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Environmental Noise Control Study

Proposed Multi-Storey Residential Buildings
3490 Innes Road, Ottawa

Prepared For

Canadian Rental Services Inc

December 10, 2021

Report: PG4488-2 Revision 2

Paterson Group Inc.
Consulting Engineers
154 Colonnade Road South
Ottawa (Nepean), Ontario
Canada K2E 7J5

Tel: (613) 226-7381
Fax: (613) 226-6344
www.patersongroup.ca

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1.0 Introduction

Paterson Group (Paterson) was commissioned by Canadian Rental Services Inc to conduct an environmental noise control study for the proposed multi-storey residential buildings to be located at 3490 Innes 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

It is understood that the proposed residential development will consist of three multi-storey residential buildings (Pavilion A, Pavilion B, and Pavilion C), all located within Zone 1 (southern portion) of the subject site. Pavilion A has six (6) stories and rises approximately 20 metres above grade. Pavilion B and Pavilion C have seven (7) stories and rise approximately 23 metres above grade. All pavilions have two (2) levels of basement. Associated at-grade pedestrian pathways, driveways, parking areas, landscaped areas, and garbage area are also anticipated. Outdoor living areas are identified at the 5th floor and 6th floor rooftop terraces at Pavilion A, the 6th floor and 7th floor rooftop terraces at Pavilion B, and the 5th floor, 6th floor, and 7th floor rooftop terraces at Pavilion C on the proposed site plan. At-grade common terrace is also identified at the rear side of Pavilion B on the proposed site plan.

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. Therefore, where noise levels exceed 55 dBA daytime and 50 dBA nighttime, the ventilation for the building should consider the provision for central air conditioning. Where noise levels exceed 65 dBA daytime and 60 dBA nighttime, central air conditioning will be required, and the building components will require higher levels of sound attenuation.

If the noise level limits are exceeded, the following Warning Clauses should be included in related deeds of sale:

Table 3 – Warning Clauses for Noise Level Exceedances

Warning Clause	Description
Warning Clause Type A	"Purchasers/tenants are advised that sound levels due to increasing road traffic (rail traffic) (air traffic) may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."
Warning Clause Type B	"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic (rail traffic) (air traffic) may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."
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."
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 buildings are bordered to the north by undeveloped grassed area, to the east by Lamarche Avenue followed by undeveloped grassed area, to the south by residential dwellings, Argonaut Circle, Crevier Walk, and Darvoy Mews, to the west by residential dwellings, commercial buildings, and Page Road. Page Road, Argonaut Circle, and Darvoy Mews are identified within the 100 m radius of Pavilion A. Lamarche Avenue, Argonaut Circle, and Crevier Walk are identified within the 100 m radius of Pavilion B. Lamarche Avenue, Argonaut Circle, Crevier Walk, and Darvoy Mews are identified within the 100 m radius of Pavilion C.

Based on the City of Ottawa's Official Plan, Schedule F, Page Road is considered a 2-lane urban collector road (2-UCU). Other roads within the 100 m radius of the proposed dwellings are not classified as either arterial, collector or major collector roads and therefore are not included in this study. It is noted that Page Road is beyond the 100 m radius of Pavilions B and C.

All noise sources are presented in Drawings PG4488-4, PG4488-5, PG4488-6 - 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 %
Page Road	2-UCU	8000	40	92/8	7	5
➢ Data obtained from the City of Ottawa document ENCG						

Three (3) levels of reception points were selected at Pavilion A for this analysis. The following elevations were 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	2.0	Living Area/Bedroom	Daytime / Nighttime
Sixth Floor	18.0	Living Area/Bedroom	Daytime / Nighttime
Fifth Floor Rooftop Terrace	15.0	Outdoor Living Area	Daytime / Nighttime
Sixth Floor Rooftop Terrace	18.0	Outdoor Living Area	Daytime / Nighttime

For this analysis, a reception point was taken at the centre of each floor, at the first floor and top floor. Receptor points were also taken at Outdoor Living Areas - fifth floor rooftop terraces and sixth floor rooftop terraces at the north end and south end of proposed Pavilion A. Reception points are detailed on Drawing PG4488-2 - 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 PG4488-4A to 4I - 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 from the building facade are considered, as stipulated by the ENGC.

The subject site is gently levelled and at grade with the neighbouring roads within 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	2.0	Pavilion A, Northern Elevation, 1st Floor	41	33
REC 1-6	18.0	Pavilion A, Northern Elevation, 6th Floor	45	38
REC 2-1	2.0	Pavilion A, Western Elevation, 1st Floor	47	40
REC 2-6	18.0	Pavilion A, Western Elevation, 6th Floor	51	44
REC 3-1	2.0	Pavilion A, Southern Elevation, 1st Floor	40	33
REC 3-6	18.0	Pavilion A, Southern Elevation, 6th Floor	46	38
REC 4	15.0	Pavilion A, Rooftop Terrace (North), 5th Floor	45	N/A*
REC 5	15.0	Pavilion A, Rooftop Terrace (South), 5th Floor	46	N/A*
REC 6	18.0	Pavilion A, Rooftop Terrace (North), 6th Floor	46	N/A*
REC 7	18.0	Pavilion A, Rooftop Terrace (South), 6th Floor	47	N/A*

*Nighttime noise levels at OLA are not considered as per ENCG

6.0 Discussion and Recommendations

6.1 Outdoor Living Areas

Rooftop terraces were noted at the proposed Pavilions A, B, and C that will serve as Outdoor Living Areas (OLA). Receptor points (REC 4 to 7) were selected in the centre of fifth floor rooftop terraces and sixth floor rooftop terraces of Pavilion A. It is assumed that the rooftop terraces will only be utilized as OLA provided that the proposed building is constructed therefore allowing the exterior wall of the proposed building to act as a noise barrier. The noise levels at the rooftop terraces of proposed Pavilion A will range between 45 dBA and 47 dBA during the daytime period (7:00-23:00), which are below the 55 dBA threshold value specified by the ENCG.

It is noted that there is no major source of traffic noise within 100 m radius of Pavilions B and C. Therefore, it is anticipated that the noise levels at the rooftop terraces of proposed Pavilions B and C will be below the 55 dBA threshold value specified by the ENCG.

6.2 Indoor Living Areas and Ventilation

The results of the STAMSON modeling indicate that the noise levels will range between 40 dBA and 51 dBA during the daytime period (07:00-23:00) and between 33 dBA and 44 dBA during the nighttime period (23:00-7:00). The noise levels on all elevations of proposed Pavilion A will be below the limit for the exterior of the pane of glass (55 dBA) specified by the ENCG. It is noted that there is no major source of traffic noise within 100 m radius of Pavilions B and C. It is anticipated that the noise levels on all elevations of proposed Pavilions B and C will be below the limit for the exterior of the pane of glass (55 dBA) specified by the ENCG. Therefore, standard building materials are acceptable to provide adequate soundproofing.

7.0 Summary of Findings

The subject site is located at 3490 Innes Road, in the City of Ottawa. It is understood that the proposed development will consist of three multi-storey residential buildings (Pavilion A, Pavilion B, and Pavilion C), all located within Zone 1 (southern portion) of the subject site. Pavilion A has six (6) stories and rises approximately 20 metres above grade. Pavilion B and Pavilion C have seven (7) stories and rise approximately 23 metres above grade. There is one major source of surface transportation noise to the proposed buildings: Page Road.

Several reception points were selected at Pavilion A for the surface transportation noise analysis, consisting of the centre of first level and top level. The results of STAMSON modeling indicate that the noise levels on all elevations of Pavilion A are expected below the 55 dBA threshold specified by the ENCG. Therefore, standard building materials are acceptable to provide adequate soundproofing.

The surface transportation noise analysis was completed at the Outdoor Living Areas – fifth floor rooftop terraces and sixth floor rooftop terraces at Pavilion A as well. The results of STAMSON modeling indicate that the noise levels at the rooftop terraces are expected below 55 dBA during the daytime period. It is also anticipated that the noise levels at the rooftop terraces at Pavilions B and C will be below 55 dBA during the daytime period.

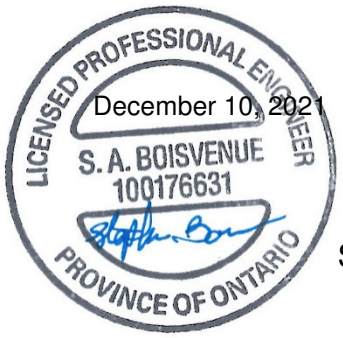
Due to the anticipated noise levels at these proposed buildings, no warning clauses will be required.

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 Services Inc. 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.Sc.Eng

Stephanie A. Boisvenue, P.Eng.

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APPENDIX 1

TABLE 7 - SUMMARY OF RECEPTION POINTS AND GEOMETRY

DRAWING PG4488-1 - SITE PLAN

DRAWING PG4488-2 - RECEPTOR LOCATION PLAN

DRAWING PG4488-4 – SITE GEOMETRY – Pavilion A

DRAWING PG4488-4A - SITE GEOMETRY (REC 1-1)

DRAWING PG4488-4B - SITE GEOMETRY (REC 1-6)

DRAWING PG4488-4C - SITE GEOMETRY (REC 2-1 and REC 2-6)

DRAWING PG4488-4D - SITE GEOMETRY (REC 3-1)

DRAWING PG4488-4E - SITE GEOMETRY (REC 3-6)

DRAWING PG4488-4F - SITE GEOMETRY (REC 4)

DRAWING PG4488-4G - SITE GEOMETRY (REC 5)

DRAWING PG4488-4H - SITE GEOMETRY (REC 6)

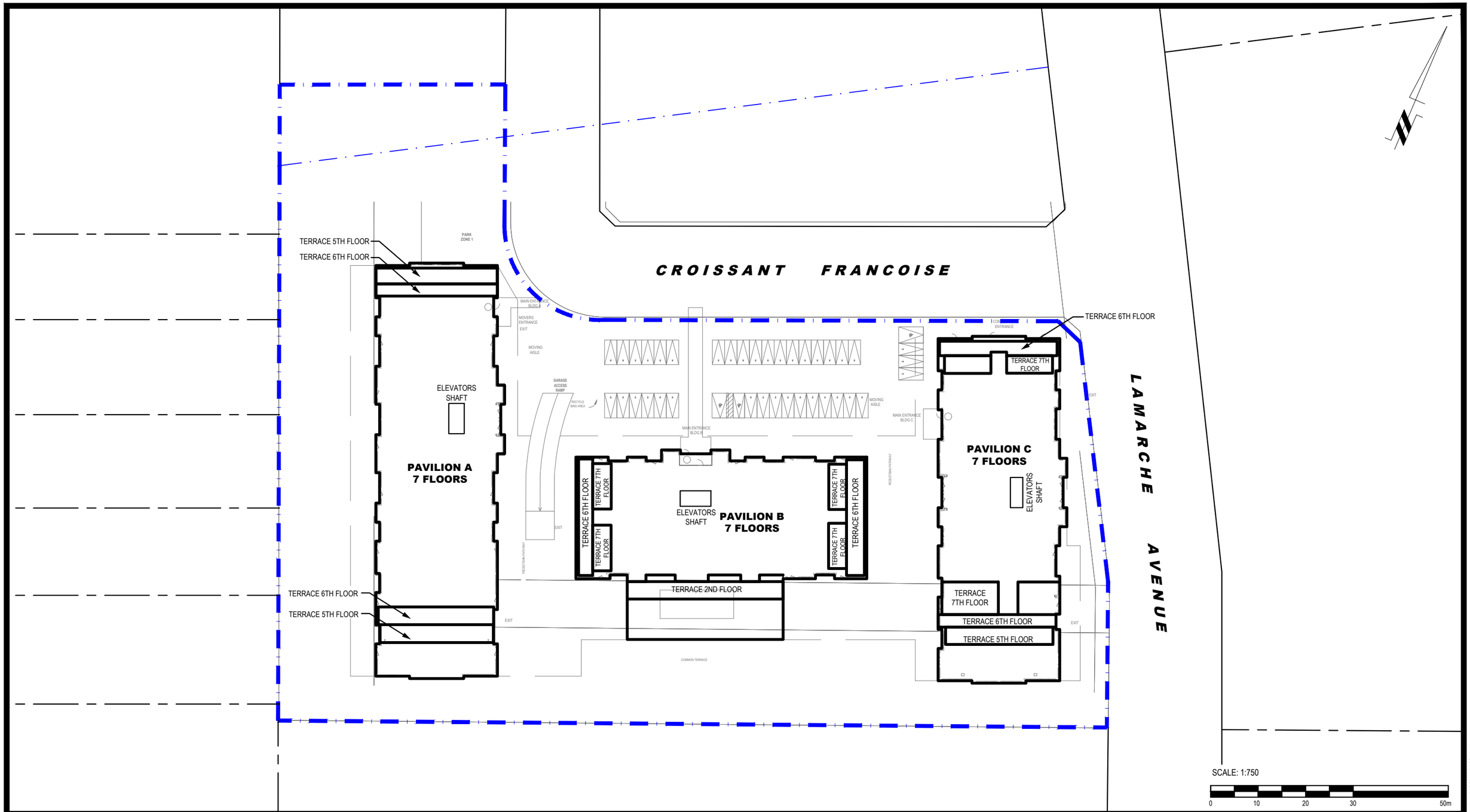
DRAWING PG4488-4I - SITE GEOMETRY (REC 7)

DRAWING PG4488-5 – SITE GEOMETRY – Pavilion B

DRAWING PG4488-6 – SITE GEOMETRY – Pavilion C

Table 7 - Summary of Reception Points and Geometry
3490 Innes Road

Point of Reception	Location	Leq Day (dBA)	PAGE ROAD					
			Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)
REC 1-1	Pavilion A, Northern Elevation, 1st Floor	41	100	2.0	100.0	0, 24	1	20
REC 1-6	Pavilion A, Northern Elevation, 6th Floor	45	100	18.0	101.61	0, 27	1	20
REC 2-1	Pavilion A, Western Elevation, 1st Floor	47	85	2.0	85.0	-42, 46	1	20
REC 2-6	Pavilion A, Western Elevation, 6th Floor	51	85	18.0	86.88	-42, 46	1	20
REC 3-1	Pavilion A, Sothern Elevation, 1st Floor	40	100	2.0	100.0	-22, 0	1	20
REC 3-6	Pavilion A, Sothern Elevation, 6th Floor	46	100	18.0	101.61	-29, 0	1	20
REC 4	Pavilion A, Rooftop Terrace (North), 5th Floor	45	100	15.0	101.1	-9, 25	1	20
REC 5	Pavilion A, Rooftop Terrace (South), 5th Floor	46	100	15.0	101.12	-27, 8	1	20
REC 6	Pavilion A, Rooftop Terrace (North), 6th Floor	46	100	18.0	101.6	-2, 27	1	20
REC 7	Pavilion A, Rooftop Terrace (South), 6th Floor	47	100	18.0	101.61	-28, 10	1	20



patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

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Title:
SITE PLAN

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Drawn by: YA	Report No.: PG4488-2
Checked by: YT	Dwg. No.: PG4488-1
Approved by: SB	Revision No.:

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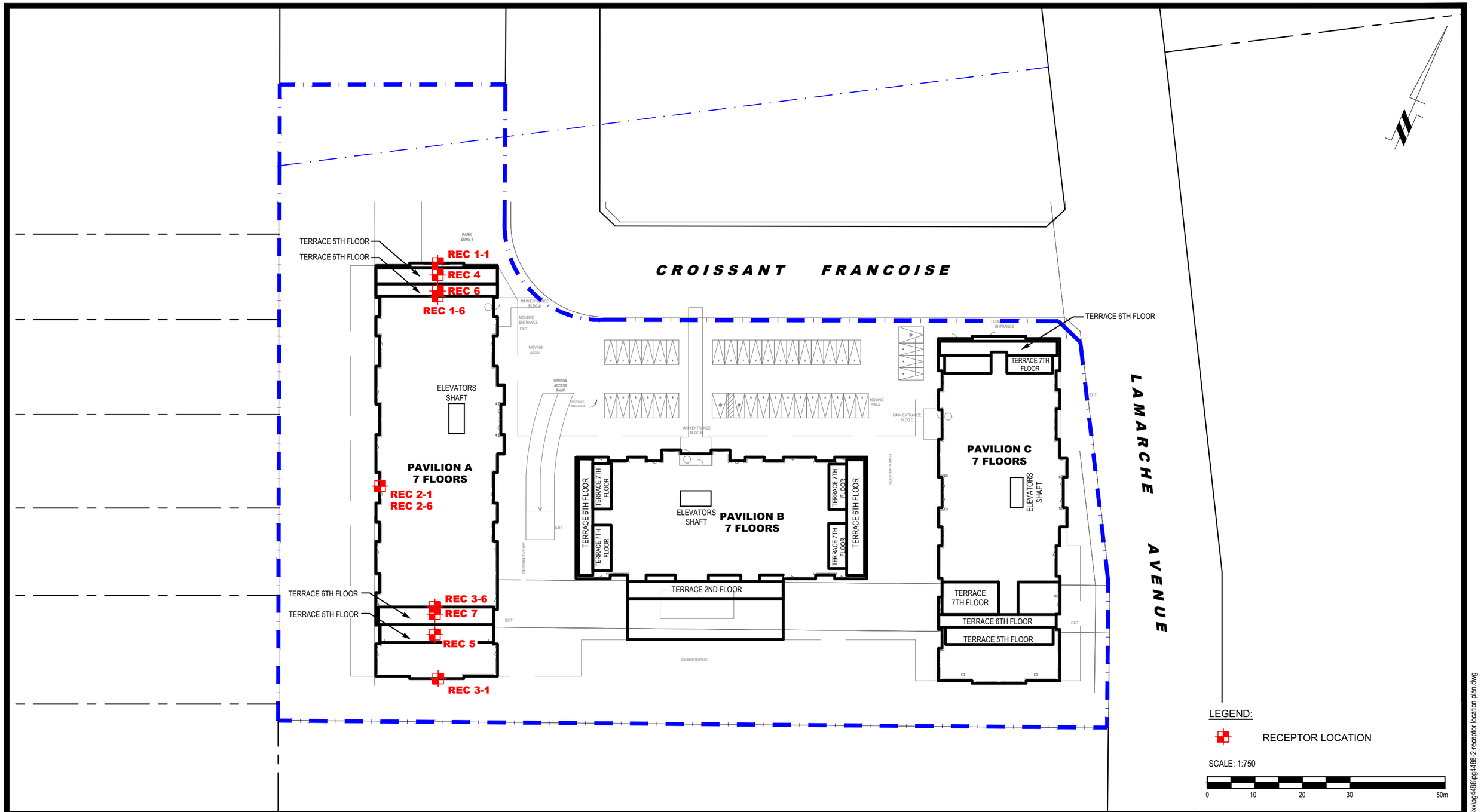

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154 Colonnade Road South
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RECEPTOR LOCATION PLAN

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Checked by: YT	Dwg. No.: PG4488-2
Approved by: SB	Revision No.:

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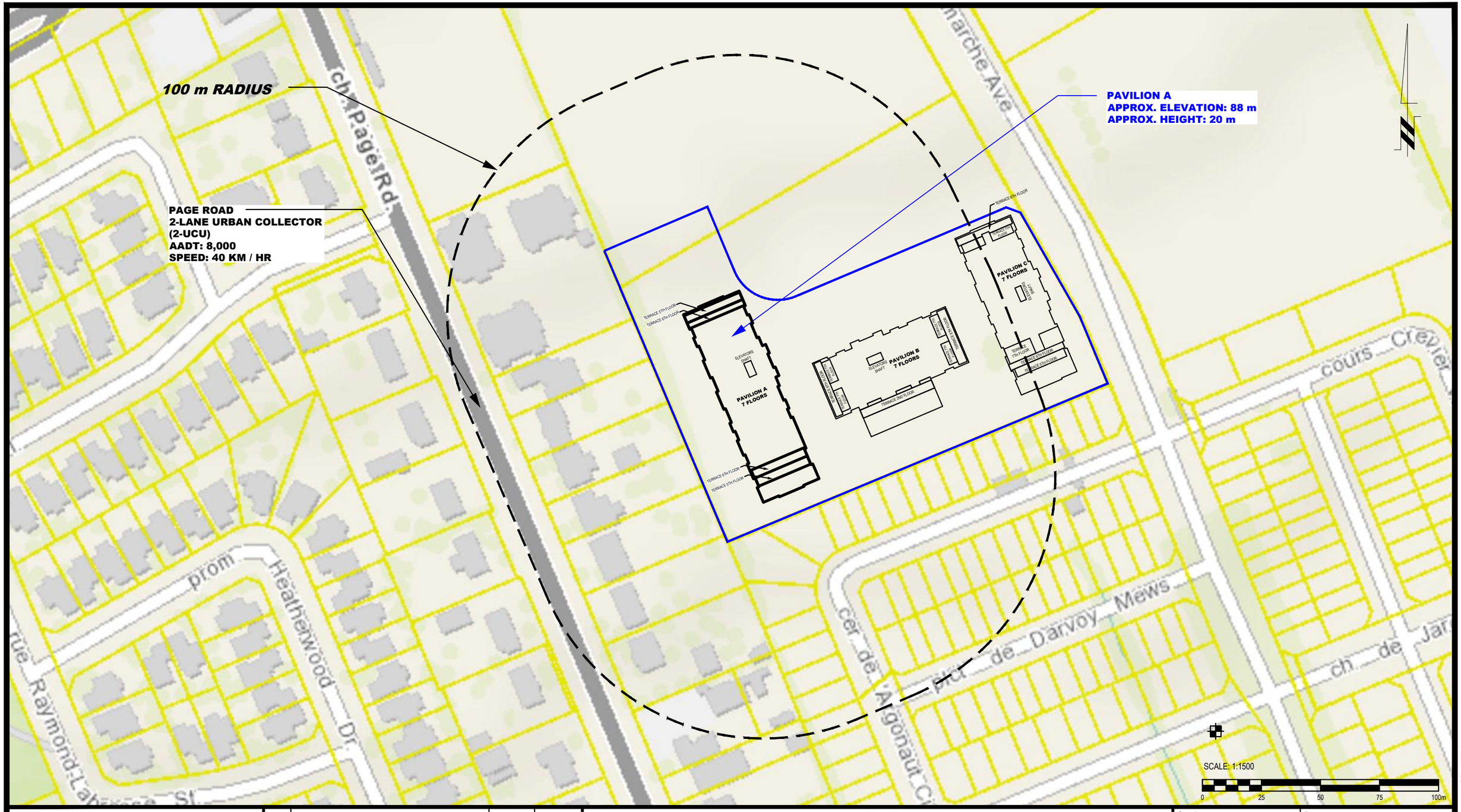

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Title:
SITE GEOMETRY - PAVILION A

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Checked by: YT	Dwg. No.: PG4488-4
Approved by: SB	Revision No.:

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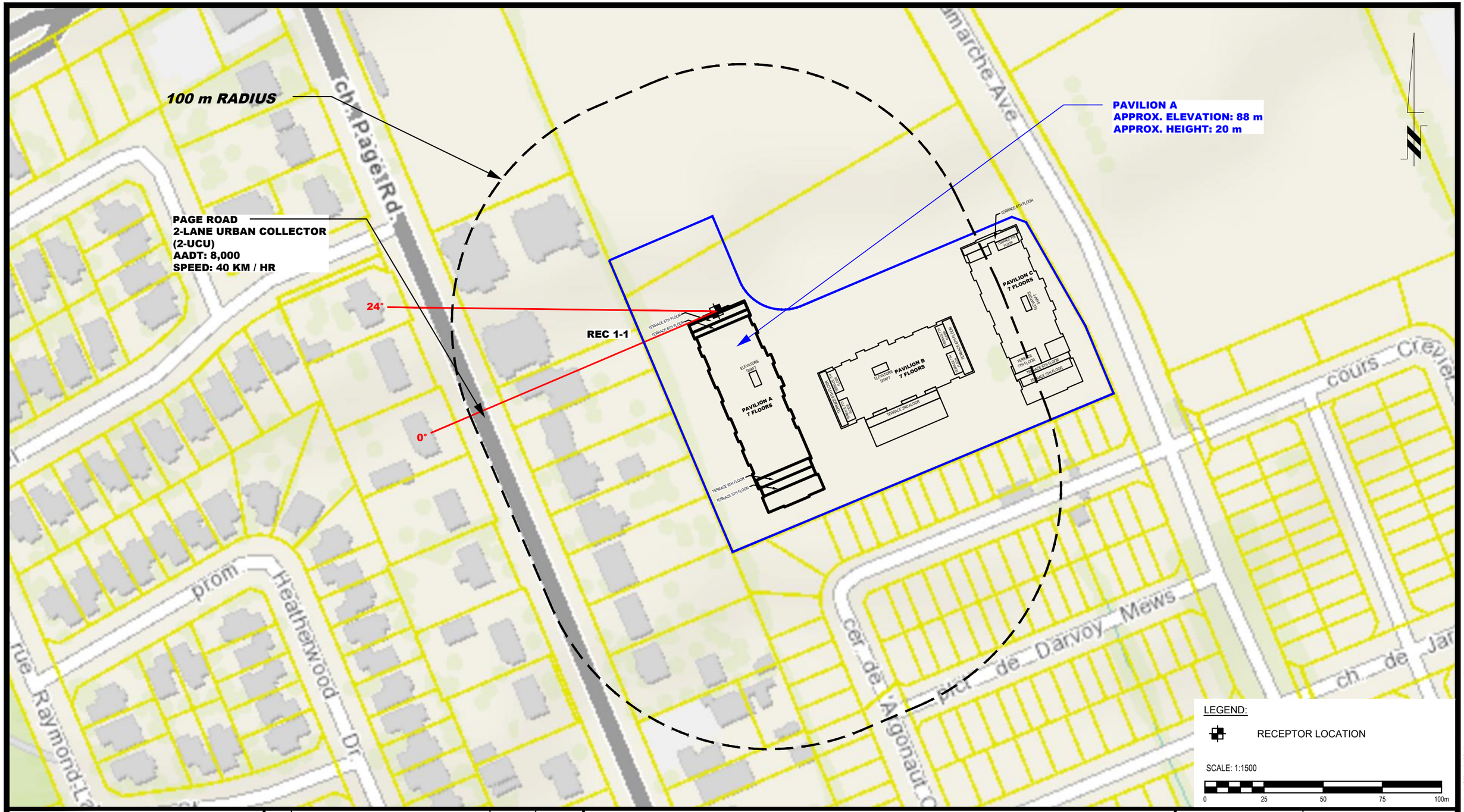

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Title:

SITE GEOMETRY - REC 1-1

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Approved by: SB	Revision No.:

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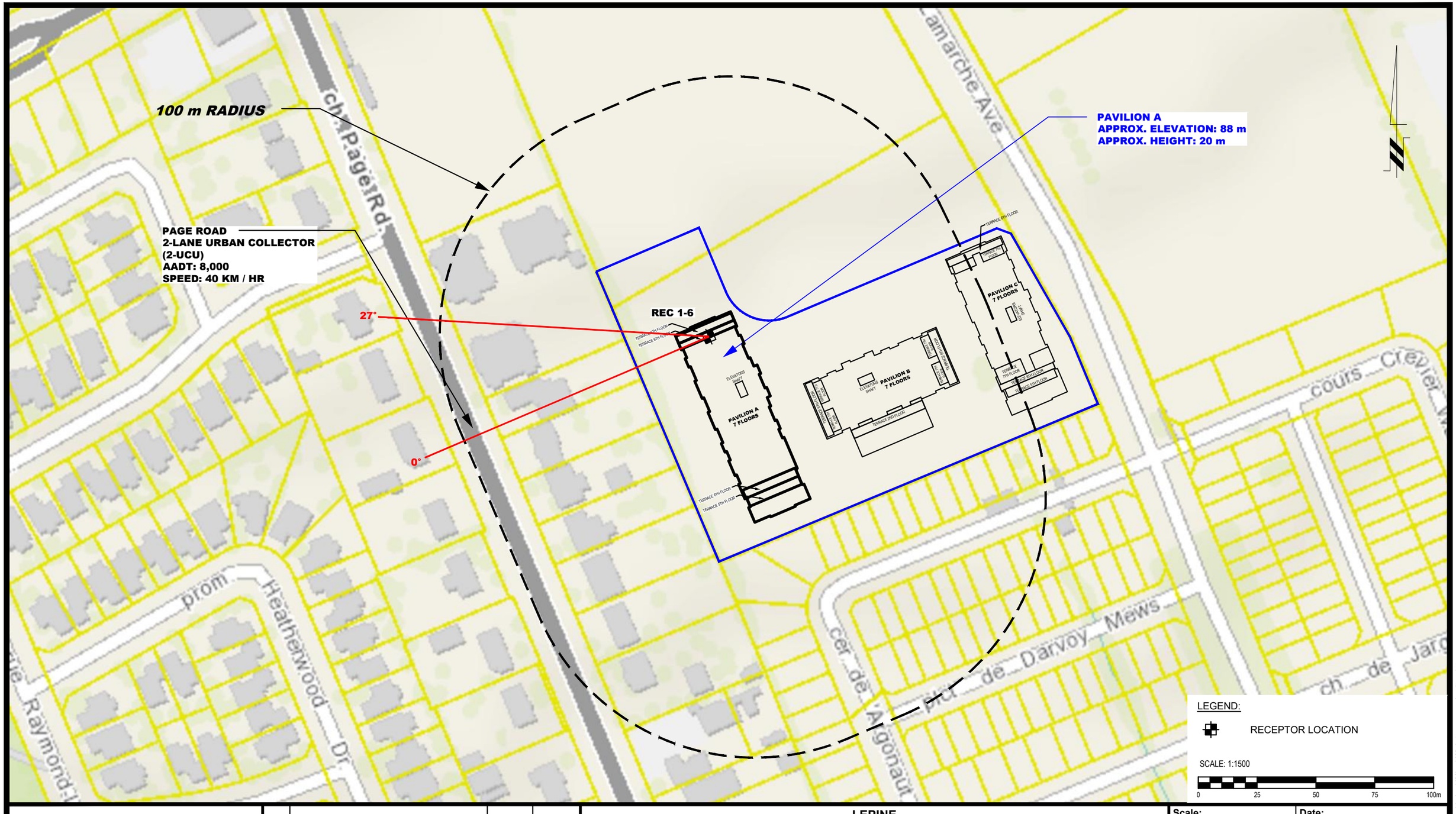

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Title:
SITE GEOMETRY - REC 1-6

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Title:
SITE GEOMETRY - REC 2-1 AND REC 2-6

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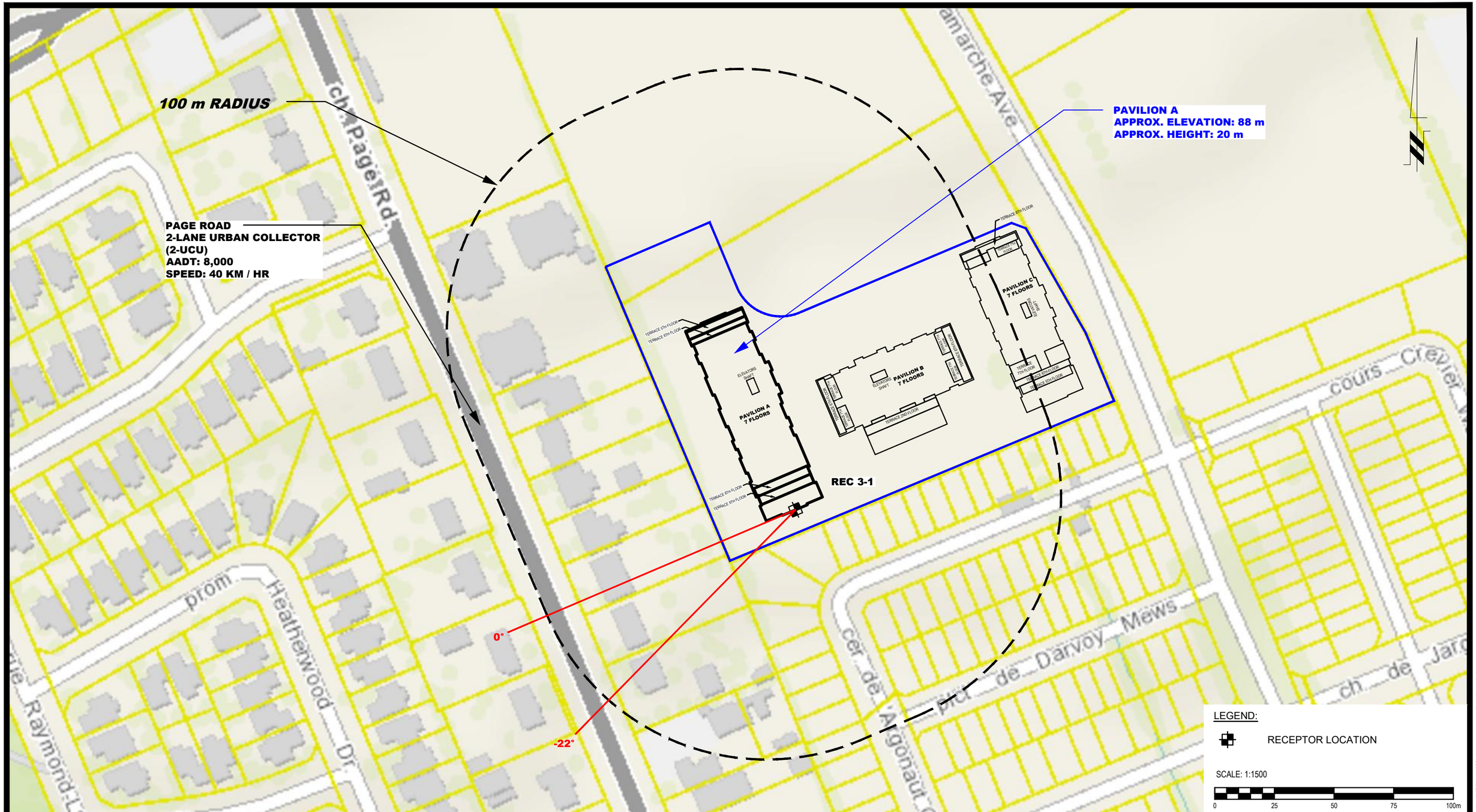

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consulting engineers

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Title:
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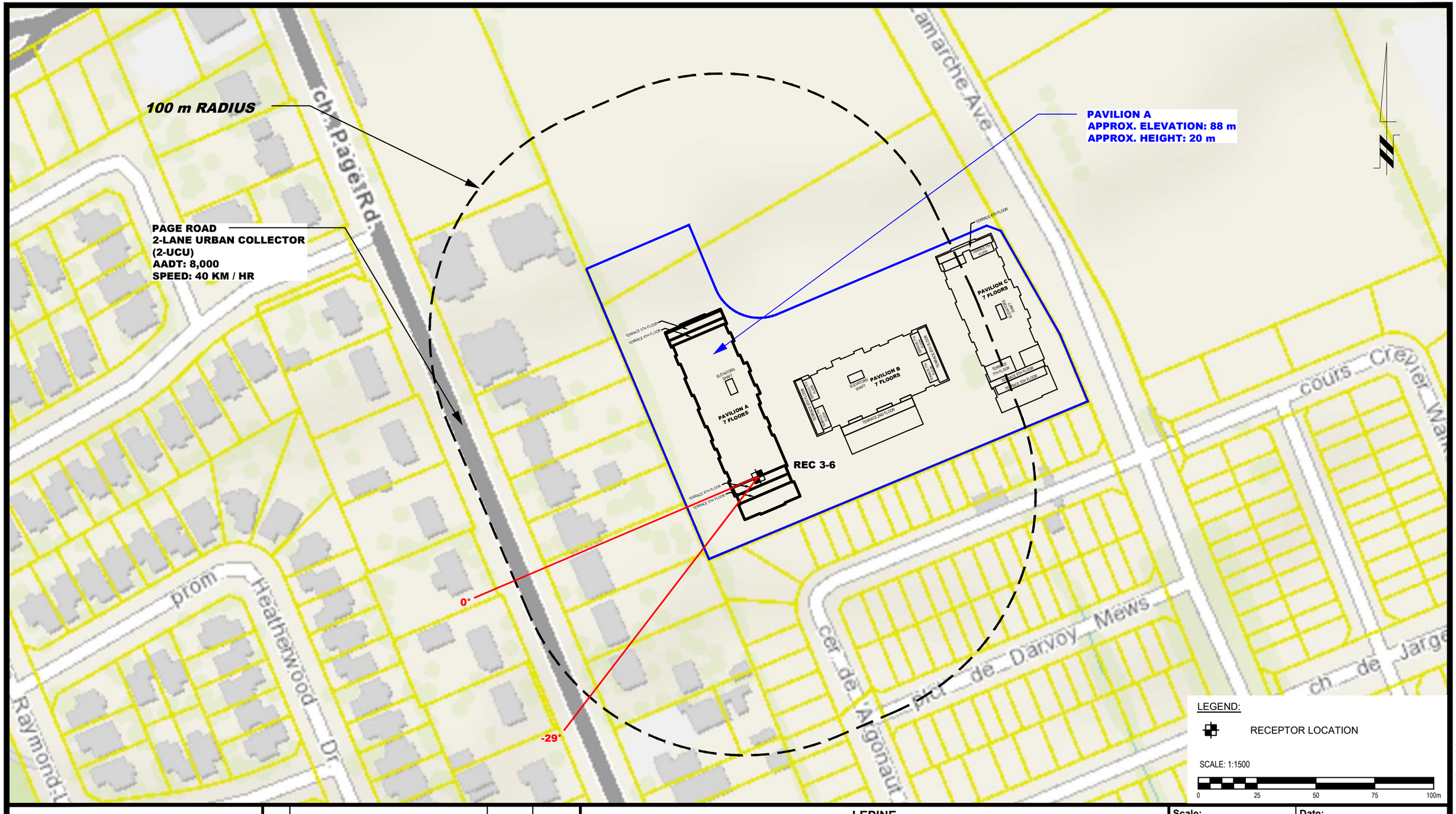

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Approved by: SB	Revision No.:

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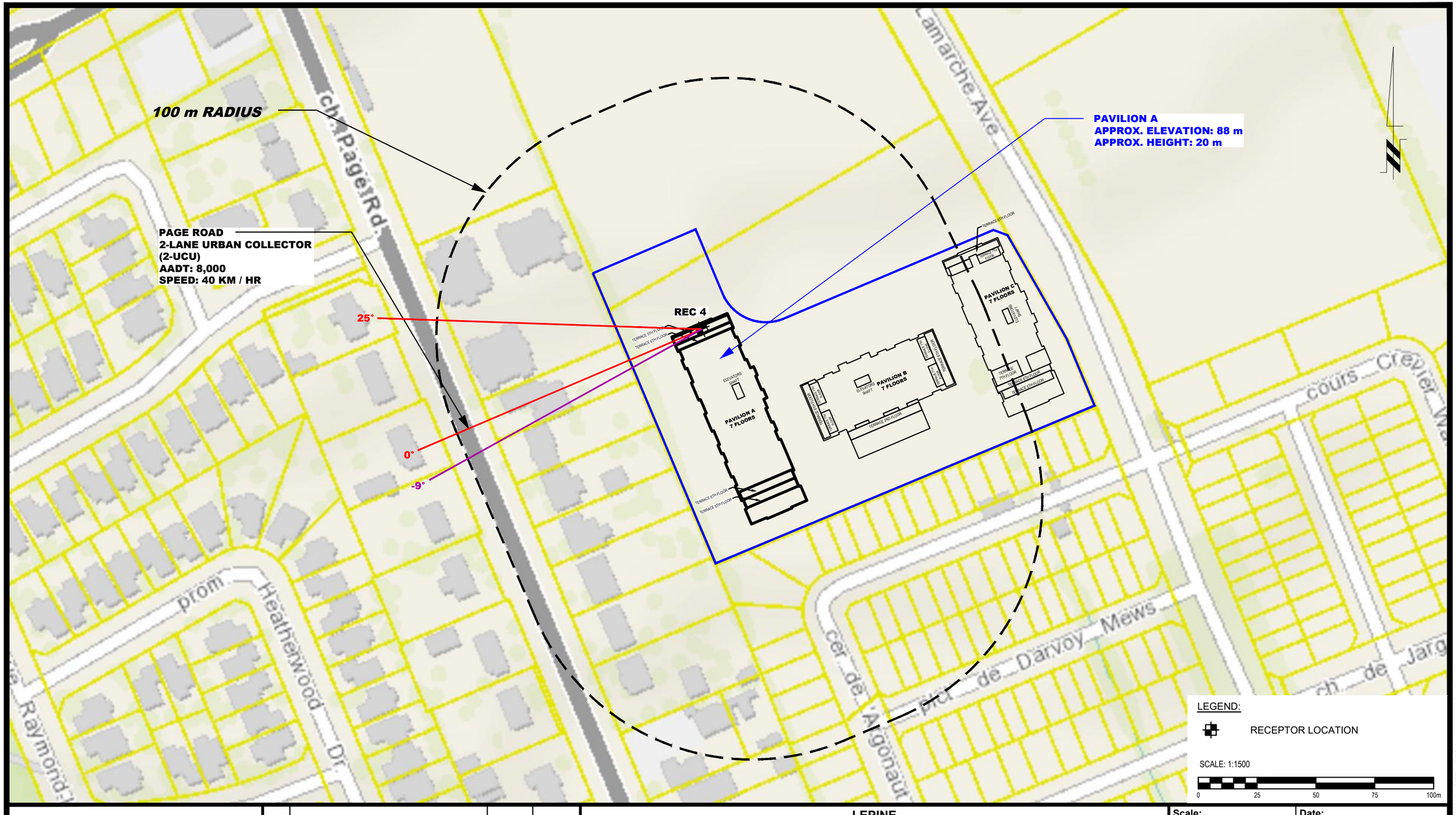

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NO.	REVISIONS	DATE	INITIAL

LEPINE
NOISE ATTENUATION STUDY
PROPOSED MULTI-STOREY BUILDING
3490 INNES ROAD
OTTAWA, ONTARIO

Title:

SITE GEOMETRY - REC 4

Scale: 1:1500	Date: 11/2021
Drawn by: YA	Report No.: PG4488-2
Checked by: YT	Dwg. No.: PG4488-4F
Approved by: SB	Revision No.:

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NOISE ATTENUATION STUDY
PROPOSED MULTI-STOREY BUILDING
3490 INNES ROAD
OTTAWA, ONTARIO

Title:

SITE GEOMETRY - REC 5

Scale: 1:1500	Date: 11/2021
Drawn by: YA	Report No.: PG4488-2
Checked by: YT	Dwg. No.: PG4488-4G
Approved by: SB	Revision No.:

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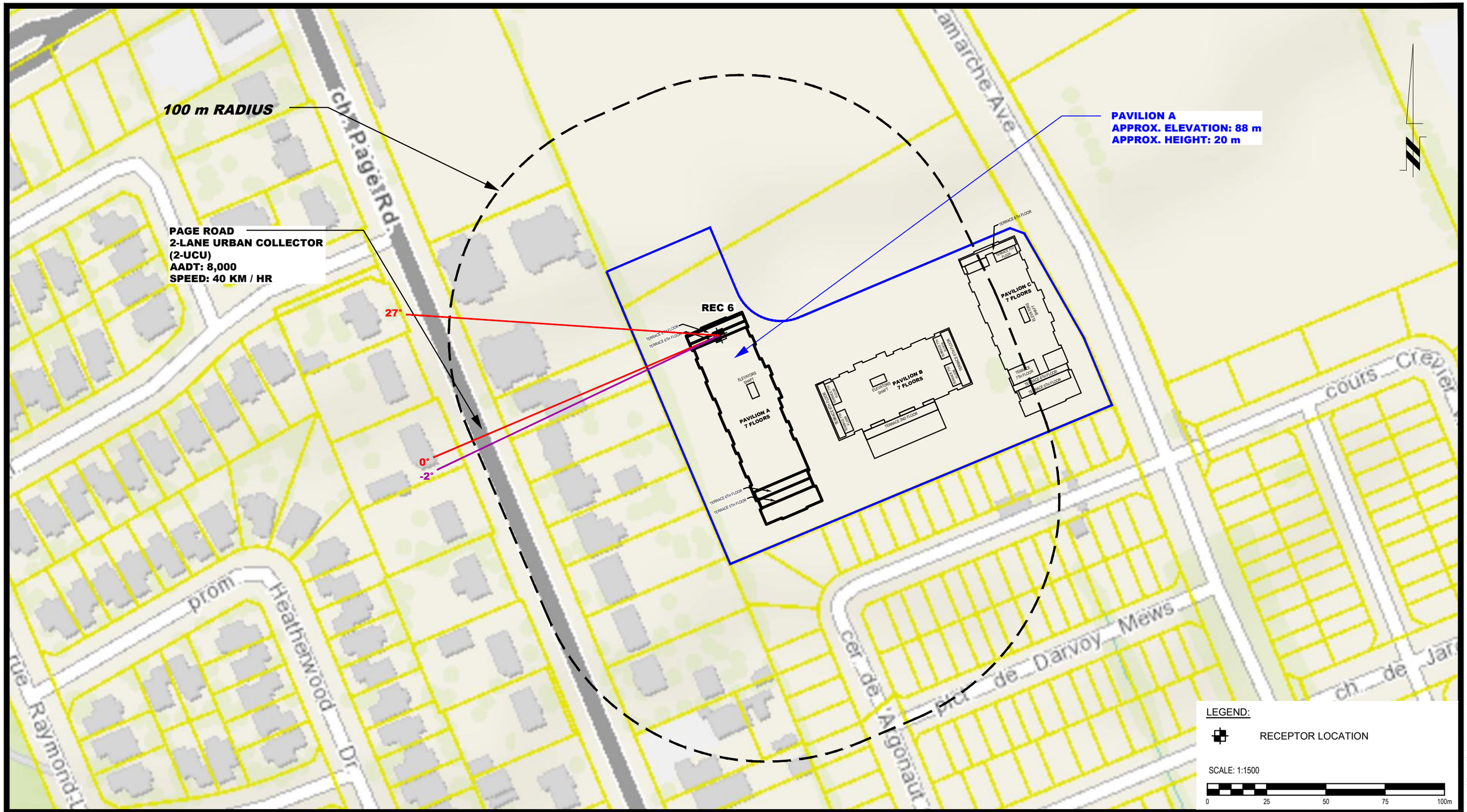

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NO.	REVISIONS	DATE	INITIAL

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NOISE ATTENUATION STUDY
PROPOSED MULTI-STOREY BUILDING
3490 INNES ROAD
OTTAWA, ONTARIO

Title:
SITE GEOMETRY - REC 6

Scale: 1:1500	Date: 11/2021
Drawn by: YA	Report No.: PG4488-2
Checked by: YT	Dwg. No.: PG4488-4H
Approved by: SB	Revision No.:

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100 m RADIUS

PAGE ROAD
2-LANE URBAN COLLECTOR
(2-UCU)
AADT: 8,000
SPEED: 40 KM / HR

PAVILION A
APPROX. ELEVATION: 88 m
APPROX. HEIGHT: 20 m

PAVILION A
7 FLOORS

PAVILION B
7 FLOORS

PAVILION C
7 FLOORS

REC 7

10°

0°

-28°

LEGEND:

RECEPTOR LOCATION

SCALE: 1:1500

0 25 50 75 100m

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OTTAWA, ONTARIO

Title:

SITE GEOMETRY - REC 7

Scale: 1:1500	Date: 11/2021
Drawn by: YA	Report No.: PG4488-2
Checked by: YT	Dwg. No.: PG4488-4I
Approved by: SB	Revision No.:

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154 Colonnade Road South
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NO.	REVISIONS	DATE	INITIAL

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PROPOSED MULTI-STOREY BUILDING
3490 INNES ROAD
OTTAWA, ONTARIO

Title:
SITE GEOMETRY - PAVILION B

Scale: 1:1500	Date: 11/2021
Drawn by: YA	Report No.: PG4488-2
Checked by: YT	Dwg. No.: PG4488-5
Approved by: SB	Revision No.:

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NO.	REVISIONS	DATE	INITIAL

LEPINE
NOISE ATTENUATION STUDY
PROPOSED MULTI-STOREY BUILDING
3490 INNES ROAD
OTTAWA, ONTARIO

Title:
SITE GEOMETRY - PAVILION C

Scale: 1:1500	Date: 11/2021
Drawn by: YA	Report No.: PG4488-2
Checked by: YT	Dwg. No.: PG4488-6
Approved by: SB	Revision No.:

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APPENDIX 2

STAMSON RESULTS

STAMSON 5.0 NORMAL REPORT Date: 02-12-2021 09:58:02
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: Page Road (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
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: Page Road (day/night)

Angle1 Angle2 : 0.00 deg 24.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 100.00 / 100.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Page Road (day)

Source height = 1.50 m

ROAD (0.00 + 40.67 + 0.00) = 40.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	24	0.65	63.96	0.00	-13.55	-8.83	0.00	-0.90	0.00	40.67

Segment Leq : 40.67 dBA

Total Leq All Segments: 40.67 dBA

↟
Results segment # 1: Page Road (night)

Source height = 1.50 m

ROAD (0.00 + 33.07 + 0.00) = 33.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	24	0.65	56.36	0.00	-13.55	-8.83	0.00	-0.90	0.00	33.07

Segment Leq : 33.07 dBA

Total Leq All Segments: 33.07 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 40.67
(NIGHT): 33.07
↟
↟

STAMSON 5.0 NORMAL REPORT Date: 02-12-2021 10:00:45
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec16.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 1-6

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

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
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: Page Road (day/night)

Angle1 Angle2 : 0.00 deg 27.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 100.00 / 100.00 m
Receiver height : 18.00 / 18.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Page Road (day)

Source height = 1.50 m

ROAD (0.00 + 45.19 + 0.00) = 45.19 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	27	0.17	63.96	0.00	-9.60	-8.27	0.00	-0.90	0.00	45.19

Segment Leq : 45.19 dBA

Total Leq All Segments: 45.19 dBA

↟
Results segment # 1: Page Road (night)

Source height = 1.50 m

ROAD (0.00 + 37.60 + 0.00) = 37.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	27	0.17	56.36	0.00	-9.60	-8.27	0.00	-0.90	0.00	37.60

Segment Leq : 37.60 dBA

Total Leq All Segments: 37.60 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 45.19
(NIGHT): 37.60
↟
↟

STAMSON 5.0 NORMAL REPORT Date: 02-12-2021 10:08:54
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: Page Road (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
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: Page Road (day/night)

Angle1 Angle2 : -42.00 deg 46.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 85.00 / 85.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Page Road (day)

Source height = 1.50 m

ROAD (0.00 + 47.27 + 0.00) = 47.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-42	46	0.65	63.96	0.00	-12.39	-3.40	0.00	-0.90	0.00	47.27

Segment Leq : 47.27 dBA

Total Leq All Segments: 47.27 dBA

↟
Results segment # 1: Page Road (night)

Source height = 1.50 m

ROAD (0.00 + 39.67 + 0.00) = 39.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-42	46	0.65	56.36	0.00	-12.39	-3.40	0.00	-0.90	0.00	39.67

Segment Leq : 39.67 dBA

Total Leq All Segments: 39.67 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 47.27
(NIGHT): 39.67
↟
↟

STAMSON 5.0 NORMAL REPORT Date: 02-12-2021 10:29:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec26.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 2-6

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

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
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: Page Road (day/night)

Angle1 Angle2 : -42.00 deg 46.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 85.00 / 85.00 m
Receiver height : 18.00 / 18.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Page Road (day)

Source height = 1.50 m

ROAD (0.00 + 51.09 + 0.00) = 51.09 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-42	46	0.17	63.96	0.00	-8.78	-3.18	0.00	-0.90	0.00	51.09

Segment Leq : 51.09 dBA

Total Leq All Segments: 51.09 dBA

↟
Results segment # 1: Page Road (night)

Source height = 1.50 m

ROAD (0.00 + 43.50 + 0.00) = 43.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-42	46	0.17	56.36	0.00	-8.78	-3.18	0.00	-0.90	0.00	43.50

Segment Leq : 43.50 dBA

Total Leq All Segments: 43.50 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 51.09
(NIGHT): 43.50

↟
↟

STAMSON 5.0 NORMAL REPORT Date: 02-12-2021 10:32:03
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: Page Road (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
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: Page Road (day/night)

Angle1 Angle2 : -22.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 100.00 / 100.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Page Road (day)

Source height = 1.50 m

ROAD (0.00 + 40.30 + 0.00) = 40.30 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-22	0	0.65	63.96	0.00	-13.55	-9.20	0.00	-0.90	0.00	40.30

Segment Leq : 40.30 dBA

Total Leq All Segments: 40.30 dBA

↟
Results segment # 1: Page Road (night)

Source height = 1.50 m

ROAD (0.00 + 32.71 + 0.00) = 32.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-22	0	0.65	56.36	0.00	-13.55	-9.20	0.00	-0.90	0.00	32.71

Segment Leq : 32.71 dBA

Total Leq All Segments: 32.71 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 40.30
(NIGHT): 32.71

↟
↟

STAMSON 5.0 NORMAL REPORT Date: 02-12-2021 10:33:58
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec36.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 3-6

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

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
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: Page Road (day/night)

Angle1 Angle2 : -29.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 100.00 / 100.00 m
Receiver height : 18.00 / 18.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Page Road (day)

Source height = 1.50 m

ROAD (0.00 + 45.50 + 0.00) = 45.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-29	0	0.17	63.96	0.00	-9.60	-7.96	0.00	-0.90	0.00	45.50

Segment Leq : 45.50 dBA

Total Leq All Segments: 45.50 dBA

↟
Results segment # 1: Page Road (night)

Source height = 1.50 m

ROAD (0.00 + 37.90 + 0.00) = 37.90 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-29	0	0.17	56.36	0.00	-9.60	-7.96	0.00	-0.90	0.00	37.90

Segment Leq : 37.90 dBA

Total Leq All Segments: 37.90 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 45.50
(NIGHT): 37.90

↟
↟

STAMSON 5.0 NORMAL REPORT Date: 02-12-2021 11:15:53
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec4.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 4

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

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
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: Page Road (day/night)

Angle1 Angle2 : -9.00 deg 25.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 100.00 / 100.00 m
Receiver height : 15.00 / 15.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -9.00 deg Angle2 : 25.00 deg
Barrier height : 13.50 m
Barrier receiver distance : 7.00 / 7.00 m
Source elevation : 88.00 m
Receiver elevation : 88.00 m
Barrier elevation : 88.00 m
Reference angle : 0.00

↑
Results segment # 1: Page Road (day)

Source height = 1.50 m

Barrier height for grazing incidence

```
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       15.00 !       14.05 !       102.05

ROAD (0.00 + 45.45 + 0.00) = 45.45 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    -9     25   0.26  63.96   0.00 -10.34  -7.27   0.00  -0.90   0.00  45.45
    -9     25   0.00  63.96   0.00  -8.24  -7.24   0.00   0.00  -3.70  44.78*
    -9     25   0.26  63.96   0.00 -10.34  -7.27   0.00   0.00   0.00  46.35
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 45.45 dBA

Total Leq All Segments: 45.45 dBA

↟
Results segment # 1: Page Road (night)
-------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       15.00 !       14.05 !       102.05

ROAD (0.00 + 37.86 + 0.00) = 37.86 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    -9     25   0.26  56.36   0.00 -10.34  -7.27   0.00  -0.90   0.00  37.86
    -9     25   0.00  56.36   0.00  -8.24  -7.24   0.00   0.00  -3.70  37.19*
    -9     25   0.26  56.36   0.00 -10.34  -7.27   0.00   0.00   0.00  38.76
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 37.86 dBA

Total Leq All Segments: 37.86 dBA

↟
```

TOTAL Leq FROM ALL SOURCES (DAY): 45.45
(NIGHT): 37.86

STAMSON 5.0 NORMAL REPORT Date: 02-12-2021 11:18:30
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec5.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 5

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

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
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: Page Road (day/night)

Angle1 Angle2 : -27.00 deg 8.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 100.00 / 100.00 m
Receiver height : 15.00 / 15.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -27.00 deg Angle2 : 8.00 deg
Barrier height : 13.50 m
Barrier receiver distance : 7.00 / 7.00 m
Source elevation : 88.00 m
Receiver elevation : 88.00 m
Barrier elevation : 88.00 m
Reference angle : 0.00

↑
Results segment # 1: Page Road (day)

Source height = 1.50 m

Barrier height for grazing incidence

```
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       15.00 !       14.05 !       102.05

ROAD (0.00 + 45.57 + 0.00) = 45.57 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -27      8   0.26  63.96   0.00 -10.34  -7.15   0.00  -0.90   0.00  45.57
   -27      8   0.00  63.96   0.00  -8.24  -7.11   0.00   0.00  -3.70  44.90*
   -27      8   0.26  63.96   0.00 -10.34  -7.15   0.00   0.00   0.00  46.47
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 45.57 dBA

Total Leq All Segments: 45.57 dBA

↟
Results segment # 1: Page Road (night)
-----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       15.00 !       14.05 !       102.05

ROAD (0.00 + 37.98 + 0.00) = 37.98 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -27      8   0.26  56.36   0.00 -10.34  -7.15   0.00  -0.90   0.00  37.98
   -27      8   0.00  56.36   0.00  -8.24  -7.11   0.00   0.00  -3.70  37.31*
   -27      8   0.26  56.36   0.00 -10.34  -7.15   0.00   0.00   0.00  38.88
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 37.98 dBA

Total Leq All Segments: 37.98 dBA

↟
```

TOTAL Leq FROM ALL SOURCES (DAY): 45.57
(NIGHT): 37.98

STAMSON 5.0 NORMAL REPORT Date: 02-12-2021 11:21:20
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec6.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 6

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

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
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: Page Road (day/night)

Angle1 Angle2 : -2.00 deg 27.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 100.00 / 100.00 m
Receiver height : 18.00 / 18.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -2.00 deg Angle2 : 27.00 deg
Barrier height : 16.50 m
Barrier receiver distance : 7.00 / 7.00 m
Source elevation : 88.00 m
Receiver elevation : 88.00 m
Barrier elevation : 88.00 m
Reference angle : 0.00

↑
Results segment # 1: Page Road (day)

Source height = 1.50 m

Barrier height for grazing incidence

```
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       18.00 !       16.84 !       104.84

ROAD (0.00 + 45.50 + 0.00) = 45.50 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    -2     27   0.17  63.96   0.00  -9.60  -7.95   0.00  -0.90   0.00  45.50
    -2     27   0.00  63.96   0.00  -8.24  -7.93   0.00   0.00  -4.54  43.25*
    -2     27   0.17  63.96   0.00  -9.60  -7.95   0.00   0.00   0.00  46.40
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 45.50 dBA

Total Leq All Segments: 45.50 dBA

↟
Results segment # 1: Page Road (night)
-------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       18.00 !       16.84 !       104.84

ROAD (0.00 + 37.91 + 0.00) = 37.91 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    -2     27   0.17  56.36   0.00  -9.60  -7.95   0.00  -0.90   0.00  37.91
    -2     27   0.00  56.36   0.00  -8.24  -7.93   0.00   0.00  -4.54  35.66*
    -2     27   0.17  56.36   0.00  -9.60  -7.95   0.00   0.00   0.00  38.81
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 37.91 dBA

Total Leq All Segments: 37.91 dBA

↟
```

TOTAL Leq FROM ALL SOURCES (DAY): 45.50
(NIGHT): 37.91

STAMSON 5.0 NORMAL REPORT Date: 02-12-2021 11:22:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec7.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 7

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

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
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: Page Road (day/night)

Angle1 Angle2 : -28.00 deg 10.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 100.00 / 100.00 m
Receiver height : 18.00 / 18.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -28.00 deg Angle2 : 10.00 deg
Barrier height : 16.50 m
Barrier receiver distance : 7.00 / 7.00 m
Source elevation : 88.00 m
Receiver elevation : 88.00 m
Barrier elevation : 88.00 m
Reference angle : 0.00

↑
Results segment # 1: Page Road (day)

Source height = 1.50 m

Barrier height for grazing incidence

```
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       18.00 !       16.84 !       104.84

ROAD (0.00 + 46.68 + 0.00) = 46.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -28     10   0.17  63.96   0.00  -9.60  -6.78   0.00  -0.90   0.00  46.68
   -28     10   0.00  63.96   0.00  -8.24  -6.75   0.00   0.00  -4.54  44.43*
   -28     10   0.17  63.96   0.00  -9.60  -6.78   0.00   0.00   0.00  47.58
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 46.68 dBA

Total Leq All Segments: 46.68 dBA

↟
Results segment # 1: Page Road (night)
-------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       18.00 !       16.84 !       104.84

ROAD (0.00 + 39.09 + 0.00) = 39.09 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -28     10   0.17  56.36   0.00  -9.60  -6.78   0.00  -0.90   0.00  39.09
   -28     10   0.00  56.36   0.00  -8.24  -6.75   0.00   0.00  -4.54  36.83*
   -28     10   0.17  56.36   0.00  -9.60  -6.78   0.00   0.00   0.00  39.99
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 39.09 dBA

Total Leq All Segments: 39.09 dBA

↟
```

TOTAL Leq FROM ALL SOURCES (DAY): 46.68
(NIGHT): 39.09