

Geotechnical
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Environmental Noise Control Study

Proposed Residential Building
77 and 81 Harvey Street
Ottawa, Ontario

Prepared For

Concorde Management Development

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Report: PG5137-1

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1.0 Introduction

Paterson Group (Paterson) was commissioned by Concorde Management Development to conduct an environmental noise control study for the proposed residential building to be located at 77 and 81 Harvey 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 Background

It is understood that the proposed development will consist of a three-storey residential building. An outdoor living area was identified at the rear of the property.

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

The City of Ottawa's Official Plan, in addition to the ENCG, dictate 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 NPC-300 outlines the limitations of the stationary and environmental noise levels in relation to the location of the receptors. These can be found in the following tables:

Table 1 - Sound Level Limits for Outdoor Living Areas	
Time Period	Required $L_{eq(16)}$ (dBA)
16-hour, 7:00-23:00	55
<input type="checkbox"/> Standards taken from Table 2.2a; Sound Level Limit for Outdoor Living Areas - Road and Rail	

Table 2 - Sound Level Limits for Indoor Living Area			
Type of Space	Time Period	Required L_{eq} (dBA)	
		Road	Rail
Living/Dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc	7:00-23:00	45	40
Theaters, place of worship, libraries, individual or semi-private offices, conference rooms, reading rooms	23:00-7:00	45	40
Sleeping quarters	7:00-23:00	45	40
	23:00-7:00	40	35
<input type="checkbox"/> Standards taken from Table 2.2b; Sound Level Limit for Indoor Living Areas - Road and Rail			

It is noted in ENCG, that the limits outlined in Table 2 are for the sound levels on the interior of the glass pane. The ENCG further goes on to state that the limit for the exterior of the pane of glass will be 55 dBA.

If the sound level limits are exceeded at the window panes for the indoor living areas, the following Warning Clauses may be referenced:

Table 3 - Warning Clauses for Sound Level Exceedances	
Warning Clause	Description
Warning Clause Type A	"Purchasers/tenants are advised that sound levels due to increasing road traffic (rail traffic) (air traffic) may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."
Warning Clause Type B	"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic (rail traffic) (air traffic) may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."
Warning Clause Type C	"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."
Warning Clause Type D	"This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."
<input type="checkbox"/> Clauses taken from section C8 Warning Clauses; Environmental Noise Guidelines - 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.

A stationary noise analysis will not be required for this analysis.

Aircraft/Airport Noise

Due to the location of the proposed development, an aircraft/airport noise analysis will not be required.

4.0 Analysis

4.1 Surface Transportation Noise

The proposed development is bordered to the north, east and west by residential buildings and to the south by Harvey Street, followed by Provincial Highway. Harvey Street, Greenfield Avenue, Main Street and Havelock Street are located within the 100 m buffer zone.

Based on the City of Ottawa Official Plan, Schedule E, Main Street is considered a 4 lane urban arterial undivided road (4-UAU). Greenfield Avenue is considered a 2 lane urban arterial road (2-UAU). All other city owned roads within the 100 m radius are not classified as either arterial, collector or major collector road and therefore are not included in this study. Additionally, the Provincial Highway 417 within the 500 m radius from the proposed building and therefore is included in this study. A 3 m high sound barrier was noted along the northern side of the westbound Highway 417 and is included in this study. All noise sources are presented in Drawing PG5137-1B to 1E - Site Geometry, located in Appendix 1.

It is understood that the proposed development will consist of a three-storey residential building. Reception points were selected on every elevation at the first floor and third floor.

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 class. It is understood that these values represent the maximum allowable capacity of the proposed roadways. The parameters to be used for sound level predictions can be found below.

Table 4 - Traffic and Road Parameters						
Road	Implied Roadway	AADT (Veh/day)	Posted Speed (km/h)	Day/Night Split %	Medium Truck %	Heavy Truck %
Main Street	4-UAU	30,000	50	92/8	7	5
Greenfield Avenue	2-UAU	15,000	50	92/8	7	5
Highway 417 East	Highway	73,332	100	92/8	7	5
Highway 417 West	Highway	73,332	100	92/8	7	5
<input type="checkbox"/> 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 building elevation plans for this development.

Table 5 - Elevation of Reception Points			
Floor Number	Elevation at Centre of Window (m)	Floor Use	Daytime/Nighttime Analysis
Ground Floor	1.5	Living and sleeping quarters	daytime/nighttime
Third floor	9	Living and sleeping quarters	daytime/nighttime

For this analysis, a reception point was taken at the centre of the predetermined floors. Reception points are noted on Drawing PG5137-1 - Receptor Locations in Appendix 1.

All horizontal distances have been measured from the reception point to the edge of the right-of-way. The roadways were analyzed where they intersected the 100 m or 500 m buffer zone, which is reflected in the local angles, presented in Drawings PG5137-2B to 2E - Site Geometry in Appendix 1.

Table 8 - Summary of Reception Points and Geometry 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 relatively flat and at grade with the neighbouring roads within the 100 m radius. The Highway 417 is approximately 3 m higher in elevation than the subject site.

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

The primary descriptors are the 16-hour daytime and the 8-hour night time equivalent sound levels, $L_{eq(16)}$ and the $L_{eq(8)}$ for City roads.

The proposed traffic noise levels were analyzed at all reception points. The results of the STAMSON software are presented in Appendix 2, and the summary of the results are detailed in Table 6 below.

Table 6 - Proposed Noise Levels				
Reception Point	Description	Daytime at Facade $L_{EQ(16)}$ (dBA)	Nighttime at Facade $L_{EQ(16)}$ (dBA)	Outdoor Living Area $L_{EQ(16)}$ (dBA)
REC 1-1	Southern elevation, 1 st floor	66.57	58.98	--
REC 1-3	Southern elevation, 3 rd floor	78.57	70.97	--
REC 2-1	Western elevation, 1 st floor	61.27	53.68	--
REC 2-3	Western elevation, 3 rd floor	73.48	65.88	--
REC 3-1	Northern elevation, 1 st floor	54.95	47.36	--
REC 3-3	Northern elevation, 3 rd floor	56.52	48.92	--
REC 4-1	Eastern elevation, 1 st floor	58.83	51.24	--
REC 4-3	Eastern elevation, 3 rd floor	69.98	62.38	--
REC 5	Outdoor Living Area	--	--	55.54

6.0 Discussion and Recommendations

6.1 Outdoor Living Areas

The outdoor living area located at the rear of the proposed building was analyzed without any building affects. The placement of the proposed building shields the outdoor living area from the Highway 417. The results of the STAMSON modeling indicates that the maximum $L_{eq(16)}$ from all sources will be 55.54 dBA. This value is marginally above the 55 dBA that was specified in Table 1. An exceedance of less than 3 dBA is considered “not generally noticeable” according to City of Ottawa documentation. Due to the marginal exceedance, no mitigation measures are required, but the warning clause that follows will be applied to all deeds of sale.

"Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some outdoor activities as the sound levels may exceed the sound level limits of the City and the Ministry of the Environment."

6.2 Indoor Living Areas and Ventilation

The results of the STAMSON modeling indicates that the daytime $L_{eq(16)}$ ranges between 54.95 dBA and 78.57 dBA. The ENGEC states that the limits for the exterior of the pane of glass is 55 dBA. This value was exceeded on all elevations of the buildings. Therefore, all units are to be designed with the installation of a central air conditioning unit. Additionally, warning clause Type D, as outlined in Table 3, is also recommended for all units.

Where the daytime sound level at the plane of the window exceeds 65 dBA on the southern, western and eastern elevations, noise control measures should be implemented. The following table outlines the MOECC recommended options for sound mitigation and the respected responses.

Table 7 - Indoor Living Area Noise Mitigation Solutions	
MOECC Recommended Option	Site Specific Response
Distance setback with soft ground.	The proposed development configuration limits the actual maximum setback distance. An additional setback is not feasible.
Insertion of noise insensitive land uses between the source and sensitive receptor.	Not applicable to this development.
Orientation of buildings to provide sheltered zones or modified interior spaces (room and corridor arrangement) and amenity areas	The proposed buildings are situated in order to shield the rear yards from the noise sources. There is a possibility that living areas and bedrooms will face the noise source.
Enhanced construction techniques and construction quality (e.g. brick veneers, multi-pane windows).	Construction techniques and building materials are to be analyzed to confirm sufficient soundproofing.
Earth berms (sound barriers).	Not required
Indoor isolation - air conditioning and ventilation, enhanced dampening materials (indoor isolation)	Not required

Proposed Construction Specifications

It is understood that typical window and wall details are proposed for the residential buildings. The effectiveness of the noise insulation can be expressed as the Acoustical Insulation Factor (AIF), calculated as follows:

$$AIF = L_{eq(16)(Exterior)} - L_{eq(16)(Interior)} + 10 \log_{10}(N) + 2 \text{dBA}$$

Where:

$L_{eq(16)(Exterior)}$ = Calculated value at the window pane
 $L_{eq(16)(Interior)}$ = 45 dBA
 N = number of components in the room

No floor plans or detailed design drawings were provided for this portion of the review. A conservative approach is to assume that there are 2 components per room. Therefore, the AIF would need to be at least 39 dBA.

A conversion from AIF to a Standard Transmission Class (STC) rating will require the knowledge of room dimensions in addition to the wall and window dimensions. However, a conservative approach would be to increase the AIF factor by 3. **Therefore, provided the building materials of either the windows and/or exterior walls have an STC rating of 41 or higher, this would be a sufficient noise attenuation device.**

A review of building materials will need to be completed once they are finalized.

The following warning clause is to be included on all Offers of Purchase and Sale and/or lease agreements:

"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."

7.0 Conclusion

The subject site is located at 77 and 81 Harvey Street. It is understood that the development will consist of a three storey building with an outdoor living area at the rear of the building. The noise analysis identified three noise sources: Main Street, Greenfield Avenue and Highway 417 (surface transportation noise).

The outdoor living area was analyzed in this study. The resulting value is marginally above 55 dBA. Due to the marginal exceedance of less than 1 dBA, no mitigation measures are required, but the warning clause that follows will be applied to all deeds of sale.

"Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some outdoor activities as the sound levels may exceed the sound level limits of the City and the Ministry of the Environment."

Pane of glass reception points were selected on the northern, eastern, western, and southern elevations, at both 1.5 m (ground floor) and 9 m (third floor). These results indicate that the noise levels will be above 65 dBA on the southern, eastern and western elevations. Therefore, a review of the construction materials will be required.

The following warning clause is to be included on all Offers of Purchase and Sale and/or lease agreements:

"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."


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 Concorde Management Development or their agent(s) is not authorized without review by this firm for the applicability of our recommendations to the altered use of the report.

Paterson Group Inc.


Stephanie A. Boisvenue, P.Eng.


Scott S. Dennis, P.Eng.



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APPENDIX 1

TABLE 8 - SUMMARY OF RECEPTION POINTS AND GEOMETRY

DRAWING PG5137-1 - RECEPTOR LOCATION PLAN

DRAWING PG5137-2 - SITE GEOMETRY

DRAWING PG5137-2B - SITE GEOMETRY (REC 1-1 and REC 1-3)

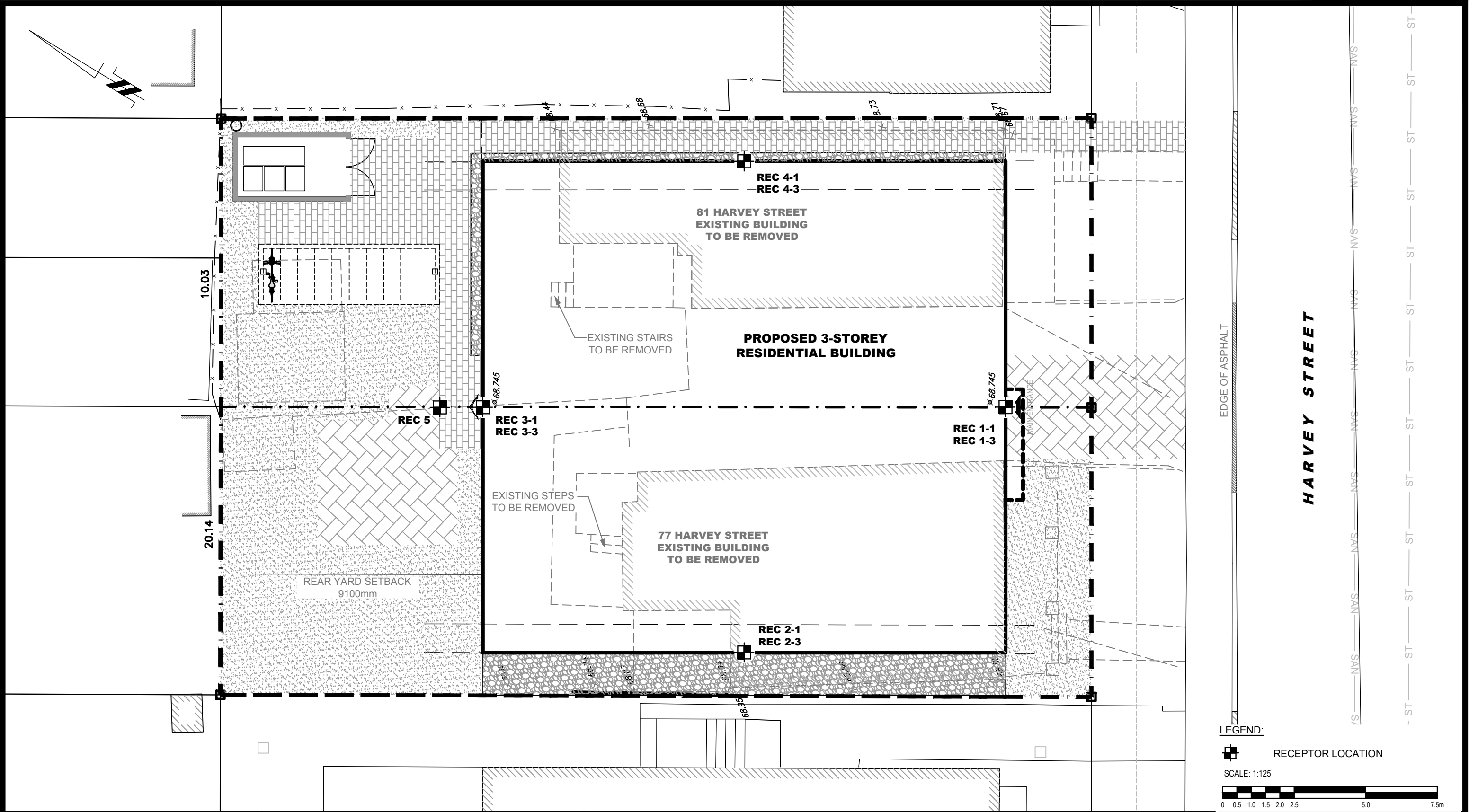
DRAWING PG5137-2C - SITE GEOMETRY (REC 2-1 and REC 2-3)

DRAWING PG5137-2D - SITE GEOMETRY (REC 3-1 and REC 3-3)

DRAWING PG5137-2E - SITE GEOMETRY (REC 4-1 and REC 4-3)

DRAWING PG5137-2F - SITE GEOMETRY (REC 5)

Table 8 - Summary of Reception Points and Geometry 77 and 81 Harvey Street																
Point of Reception	Location	Leq Day (dBA)	Main Street							Greenfield Avenue						
			Horizontal	Vertical	Total	Local Angle	Row of	Density	Local Angle	Horizontal	Vertical	Total	Local Angle	Row of	Density	Local Angle
			(m)	(m)	(m)	(degree)	Houses	(%)	(degree)	(m)	(m)	(m)	(degree)	Houses	(%)	(degree)
REC 1-1	Southern elevation, 1st floor	66.57	90	1.5	90.01	-20, 0	n/a	n/a	n/a	n /a	n/a	n/a	n/a	n/a	n/a	n/a
REC 1-3	Southern elevation, 3th floor	78.57	90	9	90.45	-20, 0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
REC 2-1	Western elevation, 1st floor	61.27	80	1.5	80.01	-27, 53	2	40	n/a	65	1.5	65.02	-24, 0	1	20	-24, 0
REC 2-3	Western elevation, 3th floor	73.48	80	9	80.5	-27, 53	2	40	n/a	65	9	65.62	-24, 0	1	20	-24, 0
REC 3-1	Northern elevation, 1st floor	54.95	90	1.5	90.01	0, 47	2	40	n/a	60	1.5	60.02	-51, 28	1	20	-51, 28
REC 3-3	Northern elevation, 3th elevation	56.52	90	9	90.45	0, 47	2	40	n/a	60	9	60.67	-51, 28	1	20	-51, 28
REC 4-1	Eastern elevation, 1st floor	58.83	n/a	n/a	n/a	n/a	n/a	n/a	n/a	65	1.5	65.02	0, 22	1	20	0, 22
REC 4-3	Eastern elevation, 3th elevation	69.98	n/a	n/a	n/a	n/a	n/a	n/a	n/a	65	9	65.62	0, 22	1	20	0, 22
REC 5	Outdoor Living Area	55.54	90	1.5	90.01	-35, 52	2	40	n/a	60	1.5	60.02	-56, 28	1	20	-56, 28
Point of Reception	Location	Leq Day (dBA)	Highway 417 Eastbound							Highway 417 Westbound						
			Horizontal	Vertical	Total	Local Angle	Noise Barrier	Distance	Local Angle	Horizontal	Vertical	Total	Local Angle	Noise Barrier	Distance	Local Angle
			(m)	(m)	(m)	(degree)	(m)	(m)	(degree)	(m)	(m)	(m)	(degree)	(m)	(m)	(degree)
REC 1-1	Southern elevation, 1st floor	66.57	55	1.5	55.02	-85, 86	3	25	-85, 86	35	1.5	35.03	-88, 90	3	10	-88, 90
REC 1-4	Southern elevation, 3th floor	78.57	55	9	55.73	-85, 86	3	25	-85, 86	35	9	36.14	-88, 90	3	10	-88, 90
REC 2-1	Western elevation, 1st floor	61.27	70	1.5	70.02	0, 85	3	25	0, 85	40	1.5	40.03	0, 88	3	10	0, 88
REC 2-4	Western elevation, 3th floor	73.48	70	9	70.58	0, 85	3	25	0, 85	40	9	41	0, 88	3	10	0, 88
REC 3-1	Northern elevation, 1st floor	54.95	n/a	n/a	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 3-4	Northern elevation, 3th elevation	56.52	n/a	n/a	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 4-1	Eastern elevation, 1st floor	58.83	55	1.5	55.02	-86, 0	3	25	-86, 0	45	1.5	45.02	-88, 0	3	10	-88, 0
REC 4-4	Eastern elevation, 3th elevation	69.98	55	9	55.73	-86, 0	3	25	-86, 0	45	9	45.89	-88, 0	3	10	-88, 0
REC 5	Outdoor Living Area	55.54	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a



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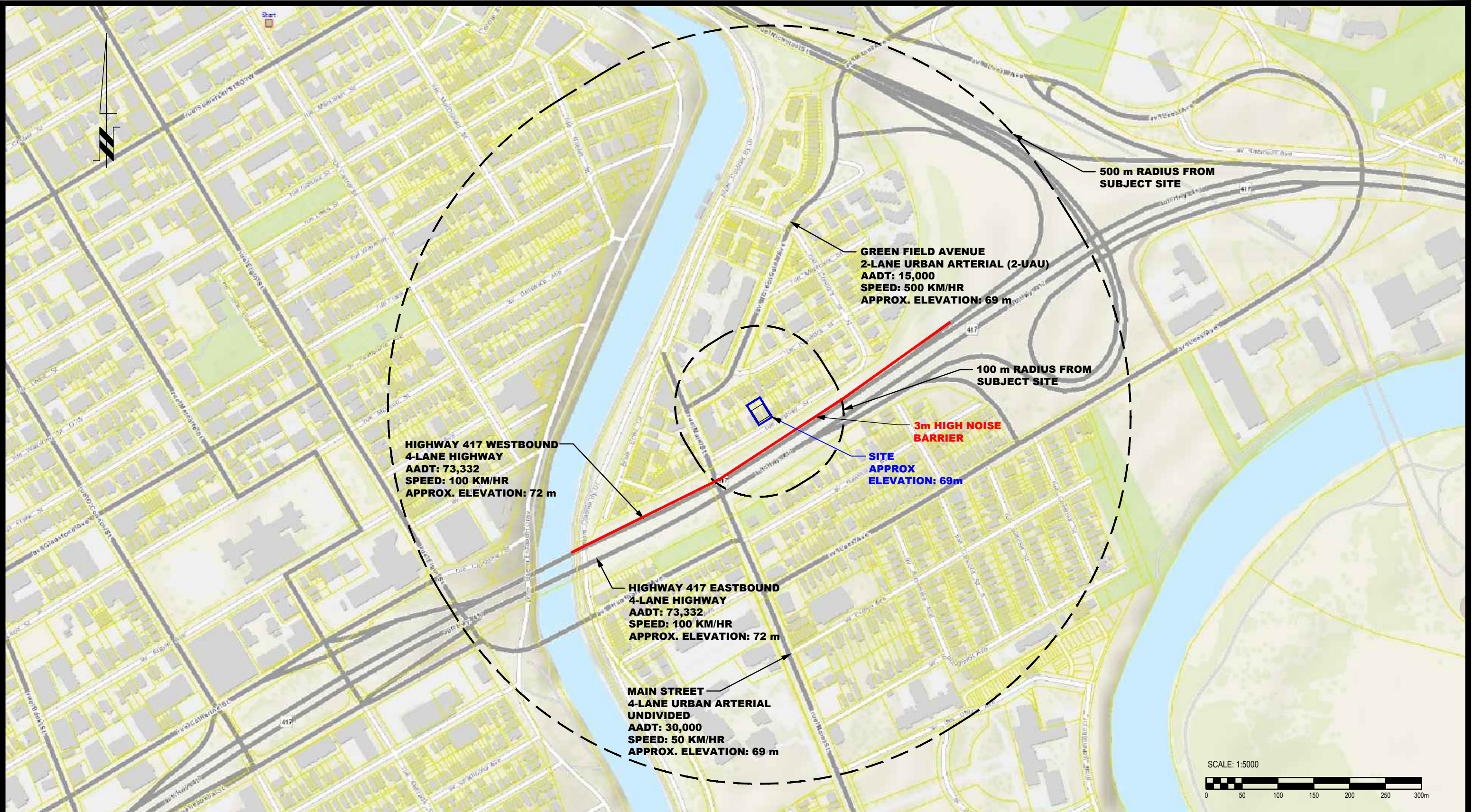
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NOISE ATTENUATION STUDY
77 AND 81 HARVEY STREET
OTTAWA, ONTARIO

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RECEPTOR LOCATION PLAN

Scale:	1:125	Date:	11/2019
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Checked by:	SB	Dwg. No.:	PG5137-1
Approved by:	DJG	Revision No.:	

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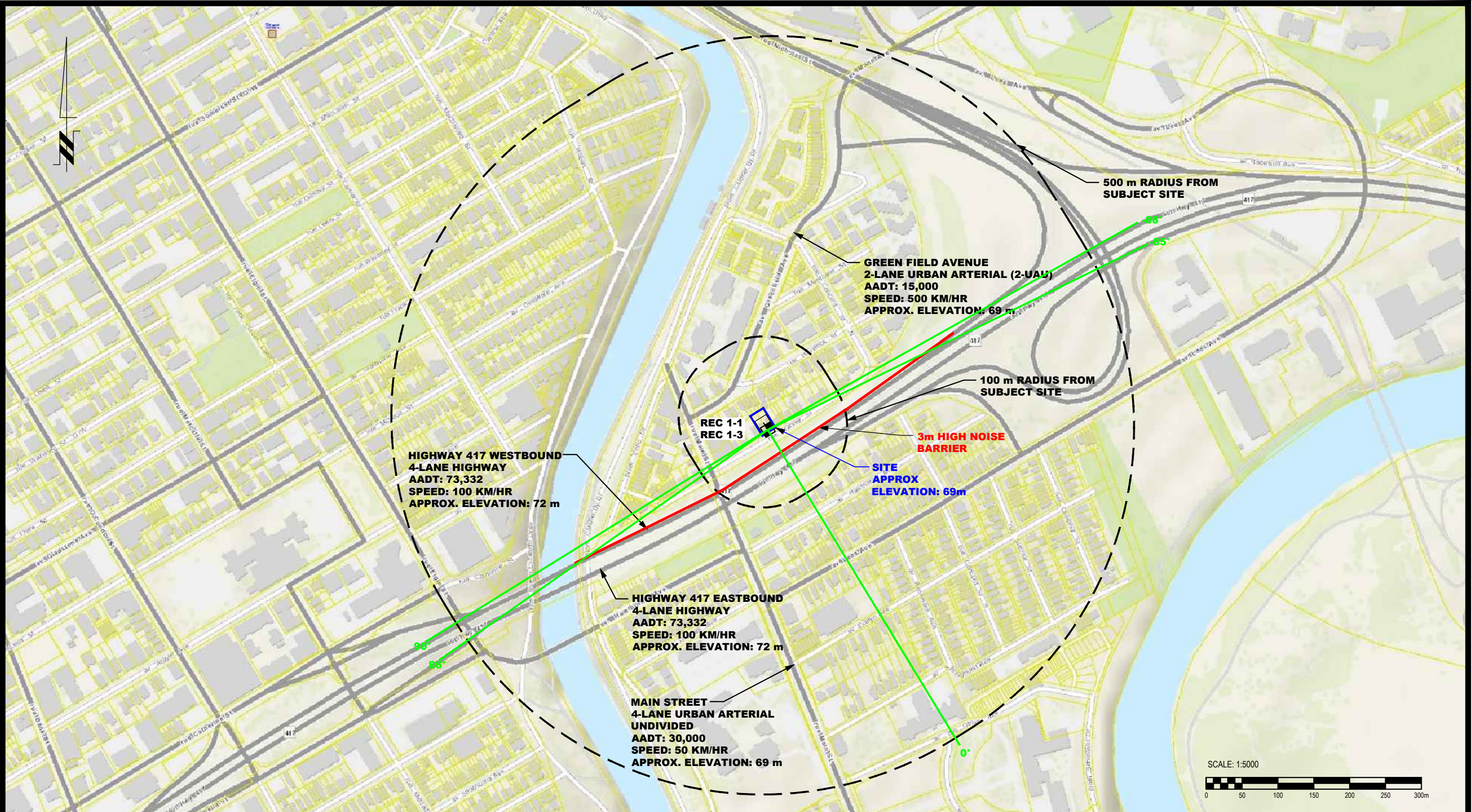
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77 AND 81 HARVEY STREET	
ONTARIO	
OTTAWA,	
Title:	
SITE GEOMETRY	

Scale:	1:5000	Date:	11/2019
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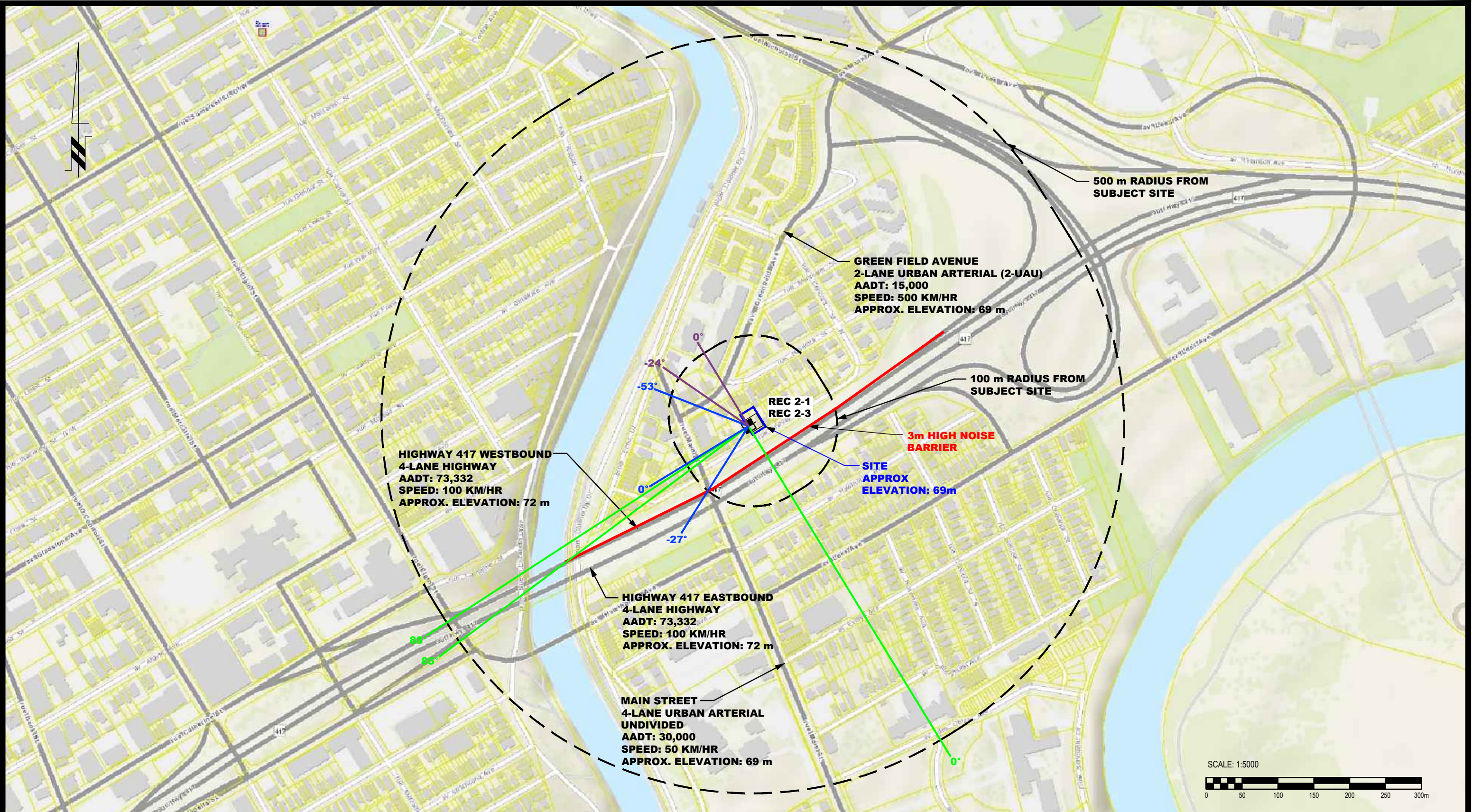
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OTTAWA, ONTARIO

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SITE GEOMETRY REC 1-1 & REC 1-3

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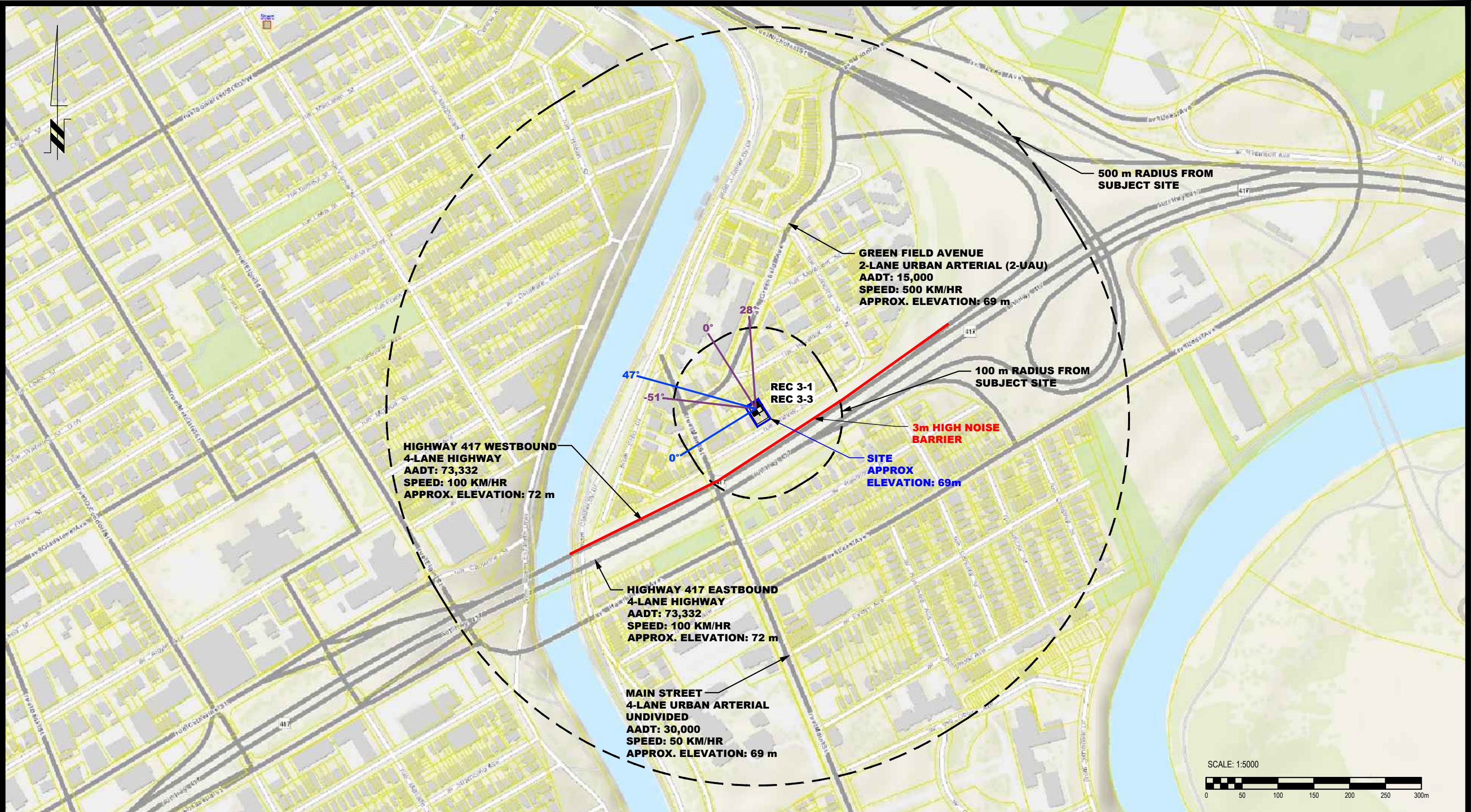
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Title:

SITE GEOMETRY REC 2-1 & REC 2-3

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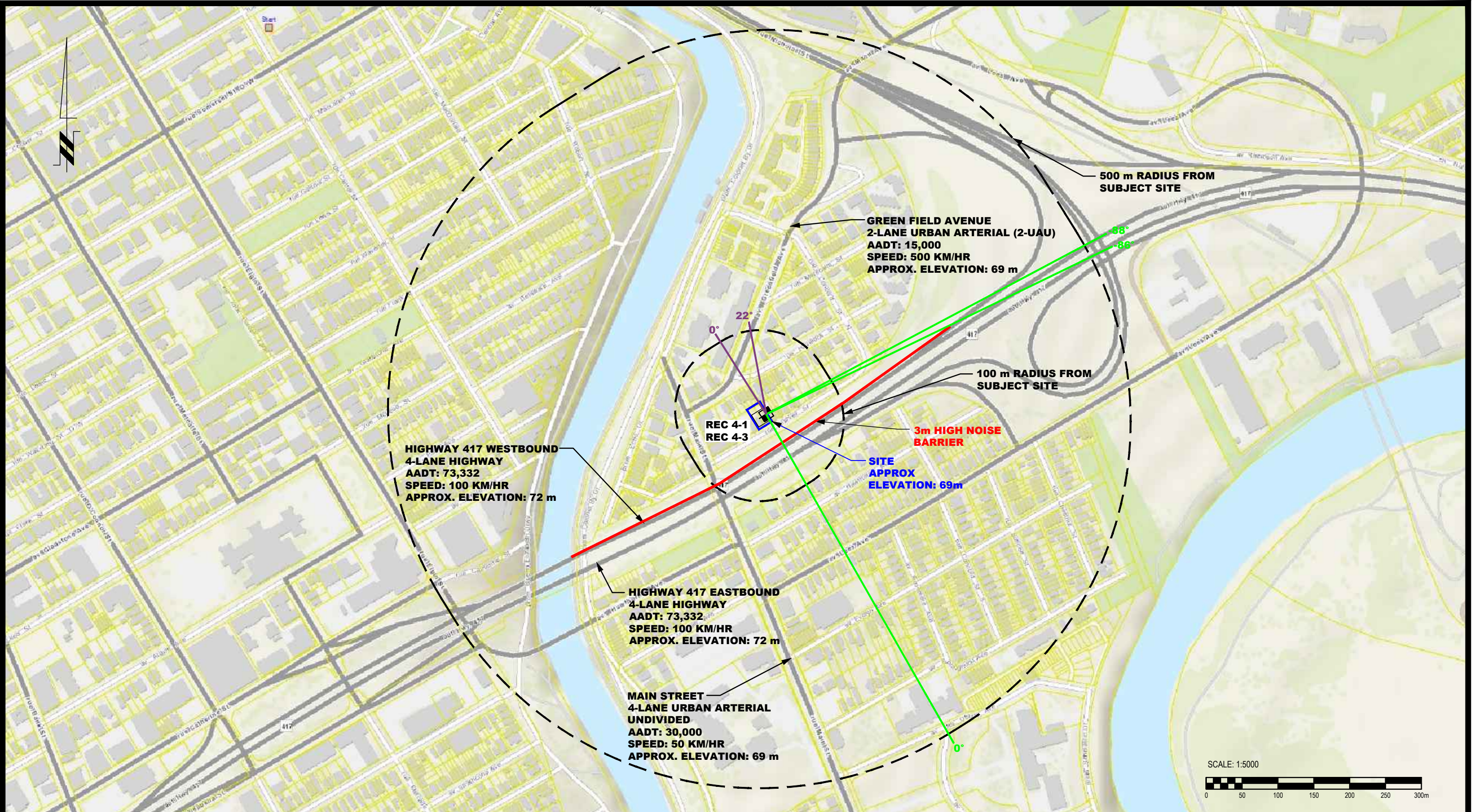
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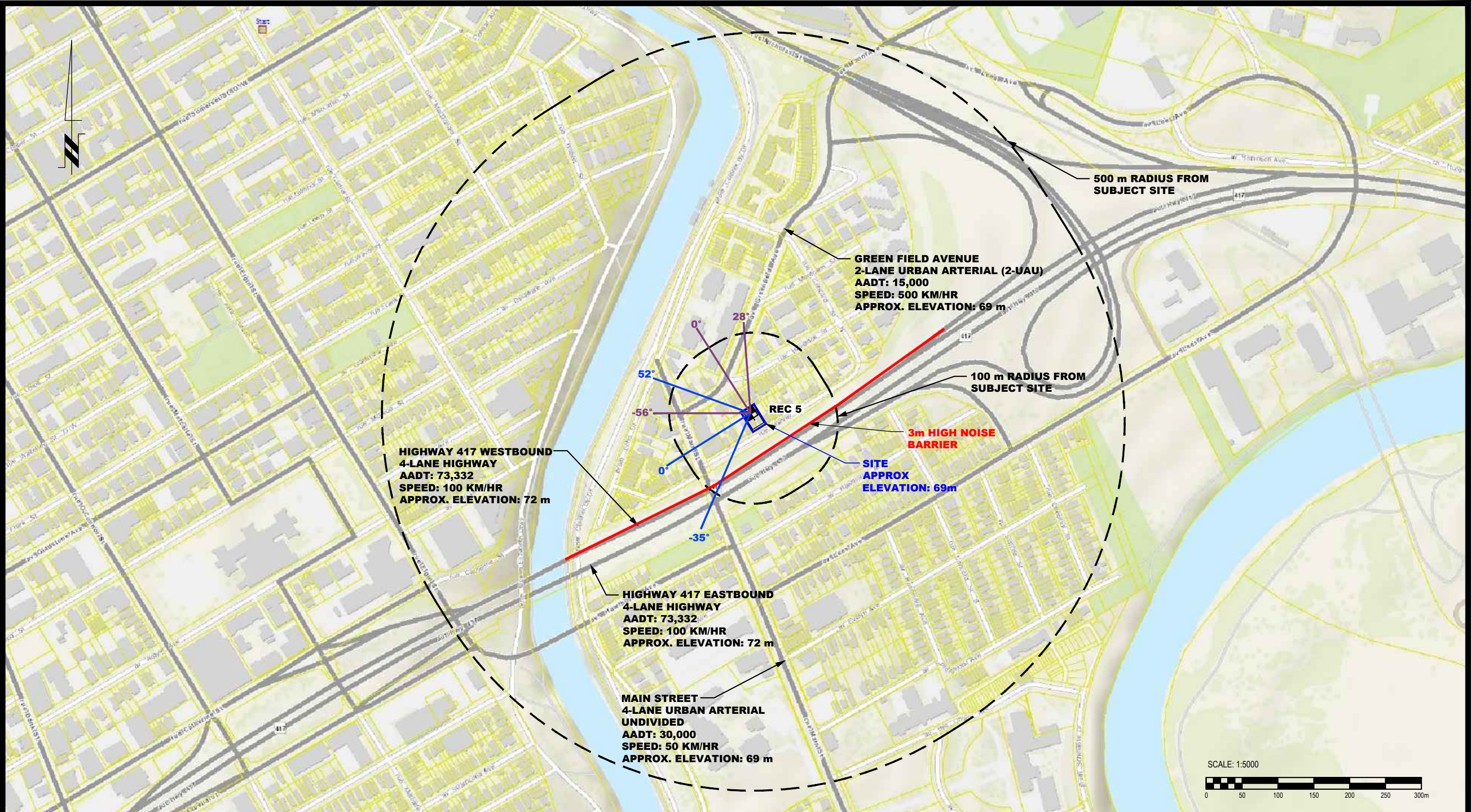
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SITE GEOMETRY REC 4-1 & REC 4-3	

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Title:
SITE GEOMETRY REC 5

Scale:	1:5000	Date:	11/2019
Drawn by:	YA	Report No.:	PG5137-1
Checked by:	SB	Dwg. No.:	PG5137-2F
Approved by:	DJG	Revision No.:	

APPENDIX 2

STAMSON RESULTS

STAMSON 5.0 NORMAL REPORT Date: 22-11-2019 13:16:22
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 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): 30000
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: Main St (day/night)

Angle1 Angle2 : -20.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 90.00 / 90.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 2: HWY 417E (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 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): 73332
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 # 2: HWY 417E (day/night)

```

-----
Angle1   Angle2       : -85.00 deg   86.00 deg
Wood depth      :           0       (No woods.)
No of house rows :           0 / 0
Surface         :           2       (Reflective ground surface)
Receiver source distance : 55.00 / 55.00 m
Receiver height  : 1.50 / 1.50 m
Topography      :           4       (Elevated; with barrier)
Barrier angle1   : -85.00 deg   Angle2 : 86.00 deg
Barrier height   : 3.00 m
Elevation        : 3.00 m
Barrier receiver distance : 25.00 / 25.00 m
Source elevation : 72.00 m
Receiver elevation : 69.00 m
Barrier elevation : 72.00 m
Reference angle  : 0.00

```



Road data, segment # 3: HWY 417W (day/night)

```

-----
Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 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):	73332
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 # 3: HWY 417W (day/night)

```

-----
Angle1   Angle2       : -88.00 deg   90.00 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 : 4 (Elevated; with barrier)
 Barrier angle1 : -88.00 deg Angle2 : 90.00 deg
 Barrier height : 3.00 m
 Elevation : 3.00 m
 Barrier receiver distance : 10.00 / 10.00 m
 Source elevation : 72.00 m
 Receiver elevation : 69.00 m
 Barrier elevation : 72.00 m
 Reference angle : 0.00

↑

Results segment # 1: Main St (day)

Source height = 1.50 m

ROAD (0.00 + 48.97 + 0.00) = 48.97 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	0	0.66	71.49	0.00	-12.92	-9.60	0.00	0.00	0.00	48.97

Segment Leq : 48.97 dBA

↑

Results segment # 2: HWY 417E (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.50 !	1.50 !	-0.14 !	71.86

ROAD (0.00 + 64.64 + 0.00) = 64.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-85	86	0.00	81.40	0.00	-5.64	-0.22	0.00	0.00	-10.89	64.64

Segment Leq : 64.64 dBA

↑

Results segment # 3: HWY 417W (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	-0.64	71.36

ROAD (0.00 + 61.91 + 0.00) = 61.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-88	90	0.39	81.40	0.00	-5.12	-0.97	0.00	0.00	-13.40	61.91

Segment Leq : 61.91 dBA

Total Leq All Segments: 66.57 dBA

↑

Results segment # 1: Main St (night)

Source height = 1.50 m

ROAD (0.00 + 41.38 + 0.00) = 41.38 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	0	0.66	63.89	0.00	-12.92	-9.60	0.00	0.00	0.00	41.38

Segment Leq : 41.38 dBA

↑

Results segment # 2: HWY 417E (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49	1.50	-0.14	71.86

ROAD (0.00 + 57.05 + 0.00) = 57.05 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-85	86	0.00	73.80	0.00	-5.64	-0.22	0.00	0.00	-10.89	57.05

Segment Leq : 57.05 dBA

↑

Results segment # 3: HWY 417W (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source	! Receiver	! Barrier	! Elevation of
Height (m)	! Height (m)	! Height (m)	Barrier Top (m)
-----+-----+-----+-----			
1.49 !	1.50 !	-0.64 !	71.36

ROAD (0.00 + 54.32 + 0.00) = 54.32 dBA

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

-88	90	0.39	73.80	0.00	-5.12	-0.97	0.00	0.00	-13.40	54.32

Segment Leq : 54.32 dBA

Total Leq All Segments: 58.98 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 66.57
(NIGHT): 58.98

↑

↑

STAMSON 5.0 NORMAL REPORT Date: 22-11-2019 13:17:10
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec13.te Time Period: Day/Night 16/8 hours
Description: Reception Point REC 1-3

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 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): 30000
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: Main St (day/night)

Angle1 Angle2 : -20.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 90.00 / 90.00 m
Receiver height : 9.00 / 9.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 2: HWY 417E (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 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): 73332
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 # 2: HWY 417E (day/night)

```

-----
Angle1   Angle2       : -85.00 deg   86.00 deg
Wood depth      :          0       (No woods.)
No of house rows :          0 / 0
Surface         :          2       (Reflective ground surface)
Receiver source distance : 55.00 / 55.00 m
Receiver height  :  9.00 / 9.00 m
Topography      :          4       (Elevated; with barrier)
Barrier angle1   : -85.00 deg   Angle2 : 86.00 deg
Barrier height    :  3.00 m
Elevation        :  3.00 m
Barrier receiver distance : 25.00 / 25.00 m
Source elevation  : 72.00 m
Receiver elevation : 69.00 m
Barrier elevation  : 72.00 m
Reference angle   :  0.00

```



Road data, segment # 3: HWY 417W (day/night)

```

-----
Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume  : 3373/293 veh/TimePeriod *
Posted speed limit  : 100 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):	73332
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 # 3: HWY 417W (day/night)

```

-----
Angle1   Angle2       : -88.00 deg   90.00 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  :  9.00 / 9.00 m

```


Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -88.00 deg Angle2 : 90.00 deg
 Barrier height : 3.00 m
 Elevation : 3.00 m
 Barrier receiver distance : 10.00 / 10.00 m
 Source elevation : 72.00 m
 Receiver elevation : 69.00 m
 Barrier elevation : 72.00 m
 Reference angle : 0.00

↑

Results segment # 1: Main St (day)

Source height = 1.50 m

ROAD (0.00 + 50.74 + 0.00) = 50.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	0	0.44	71.49	0.00	-11.17	-9.58	0.00	0.00	0.00	50.74

Segment Leq : 50.74 dBA

↑

Results segment # 2: HWY 417E (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.50 !	9.00 !	3.95 !	75.95

ROAD (0.00 + 75.53 + 0.00) = 75.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-85	86	0.00	81.40	0.00	-5.64	-0.22	0.00	0.00	-3.64	71.89*
-85	86	0.00	81.40	0.00	-5.64	-0.22	0.00	0.00	0.00	75.53

* Bright Zone !

Segment Leq : 75.53 dBA

↑

Results segment # 3: HWY 417W (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
1.50	!	9.00	!
		4.71	!
			76.71

ROAD (0.00 + 75.57 + 0.00) = 75.57 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-88	90	0.17	81.40	0.00	-4.29	-0.48	0.00	0.00	-0.41	76.22*
-88	90	0.35	81.40	0.00	-4.95	-0.88	0.00	0.00	0.00	75.57

* Bright Zone !

Segment Leq : 75.57 dBA

Total Leq All Segments: 78.57 dBA

↑

Results segment # 1: Main St (night)

Source height = 1.50 m

ROAD (0.00 + 43.14 + 0.00) = 43.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	0	0.44	63.89	0.00	-11.17	-9.58	0.00	0.00	0.00	43.14

Segment Leq : 43.14 dBA

↑

Results segment # 2: HWY 417E (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
1.49	!	9.00	!
		3.95	!
			75.95

ROAD (0.00 + 67.93 + 0.00) = 67.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-85	86	0.00	73.80	0.00	-5.64	-0.22	0.00	0.00	-3.64	64.29*
-85	86	0.00	73.80	0.00	-5.64	-0.22	0.00	0.00	0.00	67.93

* Bright Zone !

Segment Leq : 67.93 dBA

↑

Results segment # 3: HWY 417W (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
1.49 !	9.00 !	4.71 !	76.71

ROAD (0.00 + 67.97 + 0.00) = 67.97 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-88	90	0.17	73.80	0.00	-4.29	-0.48	0.00	0.00	-0.41	68.62*
-88	90	0.35	73.80	0.00	-4.95	-0.88	0.00	0.00	0.00	67.97

* Bright Zone !

Segment Leq : 67.97 dBA

Total Leq All Segments: 70.97 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 78.57
(NIGHT): 70.97

↑

↑

STAMSON 5.0 NORMAL REPORT Date: 22-11-2019 13:14:37
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: REC21.te Time Period: Day/Night 16/8 hours
Description: Reception Point REC 2-1

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 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): 30000
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: Main St (day/night)

Angle1 Angle2 : -27.00 deg 53.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 40 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 80.00 / 80.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 2: Greenfield (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000

Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Greenfield (day/night)

 Angle1 Angle2 : -24.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 1 / 1
 House density : 20 %
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 65.00 / 65.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

↑

Road data, segment # 3: Hwy 417 East (day/night)

 Car traffic volume : 59370/5163 veh/TimePeriod *
 Medium truck volume : 4723/411 veh/TimePeriod *
 Heavy truck volume : 3373/293 veh/TimePeriod *
 Posted speed limit : 100 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): 73332
 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 # 3: Hwy 417 East (day/night)

 Angle1 Angle2 : 0.00 deg 85.00 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 : 4 (Elevated; with barrier)
 Barrier angle1 : 0.00 deg Angle2 : 85.00 deg
 Barrier height : 3.00 m
 Elevation : 3.00 m
 Barrier receiver distance : 25.00 / 25.00 m

Source elevation : 72.00 m
Receiver elevation : 69.00 m
Barrier elevation : 72.00 m
Reference angle : 0.00

↑

Road data, segment # 4: Hwy 417 West (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 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): 73332
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 # 4: Hwy 417 West (day/night)

Angle1 Angle2 : 0.00 deg 88.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 40.00 / 40.00 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 88.00 deg
Barrier height : 3.00 m
Elevation : 3.00 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 72.00 m
Receiver elevation : 69.00 m
Barrier elevation : 72.00 m
Reference angle : 0.00

↑

Results segment # 1: Main St (day)

Source height = 1.50 m

ROAD (0.00 + 52.08 + 0.00) = 52.08 dBA

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

-27	53	0.66	71.49	0.00	-12.07	-3.84	0.00	-3.50	0.00	52.08
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Segment Leq : 52.08 dBA

↑
Results segment # 2: Greenfield (day)

Source height = 1.50 m

ROAD (0.00 + 48.17 + 0.00) = 48.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-24	0	0.66	68.48	0.00	-10.57	-8.84	0.00	-0.90	0.00	48.17

Segment Leq : 48.17 dBA

↑
Results segment # 3: Hwy 417 East (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	-0.43	71.57

ROAD (0.00 + 57.06 + 0.00) = 57.06 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	85	0.39	81.40	0.00	-9.30	-4.06	0.00	0.00	-10.98	57.06

Segment Leq : 57.06 dBA

↑
Results segment # 4: Hwy 417 West (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source	Receiver	Barrier	Elevation of
--------	----------	---------	--------------

Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
1.50	!	1.50	!	-0.75	!	71.25

ROAD (0.00 + 57.82 + 0.00) = 57.82 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	88	0.39	81.40	0.00	-5.92	-4.00	0.00	0.00	-13.66	57.82

Segment Leq : 57.82 dBA

Total Leq All Segments: 61.27 dBA

↑

Results segment # 1: Main St (night)

Source height = 1.50 m

ROAD (0.00 + 44.48 + 0.00) = 44.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-27	53	0.66	63.89	0.00	-12.07	-3.84	0.00	-3.50	0.00	44.48

Segment Leq : 44.48 dBA

↑

Results segment # 2: Greenfield (night)

Source height = 1.50 m

ROAD (0.00 + 40.58 + 0.00) = 40.58 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-24	0	0.66	60.88	0.00	-10.57	-8.84	0.00	-0.90	0.00	40.58

Segment Leq : 40.58 dBA

↑

Results segment # 3: Hwy 417 East (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source	!	Receiver	!	Barrier	!	Elevation of
Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
-----	+	-----	+	-----	+	-----
1.49	!	1.50	!	-0.43	!	71.57

ROAD (0.00 + 49.46 + 0.00) = 49.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
0	85	0.39	73.80	0.00	-9.30	-4.06	0.00	0.00	-10.98	49.46
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Segment Leq : 49.46 dBA

↑

Results segment # 4: Hwy 417 West (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source	!	Receiver	!	Barrier	!	Elevation of
Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
-----	+	-----	+	-----	+	-----
1.49	!	1.50	!	-0.75	!	71.25

ROAD (0.00 + 50.23 + 0.00) = 50.23 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
0	88	0.39	73.80	0.00	-5.92	-4.00	0.00	0.00	-13.66	50.23
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Segment Leq : 50.23 dBA

Total Leq All Segments: 53.68 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 61.27
(NIGHT): 53.68

↑

↑

STAMSON 5.0 NORMAL REPORT Date: 22-11-2019 13:15:34
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: REC23.te Time Period: Day/Night 16/8 hours
Description: Reception Point REC 2-3

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 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): 30000
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: Main St (day/night)

Angle1 Angle2 : -27.00 deg 53.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 40 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 80.00 / 80.00 m
Receiver height : 9.00 / 9.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 2: Greenfield (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000

Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Greenfield (day/night)

 Angle1 Angle2 : -24.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 1 / 1
 House density : 20 %
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 65.00 / 65.00 m
 Receiver height : 9.00 / 9.00 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

↑

Road data, segment # 3: Hwy 417 East (day/night)

 Car traffic volume : 59370/5163 veh/TimePeriod *
 Medium truck volume : 4723/411 veh/TimePeriod *
 Heavy truck volume : 3373/293 veh/TimePeriod *
 Posted speed limit : 100 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): 73332
 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 # 3: Hwy 417 East (day/night)

 Angle1 Angle2 : 0.00 deg 85.00 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 : 9.00 / 9.00 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : 0.00 deg Angle2 : 85.00 deg
 Barrier height : 3.00 m
 Elevation : 3.00 m
 Barrier receiver distance : 25.00 / 25.00 m

Source elevation : 72.00 m
Receiver elevation : 69.00 m
Barrier elevation : 72.00 m
Reference angle : 0.00

↑

Road data, segment # 4: Hwy 417 West (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 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): 73332
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 # 4: Hwy 417 West (day/night)

Angle1 Angle2 : 0.00 deg 88.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 40.00 / 40.00 m
Receiver height : 9.00 / 9.00 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 88.00 deg
Barrier height : 3.00 m
Elevation : 3.00 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 72.00 m
Receiver elevation : 69.00 m
Barrier elevation : 72.00 m
Reference angle : 0.00

↑

Results segment # 1: Main St (day)

Source height = 1.50 m

ROAD (0.00 + 53.82 + 0.00) = 53.82 dBA

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

-27	53	0.44	71.49	0.00	-10.43	-3.74	0.00	-3.50	0.00	53.82
-----	----	------	-------	------	--------	-------	------	-------	------	-------

Segment Leq : 53.82 dBA



Results segment # 2: Greenfield (day)

Source height = 1.50 m

ROAD (0.00 + 49.63 + 0.00) = 49.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-24	0	0.44	68.48	0.00	-9.14	-8.81	0.00	-0.90	0.00	49.63

Segment Leq : 49.63 dBA



Results segment # 3: Hwy 417 East (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.50 !	9.00 !	4.39 !	76.39

ROAD (0.00 + 68.42 + 0.00) = 68.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	85	0.17	81.40	0.00	-7.79	-3.62	0.00	0.00	-2.10	67.88*
0	85	0.35	81.40	0.00	-9.00	-3.97	0.00	0.00	0.00	68.42

* Bright Zone !

Segment Leq : 68.42 dBA



Results segment # 4: Hwy 417 West (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	9.00	4.87	76.87

ROAD (0.00 + 71.76 + 0.00) = 71.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	88	0.17	81.40	0.00	-4.96	-3.52	0.00	0.00	-0.32	72.60*
0	88	0.35	81.40	0.00	-5.73	-3.91	0.00	0.00	0.00	71.76

* Bright Zone !

Segment Leq : 71.76 dBA

Total Leq All Segments: 73.48 dBA

↑

Results segment # 1: Main St (night)

Source height = 1.50 m

ROAD (0.00 + 46.22 + 0.00) = 46.22 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-27	53	0.44	63.89	0.00	-10.43	-3.74	0.00	-3.50	0.00	46.22

Segment Leq : 46.22 dBA

↑

Results segment # 2: Greenfield (night)

Source height = 1.50 m

ROAD (0.00 + 42.04 + 0.00) = 42.04 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-24	0	0.44	60.88	0.00	-9.14	-8.81	0.00	-0.90	0.00	42.04

Segment Leq : 42.04 dBA

↑

Results segment # 3: Hwy 417 East (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)			
1.49	!	9.00	!	4.39	!	76.39

ROAD (0.00 + 60.83 + 0.00) = 60.83 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	85	0.17	73.80	0.00	-7.79	-3.62	0.00	0.00	-2.10	60.28*
0	85	0.35	73.80	0.00	-9.00	-3.97	0.00	0.00	0.00	60.83

* Bright Zone !

Segment Leq : 60.83 dBA

↑

Results segment # 4: Hwy 417 West (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)			
1.49	!	9.00	!	4.87	!	76.87

ROAD (0.00 + 64.16 + 0.00) = 64.16 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	88	0.17	73.80	0.00	-4.96	-3.52	0.00	0.00	-0.32	65.00*
0	88	0.35	73.80	0.00	-5.73	-3.91	0.00	0.00	0.00	64.16

* Bright Zone !

Segment Leq : 64.16 dBA

Total Leq All Segments: 65.88 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 73.48
(NIGHT): 65.88



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

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 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): 30000
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: Main Street (day/night)

Angle1 Angle2 : 0.00 deg 47.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 40 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 90.00 / 90.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 2: Greenfield (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000

Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Greenfield (day/night)

 Angle1 Angle2 : -51.00 deg 28.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 1 / 1
 House density : 20 %
 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: Main Street (day)

Source height = 1.50 m

ROAD (0.00 + 48.91 + 0.00) = 48.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	47	0.66	71.49	0.00	-12.92	-6.17	0.00	-3.50	0.00	48.91

Segment Leq : 48.91 dBA



Results segment # 2: Greenfield (day)

Source height = 1.50 m

ROAD (0.00 + 53.71 + 0.00) = 53.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	28	0.66	68.48	0.00	-9.99	-3.87	0.00	-0.90	0.00	53.71

Segment Leq : 53.71 dBA

Total Leq All Segments: 54.95 dBA



Results segment # 1: Main Street (night)

$$\text{ROAD } (0.00 + 41.31 + 0.00) = 41.31 \text{ dBA}$$

Segment Leq : 41.31 dBA

Source height = 1.50 m

$$\text{ROAD } (0.00 + 46.12 + 0.00) = 46.12 \text{ dBA}$$

Segment Leq : 46.12 dBA

STAMSON 5.0 NORMAL REPORT Date: 22-11-2019 13:26:56
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: REC33.te Time Period: Day/Night 16/8 hours
Description: Reception Point REC 3-3

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 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): 30000
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: Main Street (day/night)

Angle1 Angle2 : 0.00 deg 47.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 40 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 90.00 / 90.00 m
Receiver height : 9.00 / 9.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 2: Greenfield (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000

Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Greenfield (day/night)

 Angle1 Angle2 : -51.00 deg 28.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 1 / 1
 House density : 20 %
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 60.00 / 60.00 m
 Receiver height : 9.00 / 9.00 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

↑

Results segment # 1: Main Street (day)

 Source height = 1.50 m

ROAD (0.00 + 50.77 + 0.00) = 50.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	47	0.44	71.49	0.00	-11.17	-6.06	0.00	-3.50	0.00	50.77

 Segment Leq : 50.77 dBA

↑

Results segment # 2: Greenfield (day)

 Source height = 1.50 m

ROAD (0.00 + 55.17 + 0.00) = 55.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	28	0.44	68.48	0.00	-8.64	-3.77	0.00	-0.90	0.00	55.17

 Segment Leq : 55.17 dBA

Total Leq All Segments: 56.52 dBA

↑

Results segment # 1: Main Street (night)

$$\text{ROAD } (0.00 + 43.17 + 0.00) = 43.17 \text{ dBA}$$

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	47	0.44	63.89	0.00	-11.17	-6.06	0.00	-3.50	0.00	43.17

Segment Leq : 43.17 dBA

Results segment # 2: Greenfield (night)

Source height = 1.50 m

ROAD $(0.00 + 47.57 + 0.00) = 47.57$ dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	28	0.44	60.88	0.00	-8.64	-3.77	0.00	-0.90	0.00	47.57

Segment Leq : 47.57 dBA

Total Leq All Segments: 48.92 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.52
(NIGHT): 48.92

Filename: rec41.te Time Period: Day/Night 16/8 hours
Description: Reception Point 4-1

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : 0.00 deg 22.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 65.00 / 65.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 2: Hwy 417 East (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 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): 73332

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 # 2: Hwy 417 East (day/night)

 Angle1 Angle2 : -86.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 55.00 / 55.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -86.00 deg Angle2 : 0.00 deg
 Barrier height : 3.00 m
 Elevation : 3.00 m
 Barrier receiver distance : 25.00 / 25.00 m
 Source elevation : 72.00 m
 Receiver elevation : 68.00 m
 Barrier elevation : 72.00 m
 Reference angle : 0.00



Road data, segment # 3: Hwy 417 West (day/night)

 Car traffic volume : 59370/5163 veh/TimePeriod *
 Medium truck volume : 4723/411 veh/TimePeriod *
 Heavy truck volume : 3373/293 veh/TimePeriod *
 Posted speed limit : 100 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): 73332
 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 # 3: Hwy 417 West (day/night)

 Angle1 Angle2 : -88.00 deg 0.00 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 : 4 (Elevated; with barrier)
 Barrier angle1 : -88.00 deg Angle2 : 0.00 deg
 Barrier height : 3.00 m
 Elevation : 3.00 m
 Barrier receiver distance : 10.00 / 10.00 m
 Source elevation : 72.00 m
 Receiver elevation : 38.00 m
 Barrier elevation : 72.00 m
 Reference angle : 0.00

↑

Results segment # 1: Greenfield (day)

Source height = 1.50 m

ROAD (0.00 + 47.81 + 0.00) = 47.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	22	0.66	68.48	0.00	-10.57	-9.20	0.00	-0.90	0.00	47.81

Segment Leq : 47.81 dBA

↑

Results segment # 2: Hwy 417 East (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.50 !	1.50 !	-0.68 !	71.32

ROAD (0.00 + 57.64 + 0.00) = 57.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-86	0	0.39	81.40	0.00	-7.84	-4.03	0.00	0.00	-11.88	57.64

Segment Leq : 57.64 dBA

↑

Results segment # 3: Hwy 417 West (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	-24.95	47.05

ROAD (0.00 + 50.91 + 0.00) = 50.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-88	0	0.39	81.40	0.00	-6.63	-4.00	0.00	0.00	-19.85	50.91

Segment Leq : 50.91 dBA

Total Leq All Segments: 58.83 dBA

↑

Results segment # 1: Greenfield (night)

Source height = 1.50 m

ROAD (0.00 + 40.21 + 0.00) = 40.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	22	0.66	60.88	0.00	-10.57	-9.20	0.00	-0.90	0.00	40.21

Segment Leq : 40.21 dBA

↑

Results segment # 2: Hwy 417 East (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49	1.50	-0.68	71.32

ROAD (0.00 + 50.04 + 0.00) = 50.04 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-86	0	0.39	73.80	0.00	-7.84	-4.03	0.00	0.00	-11.88	50.04

Segment Leq : 50.04 dBA

↑
Results segment # 3: Hwy 417 West (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
1.49	!	1.50	!
		-24.95	!
			47.05

ROAD (0.00 + 43.32 + 0.00) = 43.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-88	0	0.39	73.80	0.00	-6.63	-4.00	0.00	0.00	-19.85	43.32

Segment Leq : 43.32 dBA

Total Leq All Segments: 51.24 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 58.83
 (NIGHT): 51.24

↑
↑

Filename: rec43.te Time Period: Day/Night 16/8 hours
Description: Reception Point 4-3

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : 0.00 deg 22.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 65.00 / 65.00 m
Receiver height : 9.00 / 9.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 2: Hwy 417 East (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 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): 73332

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 # 2: Hwy 417 East (day/night)

 Angle1 Angle2 : -86.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 55.00 / 55.00 m
 Receiver height : 9.00 / 9.00 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -86.00 deg Angle2 : 0.00 deg
 Barrier height : 3.00 m
 Elevation : 3.00 m
 Barrier receiver distance : 25.00 / 25.00 m
 Source elevation : 72.00 m
 Receiver elevation : 68.00 m
 Barrier elevation : 72.00 m
 Reference angle : 0.00



Road data, segment # 3: Hwy 417 West (day/night)

 Car traffic volume : 59370/5163 veh/TimePeriod *
 Medium truck volume : 4723/411 veh/TimePeriod *
 Heavy truck volume : 3373/293 veh/TimePeriod *
 Posted speed limit : 100 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): 73332
 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 # 3: Hwy 417 West (day/night)

 Angle1 Angle2 : -88.00 deg 0.00 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 : 9.00 / 9.00 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -88.00 deg Angle2 : 0.00 deg
 Barrier height : 3.00 m
 Elevation : 3.00 m
 Barrier receiver distance : 10.00 / 10.00 m
 Source elevation : 72.00 m
 Receiver elevation : 38.00 m
 Barrier elevation : 72.00 m
 Reference angle : 0.00

↑

Results segment # 1: Greenfield (day)

Source height = 1.50 m

ROAD (0.00 + 49.27 + 0.00) = 49.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	22	0.44	68.48	0.00	-9.14	-9.18	0.00	-0.90	0.00	49.27

Segment Leq : 49.27 dBA

↑

Results segment # 2: Hwy 417 East (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.50 !	9.00 !	3.41 !	75.41

ROAD (0.00 + 69.86 + 0.00) = 69.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-86	0	0.17	81.40	0.00	-6.57	-3.58	0.00	0.00	-4.78	66.46*
-86	0	0.35	81.40	0.00	-7.59	-3.95	0.00	0.00	0.00	69.86

* Bright Zone !

Segment Leq : 69.86 dBA

↑

Results segment # 3: Hwy 417 West (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	9.00	-19.11	52.89

ROAD (0.00 + 52.56 + 0.00) = 52.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-88	0	0.17	81.40	0.00	-5.56	-3.52	0.00	0.00	-19.76	52.56

Segment Leq : 52.56 dBA

Total Leq All Segments: 69.98 dBA



Results segment # 1: Greenfield (night)

Source height = 1.50 m

ROAD (0.00 + 41.67 + 0.00) = 41.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	22	0.44	60.88	0.00	-9.14	-9.18	0.00	-0.90	0.00	41.67

Segment Leq : 41.67 dBA



Results segment # 2: Hwy 417 East (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49	9.00	3.41	75.41

ROAD (0.00 + 62.26 + 0.00) = 62.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-86	0	0.17	73.80	0.00	-6.57	-3.58	0.00	0.00	-4.78	58.86*
-86	0	0.35	73.80	0.00	-7.59	-3.95	0.00	0.00	0.00	62.26

* Bright Zone !

Segment Leq : 62.26 dBA

↑

Results segment # 3: Hwy 417 West (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.49 !	9.00 !	-19.11 !	52.89

ROAD (0.00 + 44.96 + 0.00) = 44.96 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-88	0	0.17	73.80	0.00	-5.56	-3.52	0.00	0.00	-19.76	44.96

Segment Leq : 44.96 dBA

Total Leq All Segments: 62.38 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 69.98
(NIGHT): 62.38

↑

↑

STAMSON 5.0 NORMAL REPORT Date: 03-12-2019 11:09:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: REC5.te Time Period: Day/Night 16/8 hours
Description: Reception Point 5

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 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): 30000
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: Main Street (day/night)

Angle1 Angle2 : -15.00 deg 52.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 40 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 90.00 / 90.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 2: Greenfield (day/night)

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 15000

Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Greenfield (day/night)

 Angle1 Angle2 : -56.00 deg 28.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 1 / 1
 House density : 20 %
 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: Main Street (day)

 Source height = 1.50 m

ROAD (0.00 + 50.46 + 0.00) = 50.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-15	52	0.66	71.49	0.00	-12.92	-4.62	0.00	-3.50	0.00	50.46

Segment Leq : 50.46 dBA

↑

Results segment # 2: Greenfield (day)

 Source height = 1.50 m

ROAD (0.00 + 53.92 + 0.00) = 53.92 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-56	28	0.66	68.48	0.00	-9.99	-3.67	0.00	-0.90	0.00	53.92

Segment Leq : 53.92 dBA

Total Leq All Segments: 55.54 dBA

↑

Results segment # 1: Main Street (night)

$$\text{ROAD } (0.00 + 42.86 + 0.00) = 42.86 \text{ dBA}$$

Segment Leq : 42.86 dBA

Results segment # 2: Greenfield (night)

$$\text{ROAD } (0.00 + 46.32 + 0.00) = 46.32 \text{ dBA}$$

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-56	28	0.66	60.88	0.00	-9.99	-3.67	0.00	-0.90	0.00	46.32

Segment Leq : 46.32 dBA

Total Leq All Segments: 47.94 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.54
(NIGHT): 47.94