

Environmental Noise Control Study Proposed Industrial Building

3113 Carp Road
Ottawa, Ontario

Prepared for Canadian Rental Development

Report PG6422-3 dated May 30, 2023

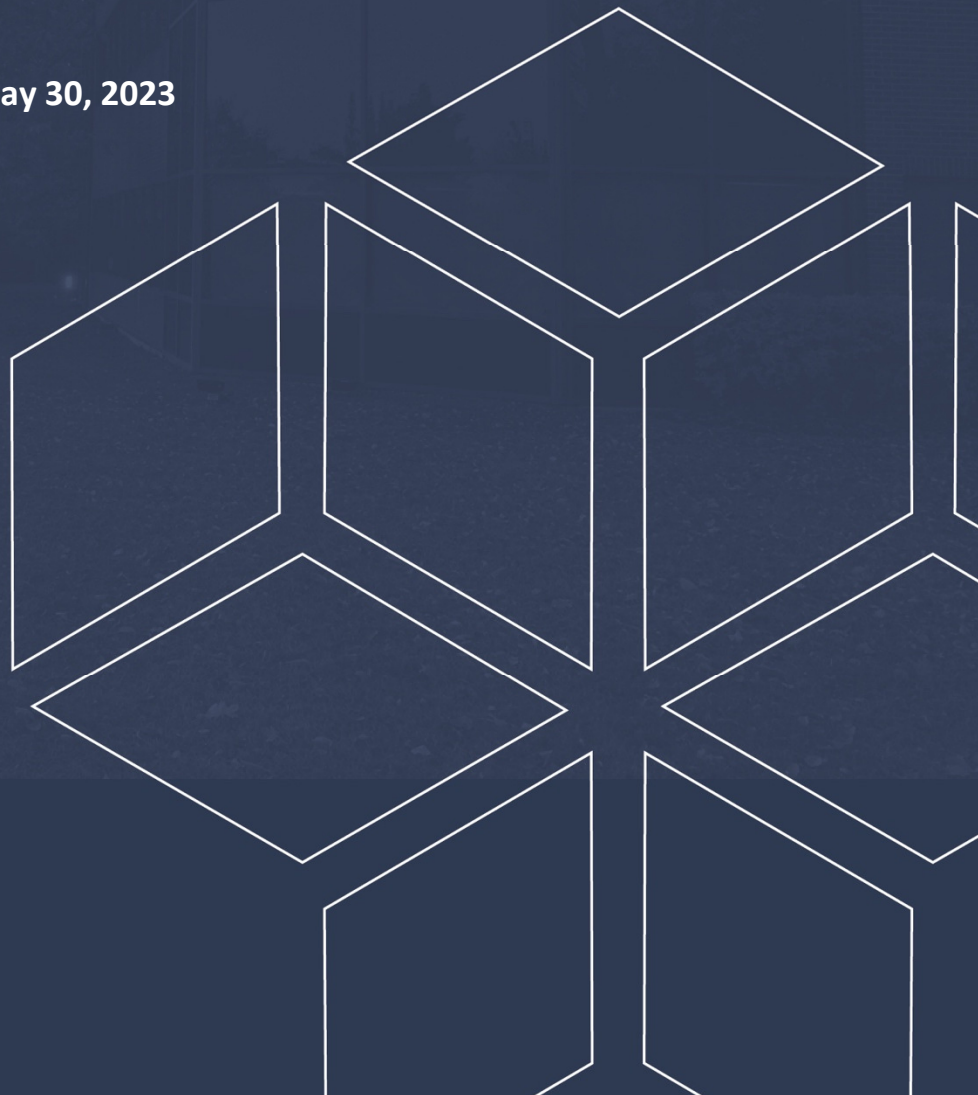


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1.0 Introduction

Paterson Group (Paterson) was commissioned by Canadian Rental Development to conduct an environmental noise control study for the proposed industrial building to be located at 3113 Carp Road, in the City of Ottawa.

The objective of the current study is to:

- Determine the primary noise sources impacting the site and compare the projected sound levels to guidelines set out by the Ministry of Environment and Climate Change (MOECC) and the City of Ottawa.
- Review the projected noise levels and offer recommendations regarding warning classes, construction materials or alternative sound barriers.

The following report has been prepared specifically and solely for the aforementioned project which is described herein. It contains our findings and includes acoustical recommendations pertaining to the design and construction of the subject development as they are understood at the time of writing this report.

This study has been conducted according to City of Ottawa document - Engineering Noise Control Guidelines (ENCG), dated January 2016, and the Ontario Ministry of the Environment Guideline NPC-300.

2.0 Proposed Development

Based on the available conceptual drawings, it is understood that the proposed industrial development will consist of a single-storey commercial warehouse building that will rise 3 m above grade. Associated access lanes, delivery areas, parking areas, and landscaped areas are further anticipated. No outdoor living area is identified on the proposed site plan, but it is anticipated that there will be office space located within the warehouse structure.

3.0 Methodology and Noise Assessment Criteria

The City of Ottawa outlines three (3) sources of environmental noise that must be analyzed separately:

- Surface Transportation Noise
- Stationary Noise
 - new noise-sensitive development applications (noise receptors) in proximity to existing or approved stationary sources of noise, and
 - new stationary sources of noise (noise generating) in proximity to existing or approved noise-sensitive developments
- Aircraft Noise

Surface Transportation Noise

Surface roadway traffic noise, equivalent to sound level energy L_{eq} , provides a measure of the time varying noise level over a period of time. For roadways, the L_{eq} is commonly calculated on the basis of 16-hour (L_{eq16}) daytime (07:00-23:00) and 8-hour (L_{eq8}) nighttime (23:00-7:00) split to assess its impact on residential, commercial and institutional buildings.

The City of Ottawa's Official Plan dictates that the influence area must contain any of following conditions to classify as a surface transportation noise source for a subject site:

- Within 100 m of the right-of-way of an existing or proposed arterial, collector or major collector road; a light rail transit corridor; bus rapid transit, or transit priority corridor
- Within 250 m of the right-of-way for an existing or proposed highway or secondary rail line
- Within 300 m from the right of way of a proposed or existing rail corridor or a secondary main railway line
- Within 500 m of an existing 400 series provincial highway, freeway or principle main railway line.

The Environmental Noise Guidelines for Stationary and Transportation Sources – NPC-300 outlines the limitations of noise levels in relation to the location of the receptors. These can be found in the following tables:

Table 1 – Noise Level Limit for Outdoor Living Areas	
Time Period	L_{eq} Level (dBA)
Daytime, 7:00-23:00	55
➤ Standard taken from Table 2.2a; Sound Level Limit for Outdoor Living Areas – Road and Rail	

Table 2 – Noise Level Limits for Indoor Living Areas			
Type of Space	Time Period	L_{eq} Level (dBA)	
		Road	Rail
General offices, reception areas, retail stores, etc.	Daytime 7:00-23:00	50	45
Theatres, places of worship, libraries, individual or semi-private offices, conference rooms, reading rooms, etc.	Daytime 7:00-23:00	45	40
Living/dining/den areas of residences , hospitals, nursing/retirement homes, schools, day-care centres	Daytime 7:00-23:00	45	40
Living/dining/den areas of residences , hospitals, nursing/retirement homes etc. (except schools or day-care centres)	Nighttime 23:00-7:00	45	40
Sleeping quarters of hotels/motels	Nighttime 23:00-7:00	45	40
Sleeping quarters of residences , hospitals, nursing/retirement homes, etc.	Nighttime 23:00-7:00	40	35
➤ Standards taken from Table 2.2b, Sound Level Limit for Indoor Living Areas – Road and Rail and Table 2.2c, Supplementary Sound Level Limits for Indoor Spaces – Road and Rail			

Predicted noise levels at the pane of window dictate the action required to achieve recommended noise levels. It is noted in ENCG that the limits outlined in Table 2 are for the noise levels on the interior of the window glass pane. An open window is considered to provide a 10 dBA noise reduction, while a standard closed window is capable to provide a minimum 20 dBA noise reduction. The noise level limit of commercial building is 60 dBA daytime. Therefore, where noise levels exceed 60 dBA daytime, the ventilation for the building should consider the provision for central air conditioning. Where noise levels exceed 70 dBA daytime, central air conditioning will be required, and the building components will require higher levels of sound attenuation.

When the noise levels are equal to or less than the specified criteria, no noise attenuation (control) measures are required.

Noise attenuation (control) measures include any or all of the following:

- Noise attenuation barrier
- Provisions for the installation of central air conditioning
- Central air conditioning
- Architectural components designed to provide additional acoustic insulation

In addition to the implementation of noise attenuation features, if required, the following Warning Clauses may be recommended to advise the prospective purchasers / tenants of affected units of potential environmental noise problem:

Table 3 – Warning Clauses for Indoor Living Areas (Commercial Building)		
Leq (dBA)	Warning Clause	Description
60 dBA < $L_{eq(16)}$ ≤ 70 dBA	Warning Clause Type C	"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments 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."
70 dBA < $L_{eq(16)}$	Warning Clause 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."
➤ Clauses taken from section C8 Warning Clauses; Environmental Noise Guidelines for Stationary and Transportation Sources - NPC-300		

Stationary Noise

Stationary noise sources include sources or facilities that are fixed or mobile and can cause a combination of sound and vibration levels emitted beyond the property line. These sources may include commercial air conditioner units, generators and fans. Facilities that may contribute to stationary noise may include car washes, snow disposal sites, transit stations and manufacturing facilities.

The subject site is not in proximity to existing or approved stationary sources of noise. Therefore, a stationary noise analysis will not be required.

Aircraft / Airport Noise

The subject site is not located within the Airport Vicinity Development Zone. Therefore this project will not require an aircraft/airport noise analysis. No warning clauses regarding aircraft or airport noise will be required.

4.0 Analysis

Surface Transportation Noise

The subject site consists of an agricultural land. The site is bordered by Carp Road followed by single family dwellings to the east, an agricultural land to south, a vacant lot to the west, and a church with associated landscaped areas to the north. A residential dwelling abuts the northeastern portion of the property, fronting Carp Road. Carp Road is identified within the 100 m radius of proposed development.

Based on the City of Ottawa's Official Plan, Schedule G, Carp Road is considered a 2-lane urban arterial road (2-UAU). Other roads within the 100 m radius of the proposed development are not classified as either arterial, collector or major collector roads and therefore are not included in this study. The major source of traffic noise is due to the Carp Road to the east of the proposed development.

All noise sources are presented in Drawing PG6422-3 - Site Geometry located in Appendix 1.

The noise levels from road traffic are provided by the City of Ottawa, taking into consideration the right-of-way width and the implied roadway classification. It is understood that these values represent the maximum allowable capacity of the proposed roadways. The parameters to be used for sound level predictions can be found below.

Table 4 – Traffic and Road Parameters						
Segment	Roadway Classification	AADT Veh/Day	Speed Limit (km/h)	Day/Night Split %	Medium Truck %	Heavy Truck %
Carp Road	2-UAU	15000	50	92/8	7	5
➤ Data obtained from the City of Ottawa document ENCG						

One (1) level of reception points was selected for this analysis. The following elevation was selected from the heights provided on the survey plan for the subject building.

Table 5 – Elevations of Reception Points			
Floor Number	Elevation at Centre of Window (m)	Floor Use	Daytime / Nighttime Analysis
First Floor	1.5	Commercial	Daytime

For this analysis, reception points were taken at the centre of the first floor. The reception points are detailed on Drawing PG6422-2 - Receptor Locations presented in Appendix 1.

All horizontal distances have been measured from the reception point to the edge of the right-of-way. The roadway was analyzed where it intersected the 100 m buffer zone, which is reflected in the local angles described in Paterson Drawings PG6422-3A to 3C - Site Geometry in Appendix 1.

Table 7 - Summary of Reception Points and Geometry, located in Appendix 1, provides a summary of the points of reception and their geometry with respect to the noise sources. The analysis is completed so that no effects of sound reflection off of the building facade are considered, as stipulated by the ENGCG.

The subject site is generally levelled and at grade with the neighbouring roads within the 100 m radius.

The analysis was completed using STAMSON version 5.04, a computer program which uses the road and rail traffic noise prediction methods using ORNAMENT (Ontario Road Noise Analysis Method for Environment and Transportation) and STEAM (Sound from Trains Environment Analysis Method), publications from the Ontario Ministry of Environment and Energy.

5.0 Results

Surface Transportation Noise

The primary descriptors are the 16-hour daytime (7:00-23:00) and the 8-hour nighttime (23:00-7:00) equivalent sound levels, $L_{eq(16)}$ and $L_{eq(8)}$ for City roads.

The exterior noise levels due to roadway traffic sources were analyzed with the STAMSON version 5.04 software at all reception points. The input and output data of the STAMSON modeling can be found in Appendix 2, and the summary of the results can be found in Table 6.

Table 6: Exterior Noise Levels due to Roadway Traffic Sources				
Reception Point	Height Above Grade (m)	Receptor Location	Daytime $L_{eq(16)}$ (dBA)	Nighttime $L_{eq(8)}$ (dBA)
REC 1-1	1.5	Eastern Elevation, 1st Floor	55	--
REC 2-1	1.5	Northern Elevation, 1st Floor	45	--
REC 3-1	1.5	Southern Elevation, 1st Floor	46	--

6.0 Discussion and Recommendations

6.1 Outdoor Living Areas

No outdoor living areas were identified for this development.

6.2 Indoor Living Areas and Ventilation

The results of the STAMSON modeling indicate that the noise levels at proposed commercial building will range between 45 dBA and 55 dBA during the daytime period (07:00-23:00). The noise levels at the proposed commercial building will be below the limit for the exterior of the pane of glass (60 dBA) specified by the ENCG. Therefore, further noise attenuation measure is not required. It is also noted that the results of STAMSON modeling indicate that the noise levels will be below 70 dBA, and therefore standard building materials are acceptable to provide adequate soundproofing.

7.0 Summary of Findings

The subject site is located at 3113 Carp Road, in the City of Ottawa. It is understood that the proposed development will consist of a single-storey commercial warehouse building. The building will rise 3 metres above grade and will contain an office area. There is a single major source of surface transportation noise to the proposed building: Carp Road.

It is noted that there is no outdoor living area at this development.

Reception points were selected for the surface transportation noise analysis, consisting of the centre of first level on three different elevations. The results of STAMSON modeling indicate that the noise levels at proposed building is expected to be below the 60 dBA threshold specified by the ENCG. Therefore, no further noise attenuation measures are required. It is also noted that the results of STAMSON modeling indicate that the noise levels will be below 70 dBA, and therefore standard building materials are acceptable to provide adequate soundproofing.

8.0 Statement of Limitations

The recommendations made in this report are in accordance with our present understanding of the project. Our recommendations should be reviewed when the project drawings and specifications are complete.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than Canadian Rental Development or their agent(s) is not authorized without review by this firm for the applicability of our recommendations to the altered use of the report.

Paterson Group Inc.



Yolanda Tang, M.A.Sc.



Stephanie A. Boisvenue, P.Eng.

Report Distribution:

- ☐ Canadian Rental Development (email copy)
- ☐ Paterson Group (1 copy)

APPENDIX 1

Table 7 – Summary of Reception Points and Geometry

Drawing PG6422-1 - Site Plan

Drawing PG6422-2 - Receptor Location Plan

Drawing PG6422-3 - Site Geometry

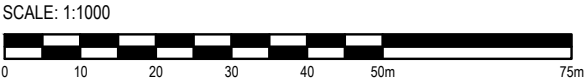
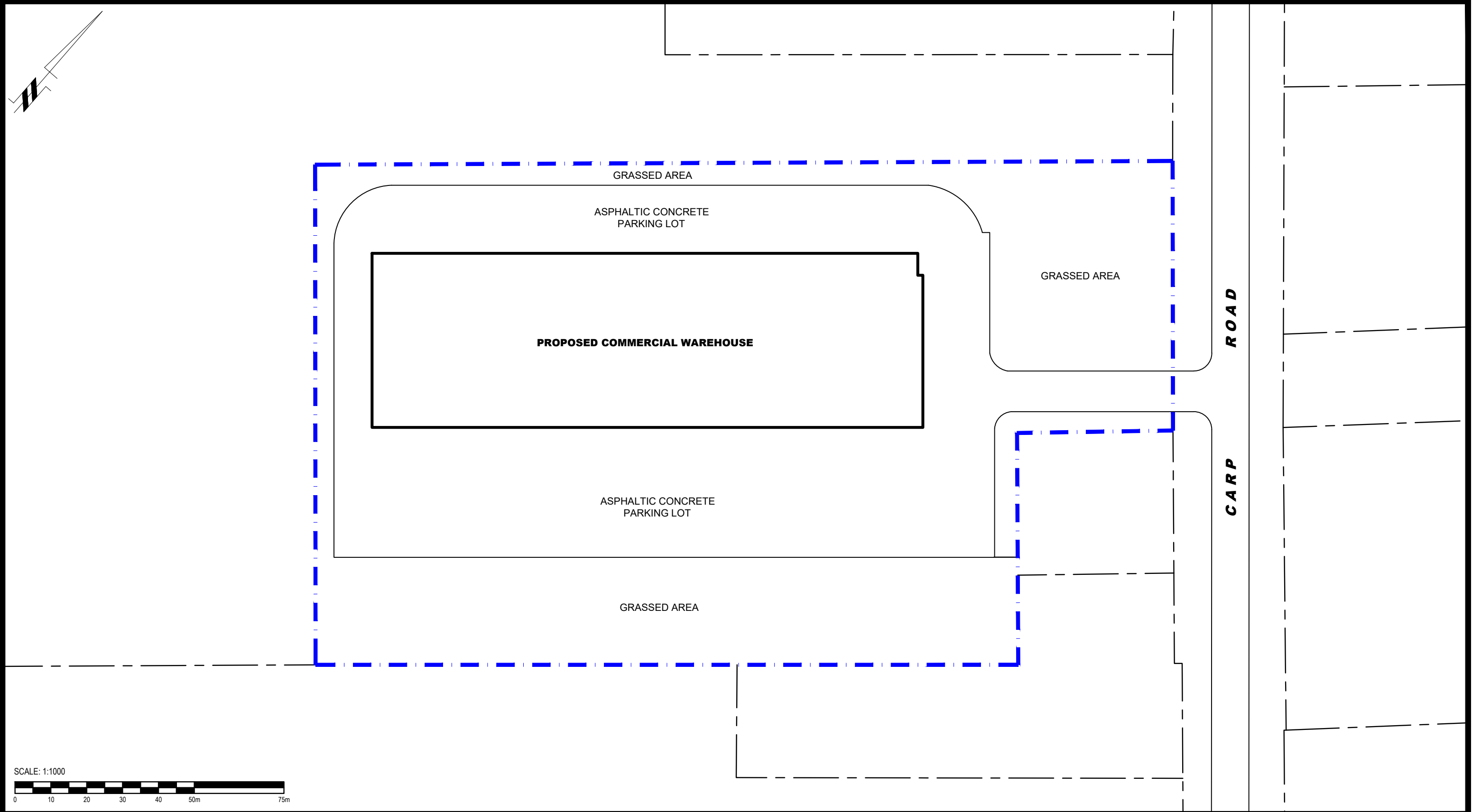
Drawing PG6422-3A - Site Geometry (REC 1-1)

Drawing PG6422-3B - Site Geometry (REC 2-1)

Drawing PG6422-3C - Site Geometry (REC 3-1)

Table 7 - Summary of Reception Points and Geometry
3113 Carp Road

Point of Reception	Location	Leq Day (dBA)	Carp Road						
			Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)	
REC 1-1	Western Elevation, 1st Floor	55	70	1.5	70.0	-64, 68	n/a	n/a	
REC 2-1	Northern Elevation, 1st Floor	45	145	1.5	145.0	-40, 0	n/a	n/a	
REC 3-1	Southern Elevation, 1st Floor	46	145	1.5	145.0	0, 46	n/a	n/a	





**PATERSON
GROUP**

9 AURIGA DRIVE
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TEL: (613) 226-7381

1	UPDATED TO NEW CONCEPTUAL PLAN	20/04/2023	SB
NO.	REVISIONS	DATE	INITIAL

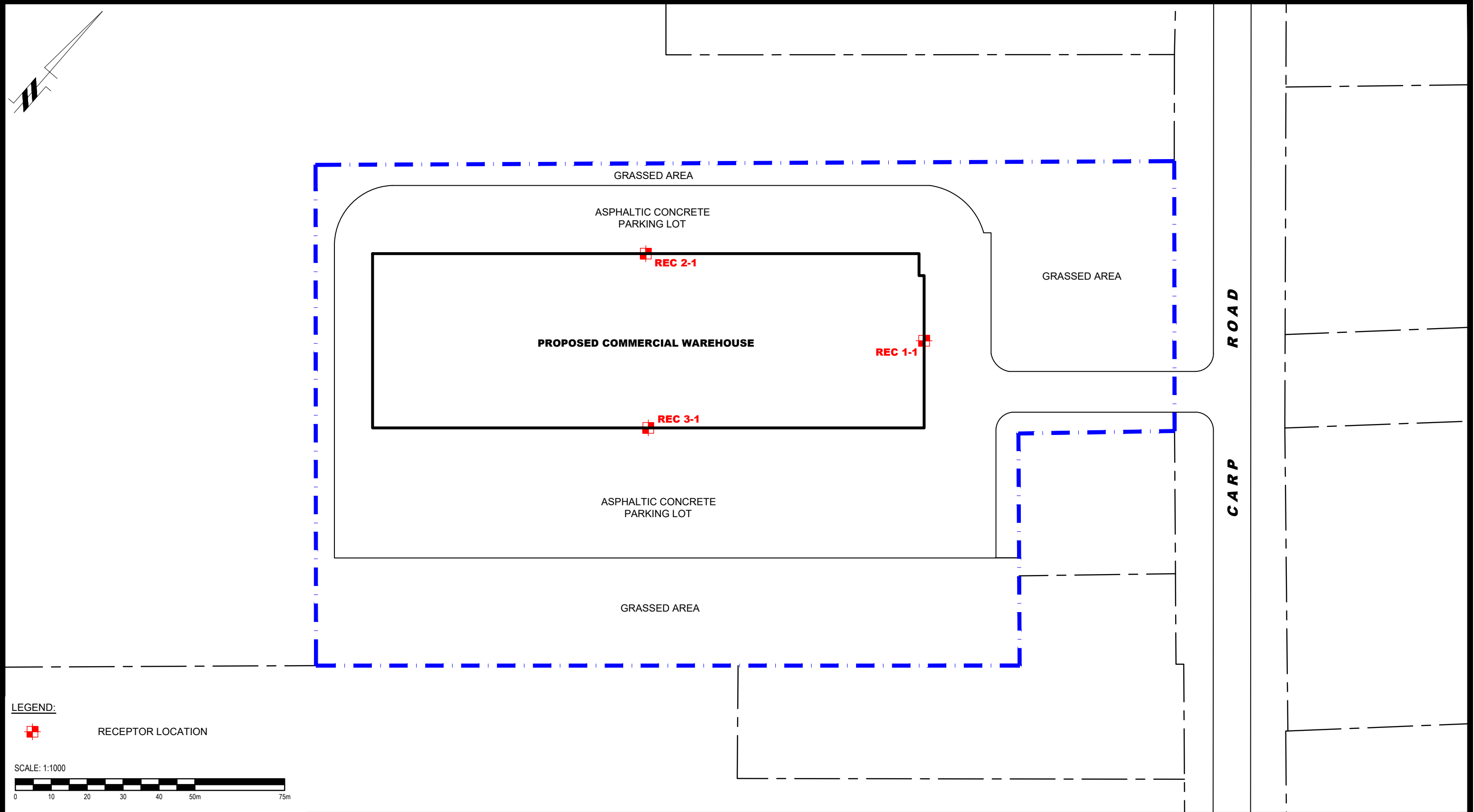
OTTAWA,
Title:

CANADIAN RENTAL DEVELOPMENT
NOISE ATTENUATION STUDY
PROPOSED COMMERCIAL WAREHOUSE BUILDING
3113 CARP ROAD

ONTARIO

SITE PLAN

Scale:	1:1000	Date:	11/2022
Drawn by:	YA	Report No.:	PG6422-3
Checked by:	YT	Dwg. No.:	PG6422-1
Approved by:	SB	Revision No.:	1



LEGEND:



RECEPTOR LOCATION

SCALE: 1:1000





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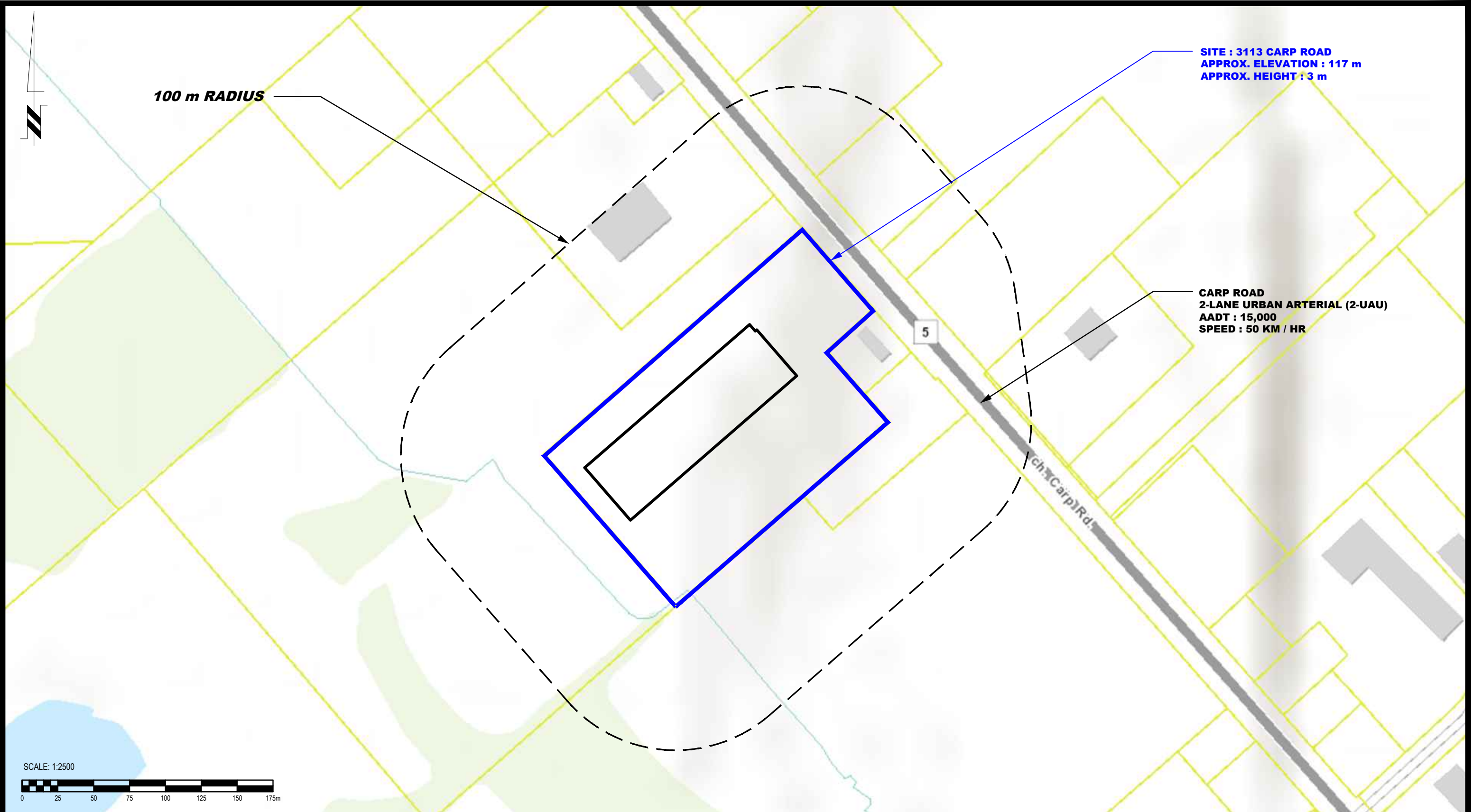
1	UPDATED TO NEW CONCEPTUAL PLAN	20/04/2023	SB
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OTTAWA,
Title:

CANADIAN RENTAL DEVELOPMENT
NOISE ATTENUATION STUDY
PROPOSED COMMERCIAL WAREHOUSE BUILDING
3113 CARP ROAD
ONTARIO

RECEPTOR LOCATION PLAN

Scale:	1:1000	Date:	11/2022
Drawn by:	YA	Report No.:	PG6422-3
Checked by:	YT	Dwg. No.:	PG6422-2
Approved by:	SB	Revision No.:	1





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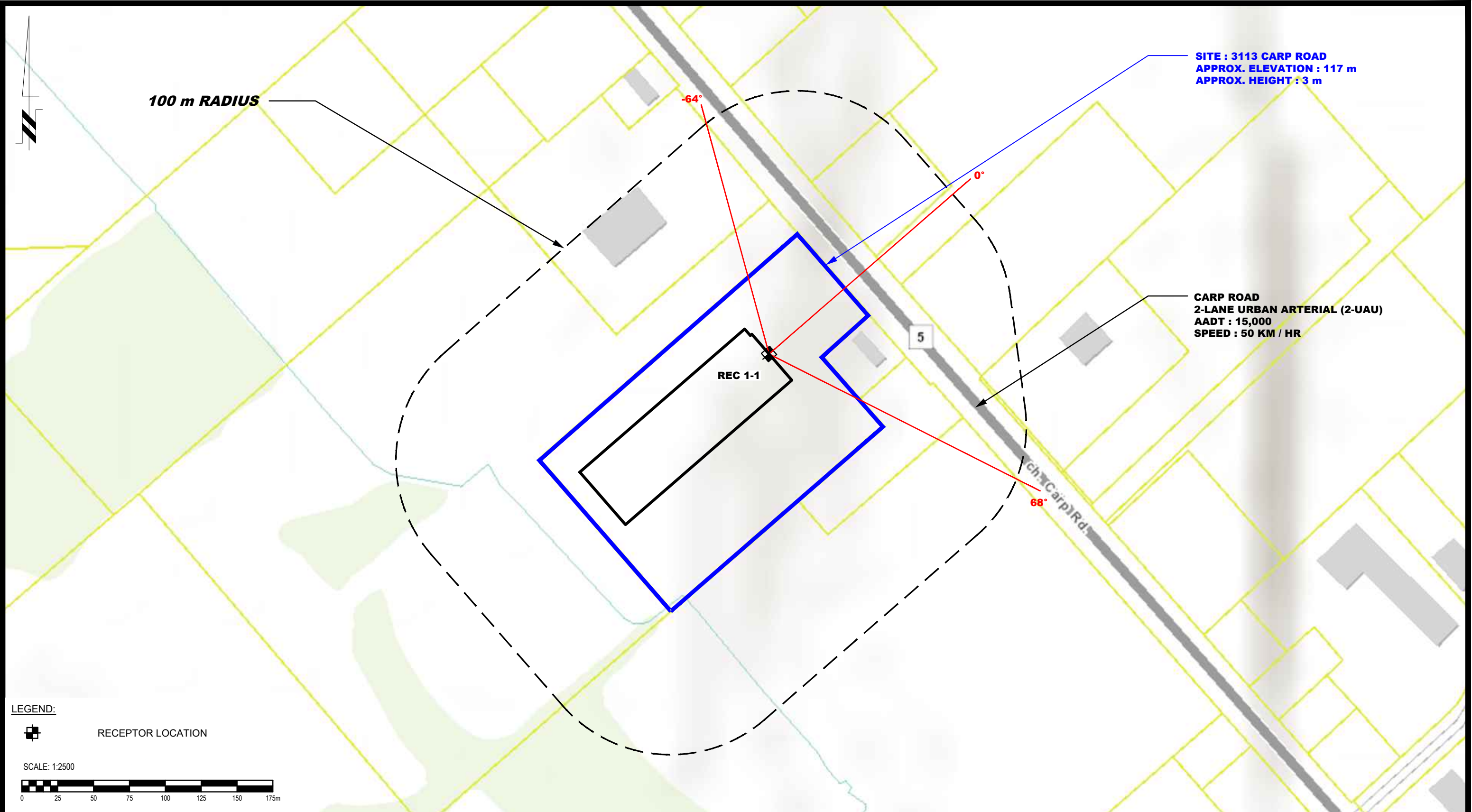
CANADIAN RENTAL DEVELOPMENT
NOISE ATTENUATION STUDY
PROPOSED COMMERCIAL WAREHOUSE BUILDING
3113 CARP ROAD

OTTAWA,
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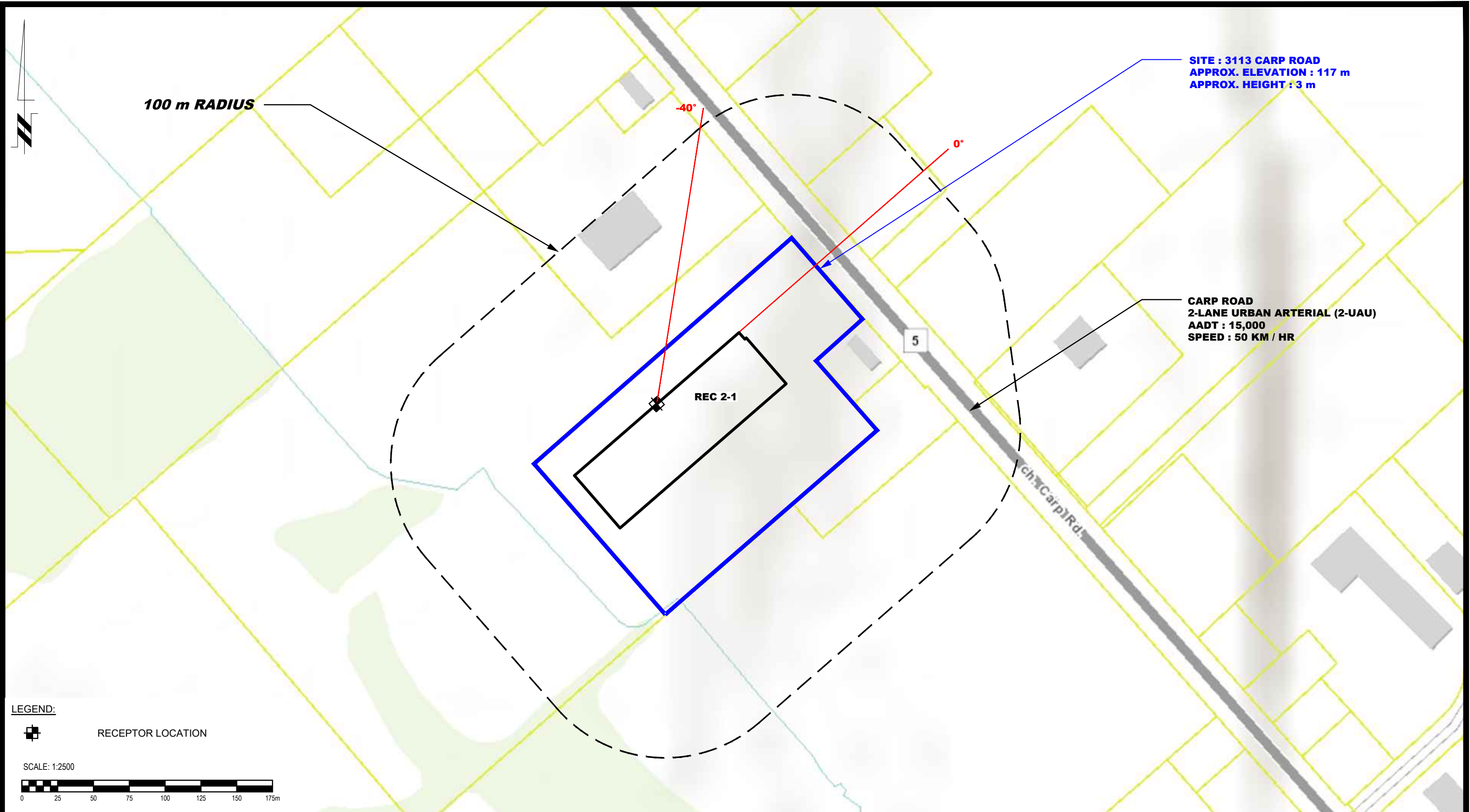
ONTARIO

SITE GEOMETRY

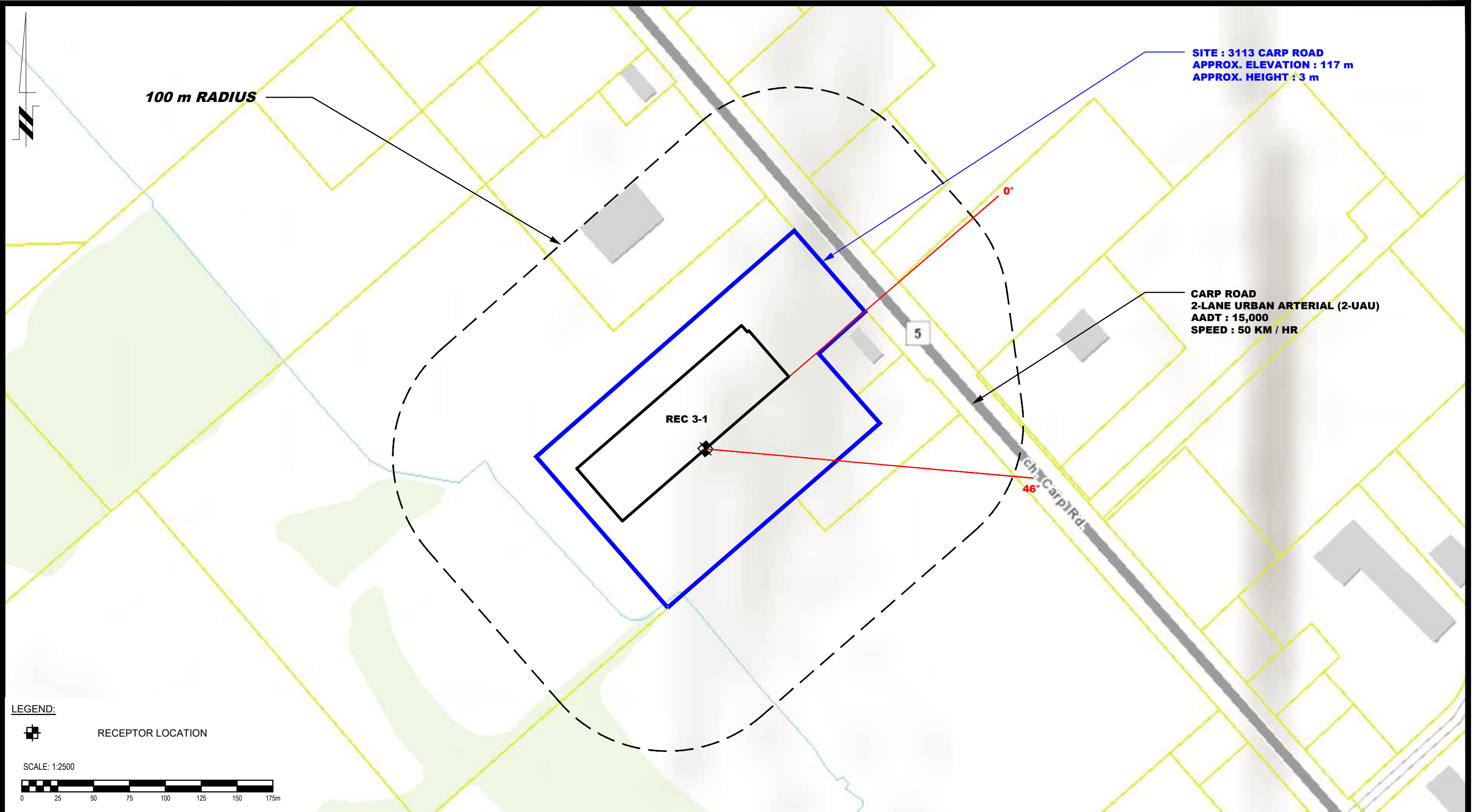
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Drawn by:	YA	Report No.:	PG6422-3
Checked by:	YT	Dwg. No.:	PG6422-3
Approved by:	SB	Revision No.:	1



 9 AURIGA DRIVE OTTAWA, ON K2E 7T9 TEL: (613) 226-7381				CANADIAN RENTAL DEVELOPMENT NOISE ATTENUATION STUDY PROPOSED COMMERCIAL WAREHOUSE BUILDING 3113 CARP ROAD			Scale:	1:2500	Date:	11/2022
							Drawn by:	YA	Report No.:	PG6422-3
				OTTAWA, Title:			Checked by:	YT	Dwg. No.:	PG6422-3A
							Approved by:	SB	Revision No.:	1
	1	UPDATED TO NEW CONCEPTUAL PLAN	20/04/2023	SB	SITE GEOMETRY - REC 1-1					
	NO.	REVISIONS	DATE	INITIAL						



 9 AURIGA DRIVE OTTAWA, ON K2E 7T9 TEL: (613) 226-7381				CANADIAN RENTAL DEVELOPMENT NOISE ATTENUATION STUDY PROPOSED COMMERCIAL WAREHOUSE BUILDING 3113 CARP ROAD			Scale:	1:2500	Date:	11/2022
							Drawn by:	YA	Report No.:	PG6422-3
				OTTAWA, Title:			Checked by:	YT	Dwg. No.:	PG6422-3B
							Approved by:	SB	Revision No.:	1
	1	UPDATED TO NEW CONCEPTUAL PLAN	20/04/2023	SB	SITE GEOMETRY - REC 2-1					
	NO.	REVISIONS	DATE	INITIAL						





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NO.	REVISIONS	DATE	INITIAL

CANADIAN RENTAL DEVELOPMENT
NOISE ATTENUATION STUDY
PROPOSED COMMERCIAL WAREHOUSE BUILDING
3113 CARP ROAD

OTTAWA,
Title:

ONTARIO

SITE GEOMETRY - REC 3-1

Scale:	1:2500	Date:	11/2022
Drawn by:	YA	Report No.:	PG6422-3
Checked by:	YT	Dwg. No.:	PG6422-3C
Approved by:	SB	Revision No.:	1

APPENDIX 2

STAMSON RESULTS

STAMSON 5.0 NORMAL REPORT Date: 20-04-2023 10:40:05
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec11.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 1-1

Road data, segment # 1: Carp Rd (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 : 50 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: Carp Rd (day/night)

Angle1 Angle2 : -64.00 deg 68.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 70.00 / 70.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Results segment # 1: Carp Rd (day)

Source height = 1.50 m

ROAD (0.00 + 55.33 + 0.00) = 55.33 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-64	68	0.66	68.48	0.00	-11.11	-2.04	0.00	0.00	0.00	55.33

Segment Leq : 55.33 dBA

Total Leq All Segments: 55.33 dBA

↑

Results segment # 1: Carp Rd (night)

Source height = 1.50 m

ROAD (0.00 + 47.74 + 0.00) = 47.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
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-64	68	0.66	60.88	0.00	-11.11	-2.04	0.00	0.00	0.00	47.74
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Segment Leq : 47.74 dBA

Total Leq All Segments: 47.74 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 55.33

(NIGHT): 47.74

↑

↑

STAMSON 5.0 NORMAL REPORT Date: 20-04-2023 10:42:20
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec21.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 2-1

Road data, segment # 1: Carp Rd (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 : 50 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: Carp Rd (day/night)

Angle1 Angle2 : -40.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 145.00 / 145.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Results segment # 1: Carp Rd (day)

Source height = 1.50 m

ROAD (0.00 + 45.35 + 0.00) = 45.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-40	0	0.66	68.48	0.00	-16.36	-6.77	0.00	0.00	0.00	45.35

Segment Leq : 45.35 dBA

Total Leq All Segments: 45.35 dBA

↑

Results segment # 1: Carp Rd (night)

Source height = 1.50 m

ROAD (0.00 + 37.76 + 0.00) = 37.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
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-40	0	0.66	60.88	0.00	-16.36	-6.77	0.00	0.00	0.00	37.76
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Segment Leq : 37.76 dBA

Total Leq All Segments: 37.76 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 45.35

(NIGHT): 37.76

↑

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STAMSON 5.0 NORMAL REPORT Date: 20-04-2023 10:43:15
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec31.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 3-1

Road data, segment # 1: Carp Rd (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 : 50 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: Carp Rd (day/night)

Angle1 Angle2 : 0.00 deg 46.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 145.00 / 145.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Results segment # 1: Carp Rd (day)

Source height = 1.50 m

ROAD (0.00 + 45.88 + 0.00) = 45.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	46	0.66	68.48	0.00	-16.36	-6.25	0.00	0.00	0.00	45.88

Segment Leq : 45.88 dBA

Total Leq All Segments: 45.88 dBA

↑

Results segment # 1: Carp Rd (night)

Source height = 1.50 m

ROAD (0.00 + 38.28 + 0.00) = 38.28 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------	--------

0	46	0.66	60.88	0.00	-16.36	-6.25	0.00	0.00	0.00	38.28
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Segment Leq : 38.28 dBA

Total Leq All Segments: 38.28 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 45.88

(NIGHT): 38.28

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