

April 23, 2020

City of Ottawa  
Planning and Infrastructure Department  
Infrastructure Approvals Division  
110 Laurier Street West  
Ottawa, ON, K1P 1J1

**Attention: Mr. Andrew McCreight**

**Reference: 245 Rideau Street – Proposed High-Rise Development  
Noise Control Study Addendum Letter:  
Revised Usage of Tower 'A' South from Hotel to Residential  
Our File No. 113195**

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A Noise Control Study report for the proposed high-rise development at 245 Rideau Street in Ottawa was submitted by Novatech and approved by the City of Ottawa in 2015. This study evaluates the environmental impact of noise from traffic and outlines noise attenuation measures to mitigate the impacts.

In March 2020, minor changes were subsequently made to the proposed development. A revised noise level analysis was completed for this proposed building layout. An addendum letter to the approved Noise Control Study was submitted to the City of Ottawa on March 19, 2020.

Subsequently, some further revisions have been made to the proposed development and site plan. The changes are summarised as follows. Refer to the attached revised Site Plan for details.

- The previously proposed hotel tower (Tower 'A' South) is now proposed to be a residential rental tower.
- The previous 2<sup>nd</sup> floor hotel amenity area has been removed and replaced by additional shared outdoor roof terrace patio area.
- A walkway connection between Tower 'A' South and Tower 'B' at the 2<sup>nd</sup> floor has been added.
- Minor changes to the floor plate shape of Tower 'A' South.
- No changes to the height of the towers, however a mezzanine level has been added to the commercial space in the podium. As a result, the podium is now considered two (2) storeys rather than one (1) storey so all towers are now considered one (1) storey taller than on the previous Site Plan.

These recent site plan revisions do not result in any changes to the noise level analysis, noise attenuation measures or notice requirements to be placed on title for units previously presented in the addendum letter dated March 19, 2020. The same residential sound level criteria was applied to the previously proposed hotel rooms.

In closing, Novatech recommends the City of Ottawa accept the findings of the previously submitted Noise Control Study addendum letter and this addendum letter as part of the site plan approval requirements for the 245 Rideau Street development.

Yours truly,

**NOVATECH**



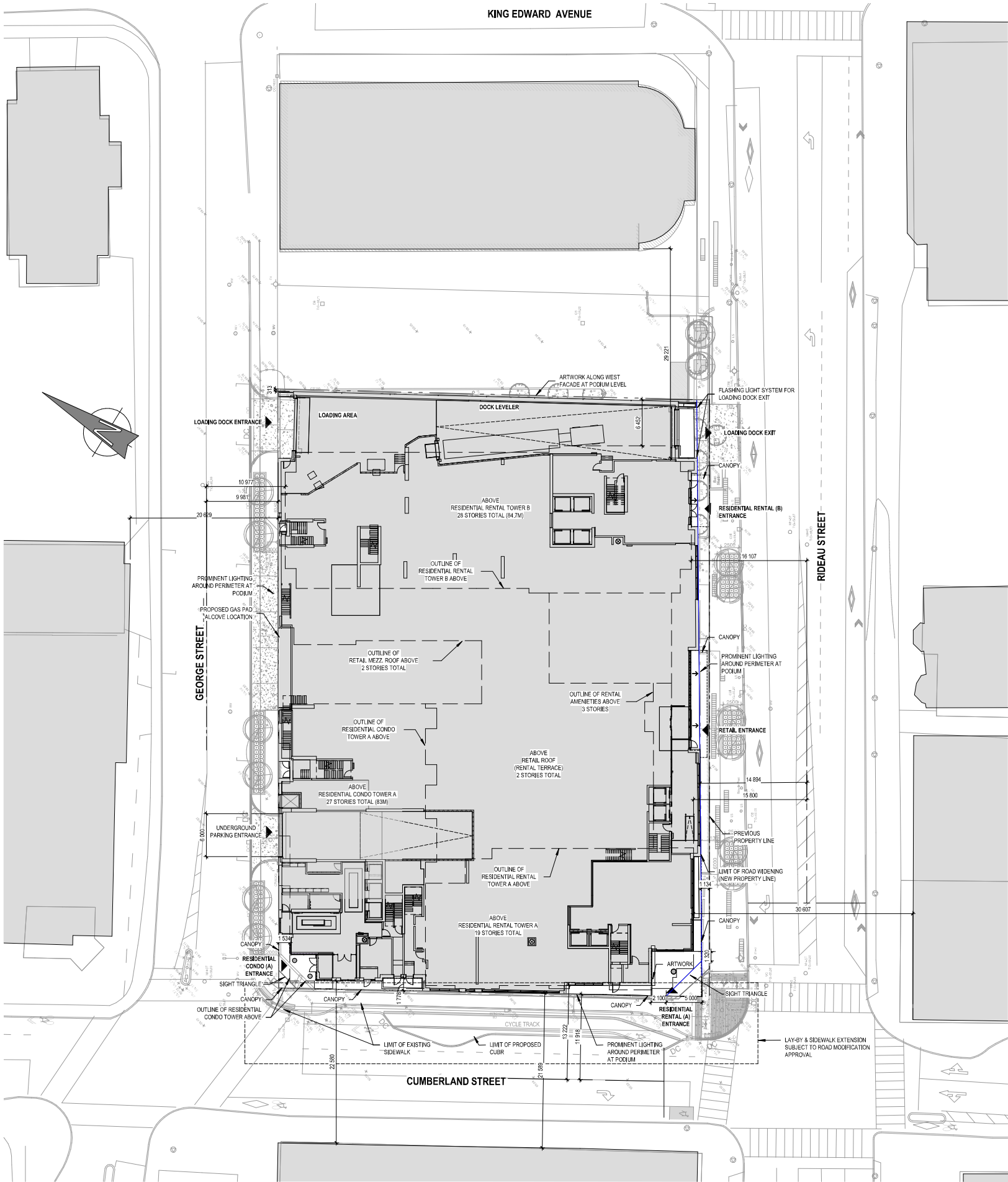
Greg MacDonald, P.Eng.  
Director, Land Development and Public Sector Infrastructure

Attachments:

- (1) Site Plan
- (2) '245 Rideau Street Façade Analysis' Letter and attached 'Noise Control Study Addendum Letter' dated 19 March 2020.

**ATTACHMENT 1:**

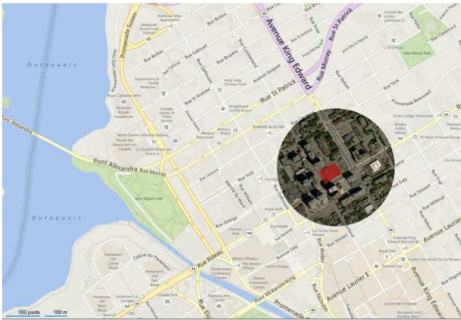
Site Plan



SITE PLAN  
1:300

NOTES

- FOR EXISTING SITE CONDITIONS SEE SURVEY PLAN BY ANNIS O'SULLIVAN VOLLEBEKK LTD. SUBMITTED SEPARATELY.
- FOR NEW GRADES AND SITE SERVICES, SEE CIVIL ENGINEERING PLAN BY NOVATECH ENGINEERING, SUBMITTED SEPARATELY.
- FOR PROPOSED VEGETATION AND LANDSCAPE INFORMATION SEE LANDSCAPE ARCHITECTURE PLAN BY JAMES B. LENNOX & ASSOCIATES, SUBMITTED SEPARATELY.



MIXED-USE WITH GROUND FLOOR COMMERCIAL, THREE RESIDENTIAL TOWERS (CONDO AND RENTAL) ZONING - MDS4		
ZONING MECHANISM	REGULATION	PROPOSED
Minimum lot area	No minimum	4575m <sup>2</sup>
Minimum lot width	No minimum	46.136m
Minimum front yard and corner side yard	No minimum	Cumberland Street: 0m Corner Side Yard - Rideau Street: 0m Corner Side Yard - George Street: 0m
Maximum building height	As per schedule 84	83m to 84.7m including mechanical penthouse
Maximum floor space index	Not applicable	Not applicable
Minimum width of landscape area	No minimum except that where a yard is provided and not used for required driveways, aisles, parking, loading spaces, or outdoor commercial patio, the whole yard must be landscaped	0m
Commercial use at ground floor	100% of the ground floor along Rideau Street (excluding mechanical / lobby areas) must be occupied by commercial uses.	100% of the ground floor along Rideau Street (excluding mechanical / lobby areas) is occupied by commercial uses.

NBR UNITS / STOREYS	PREVIOUS PROPOSAL (2015)	PREVIOUS PROPOSAL (2019)	ACTUAL PROPOSAL (2020)
TOWER A CONDO	202 UNITS / 26 STOREYS	223 UNITS / 26 STOREYS	238 UNITS / 27 <sup>1</sup> STOREYS (66 x 5, 106 x 1BR, 64 x 2BR)
TOWER A RENTAL	224 ROOMS / 19 STOREYS (HOTEL)	208 ROOMS / 18 STOREYS (HOTEL)	148 UNITS / 19 <sup>1</sup> STOREYS (16 x 5, 82 x 1BR, 50 x 2BR)
TOWER B RENTAL	241 UNITS / 28 STOREYS	341 UNITS / 27 STOREYS	341 UNITS / 28 <sup>1</sup> STOREYS (21 x 5, 216 x 1BR, 99 x 2 BR, 5 x 3BR)
RETAIL	2 STOREYS	1 STOREY (GF ONLY)	2 <sup>1</sup> STOREYS (GROUND + MEZZANINES (+10%))

<sup>1</sup> Retail mezzanines are greater than 10% of floor area, increasing the total number of stories, though not altering the height or number of residential floors in the development from the 2019 approved site plan.

GFA BY USE	PREVIOUS PROPOSAL (2015)	PREVIOUS PROPOSAL (2019)	ACTUAL PROPOSAL (2020)
TOWER A CONDO	13 662m <sup>2</sup>	13 710m <sup>2</sup> (SAME AS 2020)	13 710m <sup>2</sup> (SAME AS 2020)
TOWER A RENTAL	8 152m <sup>2</sup> (HOTEL)	7 878m <sup>2</sup> (HOTEL)	8 580m <sup>2</sup> (RENTAL)
TOWER B RENTAL	21 557m <sup>2</sup>	20 670m <sup>2</sup> (SAME AS 2020)	20 670m <sup>2</sup> (SAME AS 2020)
RETAIL 1 <sup>1</sup>	4 250m <sup>2</sup>	0m <sup>2</sup>	0m <sup>2</sup>
RETAIL 2	2 861m <sup>2</sup>	2 958m <sup>2</sup>	3 470m <sup>2</sup> (GROUND + MEZZANINES)
TOTAL	50 466m <sup>2</sup>	45 406m <sup>2</sup>	46 430m <sup>2</sup>

<sup>1</sup> Second floor retail 1 removed from project

AMENITY AND PARKING REQUIREMENTS ZONING - MDS4 - AREA Z		
ZONING MECHANISM	REGULATION	PROPOSED
Residential Parking	None Required	Residential Condo: 102 spaces Residential Rental: 215 spaces Total: 317 spaces
Visitor Parking	Residential Area Z (By-law 2016-249) Within areas X, Y, Z no more than 30 visitor spaces are required per building. Total: 30 required spaces	Condo / Rental: 30 spaces Total: 30 spaces
Commercial Parking	None Required (Retail Food Store Max. 38 spaces)	Retail: 38 spaces Total: 38 spaces
Total Parking	Total: 30 required spaces (Res. Visitor)	Total Parking: 385 spaces
Minimum bicycle parking	Residential: 0.5/bdwling (0.5727/303.5) Retail: (1/250 m <sup>2</sup> of GFA) (2556/250=11.8) Total: 376 required bicycle spaces	Residential: 364 interior spaces (P1 & P2) Retail: 12 interior spaces (P1) Total: 376 bicycle spaces
Minimum driveway width	6m	6m
Minimum aisle width	6m	6m
Loading	Min. 3 loading bays	Ground level: 2 loading bays Total: 2 loading bays
Amenities Area Requirements	Total Amenity Area - 6m <sup>2</sup> per dwelling unit 238 units (Condo A) x 6m <sup>2</sup> = 1 428m <sup>2</sup> 341 units (Rental B) x 6m <sup>2</sup> = 2 046m <sup>2</sup> 148 units (Rental A) x 6m <sup>2</sup> = 888m <sup>2</sup> Total req. Amenity Area = 4 362m <sup>2</sup> Communal Amenity Area - 50% of the required total Amenity Area = 2 181m <sup>2</sup> Layout of Communal Amenity Area - aggregated into areas up to 54m <sup>2</sup>	Total Amenity Area: Condo Tower A = 1 880 m <sup>2</sup> Rental Tower A+B (shared) = 3 570 m <sup>2</sup> Total Amenity Area = 5 750 m <sup>2</sup> Total Communal Amenity Area: Condo Tower A = 740 m <sup>2</sup> Rental Tower A+B = 1 890 m <sup>2</sup> Total Communal Amenity Area = 2 630 m <sup>2</sup>

NOTES GÉNÉRALES General Notes

1. Ces documents d'architecture sont la propriété exclusive de NEUF architect(e)s et ne pourront être utilisés, reproduits ou copiés sans autorisation écrite préalable. / These architectural documents are the exclusive property of NEUF architect(e)s and cannot be used, copied or reproduced without written pre-authorization.
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3. Veuillez aviser l'architecte de toute dimension erreur et/ou divergences entre ces documents et ceux des autres professionnels. / The architect must be notified of all errors, omissions and discrepancies between these documents and those of the others professionals.
4. Les dimensions sur ces documents doivent être lues et non mesurées. / The dimensions on these documents must be read and not measured.

MECHANIQUE ELECTRIQUE Mechanical Electrical

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1801 Carling Avenue, Suite 304, Ottawa ON K1Z 1G3  
T 613 220 1186 smithandandersen.com

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**James B. Lennox & Associates Inc.**  
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ARPENTEUR Surveyor

**Annis O'Sullivan Vollebakk Ltd.**  
14 Grosvenor Gate, Suite 500, Nepean ON K2E 7S5  
T 461.01.01

STRUCTURE Structure

**Goodeve Structural Inc.**  
77 Jung Drive, Unit 18, Ottawa ON K2E 7Z7  
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CIVIL, CH

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T 514 847 1117 NEUFarchitectes.com

SCEAU / Seal



NEUF

ARCHITECT(E)S



NEUF ARCHITECTES SENCRL

CLIENT Client



OUVRAGE Project

**ROYALE DEVELOPMENT TOWER A**

EMPLACEMENT Location NO PROJET No.  
245 RIDEAU STREET, OTTAWA 10914.01

NO	RÉVISION	DATE (aa-mm-jj)
A	ISSUED FOR FOUNDATION PERMIT	2019.06.21
B	SITE PLAN REVISION	2019.08.08
C	SITE PLAN REVISION	2019.08.30
D	ISSUED FOR EXCAVATION PERMIT	2019.11.18
E	RE-ISSUED FOR FOUNDATION PERMIT	2019.12.06
F	ISSUED FOR BUILDING PERMIT	2020.02.19
G	ISSUED FOR COORDINATION	2020.03.05
H	ISSUED FOR SITE PLAN REVISION	2020.04.24

DESSINÉ PAR Drawn by  
MH/PV/MR/NL/CR  
DATE (aa.mm.jj)  
2020-02-19

VÉRIFIÉ PAR Checked by  
ALQ/LH  
ÉCHELLE Scale  
1:300

TITRE DU DESSIN Drawing Title

**SITE PLAN AT GROUND FLOOR LEVEL**

RÉVISION Revision

NO. DESSIN Drawing Number

**H A100**

D07-12-19-0072

**ATTACHMENT 2:**

'245 Rideau Street Façade Analysis' Letter and  
attached 'Noise Control Study Addendum Letter' dated 19 March 2020.

March 19, 2020

City of Ottawa  
Planning, Infrastructure and Economic Development Department  
Planning and Infrastructure Approvals  
110 Laurier Street West, 4th Floor  
Ottawa, ON, K1P 1J1

**Attention:** Mr. Andrew McCreight, MCIP, RPP  
Planner, Development Review Urban Services

Dear Sir:

**Re: 245 Rideau Street Façade Analysis**

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Site Plan Condition No. 31 reads as follows:

**31. Noise Control Attenuation Measures**

The Owner acknowledges and agrees to implement the noise control attenuation measures recommended in the approved Noise Control Study, as follows;

- (a) Each unit is to be equipped with central air conditioning;
- (b) Prior to the issuance of the above-grade building permit, a review of building components (windows, walls, doors) is required and must be designed to achieve indoor sound levels within the City's and the Ministry of the Environment and Climate Change's noise criteria; and
- (c) Notice respecting noise shall be registered, and a warning clause shall be included in all agreements of purchase and sale or lease agreements, as detailed in paragraph 13 below.

The noise analysis of June 2015 (approved report) has been amended to address the following corrections:

Minor revisions to the proposed development described below:

- Tower A North (corner of Cumberland/George): 26-storey Residential Condominium
- Tower A South (corner of Cumberland/Rideau): 18-storey Hotel
- Tower B East: 27-storey Residential Rental

Corrections to the Stamson Input File were made to reflect the following:

- The posted speed limit for all streets is 40 kph
- The 24-hour traffic volumes (AADT) for each street was corrected (volumes equally split in each direction; approved report had full AADT each direction)

An addendum letter to the approved report is attached in **Appendix A**.

**Tables 8 and 9 of the Addendum Letter** provide the required Sound Transmission Class (STC) for the windows, doors and walls of the building façade based on the noise analysis completed for traffic noise from the surrounding streets. The architect will refer to these tables to ensure the various assemblies satisfy this requirement by taking the respective room ratios in column 1, referencing the STC for the respective assembly and provided data sheets to ensure the type of window, door and wall assembly satisfy the STC.

**Table 8: Equivalent Sound Transmission Class (STC) Values for Windows and Doors**

Window (or door) area expressed as percentage of room floor area	Conversion	Required STC for Tower B (Rental) and Tower A South (Hotel) (AIF = 30)	Required STC for Podium (Commercial) (AIF = 27)
80 %	STC - 5 = AIF	35	32
63 %	STC - 4 = AIF	34	31
50 %	STC - 3 = AIF	33	30
40 %	STC - 2 = AIF	32	29
32 %	STC - 1 = AIF	31	28
25 %	STC = AIF	30	27
20 %	STC +1 = AIF	29	26
16 %	STC +2 = AIF	28	25
12.5 %	STC +3 = AIF	27	24
10 %	STC +4 = AIF	26	23

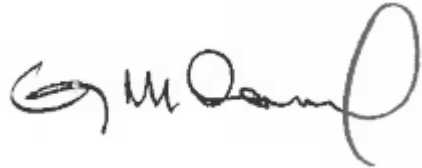
**Table 9: Equivalent Sound Transmission Class (STC) Values for Exterior Walls**

Exterior wall area expressed as percentage of room floor area	Conversion	Required STC for Tower B (Rental) and Tower A South (Hotel) (AIF = 30)	Required STC for Podium (Commercial) (AIF = 27)
200 %	STC - 10 = AIF	40	37
160 %	STC - 9 = AIF	39	36
125 %	STC - 8 = AIF	38	35
100 %	STC - 7 = AIF	37	34
80 %	STC - 6 = AIF	36	33
63 %	STC - 5 = AIF	35	32
50 %	STC - 4 = AIF	34	31
40 %	STC - 3 = AIF	33	30
32 %	STC - 2 = AIF	32	29
25 %	STC - 1 = AIF	31	28
20 %	STC = AIF	30	27
16 %	STC + 1 = AIF	29	26

Trusting this is satisfactory. Should you have any questions or require additional information, please contact the undersigned.

Yours truly,

**Novatech**

A handwritten signature in black ink, appearing to read 'Greg MacDonald', written in a cursive style.

Greg MacDonald, P.Eng.  
Director | Land Development and Public Sector Infrastructure

Attachment

Appendix A    Noise Control Study Addendum Letter, March 19, 2020



## **Appendix A**

### **Noise Control Study Addendum Letter**

March 19, 2020

City of Ottawa  
Planning and Infrastructure Department  
Infrastructure Approvals Division  
110 Laurier Street West  
Ottawa, ON, K1P 1J1

**Attention: Mr. Andrew McCreight**

**Reference: 245 Rideau Street – Proposed High-Rise Development  
Noise Control Study Addendum Letter:  
Revised Noise Level Analysis and Attenuation Measures  
Our File No. 113195**

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## **1.0 Introduction**

A Noise Control Study report for the proposed high-rise development at 245 Rideau Street in Ottawa was submitted by Novatech and approved by the City of Ottawa in 2015. This study evaluates the environmental impact of noise from traffic and outlines noise attenuation measures to mitigate the impacts.

Minor changes have subsequently been made to the proposed development by the architect. During recent co-ordination, revised noise level analysis was completed for the latest proposed building layout. It was determined that the previous input data into the STAMSON noise model was required to be corrected as follows:

- The posted speed limit for all streets which are noise sources is 40 km/hr, rather than 50 km/hr which was previously used;
- 24-hr traffic volumes (AADT) for each street are halved where there are two segments for that street and traffic is assumed to be equal in each direction.

The revised noise level analysis and noise attenuation measures are presented in this addendum letter to the previous Noise Control Study report.

## **2.0 Background**

### **2.1 Project Description**

Since the previous report, minor revisions have been made to the proposed development.

The proposed development will consist of three (3) towers, located above a common one-storey podium and multi-level underground parking structure. The proposed towers are as follows:

- Tower 'A' North (corner of Cumberland St / George St): a 26-storey residential condominium
- Tower 'A' South (corner of Cumberland St / Rideau St): an 18-storey hotel
- Tower 'B' (east of Tower 'A'): a 27-storey residential rental building

The common podium (ground floor) will include approximately 32,980 ft<sup>2</sup> of commercial floor space, entrance lobbies to the towers and a drive-through loading area with entry from George Street and exit onto Rideau Street. Entry and exit to the 4 levels of underground parking will be provided by a two-way vehicular ramp access located on George Street. Refer to the attached **Site Plan** (by Neuf Architects) for details.

## 2.2 Noise Sources

The noise sources remain the same as presented in the 2015 Noise Control Study. See Section 4.1 below for details.

## 3.0 City of Ottawa Noise Control Guidelines

### 3.1 Sound Level Criteria

The sound level criteria remain as presented in the 2015 Noise Control Study report for this development. **Table 1** and **Table 2** from this report, which outline the outdoor and indoor noise level criteria respectively, are presented here for easy reference.

**Table 1: City of Ottawa Outdoor Noise Level Criteria  
(Road and/or Rail Noise)**

Time Period	Receiver Location	Noise Level Criteria (Leq)
Daytime (07:00 – 23:00)	Outdoor Living Area (OLA)	55 dBA
Daytime (07:00 – 23:00)	Plane of Window (POW) at Living/Dining Rooms	55 dBA
Nighttime (23:00 – 07:00)	Plane of Window (POW) at Bedrooms/Sleeping Quarter	50 dBA

**Table 2: City of Ottawa Indoor Noise Level Criteria**

Time Period	Receiver Location	Noise Level Criteria (Leq)
Daytime (07:00 – 23:00)	General offices, reception areas, retail stores, etc.	50 dBA
Daytime (07:00 – 23:00)	Living/Dining Rooms of residential dwelling units, theatres, places of worship, schools, individual or semi-private offices, conference rooms, etc	45 dBA
Nighttime (23:00 – 07:00)	Sleeping quarters of residential units, hospitals, nursing homes, senior citizen homes, etc	40 dBA

### 3.2 Noise Attenuation Requirements

The noise attenuation requirements remain the same as presented in the previous Noise Control Study report for this development. **Table 3**, which outlines the noise attenuation requirements, is presented here for easy reference. Refer to the previous report for further details of attenuation measures and wording of warning clauses.

**Table 3: City of Ottawa Noise Attenuation Requirements**

Noise Level (dBA)				Noise Attenuation Requirements
Daytime (07:00-23:00)		Nighttime (23:00-07:00)		
Unattenuated	Attenuated	Unattenuated	Attenuated	
<b>OUTDOOR LIVING AREA (OLA)</b>				
OLA < 55				None
55 < OLA < 60				Noise Clause Type A
OLA > 60	OLA < 55			Noise Barrier
OLA > 60	OLA > 55			Noise Barrier Noise Clause Type B
<b>PLANE OF WINDOW (POW)</b>				
POW < 55		POW < 50		None
55 < POW < 65		50 < POW < 60		Forced Air Ventilation Noise Clause Type C
POW > 65		POW > 60		Central Air Conditioning Noise Clause Type D Building Façade Analysis

### 4.0 Prediction of Outdoor Noise Levels

#### 4.1 Roadway Traffic

Predicted noise levels were assessed using the ultimate road and traffic parameters from Appendix B of the City of Ottawa's ENCG. The traffic and roadway parameters used for sound level predictions are shown in **Table 4**.

**Table 4: Traffic and Roadway Parameters**

	<b>Rideau Street (S1)</b>	<b>King Edward Avenue (S2)</b>	<b>Cumberland Street (south of Rideau) (S3)</b>
Roadway Classification	4-Lane Urban Arterial-Undivided	6-Lane Urban Arterial-Divided	2 -Lane Urban Arterial -Undivided
Annual Average Daily Traffic (AADT)	30,000 vehicles/day	50,000 vehicles/day	15,000 vehicles/day
Day / Night Split (%)	92 / 8	92 / 8	92 / 8
Medium Trucks (%)	7	7	7
Heavy Trucks (%)	5	5	5
Posted Speed	40 km/hr	40 km/hr	40 km/hr

Calculations were performed splitting both Rideau St and King Edward Ave into two separate segments each for each direction of vehicle travel (e.g. S1 westward-bound and S1 eastward-bound). It was assumed that traffic volumes are even in each direction of travel.

## 4.2 Noise Level Analysis

Predicted noise levels were modelled using the STAMSON computer program, Version 5.03, issued by the MOE. Receptor locations used in the noise simulations are shown on the attached figure (**Figure 3 – Receptor Location Plan**). Sources located greater than 100m from a receptor were omitted in the simulation for that specific receptor.

Proposed floor levels from the latest Neuf building plans were used. As the surrounding roadways are all relatively flat, it has been assumed that the average existing grade of all roadways is approximately equal to the proposed ground floor elevation of the retail space.

Due to the reflective nature of the ground surface, the propagation of noise over acoustically non-absorptive surfaces would be the same at different elevations along a vertical line, e.g. various floor levels. To remain consistent with the previous Noise Control Study report, sound levels for all receptor locations on different floors are presented.

The STAMSON computer program has a minimum distance of 15.0m to be used in the model calculations. As the proposed building face along Rideau Street is less than 15.0m from the centre of the southwest bound traffic, the actual  $L_{eq}$  sound level at the receptor locations adjacent to Rideau Street were adjusted using the following equation taken from the “Ontario Road Noise Analysis Method for Environment and Transportation” (ORNAMENT) Technical Document by the MOE (1988).

$$L_{eq} = L_{ref} + A_d$$

Where,

$L_{ref}$  is the Reference Sound Level

$A_d$  is the Distance Adjustment.

$$A_d = 10(1 + \alpha)\log(D_{ref}/D)$$

$\alpha = 0$  (for reflective surface)

$D_{ref} = 15.0$  m

D = 12.3 m (for R1 / R5 / R9) and 11.3 m (for R3 / R8 / R12)

The Distance Adjustment ( $A_d$ ) for the receptors in close proximity to Rideau Street were calculated to be as follows:

- R1 / R5 / R9:  $A_d = 0.86$  dBA
- R3 / R8 / R12:  $A_d = 1.23$  dBA

The proposed outdoor living area on the 3<sup>rd</sup> floor is open to the sky and fully surrounded by the proposed building. For the purposes of this noise analysis update, it is concluded that noise levels will meet the requirements for an outdoor living area because there is no direct exposure (line of sight) to any of the modeled noise sources.

#### 4.3 Noise Level Results

The predicted daytime and nighttime noise levels at the selected receptor locations within the development are presented in **Table 5**. Sketches showing the exposure distances and angles used and sample detailed STAMSON modelling calculations are attached.

**Table 5: Simulation Results**

Receptor Name	Receptor Location	Calculated Noise Level - $L_{eq}$ (dBA)	
		Daytime	Nighttime
R1	Podium – SE corner	70.0 *	62.4 *
R2	Podium – NE corner	63.1	55.5
R3	Podium – SW corner	70.4 **	62.8 **
R4	Podium – NW corner	54.5	46.9
R5 / R9	Tower B – SE corner	70.0 *	62.4 *
R6 / R10	Tower B – NE corner	63.1	55.5
R7 / R11	Tower A North – NW corner	54.5	46.9
R8 / R12	Tower A South – SW corner	70.4**	62.8**
R13	Tower A North – SE corner	58.9	51.3

\* Values increased by 0.86 dBA for 15.0m minimum distance adjustment.

\*\* Values increased by 1.23 dBA for 15.0m minimum distance adjustment.

Predicted noise levels for the proposed development exceed the allowable noise level criteria, resulting in the requirement for indoor noise mitigation, which may include the installation of forced air ventilation, air conditioning, and warning clauses. Where noise levels exceed 65 dBA (daytime), the exterior cladding system of the building envelope must be acoustically assessed to ensure the indoor noise criteria is achieved.

#### 4.4 Implementation

The Acoustic Insulation Factor (AIF) method, recognized by the City of Ottawa as an appropriate analysis technique for assessing the building envelope materials, has been used to assess the wall and window requirements.

The required AIF is based on the Outside  $L_{eq}$ , Indoor  $L_{eq}$  required and the number of exterior façade components.

$$\text{Required AIF} = \text{Outside } L_{eq} - \text{Indoor } L_{eq} + \log_{10}(\text{number of components}) + 2 \text{ dB}$$

The largest required Acoustical Insulation Factors for the proposed Towers and podium are calculated as follows:

##### Tower B (Residential Rental):

- $\text{AIF}_{\text{residential(day)}-\text{Tower B}} = 70.0 \text{ dBA} - 45 \text{ dBA} + 10\log(2) \text{ dBA} + 2\text{dBA} = 30$
- $\text{AIF}_{\text{residential(night)}-\text{Tower B}} = 62.4 \text{ dBA} - 40 \text{ dBA} + 10\log(2) \text{ dBA} + 2\text{dBA} = 27$

##### Tower A South (Hotel):

- $\text{AIF}_{\text{residential(day)}-\text{Tower A South}} = 70.4 \text{ dBA} - 45 \text{ dBA} + 10\log(2) \text{ dBA} + 2\text{dBA} = 30$
- $\text{AIF}_{\text{residential(night)}-\text{Tower A South}} = 62.8 \text{ dBA} - 40 \text{ dBA} + 10\log(2) \text{ dBA} + 2\text{dBA} = 28$

##### Podium (Commercial):

- $\text{AIF}_{\text{Commercial(day)}} = 70.4 \text{ dBA} - 50 \text{ dBA} + 10\log(2) \text{ dBA} + 2\text{dBA} = 25$

##### Tower A North (Residential Condominium):

- N/A (Outside  $L_{eq} < 65 \text{ dBA}$ )

Tables 11 and 12 from the document entitled “Acoustic Insulation Factor: A Rating for the Insulation of Buildings Against Outdoor Noise”, produced by the Division of Building Research, National Research Council of Canada, June 1980 (J.D. Quirt) were used to convert the AIF values to Sound Transmission Class, or STC values. Refer to Appendix B of the previous Noise Control Study report for relevant excerpts of this document.

The required STC values for exterior windows and doors and exterior walls are summarized in **Table 8** and **Table 9** respectively.

The architect is to confirm the room floor areas and exterior window/door/wall façade data for the different unit layouts and specify the appropriate STC value for Tower B, Tower A North and the podium. If desired, the ‘worst-case’ window or exterior wall area expressed as percentage of room floor area can be used to determine the required STC values for each Tower and the podium.

**Table 8: Equivalent Sound Transmission Class (STC) Values for Windows and Doors**

Window (or door) area expressed as percentage of room floor area	Conversion	Required STC for Tower B (Rental) and Tower A South (Hotel) (AIF = 30)	Required STC for Podium (Commercial) (AIF = 27)
80 %	STC - 5 = AIF	35	32
63 %	STC - 4 = AIF	34	31
50 %	STC - 3 = AIF	33	30
40 %	STC - 2 = AIF	32	29
32 %	STC - 1 = AIF	31	28
25 %	STC = AIF	30	27
20 %	STC +1 = AIF	29	26
16 %	STC +2 = AIF	28	25
12.5 %	STC +3 = AIF	27	24
10 %	STC +4 = AIF	26	23

**Table 9: Equivalent Sound Transmission Class (STC) Values for Exterior Walls**

Exterior wall area expressed as percentage of room floor area	Conversion	Required STC for Tower B (Rental) and Tower A South (Hotel) (AIF = 30)	Required STC for Podium (Commercial) (AIF = 27)
200 %	STC - 10 = AIF	40	37
160 %	STC - 9 = AIF	39	36
125 %	STC - 8 = AIF	38	35
100 %	STC - 7 = AIF	37	34
80 %	STC - 6 = AIF	36	33
63 %	STC - 5 = AIF	35	32
50 %	STC - 4 = AIF	34	31
40 %	STC - 3 = AIF	33	30
32 %	STC - 2 = AIF	32	29
25 %	STC - 1 = AIF	31	28
20 %	STC = AIF	30	27
16 %	STC + 1 = AIF	29	26

The attenuation measures required to satisfy the City of Ottawa noise criteria and the noise clauses that are to be included on title and in the Agreement of Purchase and Sale for the various dwelling units are summarized in **Table 10**.



**Table 10 - Required Noise Attenuation Measures**

<b>Buildings</b>	<b>Attenuation Measure</b>	<b>Notice on Title</b>
Tower A South (Hotel), Tower B (Rental), Commercial	Central Air Conditioning. Acoustically selected walls and windows for all rooms.	D
Tower A North (Condo)	Forced Air Ventilation	C

## 5.0 **CONCLUSIONS**

The revised analysis of the impact of roadway traffic indicates attenuation measures will be necessary.

The following is a summary of the attenuation measures and notice requirements to be placed on title for all units.

### **Residential – Tower A South (Hotel)**

- Provide Central Air Conditioning;
- Provide window assembly to meet a sound transmission class (STC) as per Table 8.
- Provide wall assembly to meet a sound transmission class (STC) as per Table 9.
- Notice on title: Type D - "This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of Environment's noise criteria."

### **Residential – Tower B (Rental)**

- Provide Central Air Conditioning;
- Provide window assembly to meet a sound transmission class (STC) as per Table 8.
- Provide wall assembly to meet a sound transmission class (STC) as per Table 9.
- Notice on title: Type D - "This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of Environment's noise criteria."

### **Residential – Tower A North (Condo)**

- Provide Forced Air Ventilation;
- Notice on title: Type C - "This dwelling unit is fitted with a forced air heating system and the ducting, etc. was sized to accommodate a central air conditioning system. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of Environment's noise criteria. (Note: The location and installation of the outdoor air conditioning device should be done so as to comply with noise criteria of MOE Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property.)"

**Commercial**

- Provide Central Air Conditioning;
- Provide window assembly to meet a sound transmission class (STC) as per Table 8.
- Provide wall assembly to meet a sound transmission class (STC) as per Table 9.
- Notice on title: Type D - "This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of Environment's noise criteria."

In closing, Novatech recommends the City of Ottawa accept the findings of this Noise Control Study addendum letter as part of the site plan approval requirements for the 245 Rideau Street development.

Yours truly,

**NOVATECH**

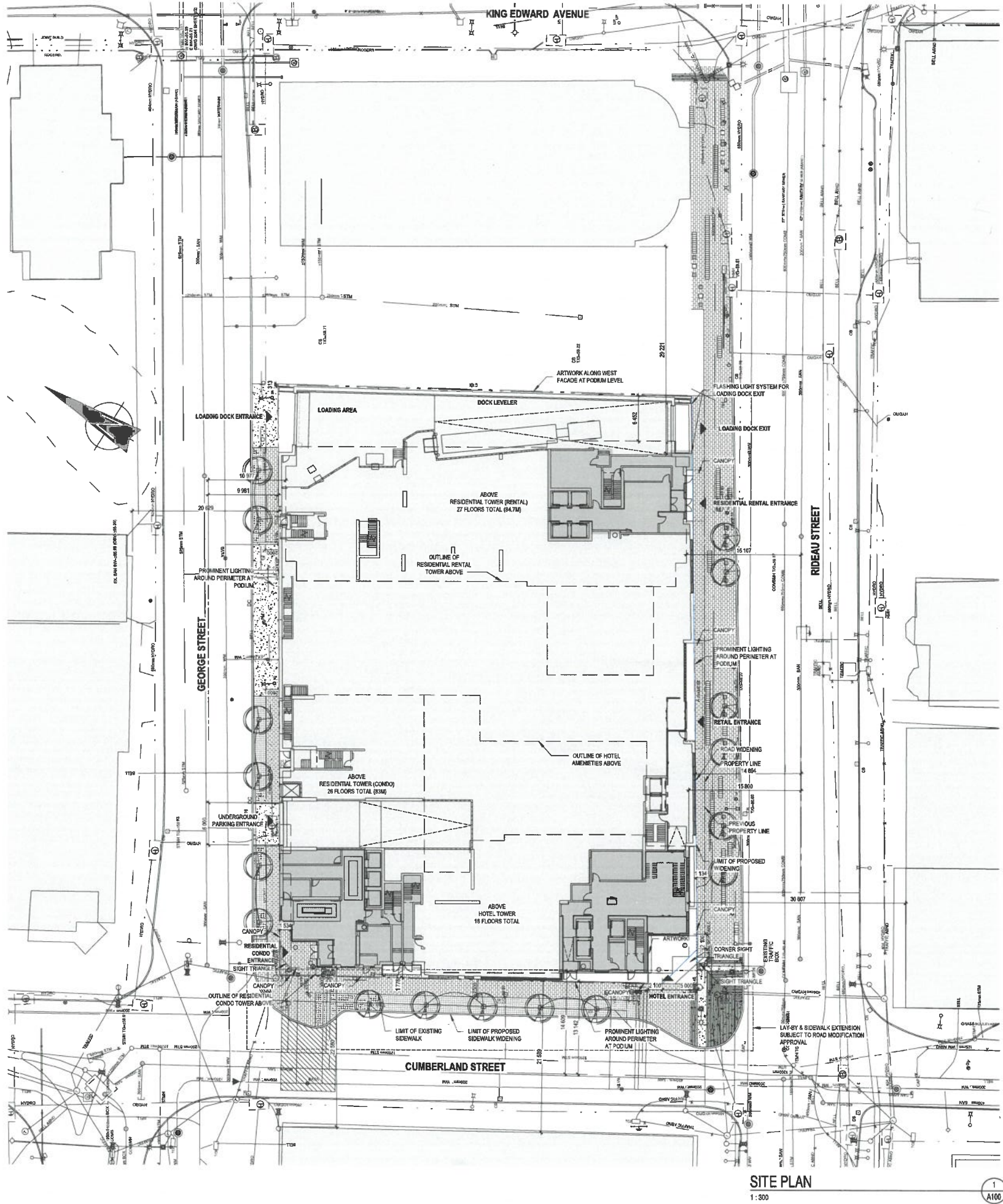


Greg MacDonald, P.Eng.  
Director, Land Development and Public Sector Infrastructure

**ATTACHMENTS:**

- Site Plan
- Figure 3: Receptor Location Plan
- Modelling Angle Sketches
- Sample STAMSON calculations





SITE PLAN  
1:300



MIXED-USE WITH GROUND FLOOR COMMERCIAL, TWO RESIDENTIAL BUILDINGS AND ONE HOTEL ZONING - MDS4		
ZONING MECHANISM	REGULATION	PROPOSED
Minimum lot area	No minimum	4575m²
Minimum lot width	No minimum	46.15m
Minimum front yard and corner side yard	No minimum	Cumberland Street: 6m Corner Side Yard - Rideau Street: 6m Corner Side Yard - George Street: 6m
Maximum building height	As per schedule B4	85m to 84.7m including mechanical penthouse
Maximum floor space index	Not applicable	Not applicable
Minimum width of landscape area	No minimum except that where a yard is provided and not used for required driveways, stairs, parking, loading spaces, or outdoor commercial patio, the whole yard must be landscaped	0m
Commercial use at ground floor	100% of the ground floor along Rideau Street (excluding mechanical / lobby areas) must be occupied by commercial uses	100% of the ground floor along Rideau Street (excluding mechanical / lobby areas) is occupied by commercial uses

NBR UNITS / STOREYS	PREVIOUS PROPOSAL (2016)	ACTUAL PROPOSAL	DIFFERENCE
TOWER A CONDO	202 UNITS / 26 STOREYS	238 UNITS / 26 STOREYS (86 x Studio; 168 x 1BR; 64 x 2BR)	+36 UNITS / -
TOWER A HOTEL	324 ROOMS / 19 STOREYS	208 ROOMS / 18 STOREYS (208 UNITS)	-16 UNITS / -1 STOREY
TOWER B RENTAL	241 UNITS / 28 STOREYS	341 UNITS / 27 STOREYS (21 x Studio; 216 x 1BR; 89 x 2 BR; 6 x 3BR)	+100 UNITS / -1 STOREY
RETAIL	2 STOREYS	1 STOREY (OF ONLY)	-1 STOREY

GFA BY USE	PREVIOUS PROPOSAL (2016)	ACTUAL PROPOSAL	DIFFERENCE
TOWER A CONDO	13 662m²	13 710m²	+48m²
TOWER A HOTEL	8 156m²	7 878m²	-278m²
TOWER B RENTAL	21 553m²	20 670m²	-883m²
RETAIL 1*	4 250m²	0m²	-4 250m²
RETAIL 2	2 881m²	2 958m²	+77m²
TOTAL	50 482m²	45 486m²	-4996m²*

\* Second floor retail 1 removed from project

AMENITY AND PARKING REQUIREMENTS ZONING - MDS4 - AREA Z		
ZONING MECHANISM	REGULATION	PROPOSED
Residential Parking	None Required	Residential Condo: 102 spaces Residential Rental: 124 spaces Total: 226 spaces
Visitor Parking	Residential Area Z (By-law 2016-249) Within areas X, Y, Z, no more than 30 Visitor spaces are required per building. Total: 30 required spaces	Condo / Rental: 30 spaces Total: 30 spaces
Commercial Parking	None Required (Retail Food Store Max. 36 spaces)	Retail: 27 spaces Hotel: 98 spaces Total: 123 spaces
Total Parking	Total: 30 required spaces (Res. Visitor)	Total Parking: 379 spaces
Minimum bicycle parking	Residential: 0.5/dwelling (0.5*979=289.5) Retail: 1 (226 m² of GFA) (255/250=1.1) Hotel: 1 (1000 m² of GFA) (2564/1000=12.7) Total: 315 required bicycle spaces	Residential: 230 interior spaces (P1 & P2) Rental: 12 interior spaces (P1) Hotel: 13 interior spaces (P1) Total: 315 blue parking (P1 & P2)
Minimum driveway width	6m	6m
Minimum aisle width	6m	6m
Loading	Min. 3 loading bays	Ground level: 2 loading bays P1 level: 1 loading bay Total: 3 loading bays
Amenities Area Requirements	Total Amenity Area - 6m² per dwelling unit 238 dwelling units (condo) x 6m² = 1428m² 341 dwelling units (rental) x 6m² = 2046m² Total required Amenity Area = 5474m²  Commercial Amenity Area - 50% of the required total Amenity Area = 1737m² Layout of Commercial Amenity Area - aggregated into areas up to 54m²	Total Amenity Areas: Condo Tower = 1880 m² Rental Tower = 2455 m² Total proposed Amenity Area: 4335 m²  Total Commercial Amenity Area: Condo Tower = 740 m² Rental Tower = 1035 m² Total proposed Commercial Amenity Area: 1775 m²

NOTES GÉNÉRALES General Notes

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- Veuillez éviter l'écriture de toute dimension en noir et blanc. / The architect must be notified of all errors, omissions and discrepancies between these documents and those of the others professionals.
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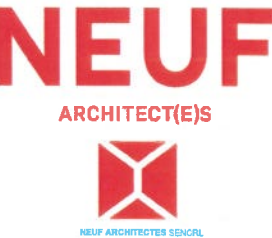
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SCÉAU / Seal



OUVRAGE Project  
**ROYALE DEVELOPMENT  
TOWER A**  
EMPLACEMENT Location NO PROJET No.  
245 RIDEAU STREET, 10914.01  
OTTAWA

NO	REVISION	DATE (aa-mm-jj)
A	ISSUED FOR FOUNDATION PERMIT	2019.06.21
B	SITE PLAN REVISION	2019.08.08
C	SITE PLAN REVISION	2019.08.30
D	ISSUED FOR EXCAVATION PERMIT	2019.11.18
E	RE-ISSUED FOR FOUNDATION PERMIT	2019.12.06
F	HOTEL COORDINATION	2019.12.10
G	FOR COORDINATION (7 FLOOR PLATES)	2020.01.31

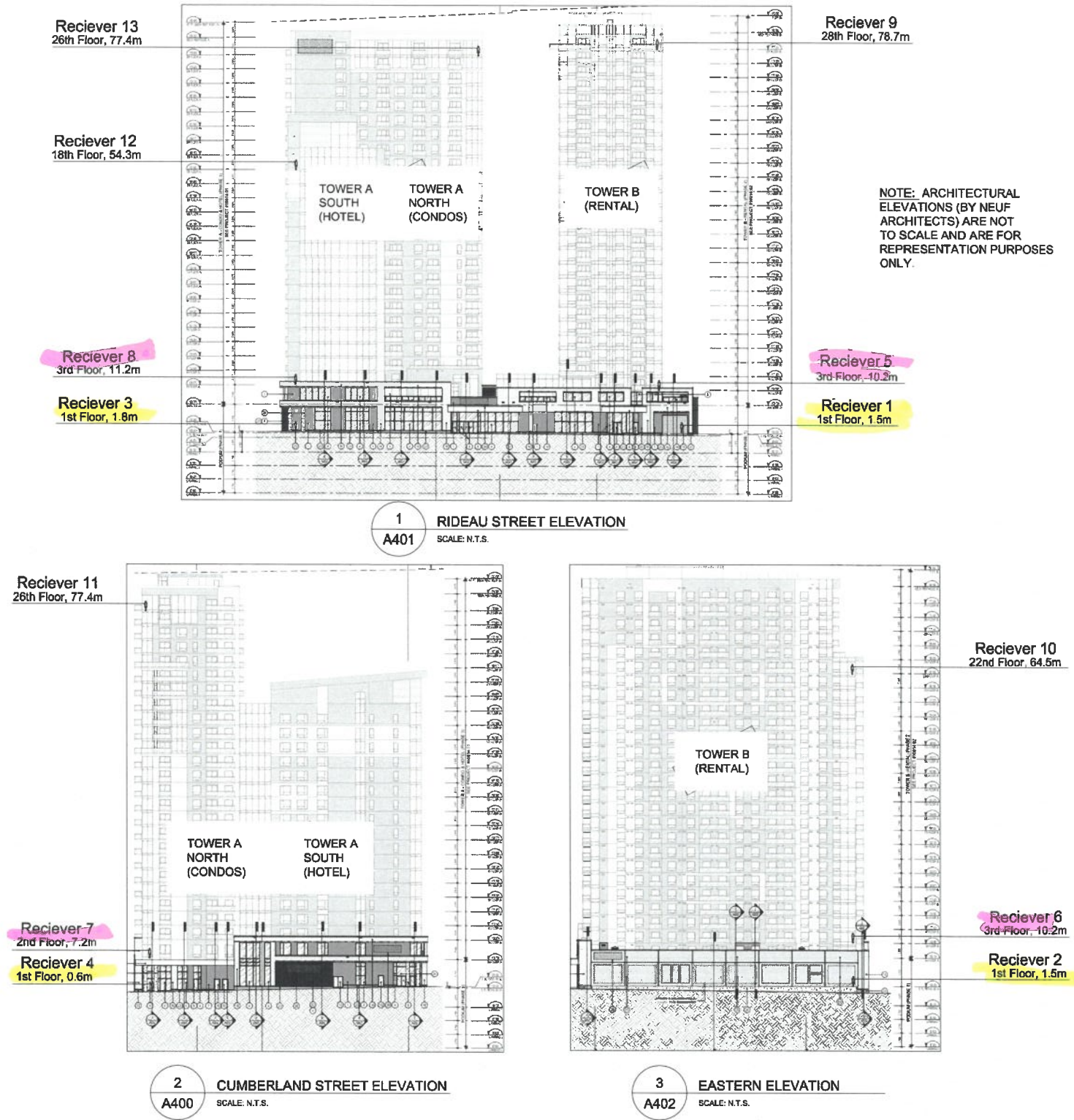
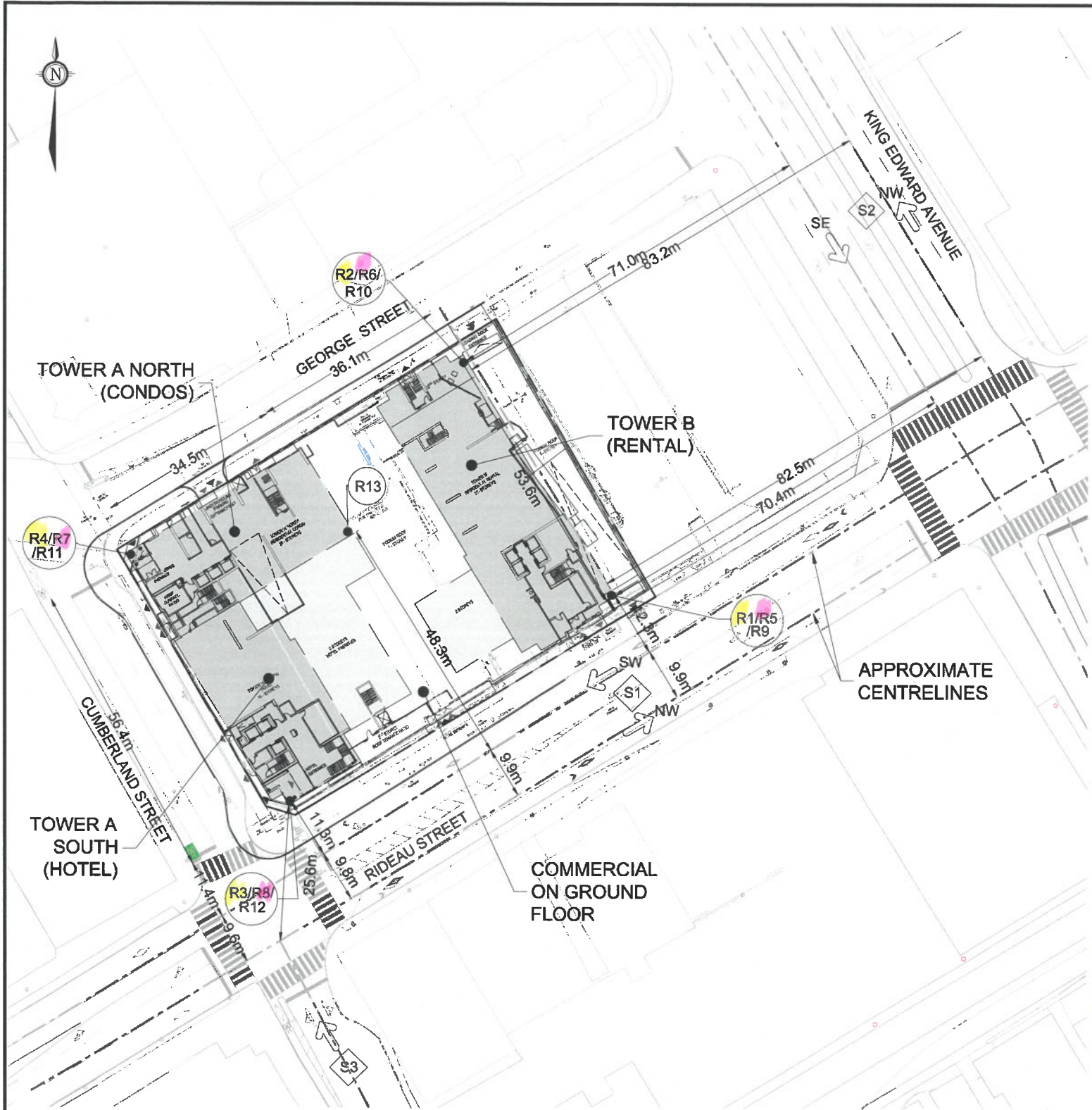
DESSINÉ PAR Drawn by  
DATE (aa-mm-jj) MAY 2019  
TITRE DU DESSIN Drawing Title  
NO. DESSIN Dwg Number  
VERIFIÉ PAR Checked by  
ALQ/LH  
ECHAELLE Scale  
1:300

**SITE PLAN AT GROUND  
FLOOR LEVEL**

REVISION Revision NO. DESSIN Dwg Number  
**G A100**

D07-12-19-0072





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 Website www.novatech-eng.com

SCALE	
PLAN	1:1000
ELEVATION PROFILE	N.T.S.

245 RIDEAU ST.  
CITY OF OTTAWA

RECEPTOR LOCATION PLAN

SAMPLE STAMSON CALCULATIONS

(R1 – R4)

STAMSON 5.0      SUMMARY REPORT      Date: 24-02-2020 15:22:34  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r1.te      Time Period: Day/Night 16/8 hours  
Description:

Road data, segment # 1: S2 NW (day/night)

-----  
Car traffic volume : 20240/1760 veh/TimePeriod \*  
Medium truck volume : 1610/140 veh/TimePeriod \*  
Heavy truck volume : 1150/100 veh/TimePeriod \*  
Posted speed limit : 40 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 25000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: S2 NW (day/night)

-----  
Angle1 Angle2 : -57.00 deg 30.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 82.50 / 82.50 m  
Receiver height : 1.50 / 1.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



Road data, segment # 2: S2 SE (day/night)

-----  
Car traffic volume : 20240/1760 veh/TimePeriod \*  
Medium truck volume : 1610/140 veh/TimePeriod \*  
Heavy truck volume : 1150/100 veh/TimePeriod \*  
Posted speed limit : 40 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 25000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: S2 SE (day/night)

-----  
Angle1 Angle2 : -57.00 deg 30.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 70.40 / 70.40 m  
Receiver height : 1.50 / 1.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



Road data, segment # 3: S1 SW (day/night)

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 40 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: S1 SW (day/night)

-----  
Angle1 Angle2 : -88.00 deg 67.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 15.00 / 15.00 m  
Receiver height : 1.50 / 1.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Road data, segment # 4: S1 NE (day/night)

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 40 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 4: S1 NE (day/night)

-----  
Angle1 Angle2 : -88.00 deg 67.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 22.20 / 22.20 m  
Receiver height : 1.50 / 1.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Result summary (day)

	! source	! Road	! Total	
	! height	! Leq	! Leq	
	! (m)	! (dBA)	! (dBA)	
1.S2 NW	!	1.50 !	58.34 !	58.34
2.S2 SE	!	1.50 !	59.03 !	59.03
3.S1 SW	!	1.50 !	66.04 !	66.04
4.S1 NE	!	1.50 !	64.33 !	64.33
Total				69.14 Dba

Result summary (night)

	! source	! Road	! Total	
	! height	! Leq	! Leq	
	! (m)	! (dBA)	! (dBA)	
1.S2 NW	!	1.50 !	50.75 !	50.75
2.S2 SE	!	1.50 !	51.44 !	51.44
3.S1 SW	!	1.50 !	58.44 !	58.44
4.S1 NE	!	1.50 !	56.74 !	56.74
Total				61.55 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.14  
(NIGHT): 61.55

STAMSON 5.0      SUMMARY REPORT      Date: 24-02-2020 15:24:30  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2.te      Time Period: Day/Night 16/8 hours  
Description:

Road data, segment # 1: S1 SW (day/night)

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 40 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: S1 SW (day/night)

-----  
Angle1 Angle2 : -59.00 deg -1.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 65.90 / 65.90 m  
Receiver height : 1.50 / 1.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Road data, segment # 2: S1 NE (day/night)

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 40 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: S1 NE (day/night)

-----  
Angle1 Angle2 : -59.00 deg -1.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 75.80 / 75.80 m  
Receiver height : 1.50 / 1.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Road data, segment # 3: S2 NW (day/night)

-----  
Car traffic volume : 20240/1760 veh/TimePeriod \*  
Medium truck volume : 1610/140 veh/TimePeriod \*  
Heavy truck volume : 1150/100 veh/TimePeriod \*  
Posted speed limit : 40 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 25000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: S2 NW (day/night)

-----  
Angle1 Angle2 : -27.00 deg 56.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 83.20 / 83.20 m  
Receiver height : 1.50 / 1.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Road data, segment # 4: S2 SE (day/night)

-----  
Car traffic volume : 20240/1760 veh/TimePeriod \*  
Medium truck volume : 1610/140 veh/TimePeriod \*  
Heavy truck volume : 1150/100 veh/TimePeriod \*  
Posted speed limit : 40 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 25000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 4: S2 SE (day/night)

-----  
Angle1 Angle2 : -27.00 deg 56.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 71.00 / 71.00 m  
Receiver height : 1.50 / 1.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Result summary (day)

	! source	! Road	! Total	
	! height	! Leq	! Leq	
	! (m)	! (dBA)	! (dBA)	
1.S1 SW	!	1.50 !	55.34 !	55.34
2.S1 NE	!	1.50 !	54.73 !	54.73
3.S2 NW	!	1.50 !	58.10 !	58.10
4.S2 SE	!	1.50 !	58.79 !	58.79
Total			63.10 dBA	

Result summary (night)

	! source	! Road	! Total	
	! height	! Leq	! Leq	
	! (m)	! (dBA)	! (dBA)	
1.S1 SW	!	1.50 !	47.74 !	47.74
2.S1 NE	!	1.50 !	47.13 !	47.13
3.S2 NW	!	1.50 !	50.51 !	50.51
4.S2 SE	!	1.50 !	51.19 !	51.19
Total			55.50 dBA	

TOTAL Leq FROM ALL SOURCES (DAY): 63.10  
(NIGHT): 55.50



STAMSON 5.0      SUMMARY REPORT      Date: 24-02-2020 15:25:44  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r3.te      Time Period: Day/Night 16/8 hours  
Description:

Road data, segment # 1: S1 SW (day/night)

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 40 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: S1 SW (day/night)

-----  
Angle1 Angle2 : -90.00 deg 87.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 15.00 / 15.00 m  
Receiver height : 1.80 / 1.80 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Road data, segment # 2: S1 NE (day/night)

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 40 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: S1 NE (day/night)

-----  
Angle1 Angle2 : -90.00 deg 87.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 21.10 / 21.10 m  
Receiver height : 1.80 / 1.80 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Road data, segment # 3: S3 NW (day/night)

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 40 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: S3 NW (day/night)

-----  
Angle1 Angle2 : -76.00 deg -48.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 25.60 / 25.60 m  
Receiver height : 1.80 / 1.80 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Result summary (day)

	! source	! Road	! Total	
	! height	! Leq	! Leq	
	! (m)	! (dBA)	! (dBA)	
1.S1 SW	!	1.50 !	66.61 !	66.61
2.S1 NE	!	1.50 !	65.13 !	65.13
3.S3 NW	!	1.50 !	56.28 !	56.28
Total			69.17 dBA	

Result summary (night)

	! source	! Road	! Total	
	! height	! Leq	! Leq	
	! (m)	! (dBA)	! (dBA)	
1.S1 SW	!	1.50 !	59.02 !	59.02
2.S1 NE	!	1.50 !	57.53 !	57.53
3.S3 NW	!	1.50 !	48.69 !	48.69
Total			61.58 dBA	

TOTAL Leq FROM ALL SOURCES (DAY): 69.17  
(NIGHT): 61.58

STAMSON 5.0      SUMMARY REPORT      Date: 24-02-2020 15:26:40  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r4.te      Time Period: Day/Night 16/8 hours  
Description:

Road data, segment # 1: S1 SW (day/night)

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 40 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: S1 SW (day/night)

-----  
Angle1 Angle2 : 1.00 deg 22.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 67.80 / 67.80 m  
Receiver height : 0.60 / 0.60 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Road data, segment # 2: S1 NE (day/night)

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 40 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: S1 NE (day/night)

-----  
Angle1 Angle2 : 1.00 deg 22.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 77.40 / 77.40 m  
Receiver height : 0.60 / 0.60 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Road data, segment # 3: S3 NW (day/night)

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 40 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: S3 NW (day/night)

-----  
Angle1 Angle2 : 3.00 deg 14.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 77.40 / 77.40 m  
Receiver height : 0.60 / 0.60 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Result summary (day)

	! source	! Road	! Total	
	! height	! Leq	! Leq	
	! (m)	! (dBA)	! (dBA)	
1.S1 SW	!	1.50 !	50.80 !	50.80
2.S1 NE	!	1.50 !	50.23 !	50.23
3.S3 NW	!	1.50 !	47.42 !	47.42
Total			54.49 dBA	

Result summary (night)

	! source	! Road	! Total	
	! height	! Leq	! Leq	
	! (m)	! (dBA)	! (dBA)	
1.S1 SW	!	1.50 !	43.21 !	43.21
2.S1 NE	!	1.50 !	42.63 !	42.63
3.S3 NW	!	1.50 !	39.82 !	39.82
Total			46.89 dBA	

TOTAL Leq FROM ALL SOURCES (DAY): 54.49  
(NIGHT): 46.89