PATERSON GROUP

Environmental Noise Control Study
Proposed Residential Development

1001 Noëlla Leclair Street
Ottawa, Ontario

Prepared for Ironclad Developments

Report PG6739-1 dated June 21, 2023

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Appendices

1.0 Introduction

Paterson Group (Paterson) was commissioned by Ironclad Developments to conduct an environmental noise control study for the proposed residential buildings to be located at 1001 Noëlla Leclair Street, 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 development will consist of two six-storey residential buildings (Building A and Building B). The buildings will extend 18.6 m above grade. Associated sidewalks, driveways, bike lane, parking spaces, garbage area, and landscaped areas are further anticipated. Outdoor living area – at-grade amenity space is identified 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. The noise level limits of residential building are 45 dBA daytime and 40 dBA nighttime. 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.

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

When the exceedance of the recommended noise level limits is between 1 dBA and 5 dBA for outdoor living areas (55 dBA < Leq ≤ 60 dBA), the proposed development can be completed with no noise control measures incorporated into the site, but the prospective purchasers / tenants should be made aware by suitable Warning Clauses. When the exceedance of recommended noise level limits is more than 5 dBA for outdoor living areas (Leq > 60 dBA), noise control measures are required to reduce Leq to below 60 dBA and as close as 55 dBA as it is technically and economically feasible.

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 Outdoor Living Areas

Leq (dBA)	Warning Clause	Description
55 dBA < $L_{eq(16)}$ ≤ 60 dBA	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."
60 dBA < $L_{eq(16)}$	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."

- Clauses taken from section C8 Warning Clauses; Environmental Noise Guidelines for Stationary and Transportation Sources - NPC-300

Table 4 – Warning Clauses for Indoor Living Areas		
Leq (dBA)	**Warning Clause**	**Description**
55 dBA < $L_{eq(16)}$ ≤ 65 dBA 50 dBA < $L_{eq(8)}$ ≤ 60 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."
65 dBA < $L_{eq(16)}$ 60 dBA < $L_{eq(8)}$	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 development is bordered to the north by proposed Lady Pellatt Street followed by undeveloped grassed area, to the east by undeveloped open area, to the west by proposed Noëlla LeClair Street followed by undeveloped open area, and to the south by undeveloped open area and proposed Vanguard Drive Extension. Noëlla LeClair Street and Lady Pellatt Street are proposed within 100 m radius of proposed Building A and at-grade amenity space. Noëlla LeClair Street, Lady Pellatt Street, and Vanguard Drive Extension are proposed within 100 m radius of proposed Building B.

Based on the City of Ottawa's Official Plan, Schedule C4, Vanguard Drive (Extension) will be a 2-lane urban main collector road (2-UMCU). 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. No major source of surface transportation noise is identified within 100 m of proposed Building A. The major source of surface transportation noise identified within 100 m of proposed Building B is due to the Vanguard Drive (Extension) to the south of the building.

All noise sources are presented in Drawing PG6739-3 - 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 5 – Traffic and Road Parameters

Segment	Roadway Classification	AADT Veh/Day	Speed Limit (km/h)	Day/Night Split %	Medium Truck %	Heavy Truck %
Vanguard Drive (Extension)	2-UMCU	12,000	50	92/8	7	5

- Data obtained from the City of Ottawa document ENCG

Two (2) levels of reception points were selected for this analysis. The following elevations were selected from the heights provided on the survey plan for the subject development.

Table 6 – Elevations of Reception Points			
Floor Number	**Elevation at Centre of Window (m)**	**Floor Use**	**Daytime / Nighttime Analysis**
First Floor	1.5	Living Area/Bedroom	Daytime / Nighttime
Sixth Floor	17.5	Living Area/Bedroom	Daytime / Nighttime

For this analysis, a reception point was taken at the centre of each floor, at the first floor and top floor. Outdoor living area – at-grade amenity space is anticipated at the proposed development. However, there is no major source of surface transportation noise within 100 m of the at-grade amenity space. Therefore, the noise level at the at-grade amenity space is expected to be negligible. Reception points are detailed on Drawing PG6739-2 - 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 are reflected in the local angles described in Paterson Drawings PG6739-4A to 4C- Site Geometry in Appendix 1.

Table 8 - 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 ENGC.

The subject site is generally levelled, and it is 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 7.

Table 7: 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	Building B, Western Elevation, 1st Floor	50	42
REC 1-6	17.5	Building B, Western Elevation, 6th Floor	53	46
REC 2-1	1.5	Building B, Southern Elevation, 1st Floor	55	47
REC 2-6	17.5	Building B, Southern Elevation, 6th Floor	58	51
REC 3-1	1.5	Building B, Eastern Elevation, 1st Floor	50	43
REC 3-6	17.5	Building B, Eastern Elevation, 6th Floor	54	46

6.0 Discussion and Recommendations

6.1 Outdoor Living Areas

Outdoor living area – at-grade amenity space is anticipated at the proposed development. However, no major source of surface transportation noise is identified within 100 m of the at-grade amenity space. Therefore, surface transportation analysis is not required for the at-grade amenity space.

6.2 Indoor Living Areas and Ventilation

There are two buildings, Building A and Building B, proposed at the subject development. It is noted that no major source of surface transportation noise is identified within 100 m of proposed Building A. Therefore, surface transportation analysis is not required for Building A. The results of the STAMSON modeling indicate that the noise levels at proposed Building B will range between 50 dBA and 58 dBA during the daytime period (07:00-23:00) and between 42 dBA and 51 dBA during the nighttime period (23:00-7:00). The noise levels on the southern elevation of proposed Building B will exceed the limit for the exterior of the pane of glass (55 dBA) specified by the ENCG. Therefore, the units on the southern elevation of proposed Building B should be designed with the provision of a central air conditioning unit, along with the warning clause Type C, as outlined in Table 3. The results of STAMSON modeling also indicate that the noise levels at proposed Building A and Building B will be below 65 dBA, and therefore standard building materials are acceptable to provide adequate soundproofing.

7.0 Summary of Findings

The subject site is located at 1001 Noëlla Leclair Street, in the City of Ottawa. It is understood that the proposed development will consist of two six-storey residential buildings. The buildings will rise 18.6 metres above grade. There is one major source of surface transportation noise to the proposed development: Vanguard Drive (Extension).

One outdoor living area, an at-grade amenity space, is anticipated at the proposed development. However, there is no major source of surface transportation noise sources identified within 100 m of the at-grade amenity space. Therefore, a surface transportation analysis is not required for this at-grade amenity space.

There are two buildings, Building A and Building B, proposed at the subject development. It is noted that no major source of surface transportation noise is identified within 100 m of proposed Building A. Therefore, surface transportation analysis is not required for Building A. Several reception points were selected for the surface transportation noise analysis, consisting of the centre of first level and top level at Building B. The results of STAMSON modeling indicate that noise levels on the southern elevation of proposed Building B are expected to exceed the 55 dBA threshold specified by the ENCG. Therefore, design with the provision for a central air conditioning unit, along with a warning clause Type C, will be required for the units on the southern elevation of Building B. The modeling results also indicate that the noise levels at Building A and Building B are below 65 dBA, and therefore standard building materials are acceptable to provide adequate soundproofing.

The following warning clause is to be included on all Offers of Purchase and Sale and/or lease agreements for the units on the southern elevation of Building B:

> " 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."

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 Ironclad Developments 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:

- ❑ Ironclad Developments (email copy)
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APPENDIX 1

TABLE 8 - SUMMARY OF RECEPTION POINTS AND GEOMETRY

DRAWING PG6739-1 - SITE PLAN

DRAWING PG6739-2 - RECEPTOR LOCATION PLAN

DRAWING PG6739-3 - SITE GEOMETRY (BUILDING A)

DRAWING PG6739-4 - SITE GEOMETRY (BUILDING B)

DRAWING PG6739-4A - SITE GEOMETRY - REC 1-1 AND REC 1-6

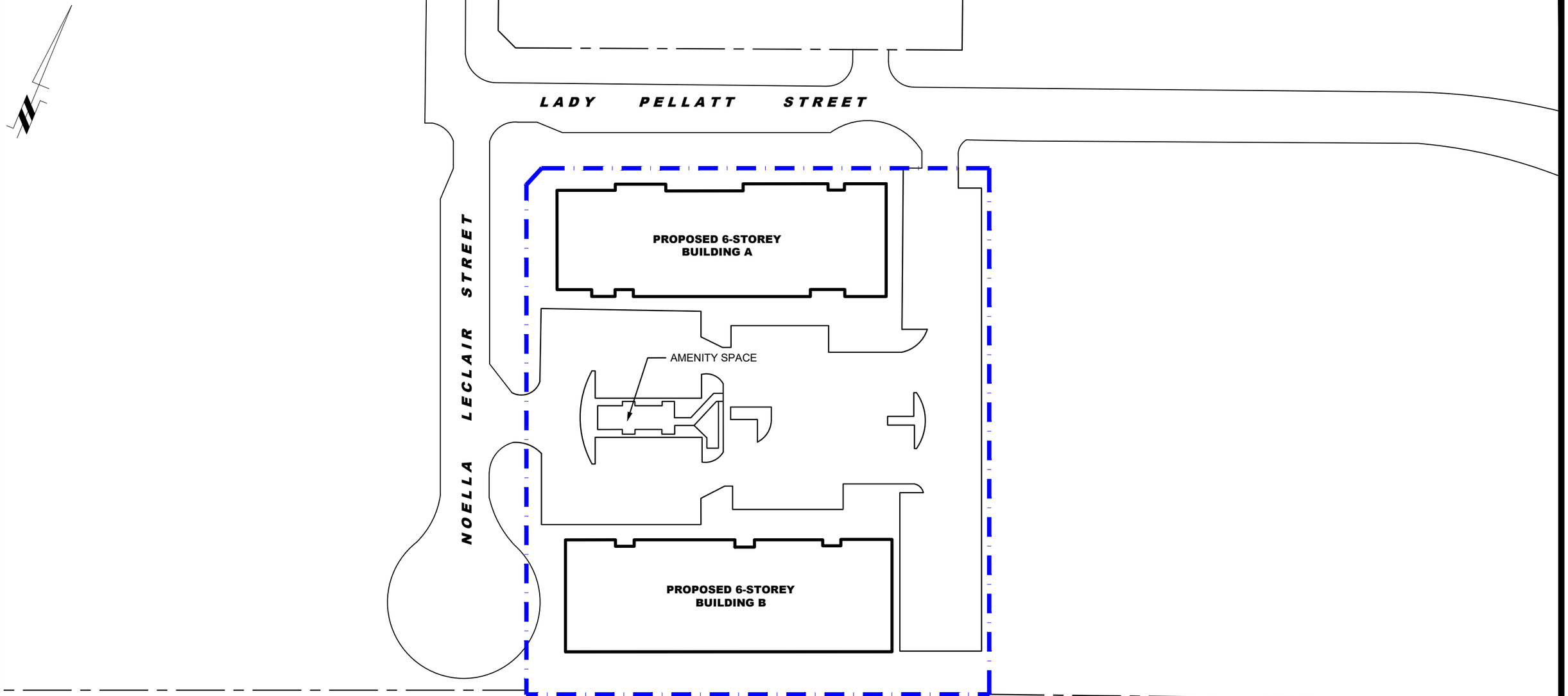
DRAWING PG6739-4B - SITE GEOMETRY - REC 2-1 AND REC 2-6

DRAWING PG6739-4C - SITE GEOMETRY - REC 3-1 AND REC 3-6

DRAWING PG6739-5 - SITE GEOMETRY (OUTDOOR AMENITY SPACE)

Table 8 - Summary of Reception Points and Geometry
1001 Noella Leclair Street

Point of Reception	Location	Leq Day (dBA)	Vanguard Drive (Extension)					
			Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)
REC 1-1	Building B, Western Elevation, 1st Floor	50	70	1.5	70.0	0, 43	n/a	n/a
REC 1-6	Building B, Western Elevation, 6th Floor	53	70	17.5	72.2	0, 43	n/a	n/a
REC 2-1	Building B, Southern Elevation, 1st Floor	55	60	1.5	60.0	-60, 56	n/a	n/a
REC 2-6	Building B, Southern Elevation, 6th Floor	58	60	17.5	62.5	-60, 56	n/a	n/a
REC 3-1	Building B, Eastern Elevation, 1st Floor	50	70	1.5	70.0	-46, 0	n/a	n/a
REC 3-6	Building B, Eastern Elevation, 6th Floor	54	70	17.5	72.2	-46, 0	n/a	n/a



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9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

IRONCLAD DEVELOPMENTS

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
1001 NOELLA LECLAIR STREET

OTTAWA, ONTARIO

Title:

SITE PLAN

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Checked by: YT	Dwg. No.: PG6739-1
Approved by: SB	Revision No.:

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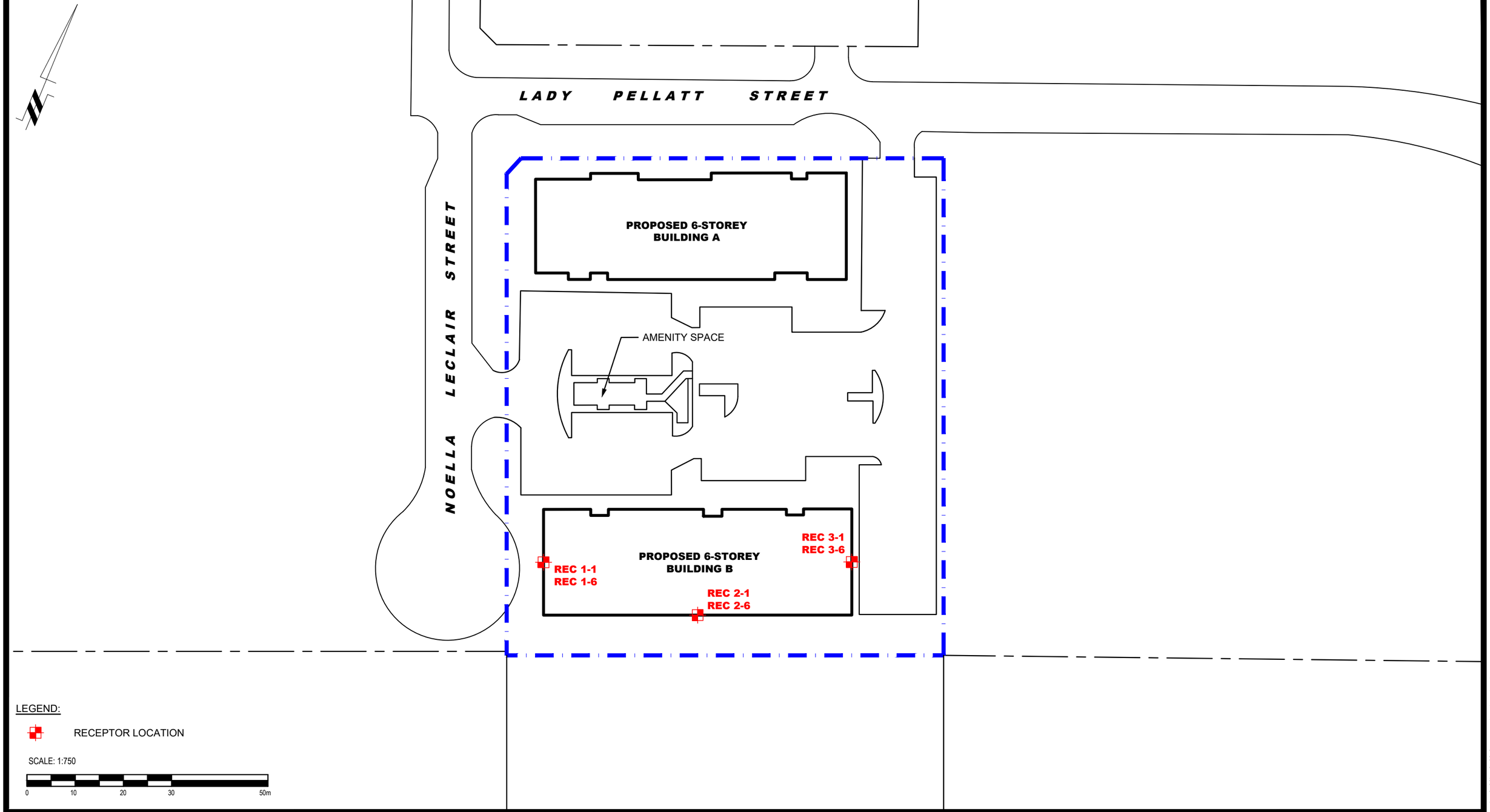

LEGEND:

RECEPTOR LOCATION

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Approved by: SB	Revision No.:

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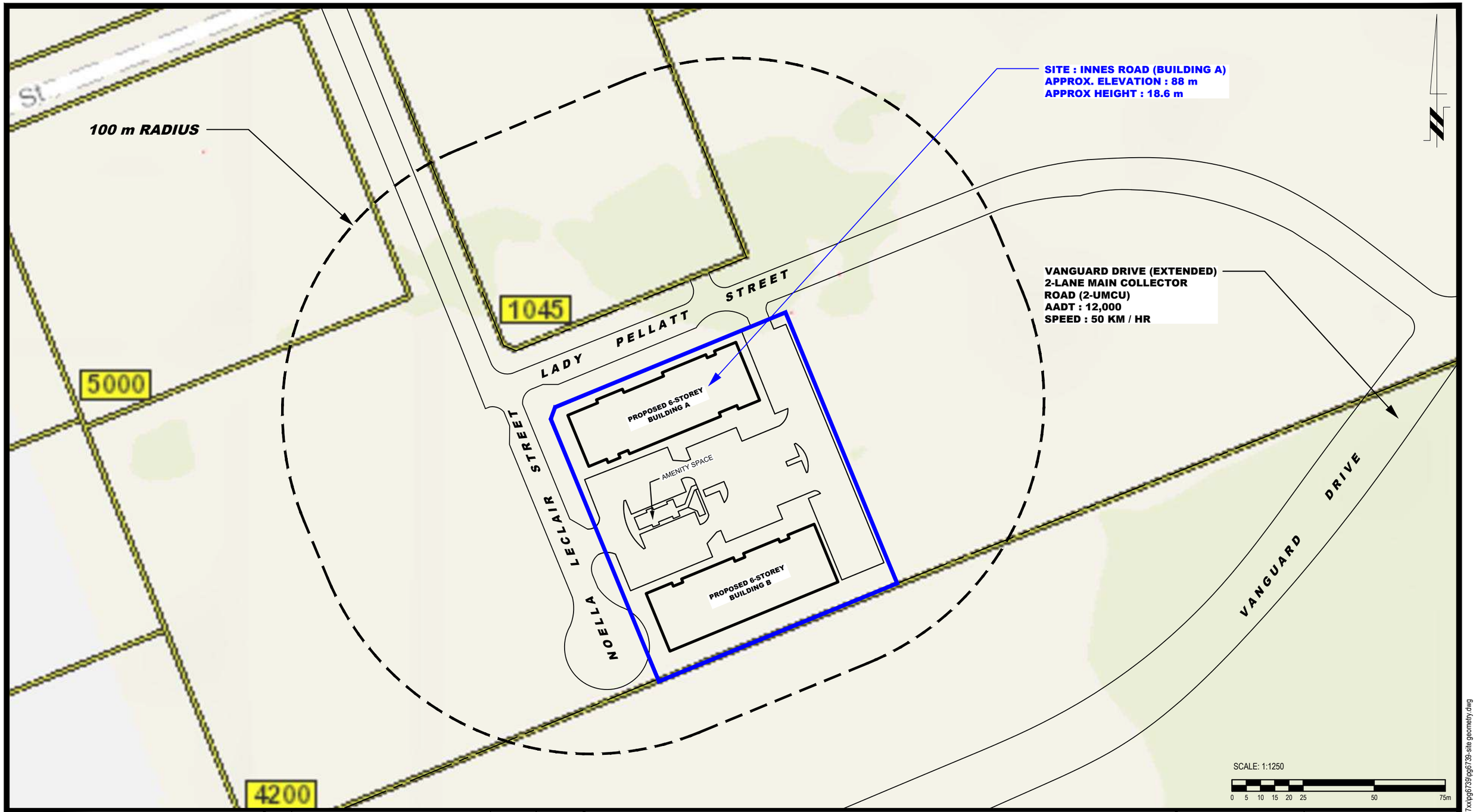

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SITE GEOMETRY - BUILDING A

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Approved by: SB	Revision No.:

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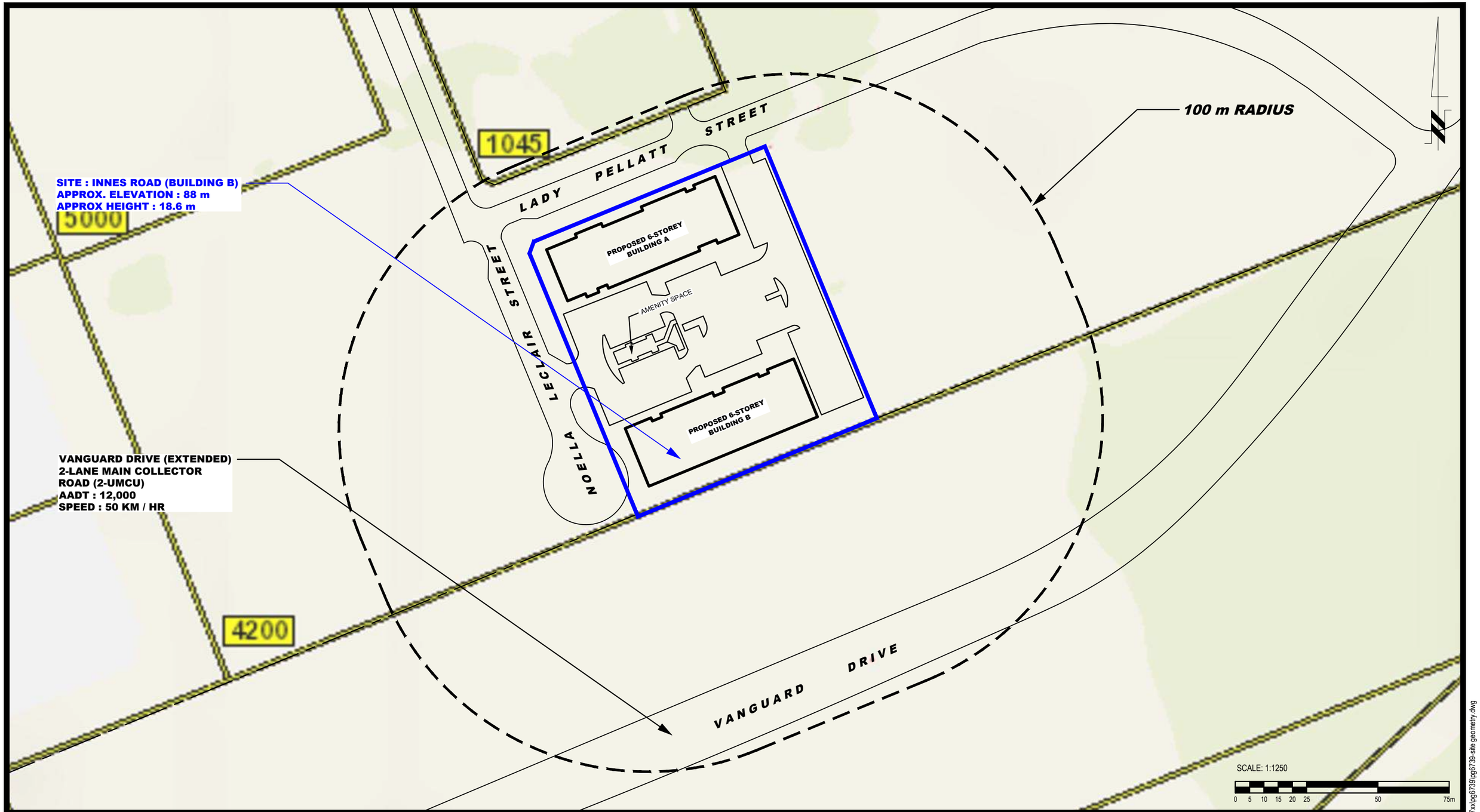

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Title:

SITE GEOMETRY - BUILDING B

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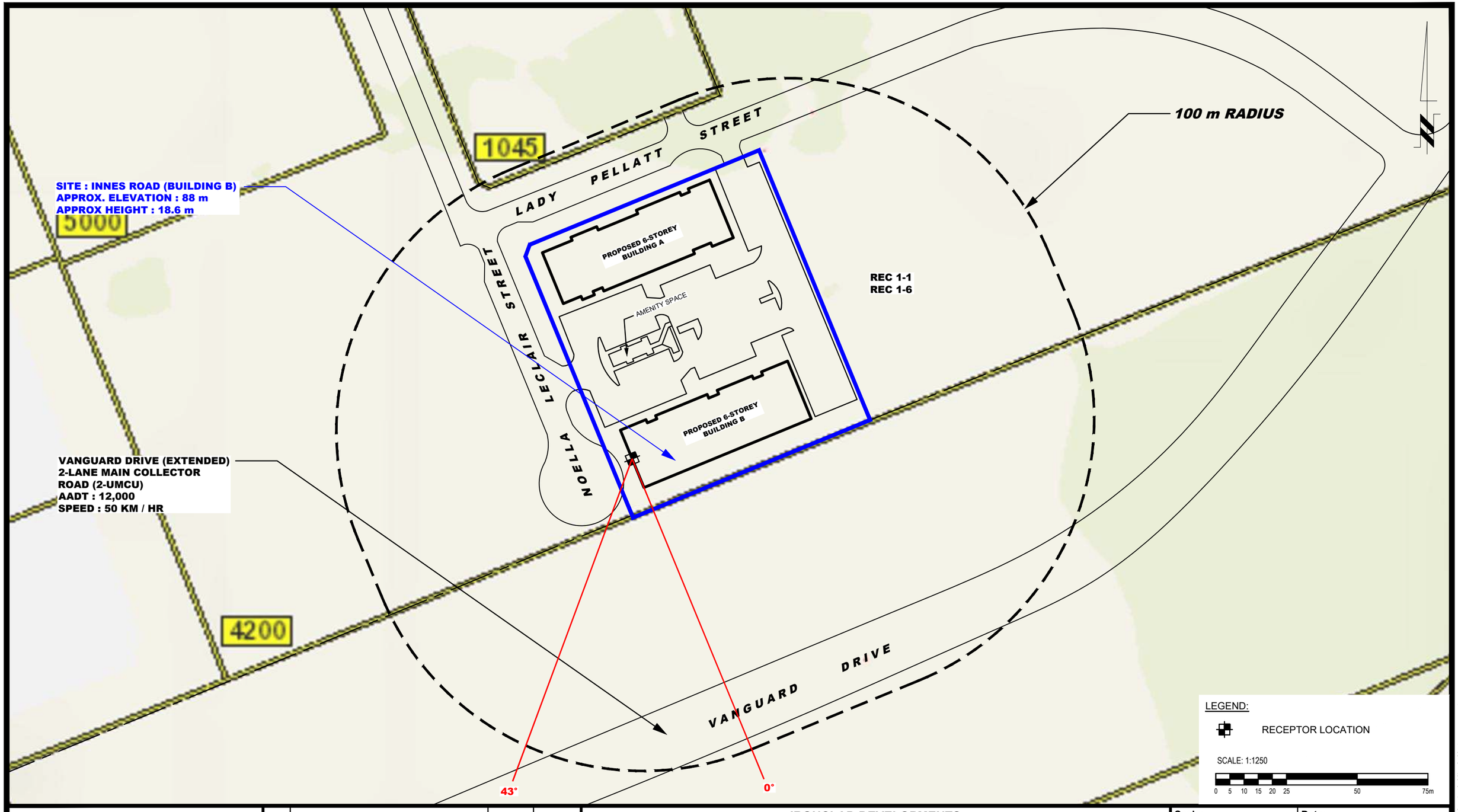

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SITE GEOMETRY - REC 1-1 AND REC 1-6

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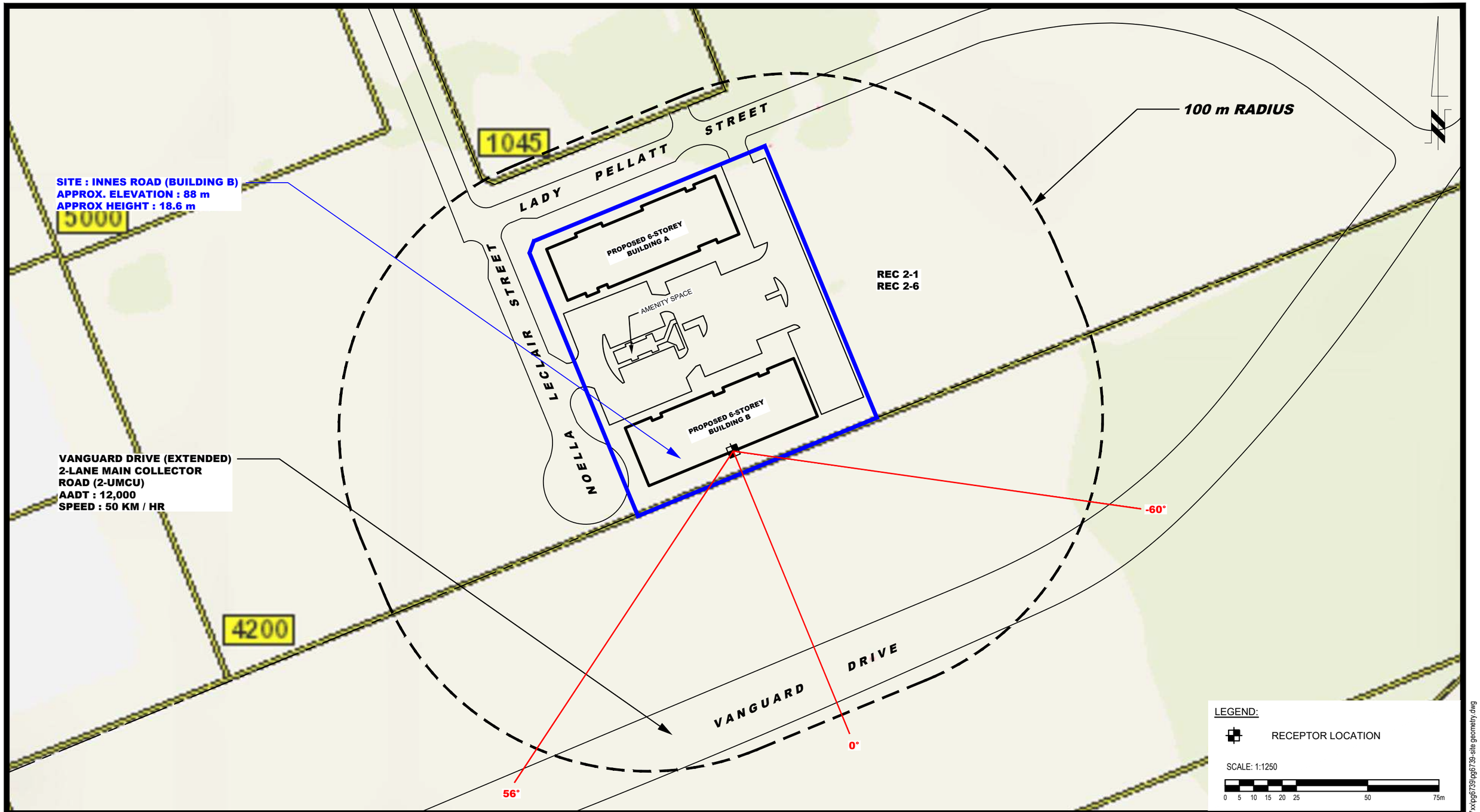

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SITE GEOMETRY - REC 2-1 AND REC 2-6

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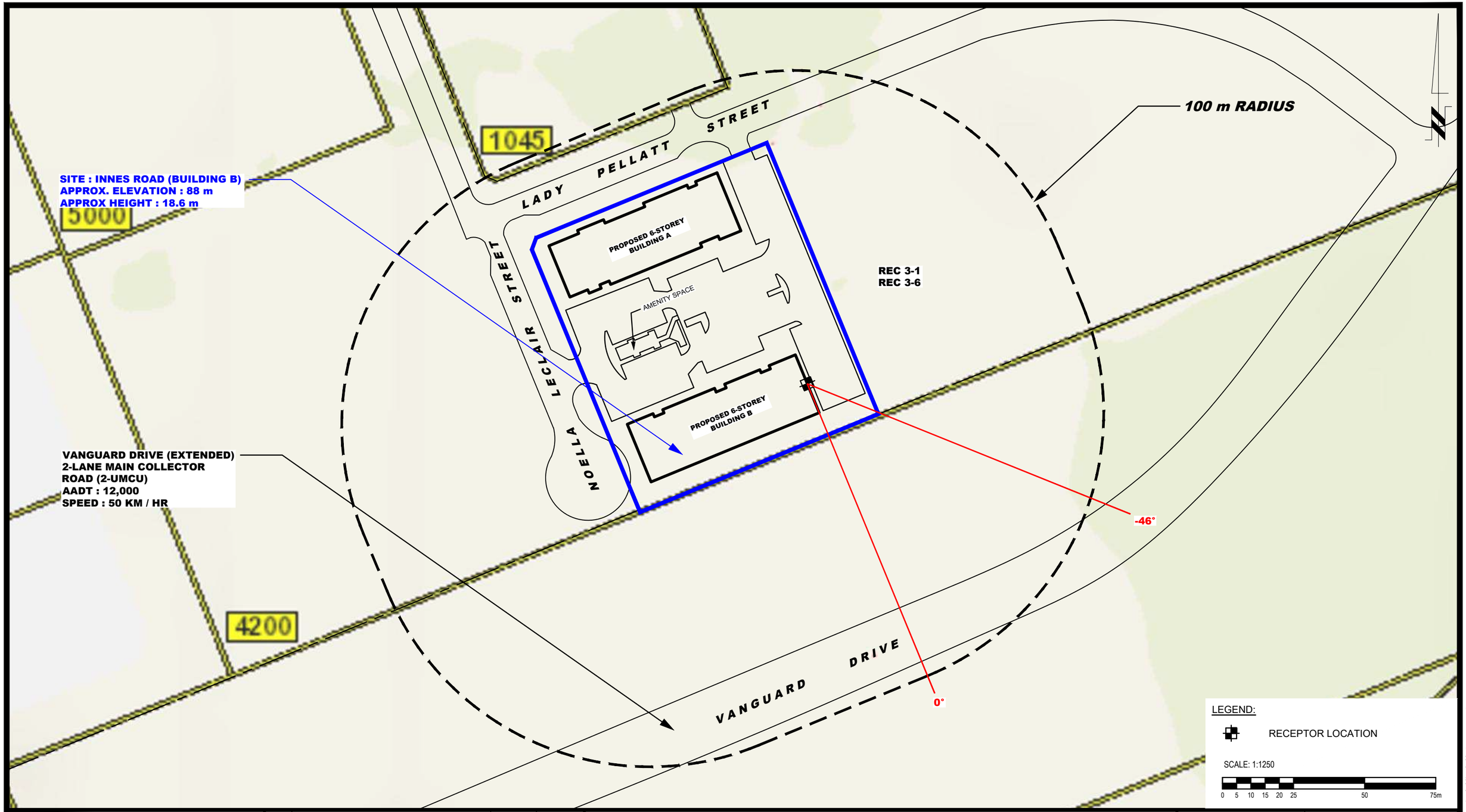

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SITE GEOMETRY - REC 3-1 AND REC 3-6

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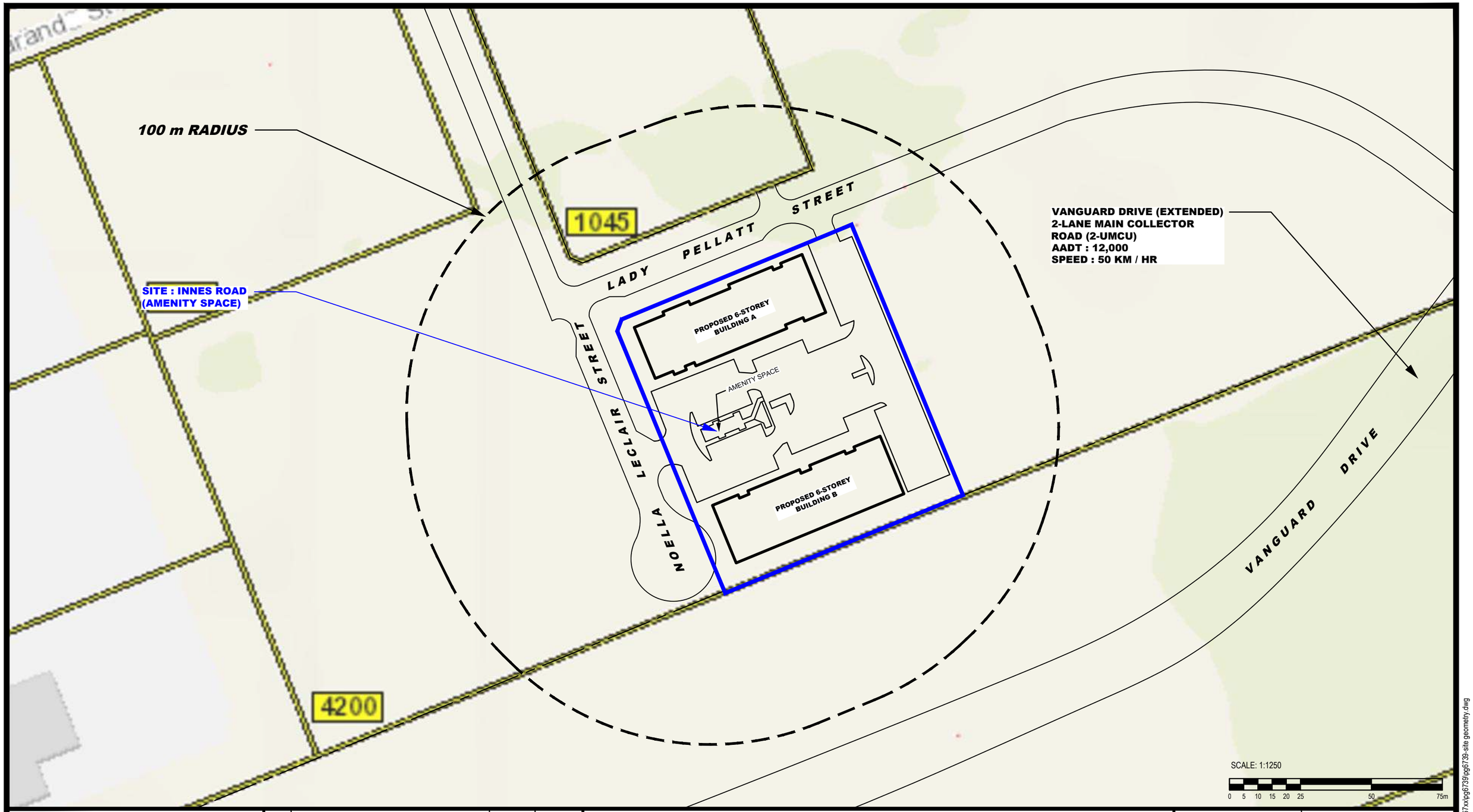

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Title:
SITE GEOMETRY - AMENITY SPACE

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Approved by: SB	Revision No.:

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APPENDIX 2

STAMSON RESULTS

STAMSON 5.0 NORMAL REPORT Date: 20-06-2023 14:21:13
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: Vanguard Dr (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Vanguard Dr (day/night)

Angle1 Angle2 : 0.00 deg 43.00 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: Vanguard Dr (day)

Source height = 1.50 m

ROAD (0.00 + 49.91 + 0.00) = 49.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	43	0.66	67.51	0.00	-11.11	-6.50	0.00	0.00	0.00	49.91

Segment Leq : 49.91 dBA

Total Leq All Segments: 49.91 dBA

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Results segment # 1: Vanguard Dr (night)

Source height = 1.50 m

ROAD (0.00 + 42.31 + 0.00) = 42.31 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	43	0.66	59.91	0.00	-11.11	-6.50	0.00	0.00	0.00	42.31

Segment Leq : 42.31 dBA

Total Leq All Segments: 42.31 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 49.91
(NIGHT): 42.31

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STAMSON 5.0 NORMAL REPORT Date: 20-06-2023 14:22:10
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: Vanguard Dr (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Vanguard Dr (day/night)

Angle1 Angle2 : 0.00 deg 43.00 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 : 17.50 / 17.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Vanguard Dr (day)

Source height = 1.50 m

ROAD (0.00 + 53.32 + 0.00) = 53.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	43	0.18	67.51	0.00	-7.90	-6.30	0.00	0.00	0.00	53.32

Segment Leq : 53.32 dBA

Total Leq All Segments: 53.32 dBA

↟
Results segment # 1: Vanguard Dr (night)

Source height = 1.50 m

ROAD (0.00 + 45.72 + 0.00) = 45.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	43	0.18	59.91	0.00	-7.90	-6.30	0.00	0.00	0.00	45.72

Segment Leq : 45.72 dBA

Total Leq All Segments: 45.72 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 53.32
(NIGHT): 45.72

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STAMSON 5.0 NORMAL REPORT Date: 20-06-2023 14:31:37
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: Vanguard Dr (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Vanguard Dr (day/night)

Angle1 Angle2 : -60.00 deg 56.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 60.00 / 60.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Vanguard Dr (day)

Source height = 1.50 m

ROAD (0.00 + 55.08 + 0.00) = 55.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-60	56	0.66	67.51	0.00	-9.99	-2.43	0.00	0.00	0.00	55.08

Segment Leq : 55.08 dBA

Total Leq All Segments: 55.08 dBA

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Results segment # 1: Vanguard Dr (night)

Source height = 1.50 m

ROAD (0.00 + 47.49 + 0.00) = 47.49 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-60	56	0.66	59.91	0.00	-9.99	-2.43	0.00	0.00	0.00	47.49

Segment Leq : 47.49 dBA

Total Leq All Segments: 47.49 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 55.08
(NIGHT): 47.49

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STAMSON 5.0 NORMAL REPORT Date: 20-06-2023 14:33:02
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: Vanguard Dr (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Vanguard Dr (day/night)

Angle1 Angle2 : -60.00 deg 56.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 60.00 / 60.00 m
Receiver height : 17.50 / 17.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Vanguard Dr (day)

Source height = 1.50 m

ROAD (0.00 + 58.35 + 0.00) = 58.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-60	56	0.18	67.51	0.00	-7.11	-2.06	0.00	0.00	0.00	58.35

Segment Leq : 58.35 dBA

Total Leq All Segments: 58.35 dBA

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Results segment # 1: Vanguard Dr (night)

Source height = 1.50 m

ROAD (0.00 + 50.75 + 0.00) = 50.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-60	56	0.18	59.91	0.00	-7.11	-2.06	0.00	0.00	0.00	50.75

Segment Leq : 50.75 dBA

Total Leq All Segments: 50.75 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 58.35
(NIGHT): 50.75

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STAMSON 5.0 NORMAL REPORT Date: 20-06-2023 14:26:30
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: Vanguard Dr (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Vanguard Dr (day/night)

Angle1 Angle2 : -46.00 deg 0.00 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: Vanguard Dr (day)

Source height = 1.50 m

ROAD (0.00 + 50.16 + 0.00) = 50.16 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	0	0.66	67.51	0.00	-11.11	-6.25	0.00	0.00	0.00	50.16

Segment Leq : 50.16 dBA

Total Leq All Segments: 50.16 dBA

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Results segment # 1: Vanguard Dr (night)

Source height = 1.50 m

ROAD (0.00 + 42.56 + 0.00) = 42.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	0	0.66	59.91	0.00	-11.11	-6.25	0.00	0.00	0.00	42.56

Segment Leq : 42.56 dBA

Total Leq All Segments: 42.56 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 50.16
(NIGHT): 42.56

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STAMSON 5.0 NORMAL REPORT Date: 20-06-2023 14:27:31
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: Vanguard Dr (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Vanguard Dr (day/night)

Angle1 Angle2 : -46.00 deg 0.00 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 : 17.50 / 17.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Vanguard Dr (day)

Source height = 1.50 m

ROAD (0.00 + 53.60 + 0.00) = 53.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	0	0.18	67.51	0.00	-7.90	-6.01	0.00	0.00	0.00	53.60

Segment Leq : 53.60 dBA

Total Leq All Segments: 53.60 dBA

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Results segment # 1: Vanguard Dr (night)

Source height = 1.50 m

ROAD (0.00 + 46.00 + 0.00) = 46.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	0	0.18	59.91	0.00	-7.90	-6.01	0.00	0.00	0.00	46.00

Segment Leq : 46.00 dBA

Total Leq All Segments: 46.00 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 53.60
(NIGHT): 46.00

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