PATERSON GROUP

Environmental Noise Control Study
Proposed Residential Development

930 Smith Road
Ottawa, Ontario

Prepared for Hierarchy Developments and Design

Report PG6765-1 – Revision 2 - Dated March 19, 2024

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1.0 Introduction

Paterson Group (Paterson) was commissioned by Hierarchy Developments and Design to conduct an environmental noise control study for the proposed residential buildings to be located at 930 Smith 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 the 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 subject property will be subdivided into seven lots (Lot 1 to Lot 7). The proposed development will consist of seven two-storey residential dwellings, one in each lot and will rise 7 m above grade. Associated sidewalks, driveways, parking spaces, septic tanks, and landscaped areas are further anticipated. The outdoor living area consisting of an at-grade rear yard is identified at each subdivided lot on the proposed site plan.

3.0 Methodology and Noise Assessment Criteria

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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 based on 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 the 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, and 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 the 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 of providing a minimum 20 dBA noise reduction. The noise level limits of residential buildings are 45 dBA daytime and 40 dBA nighttime. Therefore, where noise levels exceed 55 dBA during daytime and 50 dBA during nighttime, the ventilation for the building should consider the provision for central air conditioning. Where noise levels exceed 65 dBA during daytime and 60 dBA during 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 problems:

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 proposed development is not in proximity to any existing or approved stationary sources of noise. Therefore, a stationary noise analysis will not be required with respect to off-site stationary noise sources impacting the proposed development.

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 Methodology and Vibration Assessment Criteria

Due to the locations of the existing VIA-Train Railway-Ottawa Corridor, a ground vibration and ground-borne noise review was also performed for this building.

Effects of the Rail Corridor on the Proposed Development

The human body can be affected by exposure to vibration, in particular ground-borne vibrations occurring at low frequencies. These can be caused by the surrounding vibration sources previously identified, such as wheels on a road or rail system. These ground-borne vibrations can cause the building to shake (ground-borne vibration) and/or cause rumbling sounds (ground-borne noise).

The methods of defining and measuring vibrations have their own challenges, based on the oscillatory motion identified as a vibration. Due to the nature of the oscillatory motion of the vibration, there is no net movement of the vibration element, and therefore motion descriptors are zero.

There are two (2) main methods of defining the magnitude of the overall vibration. The main one utilized in construction activities is the peak particle velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration signal and is often used when monitoring blasting vibrations and is ideal for evaluating the potential for building damage.

However, human responses require a different method of analysis as the human body requires time to respond to vibration signals. The average vibration amplitude would be an applicable method of reporting the ground-borne vibrations that humans would respond to, however, with the vibration being represented as a sine wave, the average vibration amplitude would be zero. Therefore, the root mean square (RMS) amplitude, typically calculated over a 1-second interval, is utilized for the analysis. The RMS value is always less than the PPV.

General factors that could affect the magnitude of the created vibrations include but are not limited to, whether the rail is above grade or below grade, speed, vehicle suspension, wheel and track condition, track support system, depth of system and soil conditions. It should be noted that vibrations that travel through the bedrock surface should be minimal but can travel a further distance.

The Federal Transit Administration's Transit Noise and Vibration Impact Assessment Manual: FTA Report No. 0123 dated September 2018 outlines the vibration standards caused by rail sources. Upon review of this document, the following standards were obtained that are applicable to this analysis.

Screening distances are set based on land-use categories and the type of project vehicles. VIA-Train Railway Alexandria-Ottawa Corridor is considered Locomotive Powered Passenger or Freight Vehicle, and O-Train Railway Confederation Line and O-Train Railway MSF Connector Tunnel are considered Rapid Transit or Light Rail Vehicles. The proposed building would be classified as a Vibration Category 2 - Residential. Therefore, the screening distance is 61 metres (200 ft) for Locomotive Powered Vehicle and 46 metres (150 ft) for Light Rail Vehicle. Vibration assessment is required only when the proposed building is located within the screening distance from the railway.

The criteria for the environmental impact from vibrations are based on the RMS vibration levels for repeated events. The proposed building would be classified as a Vibration Category 2 - Residential. The following table outlines the limits for ground-borne vibrations.

Table 5 - Ground-Borne Vibration (GBV) for General Assessment

Land Use Category	GBV Impact Levels (VdB re 1 micro-inch/sec)		
	Frequent Events	**Occasional Events**	**Infrequent Events**
Category 2	72 VdB	75 VdB	80 VdB

Notes:

- Standards taken from Table 6.3; Indoor Ground-Borne Vibration and Ground-Borne Noise Impact Criteria for General Vibration Assessment.
- Frequent events are defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
- Occasional events are defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.
- Infrequent events are defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.

Ground-borne vibration can also result in ground-borne noise. This is separate from the noise caused by the trains directly and instead focuses on the vibration of objects to emit noise. Similar to ground-borne vibration, the noise impacts are based on criteria for human annoyance and activity interference. For residential buildings, the criteria for acceptability is given in the table on the following page:

Table 6 - Ground-Borne Noise (GBN) for General Assessment

Land Use Category	GBN Impact Levels (dBA re 20 micro Pascals)		
	Frequent Events	**Occasional Events**	**Infrequent Events**
Category 2	35 dBA	38 dBA	43 dBA

Notes:

- Standards taken from Table 6.3; Indoor Ground-Borne Vibration and Ground-Borne Noise Impact Criteria for General Vibration Assessment.
- Frequent events are defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
- Occasional events are defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.
- Infrequent events are defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.

5.0 Analysis

Surface Transportation Noise

The subject development is bordered to the north by residential dwellings and Meteor Avenue, to the east by Smith Road, Ruisseau McKinnons Creek, and residential dwellings, to the west by residential dwellings and undeveloped grassed and treed area, and to the south by Smith Road, residential dwellings, and undeveloped grassed area. Meteor Avenue and Smith Road are identified within the 100 m radius of the proposed dwellings.

Based on the City of Ottawa's Official Plan, Schedule C9, Smith Road is a 2-lane urban collector road (2-UCU). 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 the 100 m radius of the proposed dwelling at Lot 1. The major source of surface transportation noise identified within the 100 m radius of proposed dwellings at Lot 2 to Lot 7 is due to the Smith Road to the south and the east of the dwellings.

The VIA-Train Railway Ottawa Corridor is identified within 300 m of the proposed development. It is understood that the Ottawa Corridor is used by VIA-Train Rail. volume of trains along the VIA rail line is provided in the email discussion with Mr. Paul Charbachi, P.Eng. of VIA Rail Canada. It was further confirmed by VIA Rail Canada, that each VIA train consists of one diesel locomotive pulling five cars.

All noise sources are presented in Drawings PG6765-3 to PG6765-9 - 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 7 – Traffic and Road Parameters						
Segment	**Roadway Classification**	**AADT Veh/Day**	**Speed Limit (km/h)**	**Day/Night Split %**	**Medium Truck %**	**Heavy Truck %**
Smith Road	2-UCU	8,000	50	92/8	7	5
➢ Data obtained from the City of Ottawa document ENCG						

Table 8 - Rail Parameters - Daytime (0700-2300)				
Rail Line	**Engine Type**	**Maximum Speed (km/hr)**	**Number of Trips/day**	**Length of Train**
VIA Train Rail	Diesel	160	16	10

Table 9 - Rail Parameters – Nighttime (2300-0700)				
Rail Line	**Engine Type**	**Maximum Speed (km/hr)**	**Number of Trips/day**	**Length of Train**
VIA Train Rail	Diesel	160	0	10

Three (3) 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 10 – Elevations of Reception Points			
Floor Number	**Elevation at the Centre of the Window (m)**	**Floor Use**	**Daytime / Nighttime Analysis**
First Floor	1.5	Living Area/Bedroom	Daytime / Nighttime
Second Floor	4.5	Living Area/Bedroom	Daytime / Nighttime
At-Grade Rear Yard	1.5	--	Outdoor Living Area

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 rear yard is anticipated at each subdivided lot (Lot 1 to Lot 7). One receptor (REC 7) was selected in the centre of the rear yard at Lot 3, 1.5 m, where the noise level is expected to be the highest among all rear yards. Reception points are detailed in Drawing PG6765-2 - 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 analysed where it intersected the 100 m buffer zone, which is reflected in the local angles described in Paterson Drawings PG6765-3A, PG6765-4A to 4B, PG6765-5A to 5C, PG6765-7A, and PG6765-9A - Site Geometry in Appendix 1.

Table 13 - 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 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.

The subject site is generally levelled and at grade with the neighbouring roads within a 500 m radius.

Ground-borne vibration assessment is required for the VIA-Railway. However, it is noted that the distance between the VIA Railway Ottawa Corridor and the proposed development is greater than 113 m (370 ft). This distance is greater than the screening distances specified in The Federal Transit Administration's Transit Noise and Vibration Impact Assessment Manual. Therefore, ground-borne vibration assessment is not required for the railway.

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 modelling can be found in Appendix 2, and the summary of the results can be found in Table 7.

Table 11 – Exterior Noise Levels due to Roadway Traffic and Rail Sources

Reception Point	Height Above Grade (m)	Receptor Location	Daytime $L_{eq(16)}$ (dBA)	Nighttime $L_{eq(8)}$ (dBA)
REC 1-1	1.5	Lot 2 Dwelling, Southern Elevation, 1st Floor	62.30	54.64
REC 1-2	4.5	Lot 2 Dwelling, Southern Elevation, 2nd Floor	62.57	54.90
REC 2-1	1.5	Lot 2 Dwelling, Eastern Elevation, 1st Floor	57.57	49.91
REC 2-2	4.5	Lot 2 Dwelling, Eastern Elevation, 2nd Floor	57.90	50.24
REC 3-1	1.5	Lot 3 Dwelling, Southern Elevation, 1st Floor	58.14	50.50
REC 3-2	4.5	Lot 3 Dwelling, Southern Elevation, 2nd Floor	58.63	50.97
REC 4-1	1.5	Lot 3 Dwelling, Eastern Elevation, 1st Floor	55.57	48.13
REC 4-2	4.5	Lot 3 Dwelling, Eastern Elevation, 2nd Floor	56.30	48.67
REC 5-1	1.5	Lot 5 Dwelling, Eastern Elevation, 1st Floor	53.35	45.75
REC 5-2	4.5	Lot 5 Dwelling, Eastern Elevation, 2nd Floor	53.96	46.37
REC 6-1	1.5	Lot 7 Dwelling, Eastern Elevation, 1st Floor	52.67	45.08
REC 6-2	4.5	Lot 7 Dwelling, Eastern Elevation, 2nd Floor	53.26	45.67
REC 7	1.5	Lot 3 Dwelling, At-Grade Rear Yard	54.71	--
REC 8-1	1.5	Lot 1 Dwelling, Southern Elevation, 1st Floor	44.23	35.20
REC 8-2	4.5	Lot 1 Dwelling, Southern Elevation 2nd Floor	45.30	36.27

6.0 Discussion and Recommendations

6.1 Outdoor Living Areas

Outdoor living area – at-grade rear yard is anticipated at each subdivided lot (Lot 1 to Lot 7). One receptor (REC 7) was selected in the centre of the rear yard at Lot 3, 1.5 m, where the noise level is expected to be the highest among all rear yards. It is assumed that the rear yards will only be utilized as outdoor living areas provided that the proposed dwellings are constructed. Utilizing the exteriors of proposed dwellings as noise barriers, the proposed Leq(16) at the rear yards will be up to 55 dBA, which is equal to the 55 dBA threshold value specified by the ENCG. Therefore, no further noise attenuation measures are required.

6.2 Indoor Living Areas and Ventilation

The results of the STAMSON modelling indicate that the Leq(16) ranges between 44.30 dBA and 62.57 dBA. Some of the values calculated exceed the limit of 55 dBA as specified by the ENGCC and therefore warning clauses will be required to be stated on any deeds of sale. The applicable warning clauses are summarized in Table 12 on the following page.

Table 12 – Summary of Warning Clauses – Indoor Living Areas				
Lot	**Elevation**	**Floor**	**Applicable Warning Clauses**	**Additional Considerations**
Lot 1	Southern	1	n/a	n/a
	Southern	2	n/a	n/a
Lot 2	Eastern	1	Warning Clause 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.
	Eastern	2	Warning Clause 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.
Lot 3	Southern	1	Warning Clause 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.
	Southern	2	Warning Clause 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.
Lot 4	Eastern	1	Warning Clause 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.
	Eastern	2	Warning Clause 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.
Lot 5	Eastern	1 & 2	n/a	n/a
Lot 6	Eastern	1 & 2	n/a	n/a
Lot 7	Eastern	1 & 2	n/a	n/a

7.0 Summary of Findings

The subject site is located at 930 Smith Road, in the City of Ottawa. It is understood that the subject property will be subdivided into seven lots (Lot 1 to Lot 7). The proposed development will consist of seven two-storey residential dwellings, one in each lot. The dwellings will rise 7 m above grade. There are two major sources of surface transportation noise to the proposed development: Smith Road and the VIA-Train Railway Ottawa-Corridor.

Outdoor Living Area and an at-grade rear yard are anticipated at each subdivided lot (Lot 1 to Lot 7). Utilizing the exteriors of proposed dwellings as noise barriers, the proposed Leq(16) at the rear yards will be up to 55 dBA, which is equal to the 55 dBA threshold value specified by the ENCG. Therefore, no further noise attenuation measures are required.

Ground-borne vibration and noise assessment is required for the VIA-Train Railway. However, VIA-Train Railway is located at distances greater than the screening distances specified in The Federal Transit Administration's Transit Noise and Vibration Impact Assessment Manual. Therefore, ground-borne vibration and noise assessment is not required.

The proposed development will consist of seven two-storey residential dwellings, one in each lot. It is noted that no major source of surface transportation noise is identified within the 100 m and 300 m radius of the proposed Lot 1 dwelling. Therefore, surface transportation analysis is not required for Lot 1 dwelling. Several reception points were selected at the proposed dwellings for the surface transportation noise analysis, where the noise levels are expected to be the highest. The results of STAMSON modelling indicate that noise levels at the proposed Lot 2 dwelling and Lot 3 dwelling 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 proposed Lot 2 dwelling and Lot 3 dwelling. The results of STAMSON modelling also indicate that the noise levels at all proposed dwellings will be 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 dwellings at Lot 2, Lot 3 and Lot 4:

> " 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."

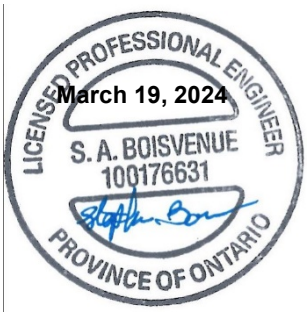
8.0 Statement of Limitations

The recommendations made in this report are by 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 Hierarchy Developments and Design 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.

Otillia McLaughlin B.Eng.



Stephanie A. Boisvenue, P.Eng.

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APPENDIX 1

TABLE 13 - SUMMARY OF RECEPTION POINTS AND GEOMETRY

DRAWING PG6765-1 - SITE PLAN

DRAWING PG6765-2 - RECEPTOR LOCATION PLAN

DRAWING PG6765-3 - SITE GEOMETRY (LOT 1 DWELLING)

DRAWING PG6765-3A – SITE GEOMETRY – REC 8-1 and REC 8-2

DRAWING PG6765-4 - SITE GEOMETRY (LOT 2 DWELLING)

DRAWING PG6765-4A - SITE GEOMETRY - REC 1-1 AND REC 1-2

DRAWING PG6765-4B - SITE GEOMETRY - REC 2-1 AND REC 2-2

DRAWING PG6765-5 - SITE GEOMETRY (LOT 3 DWELLING)

DRAWING PG6765-5A - SITE GEOMETRY - REC 3-1 AND REC 3-2

DRAWING PG6765-5B - SITE GEOMETRY - REC 4-1 AND REC 4-2

DRAWING PG6765-5C - SITE GEOMETRY - REC 7

DRAWING PG6765-6 - SITE GEOMETRY (LOT 4 DWELLING)

DRAWING PG6765-7 - SITE GEOMETRY (LOT 5 DWELLING)

DRAWING PG6765-7A - SITE GEOMETRY - REC 5-1 AND REC 5-2

DRAWING PG6765-8 - SITE GEOMETRY (LOT 6 DWELLING)

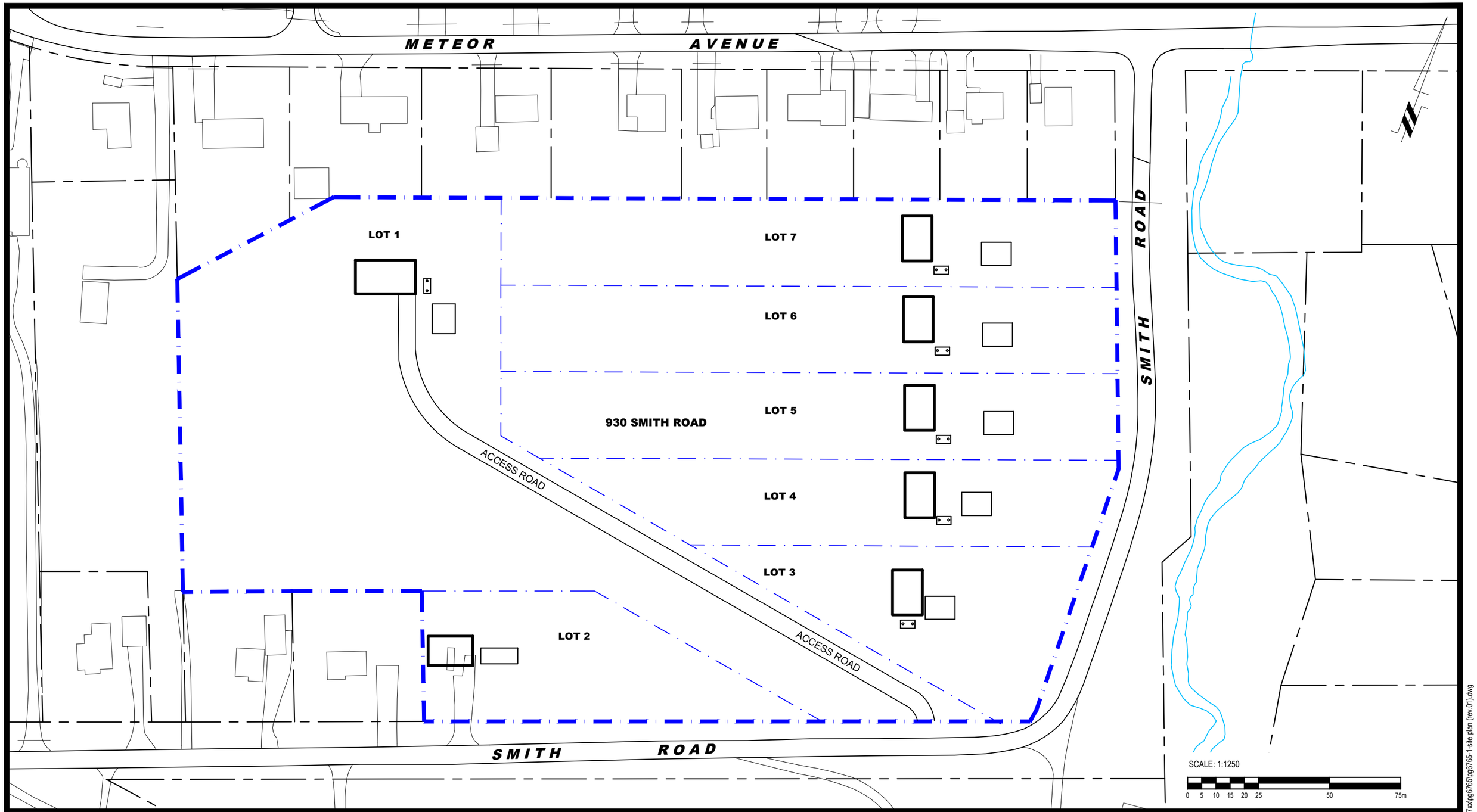
DRAWING PG6765-9 - SITE GEOMETRY (LOT 7 DWELLING)

DRAWING PG6765-9A - SITE GEOMETRY - REC 6-1 AND REC 6-2

Table 13 - Summary of Reception Points and Geometry

930 Smith Road

Point of Reception	Location	Leq Day (dBA)	Leq Night (dBA)	Smith Road								Via Rail Corridor							
				Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)	Barrier Height (m)	Barrier Distance (m)	Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)	Barrier Height (m)	Barrier Distance (m)
REC 1-1	Lot 2 Dwelling, Southern Elevation, 1st Floor	62.30	54.64	20	1.5	20.1	-79, 79	n/a	n/a	n/a	n/a	115	1.5	115.01	-45, 72	n/a	n/a	n/a	n/a
REC 1-2	Lot 2 Dwelling, Southern Elevation, 2nd Floor	62.57	54.90	20	4.5	20.5	-79, 79	n/a	n/a	n/a	n/a	115	4.5	115.09	-45, 72	n/a	n/a	n/a	n/a
REC 2-1	Lot 2 Dwelling, Eastern Elevation, 1st Floor	57.57	49.91	25	1.5	25.0	-75, 0	n/a	n/a	n/a	n/a	130	1.5	130.01	-43, 73	n/a	n/a	n/a	n/a
REC 2-2	Lot 2 Dwelling, Eastern Elevation, 2nd Floor	57.90	50.24	25	4.5	25.4	-75, 0	n/a	n/a	n/a	n/a	130	4.5	130.08	-43, 73	n/a	n/a	n/a	n/a
REC 3-1	Lot 3 Dwelling, Southern Elevation, 1st Floor	58.14	50.50	35	1.5	n/a	-90, 69	n/a	n/a	n/a	n/a	220	1.5	220.01	-25, 78	n/a	n/a	n/a	n/a
REC 3-2	Lot 3 Dwelling, Southern Elevation, 2nd Floor	58.63	50.97	35	4.5	n/a	-90, 69	n/a	n/a	n/a	n/a	220	4.5	220.05	-25, 78	n/a	n/a	n/a	n/a
REC 4-1	Lot 3 Dwelling, Eastern Elevation, 1st Floor	55.57	48.13	45	1.5	45.0	-49, 90	n/a	n/a	n/a	n/a	235	1.5	235.00	-25, 0	n/a	n/a	n/a	n/a
REC 4-2	Lot 3 Dwelling, Eastern Elevation, 2nd Floor	56.30	48.67	45	4.5	45.2	-49, 90	n/a	n/a	n/a	n/a	235	4.5	235.04	-25, 0	n/a	n/a	n/a	n/a
REC 5-1	Lot 5 Dwelling, Eastern Elevation, 1st Floor	53.35	45.75	60	1.5	60.0	-51, 67	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
REC 5-2	Lot 5 Dwelling, Eastern Elevation, 2nd Floor	53.96	46.37	60	4.5	60.2	-51, 67	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
REC 6-1	Lot 7 Dwelling, Eastern Elevation, 1st Floor	52.67	45.08	60	1.5	60.0	-46, 50	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
REC 6-2	Lot 7 Dwelling, Eastern Elevation, 2nd Floor	53.26	45.67	60	4.5	60.2	-46, 50	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
REC 7	Lot 3 Dwelling, Rear Yard	54.71	n/a	45	1.5	45.0	-36, 61	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
REC 8-1	Lot 1 Dwelling, Southern Elevation, 1st Floor	44.23	35.20	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	219	1.5	219.01	-37, 55	n/a	n/a	n/a	n/a
REC 8-2	Lot 1 Dwelling, Southern Elevation, 2nd Floor	45.30	36.27	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	219	4.5	219.05	-37, 55	n/a	n/a	n/a	n/a



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

NO.	REVISIONS	DATE	INITIAL
1	NEW NOISE SOURCE UPDATED	19/12/2023	OM

HIERARCHY DEVELOPMENTS AND DESIGN

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD

NAVAN, ONTARIO

Title:

SITE PLAN

Scale: 1:1250	Date: 07/2023
Drawn by: YA	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-1
Approved by: SB	Revision No.: 1

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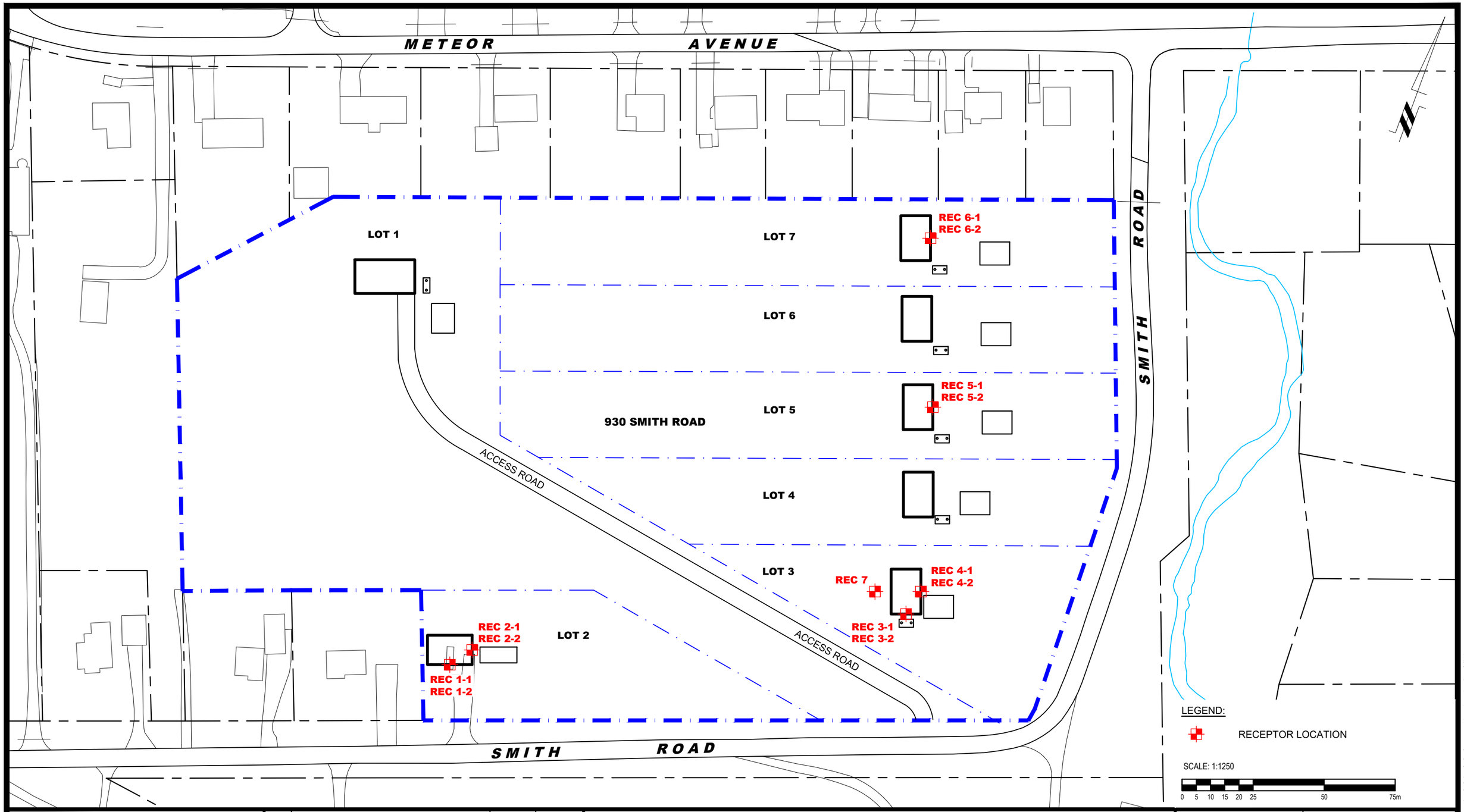

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TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
1	NEW NOISE SOURCE UPDATED	19/12/2023	OM

HIERARCHY DEVELOPMENTS AND DESIGN

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD

NAVAN, ONTARIO

Title:

RECEPTOR LOCATION PLAN

Scale: 1:1250	Date: 07/2023
Drawn by: YA	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-2
Approved by: SB	Revision No.: 1

11x17

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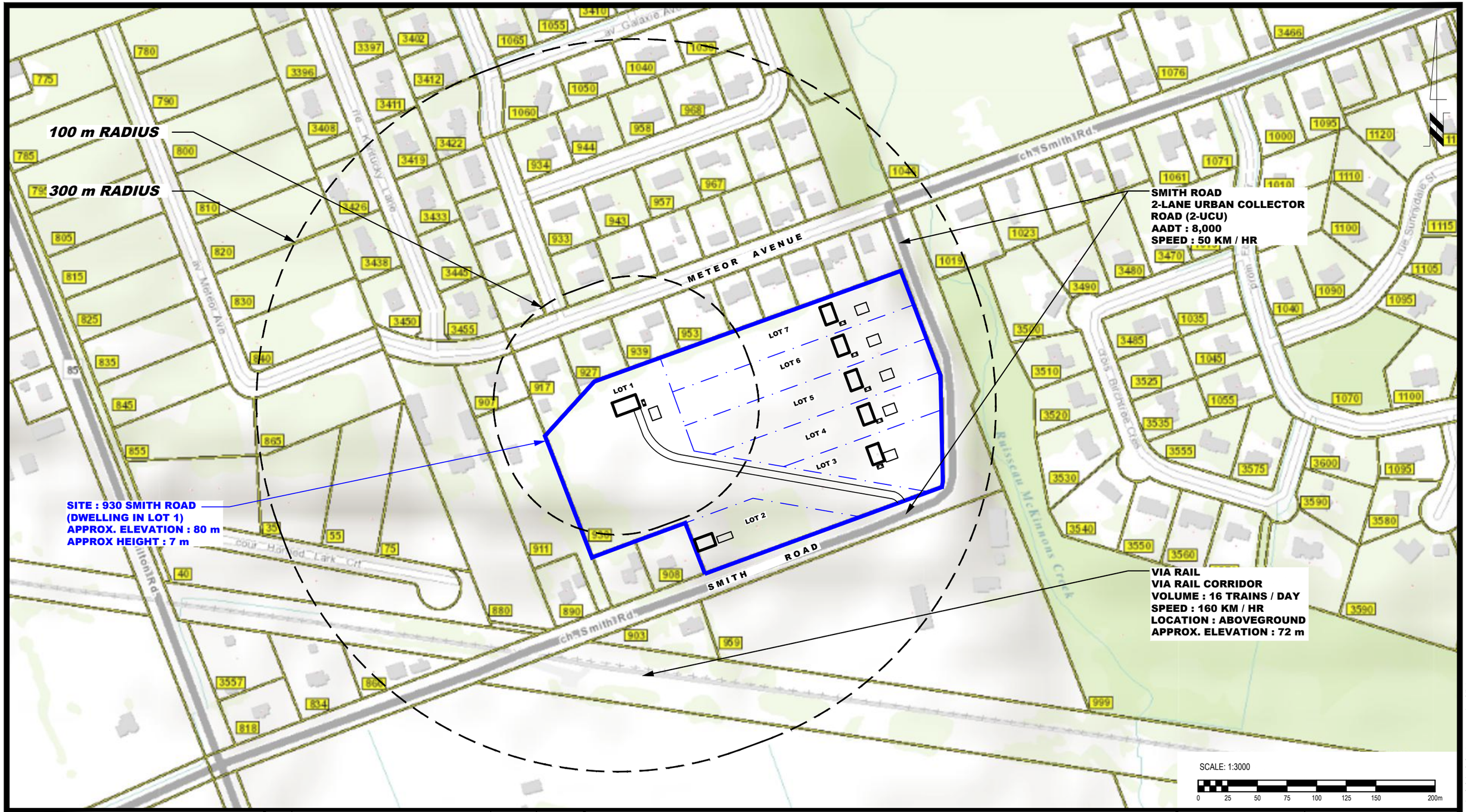

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NO.	REVISIONS	DATE	INITIAL
1	NEW NOISE SOURCE UPDATED	19/12/2023	OM

HIERARCHY DEVELOPMENTS AND DESIGN

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD

NAVAN, ONTARIO

Title:

SITE GEOMETRY - DWELLING IN LOT 1

Scale: 1:3000	Date: 07/2023
Drawn by: YA	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-3
Approved by: SB	Revision No.: 1

11x17

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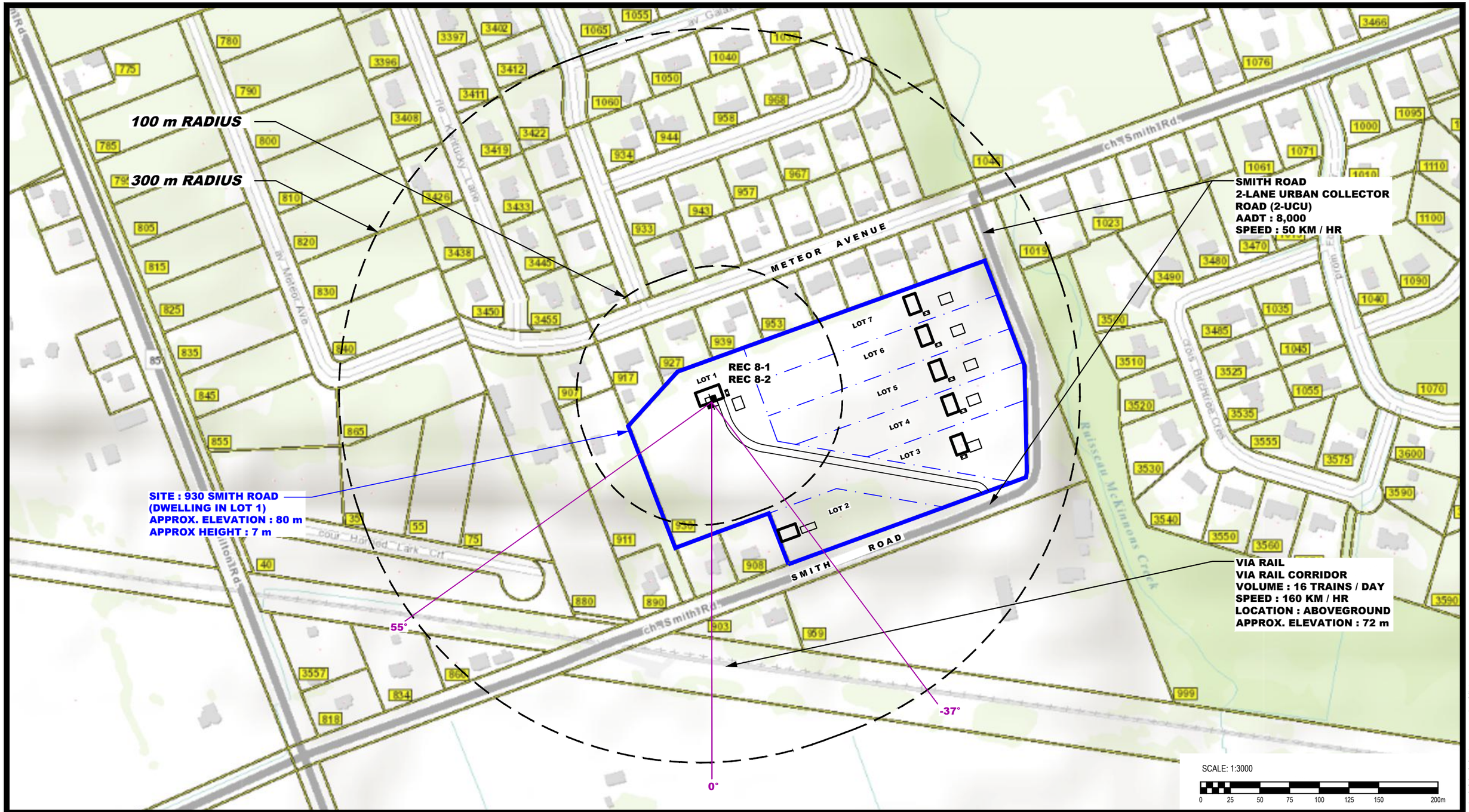

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NO.	REVISIONS	DATE	INITIAL
1	NEW NOISE SOURCE UPDATED	19/12/2023	OM

HIERARCHY DEVELOPMENTS AND DESIGN

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD

NAVAN, ONTARIO

Title:

SITE GEOMETRY - REC 8-1 AND 8-2

Scale: 1:3000	Date: 07/2023
Drawn by: NFRV	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-3A
Approved by: SB	Revision No.: 1

11x17

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1	NEW NOISE SOURCE UPDATED	19/12/2023	OM

HIERARCHY DEVELOPMENTS AND DESIGN

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD

NAVAN, ONTARIO

Title:

SITE GEOMETRY - DWELLING IN LOT 2

Scale: 1:3000	Date: 07/2023
Drawn by: YA	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-4
Approved by: SB	Revision No.: 1

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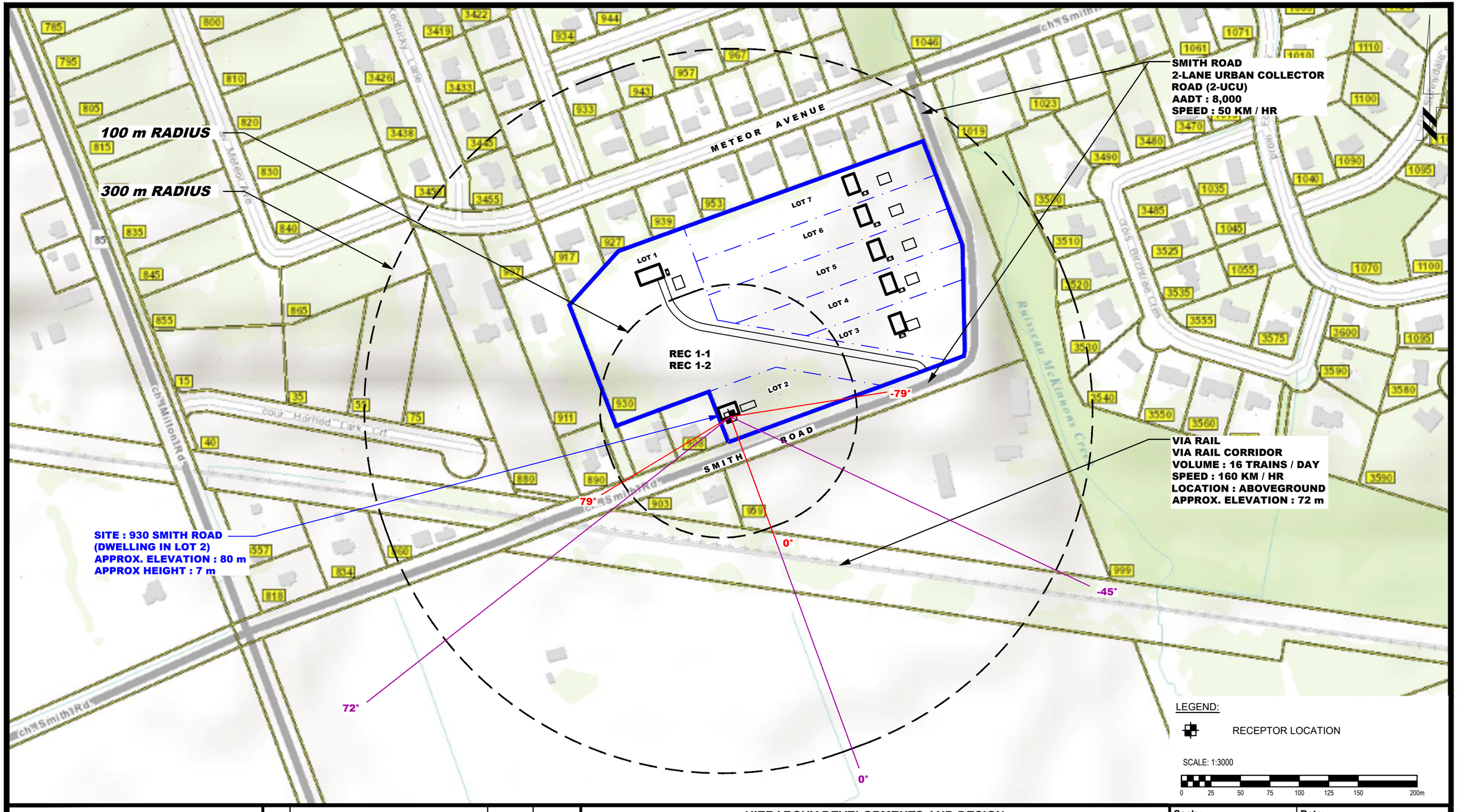

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TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
1	NEW NOISE SOURCE UPDATED	19/12/2023	OM

HIERARCHY DEVELOPMENTS AND DESIGN

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD

NAVAN, ONTARIO

Title:

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

Scale: 1:3000	Date: 07/2023
Drawn by: YA	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-4A
Approved by: SB	Revision No.: 1

11x17

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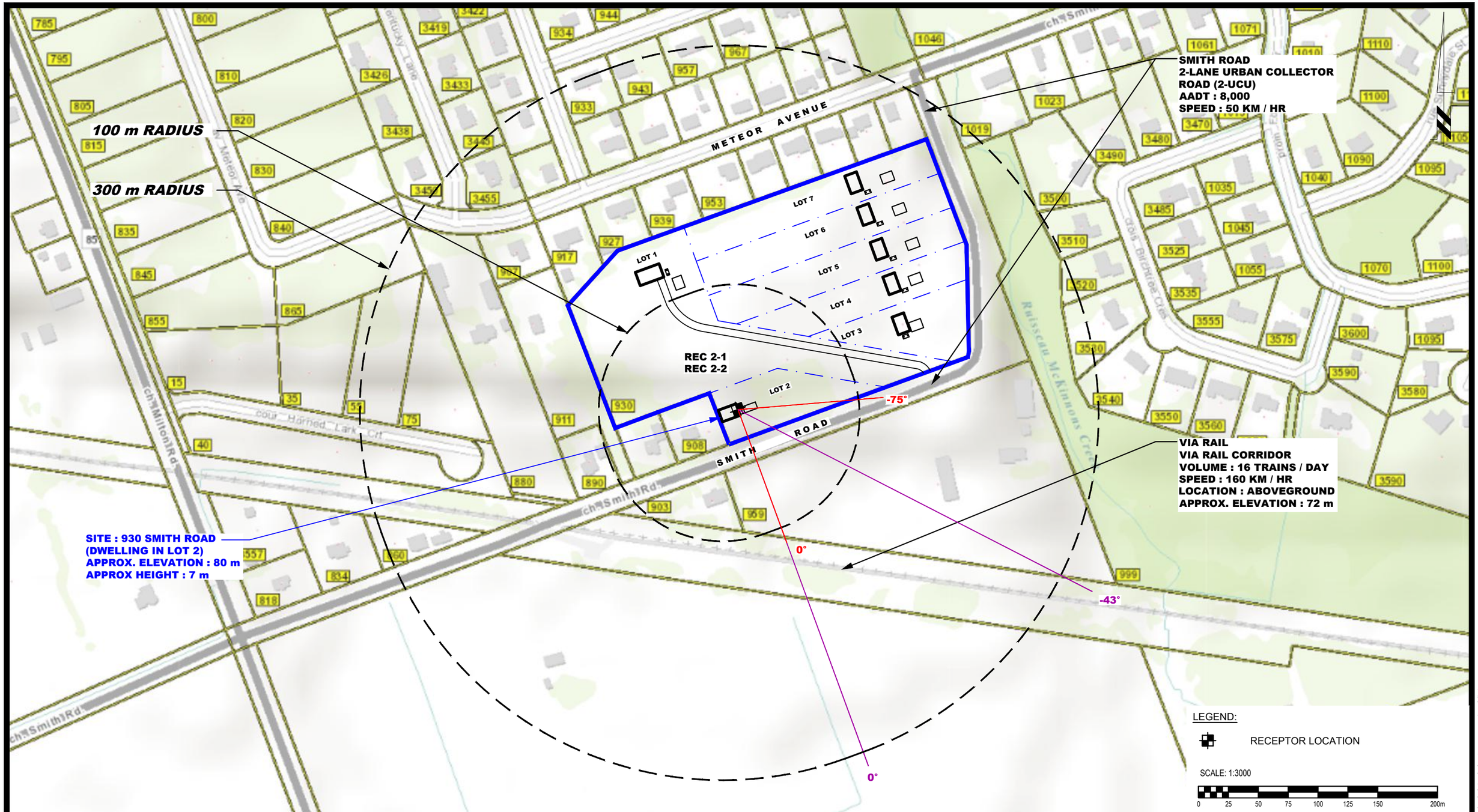

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TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
1	NEW NOISE SOURCE UPDATED	19/12/2023	OM

HIERARCHY DEVELOPMENTS AND DESIGN

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD

NAVAN, ONTARIO

Title:

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

Scale: 1:3000	Date: 07/2023
Drawn by: YA	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-4B
Approved by: SB	Revision No.: 1

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NO.	REVISIONS	DATE	INITIAL
1	NEW NOISE SOURCE UPDATED	19/12/2023	OM

HIERARCHY DEVELOPMENTS AND DESIGN

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD

NAVAN, ONTARIO

Title:

SITE GEOMETRY - DWELLING IN LOT 3

Scale: 1:3000	Date: 07/2023
Drawn by: YA	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-5
Approved by: SB	Revision No.: 1

11x17

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100 m RADIUS

300 m RADIUS

SMITH ROAD
2-LANE URBAN COLLECTOR ROAD (2-UCU)
AADT : 8,000
SPEED : 50 KM / HR

METEOR AVENUE

LOT 1
LOT 2
LOT 3
LOT 4
LOT 5
LOT 6
LOT 7

REC 3-1
REC 3-2

-90°
69°
0°
78°
-25°
0°

SMITH ROAD

VIA RAIL
VIA RAIL CORRIDOR
VOLUME : 16 TRAINS / DAY
SPEED : 160 KM / HR
LOCATION : ABOVEGROUND
APPROX. ELEVATION : 72 m

SITE : 930 SMITH ROAD
(DWELLING IN LOT 3)
APPROX. ELEVATION : 80 m
APPROX HEIGHT : 7 m

LEGEND:

RECEPTOR LOCATION

SCALE: 1:3000

0 25 50 75 100 125 150 200m

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

NO.	REVISIONS	DATE	INITIAL
1	NEW NOISE SOURCE UPDATED	19/12/2023	OM

HIERARCHY DEVELOPMENTS AND DESIGN

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD

NAVAN, ONTARIO

Title:

SITE GEOMETRY - REC 3-1 AND REC 3-2

Scale: 1:3000	Date: 07/2023
Drawn by: YA	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-5A
Approved by: SB	Revision No.: 1

11x17

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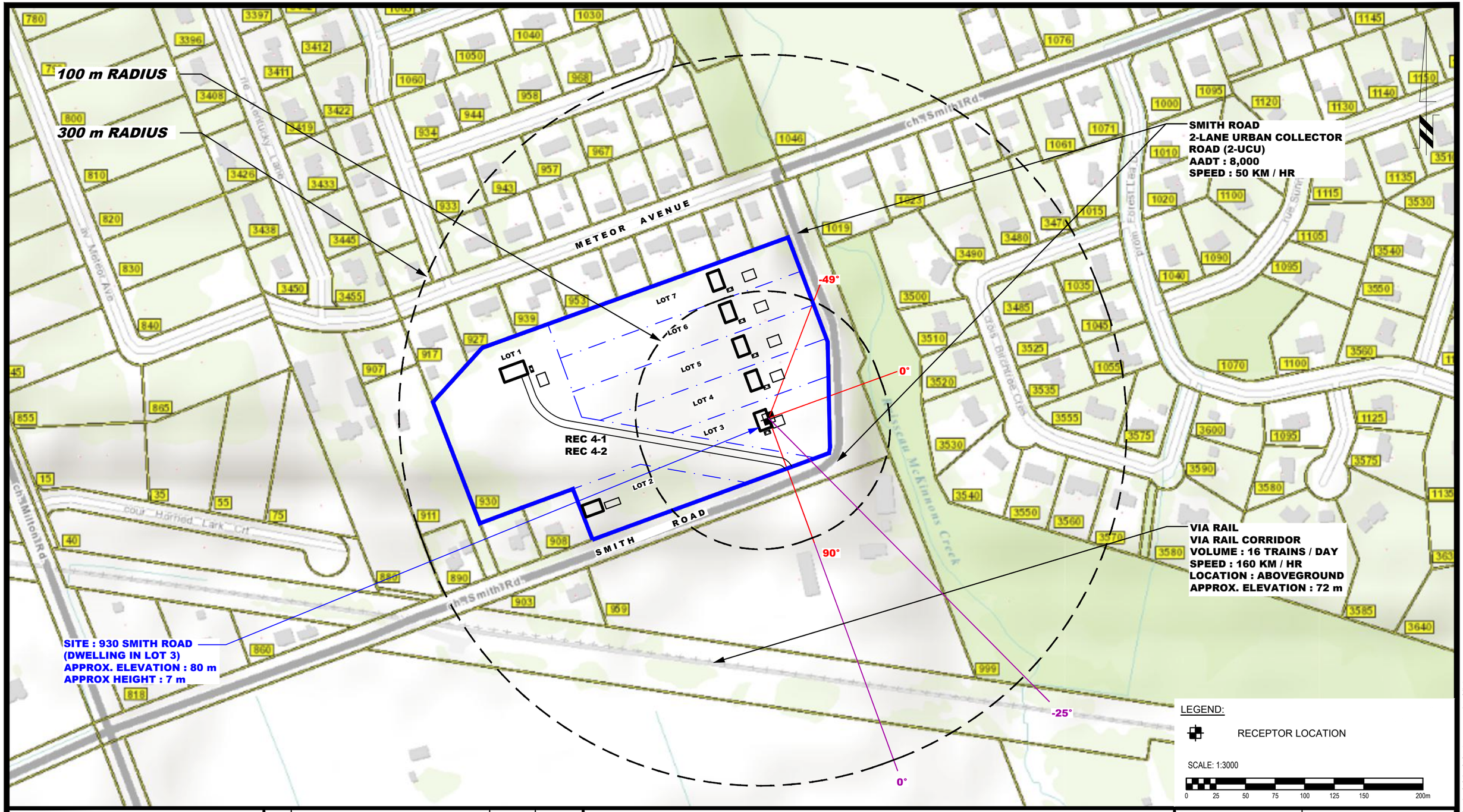

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
1	NEW NOISE SOURCE UPDATED	19/12/2023	OM

HIERARCHY DEVELOPMENTS AND DESIGN

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD

NAVAN, ONTARIO

Title:

SITE GEOMETRY - REC 4-1 AND REC 4-2

Scale: 1:3000	Date: 07/2023
Drawn by: YA	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-5B
Approved by: SB	Revision No.: 1

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100 m RADIUS

300 m RADIUS

SMITH ROAD
2-LANE URBAN COLLECTOR ROAD (2-UCU)
AADT : 8,000
SPEED : 50 KM / HR

METEOR AVENUE

SMITH ROAD

LOT 1
LOT 2
LOT 3
LOT 4
LOT 5
LOT 6
LOT 7
REC 7

VIA RAIL
VIA RAIL CORRIDOR
VOLUME : 16 TRAINS / DAY
SPEED : 160 KM / HR
LOCATION : ABOVEGROUND
APPROX. ELEVATION : 72 m

SITE : 930 SMITH ROAD
(DWELLING IN LOT 3)
APPROX. ELEVATION : 80 m
APPROX HEIGHT : 7 m

77°
61°
0°
-36°
0°
-26°

LEGEND:

RECEPTOR LOCATION

SCALE: 1:3000

0 25 50 75 100 125 150 200m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
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NO.	REVISIONS	DATE	INITIAL
1	NEW NOISE SOURCE UPDATED	19/12/2023	OM

HIERARCHY DEVELOPMENTS AND DESIGN

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD

NAVAN, ONTARIO

Title:

SITE GEOMETRY - REC 7

Scale: 1:3000	Date: 07/2023
Drawn by: YA	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-5C
Approved by: SB	Revision No.: 1

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PATERSON GROUP
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NO.	REVISIONS	DATE	INITIAL
1	NEW NOISE SOURCE UPDATED	19/12/2023	OM

HIERARCHY DEVELOPMENTS AND DESIGN

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD

NAVAN, ONTARIO

Title:

SITE GEOMETRY - DWELLING IN LOT 4

Scale: 1:3000	Date: 07/2023
Drawn by: YA	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-6
Approved by: SB	Revision No.: 1

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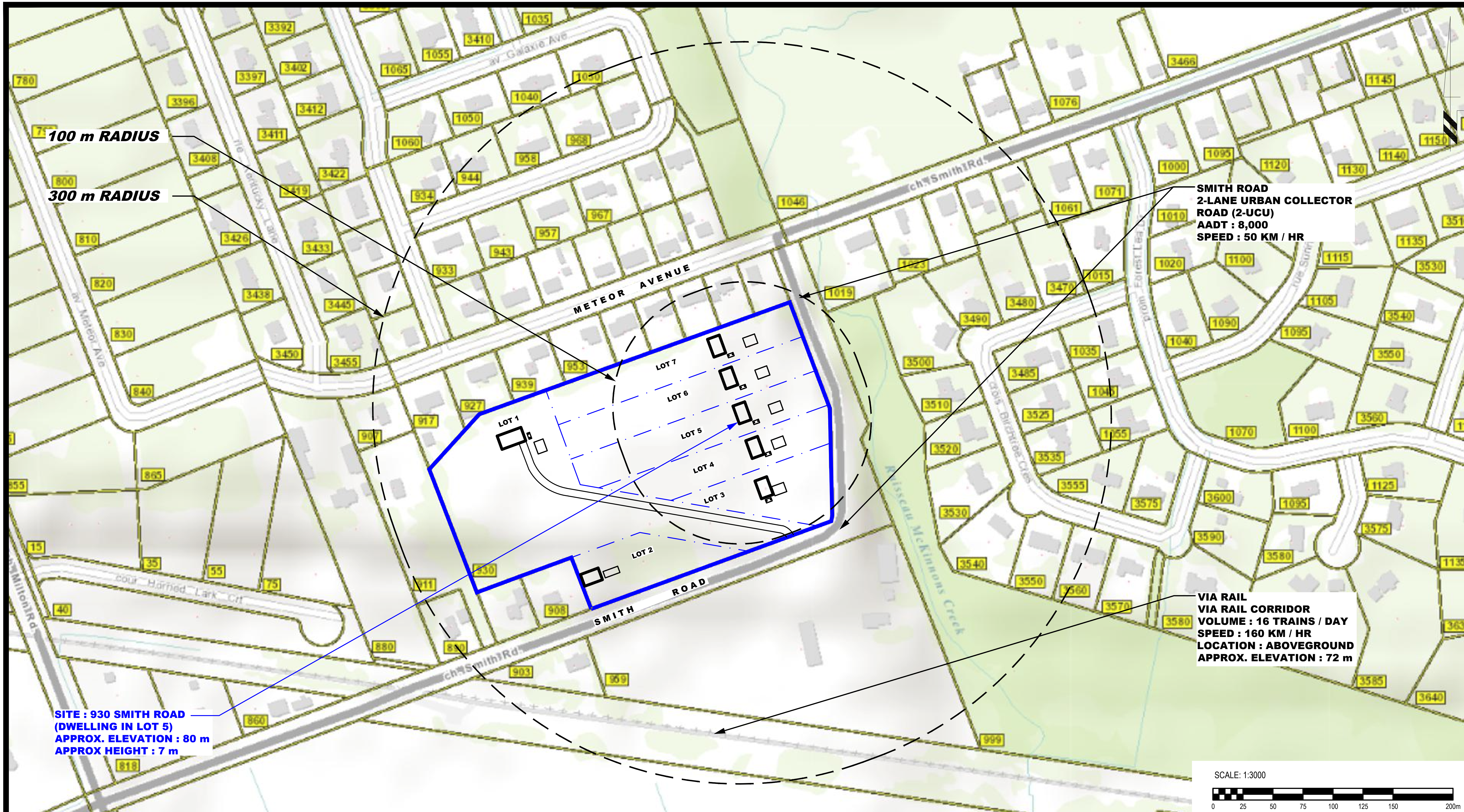

1	NEW NOISE SOURCE UPDATED	19/12/2023	OM
NO.	REVISIONS	DATE	INITIAL

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

HIERARCHY DEVELOPMENTS AND DESIGN
NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD
NAVAN, ONTARIO

Title:
SITE GEOMETRY - DWELLING IN LOT 5

Scale: 1:3000	Date: 07/2023
Drawn by: YA	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-7
Approved by: SB	Revision No.: 1

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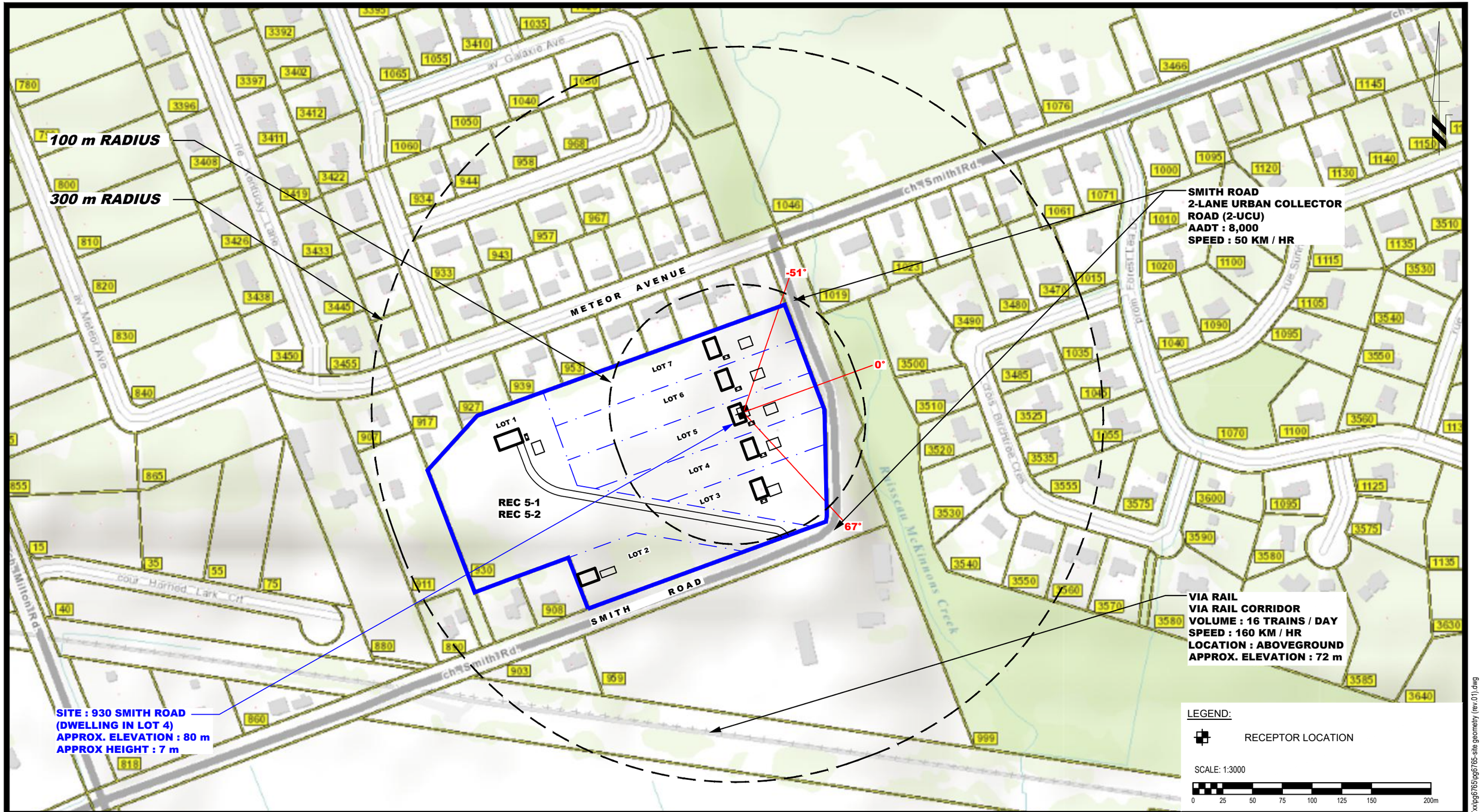

PATERSON GROUP
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OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
1	NEW NOISE SOURCE UPDATED	19/12/2023	OM

HIERARCHY DEVELOPMENTS AND DESIGN

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD

NAVAN, ONTARIO

Title:

SITE GEOMETRY - REC 5-1 AND REC 5-2

Scale: 1:3000	Date: 07/2023
Drawn by: YA	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-7A
Approved by: SB	Revision No.: 1

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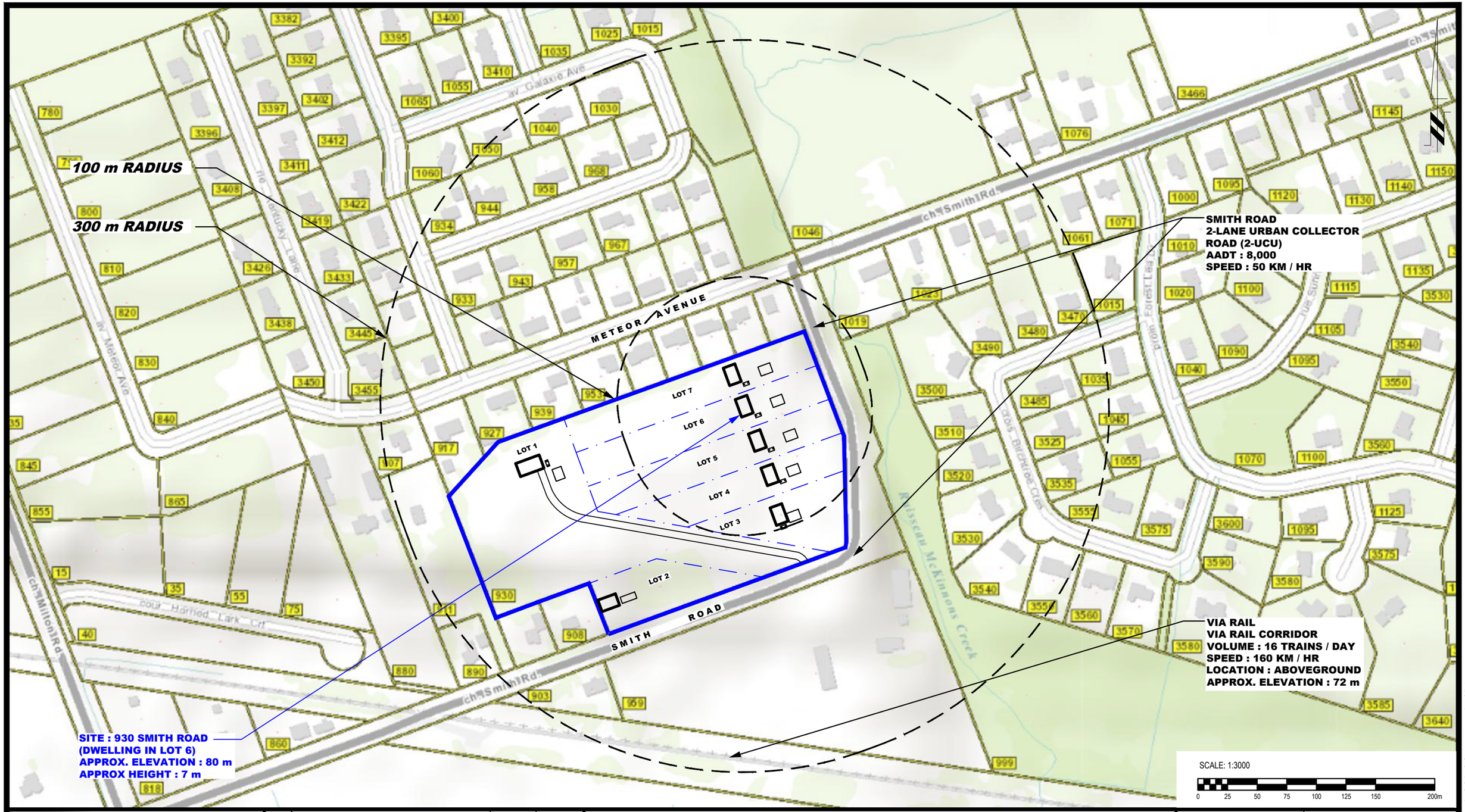

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1	NEW NOISE SOURCE UPDATED	19/12/2023	OM

HIERARCHY DEVELOPMENTS AND DESIGN

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD

NAVAN, ONTARIO

Title:

SITE GEOMETRY - DWELLING IN LOT 6

Scale: 1:3000	Date: 07/2023
Drawn by: YA	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-8
Approved by: SB	Revision No.: 1

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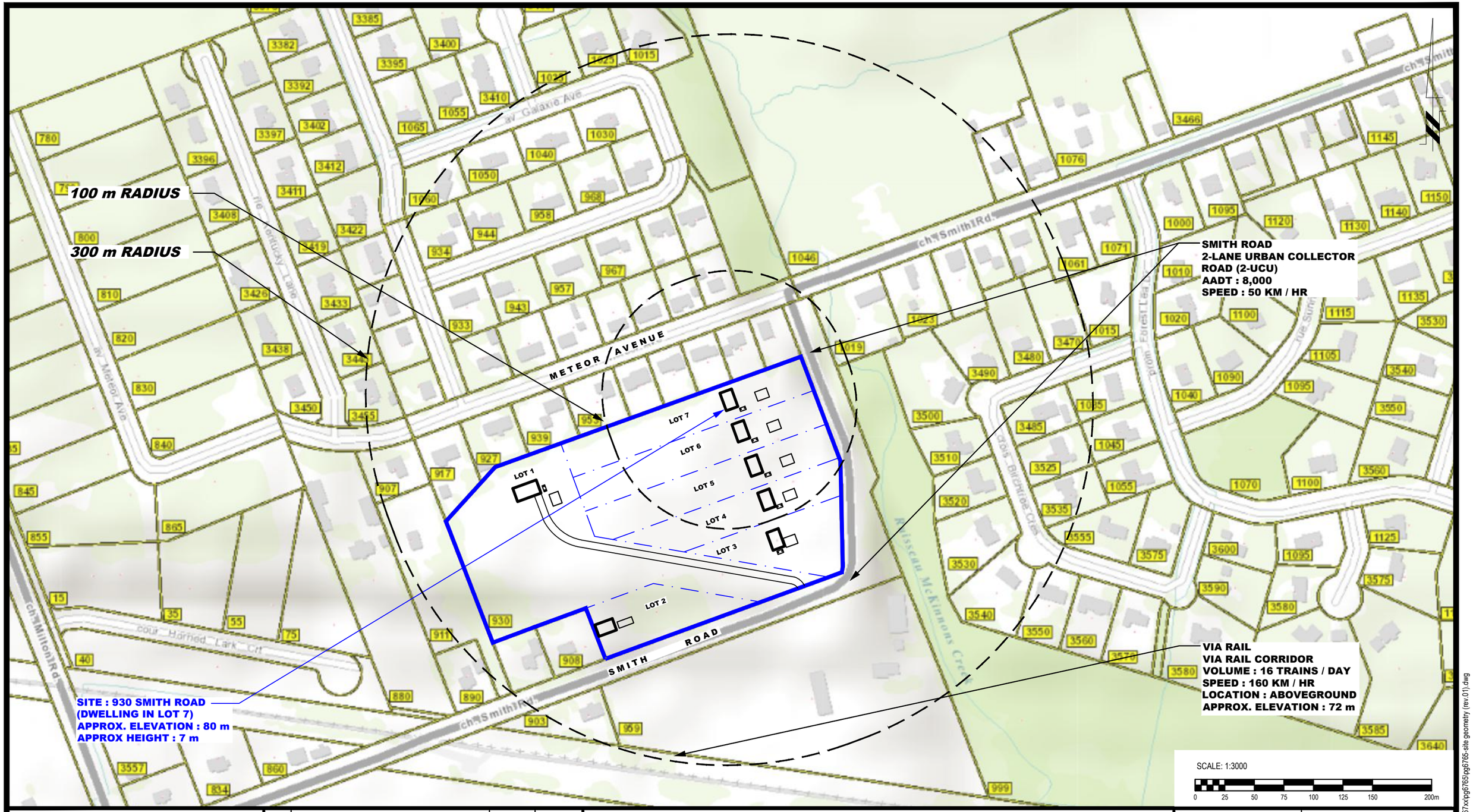

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K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
1	NEW NOISE SOURCE UPDATED	19/12/2023	OM

HIERARCHY DEVELOPMENTS AND DESIGN

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD

NAVAN, ONTARIO

Title:

SITE GEOMETRY - DWELLING IN LOT 7

Scale: 1:3000	Date: 07/2023
Drawn by: YA	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-9
Approved by: SB	Revision No.: 1

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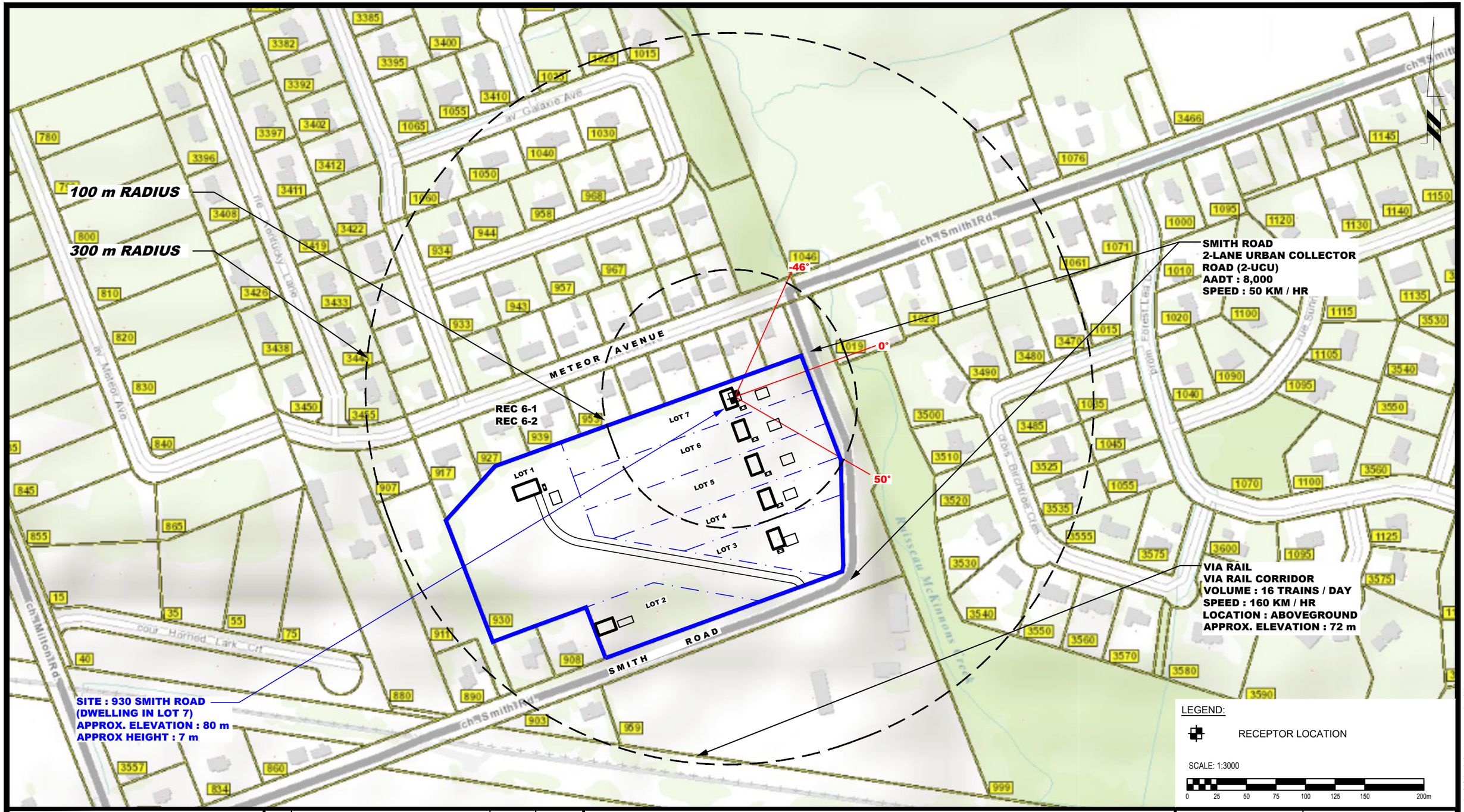

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OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
1	NEW NOISE SOURCE UPDATED	19/12/2023	OM

HIERARCHY DEVELOPMENTS AND DESIGN

NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
930 SMITH ROAD

NAVAN, ONTARIO

Title:

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

Scale: 1:3000	Date: 07/2023
Drawn by: YA	Report No.: PG6765-1
Checked by: YT	Dwg. No.: PG6765-9A
Approved by: SB	Revision No.: 1

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APPENDIX 2

STAMSON RESULTS

STAMSON 5.0 NORMAL REPORT Date: 20-12-2023 30:03:57
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec11sb.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 1-1

Rail data, segment # 1: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. VIA	16.0/1.0	100.0	1.0	4.0	Diesel	Yes

Data for Segment # 1: VIA (day/night)

Angle1 Angle2	: -45.00 deg	72.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0 / 0	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 115.00 / 115.00 m	
Receiver height	: 1.50 / 1.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)

No Whistle
Reference angle : 0.00

↟
Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 49.15 + 0.00) = 49.15 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	72	0.58	65.60	-14.02	-2.43	0.00	0.00	0.00	49.15

WHEEL (0.00 + 38.11 + 0.00) = 38.11 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	72	0.66	55.29	-14.68	-2.50	0.00	0.00	0.00	38.11

Segment Leq : 49.48 dBA

Total Leq All Segments: 49.48 dBA

↟
Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 40.12 + 0.00) = 40.12 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	72	0.58	56.57	-14.02	-2.43	0.00	0.00	0.00	40.12

WHEEL (0.00 + 29.08 + 0.00) = 29.08 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	72	0.66	46.26	-14.68	-2.50	0.00	0.00	0.00	29.08

Segment Leq : 40.45 dBA

Total Leq All Segments: 40.45 dBA

↟

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

Angle1 Angle2	-79.00 deg	79.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	20.00 / 20.00	m
Receiver height	1.50 / 1.50	m
Topography	1	(Flat/gentle slope; no barrier)
Reference angle	0.00	

↟

Results segment # 1: Smith Rd (day)

Source height = 1.50 m

ROAD (0.00 + 62.07 + 0.00) = 62.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	79	0.66	65.75	0.00	-2.07	-1.61	0.00	0.00	0.00	62.07

Segment Leq : 62.07 dBA

Total Leq All Segments: 62.07 dBA

↟

Results segment # 1: Smith Rd (night)

Source height = 1.50 m

ROAD (0.00 + 54.47 + 0.00) = 54.47 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	79	0.66	58.16	0.00	-2.07	-1.61	0.00	0.00	0.00	54.47

Segment Leq : 54.47 dBA

Total Leq All Segments: 54.47 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 62.30
(NIGHT): 54.64

↟

↟

STAMSON 5.0 NORMAL REPORT Date: 20-12-2023 30:04:34
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec12sb.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 1-2

Rail data, segment # 1: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. VIA	16.0/1.0	100.0	1.0	4.0	Diesel	Yes

Data for Segment # 1: VIA (day/night)

Angle1 Angle2	: -45.00 deg	72.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0 / 0	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 115.00 / 115.00 m	
Receiver height	: 4.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

↟

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 50.02 + 0.00) = 50.02 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	72	0.50	65.60	-13.22	-2.35	0.00	0.00	0.00	50.02

WHEEL (0.00 + 38.69 + 0.00) = 38.69 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	72	0.60	55.29	-14.15	-2.45	0.00	0.00	0.00	38.69

Segment Leq : 50.33 dBA

Total Leq All Segments: 50.33 dBA

↟

Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 40.99 + 0.00) = 40.99 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	72	0.50	56.57	-13.22	-2.35	0.00	0.00	0.00	40.99

WHEEL (0.00 + 29.66 + 0.00) = 29.66 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	72	0.60	46.26	-14.15	-2.45	0.00	0.00	0.00	29.66

Segment Leq : 41.30 dBA

Total Leq All Segments: 41.30 dBA

↟

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

```
Angle1   Angle2           : -79.00 deg   79.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  20.00 / 20.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

↟

Results segment # 1: Smith Rd (day)

Source height = 1.50 m

ROAD (0.00 + 62.30 + 0.00) = 62.30 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	79	0.57	65.75	0.00	-1.96	-1.48	0.00	0.00	0.00	62.30

Segment Leq : 62.30 dBA

Total Leq All Segments: 62.30 dBA

Results segment # 1: Smith Rd (night)

Source height = 1.50 m

ROAD (0.00 + 54.71 + 0.00) = 54.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	79	0.57	58.16	0.00	-1.96	-1.48	0.00	0.00	0.00	54.71

Segment Leq : 54.71 dBA

Total Leq All Segments: 54.71 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.57
(NIGHT): 54.90

STAMSON 5.0 NORMAL REPORT Date: 20-12-2023 30:09:35
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec21SB.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 2-1

Rail data, segment # 1: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1.	16.0/1.0	100.0	1.0	4.0	Diesel	Yes

Data for Segment # 1: VIA (day/night)

Angle1 Angle2	-43.00 deg	0.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	130.00 / 130.00 m	
Receiver height	1.50 / 1.50 m	
Topography	1	(Flat/gentle slope; no barrier)

No Whistle
Reference angle : 0.00

↟
Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 44.27 + 0.00) = 44.27 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	0	0.58	65.60	-14.86	-6.47	0.00	0.00	0.00	44.27

WHEEL (0.00 + 33.23 + 0.00) = 33.23 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	0	0.66	55.29	-15.57	-6.50	0.00	0.00	0.00	33.23

Segment Leq : 44.60 dBA

Total Leq All Segments: 44.60 dBA

↟
Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 35.24 + 0.00) = 35.24 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	0	0.58	56.57	-14.86	-6.47	0.00	0.00	0.00	35.24

WHEEL (0.00 + 24.20 + 0.00) = 24.20 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	0	0.66	46.26	-15.57	-6.50	0.00	0.00	0.00	24.20

Segment Leq : 35.57 dBA

Total Leq All Segments: 35.57 dBA

↟

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

```
Angle1   Angle2           : -75.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  25.00 / 25.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

↟

Results segment # 1: Smith Rd (day)

Source height = 1.50 m

ROAD (0.00 + 57.34 + 0.00) = 57.34 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-75	0	0.66	65.75	0.00	-3.68	-4.73	0.00	0.00	0.00	57.34

Segment Leq : 57.34 dBA

Total Leq All Segments: 57.34 dBA

↟

Results segment # 1: Smith Rd (night)

Source height = 1.50 m

ROAD (0.00 + 49.75 + 0.00) = 49.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-75	0	0.66	58.16	0.00	-3.68	-4.73	0.00	0.00	0.00	49.75

Segment Leq : 49.75 dBA

Total Leq All Segments: 49.75 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 57.57
(NIGHT): 49.91

↟

↟

STAMSON 5.0 NORMAL REPORT Date: 20-12-2023 30:07:48
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec22SB.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 2-2

Rail data, segment # 1: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1.	16.0/1.0	100.0	1.0	4.0	Diesel	Yes

Data for Segment # 1: VIA (day/night)

Angle1 Angle2	-43.00 deg	0.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	130.00 / 130.00 m	
Receiver height	4.50 / 4.50 m	
Topography	1	(Flat/gentle slope; no barrier)

No Whistle
Reference angle : 0.00

↟
Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 45.15 + 0.00) = 45.15 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	0	0.50	65.60	-14.02	-6.43	0.00	0.00	0.00	45.15

WHEEL (0.00 + 33.81 + 0.00) = 33.81 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	0	0.60	55.29	-15.01	-6.47	0.00	0.00	0.00	33.81

Segment Leq : 45.46 dBA

Total Leq All Segments: 45.46 dBA

↟
Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 36.12 + 0.00) = 36.12 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	0	0.50	56.57	-14.02	-6.43	0.00	0.00	0.00	36.12

WHEEL (0.00 + 24.78 + 0.00) = 24.78 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	0	0.60	46.26	-15.01	-6.47	0.00	0.00	0.00	24.78

Segment Leq : 36.43 dBA

Total Leq All Segments: 36.43 dBA

↟

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

```
Angle1   Angle2           : -75.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  25.00 / 25.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

↟

Results segment # 1: Smith Rd (day)

Source height = 1.50 m

ROAD (0.00 + 57.65 + 0.00) = 57.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-75	0	0.57	65.75	0.00	-3.48	-4.61	0.00	0.00	0.00	57.65

Segment Leq : 57.65 dBA

Total Leq All Segments: 57.65 dBA

↟

Results segment # 1: Smith Rd (night)

Source height = 1.50 m

ROAD (0.00 + 50.06 + 0.00) = 50.06 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-75	0	0.57	58.16	0.00	-3.48	-4.61	0.00	0.00	0.00	50.06

Segment Leq : 50.06 dBA

Total Leq All Segments: 50.06 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 57.90
(NIGHT): 50.24

↟

↟

STAMSON 5.0 NORMAL REPORT Date: 21-12-2023 08:37:07
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec31sb.te Time Period: Day/Night 16/8 hours
Description: Reception Point 3-1

Rail data, segment # 1: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1.	16.0/1.0	100.0	1.0	4.0	Diesel	Yes

Data for Segment # 1: VIA (day/night)

Angle1 Angle2	-25.00 deg	78.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	220.00 / 220.00 m	
Receiver height	1.50 / 1.50 m	
Topography	1	(Flat/gentle slope; no barrier)

No Whistle
Reference angle : 0.00

↟
Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 44.00 + 0.00) = 44.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	78	0.58	65.60	-18.49	-3.12	0.00	0.00	0.00	44.00

WHEEL (0.00 + 32.74 + 0.00) = 32.74 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	78	0.66	55.29	-19.36	-3.19	0.00	0.00	0.00	32.74

Segment Leq : 44.31 dBA

Total Leq All Segments: 44.31 dBA

↟
Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 34.97 + 0.00) = 34.97 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	78	0.58	56.57	-18.49	-3.12	0.00	0.00	0.00	34.97

WHEEL (0.00 + 23.70 + 0.00) = 23.70 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	78	0.66	46.26	-19.36	-3.19	0.00	0.00	0.00	23.70

Segment Leq : 35.28 dBA

Total Leq All Segments: 35.28 dBA

↟

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

```
Angle1   Angle2           : -90.00 deg   69.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  35.00 / 35.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

↟

Results segment # 1: Smith Rd (day)

Source height = 1.50 m

ROAD (0.00 + 57.96 + 0.00) = 57.96 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	69	0.66	65.75	0.00	-6.11	-1.68	0.00	0.00	0.00	57.96

Segment Leq : 57.96 dBA

Total Leq All Segments: 57.96 dBA

↟

Results segment # 1: Smith Rd (night)

Source height = 1.50 m

ROAD (0.00 + 50.37 + 0.00) = 50.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	69	0.66	58.16	0.00	-6.11	-1.68	0.00	0.00	0.00	50.37

Segment Leq : 50.37 dBA

Total Leq All Segments: 50.37 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 58.14
(NIGHT): 50.50

↟

↟

STAMSON 5.0 NORMAL REPORT Date: 21-12-2023 08:38:17
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec32SB.te Time Period: Day/Night 16/8 hours
Description: Reception Point 3-2

Rail data, segment # 1: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1.	16.0/1.0	100.0	1.0	4.0	Diesel	Yes

Data for Segment # 1: VIA (day/night)

Angle1 Angle2	-25.00 deg	78.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	220.00 / 220.00 m	
Receiver height	4.50 / 4.50 m	
Topography	1	(Flat/gentle slope; no barrier)

No Whistle
Reference angle : 0.00

↟
Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 45.14 + 0.00) = 45.14 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	78	0.50	65.60	-17.44	-3.02	0.00	0.00	0.00	45.14

WHEEL (0.00 + 33.50 + 0.00) = 33.50 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	78	0.60	55.29	-18.66	-3.13	0.00	0.00	0.00	33.50

Segment Leq : 45.43 dBA

Total Leq All Segments: 45.43 dBA

↟
Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 36.11 + 0.00) = 36.11 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	78	0.50	56.57	-17.44	-3.02	0.00	0.00	0.00	36.11

WHEEL (0.00 + 24.47 + 0.00) = 24.47 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	78	0.60	46.26	-18.66	-3.13	0.00	0.00	0.00	24.47

Segment Leq : 36.40 dBA

Total Leq All Segments: 36.40 dBA

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

Angle1 Angle2	-90.00 deg	69.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	35.00 / 35.00	m
Receiver height	4.50 / 4.50	m
Topography	1	(Flat/gentle slope; no barrier)
Reference angle	0.00	

Results segment # 1: Smith Rd (day)

Source height = 1.50 m

ROAD (0.00 + 58.42 + 0.00) = 58.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	69	0.57	65.75	0.00	-5.78	-1.55	0.00	0.00	0.00	58.42

Segment Leq : 58.42 dBA

Total Leq All Segments: 58.42 dBA

↟

Results segment # 1: Smith Rd (night)

Source height = 1.50 m

ROAD (0.00 + 50.82 + 0.00) = 50.82 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	69	0.57	58.16	0.00	-5.78	-1.55	0.00	0.00	0.00	50.82

Segment Leq : 50.82 dBA

Total Leq All Segments: 50.82 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 58.63
(NIGHT): 50.97

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↟

STAMSON 5.0 NORMAL REPORT Date: 21-12-2023 08:40:57
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec41SB.te Time Period: Day/Night 16/8 hours
Description: Reception Point 4-1

Rail data, segment # 1: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1.	16.0/1.0	100.0	1.0	4.0	Diesel	Yes

Data for Segment # 1: VIA (day/night)

Angle1 Angle2	-25.00 deg	0.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	235.00 / 235.00 m	
Receiver height	1.50 / 1.50 m	
Topography	1	(Flat/gentle slope; no barrier)

No Whistle
Reference angle : 0.00

↟
Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 38.01 + 0.00) = 38.01 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	0	0.58	65.60	-18.94	-8.65	0.00	0.00	0.00	38.01

WHEEL (0.00 + 26.79 + 0.00) = 26.79 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	0	0.66	55.29	-19.84	-8.67	0.00	0.00	0.00	26.79

Segment Leq : 38.33 dBA

Total Leq All Segments: 38.33 dBA

↟
Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 28.98 + 0.00) = 28.98 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	0	0.58	56.57	-18.94	-8.65	0.00	0.00	0.00	28.98

WHEEL (0.00 + 17.76 + 0.00) = 17.76 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	0	0.66	46.26	-19.84	-8.67	0.00	0.00	0.00	17.76

Segment Leq : 29.30 dBA

Total Leq All Segments: 29.30 dBA

↟

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

Angle1 Angle2	-49.00 deg	90.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	45.00 / 45.00	m
Receiver height	1.50 / 1.50	m
Topography	1	(Flat/gentle slope; no barrier)
Reference angle	0.00	

↟

Results segment # 1: Smith Rd (day)

Source height = 1.50 m

ROAD (0.00 + 55.67 + 0.00) = 55.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-49	90	0.66	65.75	0.00	-7.92	-2.16	0.00	0.00	0.00	55.67

Segment Leq : 55.67 dBA

Total Leq All Segments: 55.67 dBA

↟

Results segment # 1: Smith Rd (night)

Source height = 1.50 m

ROAD (0.00 + 48.07 + 0.00) = 48.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-49	90	0.66	58.16	0.00	-7.92	-2.16	0.00	0.00	0.00	48.07

Segment Leq : 48.07 dBA

Total Leq All Segments: 48.07 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 55.75
(NIGHT): 48.13

↟

↟

STAMSON 5.0 NORMAL REPORT Date: 21-12-2023 08:42:17
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec42SB.te Time Period: Day/Night 16/8 hours
Description: Reception Point 4-2

Rail data, segment # 1: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1.	16.0/1.0	100.0	1.0	4.0	Diesel	Yes

Data for Segment # 1: VIA (day/night)

Angle1 Angle2	-25.00 deg	0.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	235.00 / 235.00 m	
Receiver height	4.50 / 4.50 m	
Topography	1	(Flat/gentle slope; no barrier)

No Whistle
Reference angle : 0.00

↟
Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 39.09 + 0.00) = 39.09 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	0	0.50	65.60	-17.86	-8.64	0.00	0.00	0.00	39.09

WHEEL (0.00 + 27.52 + 0.00) = 27.52 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	0	0.60	55.29	-19.12	-8.66	0.00	0.00	0.00	27.52

Segment Leq : 39.38 dBA

Total Leq All Segments: 39.38 dBA

↟
Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 30.06 + 0.00) = 30.06 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	0	0.50	56.57	-17.86	-8.64	0.00	0.00	0.00	30.06

WHEEL (0.00 + 18.48 + 0.00) = 18.48 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-25	0	0.60	46.26	-19.12	-8.66	0.00	0.00	0.00	18.48

Segment Leq : 30.35 dBA

Total Leq All Segments: 30.35 dBA

↟

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

```
Angle1   Angle2           : -49.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  45.00 / 45.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

↟

Results segment # 1: Smith Rd (day)

Source height = 1.50 m

ROAD (0.00 + 56.21 + 0.00) = 56.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-49	90	0.57	65.75	0.00	-7.49	-2.05	0.00	0.00	0.00	56.21

Segment Leq : 56.21 dBA

Total Leq All Segments: 56.21 dBA

↟

Results segment # 1: Smith Rd (night)

Source height = 1.50 m

ROAD (0.00 + 48.61 + 0.00) = 48.61 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-49	90	0.57	58.16	0.00	-7.49	-2.05	0.00	0.00	0.00	48.61

Segment Leq : 48.61 dBA

Total Leq All Segments: 48.61 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 56.30
(NIGHT): 48.67

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STAMSON 5.0 NORMAL REPORT Date: 06-07-2023 16:30:31
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec51.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 5-1

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

Angle1 Angle2 : -51.00 deg 67.00 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: Smith Rd (day)

Source height = 1.50 m

ROAD (0.00 + 53.35 + 0.00) = 53.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	67	0.66	65.75	0.00	-9.99	-2.41	0.00	0.00	0.00	53.35

Segment Leq : 53.35 dBA

Total Leq All Segments: 53.35 dBA

↟
Results segment # 1: Smith Rd (night)

Source height = 1.50 m

ROAD (0.00 + 45.75 + 0.00) = 45.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	67	0.66	58.16	0.00	-9.99	-2.41	0.00	0.00	0.00	45.75

Segment Leq : 45.75 dBA

Total Leq All Segments: 45.75 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 53.35
(NIGHT): 45.75

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STAMSON 5.0 NORMAL REPORT Date: 06-07-2023 16:32:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec52.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 5-2

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

Angle1 Angle2 : -51.00 deg 67.00 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 : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Smith Rd (day)

Source height = 1.50 m

ROAD (0.00 + 53.96 + 0.00) = 53.96 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	67	0.57	65.75	0.00	-9.45	-2.34	0.00	0.00	0.00	53.96

Segment Leq : 53.96 dBA

Total Leq All Segments: 53.96 dBA

↟

Results segment # 1: Smith Rd (night)

Source height = 1.50 m

ROAD (0.00 + 46.37 + 0.00) = 46.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	67	0.57	58.16	0.00	-9.45	-2.34	0.00	0.00	0.00	46.37

Segment Leq : 46.37 dBA

Total Leq All Segments: 46.37 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 53.96
(NIGHT): 46.37

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STAMSON 5.0 NORMAL REPORT Date: 06-07-2023 16:35:05
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec61.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 6-1

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

Angle1 Angle2 : -46.00 deg 50.00 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: Smith Rd (day)

Source height = 1.50 m

ROAD (0.00 + 52.67 + 0.00) = 52.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	50	0.66	65.75	0.00	-9.99	-3.08	0.00	0.00	0.00	52.67

Segment Leq : 52.67 dBA

Total Leq All Segments: 52.67 dBA

↟

Results segment # 1: Smith Rd (night)

Source height = 1.50 m

ROAD (0.00 + 45.08 + 0.00) = 45.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	50	0.66	58.16	0.00	-9.99	-3.08	0.00	0.00	0.00	45.08

Segment Leq : 45.08 dBA

Total Leq All Segments: 45.08 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 52.67
(NIGHT): 45.08

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STAMSON 5.0 NORMAL REPORT Date: 06-07-2023 16:36:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec62.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 6-2

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

Angle1 Angle2 : -46.00 deg 50.00 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 : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Smith Rd (day)

Source height = 1.50 m

ROAD (0.00 + 53.26 + 0.00) = 53.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	50	0.57	65.75	0.00	-9.45	-3.04	0.00	0.00	0.00	53.26

Segment Leq : 53.26 dBA

Total Leq All Segments: 53.26 dBA

↟

Results segment # 1: Smith Rd (night)

Source height = 1.50 m

ROAD (0.00 + 45.67 + 0.00) = 45.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	50	0.57	58.16	0.00	-9.45	-3.04	0.00	0.00	0.00	45.67

Segment Leq : 45.67 dBA

Total Leq All Segments: 45.67 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 53.26
(NIGHT): 45.67

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STAMSON 5.0 NORMAL REPORT Date: 06-07-2023 16:38:19
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: Smith Rd (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 : 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): 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: Smith Rd (day/night)

Angle1 Angle2 : -36.00 deg 61.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 45.00 / 45.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00


Results segment # 1: Smith Rd (day)

Source height = 1.50 m

ROAD (0.00 + 54.71 + 0.00) = 54.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-36	61	0.66	65.75	0.00	-7.92	-3.12	0.00	0.00	0.00	54.71

Segment Leq : 54.71 dBA

Total Leq All Segments: 54.71 dBA

↟
Results segment # 1: Smith Rd (night)

Source height = 1.50 m

ROAD (0.00 + 47.12 + 0.00) = 47.12 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-36	61	0.66	58.16	0.00	-7.92	-3.12	0.00	0.00	0.00	47.12

Segment Leq : 47.12 dBA

Total Leq All Segments: 47.12 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 54.71
(NIGHT): 47.12

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STAMSON 5.0 NORMAL REPORT Date: 06-03-2024 12:41:45
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: REC81.te Time Period: Day/Night 16/8 hours
Description: REC 8-1 Lot 1

Rail data, segment # 1: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1.	16.0/1.0	100.0	1.0	4.0	Diesel	Yes

Data for Segment # 1: VIA (day/night)

Angle1 Angle2	-37.00 deg	55.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	219.00 / 219.00 m	
Receiver height	1.50 / 1.50 m	
Topography	1	(Flat/gentle slope; no barrier)

No Whistle
Reference angle : 0.00

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 43.91 + 0.00) = 43.91 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-37	55	0.58	65.60	-18.45	-3.23	0.00	0.00	0.00	43.91

WHEEL (0.00 + 32.69 + 0.00) = 32.69 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-37	55	0.66	55.29	-19.33	-3.27	0.00	0.00	0.00	32.69

Segment Leq : 44.23 dBA

Total Leq All Segments: 44.23 dBA

Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 34.88 + 0.00) = 34.88 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-37	55	0.58	56.57	-18.45	-3.23	0.00	0.00	0.00	34.88

WHEEL (0.00 + 23.66 + 0.00) = 23.66 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-37	55	0.66	46.26	-19.33	-3.27	0.00	0.00	0.00	23.66

Segment Leq : 35.20 dBA

Total Leq All Segments: 35.20 dBA

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TOTAL Leq FROM ALL SOURCES (DAY): 44.23
(NIGHT): 35.20

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♠

STAMSON 5.0 NORMAL REPORT Date: 06-03-2024 12:46:25
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: REC82.te Time Period: Day/Night 16/8 hours
Description: REC 8-2 Lot 1

Rail data, segment # 1: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1.	16.0/1.0	100.0	1.0	4.0	Diesel	Yes

Data for Segment # 1: VIA (day/night)

Angle1 Angle2	-37.00 deg	55.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	219.00 / 219.00 m	
Receiver height	4.50 / 4.50 m	
Topography	1	(Flat/gentle slope; no barrier)

No Whistle
Reference angle : 0.00

↟

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 45.01 + 0.00) = 45.01 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-37	55	0.50	65.60	-17.41	-3.19	0.00	0.00	0.00	45.01

WHEEL (0.00 + 33.42 + 0.00) = 33.42 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-37	55	0.60	55.29	-18.63	-3.24	0.00	0.00	0.00	33.42

Segment Leq : 45.30 dBA

Total Leq All Segments: 45.30 dBA

↟

Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 35.98 + 0.00) = 35.98 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-37	55	0.50	56.57	-17.41	-3.19	0.00	0.00	0.00	35.98

WHEEL (0.00 + 24.39 + 0.00) = 24.39 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-37	55	0.60	46.26	-18.63	-3.24	0.00	0.00	0.00	24.39

Segment Leq : 36.27 dBA

Total Leq All Segments: 36.27 dBA

♠

TOTAL Leq FROM ALL SOURCES (DAY): 45.30
(NIGHT): 36.27

♠
♠

APPENDIX 3

VIA Rail Information

From: Paul Charbachi <Paul_Charbachi@viarail.ca>
Sent: Friday, June 9, 2023 11:24 AM
To: Yolanda Tang <YTang@patersongroup.ca>
Cc: Stephanie Boisvenue <SBoisvenue@patersongroup.ca>
Subject: RE: Request For Rail Information

Hello,
My answers are below, and please keep in mind it`s based on current operations and could change any time.
Pc

From: Yolanda Tang <YTang@patersongroup.ca>
Sent: Friday, June 9, 2023 11:11 AM
To: Paul Charbachi <Paul_Charbachi@viarail.ca>
Cc: Stephanie Boisvenue <SBoisvenue@patersongroup.ca>
Subject: Request For Rail Information

Good morning Paul,

Paterson is currently working on the noise study for the proposed development at 1346 Avenue Q, Ottawa, Ontario, in close proximity to the VIA's mainline track at Ottawa.
It is located at the rail line that connects the Alexandria and Ottawa Train Stations. I was wondering if you could fill in some information for me.

Rail Line: Alexandria - Ottawa Rail Corridor (Ottawa, Ontario)
Number of trains a day: 16 trains
Number of Engines: 2 engines
Type of Engine: P42 , Charger Siemens
Number of Cars: 6 to 8 cars , welded rail
Approximate Speed:100 MPH

Thanks for your time.

Best Regards
Yolanda

PATERSON GROUP
SOLUTION ORIENTED ENGINEERING

YOLANDA TANG, M.A.Sc.
JUNIOR PROJECT MANAGER

DIRECT: (613) 800-0148

9 AURIGA DRIVE
OTTAWA ON K2E 7T9

patersongroup.ca

From: Paul Charbachi <Paul_Charbachi@viarail.ca>
Sent: Thursday, February 23, 2023 10:16 AM
To: Yolanda Tang <YTang@patersongroup.ca>
Cc: Stephanie Boisvenue <SBoisvenue@patersongroup.ca>
Subject: RE: Request For Rail Information - MP 46.70 of the Alexandria Subdivision

Hello Yolanda,
Please find my answers below and please kee in mind the traffic could change at any given thime ,
Thanks,
Pc

From: Yolanda Tang <YTang@patersongroup.ca>
Sent: Thursday, February 23, 2023 10:11 AM
To: Paul Charbachi <Paul_Charbachi@viarail.ca>
Cc: Stephanie Boisvenue <SBoisvenue@patersongroup.ca>
Subject: Request For Rail Information - MP 46.70 of the Alexandria Subdivision

Good morning Paul,

Paterson is currently working on the noise study for the proposed development at 52-54 Racine Street, Casselman, Ontario, in close proximity to the VIA's mainline track at MP 46.70 of the Alexandria Subdivision. It is located at the rail line that connects the Alexandria and Ottawa Train Stations. I was wondering if you could fill in some information for me.

Rail Line: MP46.70 of Alexandria - Ottawa Rail Corridor (Casselman, Ontario)
Number of trains a day: 14 + 2 CN trains
Number of Engines: 2 Engines per train set
Type of Engine: Charger Siemens and GE 900 series
Number of Cars: 6 to 8 cars
Approximate Speed: 100 MPH

Thanks for your time.

Best Regards
Yolanda

PATERSON GROUP
SOLUTION ORIENTED ENGINEERING

YOLANDA TANG, M.A.Sc.
JUNIOR PROJECT MANAGER

TEL: (613) 226-7381 ext. 127
DIRECT: (613) 800-0148

9 AURIGA DRIVE
OTTAWA ON K2E 7T9

patersongroup.ca

From: Paul Charbachi <Paul_Charbachi@viarail.ca>
Sent: December 15, 2021 3:54 PM
To: Yolanda Tang <YTang@patersongroup.ca>
Cc: Stephanie Boisvenue <SBoisvenue@patersongroup.ca>
Subject: RE: Request For Rail Information - Beachburg Rail Corridor

Hello Yolanda,
Please check below my answers,
Pc

From: Yolanda Tang <YTang@patersongroup.ca>
Sent: Wednesday, December 15, 2021 3:28 PM
To: Paul Charbachi <Paul_Charbachi@viarail.ca>
Cc: Stephanie Boisvenue <SBoisvenue@patersongroup.ca>
Subject: Request For Rail Information - Beachburg Rail Corridor

Good afternoon Paul,

I believe that VIA Rail trains operate along the Beachburg Rail Corridor, as it is the rail line that connects the Ottawa and Fallowfield Train Stations. I was wondering if you could fill in some information for me.

Rail Line: Beachburg Rail Corridor (Ottawa)
Number of trains a day: depending, with high frequency Rail project it's will be one every hour from 5 AM to Mid night plus freight operation 2 twice a day
Number of Engines: 2
Type of Engine: Charger Siemens
Number of Cars: 6
Approximate Speed: 60 MPH

Thanks for your time.

Best Regards

Yolanda Tang, M.Sc.Eng.
patersongroup
solution oriented engineering
over 60 years serving our clients

154 Colonnade Road South
Ottawa, Ontario, K2E 7J5
Tel: (613) 226-7381 Ext.255