, respectively.

Table 6: Summary of Transportation Facade Sound Levels

Building Section	Façade [1]	Roadway Sound Levels [2]	
		L_{eq} Day (L_{eq-16h}, dBA)	L_{eq} Night (L_{eq-8h}, dBA)
Guest Rooms – Floors 1st to 4th	East	64	59
	West	58	51

Notes: [1] Façade locations are shown in **Figure 2 and Figure 3**
[2] The sound levels presented are for the worst-case exposed façade, in which totals may not correspond to the same location.

2.4.2 OUTDOOR AMENITY AREAS

No outdoor amenity areas are included with the development. Therefore, a detailed assessment was not completed.

2.5 FAÇADE RECOMMENDATIONS

2.5.1 GLAZING REQUIREMENTS

MECP NPC-300

As the predicted roadway noise levels are at or below 65 dBA during the daytime and 60 dBA during the night-time, construction meeting the minimum Ontario Building Code (OBC) is considered sufficient. Upgraded glazing is not required for the development to meet the MECP guideline requirements.

Marriott Brand Standards

An assessment of glazing requirements was performed to confirm the indoor levels are in compliance with the Marriot Brand Standards specified in Section 2.2.3.

Indoor sound levels and required façade Sound Transmission Classes (STCs) were estimated using the procedures outlined in National Research Council Building Practice Note BPN-56 and the daytime (L_{eq-16h}) and night-time (L_{eq-8h}) sound levels predicted above.

Façade calculations are provided in Appendix C. Detailed floor and façade plans were applied in this assessment (refer to Appendix A). A wall rating of STC 45 was assumed for all locations in the development, as a conservatively approximation of the non-glazing component.

A worst-case window with an STC 21 rating is required to meet the MECP daytime/night-time (L_{eq-16h}/L_{eq-8h}) guideline requirements. Based on a review of SLR historical hourly traffic data, the worst-case hour for daytime and night-time periods are expected to have approximately a 2 dBA higher noise level than the daytime/nighttime overall averages. As the BPN-56 adjustments for determining STC requirements are based on dBA values, an OBC window (STC29) is considered sufficient for meeting the Marriott Brand Standard 1-hour (L_{eq-1h}) requirements. Therefore, upgraded glazing is not required for the development to meet the Marriott Brand Standard requirements.

Façade Calculations are provided in Appendix D.

2.6 VENTILATION AND WARNING CLAUSE REQUIREMENTS

The requirements regarding warning clauses are summarized in Table 3. Where required, the Warning Clauses should be included in agreements registered on Title for the residential units, and included in all agreements of purchase and sale or lease, and all rental agreements.

Based on the predicted façade noise levels, forced air heating with provisions for future installation of central air-conditioning, and a Type C warning are required for all the guestroom units in the proposed development.

As the hotel is expected to include Air Conditioning for all guest suites, this requirement is considered to be met.

3. STATIONARY SOURCE NOISE IMPACTS

A review has been conducted for the potential impacts on the proposed development from “stationary” industrial and commercial noise sources. Several facilities within the surrounding area include potentially significant noise sources, such as paint booths, dust collector, and rooftop cooling equipment. The immediate surrounding land uses were identified to be primarily commercial/retail lands and/or storage yards.

A site visit was completed on July 9, 2020 by SLR-Novus personnel to review the surrounding stationary noise sources. The acoustic environment is dominated by roadway noise along Highway 50. No significant stationary noise was clearly audible within the development site and in the surrounding area.

The proposed development is understood to incorporate sealed windows for all noise sensitive spaces (i.e., bedroom suites and conference rooms). This is an acceptable noise control measure for noise sensitive commercial uses under Publication NPC-300 noise guidelines. As no significant stationary noise was observed by SLR-Novus personnel at the development site, windows meeting minimum OBC requirements will be adequate to ensure an acceptable indoor acoustical environment. No additional noise mitigation is required for the proposed development or surrounding industries/commercial properties.

PART 2: IMPACTS OF THE DEVELOPMENT ON THE SURROUNDING AREA

4. IMPACTS ON SURROUNDING PROPERTIES

In terms of the noise environment of the area, it is expected that the project will have a negligible effect on the neighbouring properties.

The traffic related to the proposed development will be small relative to the existing traffic volumes within the area and is not of concern with respect to noise impact.

Other possible development noise sources with possible adverse impacts on the surrounding neighbourhood are the potential mechanical equipment (e.g. make up air units, pool mechanical equipment, and PTAC units). This equipment is required to meet MECP Publication NPC-300 requirements at the worst-case off-site noise sensitive receptors.

Off-site impacts are not anticipated given the high ambient sound levels in the area, the anticipated equipment at the hotel, and the separation distances to the closest receptors (approx.. 150 m).

Regardless, potential impacts should be assessed as part of the final building design to ensure compliance.

PART 3: IMPACTS OF THE DEVELOPMENT ON ITSELF

5. NOISE IMPACTS FROM THE DEVELOPMENT MECHANICAL SYSTEMS ON ITSELF

The building mechanical systems (e.g., make up air units, pool mechanical equipment, and PTAC units) have not been sufficienlty designed in detail at this stage. Although no adverse impacts are expected, such equipment has the potential to result in noise impacts on the noise sensitive spaces within the development.

Therefore, the potential impacts should be assessed as part of the final building design. The criteria is expected to be met at all on-site receptors with the appropriate selection of mechanical equipment, by locating equipment to minimize noise impacts within the development, and by incorporating control measures (e.g., silencers, barriers) into the design.

It is recommended that the mechanical systems be reviewed by an Acoustical Consultant prior to final selection of equipment.

6. CONCLUSIONS AND RECOMMENDATIONS

The potential for noise impacts on and from the proposed development have been assessed. Impacts of the environment on the development, the development on the surrounding area and the development on itself have been considered. Based on the results of our studies, the following conclusions have been reached:

6.1 TRANSPORTATION NOISE

- An assessment of transportation noise impacts from surrounding roadways has been completed.
- As outlined in Section 2.5, Ontario Building Code (OBC) building components are anticipated to be sufficient for all the guestrooms in the development, in order to meet the MECP Publication NPC-300 Building Component Requirements and the Marriot Brand Standards for acoustic control.
- As outlined in Section 2.6, Forced air heating with provisions for future installation of central air-conditioning, and a Type C warning is recommended for all the guestrooms in the development. As the proposed hotel is expected to include air conditioning for all guest suites, this condition is considered to be met.

6.2 STATIONARY NOISE

- Sealed windows are to be incorporated for all noise sensitive spaces, which is an acceptable noise control measure for a noise sensitive commercial use under MECP NPC-300.
- As no significant stationary noise was observed by SLR-Novus personnel, windows meeting minimum OBC requirements will be adequate to ensure an acceptable indoor acoustical environment. No additional noise mitigation is required for the proposed development or the surrounding industry and commercial properties.

6.3 OVERALL ASSESSMENT

- Impacts of the environment on the proposed development can be adequately controlled without additional noise control measures, detailed in Part 1 of this report.
- Impacts of the proposed development on the surrounding area are not anticipated to be a concern and can be adequately controlled by following the design guidance outlined in Part 2 of this report.
- Impacts of the proposed development on itself are not anticipated to be concern and can be adequately controlled by following the design guidance outlined in Part 3 of this report.
- As the mechanical systems for the proposed development have not been designed at the time of this assessment, the acoustical requirements above should be confirmed by an Acoustical Consultant as part of the final building design.

7. REFERENCES

International Organization for Standardization, ISO 9613-2: Acoustics – Attenuation of Sound During Propagation Outdoors Part 2: General Method of Calculation, Geneva, Switzerland, 1996.

National Research Council, Building Practice Note 56: *Controlling Sound Transmission into Buildings*, Canada 1985.

Ontario Ministry of the Environment, Conservation and Parks, 1989, Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT)

Ontario Ministry of the Environment, Conservation and Parks, 1996, STAMSON v5.04: Road, Rail and Rapid Transit Noise Prediction Model

Ontario Ministry of the Environment, Conservation and Parks, Publication NPC-300: *Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning*, 2013.

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FIGURES

Environmental Noise Study
Marriott Hotel Bolton
SLR Project No.: 241.20139.00000

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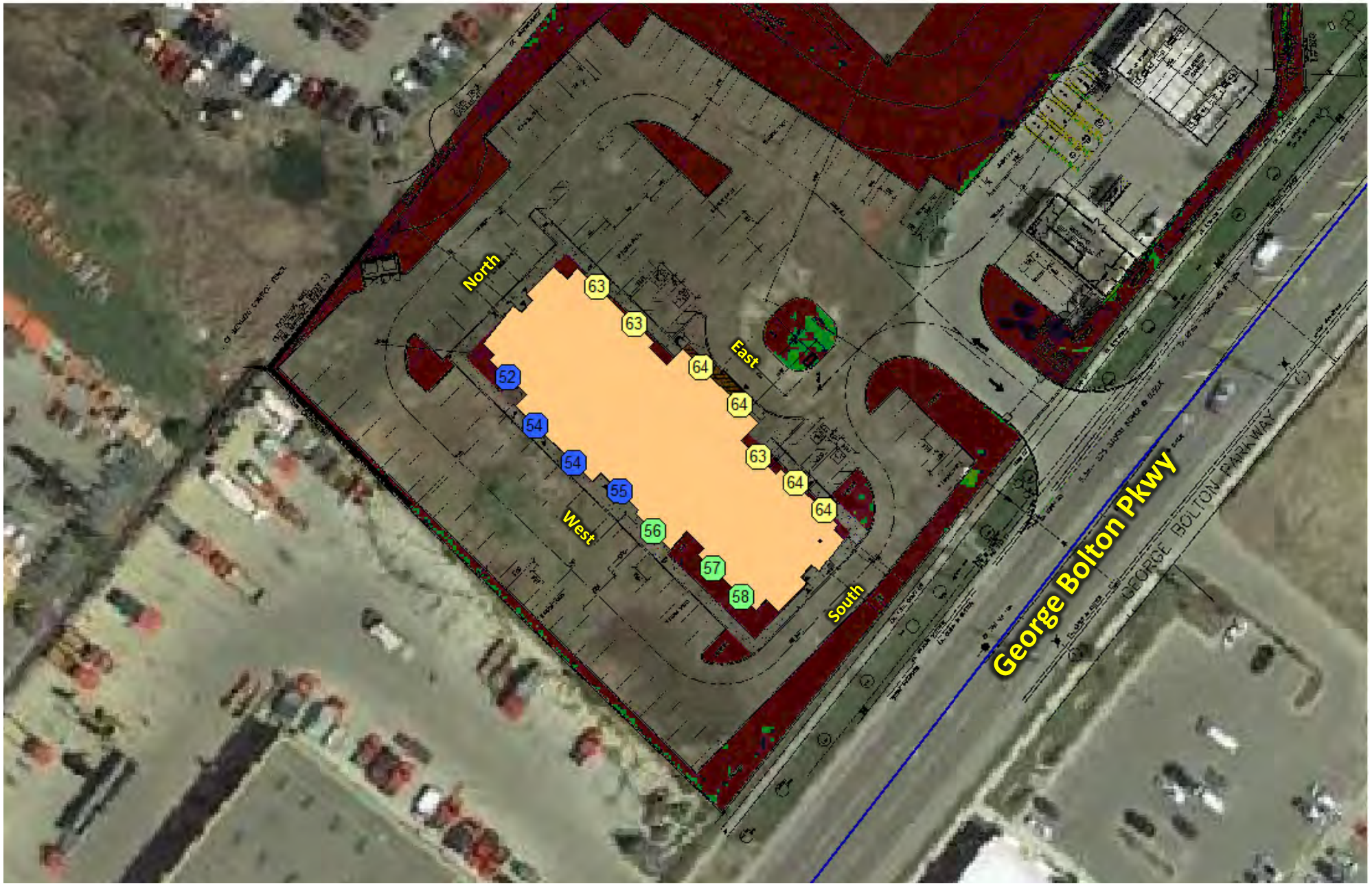
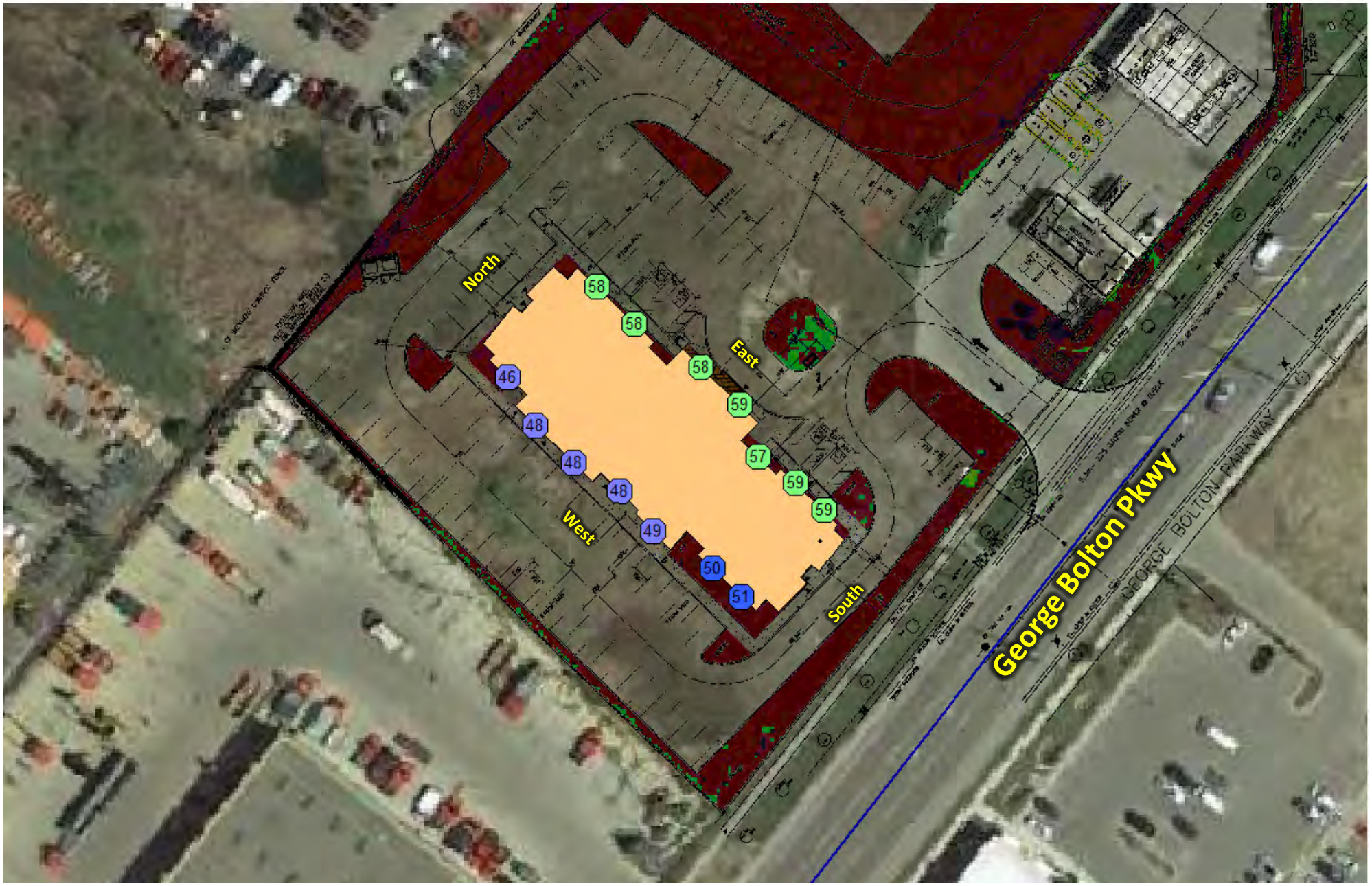
ANTRIX ARCHITECTS INC.	True North	Scale: 1:4,000	METRES	novus ENVIRONMENTAL
MARRIOT HOTEL BOLTON		Date: Jul 09, 2020 Rev 1.0	Figure No. 1	NOW PART OF SLR
CONTEXT PLAN		Project No. 241-20139-0000		



ANTRIX ARCHITECTS INC	True North	Scale: 1:750	METRES	novus ENVIRONMENTAL
MARRIOT HOTEL BOLTON		Date: Jul 09, 2020 Rev 1.0	Figure No. **2**	NOW PART OF SLR
FAÇADE SOUND LEVELS – ROADWAY – DAYTIME		Project No. 241-20139-0000		



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MARRIOT HOTEL BOLTON		Date: Jul 09, 2020 Rev 1.0	Figure No. **3**	NOW PART OF SLR
FAÇADE SOUND LEVELS – ROADWAY – NIGHTTIME		Project No. 241-20139-0000		

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FIGURES

Environmental Noise Study
Marriott Hotel Bolton
SLR Project No.: 241.20139.00000

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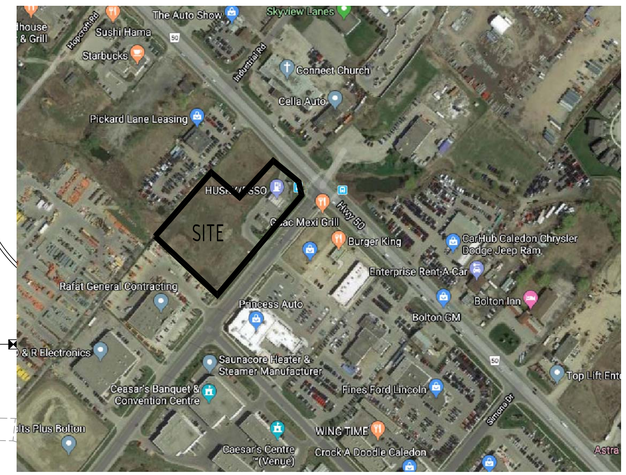
SITE INFORMATION: - CHB ZONING		
	REQUIREMENTS	PROPOSED
MIN. LOT AREA	2750 SQ.M.	12,616 SQ.M.
MIN. LOT FRONTAGE (HIGHWAY 50)	40.0 M	52.5 M
MAX. BUILDING AREA	30%	10.25 % (120+1174 SQM)
MIN. FRONT YARD SETBACK (HIGHWAY 50)	18 M	20.0 M (EXISTING)
MIN. EXTERIOR SIDE YARD (GEORGE BOLTON PARKWAY)	18 M	3 M (EXISTING)
MIN. REAR SETBACK	10.5 M	22.5 M
MIN. INTERIOR SIDE YARD SETBACK	7.5 M	22.9 M
MOTOR VEHICLE GAS BAR SETBACK		
FROM ANY LOT LINE	6.0 M	6.0 M
FROM ANY SIGHT ANGLE	3.0 M	7.0 M
MAX. BUILDING HEIGHT	10.5 M	19.2 M
LANDSCAPING AREA (MINIMUM)	20% (2523.2 SQM)	32.1% (4062 SQM)
RETAIL STORE, ACCESSORY	93 SQM	120 SQM (EXISTING)
PLANTING STRIP LOCATION	-	FRONT AND EXTERIOR LOT LINE
MIN. PLANTING STRIP WIDTH	6.0 M	3.0 M (EXISTING)
MIN. PARKING SPACE SETBACKS		
FROM ANY STREET LINE	6.0 M	3.0 M (EXISTING)
FROM ANY OTHER LOT LINE	1.5 M	1.5 M
MIN. PARKING SPACES PER USE: HOTEL -@ 1 SPACE PER ROOM, FOR 111 ROOMS MOTOR VEHICLE GAS BAR - @ 1 SPACE PER 20 SQM FOR 120 SQM	111 SPACES + 6 SPACES = 117 SPACES	121 SPACES (PROPOSED) + 5 SPACES (EXISTING) = 126 SPACES
MIN. LOADING SPACES	1	1
MIN. DELIVERY SPACES	1	1

▲ DENOTES ENTRY/EXIT TO BUILDING



PROPOSED KEY PLAN
SCALE : NTS

PROPOSED SITE PLAN
SCALE : 1:300

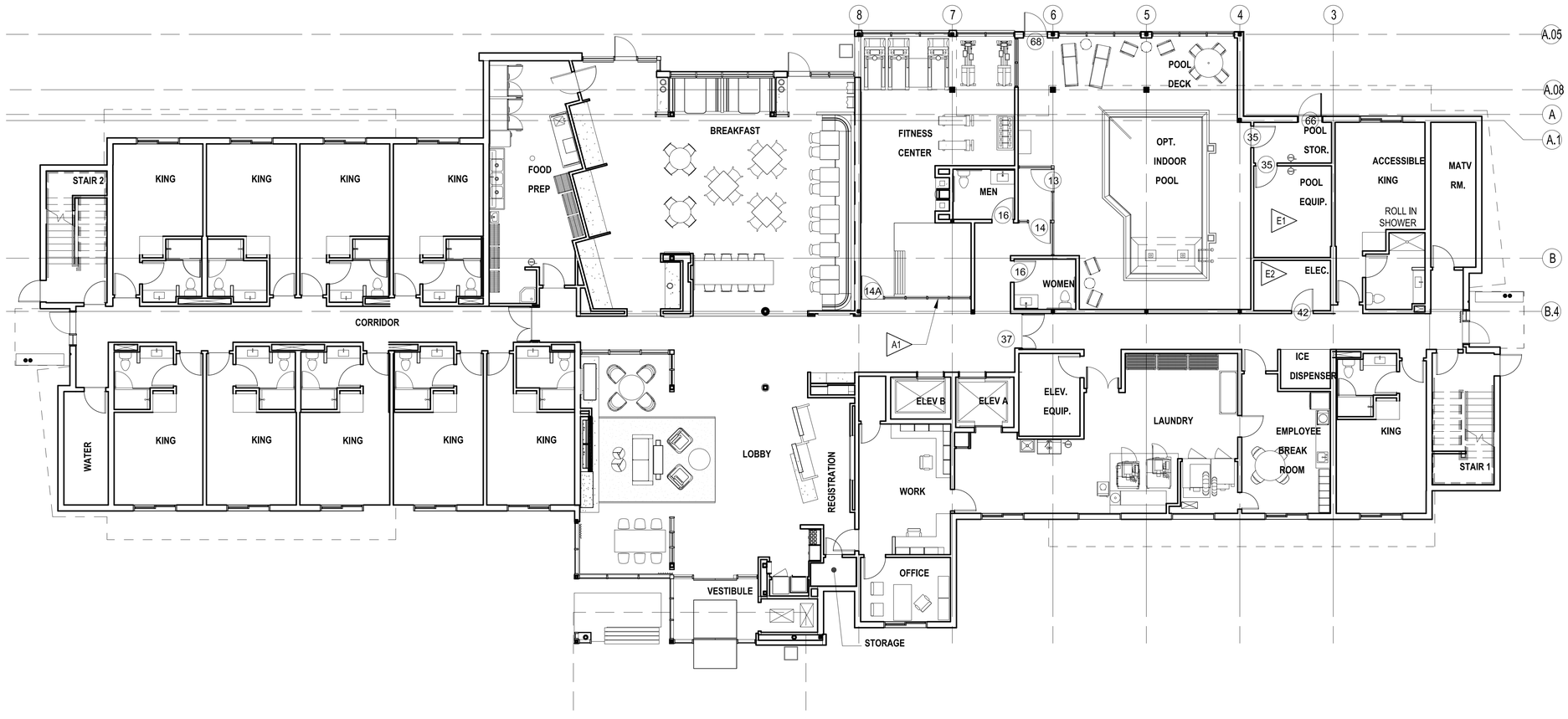
ANTRIX
ARCHITECTS INC.
1109 BRITANNIA RD E., MISSISSAUGA
ON L4W 3X1 PHONE 905 564 1154
FAX 888 501 0265

ISSUED FOR REVIEW	18-03-2020

PROJECT
PROPOSED MARRIOTT HOTEL

12476 HIGHWAY 50
CALEDON, ON

DRAWN BY	NL
SCALE	
PROJECT NO.	2001
DRAWING TITLE & NO. PROPOSED FLOOR PLANS	A01



PROPOSED FIRST FLOOR PLAN

SCALE : 1=100

NORTH

ANTRIX
ARCHITECTS INC.
1109 BRITANNIA RD E., MISSISSAUGA
ON L4W 3X1. PHONE 905 564 1154
FAX 888 501 0265

ISSUED FOR REVIEW	18-03-2020

PROJECT
PROPOSED MARRIOTT HOTEL

12476 HIGHWAY 50
CALEDON, ON

DRAWN BY	NL
SCALE	
PROJECT NO.	2001
DRAWING TITLE & NO.	
PROPOSED FIRST FLOOR PLAN	A02

PROPOSED TYPICAL SECOND TO FIFTH FLOOR PLAN

SCALE : 1=100

NORTH

ANTRIX
ARCHITECTS INC.
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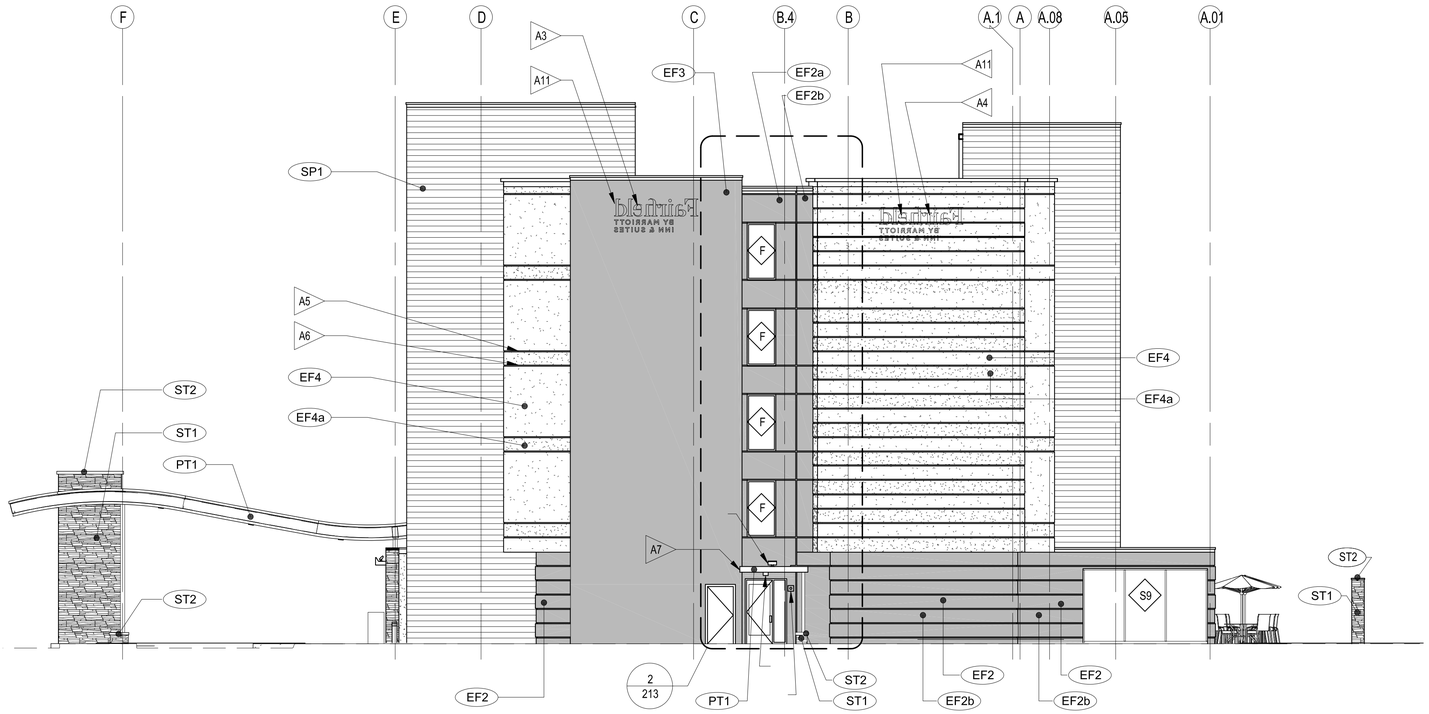
ON L4W 3X1 PHONE 905 564 1154
FAX 888 501 0265

ISSUED FOR REVIEW	18-03-2020

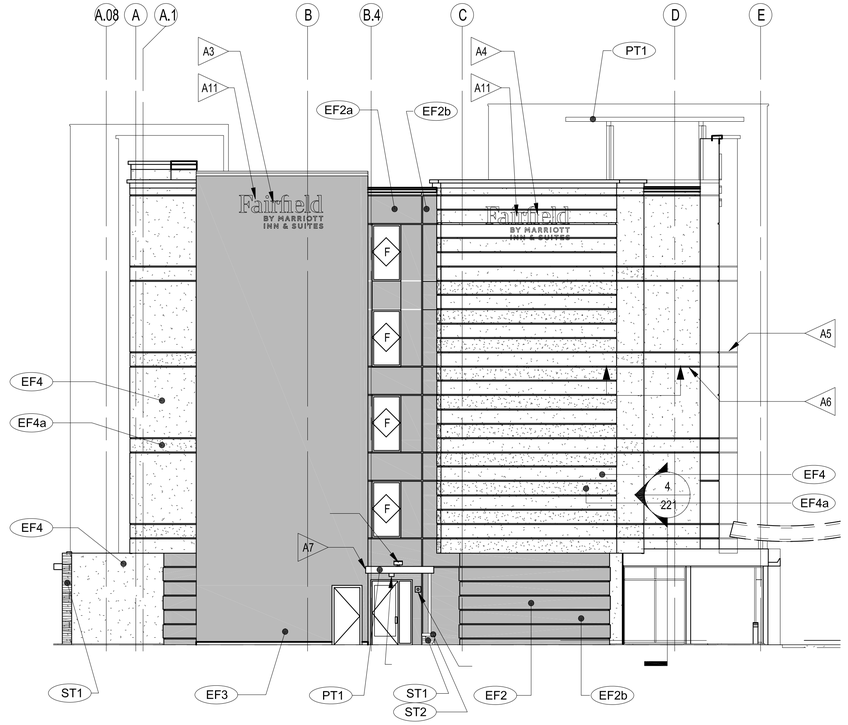
PROJECT
PROPOSED MARRIOTT HOTEL

12476 HIGHWAY 50
CALEDON, ON

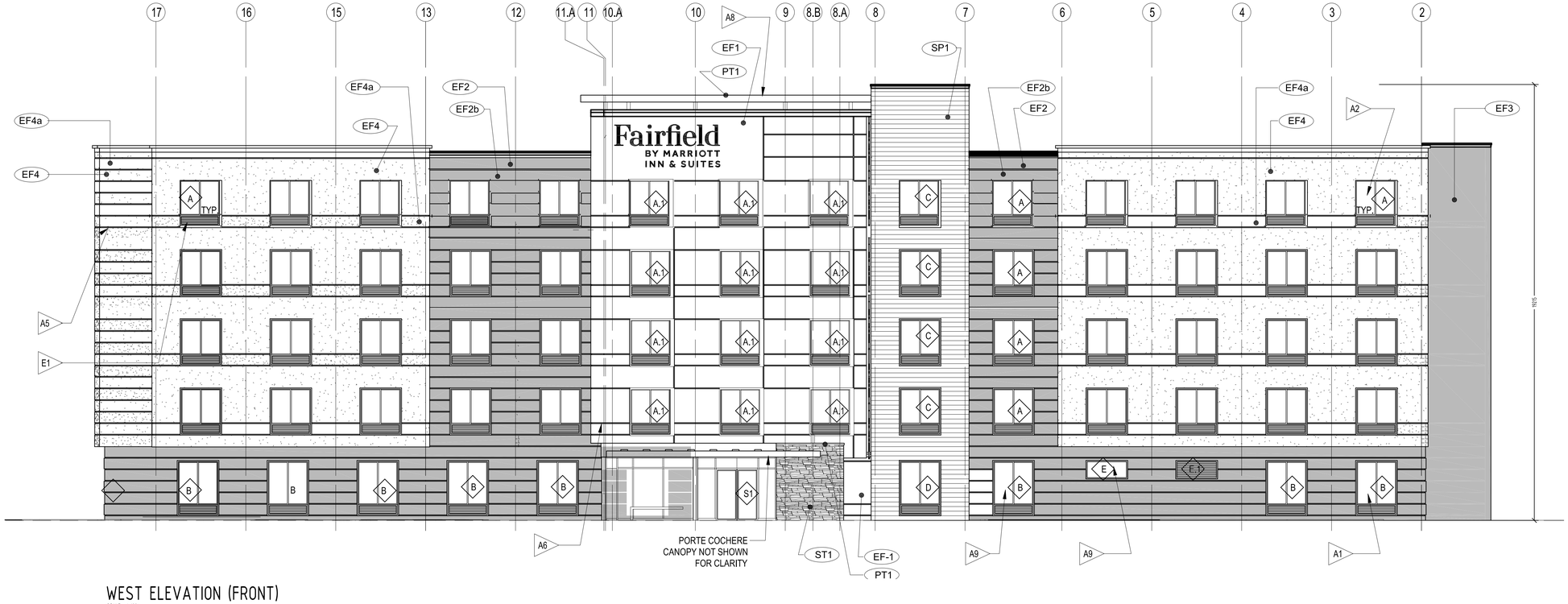
DRAWN BY	NL
SCALE	
PROJECT NO.	2001
DRAWING TITLE & NO.	
PROPOSED TYP. FLOOR PLANS	A03



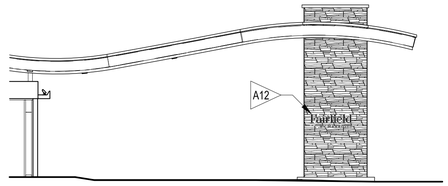
SOUTH ELEVATION (SIDE)
SCALE : 1=100



NORTH ELEVATION (SIDE)
SCALE : 1=100



WEST ELEVATION (FRONT)
SCALE : 1=100



PARTIAL NORTH ELEVATION (SIDE)
SCALE : 1=100

EXTERIOR FINISH KEY

	EF1	EIFS1
	EF2	EIFS2
	EF2a	EIFS2a
	EF2b	EIFS2b
	EF3	EIFS3
	EF4	EIFS4
	EF4a	EIFS4a
	ST1	MANUFACTURED STONE MASONRY
	ST2	CAST STONE MASONRY
	SP1	SOLID PHENOLIC EXTERIOR WALL PANELS
	PT1	PAINT

ANTRIX
ARCHITECTS INC.
1109 BRITANNIA RD E., MISSISSAUGA
ON L4W 3X1. PHONE 905 564 1154
FAX 888 501 0265

ISSUED FOR REVIEW	18-03-2020

PROJECT
PROPOSED MARRIOTT HOTEL
12476 HIGHWAY 50
CALEDON, ON

DRAWN BY	NL
SCALE	
PROJECT NO.	2001
DRAWING TITLE & NO.	
ELEVATIONS	A04

APPENDIX B
Traffic Data and Calculations

Environmental Noise Study
Marriott Hotel Bolton
SLR Project No.: 241.20139.00000

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Date: June 26, 2020
From: Marcus Li, Acoustics Noise and Vibration
Re: Traffic Data Request – 12476 Highway 50
Town of Caledon (Bolton)

Marcus,
As per your request, we are providing the following 2019 traffic data:

	Existing	Ultimate
24 Hour Traffic Volume[1] [2]	32,102	32,400
# of Lanes	4	4
Day/Night Split	88/12	88/12
Day Trucks (% of Total Volume)	1.05% Medium 5.30% Heavy	1.05% Medium 5.30% Heavy
Night Trucks (% of Total Volume)	0.94% Medium 6.96% Heavy	0.94% Medium 6.96% Heavy
Right-of-Way Width	45 meters	
Posted Speed Limit	60 km/h	

Notes:
[1] - The current (existing) 24 Hour Traffic Volume is not the Annual Average Daily Traffic, but the averaged raw volumes over three data collection days. If you need the Annual Average Traffic Volume, please visit the Peel Open Data website below: http://opendata.peelregion.ca/data-categories/transportation/traffic-count-stations.aspx
[2] - The ultimate volume is the planned volume during a level of service 'D' where a 2 second vehicle headway and a volume to capacity ratio of 0.9 is assumed. Traffic signals and hourly variations in traffic are also incorporated into the ultimate volume.

If you require further assistance, please contact me at (905) 791-7800 ext. 4381

Regards,

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Peak Hour: 07:00 AM - 08:00 AM Weather: Overcast (20.2 °C)

Start Time	N Approach HWY 50						E Approach DRIVEWAY						S Approach HWY 50						W Approach GEORGE BOLTON PKWY						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
07:00:00	20	344	1	0	1	365	0	0	0	0	0	0	0	157	16	0	0	173	15	0	3	0	0	18	556
07:15:00	11	332	0	0	0	343	0	0	0	0	0	0	1	140	17	0	0	158	11	1	4	0	1	16	517
07:30:00	19	320	0	0	0	339	0	0	0	0	0	0	0	194	20	0	1	214	13	0	8	0	0	21	574
07:45:00	22	272	0	0	0	294	0	0	0	0	0	0	0	216	14	0	0	230	14	0	8	0	0	22	546
Grand Total	72	1268	1	0	1	1341	0	0	0	0	0	0	1	707	67	0	1	775	53	1	23	0	1	77	**2193**
Approach%	5.4%	94.6%	0.1%	0%		-	0%	0%	0%	0%		-	0.1%	91.2%	8.6%	0%		-	68.8%	1.3%	29.9%	0%		-	**-**
Totals %	3.3%	57.8%	0%	0%		61.1%	0%	0%	0%	0%		0%	0%	32.2%	3.1%	0%		35.3%	2.4%	0%	1%	0%		3.5%	**-**
PHF	0.82	0.92	0.25	0		0.92	0	0	0	0		0	0.25	0.82	0.84	0		0.84	0.88	0.25	0.72	0		0.88	**-**
Heavy	2	86	0	0		88	0	0	0	0		0	0	65	14	0		79	18	0	4	0		22	**-**
Heavy %	2.8%	6.8%	0%	0%		6.6%	0%	0%	0%	0%		0%	0%	9.2%	20.9%	0%		10.2%	34%	0%	17.4%	0%		28.6%	**-**
Lights	70	1182	1	0		1253	0	0	0	0		0	1	642	53	0		696	35	1	19	0		55	**-**
Lights %	97.2%	93.2%	100%	0%		93.4%	0%	0%	0%	0%		0%	100%	90.8%	79.1%	0%		89.8%	66%	100%	82.6%	0%		71.4%	**-**
Single-Unit Trucks	2	43	0	0		45	0	0	0	0		0	0	48	6	0		54	14	0	3	0		17	**-**
Single-Unit Trucks %	2.8%	3.4%	0%	0%		3.4%	0%	0%	0%	0%		0%	0%	6.8%	9%	0%		7%	26.4%	0%	13%	0%		22.1%	**-**
Buses	0	4	0	0		4	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	**-**
Buses %	0%	0.3%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0.1%	0%	0%		0.1%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	39	0	0		39	0	0	0	0		0	0	16	8	0		24	4	0	1	0		5	**-**
Articulated Trucks %	0%	3.1%	0%	0%		2.9%	0%	0%	0%	0%		0%	0%	2.3%	11.9%	0%		3.1%	7.5%	0%	4.3%	0%		6.5%	**-**
Pedestrians	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	**-**
Pedestrians%	-	-	-	-	33.3%		-	-	-	-	0%		-	-	-	-	33.3%		-	-	-	-	33.3%		**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Peak Hour: 04:15 PM - 05:15 PM Weather: Mostly Cloudy (24.2 °C)

Start Time	N Approach HWY 50						E Approach DRIVEWAY						S Approach HWY 50						W Approach GEORGE BOLTON PKWY						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:15:00	20	229	0	0	0	249	0	0	0	0	0	0	0	317	14	0	0	331	28	1	20	0	0	49	629
16:30:00	14	265	1	0	0	280	1	0	0	0	0	1	0	335	14	0	0	349	27	0	32	0	0	59	689
16:45:00	13	197	0	0	0	210	4	2	1	0	0	7	0	307	21	0	0	328	35	0	19	0	1	54	599
17:00:00	19	282	0	0	0	301	3	2	2	0	0	7	0	344	10	0	0	354	52	0	36	0	1	88	750
Grand Total	66	973	1	0	0	1040	8	4	3	0	0	15	0	1303	59	0	0	1362	142	1	107	0	2	250	**2667**
Approach%	6.3%	93.6%	0.1%	0%		-	53.3%	26.7%	20%	0%		-	0%	95.7%	4.3%	0%		-	56.8%	0.4%	42.8%	0%		-	**-**
Totals %	2.5%	36.5%	0%	0%		39%	0.3%	0.1%	0.1%	0%		0.6%	0%	48.9%	2.2%	0%		51.1%	5.3%	0%	4%	0%		9.4%	**-**
PHF	0.83	0.86	0.25	0		0.86	0.5	0.5	0.38	0		0.54	0	0.95	0.7	0		0.96	0.68	0.25	0.74	0		0.71	**-**
Heavy	1	41	0	0		42	0	0	0	0		0	0	48	15	0		63	6	0	2	0		8	**-**
Heavy %	1.5%	4.2%	0%	0%		4%	0%	0%	0%	0%		0%	0%	3.7%	25.4%	0%		4.6%	4.2%	0%	1.9%	0%		3.2%	**-**
Lights	65	932	1	0		998	8	4	3	0		15	0	1255	44	0		1299	136	1	105	0		242	**-**
Lights %	98.5%	95.8%	100%	0%		96%	100%	100%	100%	0%		100%	0%	96.3%	74.6%	0%		95.4%	95.8%	100%	98.1%	0%		96.8%	**-**
Single-Unit Trucks	1	25	0	0		26	0	0	0	0		0	0	25	12	0		37	3	0	2	0		5	**-**
Single-Unit Trucks %	1.5%	2.6%	0%	0%		2.5%	0%	0%	0%	0%		0%	0%	1.9%	20.3%	0%		2.7%	2.1%	0%	1.9%	0%		2%	**-**
Buses	0	1	0	0		1	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	**-**
Buses %	0%	0.1%	0%	0%		0.1%	0%	0%	0%	0%		0%	0%	0.1%	0%	0%		0.1%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	15	0	0		15	0	0	0	0		0	0	22	3	0		25	3	0	0	0		3	**-**
Articulated Trucks %	0%	1.5%	0%	0%		1.4%	0%	0%	0%	0%		0%	0%	1.7%	5.1%	0%		1.8%	2.1%	0%	0%	0%		1.2%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	100%		**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

O R N A M E N T - Sound Power Emissions & Source Heights

Ontario Road Noise Analysis Method for Environment and Transportation

Road Segment ID	Roadway Name	Link Description	Speed (kph)	Period (h)	Total Traffic Volumes	Auto %	Med %	Hvy %	Auto	Med	Heavy	Road Gradient (%)	Cadna/A Ground Absorption G	PWL (dBA)	Source Height, s (m)
Hwy 50	Highway 50	Daytime Impacts	60	16	28512	93.7%	1.1%	5.3%	26701	299	1511	0	0.00	**87.6**	**1.2**
		Nighttime Impacts	60	8	3888	92.1%	0.9%	7.0%	3581	37	271	0	0.00	**82.7**	**1.2**
George Bolton	George Bolton Pkwy	Daytime Impacts	50	16	5486	93.7%	0.0%	6.3%	5141	0	346	0	0.00	**79.4**	**1.2**
		Nighttime Impacts	50	8	610	93.7%	0.0%	6.3%	571	0	38	0	0.00	**72.9**	**1.2**

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APPENDIX C
STAMSON Validation Files

Environmental Noise Study
Marriott Hotel Bolton
SLR Project No.: 241.20139.00000

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ANTRIX ARCHITECTS INC	True North	Scale: 1:750	METRES	novus ENVIRONMENTAL
MARRIOT HOTEL BOLTON		Date: Jul 09, 2020 Rev 1.0	Figure No. **C.1**	NOW PART OF SLR
COMPARISON OF CADNAA AND STAMSON		Project No. 241-20139-0000		

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STAMSON 5.0 NORMAL REPORT Date: 10-07-2020 07:02:58
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: Marriott.te Time Period: 16 hours
Description: Ground Floor, east facade

Road data, segment # 1: Hwy50

Car traffic volume : 26701 veh/TimePeriod
Medium truck volume : 299 veh/TimePeriod
Heavy truck volume : 1511 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Hwy50

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 132.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: GBPkwy

Car traffic volume : 5141 veh/TimePeriod
Medium truck volume : 0 veh/TimePeriod
Heavy truck volume : 346 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: GBPkwy

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 30.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Hwy50

Source height = 1.52 m

ROAD (0.00 + 63.04 + 0.00) = 63.04 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	72.48	0.00	-9.44	0.00	0.00	0.00	0.00	63.04

Segment Leq : 63.04 dBA

Results segment # 2: GBPkwy

Source height = 1.58 m

ROAD (0.00 + 58.32 + 0.00) = 58.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	64.34	0.00	-3.01	-3.01	0.00	0.00	0.00	58.32

Segment Leq : 58.32 dBA

Total Leq All Segments: 64.30 dBA

TOTAL Leq FROM ALL SOURCES: 64.30

APPENDIX D
Facade STC Calcultations

Environmental Noise Study
Marriott Hotel Bolton
SLR Project No.: 241.20139.00000

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BPN 56 Calculation Procedure - Required Glazing STC Rating (Fixed Veneer), Roadway

Receptor ID	Source Description	Sound Levels				Room / Façade Inputs					Source Inputs			Veneer - Component 1		Glazing - Component 2	
		Façade Sound Level: (dBA)	Free - field Corr: (dBA)	Req'd Indoor Sound Level: (dBA)	Req'd Noise Red'n: (dBA)	Glazing as % of Wall Area	Exp Wall Height (m)	Exp Wall Length (m)	Room Depth (m)	Room Absorption:	Incident Sound Angle: (deg)	Angle Corr Factor:	Spectrum type:	Assumed Veneer STC (STC)	Component Category:	Component Category:	Req'd Glazing STC (STC)
DAYTIME																	
Guest Room, East Façade	Roadway	64	3	45	22	32%	3.1	3.8	3.9	Intermediate	0 - 90	0	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**21**
Guest Room, West Façade	Roadway	58	3	45	16	32%	3.1	3.8	3.9	Intermediate	0 - 90	0	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**15**
NIGHT-TIME																	
Guest Room, East Façade	Roadway	56	3	40	19	32%	3.1	3.8	3.9	Intermediate	0 - 90	0	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**18**
Guest Room, West Façade	Roadway	51	3	40	14	32%	3.1	3.8	3.9	Intermediate	0 - 90	0	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**13**

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