

## PROPOSED DEVELOPMENT AT 1117 LONGFIELDS DRIVE / 1034 MCGARRY TERRACE

BARRHAVEN, ONTARIO

### NOISE FEASIBILITY ASSESSMENT

RWDI #1802100

January 15, 2018

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## EXECUTIVE SUMMARY

RWDI was retained by 1879369 Ontario Inc. to conduct an environmental noise feasibility study as part of the Site Plan Approval (SPA) for the proposed development, to be located at the northwest corner of Longfields Drive and Marketplace Avenue in Barrhaven, Ontario. The purpose of this assessment was to predict noise levels affecting the proposed development using the applicable guidelines and to determine the overall feasibility of the project.

This study assessed sound impacts due to road-traffic noise and stationary sources surrounding the development, as well as aircraft noise originating from air traffic at Ottawa International Airport. The sound levels modelled for the road-traffic noise and stationary sources were assessed using the City of Ottawa guidelines, and supplemented where applicable by MOECC Publication NPC-300. Per both guidelines, the impacts from road traffic noise, air traffic noise, and stationary sources were assessed separately.

The sound levels due to road-traffic sources are predicted to exceed the Ottawa City Guidelines and NPC-300 sound level limits at the proposed development. For road-traffic sources, the development can meet the requirements with:

- The implementation of central air conditioning; and
- Warning clauses in purchase or lease/rental agreements.

For sound due to air traffic noise, it is predicted that the proposed development will meet NPC-300 and Ottawa City Guidelines.

For sound due to surrounding stationary sources, it is anticipated that the proposed development will meet the NPC-300 and Ottawa City Guidelines limits following a 1-hour background sound modelling assessment. This is to be completed as part of the detailed design.

The feasibility study is based on assumptions regarding currently-available building configuration and construction information and therefore the resulting recommendations are broad. As such, the recommendations must be refined by a detailed design study prior to the construction of the building to ensure that appropriate noise control measures have been incorporated into the final design.



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## 1 INTRODUCTION

RWDI AIR Inc. (RWDI) was retained by 1879369 Ontario Inc. to conduct an environmental noise feasibility study as part of the Site Plan Approval (SPA) for the proposed development, to be located at the northwest corner of Longfields Drive and Marketplace Avenue in Barrhaven, Ontario. The purpose of this assessment was to predict noise levels affecting the proposed development using the applicable guidelines and to determine the overall feasibility of the project. This assessment is based on the design drawings received on December 22<sup>nd</sup>, 2017.

The relevant sources of sound for a noise impact assessment are as follows: City of Ottawa Environmental Noise Control Guidelines (Ottawa City Guidelines) and Ministry of the Environment and Climate Change (MOECC) Publication NPC-300 (NPC-300):

- Transportation-related sources, in this case sound due to road traffic and air traffic from Ottawa International Airport; and
- Stationary sources, in this case existing heating ventilation and air-conditioning (HVAC) equipment on surrounding commercial/institutional buildings.

The scope of this study did not include evaluation of noise from stationary sources proposed as part of the development itself. The mechanical equipment will be designed to achieve compliance with City of Ottawa and MOECC guidelines.

## 2 DESCRIPTION OF PROJECT AND SITE

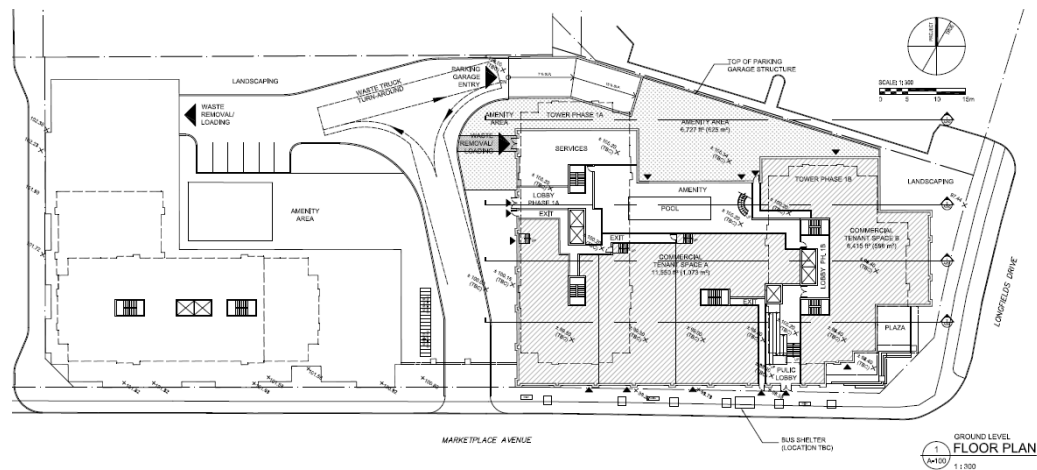
The proposed development site will be located on the northwest corner of the intersection of Longfields Drive and Marketplace Avenue in Barrhaven, Ontario (see Figure 1). The proposed development includes two phases. The current assessment focused on Phase 1, which includes Phase 1A tower of 16 storeys and Phase 1B tower of 15 storeys connected by a three-storey podium (see Figure 2). The future Phase 2 development would consist of a lower tower to cover the west portion of the site that would be separated from Phase 1 by a driveway (see Figure 3). This noise feasibility study does not include Phase 2.

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**Figure 1:** Aerial View of Existing Site and Surroundings





Marketplace Avenue, Longfields Drive, and Strandherd Drive are the nearest sources of road traffic noise. Ottawa International Airport is approximately eight kilometres to the northeast of the site, and thus is included in this assessment. There are no other transportation-related noise sources, such as rail lines, in close proximity to the development. Pierre Savard Catholic Secondary School, across Longfields Drive to the east of the development, has mechanical equipment which is a source of stationary sound.

## 3 SOUND ON PROPOSED DEVELOPMENT

The detailed evaluation of transportation-related and stationary sources affecting the development were assessed using the MOECC Land Use Compatibility D-Series Guidelines (MOECC, 1995), the MOECC NPC-300 Guidelines (MOECC, 2013) and the City of Ottawa Environmental Noise Control Guidelines (City of Ottawa, 2016). The relevant section of NPC-300 is Part C – Land Use Planning, which specifies that the identified road traffic, air traffic, and stationary sources are to be assessed separately. The relevant sections of Ottawa City Guidelines are Part 1 – Environmental Noise Control Guidelines for Land Use Planning and Part 4 – Technical Requirements for Environmental Noise Control Studies and Implementation.

### 3.1 Road-Traffic Noise Assessment

#### 3.1.1 Road-Traffic Source Assessment Criteria

For assessing sound originating from road-traffic sources, both Ottawa City Guidelines and NPC-300 define sound level criteria for two classes of locations: outdoor living areas (OLAs) and indoor areas of sensitive uses.

An OLA is defined as an outdoor area easily accessible from the building and designed for the quiet enjoyment of the outdoor environment. Courtyards, terraces and balconies (with a depth of more than 4 m) are considered noise-sensitive OLAs. The daytime sound level limit for OLAs is an equivalent sound level ( $L_{EQ}$ ) of 55 dBA averaged over the daytime hours (07:00 to 23:00h). Neither Ottawa City Guidelines nor NPC-300 define a nighttime sound level limit for OLAs.

Indoor spaces are limited by daytime and nighttime sound level restrictions based on the type of usage, such as living/dining rooms or bedrooms. Indoor living areas within the proposed developments include dining/living rooms and bedrooms. The sound level criteria are based on all windows and doors being closed to the environment. The daytime sound level limit for indoor spaces is an  $L_{EQ}$  of 45 dBA averaged over 07:00 to 23:00h. The nighttime sound level limits for indoor spaces are  $L_{EQ}$ s of 45 and 40 dBA averaged over 23:00 to 07:00h, for an indoor living area and sleeping quarters, respectively. As no details regarding the specific layouts of the residential units was available at the time of the assessment, the more conservative 40 dBA limit was used for all indoor spaces evaluated.

The Ottawa City Guidelines and NPC-300 sound level criteria for road traffic sources are summarized in Table 1.

**Table 1:** Ottawa City Guidelines and NPC-300 Road-Traffic Source Sound Level Criteria for Sensitive Land Uses

Assessment Location	Time of Day	Time Period	Sound Level Limit <sup>(1)</sup>
Outdoor Living Area	Daytime	07:00-23:00h	55 dBA
Indoor Living Area	Daytime	07:00-23:00h	45 dBA
	Nighttime	23:00-07:00h	45 dBA
Sleeping Quarters	Daytime	07:00-23:00h	45 dBA
	Nighttime	23:00-07:00h	40 dBA

1. The average sound level over the time period at the assessment location must not exceed the sound level limit.

### 3.1.2 Traffic Data

The City of Ottawa requires assessment of all arterial, collector, or major collector roads which are located 100 metres from the proposed development. At the proposed location, three roadways were evaluated: Marketplace Avenue to the south, Longfields Drive to the east, and Strandherd Drive to the north. Strandherd Drive does not fall within 100 metres of the proposed development, but was included to allow for a conservative assessment. The location of the proposed development in relation to these roadways is shown in Figure 1.

As per Schedule E of the City of Ottawa Official Plan, and in conjunction with Appendix B of Part 4 of Ottawa City Guidelines, Marketplace Avenue was identified as a 2-Lane Major Collector, while Longfields Drive and Strandherd Drive were classified 4-Lane Urban Arterial-Divided. The corresponding ultimate annual average daily traffic (AADT), vehicle type breakdown, and daytime-nighttime split data values provided by Appendix B are summarized in Table 2, along with respective road traffic speeds.

Roadway Link	Ultimate AADT <sup>(1)</sup> (2027)	Daytime / Nighttime Split (%Day / %Night)	%Light	%Medium	%Heavy	Speed (km/hr)
Marketplace Avenue	12000	92 / 8	88	7	5	50
Longfields Drive	35000		88	7	5	50
Strandherd Drive	35000		88	7	5	70

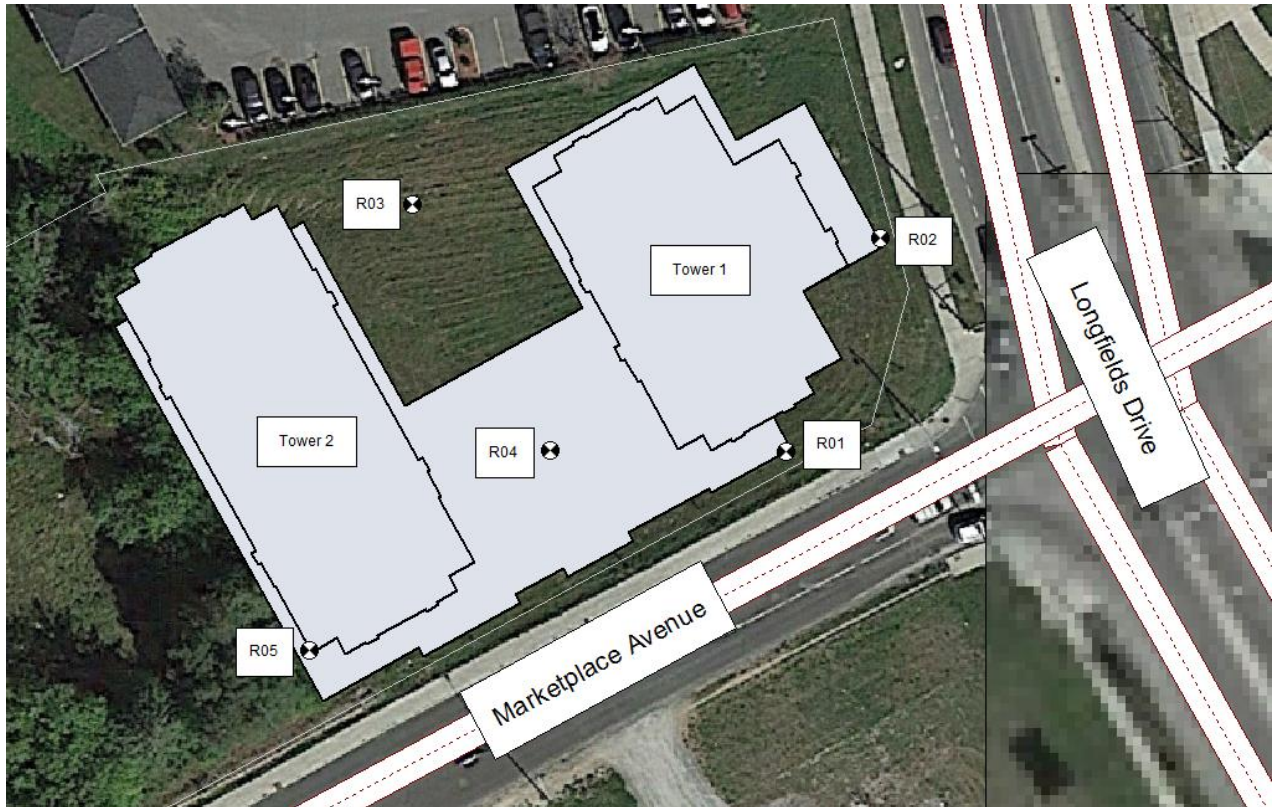
**Table 2:** Road Traffic Data for Transportation-related Source Assessment

1. AADT – Annual Average Daily Traffic.



### 3.1.3 Representative Receptors for Transportation Sources

The selection of receptors is based on drawings dated December 22<sup>nd</sup>, 2017, which show the intended use of areas within the proposed building and locations of outdoor living areas. The locations of the receptors in relation to the roadways and the development site plan are shown in Figure 4.



**Figure 4:** Representative Receptors for Traffic Modelling

Five worst-case outdoor receptors were selected for modelling:

- R01 – Podium – Southeast Facade
- R02 – Podium – Northeast Facade
- R03 – OLA – Rear Amenity Area
- R04 – Podium OLA – Amenity Area
- R05 – Tower 2 – Southwest Facade

Facade receptor locations represent the exterior plane of window into indoor sensitive areas such as sleeping or living rooms. No private balconies on the towers or the podium have a depth of more than four meters, and were not assessed. Therefore, only common amenity areas – on the podium and at the rear of the property – were considered as OLAs.



### 3.1.4 Noise Modelling Results

Sound levels due to road traffic were predicted using ORNAMENT. The sound level calculations are provided in Appendix B with results summarized in Table 3. The predicted facade sound levels represent the sound levels at the exterior plane of the window. Indoor sound levels were calculated from the plane of window calculation by assuming a 10 dB loss through an open window, consistent with industry standard practice.

OLA nighttime calculations were not necessary, as Ottawa City Guidelines and NPC-300 do not specify a nighttime limit. Additionally, indoor sound level limits may not be applied to OLAs.

**Table 3:** Results of Facade ORNAMENT Modelling for Traffic-Noise Assessment

Receptor	Predicted Facade or OLA Road-Traffic Sound Exposures (dBA)		Predicted Indoor Road-Traffic Sound Exposures (dBA) <sup>[1]</sup>		Sound Level Limit (dBA) <sup>[2]</sup>		Meets Criteria? (Yes/No)
	Daytime L <sub>EQ</sub> , 16hr	Nighttime L <sub>EQ</sub> , 8hr	Daytime L <sub>EQ</sub> , 16hr	Nighttime L <sub>EQ</sub> , 8hr	Daytime L <sub>EQ</sub> , 16hr	Nighttime L <sub>EQ</sub> , 8hr	
<b>R01 - Facade</b>	71	63	61	53	45	40	No
<b>R02 - Facade</b>	72	65	62	55	45	40	No
<b>R03 - OLA</b>	58	-	-	-	55	-	No
<b>R04 - OLA</b>	58	-	-	-	55	-	No
<b>R05 - Facade</b>	65	57	55	47	45	40	No

1. Predicted indoor sound levels include a 10 dB reduction in sound level due to loss through an open window.
2. Sound level limits are indoors for Façade locations and outdoors for OLA locations.

Sound levels from road traffic at all receptors exceed the City of Ottawa and MOECC sound level limits. Noise control recommendations are presented in the following section.

### 3.1.5 Addressing Excess Sound

For facade receptors where the sound level at the window is greater than 65 dBA during the daytime, and/or 60 dBA during the nighttime, which includes R01 and R02, both the City of Ottawa and the MOECC require that the residential unit includes the installation of central air conditioning. NPC-300 also requires a warning clause "Type D" included. For facade receptors where the sound level at the window is greater than 55 dBA during the daytime, and/or 50 dBA during the nighttime, which includes receptor R05, warning clause "Type C" must be included, which requires the dwelling to be designed to allow for installation of air conditioning. If the proposed development will be built with central air conditioning for all units, Warning clause "Type D" is appropriate for all units.

The wording of the “Type D” warning clause is presented in Section 4. In addition to NPC-300 warning clause requirements, Ottawa City Guidelines require standard city wording to be included in any warning clause, examples of which can be found in the City of Ottawa guidelines. This city-mandated warning clause language requirement should be revisited during the detailed design stage, after design and building components have been confirmed. Final wording of any warning clause must be approved by the City of Ottawa.

For OLA receptors where the sound level at the OLA is greater than 55 dBA, but less than or equal to 60 dBA, which includes both OLAs investigated, warning clause “Type A” must be included. If mitigation is installed that reduces the levels at the OLAs below 55 dBA, then no warning clause is required. It is recommended that the safety railing or parapet surrounding the rooftop amenity area be constructed of a solid, continuous material with a minimum face density of 20 kg/m<sup>2</sup>.

In addition to the required warning clauses, building components including windows, walls and doors need to be designed to ensure the indoor sound levels comply with the limits detailed in Table 3. Indoor sound level limits are predicted to meet requirements with standard Ontario Building Code window, wall and door construction.

## 3.2 Air Traffic Noise Assessment

### 3.2.1 Air-Traffic Source Assessment Criteria

For assessing sound originating from air-traffic sources, both Ottawa City Guidelines and NPC-300 again define sound level criteria for two classes of locations: OLAs and indoor areas of sensitive uses.

The sound level limit for both classes of sources is based on Noise Exposure Forecast/Noise Exposure Projection (NEF/NEP) contours. Per NPC-300, it is set at a NEF/NEP value of 30. The conversion to a 24-hour Leq limit yields a value of 62 dBA. Since 2005, new residential developments in aircraft zones above the NEF/NEP values have been largely banned. For areas where NEF/NEP contours do not reach 30, the limits are as given in Table 4. If the outdoor limit is less than an NEF value of 25, no further assessment is required.

**Table 4:** Ottawa City Guidelines and NPC-300 Air-Traffic Sound Level Criteria for Sensitive Land Uses

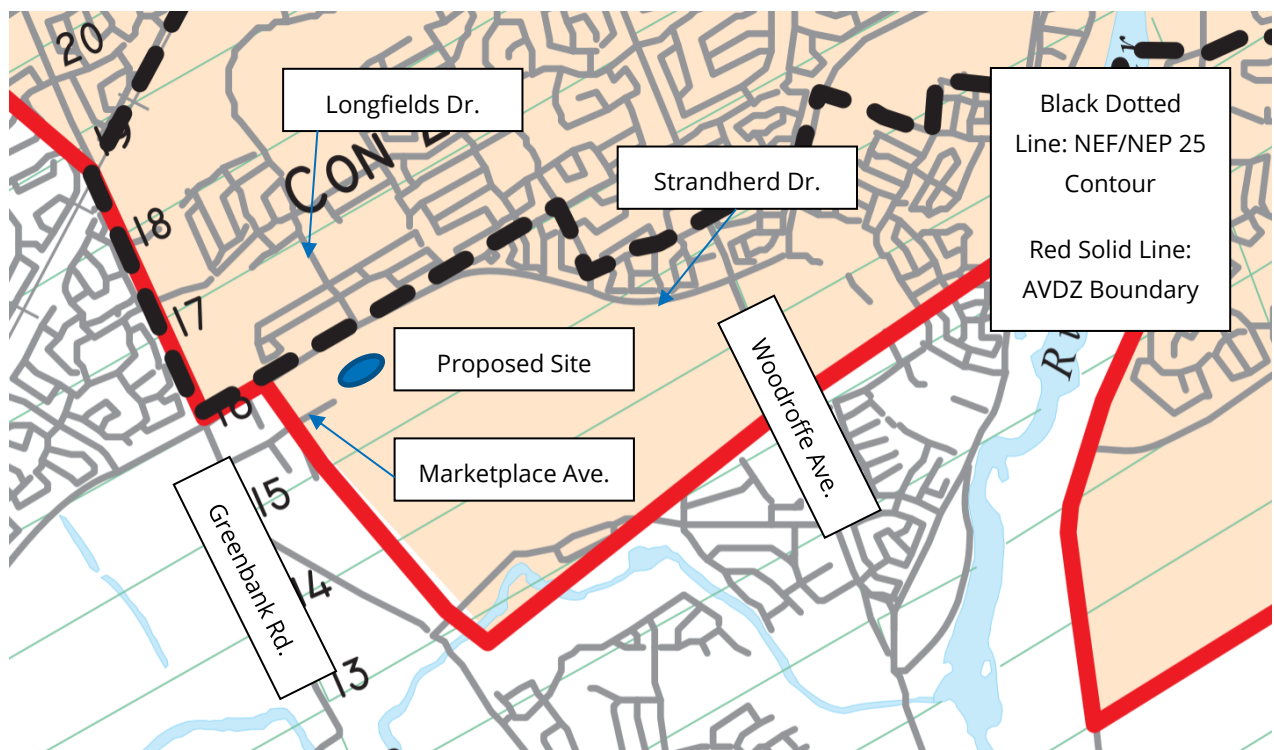
Assessment Location	Time of Day	NEF/NEP	Corresponding Leq Limit <sup>[1]</sup>
Outdoor Area	Full Day	30	62 dBA
Indoor Living Area	Full Day	5	37 dBA
Indoor Sleeping Quarters	Full Day	0	32 dBA

1. The average sound level over the entire day at the assessment location must not exceed the sound level limit.

Ottawa City Guidelines refer to the Airport Operating Influence Zone (AOIZ), which mimics NEF/NEP 30 contours, and within which new noise-sensitive development is prohibited. This is similar to the NPC-300 requirement. However, the City of Ottawa also defined an Airport Vicinity Development Zone (AVDZ), which contains not only the AOIZ, but also NEF/NEP 25 contours, as well as additional areas outside even the NEF/NEP 25 contours. A map of the zones in question is provided as Annex 10 of the City of Ottawa Official Plan and included in full in Appendix C. Within the AVDZ zone, a proposed noise-sensitive development must undergo a noise assessment prior to approval.

### 3.2.2 Air Traffic Predicted Levels

The proposed site plan is located outside of the AOIZ and outside of NEF/NEP 25 contours, but within the AVDZ, as illustrated in Figure 5 below, which is an enlarged section of a portion of the larger Annex 10 document.



**Figure 5:** Enlarged Excerpt from Annex 10 of the City of Ottawa Official Plan, Showing Proposed Development Site in Relation to Noise Boundaries

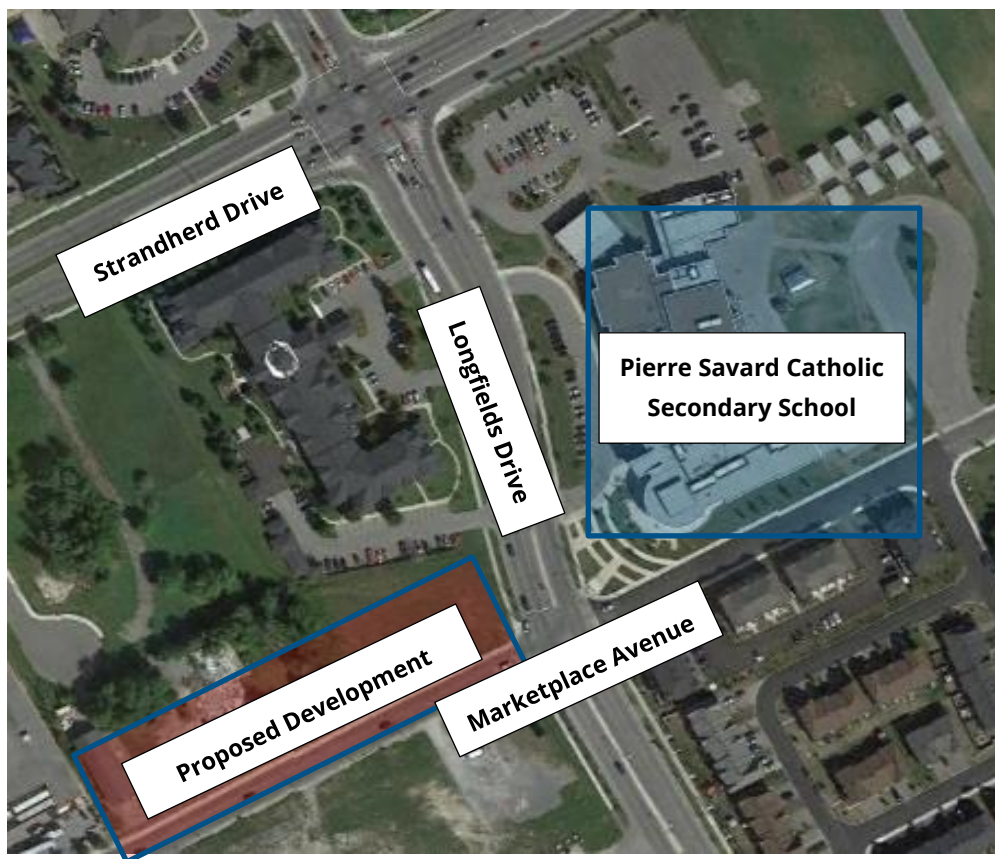


The proposed site is outside of NEF/NEP 25 contours, indoor sound level limits are predicted to meet requirements with standard Ontario Building Code construction.

As the building is a high-rise building, the prescribed measures for aircraft noise outlined in Part 6 of the City of Ottawa Guidelines are not required. Therefore, no warning clause is required. However, a minor amendment to the general warning clause language may be beneficial. Final wording of the warning clause must be approved by the City of Ottawa.

### **3.3 Stationary Source Noise Assessment**

The potential influence of the existing secondary school to the northeast of the proposed development across Longfields Drive was evaluated. The location of the school with respect to the proposed development is shown in Figure 6.



**Figure 6:** Location of Secondary School in Relation to Proposed Development



### **3.3.1 Applicable Limits**

The stationary source assessment considered the following applicable guidelines:

- MOECC Land Use Compatibility D-Series Guidelines (MOECC, 1995);
- MOECC Environmental Noise Guideline NPC-300, Stationary and Transportation Sources – Approval and Planning (MOECC, 2013);
- City of Ottawa Environmental Noise Control Guidelines (City of Ottawa, 2016)

#### *3.3.1.1 D-Series Guidelines*

The MOECC D-series guidelines provide direction for land use planning to maximize compatibility of industrial uses with adjacent land uses. The goal of Guideline D-6 is to minimize encroachment of sensitive land uses on industrial facilities and vice versa, with views to address potential incompatibility due to adverse effects such as noise, odour and dust. Recommended minimum separation distances are provided based on the industry size and operation type.

The D-series guidelines were not explicitly applied in this noise assessment. However, Ottawa City Guidelines are based on the D-series guidelines and expand upon them, as is noted in Section 3.3.1.3.

#### *3.3.1.2 NPC-300 Guidelines – Stationary Sources*

Stationary sources are treated differently from transportation sources and require sound levels to be assessed for the predictable worst-case 1-hour  $L_{eq}$  for each period of the day. For assessing sound originating from stationary sources, NPC-300 defines sound level criteria for two types of Points of Reception (PORs): outdoor and facade.

The assessment criteria for all points PORs is the higher of either the exclusion limit per NPC-300 or the minimum background sound level that occurs, or is likely to occur, at a POR. The applicable exclusion limit is determined based on the level of urbanization or “Class” of the area. This development is considered to be in a Class 1 (urban) area.

The background sound levels were not determined in this feasibility assessment through measurement or modelling, as this is typically completed in the detailed assessment. However, it was noted that based on the modelled daytime and nighttime sound levels from road traffic that the lowest 1-hour modelled sound levels are anticipated to be approximately 5 dB to 20 dB above the exclusion limits in areas most exposed to stationary sound.

Only continuous stationary sources influence the proposed development. No significant impulsive sources were identified. The NPC-300 limits for continuously operating stationary sources are summarized in Table 5. For a facade, the exclusion limits apply at the exterior plane of window, assuming that interior noise will be acceptable if facade levels are lower than the values shown in Table 5.

**Table 5:** NPC-300 Class 1 Stationary Exclusion Limit – Continuous Source

Assessment Location	Time of Day	Time Period	Exclusion Limit <sup>[1]</sup>
			Class 4 L <sub>EQ-1hr</sub>
<b>Outdoor Point of Reception</b>	Daytime	07:00-23:00h	50 dBA
	Evening	19:00-23:00h	50 dBA
<b>Facade Point of Reception</b>	Daytime	07:00-23:00h	50 dBA
	Evening	19:00-23:00h	50 dBA
	Nighttime	23:00-07:00h	45 dBA

1. The sound level averaged over a one-hour time period at the assessment location must not exceed the exclusion limit or background sound level, whichever is higher.

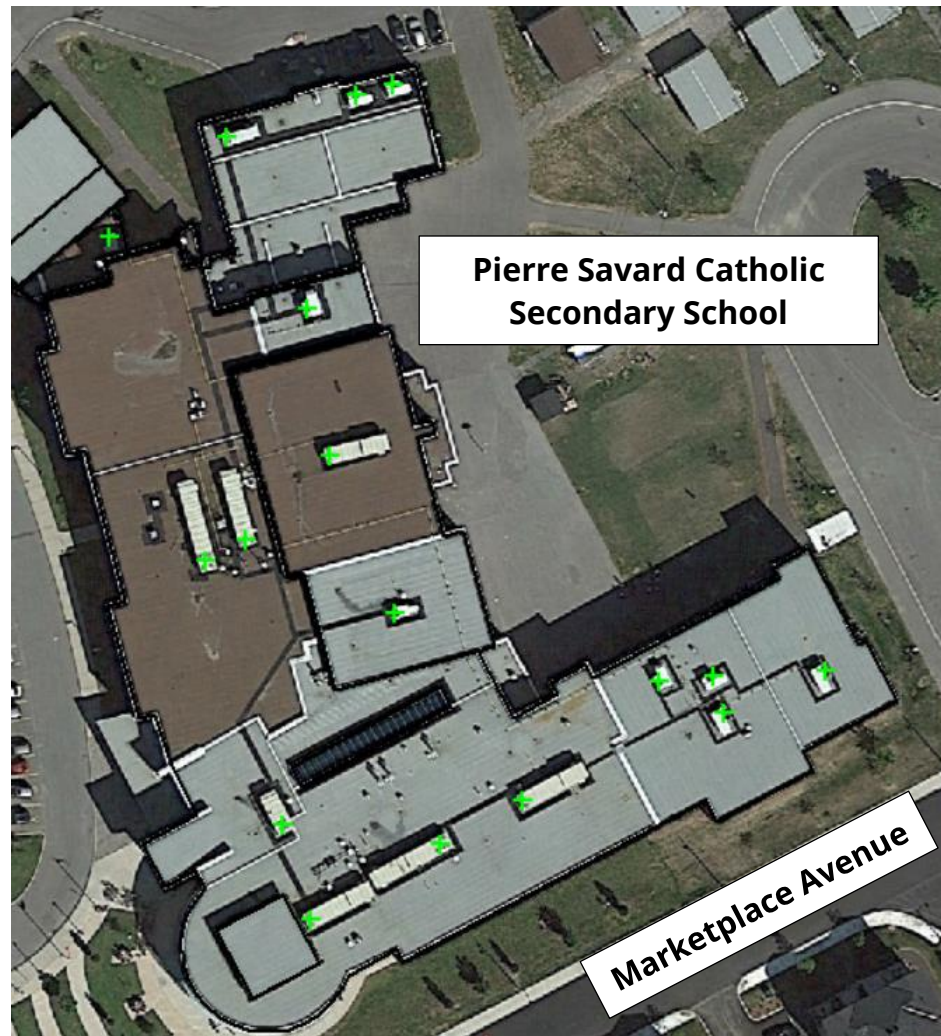
### 3.3.1.3 Ottawa City Guidelines

The City of Ottawa guidelines provide guidance for the process of assessing land use compatibility, offering clarifications on the application of the MOECC D-Series and NPC-300 guidelines. These clarifications were used, where required, in completing the assessment. Where not stated otherwise, City of Ottawa guidelines matched those of the MOECC.

## 3.3.2 Stationary Source Data

A relevant clarification by the Ottawa City Guidelines for stationary sources is the requirement that a proposed new noise-sensitive development must be assessed for noise limit compliance if it is within 100 metres of an existing stationary source. For the case of the site in question, a source of existing stationary sources that is located less than 100 metres away is Pierre Savard Catholic Secondary School, located as shown in Figure 6.

The existing stationary sources were identified from publicly available aerial imagery of the school, from which a total of 17 HVAC units were identified, as shown by the green markers in Figure 7. Mechanical equipment on the commercial development was assumed to operate fully during the daytime and evening with cooling equipment assumed to operate at a significant lower capacity during the nighttime. Source sound power levels were based on proxy data available on file at RWDI.



**Figure 7:** HVAC Units on Commercial Development to the Northeast of the Development Site (Denoted by Green Markers).

### 3.3.3 Representative Receptors

The impact of the adjacent stationary sources was assessed at the facades of the podium and towers. Sound levels were investigated at the plane of window of each floor of the building. Sound levels were also investigated at the rooftop amenity area of the podium and the outdoor amenity area at the rear of the development, corresponding to R03 and R04 of the road traffic noise analysis, respectively.



### 3.3.4 Noise Modelling Results

Detailed noise modelling of existing stationary sources was carried out using the Cadna/A software package, a commercially available implementation of the ISO 9613 algorithms (ISO, 1994 and ISO, 1996). The predicted sound levels during the worst-case hour are presented in Table 6.

**Table 6:** Predicted Sound Levels at Worst-Case Locations – Continuous

Receptor ID and Description	Time of Day	Sound Level (dBA)	Class 1 Sound Level Exclusion Limit (dBA)	Meets Criteria?
<b>Northeast- Facing Facades of Podium</b>	Day / Evening	53 / 50	50	No
	Night	50	45	No
<b>Northeast- Facing Facades of Tower 1</b>	Day / Evening	54 / 51	50	No
	Night	51	45	No
<b>Northeast-Facing Facades of Tower 2</b>	Day / Evening	51 / 48	50	No
	Night	48	45	No
<b>OLA at Rear of Development</b>	Day	50	50	Yes
<b>Podium OLA</b>	Day	31	50	Yes

Sound levels from surrounding stationary sources for most cases are anticipated to exceed the MOECC Class 1 default limits at the proposed development (see Table 6). However, as noted in Section 3.3.1.2, if background sound levels were modelled for the lowest hour during daytime, evening, and nighttime, the exclusion limits are expected to be rise by approximately 5 to 20 dB, rendering all stationary sources compliant in terms of the noise assessment. However, this should be confirmed when background sound level modelling is complete, a task that should be performed during the detailed design stage.

## 4 WARNING CLAUSES

**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 sound level limits of the Municipality and the Ministry of the Environment."*



## 5 CONCLUSION

RWDI completed a noise feasibility study to assess the noise impact potential of noise sources affecting the proposed development at the northwest corner of Marketplace Avenue and Longfields Drive in Barrhaven, Ontario. Road traffic noise from Marketplace Avenue, Longfields Drive, and Strandherd Drive, as well as air traffic noise from Ottawa International Airport, and applicable stationary sources located on the secondary school building to the northeast of the development were identified as sources of sound that could affect the proposed development. The sound emissions were assessed at the proposed development using the applicable guidelines.

Road traffic noise was predicted to exceed the guideline limits at most modelled receptors. Guideline limits will be met with the implementation of the following,

- The implementation of central air conditioning; and
- Warning clause "Type D" in purchase or rental agreements;

For sound due to air traffic sources, it is predicted that the proposed development will meet NPC-300 and Ottawa City Guidelines.

For sound due to surrounding stationary sources, it is anticipated that the proposed development will meet the NPC-300 and Ottawa City Guidelines limits following a 1-hour background sound modelling assessment. This is to be completed as part of the detailed design.

When data becomes available, noise impact associated with the proposed development's mechanical equipment on the development itself and on the surrounding environment should be assessed. An acoustical consultant must review the final building plans to ensure compliance with the MOECC and City of Ottawa guidelines.

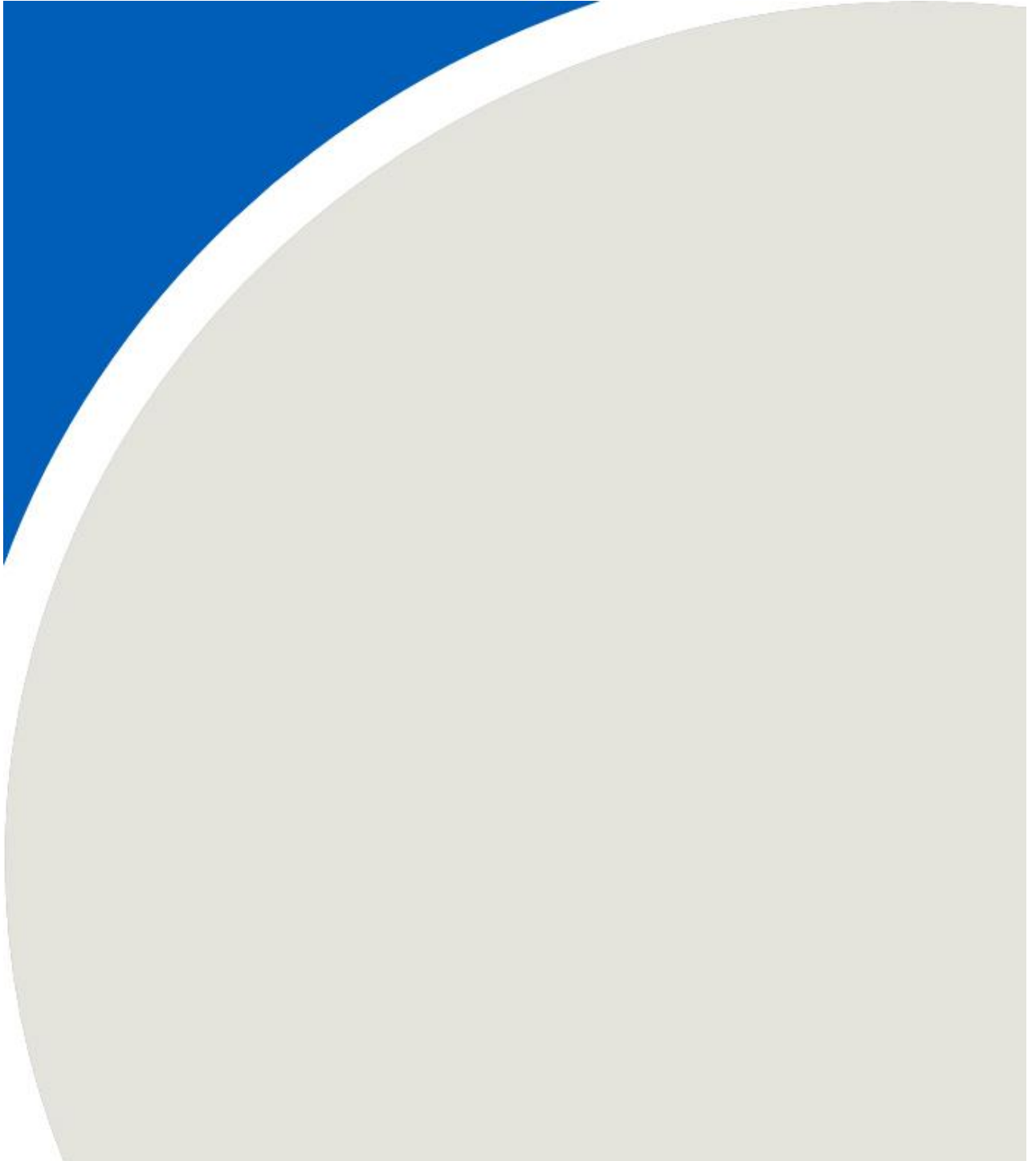
This feasibility assessment was based on assumptions regarding currently available building configuration and construction information and therefore the resulting recommendations are broad. A detailed assessment is required prior to the construction of the building, when additional building details become available.

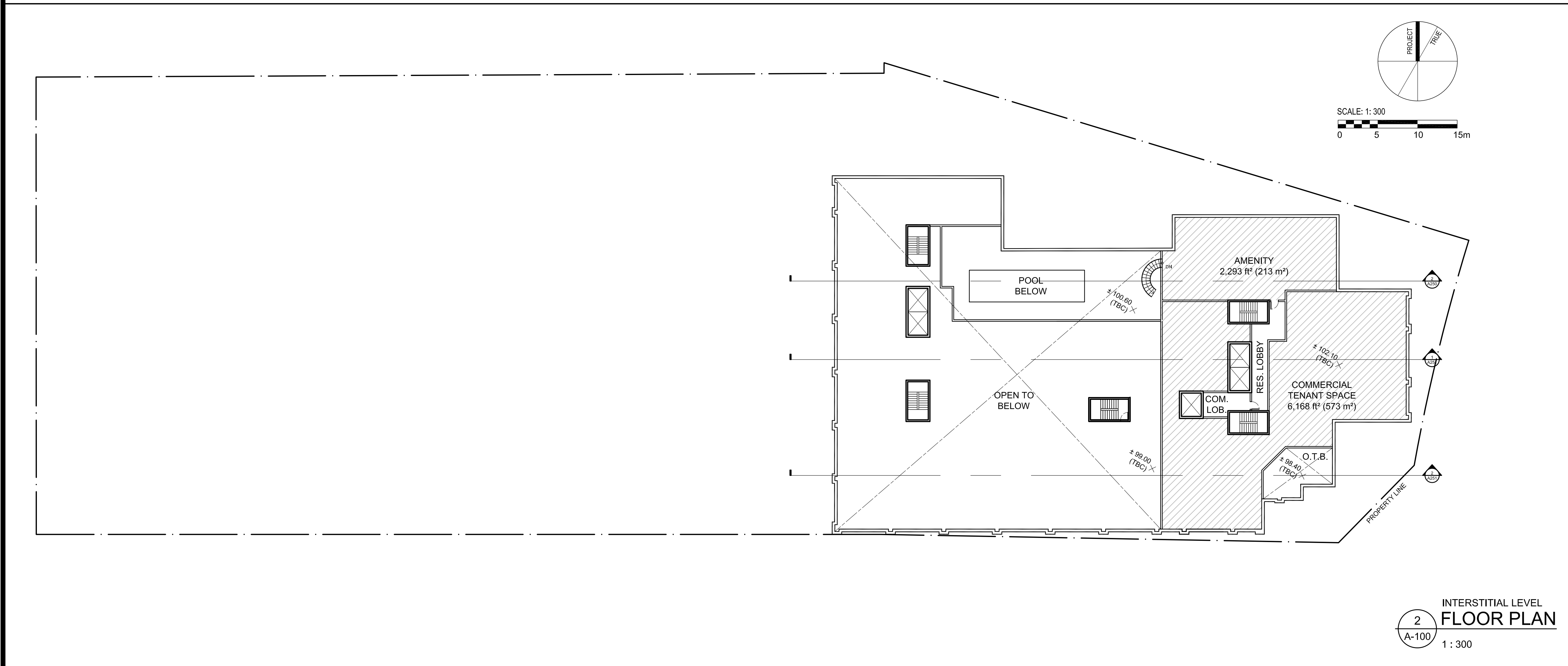
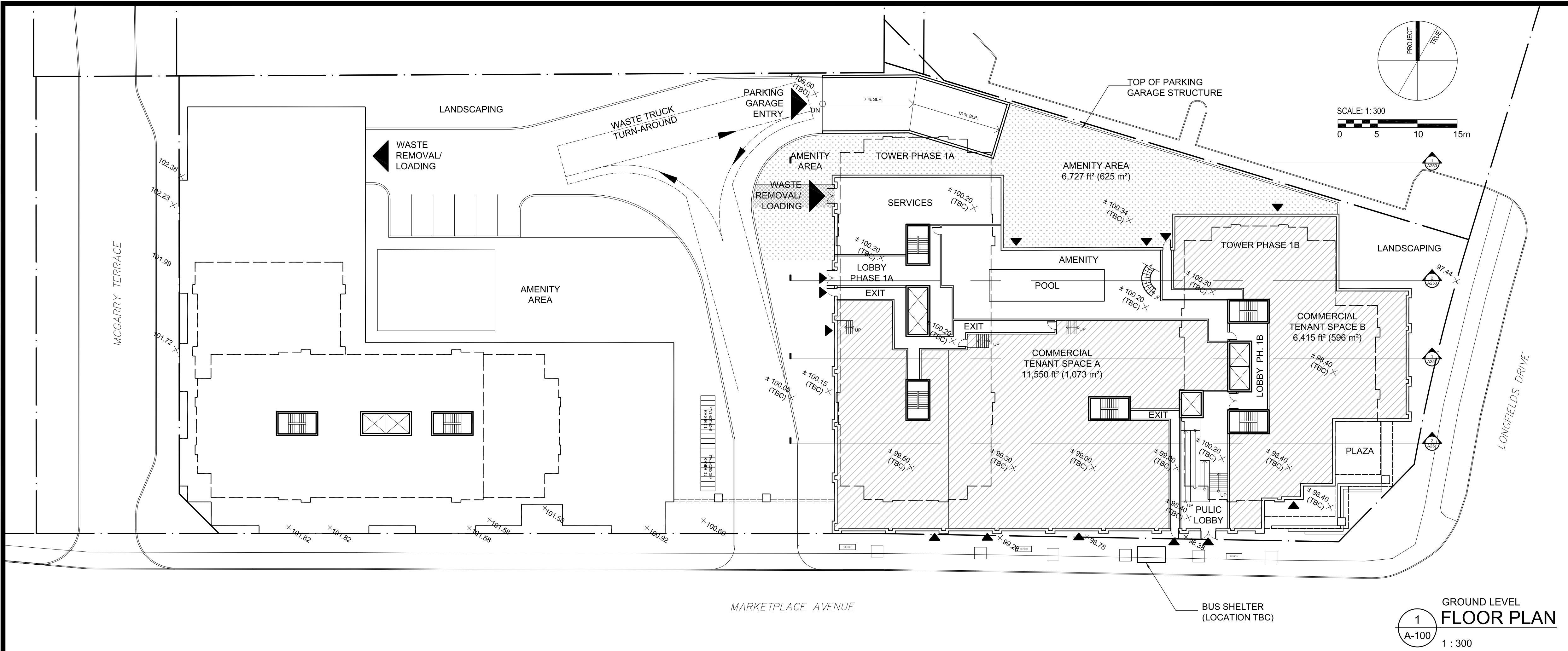


## 6 REFERENCES

1. Ontario Ministry of the Environment and Climate Change (MOECC), 1995, *Guideline D-6, Compatibility Between Industrial Facilities and Sensitive Land Uses*
2. Ontario Ministry of the Environment and Climate Change (MOECC), August 2013, Publication NPC-300, *Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning*
3. Ontario Ministry of the Environment and Climate Change (MOECC), 1989, ORNAMENT Ontario Road Noise Analysis Method for Environment and Transportation, Technical Publication
4. International Organization for Standardization (ISO), 1994b, International Standard ISO 9613-1:1994, *Acoustics –Attenuation of Sound during propagation outdoors. Part 1: Calculation of the absorption of sound by the atmosphere.*
5. International Organization for Standardization (ISO), 1996, International Standard ISO 9613-2:1996, *Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation*
6. City of Ottawa, 2016, *Environmental Noise Control Guidelines.*

## APPENDIX A





rev. / issue	description	date
05	ISSUED FOR CLIENT REVIEW	18 Dec. '17
04	ISSUED FOR CLIENT REVIEW	17 Nov. '17
03	ISSUED TO CLIENT	06 Nov. '17
02	ISSUED FOR CLIENT REVIEW	03 Nov. '17
01	ISSUED FOR CLIENT REVIEW	12 Sep. '17

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IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND PROMPTLY REPORT ALL ERRORS AND/OR OMISSIONS TO THE CONSULTANT BEFORE WORK COMMENCES.

ALL WORK IS TO FOLLOW THE OBC 2012 AND ANY OTHER APPLICABLE CODES AND REGULATIONS.

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professional stamp project north

Kristopher D. Benes, OAA, MRAIC, LEED AP

**OPA** open plan  
architects inc.  
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2305 HILLARY AVE. | OTTAWA | ON | K1H 7J2  
613.883.5090 | info@openplan.ca

project

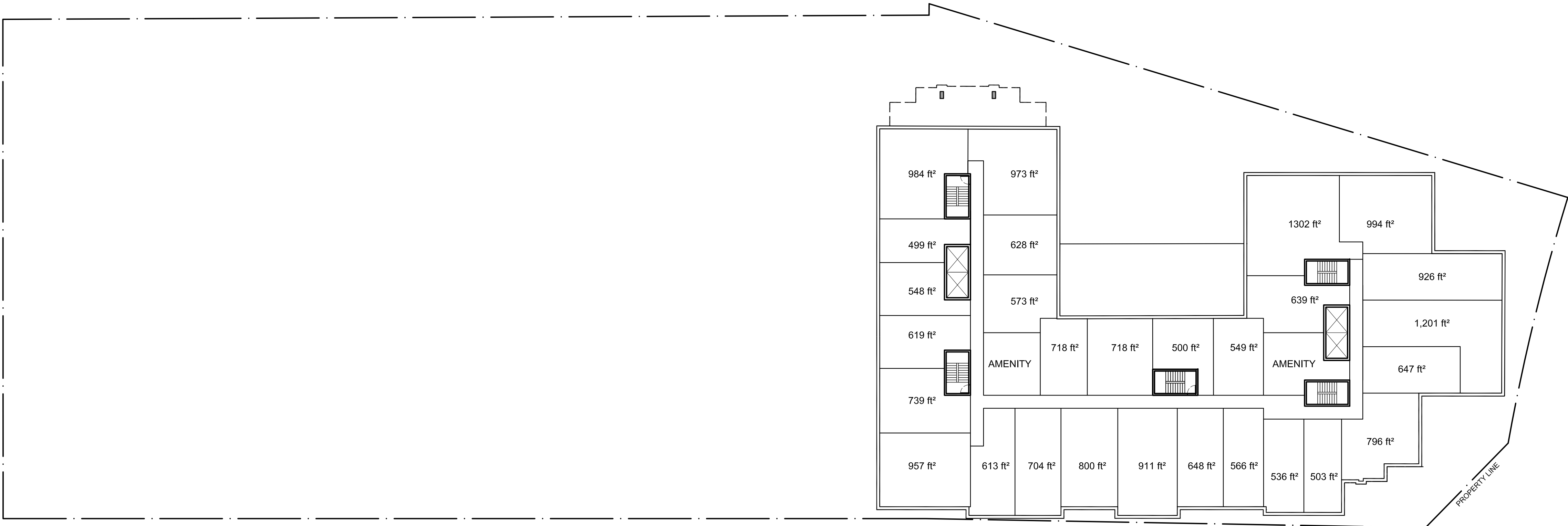
**MIXED USE DEVELOPMENT**  
1034 MCGARRY TERRACE &  
1117 LONGFIELDS DRIVE, OTTAWA

drawing  
**CONCEPTUAL SITE PLAN  
AND INTERSTITIAL LEVEL  
PHASE 1A & 1B**

drawn	K.D.B.	date	SEPTEMBER 2017
approved	K.D.B.	revision	△
project no.	1212	scale	1 : 300

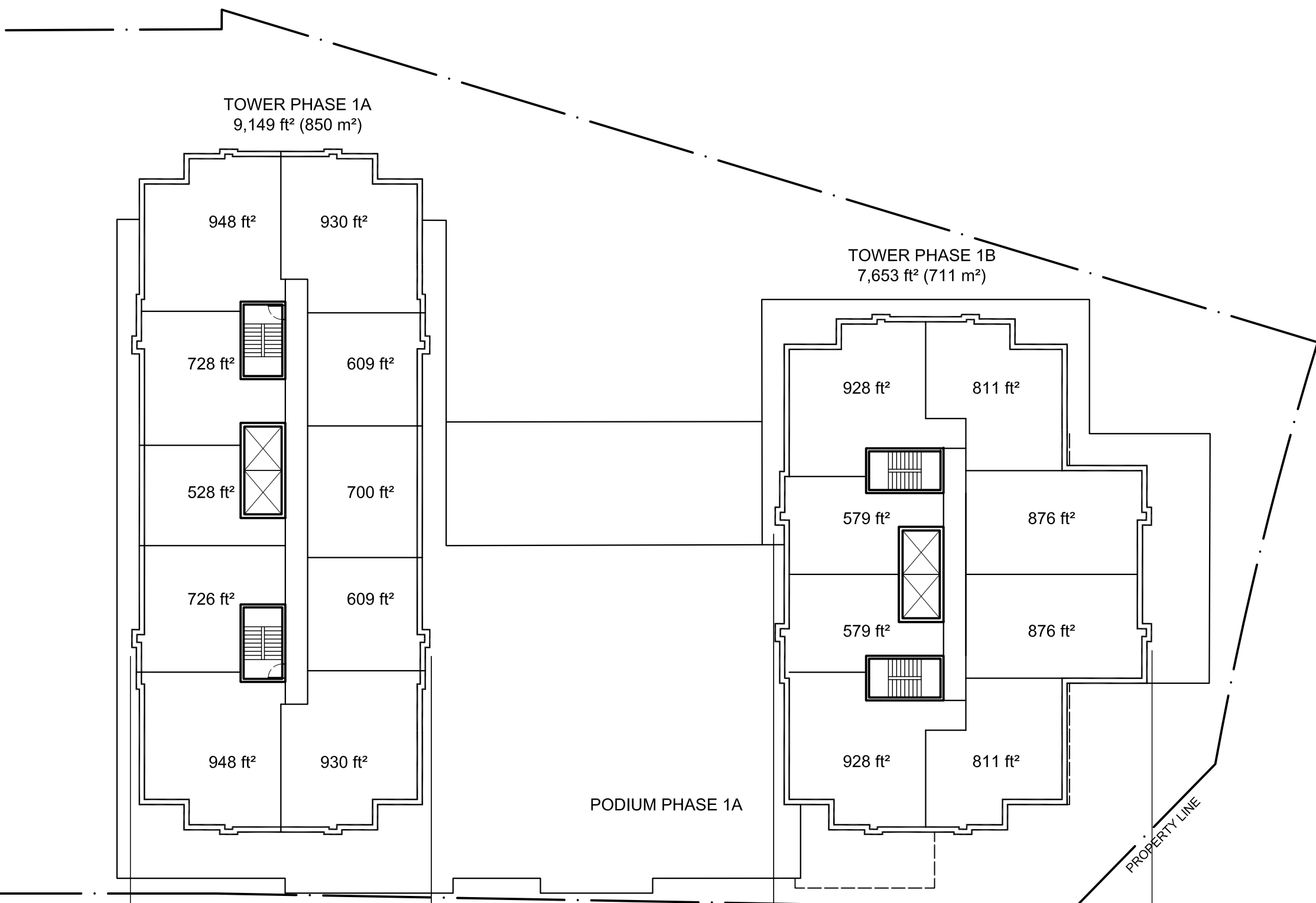
drawing no.

**A-100**  
A001-R00.DWG



PODIUM PHASE 1A  
15,974 ft² (1,484 m²)

PHASE 1A and 1B  
**PLAN 2 & 3**  
1 : 300



TOWER PHASE 1A  
9,149 ft² (850 m²)

TOWER PHASE 1B  
7,653 ft² (711 m²)

PODIUM PHASE 1A

PHASE 1A and 1B  
**PLAN 14 & 16**  
1 : 300

rev./issue	description	date
05	ISSUED FOR CLIENT REVIEW	18 Nov. '17
04	ISSUED FOR CLIENT REVIEW	17 Nov. '17
03	ISSUED TO CLIENT	06 Nov. '17
02	ISSUED FOR CLIENT REVIEW	03 Nov. '17
01	ISSUED FOR CLIENT REVIEW	12 Sep. '17

THE ARCHITECT WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS, AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ARCHITECT'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES, AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

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613.883.5090 | info@openplan.ca

project  
**MIXED USE DEVELOPMENT**  
1034 MCGARRY TERRACE &  
1117 LONGFIELDS DRIVE, OTTAWA

drawing  
**CONCEPTUAL PLANS**

drawn	K.D.B.	date	SEPTEMBER 2017
approved	K.D.B.	revision	△
project no.	1212	scale	1 : 300

drawing no.  
**ASK-03-R0**  
A001-R00.DWG

## APPENDIX B





Job No. 1802100  
Job Name 1117 Longfields Drive / 1034 McGarry Terrace

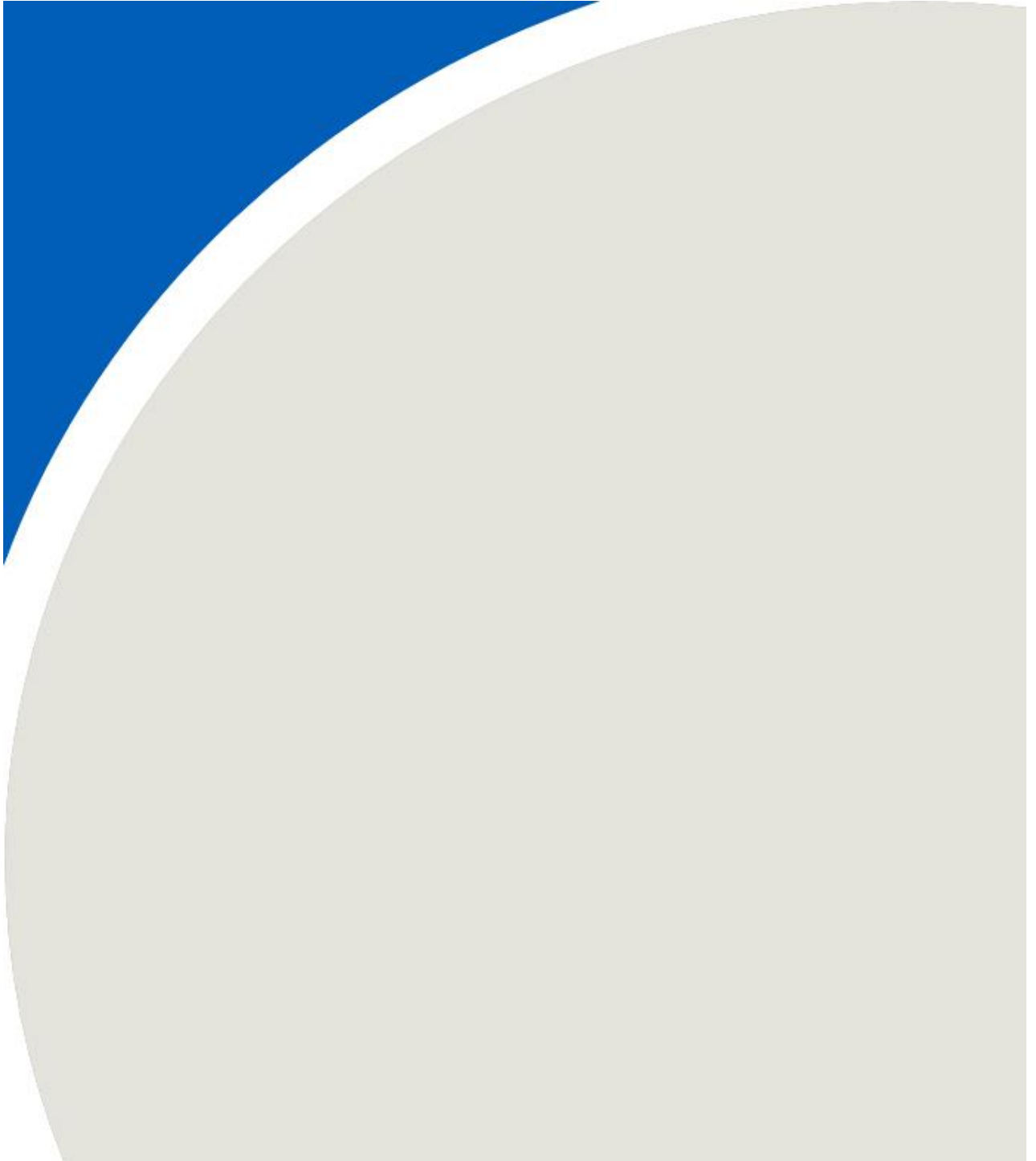
## ROAD CHARACTERISTICS

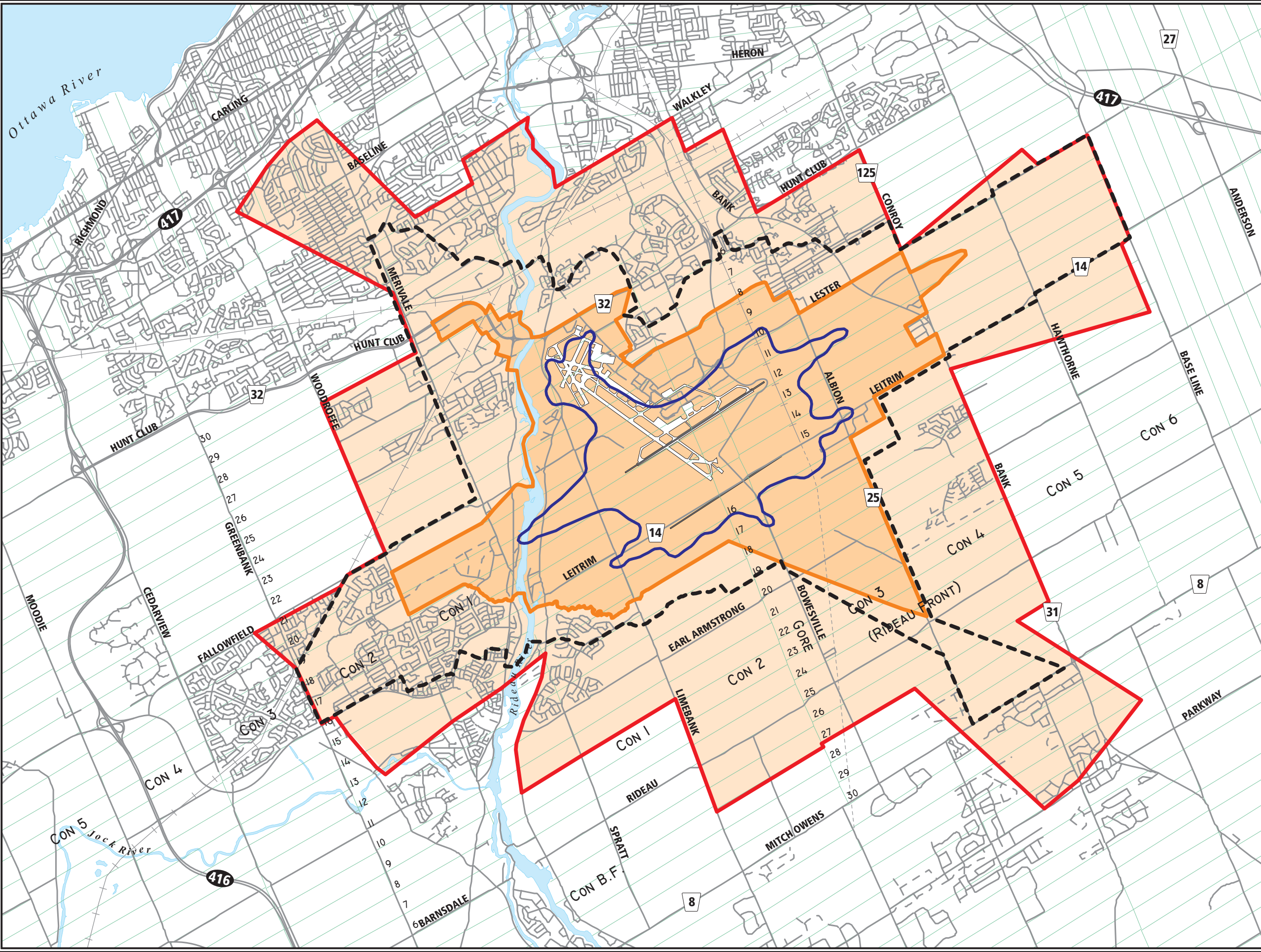
## SOURCE-RECEIVER-BARRIER-TOPOGRAPHY CHARACTERISTICS

ID	Description	Time Period	Number of Vehicles			Speed (km/h)	Road Gradient (%)	Two Way? (y/n)	Pavement Type	Road Viewable Angle		Source-Receiver Distance (m)	Ground Type (Hard/Soft)	Topography Type	Source Height (m)	Road Elevation (m asl)	Receptor Height (m)	Receptor Elevation (m asl)	Ground Elevation Change (m)			Barrier Height (m)	Barrier Elevation (m asl)	Barrier-Receiver Distance (m)	Barrier Viewable Angle		No. of Rows of Houses	Density of Houses (% Houses)	Depth of Woods	Adjustment (dB)	Reason For Adjustment	Total Segment L <sub>eq</sub> (dBA)	
			Autos	Medium	Heavy					Θ <sub>1</sub>	Θ <sub>2</sub>								Elevation Change e (m)	Hor. Dist a (m)	Hor. Dist b (m)				Θ <sub>1</sub>	Θ <sub>2</sub>							
R01 Day	Marketplace East and West	16	9715	773	552	50	0	y	1	-90	90	10.0	Hard	A	1.5	0.0	1.5	0.0														69	
	Longfields South (Segment 1)	16	14168	1127	805	50	0	n	1	-16	12	27.0	Hard	A	1.5	0.0	1.5	0.0														58	
	Longfields South (Segment 2)	16	14168	1127	805	50	0	n	1	30	90	25.0	Hard	A	1.5	0.0	1.5	0.0														62	
	Longfields North (Segment 1)	16	14168	1127	805	50	0	n	1	-18	7	40.0	Hard	A	1.5	0.0	1.5	0.0														56	
	Longfields North (Segment 2)	16	14168	1127	805	50	0	n	1	24	90	37.0	Hard	A	1.5	0.0	1.5	0.0														61	
															-																R01 Day Total	71	
R01 Night	Marketplace East and West	8	845	67	48	50	0	y	1	-90	90	10.0	Hard	A	1.5	0.0	1.5	0.0															62
	Longfields South (Segment 1)	8	1232	98	70	50	0	n	1	-16	12	27.0	Hard	A	1.5	0.0	1.5	0.0															51
	Longfields South (Segment 2)	8	1232	98	70	50	0	n	1	30	90	24.5	Hard	A	1.5	0.0	1.5	0.0															55
	Longfields North (Segment 1)	8	1232	98	70	50	0	n	1	-18	7	40.0	Hard	A	1.5	0.0	1.5	0.0															49
	Longfields North (Segment 2)	8	1232	98	70	50	0	n	1	24	90	37.0	Hard	A	1.5	0.0	1.5	0.0															53
															-																	R01 Night Total	63
R02 Day	Marketplace East and West	16	9715	773	552	50	0	y	1	-90	0	24.5	Hard	A	1.5	0.0	1.5	0.0															62
	Longfields South (Segment 1)	16	14168	1127	805	50	0	n	1	-90	62	13.0	Hard	A	1.5	0.0	1.5	0.0															69
	Longfields South (Segment 2)	16	14168	1127	805	50	0	n	1	78	90	6.0	Hard	A	1.5	0.0	1.5	0.0															62
	Longfields North (Segment 1)	16	14168	1127	805	50	0	n	1	-90	42	26.0	Hard	A	1.5	0.0	1.5	0.0															65
	Longfields North (Segment 2)	16	14168	1127	805	50	0	n	1	59	90	18.5	Hard	A	1.5	0.0	1.5	0.0															61
	Strandherd East	16	14168	1127	805	70	0	n	1	0	90	194.0	Hard	A	1.5	0.0	1.5	0.0															58
	Strandherd West	16	14168	1127	805	70	0	n	1	0	90	208.0	Hard	A	1.5	0.0	1.5	0.0															58
															-																	R02 Day Total	72
R02 Night	Marketplace East and West	8	845	67	48	50	0	y	1	-90	0	24.5	Hard	A	1.5	0.0	1.5	0.0															55
	Longfields South (Segment 1)	8	1232	98	70	50	0	n	1	-90	62	13.0	Hard	A	1.5	0.0	1.5	0.0															61
	Longfields South (Segment 2)	8	1232	98	70	50	0	n	1	78	90	6.0	Hard	A	1.5	0.0	1.5	0.0															54
	Longfields North (Segment 1)	8	1232	98	70	50	0	n	1	-90	42	26.0	Hard	A	1.5	0.0	1.5	0.0															58
	Longfields North (Segment 2)	8	1232	98	70	50	0	n	1	59	90	18.5	Hard	A	1.5	0	1.5	0															53
	Strandherd East	8	1232	98	70	70	0	n	1	0	90	194.0	Hard	A	1.5	0.0	1.5	0.0															50
	Strandherd West	8	1232	98	70	70	0	n	1	0	90	208.0	Hard	A	1.5	0.0	1.5	0.0															50
															-																	R02 Night Total	65
R03 OLA_1	Longfields South (Segment 1)	16	14168	1127	805	50	0	n	1	-35	-15	60.5	Hard	A	1.5	0.0	1.5	0.0															54
	Longfields North (Segment 1)	16	14168	1127	805	50	0	n	1	-35	-15	73.5	Hard	A	1.5	0.0	1.5	0.0															53
	Strandherd East	16	14168	1127	805	70	0	n	1	-60	-10	168.0	Soft	A	1.5	0.0	1.5	0.0															49
	Strandherd West	16	14168	1127	805	70	0	n	1	-60	-10	182.0	Soft	A	1.5	0.0	1.5	0.0															48
															-																	R03 OLA_1 Total	58
R04 OLA_2	Longfields South (Segment 2)	16	14168	1127	805	50	0	n	1	30	90	45.0	Hard	A	1.5	0.0	12.0	0.0				10.5			10.0	30	90						54
	Longfields North (Segment 2)	16	14168	1127	805	50	0	n	1	25	90	58.0	Hard	A	1.5	0.0	12.0	0.0				10.5			10.0	25	90						54
	Strandherd East	16	14168	1127	805	70	0	n	1	-20	0	197.0	Soft	A	1.5	0.0	12.0	0.0				10.5			11.5	-20	0						46
	Strandherd West	16	14168	1127	805	70	0	n	1	-20	0	211.0	Soft	A	1.5	0.0	12.0	0.0				10.5			11.5	-20	0						45
	Marketplace East and West	16	9715	773	552	50	0	y	1	-65	65	21.5	Hard	A	1.5	0.0	12.0	0.0				10.5			11.5	-65	65						48
															-																	R04 OLA_1 Total	58
R05 Day	Marketplace East and West	16	9715	773	552	50	0	y	1	0	90	15.0	Hard	A	1.5	0.0	1.5	0.0															65
	Strandherd East	16	14168	1127	805	70	0	n	1	-90	0	203.0	Soft	A	1.5	0.0	1.5	0.0															49
	Strandherd West	16	14168	1127	805	70	0	n	1	-90	0	217.0	Soft	A	1.5	0.0	1.5	0.0															48
																																R05 Day Total	65
R05 Night	Marketplace East and West	8	845	67	48	50	0	y	1	0	90	15.0	Hard	A	1.5	0.0	1.5	0.0															57
	Strandherd East	8	1232	98	70	70	0	n	1	-90	0	203.0	Soft	A	1.5	0.0	1.5	0.0															41
	Strandherd West	8	1232	98	70	70	0	n	1	-90	0	217.0	Soft	A	1.5	0.0	1.5	0.0															41
																																R05 Night Total	57



## APPENDIX C





# OFFICIAL PLAN - ANNEX 10 Land Use Constraints Due to Aircraft Noise

Prepared by: City of Ottawa,  
Department of Planning, Transit and the Environment,  
September 2011

## PLAN OFFICIEL - APPENDICE 10 Contraintes limitant l'utilisation en raison du bruit des avions

Préparé par : Ville d'Ottawa,  
Le Service de l'urbanisme, du transport en commun et de l'environnement,  
septembre 2011

- Airport Vicinity Development Zone  
Zone d'aménagement dans le voisinage de l'aéroport
- 25 Line (Composite of 25 NEF/NEP)  
Ligne 25 (ensemble des courbes NEF et NEP 25)
- 35 Line Noise Exposure Protection (NEP 2023)  
Ligne 35 : prévisions à long terme de l'ambiance sonore (NEP 2023)
- Airport Zoning Regulations  
Règlements de zonage applicables à de l'Aéroport
- Airport Operating Influence Zone  
Zone d'influence d'exploitation de l'aéroport

**Note:**  
The boundaries of the Ottawa Airport Operating Influence Zone and the Airport Vicinity Development Zone, are not subject to interpretation and their precise locations should be read from a map at a scale of 1:50,000 available from the City of Ottawa and the Ottawa International Airport Authority.

Scale / Échelle  
1km 0 1 2 3 km

