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Environmental Noise Control Study

Proposed Multi-Storey Building
1155 Joseph Cyr Street
and 1082 Cyrville Road
Ottawa, Ontario

Prepared For

TC United Development Corporation
c/o ZW Project Man.

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1.0 Introduction

Paterson Group (Paterson) was commissioned by TC United Development Corporation c/o ZW Project Management to conduct an environmental noise control study for the proposed multi-storey building to be located at 1155 Joseph Cyr Street and 1082 Cyrville Road, in the City of Ottawa.

The objective of the current study is to:

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

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

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

2.0 Background

It is understood that the proposed development will consist of a six-storey building. Final details are not known at the time of issuance of this report. Due to the proximity of the proposed building to the property lines, it is assumed that there will be no ground-surface outdoor living areas. A roof top patio was identified on the plans and will be analysed as an outdoor living area.

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 of 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 was not completed for this analysis.

Aircraft/Airport Noise

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

4.0 Analysis

4.1 Surface Transportation Noise

The proposed development is bordered to the north by commercial units followed by Ogilvie Road and Coventry Road, to the east by Cyrville Road, to the south by commercial buildings followed by Labelle Street and Lemieux Street, and to the west by Joseph Cyr Street. Ogilvie Road, Coventry Road, Cyrville Road and Joseph Cyr Street are located within the 100 m buffer zone.

Based on the City of Ottawa Official Plan, Schedule E, Ogilvie Road is considered a 4 lane urban arterial road (4-UAD). Coventry Road is also considered a 4 lane urban arterial road (4-UAD). Cyrville Road is considered a 2 lane major collector road (2-UMCU). All other roads within the 100 m radius are not classified as either arterial, collector or major collector roads and therefore are not included in this study. Additionally, the Highway 417 is located within the 500 m radius from the proposed building. All noise sources are presented in Drawing PG5401-2A to 2D - Site Geometry, located in Appendix 1.

It is understood that the proposed development will consist of a 6-storey residential building. Reception points were selected on every elevation at the first and third floors.

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 %
Hwy 417 West	3-Queensway	54999	100	92/8	7	5
Hwy 417 East	3-Queensway	54999	100	92/8	7	5
Ogilvie Road	4-UAD	35000	60	92/8	7	5
Coventry Road	4-UAD	35000	60	92/8	7	5
Cyrville Road	2-UMCU	12000	40	92/8	7	5
<input type="checkbox"/> Data obtained from the City of Ottawa document ENCG						

Due to Coventry Road and Ogilvie Road being classified as the same type of road with the same car speed and volume, the two roads have been combined and analyzed under one road name - "Ogilvie Road". Therefore, although Coventry Road is not directly discussed in the analysis, the portion of Coventry Road included within the 100 m radius has been included in this study.

Three (3) 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 (m)	Floor Use	Daytime/Nighttime Analysis
First Floor	1.5	Living and sleeping quarters	daytime/nighttime
Sixth Floor	16.5	Living and sleeping quarters	daytime/nighttime
Roof Top Patio	19.5	Outdoor living area	--

For this analysis, a reception point was taken at the centre of the predetermined floors. Reception points are noted on Drawing PG5401-3 - 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 buffer zone, which is reflected in the local angles, presented in Drawings PG5401-2A to 2D - Site Geometry in Appendix 1. Although Coventry Road is located within the 100 m buffer zone, It is noted that the signals from receptor points could not reach Coventry Road.

Table 7 - 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 was noted at a geodetic elevation of approximately 72 m, which is 4 m above 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

5.1 Surface Transportation Noise

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	Northern elevation, first floor	67.20	59.60	--
REC 1-6	Northern elevation, sixth floor	67.20	59.60	--
REC 2-1	Eastern elevation, first floor	63.20	56.61	--
REC 2-6	Eastern elevation, sixth floor	63.20	55.60	--
REC 3-1	Southern elevation, first floor	62.59	55.00	--
REC 3-6	Southern elevation, sixth floor	62.59	55.00	--
REC 4-1	Western elevation, first floor	64.23	56.64	--
REC 4-6	Western elevation, sixth floor	64.23	56.64	--
REC 5	Roof Top Patio	--	--	66.60

6.0 Discussion and Recommendations

6.1 Outdoor Living Areas

Due to the proximity of the proposed building to the property lines, it is assumed that a ground-surface outdoor living areas is not present. However, a roof top patio was identified. This roof top patio was analyzed as an outdoor living area. The results of the STAMSON modeling indicates that the daytime $L_{eq(16)}$ is 66.60 dBA when no building effects are taken into consideration. However, the ENGc states that when there is an exceedance of the outdoor living area, the following noise control measures are recommended:

1. Distance setback with soft ground
2. Insertion of noise insensitive land uses between the source and sensitive receptor
3. Orientation of buildings to provide sheltered zones in the rear yards

With respect to this development, there is no way to increase the setback distance with soft ground or to insert noise insensitive land use between the source and sensitive receptor. Therefore, the building is to be orientated to provide a sheltered zone. This was completed using three factors:

1. No ground surface outdoor living areas are proposed, allowing for a maximum separation between the noise receptor and the surrounding roadways
2. A 1 m solid barrier is proposed around the perimeter of the outdoor living area, which will act as a noise barrier.
3. The proposed building will act as a noise barrier that will assist in reflecting some noise away from the proposed outdoor living area. This analysis, taking into the effects of the building is considered acceptable since the outdoor living area (roof top patio) will not exist if the proposed building was not already constructed.

Using these noise mitigation measures, the roof top patio Reception Point 5R $L_{eq(16)}$ was calculated to be 58.72 dBA. This value is still above the 55 dBA threshold that is required for an outdoor living area. However, the use of a berm or an acoustic barrier on a roof top patio is not feasible. Therefore, warning clause type A will be required for this outdoor living area. This warning clause can be found below:

“Purchasers/tenants are advised that sound levels due to increasing road 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.”

6.2 Indoor Living Areas and Ventilation

The results of the STAMSON modeling indicates that the daytime $L_{eq(16)}$ ranges between 62.59 dBA and 67.20 dBA.

Where the $L_{eq(16)}$ is between 55 dBA and 65 dBA, the units are to be designed with a provision of the installation of central air conditioning and the warning clause Type C is to be included on all deeds of sale. This would include all units on the southern, eastern and western elevation.

However, the northern elevation has an $L_{eq(16)}$ of greater than 65 dBA. Therefore, all units located on the northern elevation are to be designed with the installation of a central air conditioner and the warning clause Type D is to be located on all deeds of sale. Additionally, the northern elevation is to undertake an additional analysis of building materials to ensure adequate acoustical soundproofing.

Proposed Construction Specifications

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

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

Where:

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

A conservative approach is to assume that there are 2 components per room. Therefore, the AIF would need to be at least 28 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 31 or higher, this would be a sufficient noise attenuation device.**

A review of industry standards for construction material indicates that, as long as the

exterior cladding of the northern, southern and western elevations consist of brick or concrete panels and that all windows consist of double pane glass, these materials have an STC rating of greater than 31 and are considered acceptable. If alternative materials are to be utilized on the northern, southern or western elevations, then a review will need to be completed once design details are finalized.

7.0 Conclusion

The subject site is located at 1155 Joseph Cyr Street and 1082 Cyrville Road. It is understood that the development will consist of a 6-storey building. The noise analysis identified four noise sources: Highway 417, Ogilvie Road, Coventry Road and Cyrville Road (surface transportation noise).

A roof top patio was noted on the design drawings and therefore was classified as an outdoor living area. A reception point located approximately 1.5 m above the proposed roof top patio was selected for this analysis. Due to the surface transportation noise at this location, two mitigation measures were used to reduce the noise levels: building orientation and the use of a solid guard rail around the perimeter of the roof top patio. However, even taking these factors into account, there was an exceedance of the 55 dBA threshold that is required for an outdoor living area. Therefore, Warning Clause Type A is to be included on all Offers of Purchase and Sale and/or lease agreements for units that will access the roof top patio:

"Purchasers/tenants are advised that sound levels due to increasing road 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."

Pane of glass reception points were selected on the northern, eastern, southern and western elevations, at both 1.5 m (first floor) and 16.5 m (sixth floor). These results indicate that the noise levels will be above 65 dBA on the northern elevation. Therefore, a review of the construction materials will be required for this elevation. Based on industry standards, the construction materials suitable for the proposed noise attenuation would be concrete panels or brick veneer, with windows being double pane. If alternative construction materials are proposed, a review will be required.

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

"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."

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

"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."

8.0 Statement of Limitations

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

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than TC United Development Corporation c/o ZW Project Management 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.



Scott S. Dennis, P.Eng.



Stephanie A. Boisvenue, P.Eng.



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APPENDIX 1

TABLE 7 - SUMMARY OF RECEPTION POINTS AND GEOMETRY

DRAWING PG5401-2A - SITE GEOMETRY (REC 1-1 and REC 1-3)

DRAWING PG5401-2B - SITE GEOMETRY (REC 2-1 and REC 2-3)

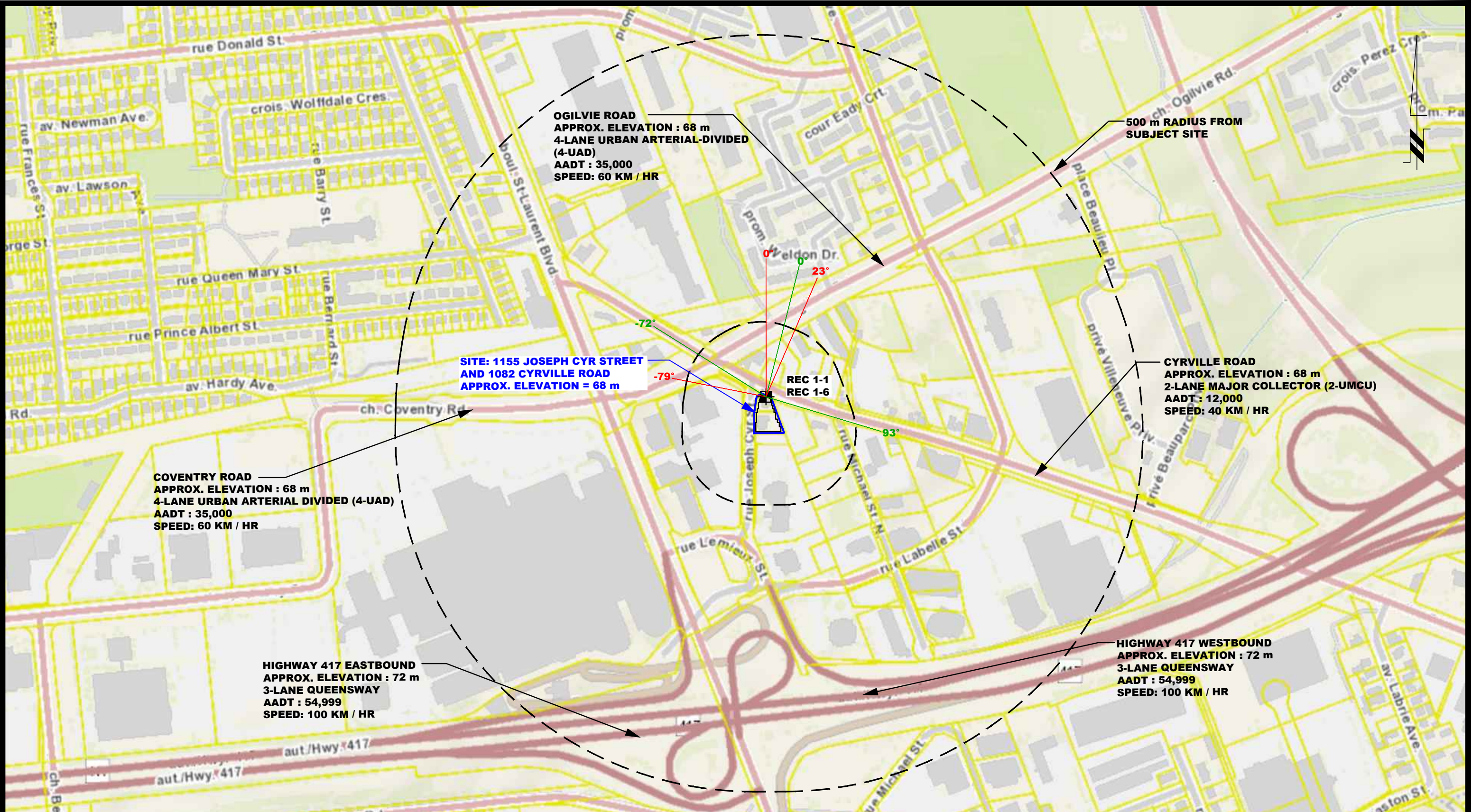
DRAWING PG5401-2C - SITE GEOMETRY (REC 3-1 and REC 3-3)

DRAWING PG5401-2D - SITE GEOMETRY (REC 4-1 and REC 4-3)

DRAWING PG5401-2E - SITE GEOMETRY (REC 5)

DRAWING PG5401-3 - RECEPTOR LOCATION PLAN

Table 7 - Summary of Reception Points and Geometry 1155 Joseph Cyr Street and 1082 Cyrville Road														
Point of Reception	Location	Leq Day (dBA)	Ogilvie Road						Cyrville Road					
			Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)	Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)
REC 1-1	Northern Elevation, 1st Floor	67.20	85	1.5	85.01	-79, 23	1	20	15	1.5	15.07	-72,90	n/a	n/a
REC 1-6	Northern Elevation, 6th Floor	67.20	85	7.5	85.33	-79, 23	1	20	15	7.5	16.77	-72,90	n/a	n/a
REC 2-1	Eastern Elevation, 1st Floor	63.2	115	1.5	115.01	-17, 14	1	20	30	1.5	30.04	-88,27	n/a	n/a
REC 2-6	Eastern Elevation, 6th Floor	63.2	115	7.5	115.24	-17, 14	1	20	30	7.5	30.92	-88,27	n/a	n/a
REC 3-1	Southern Elevation, 1st Floor	62.59	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 3-6	Southern Elevation, 6th Floor	62.59	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	Western Elevation, 1st Floor	64.23	100	1.5	100.01	-69, 15	n/a	n/a	45	1.5	45.02	-48, 14	n/a	n/a
REC 4-6	Western Elevation, 6th Floor	64.23	100	7.5	100.28	n/a	n/a	n/a	45	7.5	45.62	n/a	n/a	n/a
REC 5	Roof Top Patio	58.72	110	19.5	111.72	-66, 9	n/a	n/a	30	19.5	35.78	-83, 53	n/a	n/a
Point of Reception	Location	Leq Day (dBA)	Highway 417 Westbound						Highway 417 Eastbound					
			Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)	Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)
REC 1-1	Northern Elevation, 1st Floor	67.20	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 1-6	Northern Elevation, 6th Floor	67.20	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 2-1	Eastern Elevation, 1st Floor	63.2	410	1.5	410	-54, -25	2	40	425	1.5	425	-45, -25	2	40
REC 2-6	Eastern Elevation, 6th Floor	63.2	410	7.5	410.07	-54, -25	2	40	425	7.5	425.07	-45, -25	2	40
REC 3-1	Southern Elevation, 1st Floor	62.59	385	1.5	385	-59, 39	2	40	400	1.5	400	-46,34	2	40
REC 3-6	Southern Elevation, 6th Floor	62.59	385	7.5	385.07	-59, 39	2	40	400	7.5	400.07	-46,34	2	40
REC 4-1	Western Elevation, 1st Floor	64.23	415	1.5	415	0, 35	n/a	n/a	430	1.5	430	0, 27	n/a	n/a
REC 4-6	Western Elevation, 6th Floor	64.23	415	7.5	415.07	0, 35	n/a	n/a	430	1.5	430	0, 27	n/a	n/a
REC 5	Roof Top Patio	58.72	410	19.5	410.46	-54, 37	n/a	n/a	430	19.5	430.44	-46, 33	n/a	n/a



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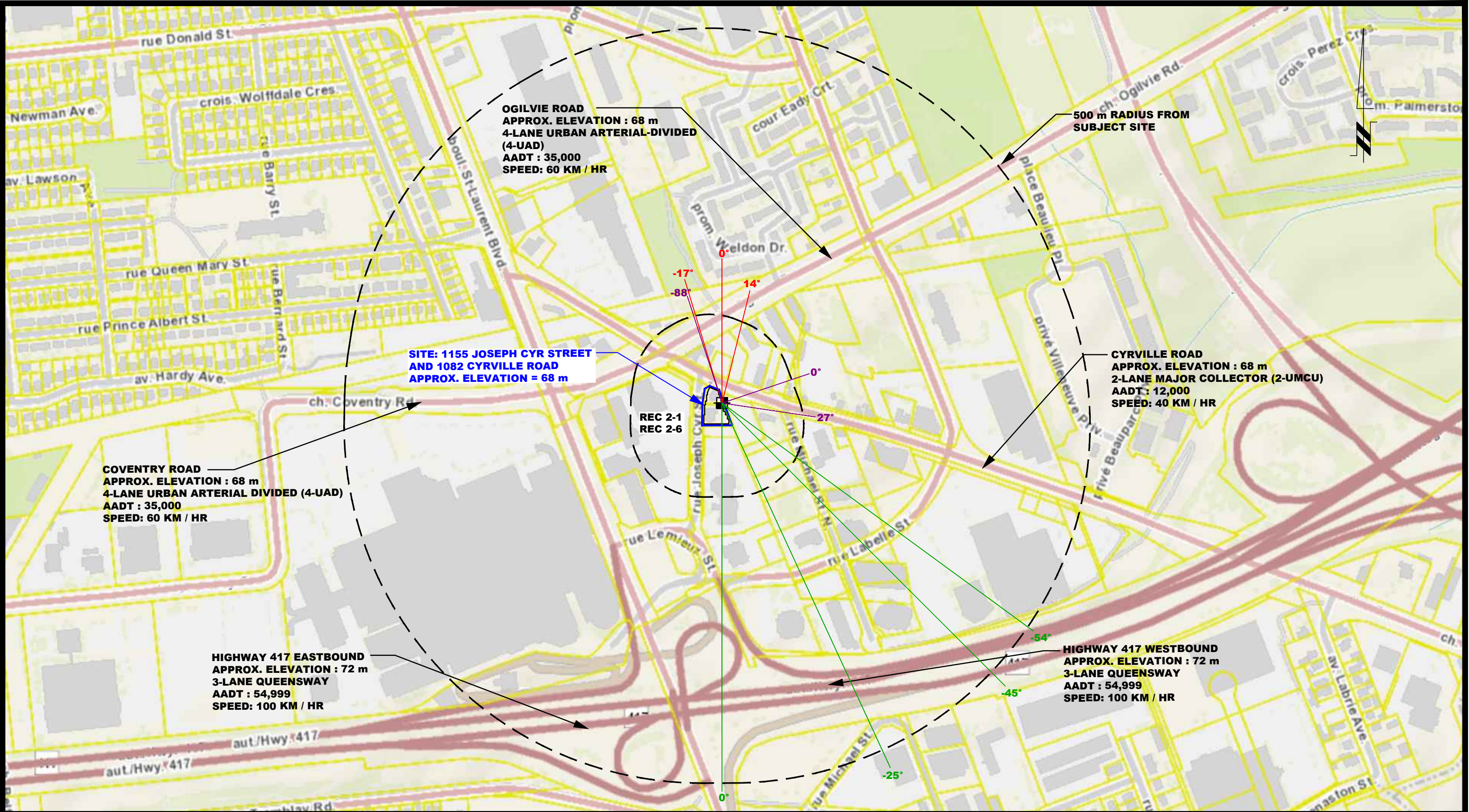
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NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL BUILDING
1155 JOSEPH CYR STREET AND 1082 CYRVILLE ROAD
ONTARIO

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SITE GEOMETRY - REC 1-1 & REC 1-6

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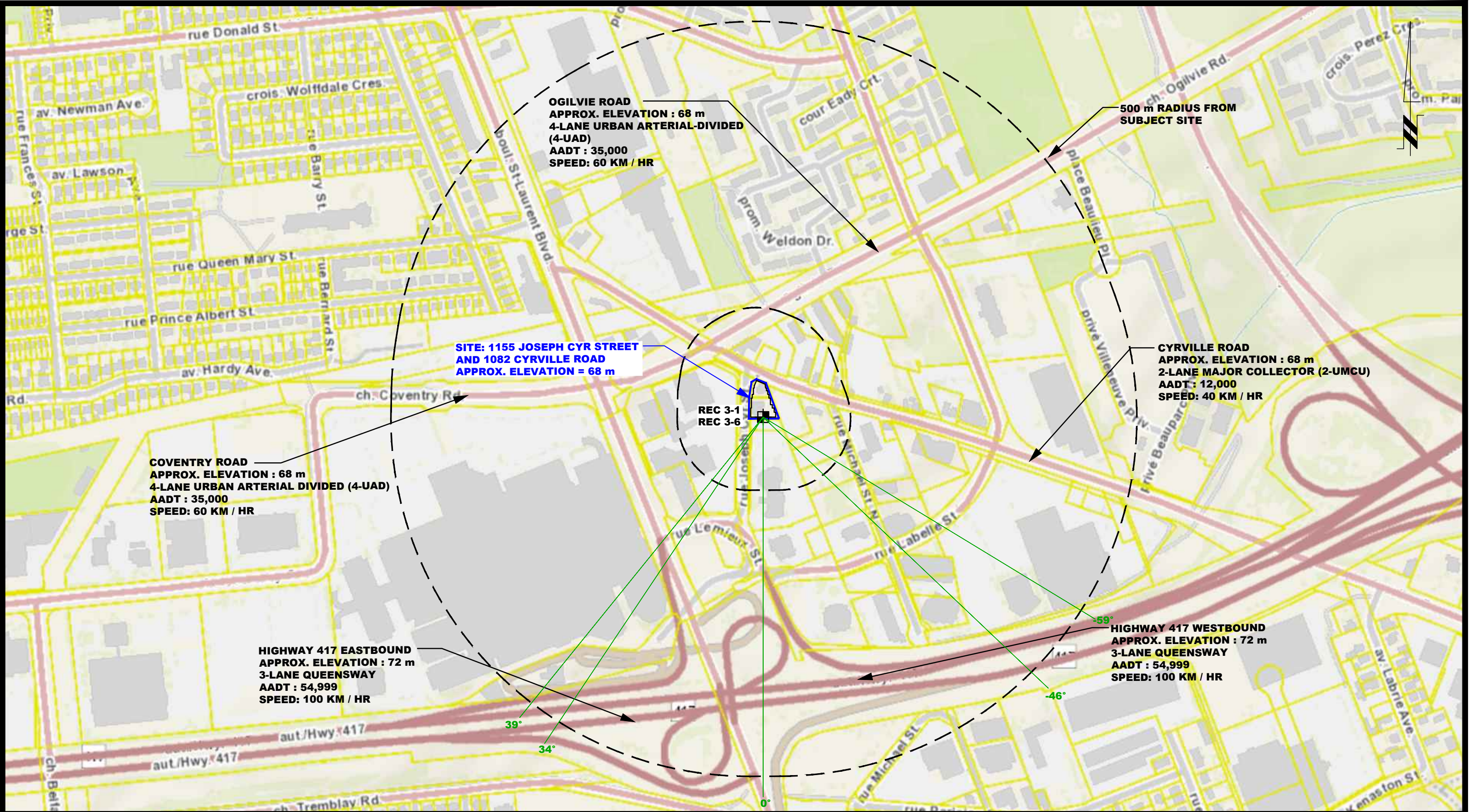
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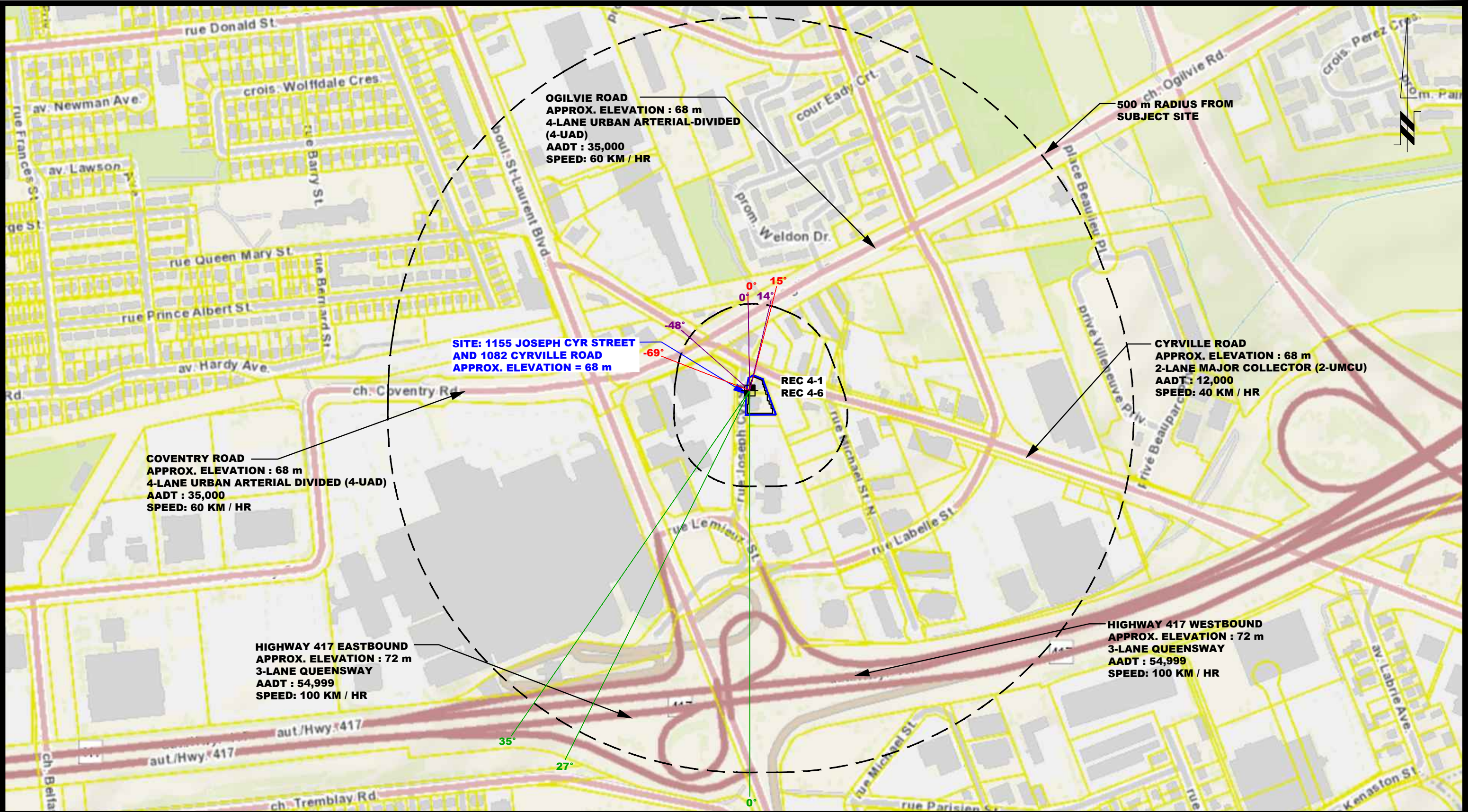
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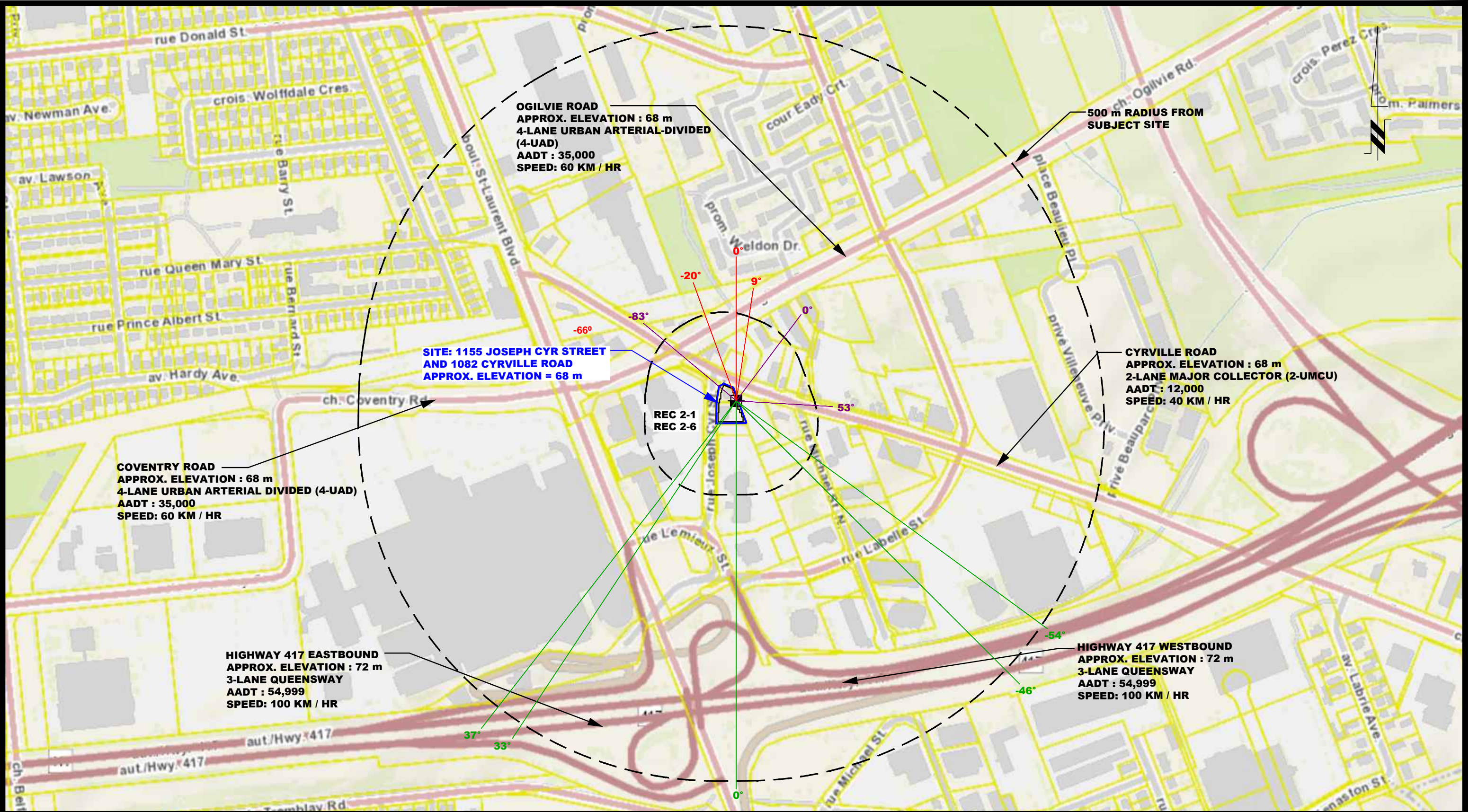
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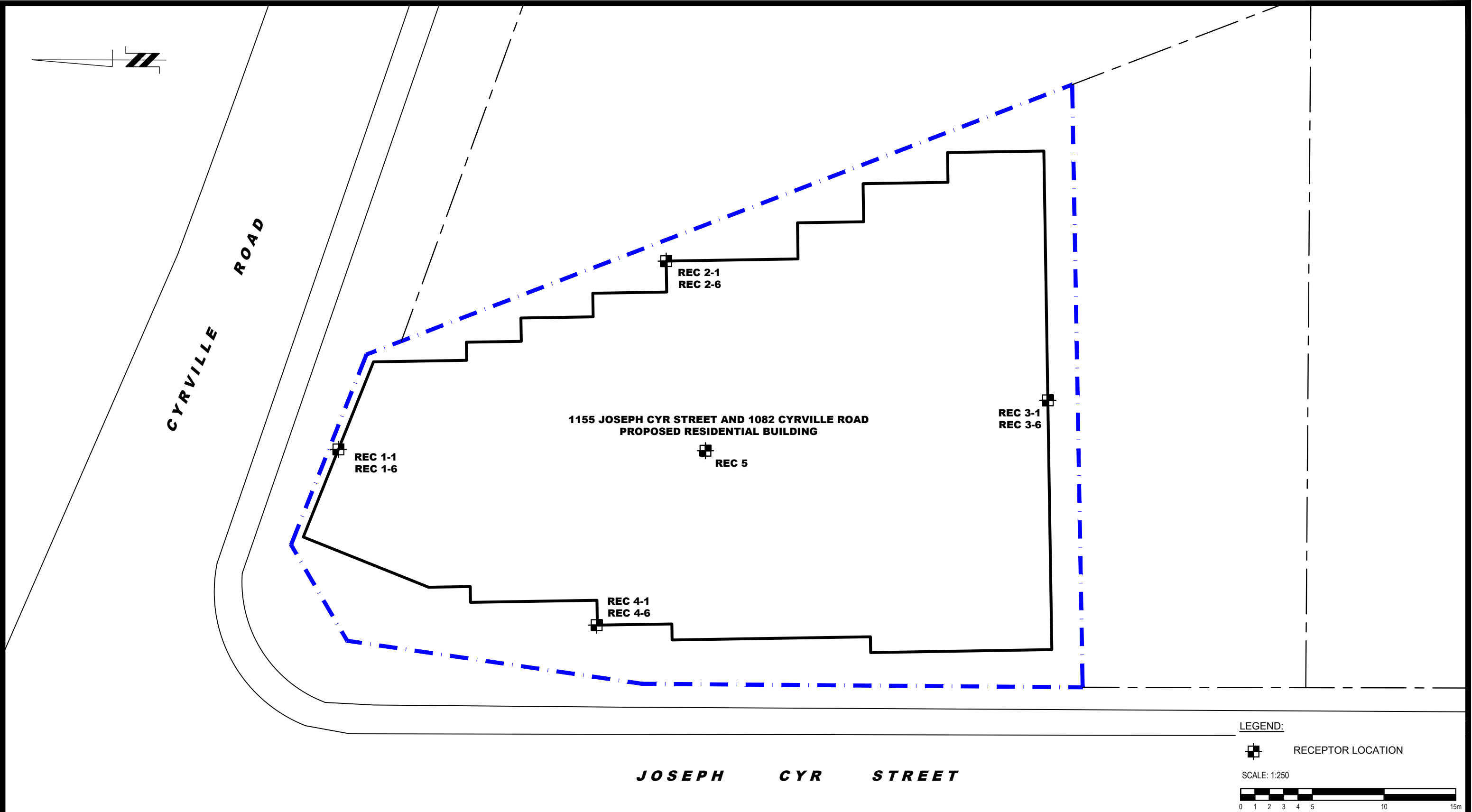
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NOISE ATTENUATION STUDY
PROPOSED RESIDENTIAL BUILDING
1155 JOSEPH CYR STREET AND 1082 CYRVILLE ROAD
ONTARIO

OTTAWA,
Title:
SITE GEOMETRY - REC 5 (ROOFTOP)

Scale:	1:5000	Date:	09/2020
Drawn by:	YA	Report No.:	PG5401-1
Checked by:	SB	Dwg. No.:	PG5401-2E
Approved by:	FA	Revision No.:	

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NO.	REVISIONS	DATE	INITIAL

TCU DEVELOPMENTS NOISE ATTENUATION STUDY PROPOSED RESIDENTIAL BUILDING 1155 JOSEPH CYR STREET AND 1082 CYRVILLE ROAD			ONTARIO
RECEPTOR LOCATION PLAN			

Scale:	1:250	Date:	09/2020
Drawn by:	YA	Report No.:	PG5401-1
Checked by:	SB	Dwg. No.:	PG5401-3
Approved by:	FA	Revision No.:	

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APPENDIX 2

STAMSON RESULTS

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

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 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): 35000
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: Ogilvie Road (day/night)

Angle1 Angle2 : -79.00 deg 23.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 85.00 / 85.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000

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

Data for Segment # 2: Cyrville Roa (day/night)

 Angle1 Angle2 : -72.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 15.00 / 15.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

↑

Results segment # 1: Ogilvie Road (day)

 Source height = 1.50 m

ROAD (0.00 + 62.78 + 0.00) = 62.78 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	23	0.00	73.68	0.00	-7.53	-2.47	0.00	-0.90	0.00	62.78

Segment Leq : 62.78 dBA

↑

Results segment # 2: Cyrville Roa (day)

 Source height = 1.50 m

ROAD (0.00 + 65.26 + 0.00) = 65.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-72	90	0.00	65.72	0.00	0.00	-0.46	0.00	0.00	0.00	65.26

Segment Leq : 65.26 dBA

Total Leq All Segments: 67.20 dBA

↑

Results segment # 1: Ogilvie Road (night)

Source height = 1.50 m

ROAD (0.00 + 55.18 + 0.00) = 55.18 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	23	0.00	66.08	0.00	-7.53	-2.47	0.00	-0.90	0.00	55.18

Segment Leq : 55.18 dBA

↑

Results segment # 2: Cyrville Roa (night)

Source height = 1.50 m

ROAD (0.00 + 57.66 + 0.00) = 57.66 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-72	90	0.00	58.12	0.00	0.00	-0.46	0.00	0.00	0.00	57.66

Segment Leq : 57.66 dBA

Total Leq All Segments: 59.60 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 67.20
(NIGHT): 59.60

↑

↑

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

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 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): 35000
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: Ogilvie Road (day/night)

Angle1 Angle2 : -79.00 deg 23.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 85.00 / 85.00 m
Receiver height : 16.50 / 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000

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

Data for Segment # 2: Cyrville Roa (day/night)

 Angle1 Angle2 : -72.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 15.00 / 15.00 m
 Receiver height : 16.50 / 16.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

↑

Results segment # 1: Ogilvie Road (day)

 Source height = 1.50 m

ROAD (0.00 + 62.78 + 0.00) = 62.78 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	23	0.00	73.68	0.00	-7.53	-2.47	0.00	-0.90	0.00	62.78

Segment Leq : 62.78 dBA

↑

Results segment # 2: Cyrville Roa (day)

 Source height = 1.50 m

ROAD (0.00 + 65.26 + 0.00) = 65.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-72	90	0.00	65.72	0.00	0.00	-0.46	0.00	0.00	0.00	65.26

Segment Leq : 65.26 dBA

Total Leq All Segments: 67.20 dBA

↑

Results segment # 1: Ogilvie Road (night)

Source height = 1.50 m

ROAD (0.00 + 55.18 + 0.00) = 55.18 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	23	0.00	66.08	0.00	-7.53	-2.47	0.00	-0.90	0.00	55.18

Segment Leq : 55.18 dBA

↑

Results segment # 2: Cyrville Roa (night)

Source height = 1.50 m

ROAD (0.00 + 57.66 + 0.00) = 57.66 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-72	90	0.00	58.12	0.00	0.00	-0.46	0.00	0.00	0.00	57.66

Segment Leq : 57.66 dBA

Total Leq All Segments: 59.60 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 67.20
(NIGHT): 59.60

↑

↑

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

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 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): 35000
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: Ogilvie Road (day/night)

Angle1 Angle2 : -17.00 deg 14.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 115.00 / 115.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000

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

Data for Segment # 2: Cyrville Roa (day/night)

Angle1	Angle2	:	-88.00 deg	27.00 deg
Wood depth	:	0	(No woods.)	
No of house rows	:	0 / 0		
Surface	:	2	(Reflective ground surface)	
Receiver source distance	:	30.00 / 30.00	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 west (day/night)

Car traffic volume	:	44527/3872	veh/TimePeriod	*
Medium truck volume	:	3542/308	veh/TimePeriod	*
Heavy truck volume	:	2530/220	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):	54999
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	:	-54.00 deg	-25.00 deg
Wood depth	:	0	(No woods.)	
No of house rows	:	2 / 0		
Surface	:	2	(Reflective ground surface)	
Receiver source distance	:	410.00 / 410.00	m	
Receiver height	:	1.50 / 1.50	m	
Topography	:	3	(Elevated; no barrier)	
Elevation	:	4.00 m		
Reference angle	:	0.00		



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

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-----
Car traffic volume : 44527/3872 veh/TimePeriod *
Medium truck volume : 3542/308 veh/TimePeriod *
Heavy truck volume : 2530/220 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

```

24 hr Traffic Volume (AADT or SADT): 54999
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

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Data for Segment # 4: Hwy 417 east (day/night)

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Angle1 Angle2 : -45.00 deg -25.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 425.00 / 425.00 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 4.00 m
Reference angle : 0.00

```

↑

Results segment # 1: Ogilvie Road (day)

Source height = 1.50 m

ROAD (0.00 + 56.29 + 0.00) = 56.29 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-17	14	0.00	73.68	0.00	-8.85	-7.64	0.00	-0.90	0.00	56.29

Segment Leq : 56.29 dBA

↑

Results segment # 2: Cyrville Roa (day)

Source height = 1.50 m

ROAD (0.00 + 60.76 + 0.00) = 60.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-88	27	0.00	65.72	0.00	-3.01	-1.95	0.00	0.00	0.00	60.76

Segment Leq : 60.76 dBA



Results segment # 3: Hwy 417 west (day)

Source height = 1.50 m

ROAD (0.00 + 54.52 + 0.00) = 54.52 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-54	-25	0.00	80.15	0.00	-14.37	-7.93	0.00	-3.33	0.00	54.52

Segment Leq : 54.52 dBA



Results segment # 4: Hwy 417 east (day)

Source height = 1.50 m

ROAD (0.00 + 52.76 + 0.00) = 52.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	-25	0.00	80.15	0.00	-14.52	-9.54	0.00	-3.32	0.00	52.76

Segment Leq : 52.76 dBA

Total Leq All Segments: 63.20 dBA



Results segment # 1: Ogilvie Road (night)

Source height = 1.50 m

ROAD (0.00 + 48.69 + 0.00) = 48.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-17	14	0.00	66.08	0.00	-8.85	-7.64	0.00	-0.90	0.00	48.69

Segment Leq : 48.69 dBA



Results segment # 2: Cyrville Roa (night)

Source height = 1.50 m

ROAD (0.00 + 53.16 + 0.00) = 53.16 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
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-88	27	0.00	58.12	0.00	-3.01	-1.95	0.00	0.00	0.00	53.16
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Segment Leq : 53.16 dBA



Results segment # 3: Hwy 417 west (night)

Source height = 1.50 m

ROAD (0.00 + 50.26 + 0.00) = 50.26 dBA

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

-54	-25	0.00	72.55	0.00	-14.37	-7.93	0.00	0.00	0.00	50.26
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Segment Leq : 50.26 dBA



Results segment # 4: Hwy 417 east (night)

Source height = 1.50 m

ROAD (0.00 + 48.49 + 0.00) = 48.49 dBA

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

-45	-25	0.00	72.55	0.00	-14.52	-9.54	0.00	0.00	0.00	48.49
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Segment Leq : 48.49 dBA

Total Leq All Segments: 56.61 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 63.20

(NIGHT): 56.61



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

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 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): 35000
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: Ogilvie Road (day/night)

Angle1 Angle2 : -17.00 deg 14.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 20 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 115.00 / 115.00 m
Receiver height : 16.50 / 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000

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

Data for Segment # 2: Cyrville Roa (day/night)

Angle1	Angle2	:	-88.00 deg	27.00 deg
Wood depth	:	0	(No woods.)	
No of house rows	:	0 / 0		
Surface	:	2	(Reflective ground surface)	
Receiver source distance	:	30.00 / 30.00	m	
Receiver height	:	16.50 / 16.50	m	
Topography	:	1	(Flat/gentle slope; no barrier)	
Reference angle	:	0.00		

↑

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

Car traffic volume	:	44527/3872	veh/TimePeriod	*
Medium truck volume	:	3542/308	veh/TimePeriod	*
Heavy truck volume	:	2530/220	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):	54999
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	:	-54.00 deg	-25.00 deg
Wood depth	:	0	(No woods.)	
No of house rows	:	2 / 2		
House density	:	40 %		
Surface	:	2	(Reflective ground surface)	
Receiver source distance	:	410.00 / 410.00	m	
Receiver height	:	16.50 / 16.50	m	
Topography	:	3	(Elevated; no barrier)	
Elevation	:	4.00 m		
Reference angle	:	0.00		

↑

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

Car traffic volume : 44527/3872 veh/TimePeriod *
Medium truck volume : 3542/308 veh/TimePeriod *
Heavy truck volume : 2530/220 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): 54999
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 east (day/night)

Angle1 Angle2 : -45.00 deg -25.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 40 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 425.00 / 425.00 m
Receiver height : 16.50 / 16.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 4.00 m
Reference angle : 0.00

↑

Results segment # 1: Ogilvie Road (day)

Source height = 1.50 m

ROAD (0.00 + 56.29 + 0.00) = 56.29 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-17	14	0.00	73.68	0.00	-8.85	-7.64	0.00	-0.90	0.00	56.29

Segment Leq : 56.29 dBA

↑

Results segment # 2: Cyrville Roa (day)

Source height = 1.50 m

ROAD (0.00 + 60.76 + 0.00) = 60.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-88	27	0.00	65.72	0.00	-3.01	-1.95	0.00	0.00	0.00	60.76

Segment Leq : 60.76 dBA



Results segment # 3: Hwy 417 west (day)

Source height = 1.50 m

ROAD (0.00 + 54.52 + 0.00) = 54.52 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-54	-25	0.00	80.15	0.00	-14.37	-7.93	0.00	-3.33	0.00	54.52

Segment Leq : 54.52 dBA



Results segment # 4: Hwy 417 east (day)

Source height = 1.50 m

ROAD (0.00 + 52.76 + 0.00) = 52.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	-25	0.00	80.15	0.00	-14.52	-9.54	0.00	-3.32	0.00	52.76

Segment Leq : 52.76 dBA

Total Leq All Segments: 63.20 dBA



Results segment # 1: Ogilvie Road (night)

Source height = 1.50 m

ROAD (0.00 + 48.69 + 0.00) = 48.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-17	14	0.00	66.08	0.00	-8.85	-7.64	0.00	-0.90	0.00	48.69

Segment Leq : 48.69 dBA



Results segment # 2: Cyrville Roa (night)

Source height = 1.50 m

ROAD (0.00 + 53.16 + 0.00) = 53.16 dBA

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

-88	27	0.00	58.12	0.00	-3.01	-1.95	0.00	0.00	0.00	53.16
-----	----	------	-------	------	-------	-------	------	------	------	-------

Segment Leq : 53.16 dBA



Results segment # 3: Hwy 417 west (night)

Source height = 1.50 m

ROAD (0.00 + 46.93 + 0.00) = 46.93 dBA

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

-54	-25	0.00	72.55	0.00	-14.37	-7.93	0.00	-3.33	0.00	46.93
-----	-----	------	-------	------	--------	-------	------	-------	------	-------

Segment Leq : 46.93 dBA



Results segment # 4: Hwy 417 east (night)

Source height = 1.50 m

ROAD (0.00 + 45.16 + 0.00) = 45.16 dBA

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

-45	-25	0.00	72.55	0.00	-14.52	-9.54	0.00	-3.32	0.00	45.16
-----	-----	------	-------	------	--------	-------	------	-------	------	-------

Segment Leq : 45.16 dBA

Total Leq All Segments: 55.60 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 63.20
(NIGHT): 55.60



STAMSON 5.0 NORMAL REPORT Date: 31-08-2020 01:08:33
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Hwy 417 west (day/night)

Car traffic volume : 44527/3872 veh/TimePeriod *
Medium truck volume : 3542/308 veh/TimePeriod *
Heavy truck volume : 2530/220 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): 54999
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: Hwy 417 west (day/night)

Angle1 Angle2 : -59.00 deg 39.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 40 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 385.00 / 385.00 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 72.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 44527/3872 veh/TimePeriod *
Medium truck volume : 3542/308 veh/TimePeriod *
Heavy truck volume : 2530/220 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): 54999
 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 : -46.00 deg 34.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 2 / 2
 House density : 40 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 400.00 / 400.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 3 (Elevated; no barrier)
 Elevation : 72.00 m
 Reference angle : 0.00

↑

Results segment # 1: Hwy 417 west (day)

Source height = 1.50 m

ROAD (0.00 + 60.07 + 0.00) = 60.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-59	39	0.00	80.15	0.00	-14.09	-2.64	0.00	-3.34	0.00	60.07

Segment Leq : 60.07 dBA

↑

Results segment # 2: Hwy 417 east (day)

Source height = 1.50 m

ROAD (0.00 + 59.03 + 0.00) = 59.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	34	0.00	80.15	0.00	-14.26	-3.52	0.00	-3.33	0.00	59.03

Segment Leq : 59.03 dBA

Total Leq All Segments: 62.59 dBA



Results segment # 1: Hwy 417 west (night)

Source height = 1.50 m

ROAD (0.00 + 52.48 + 0.00) = 52.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-59	39	0.00	72.55	0.00	-14.09	-2.64	0.00	-3.34	0.00	52.48

Segment Leq : 52.48 dBA



Results segment # 2: Hwy 417 east (night)

Source height = 1.50 m

ROAD (0.00 + 51.44 + 0.00) = 51.44 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	34	0.00	72.55	0.00	-14.26	-3.52	0.00	-3.33	0.00	51.44

Segment Leq : 51.44 dBA

Total Leq All Segments: 55.00 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 62.59
(NIGHT): 55.00



STAMSON 5.0 NORMAL REPORT Date: 04-09-2020 09:45:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Hwy 417 west (day/night)

Car traffic volume : 44527/3872 veh/TimePeriod *
Medium truck volume : 3542/308 veh/TimePeriod *
Heavy truck volume : 2530/220 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): 54999
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: Hwy 417 west (day/night)

Angle1 Angle2 : -59.00 deg 39.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 40 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 385.00 / 385.00 m
Receiver height : 16.50 / 16.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 72.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 44527/3872 veh/TimePeriod *
Medium truck volume : 3542/308 veh/TimePeriod *
Heavy truck volume : 2530/220 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): 54999
 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 : -46.00 deg 34.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 2 / 2
 House density : 40 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 400.00 / 400.00 m
 Receiver height : 16.50 / 16.50 m
 Topography : 3 (Elevated; no barrier)
 Elevation : 72.00 m
 Reference angle : 0.00

↑

Results segment # 1: Hwy 417 west (day)

Source height = 1.50 m

ROAD (0.00 + 60.07 + 0.00) = 60.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-59	39	0.00	80.15	0.00	-14.09	-2.64	0.00	-3.34	0.00	60.07

Segment Leq : 60.07 dBA

↑

Results segment # 2: Hwy 417 east (day)

Source height = 1.50 m

ROAD (0.00 + 59.03 + 0.00) = 59.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	34	0.00	80.15	0.00	-14.26	-3.52	0.00	-3.33	0.00	59.03

Segment Leq : 59.03 dBA

Total Leq All Segments: 62.59 dBA



Results segment # 1: Hwy 417 west (night)

Source height = 1.50 m

ROAD (0.00 + 52.48 + 0.00) = 52.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-59	39	0.00	72.55	0.00	-14.09	-2.64	0.00	-3.34	0.00	52.48

Segment Leq : 52.48 dBA



Results segment # 2: Hwy 417 east (night)

Source height = 1.50 m

ROAD (0.00 + 51.44 + 0.00) = 51.44 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	34	0.00	72.55	0.00	-14.26	-3.52	0.00	-3.33	0.00	51.44

Segment Leq : 51.44 dBA

Total Leq All Segments: 55.00 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 62.59
(NIGHT): 55.00



STAMSON 5.0 NORMAL REPORT Date: 31-08-2020 01:09:36
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 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): 35000
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: Ogilvie Road (day/night)

Angle1 Angle2 : -69.00 deg 15.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 100.00 / 100.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000
Percentage of Annual Growth : 0.00

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

Data for Segment # 2: Cyrville Roa (day/night)

```

-----
Angle1   Angle2       : -48.00 deg   14.00 deg
Wood depth      :           0       (No woods.)
No of house rows :           0 / 0
Surface         :           2       (Reflective 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

```



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

```

-----
Car traffic volume : 44527/3872 veh/TimePeriod *
Medium truck volume : 3542/308 veh/TimePeriod *
Heavy truck volume : 2530/220 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):	54999
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       : 0.00 deg   35.00 deg
Wood depth      :           0       (No woods.)
No of house rows :           2 / 2
House density    :           40 %
Surface         :           2       (Reflective ground surface)
Receiver source distance : 415.00 / 415.00 m
Receiver height  :           1.50 / 1.50 m
Topography       :           3       (Elevated; no barrier)
Elevation        :           72.00 m
Reference angle  :           0.00

```



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

```

-----
Car traffic volume : 44527/3872 veh/TimePeriod *
Medium truck volume : 3542/308 veh/TimePeriod *
Heavy truck volume : 2530/220 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): 54999
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 east (day/night)

```

-----
Angle1 Angle2 : 0.00 deg 27.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 40 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 430.00 / 430.00 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 72.00 m
Reference angle : 0.00

```

↑

Results segment # 1: Ogilvie Road (day)

Source height = 1.50 m

ROAD (0.00 + 62.13 + 0.00) = 62.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-69	15	0.00	73.68	0.00	-8.24	-3.31	0.00	0.00	0.00	62.13

Segment Leq : 62.13 dBA

↑

Results segment # 2: Cyrville Roa (day)

Source height = 1.50 m

ROAD (0.00 + 56.32 + 0.00) = 56.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-48	14	0.00	65.72	0.00	-4.77	-4.63	0.00	0.00	0.00	56.32

Segment Leq : 56.32 dBA



Results segment # 3: Hwy 417 west (day)

Source height = 1.50 m

ROAD (0.00 + 55.29 + 0.00) = 55.29 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	35	0.00	80.15	0.00	-14.42	-7.11	0.00	-3.33	0.00	55.29

Segment Leq : 55.29 dBA



Results segment # 4: Hwy 417 east (day)

Source height = 1.50 m

ROAD (0.00 + 54.01 + 0.00) = 54.01 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	27	0.00	80.15	0.00	-14.57	-8.24	0.00	-3.32	0.00	54.01

Segment Leq : 54.01 dBA

Total Leq All Segments: 64.23 dBA



Results segment # 1: Ogilvie Road (night)

Source height = 1.50 m

ROAD (0.00 + 54.53 + 0.00) = 54.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-69	15	0.00	66.08	0.00	-8.24	-3.31	0.00	0.00	0.00	54.53

Segment Leq : 54.53 dBA



Results segment # 2: Cyrville Roa (night)

Source height = 1.50 m

ROAD (0.00 + 48.72 + 0.00) = 48.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-48	14	0.00	58.12	0.00	-4.77	-4.63	0.00	0.00	0.00	48.72

Segment Leq : 48.72 dBA



Results segment # 3: Hwy 417 west (night)

Source height = 1.50 m

ROAD (0.00 + 47.69 + 0.00) = 47.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	35	0.00	72.55	0.00	-14.42	-7.11	0.00	-3.33	0.00	47.69

Segment Leq : 47.69 dBA



Results segment # 4: Hwy 417 east (night)

Source height = 1.50 m

ROAD (0.00 + 46.42 + 0.00) = 46.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	27	0.00	72.55	0.00	-14.57	-8.24	0.00	-3.32	0.00	46.42

Segment Leq : 46.42 dBA

Total Leq All Segments: 56.64 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 64.23
(NIGHT): 56.64



STAMSON 5.0 NORMAL REPORT Date: 04-09-2020 09:46:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec46.te Time Period: Day/Night 16/8 hours
Description: Reception Point 4-6

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 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): 35000
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: Ogilvie Road (day/night)

Angle1 Angle2 : -69.00 deg 15.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 100.00 / 100.00 m
Receiver height : 16.50 / 16.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000
Percentage of Annual Growth : 0.00

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

Data for Segment # 2: Cyrville Roa (day/night)

```

-----
Angle1   Angle2       : -48.00 deg   14.00 deg
Wood depth      :          0       (No woods.)
No of house rows :          0 / 0
Surface         :          2       (Reflective ground surface)
Receiver source distance : 45.00 / 45.00 m
Receiver height  : 16.50 / 16.50 m
Topography      :          1       (Flat/gentle slope; no barrier)
Reference angle  :          0.00

```



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

```

-----
Car traffic volume : 44527/3872 veh/TimePeriod *
Medium truck volume : 3542/308 veh/TimePeriod *
Heavy truck volume : 2530/220 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):	54999
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       :  0.00 deg   35.00 deg
Wood depth      :          0       (No woods.)
No of house rows :          2 / 2
House density    :         40 %
Surface         :          2       (Reflective ground surface)
Receiver source distance : 415.00 / 415.00 m
Receiver height  : 16.50 / 16.50 m
Topography      :          3       (Elevated; no barrier)
Elevation       : 72.00 m
Reference angle  :          0.00

```



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

```

-----
Car traffic volume : 44527/3872 veh/TimePeriod *
Medium truck volume : 3542/308 veh/TimePeriod *
Heavy truck volume : 2530/220 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): 54999
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 east (day/night)

```

-----
Angle1 Angle2 : 0.00 deg 27.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 40 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 430.00 / 430.00 m
Receiver height : 16.50 / 16.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 72.00 m
Reference angle : 0.00

```

↑

Results segment # 1: Ogilvie Road (day)

Source height = 1.50 m

ROAD (0.00 + 62.13 + 0.00) = 62.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-69	15	0.00	73.68	0.00	-8.24	-3.31	0.00	0.00	0.00	62.13

Segment Leq : 62.13 dBA

↑

Results segment # 2: Cyrville Roa (day)

Source height = 1.50 m

ROAD (0.00 + 56.32 + 0.00) = 56.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-48	14	0.00	65.72	0.00	-4.77	-4.63	0.00	0.00	0.00	56.32

Segment Leq : 56.32 dBA



Results segment # 3: Hwy 417 west (day)

Source height = 1.50 m

ROAD (0.00 + 55.29 + 0.00) = 55.29 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	35	0.00	80.15	0.00	-14.42	-7.11	0.00	-3.33	0.00	55.29

Segment Leq : 55.29 dBA



Results segment # 4: Hwy 417 east (day)

Source height = 1.50 m

ROAD (0.00 + 54.01 + 0.00) = 54.01 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	27	0.00	80.15	0.00	-14.57	-8.24	0.00	-3.32	0.00	54.01

Segment Leq : 54.01 dBA

Total Leq All Segments: 64.23 dBA



Results segment # 1: Ogilvie Road (night)

Source height = 1.50 m

ROAD (0.00 + 54.53 + 0.00) = 54.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-69	15	0.00	66.08	0.00	-8.24	-3.31	0.00	0.00	0.00	54.53

Segment Leq : 54.53 dBA



Results segment # 2: Cyrville Roa (night)

Source height = 1.50 m

ROAD (0.00 + 48.72 + 0.00) = 48.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-48	14	0.00	58.12	0.00	-4.77	-4.63	0.00	0.00	0.00	48.72

Segment Leq : 48.72 dBA



Results segment # 3: Hwy 417 west (night)

Source height = 1.50 m

ROAD (0.00 + 47.69 + 0.00) = 47.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	35	0.00	72.55	0.00	-14.42	-7.11	0.00	-3.33	0.00	47.69

Segment Leq : 47.69 dBA



Results segment # 4: Hwy 417 east (night)

Source height = 1.50 m

ROAD (0.00 + 46.42 + 0.00) = 46.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	27	0.00	72.55	0.00	-14.57	-8.24	0.00	-3.32	0.00	46.42

Segment Leq : 46.42 dBA

Total Leq All Segments: 56.64 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 64.23
(NIGHT): 56.64



STAMSON 5.0 NORMAL REPORT Date: 09-09-2020 02:22:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rec5.te Time Period: Day/Night 16/8 hours
Description: REC 5 - Roof top patio without building effects

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 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): 35000
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: Ogilvie (day/night)

Angle1 Angle2 : -66.00 deg 9.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 110.00 / 110.00 m
Receiver height : 19.50 / 19.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000
Percentage of Annual Growth : 0.00

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

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

 Angle1 Angle2 : -83.00 deg 53.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 30.00 / 30.00 m
 Receiver height : 19.50 / 19.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00



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

 Car traffic volume : 44527/3872 veh/TimePeriod *
 Medium truck volume : 3542/308 veh/TimePeriod *
 Heavy truck volume : 2530/220 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): 54999
 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 E (day/night)

 Angle1 Angle2 : -46.00 deg 33.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 2 / 2
 House density : 40 %
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 430.00 / 430.00 m
 Receiver height : 19.50 / 19.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00



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

Car traffic volume : 44527/3872 veh/TimePeriod *
 Medium truck volume : 3542/308 veh/TimePeriod *
 Heavy truck volume : 2530/220 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): 54999
 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 W (day/night)

 Angle1 Angle2 : -54.00 deg 37.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 2 / 2
 House density : 40 %
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 410.00 / 410.00 m
 Receiver height : 19.50 / 19.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

↑

Results segment # 1: Ogilvie (day)

Source height = 1.50 m

ROAD (0.00 + 59.16 + 0.00) = 59.16 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-66	9	0.12	73.68	0.00	-9.69	-3.92	0.00	-0.90	0.00	59.16

Segment Leq : 59.16 dBA

↑

Results segment # 2: Cyrville (day)

Source height = 1.50 m

ROAD (0.00 + 64.26 + 0.00) = 64.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-66	9	0.12	73.68	0.00	-9.69	-3.92	0.00	-0.90	0.00	59.16

-83 53 0.12 69.03 0.00 -3.37 -1.40 0.00 0.00 0.00 64.26

Segment Leq : 64.26 dBA



Results segment # 3: Hwy 417 E (day)

Source height = 1.50 m

ROAD (0.00 + 56.88 + 0.00) = 56.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	33	0.12	80.15	0.00	-16.32	-3.62	0.00	-3.32	0.00	56.88

Segment Leq : 56.88 dBA



Results segment # 4: Hwy 417 W (day)

Source height = 1.50 m

ROAD (0.00 + 57.70 + 0.00) = 57.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-54	37	0.12	80.15	0.00	-16.09	-3.03	0.00	-3.33	0.00	57.70

Segment Leq : 57.70 dBA

Total Leq All Segments: 66.60 dBA



Results segment # 1: Ogilvie (night)

Source height = 1.50 m

ROAD (0.00 + 52.47 + 0.00) = 52.47 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-66	9	0.12	66.08	0.00	-9.69	-3.92	0.00	0.00	0.00	52.47

Segment Leq : 52.47 dBA



Results segment # 2: Cyrville (night)

Source height = 1.50 m

ROAD (0.00 + 56.66 + 0.00) = 56.66 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-83	53	0.12	61.43	0.00	-3.37	-1.40	0.00	0.00	0.00	56.66

Segment Leq : 56.66 dBA



Results segment # 3: Hwy 417 E (night)

Source height = 1.50 m

ROAD (0.00 + 49.28 + 0.00) = 49.28 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	33	0.12	72.55	0.00	-16.32	-3.62	0.00	-3.32	0.00	49.28

Segment Leq : 49.28 dBA



Results segment # 4: Hwy 417 W (night)

Source height = 1.50 m

ROAD (0.00 + 50.10 + 0.00) = 50.10 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-54	37	0.12	72.55	0.00	-16.09	-3.03	0.00	-3.33	0.00	50.10

Segment Leq : 50.10 dBA

Total Leq All Segments: 59.18 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 66.60
(NIGHT): 59.18



STAMSON 5.0 NORMAL REPORT Date: 09-09-2020 02:05:21
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: REC5R.te Time Period: Day/Night 16/8 hours
Description: REC 5R - Roof top patio with building effects

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 60 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): 35000
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: Ogilvie (day/night)

Angle1 Angle2 : -66.00 deg 9.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 110.00 / 110.00 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -66.00 deg Angle2 : 9.00 deg
Barrier height : 1.00 m
Elevation : 18.00 m
Barrier receiver distance : 20.00 / 20.00 m
Source elevation : 68.00 m
Receiver elevation : 86.00 m
Barrier elevation : 86.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 60 km/h

Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -83.00 deg 53.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.00 / 30.00 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -83.00 deg Angle2 : 53.00 deg
Barrier height : 1.00 m
Elevation : 18.00 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 68.00 m
Receiver elevation : 86.00 m
Barrier elevation : 86.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 44527/3872 veh/TimePeriod *
Medium truck volume : 3542/308 veh/TimePeriod *
Heavy truck volume : 2530/220 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): 54999
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 E (day/night)

```

-----
Angle1   Angle2       : -46.00 deg   33.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      2 / 0
Surface        :      1      (Absorptive ground surface)
Receiver source distance : 425.00 / 425.00 m
Receiver height  :      1.50 / 1.50 m
Topography      :      4      (Elevated; with barrier)
Barrier angle1   : -46.00 deg   Angle2 : 33.00 deg
Barrier height   :      1.50 m
Elevation        :      14.00 m
Barrier receiver distance : 15.00 / 15.00 m
Source elevation :      72.00 m
Receiver elevation :      86.00 m
Barrier elevation :      86.00 m
Reference angle  :      0.00

```

▲

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

```

-----
Car traffic volume : 44527/3872 veh/TimePeriod *
Medium truck volume : 3542/308 veh/TimePeriod *
Heavy truck volume : 2530/220 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): 54999
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 W (day/night)

```

-----
Angle1   Angle2       : -54.00 deg   37.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      2 / 0
Surface        :      1      (Absorptive ground surface)
Receiver source distance : 410.00 / 410.00 m
Receiver height  :      1.50 / 1.50 m
Topography      :      4      (Elevated; with barrier)
Barrier angle1   : -54.00 deg   Angle2 : 37.00 deg
Barrier height   :      1.50 m
Elevation        :      14.00 m
Barrier receiver distance : 20.00 / 20.00 m
Source elevation :      72.00 m

```

Receiver elevation : 86.00 m
Barrier elevation : 86.00 m
Reference angle : 0.00

↑

Results segment # 1: Ogilvie (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	!
		-1.77	!
			84.23

ROAD (0.00 + 50.02 + 0.00) = 50.02 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-66	9	0.06	73.68	0.00	-9.17	-3.86	0.00	0.00	-10.63	50.02

Segment Leq : 50.02 dBA

↑

Results segment # 2: Cyrville (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	!
		-4.50	!
			81.50

ROAD (0.00 + 46.95 + 0.00) = 46.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-83	53	0.06	69.03	0.00	-3.19	-1.31	0.00	0.00	-17.58	46.95

Segment Leq : 46.95 dBA

↑

Results segment # 3: Hwy 417 E (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 !          1.01 !          87.01
```

ROAD (0.00 + 54.41 + 0.00) = 54.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	33	0.24	80.15	0.00	-18.01	-3.67	0.00	-3.32	0.00	55.14
-46	33	0.15	80.15	0.00	-16.70	-3.64	0.00	0.00	-5.40	54.41

Segment Leq : 54.41 dBA

↑

Results segment # 4: Hwy 417 W (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 !          0.82 !          86.82
```

ROAD (0.00 + 55.03 + 0.00) = 55.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-54	37	0.24	80.15	0.00	-17.82	-3.09	0.00	-3.33	0.00	55.91
-54	37	0.15	80.15	0.00	-16.52	-3.04	0.00	0.00	-5.55	55.03

Segment Leq : 55.03 dBA

Total Leq All Segments: 58.72 dBA

↑

Results segment # 1: Ogilvie (night)

Source height = 1.50 m

Barrier height for grazing incidence

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

-46	33	0.15	72.55	0.00	-16.70	-3.64	0.00	0.00	-5.40	46.82
-----	----	------	-------	------	--------	-------	------	------	-------	-------

Segment Leq : 46.82 dBA

↑

Results segment # 4: Hwy 417 W (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source	!	Receiver	!	Barrier	!	Elevation of
Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
-----+		-----+		-----+		-----
1.50	!	1.50	!	0.82	!	86.82

ROAD (0.00 + 47.43 + 0.00) = 47.43 dBA

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

-54	37	0.15	72.55	0.00	-16.52	-3.04	0.00	0.00	-5.55	47.43

Segment Leq : 47.43 dBA

Total Leq All Segments: 51.12 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 58.72
(NIGHT): 51.12

↑

↑

APPENDIX 3

INDUSTRY STANDARDS

Noise / Acoustics

- Noise separation becomes an important design issue when the building is located next to a source such as an airport or busy highway. Typical concrete elements are sufficiently massive to form effective elements in a sound insulation design.
- The sound transmission of a wall is largely determined by the performance of the windows and doors, and by the air tightness of the assembly. Windows and doors can be designed for improved sound insulation, but only if they are kept closed.
- An air barrier system will have a positive effect on the sound insulation of the assembly.
- A 100-mm (4-inch) thick concrete wall panel has an STC (sound transmission class) of 50, which is the minimum STC required between dwelling units by the National Building Code (NBC).
- Adding insulation and gypsum board raises the STC further, such that a precast concrete assembly can easily be designed to exceed this value.

Durability

- Concrete resists weathering, and prefabrication provides an opportunity for precast panels to be designed for long term durability.
- Durability issues to be considered include:
- freeze/thaw resistance of the concrete
 - weathering of the finish
 - corrosion of the reinforcing steel
 - joint sealant performance
 - glass etching from water runoff
 - access for maintenance

Wall & Floor Assembly Guide

Insulation for Sound & Fire Rated Assemblies

Sound Transmission Loss of Exterior Doors and Windows

<i>Door</i>	<i>Weather Strip</i>	<i>Normally closed STC</i>
Wood, flush solid core(1)	Brass	27
Wood, flush solid core(1)	Plastic	27
Steel, flush(2)	Magnetic	28

Door Construction Detail

(1) Flush solid core wood door	Width	1 -3/4"
	Weight	78lb, 3.9 lb/sq ft
(2) Flush steel door	Width	1 -3/4"
	Faces	0.028" steel, separated by plastic perimeter strip
	Core	Rigid polyurethane, 2 2-1/2" lb/cu.ft, foamed in place
	Weight	64lb, 3.2 lb/sq ft

Sound Transmission Loss of Windows

<i>Material</i>	<i>Type</i>	<i>Size</i>	<i>Glazing'</i>	<i>Sealed STC</i>	<i>Locked STC</i>	<i>Unlocked STC</i>
Wood	Double hung	3'x5'	ss	29		23
			ss-d	29		
			ds	29		
			ds-d	30		
	Fixed picture	6'x5'	ln-7/16"	28	26	22
			ss-d	28		
			ds	29		
			in-1"	34	STC	STC
Wood-plastic	Double hung		ss	29	26	26
			in-3/8"	26	26	25
	Storm sash		ds	30	27	
			in-3/8"	28	24	
	Fixed casement		ds	31		
					30	22
Aluminum	Sliding glass door		lam-3/16"	31	26	26
	Sliding		ss	28	24	
	Operable casement		ds	31	21	17
	Single hung		in-7/16"	30	27	25
	Single pane 1/4" laminated glass					34

'ss	=	single strength
ds	=	double strength
d	=	divided lights
in	=	insulating glass of indicated overall thickness
lam	=	laminated safety glass of indicated overall thickness

Taken from the U.S. Department of Commerce National Bureau of Standards Building Science Series 77.

* Information received in imperial units only

Wall & Floor Assembly Guide

Insulation for Sound & Fire Rated Assemblies

Sound Transmission Loss of Exterior Walls

<i>Exterior finish</i>	<i>Cavity Insulation</i>	<i>Resilient channel</i>	<i>STC</i>
Wood siding (1)	None	No	37
	3-1/2" PINK™ FIBERGLAS® Batt Insulation	No	39
	None	Yes	43
	3-1/2" PINK™ FIBERGLAS® Batt Insulation	Yes	47
Stucco (2)	3-1/2" PINK™ FIBERGLAS® Batt Insulation	No	46
	None	Yes	49
	3-1/2" PINK™ FIBERGLAS® Batt Insulation	Yes	57
Brick veneer (3)	3-1/2" PINK™ FIBERGLAS® Batt Insulation	No	56
	None	Yes	54
	3-1/2" PINK™ FIBERGLAS® Batt Insulation	Yes	58
Concrete block	None	No	45

Wall construction details

Wood siding (1)	Framing	2"x4" wood studs, (16" o.c.)
	Sheathing	1/2" wood fiberboard insulation nailed to studs
	Siding	5/8"x10" redwood nailed through sheathing into studs
	Interior	1/2" gypsum board screwed to studs or to metal resilient channels which were attached to the studs
Stucco (2)	Framing	2"x4" woods studs, (16" o.c.)
	Sheathing	None
	Stucco	No. 15 felt building and 1" wire mesh nailed to studs. Stucco Applied in 3 coats to 7/8" total thickness. Dry weight of Stucco 7.9 lb/sq ft
	Interior	1/2" gypsum board screwed to studs or resilient channel
Brick veneer (3)	Framing	2"x4" wood studs, (16" o.c.)
	Sheathing	3/4" wood fiberboard insulation
	Brick	standard face brick 3-1/2" wide, spaced 1/2" out from sheathing with metal ties nailed through sheathing into studs. Dry weight of brick and mortar 41 lb/sq ft .
	Interior	1/2" gypsum board screwed to studs or resilient channel

Taken from the U.S. Department of Commerce National Bureau of Standards Building Science Series 77.

* Information received in imperial units only

Insulating Glass (Table 2)

Glass Makeup			Frequency in Hertz (Hz)																			STC
			100	125	160	200	250	315	400	500	650	800	1000	1250	1600	2000	2500	3150	4000	5000		
Sound Transmission Loss (dB)																						
Glass Ply	Air Space	Glass Ply																				
1/8" 3 mm	1/4" 6 mm	1/8" 3 mm	26	21	23	23	26	21	19	24	27	30	33	36	40	44	46	39	34	45	28	
1/8" 3 mm	3/8" 9 mm	1/8" 3 mm	26	23	23	20	23	19	23	27	29	32	35	39	44	47	48	41	36	43	31	
1/4" 6 mm	1/2" 13 mm	1/4" 6 mm	27	24	29	22	22	25	30	33	35	38	40	42	42	37	37	43	46	49	35	
1/4" 6 mm	1/2" 13 mm	5/16" 8 mm	28	29	33	29	29	32	36	37	40	43	42	43	42	37	40	44	48	53	40	
1/4" 6 mm	1/2" 13 mm	3/8" 10 mm	28	26	32	29	29	31	35	37	38	39	41	43	41	40	41	44	47	49	39	
5/16" 8 mm	1/2" 13 mm	5/16" 8 mm	26	24	25	31	24	32	32	35	37	39	39	38	36	38	42	44	46	49	37	
1/4" 6 mm	3/4" 19 mm	1/4" 6 mm	27	23	28	21	27	29	34	35	37	41	43	45	44	39	39	46	49	52	38	
1/4" 6 mm	1" 25 mm	1/4" 6 mm	22	19	27	23	31	30	35	35	36	39	41	42	41	36	37	46	51	56	37	

Laminated Insulating Glass (Table 3)

Glass Makeup					Frequency in Hertz (Hz)																		STC
					100	125	160	200	250	315	400	500	650	800	1000	1250	1600	2000	2500	3150	4000	5000	
Sound Transmission Loss (dB)																							
Glass Ply	Air Space	Glass Ply	PVB*	Glass Ply																			
3/16" 5 mm	3/8" 9 mm	1/8" 3 mm	.030" .76 mm	1/8" 3 mm	27	27	26	24	22	28	32	35	38	38	39	40	42	43	41	45	52	57	37
3/16" 5 mm	1/2" 13 mm	1/8" 3 mm	.030" .76 mm	1/8" 3 mm	26	23	25	23	27	31	34	36	38	39	41	43	45	46	43	49	55	55	39
1/4" 6 mm	1/2" 13 mm	1/8" 3 mm	.030" .76 mm	1/8" 3 mm	28	20	29	24	26	30	34	36	39	42	43	44	44	41	40	47	52	56	39
1/4" 6 mm	1/2" 13 mm	1/4" 6 mm	.030" .76 mm	1/8" 3 mm	28	17	28	29	33	34	38	40	40	41	41	41	41	40	43	49	54	58	40
1/4" 6 mm	1/2" 13 mm	3/16" 5 mm	.060" 1.52 mm	3/16" 5 mm	30	29	31	28	31	34	37	39	41	42	44	46	45	44	47	52	55	60	42
1/4" 6 mm	1/2" 13 mm	1/4" 6 mm	.030" .76 mm	1/4" 6 mm	31	29	32	30	32	35	38	40	40	42	44	46	47	46	47	52	56	61	43
5/16" 8 mm	5/8" 16 mm	3/16" 5 mm	.060" 1.52 mm	3/16" 5 mm	28	28	34	36	33	40	41	42	43	43	42	40	40	43	49	53	57	61	43
1/4" 6 mm	3/4" 19 mm	3/16" 5 mm	.060" 1.52 mm	3/16" 5 mm	28	26	32	30	35	37	40	41	43	44	45	47	47	44	47	53	57	60	44
1/4" 6 mm	3/4" 19 mm	1/4" 6 mm	.060" 1.52 mm	1/4" 6 mm	28	29	36	32	34	39	41	41	41	43	44	45	45	46	47	52	56	61	44
3/8" 10 mm	3/4" 19 mm	1/4" 6 mm	.060" 1.52 mm	1/4" 6 mm	25	31	38	33	37	39	42	43	43	42	40	40	41	56	50	55	58	61	43

Data based on testing 36" x 84" glass in an acoustical wall. Glass size and glazing system will affect STC rating.
 *PVB (polyvinyl butyral) interlayer