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## Environmental Noise Control Study

Proposed Residential Buildings  
21 Withrow Avenue - Ottawa

Prepared For

Theberge Homes

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Report: PG4239-1R

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## 1.0 Introduction

Paterson Group (Paterson) was commissioned by Theberge Homes to conduct an environmental noise control study for the proposed residential buildings to be located at 21 Withrow Avenue, 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 several low-rise residential buildings with associated parking and landscaped areas. It is assumed that each building will consist of a two storey structure with a basement level.

### 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	

<b>Table 2 - Sound Level Limits for Indoor Living Area</b>			
<b>Type of Space</b>	<b>Time Period</b>	<b>Required <math>L_{eq}</math> (dBA)</b>	
		<b>Road</b>	<b>Rail</b>
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 pane of glass. 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:

<b>Table 3 - Warning Clauses for Sound Level Exceedances</b>	
<b>Warning Clause</b>	<b>Description</b>
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.

The impact of stationary noise sources are directly related to the location of the subject site within the urban environment. The proposed development can be classified as Class 2 by provincial guidelines and outlined in the ENGCG, meaning "a suburban areas of the City outside of the busy core where the urban hum is evident but within the urban boundary."

Table 4 - Guidelines for Stationary Noise - Class 2		
Time of Day	Outdoor Point of Reception	Pane of Window
7:00-19:00	50	50
19:00-23:00	45	50
23:00-7:00	-	45
<input type="checkbox"/> Standards taken from Table 3.2a; Guidelines for Stationary Noise - Steady and Varying Sound		

Due to the location of the subject site, an analysis of stationary noise is not required.

### **Aircraft/Airport Noise**

Aircraft noise is distinct, as it is typically low frequency for longer durations. The sound level may also differ between different types of aircraft. Due to the location of the subject site, an analysis of aircraft/airport noise is not required.

## 4.0 Analysis

The proposed development is bordered to the south by Withrow Avenue, and to the north, east and west by residential buildings. Rita Avenue intersects with the subject property along the west property line.

Based on the City of Ottawa Official Plan, Schedule E, Withrow Avenue is classified as a 2 lane urban collector (2-UCU). The remainder of the roads within the 100 m radius include St. Helen's Place, Rossland Avenue, Cleto Avenue, Rita Avenue and Tower Road. However, Schedule E does not classify these roads as either an arterial, collector or major collector road. Noise sources are presented on Paterson Drawing PG4239-1 - Site Plan, located in Appendix 1.

There are no stationary noise sources or aircraft noise within the influence area for this subject site.

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.

<b>Table 5 - Traffic and Road Parameters</b>						
<b>Road</b>	<b>Implied Roadway</b>	<b>AADT (Veh/day)</b>	<b>Posted Speed (km/h)</b>	<b>Day/Night Split %</b>	<b>Medium Truck %</b>	<b>Heavy Truck %</b>
Withrow Avenue	2-UCU	8000	40	92/8	7	5
<input type="checkbox"/> Data obtained from the City of Ottawa document ENCG						

There were several reception points that were considered for a thorough analysis of the proposed residential development. No Outdoor Living Areas (OLA) were noted on the site plan. However, due to the nature of the proposed residential development, exterior reception points throughout the property were also analyzed. The analysis is completed so that no effects of sound reflection off of the building facade is considered, as stipulated by the ENCG.



Additional reception points were selected at the bedroom windows at different elevations. For this analysis, a reception point was taken at the centre of the window pane, at the ground level and at the second floor. Reception points are noted on Paterson Drawing PG4239-2 - Receptor Locations, located in Appendix 1.

Table 8 - Summary of Reception Points and Geometry, located in Appendix 1, provides a summary of the points of reception and their geometry with respect to the noise sources.

The analysis 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 can be located in Appendix 2, and the summary of the results can be noted in Table 6.

<b>Table 6 - Proposed Noise Levels</b>				
<b>Reception Point</b>	<b>Description</b>	<b>Outdoor Area <math>L_{EQ(16)}</math> (dBA)</b>	<b>Daytime at Facade <math>L_{EQ(16)}</math> (dBA)</b>	<b>Nighttime at Facade <math>L_{eq(8)}</math> (dBA)</b>
REC 1-1	Southern Property Line - ground floor	--	62.44	54.85
REC 1-2	Southern Property Line - second floor	--	62.58	54.99
REC 2-1	Centre of property - ground floor	--	52.35	44.75
REC 2-2	Centre of property - second floor	--	52.91	45.32
REC 3-1	Southeastern Property Line - ground floor	--	52.12	44.53
REC 3-2	Southeastern Property Line - second floor	--	52.67	45.07
REC 4-1	Northern Property Portion - ground floor	--	46.7	39.11
REC 4-2	Northern Property Portion - second floor	--	47.59	39.99
REC 5-0	Rear yard - eastern edge of property	54.73	—	--
REC 6-0	Rear yard - western edge of property	52.99	—	--
REC 7-0	Rear yard - northeastern edge of property	45.75	--	--

## 6.0 Discussion and Recommendations

### 6.1 Outdoor Living Areas

There were no outdoor living areas identified on the proposed development. However, the rear yards are of sufficient size to be analyzed. Three (3) reception points were located within the rear yards. This location was completed as a “free-field” sound level, so it is not affected by the presence of the building under assessment. The results of the STAMSON modeling indicates that the maximum  $L_{eq(16)}$  from all sources will be 54.73 dBA, located at the western property edge, in the rear yard. This value is below the 55 dBA that was specified in Table 1, and therefore no noise attenuation measures are required.

### 6.2 Indoor Living Areas and Ventilation

The results of the STAMSON modelling indicates that the  $L_{eq(16)}$  ranges between 62.58 dBA and 46.70 dBA. Several values exceed the limit of 55 dBA as specified by the ENCG and therefore warning clauses will be required to be stated on any property titles. The applicable warning clauses are summarized in Table 7.

Table 7 - Summary of Warning Clauses		
Elevation	Applicable Warning Clause	Additional Considerations
Residential Buildings fronting Withrow Avenue	Warning Clause Type C	All units must be equipped with a central air conditioning system, reducing the need to open windows.

The houses fronting Withrow Avenue exceeds the required limit of 55 dBA, but is less than 65 dBA. Therefore, the inclusion of the aforementioned warning clause is sufficient. No further analysis of building materials or construction methods are required.

## 7.0 Conclusion

The subject site is located at 21 Withrow Avenue. It is understood that the proposed development will consist of several low-rise residential buildings with associated parking and landscaped areas. It is assumed that each building will consist of a two storey structure with a basement level. The site layout indicated that there would be several rows of houses, surrounded to the east and west by existing buildings, and fronting directly onto Withrow Avenue.

Several reception points were selected for the analysis, consisting of pane of glass reception points on both the first and second level and the rear yards.

The buildings fronting directly onto Withrow Avenue had pane of glass reception points that exceeded the 55 dBA guideline specified by the ENCG. Therefore, a warning clause will be required for these units. It is calculated that the noise level of all reception points are below the 65 dBA threshold for nighttime noise and therefore no additional analysis will be required.

Three (3) outdoor living areas were analyzed for this development, all in the rear yards at varying distances from Withrow Avenue. It was noted that the reception points in the rear yards were below the 55 dBA guideline and is considered acceptable for an outdoor living area.

## 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 the Theberge Homes 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.



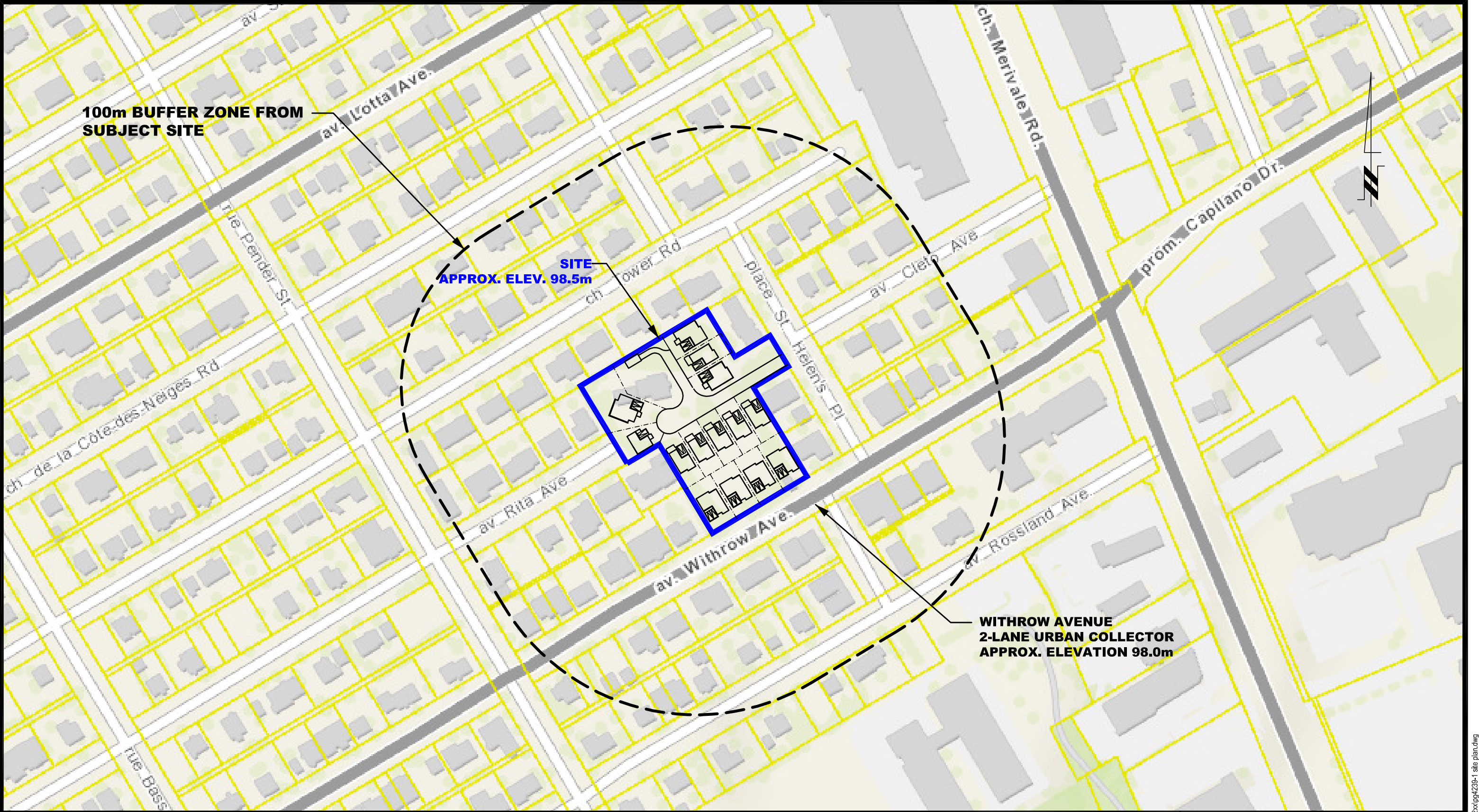
David J. Gilbert, P.Eng.



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Table 8 - Summary of Reception Points and Geometry 21 Withrow Avenue									
Point of Reception	Location	Leq Day (dBA)	Withrow Avenue						
			Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Barrier Height (m)	Distance (m)	Rows of Houses
REC 1-1	Southern property line, ground floor	62.44	15	1.5	15.07481	-85, 83	n/a	n/a	n/a
REC 1-2	Southern property line, second floor	62.58	15	4.5	15.66046	-85, 83	n/a	n/a	n/a
REC 2-1	Centre of property, ground floor	52.35	48	1.5	48.02343	-71, -35	7.5	20	1
						-35, 57	n/a	n/a	n/a
						57, 72	7.5	60	1
REC 2-2	Centre of property, second floor	52.91	48	4.5	48.21048	-71, -35	7.5	20	1
						-35, 57	n/a	n/a	n/a
						57, 72	7.5	60	1
REC 3-1	Centre of property, ground floor	52.12	48	1.5	48.02343	-75.5, -64.4	7.5	64	1
						-64.4, 26	n/a	n/a	n/a
						26, 67.5	7.5	40	1
REC 3-2	Centre of property, second floor	52.67	48	4.5	48.21048	-75.5, -64.4	7.5	64	1
						-64.4, 26	n/a	n/a	n/a
						26, 67.5	7.5	40	1
REC 4-1	Northern property portion, ground floor	46.7	80	1.5	80.01406	-57.5, -12.5	7.5	20	2
						-12.5, 41.7	n/a	n/a	n/a
						41.7, 62.7	7.5	90	2
REC 4-2	Northern portion of property, second floor	47.59	80	4.5	80.12646	-57.5, -12.5	7.5	20	2
						-12.5, 41.7	n/a	n/a	n/a
						41.7, 62.7	7.5	90	2
REC 5-0	Backyard, centre of property	54.73	35	1	35.01428	-75, -30	7.5	30	1
						-30, 69	n/a	n/a	n/a
						69, 75	7.5	65	1
REC 6-0	Backyard, centre of property	52.99	35	1	35.01428	-79, -72	7.5	68	1
						-72, 36	n/a	n/a	n/a
						36, 73	7.5	25	1
REC 7-0	Backyard, western portion of property	45.75	85	1	85.00588	-79, -72	7.5	20	2
						-72, 36	n/a	n/a	n/a
						36, 73	7.5	60	2



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21 WITHROW AVENUE

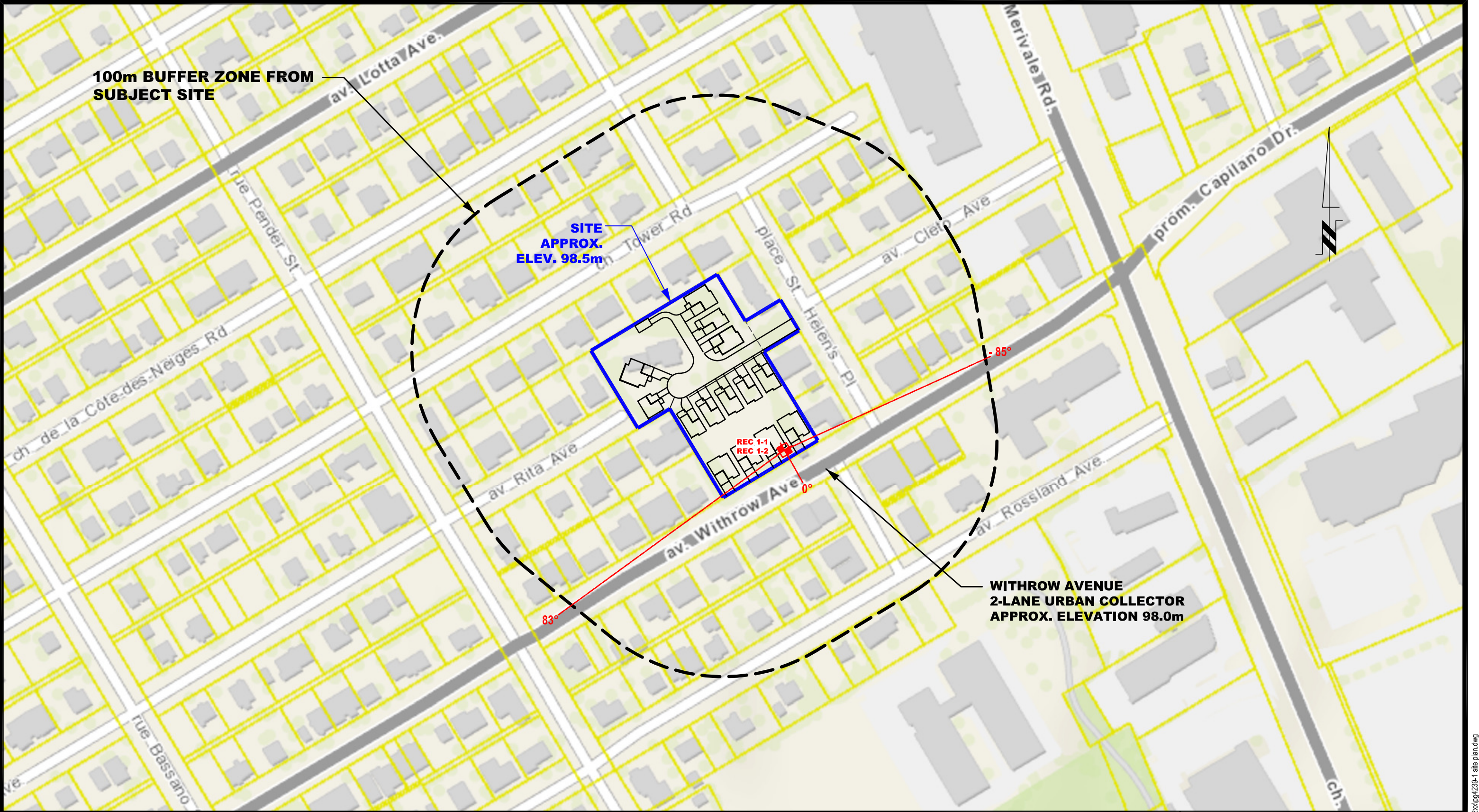
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**SITE PLAN**

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Approved by:	DJG

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Dwg. No.:	<b>PG4239-1</b>
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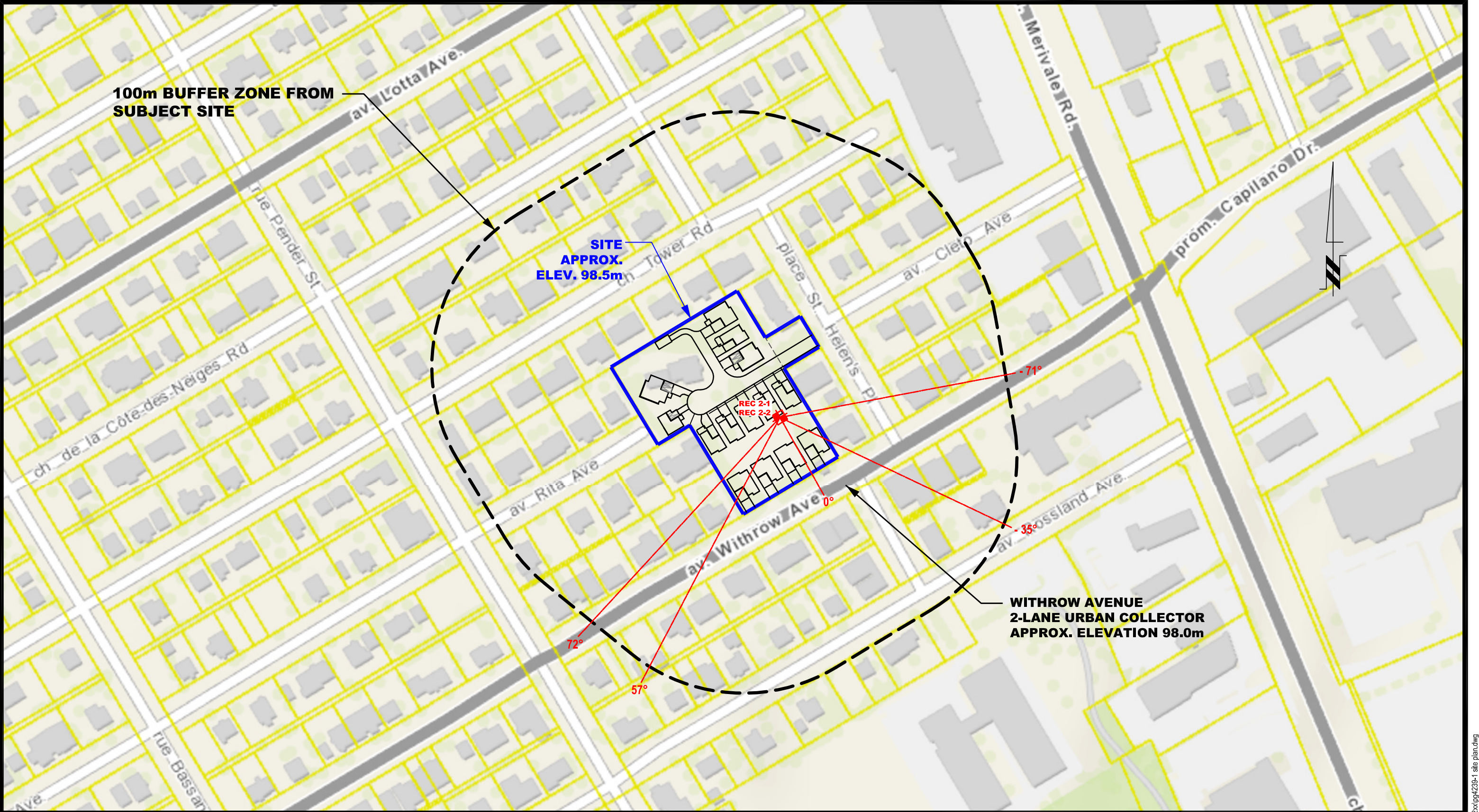
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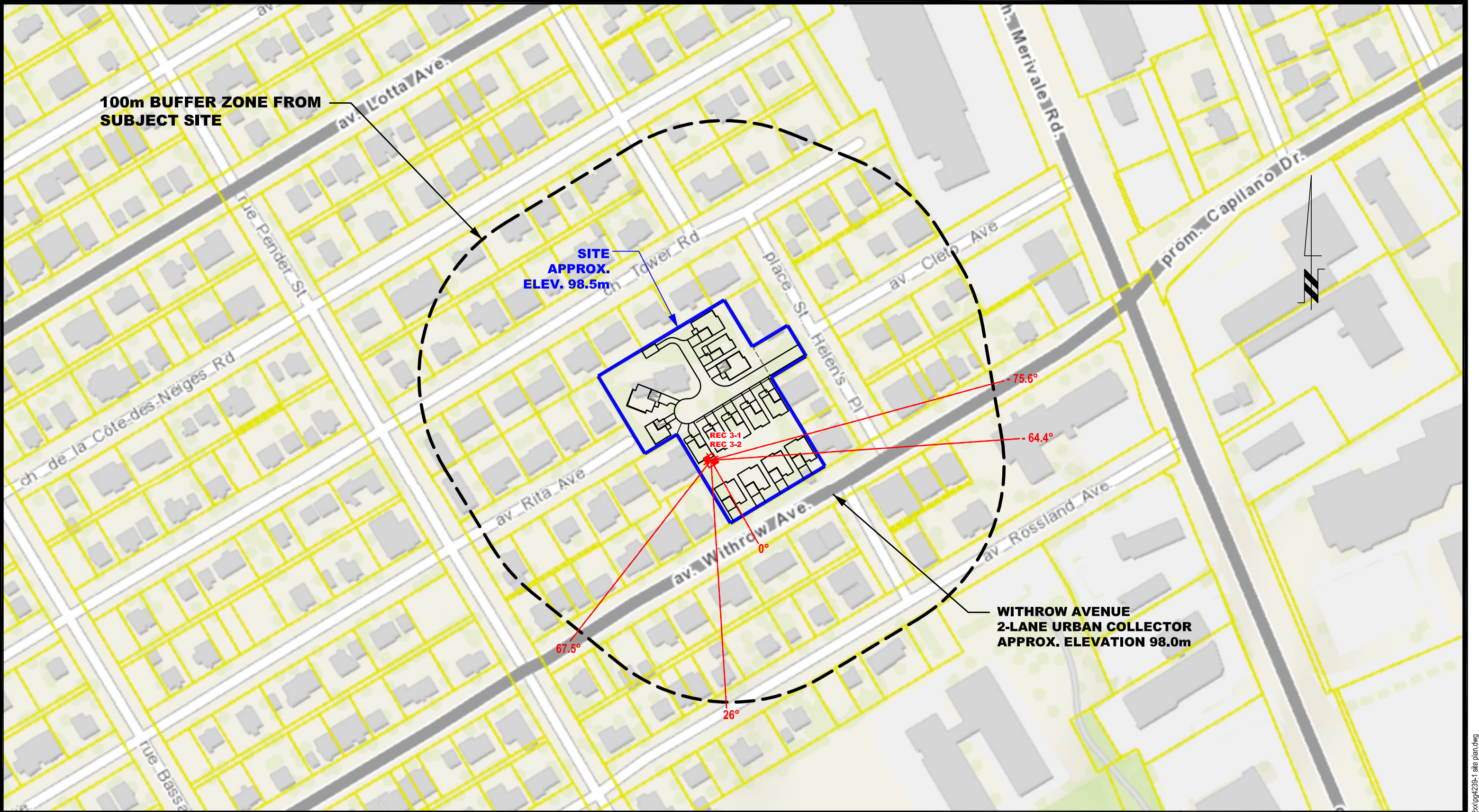
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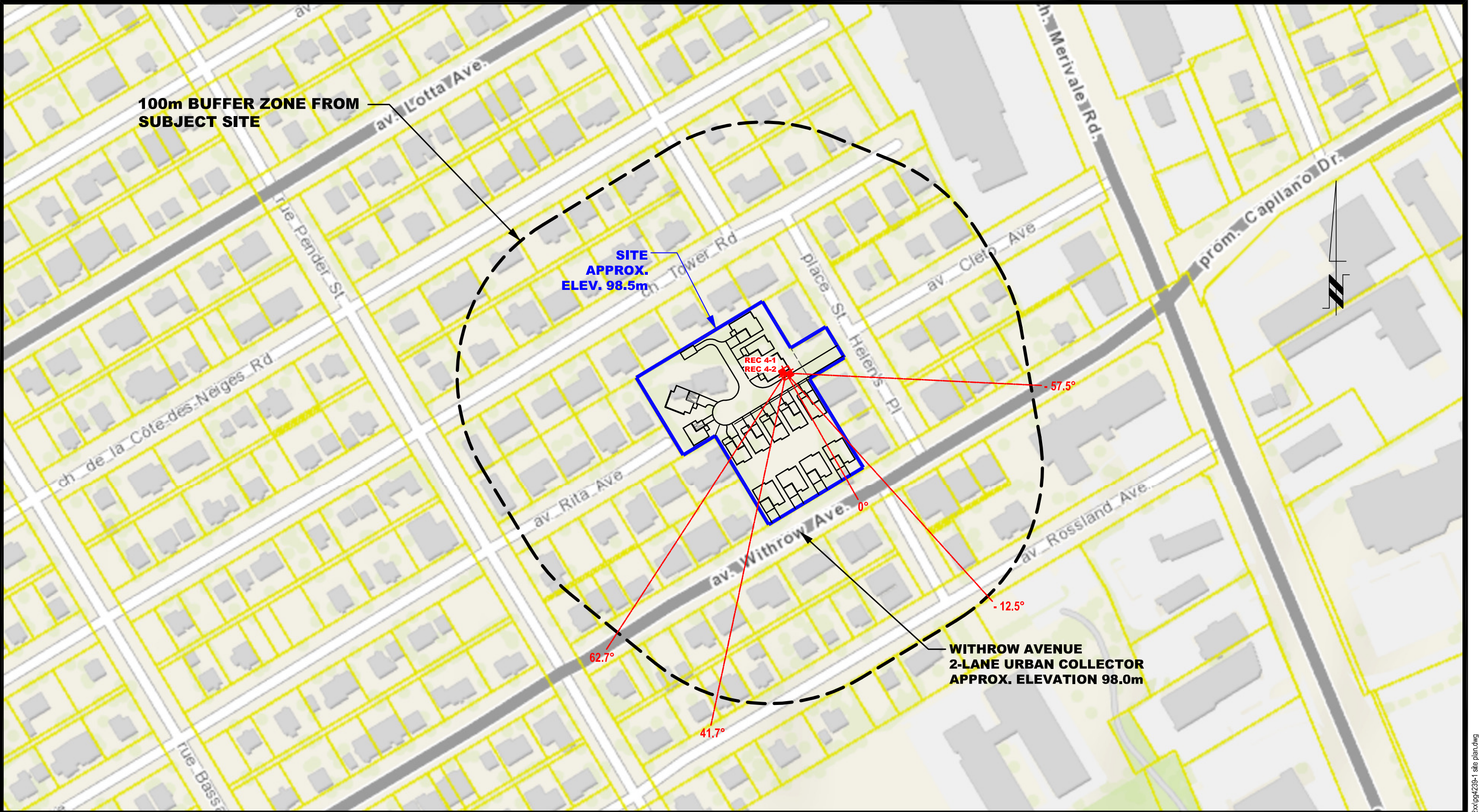
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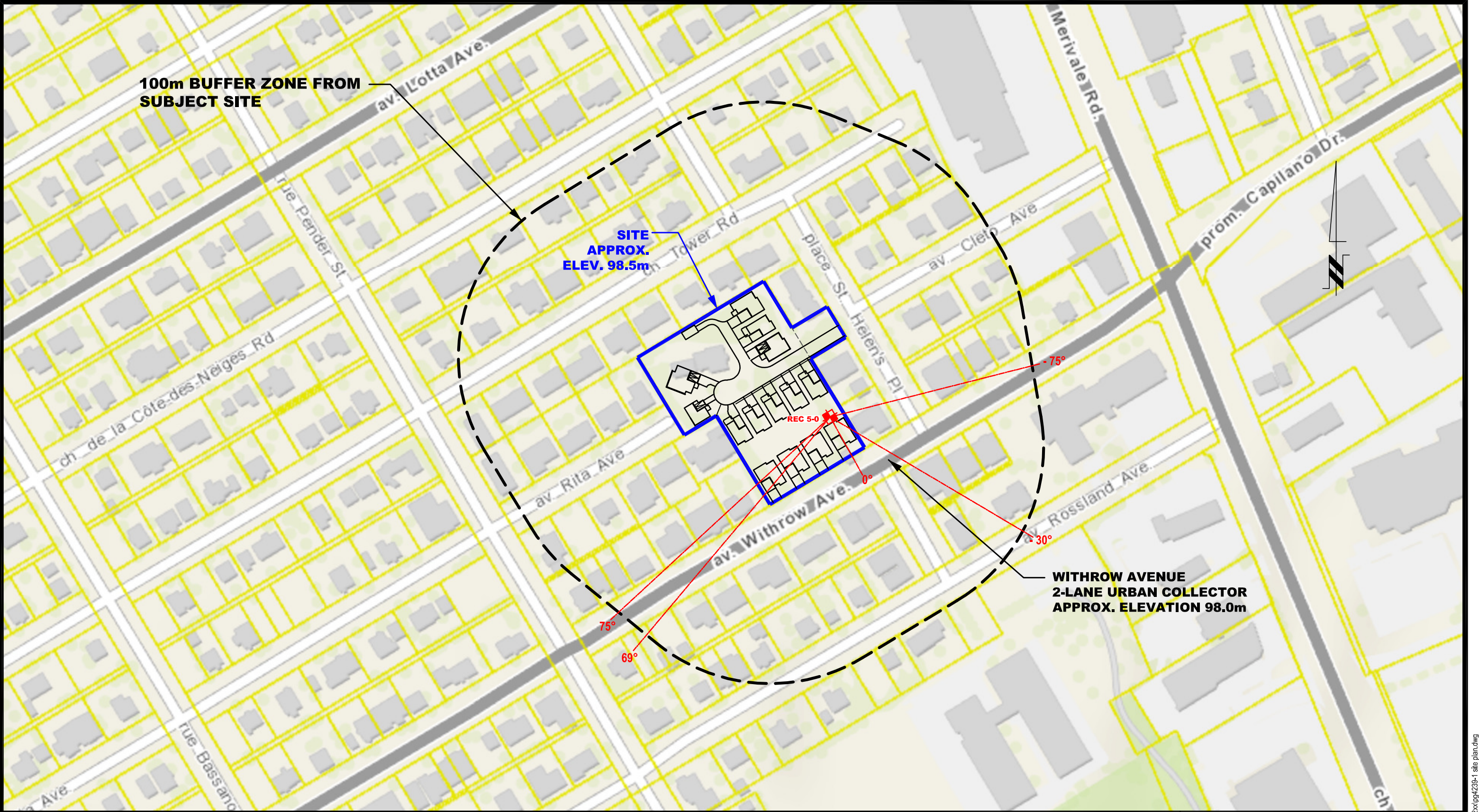
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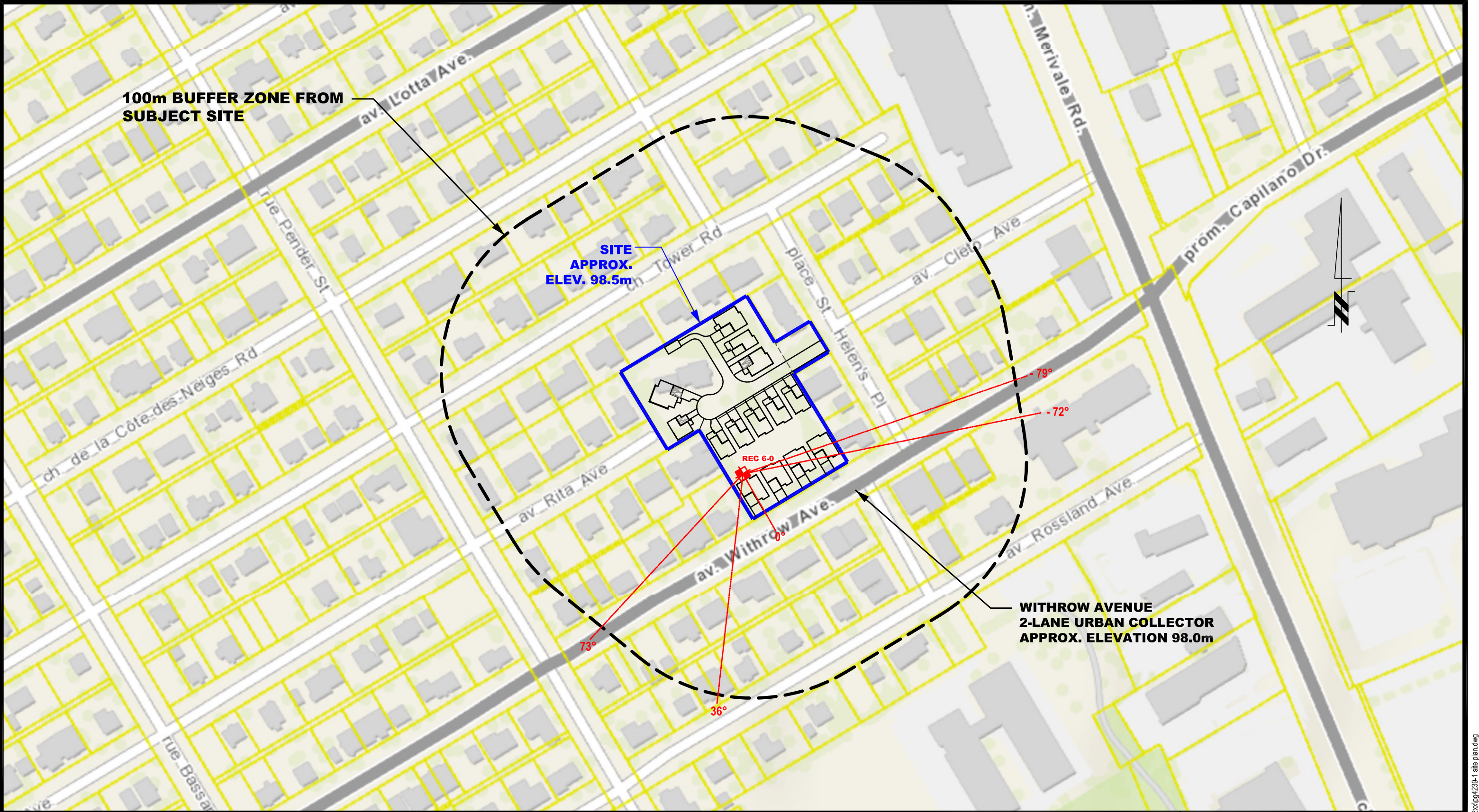
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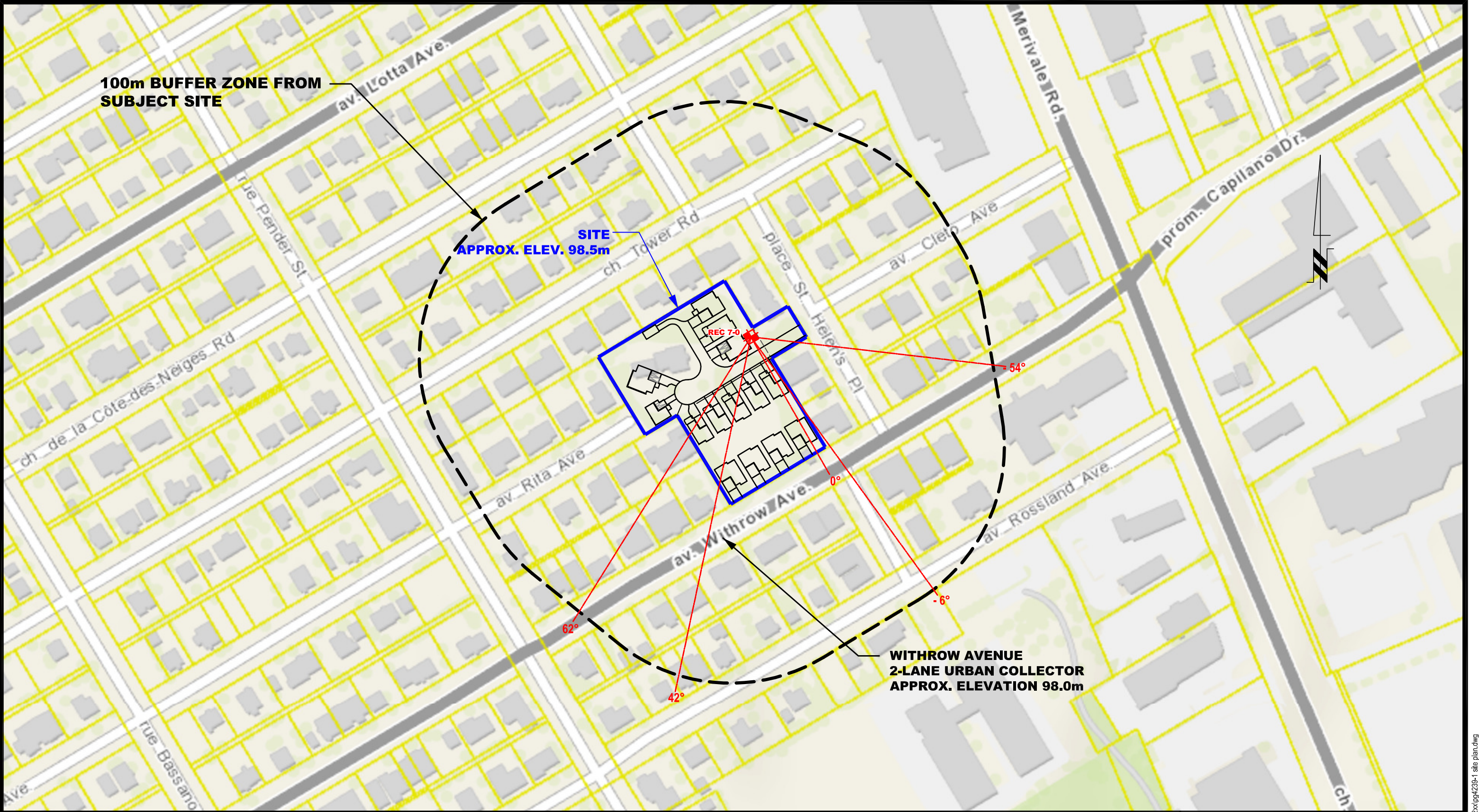
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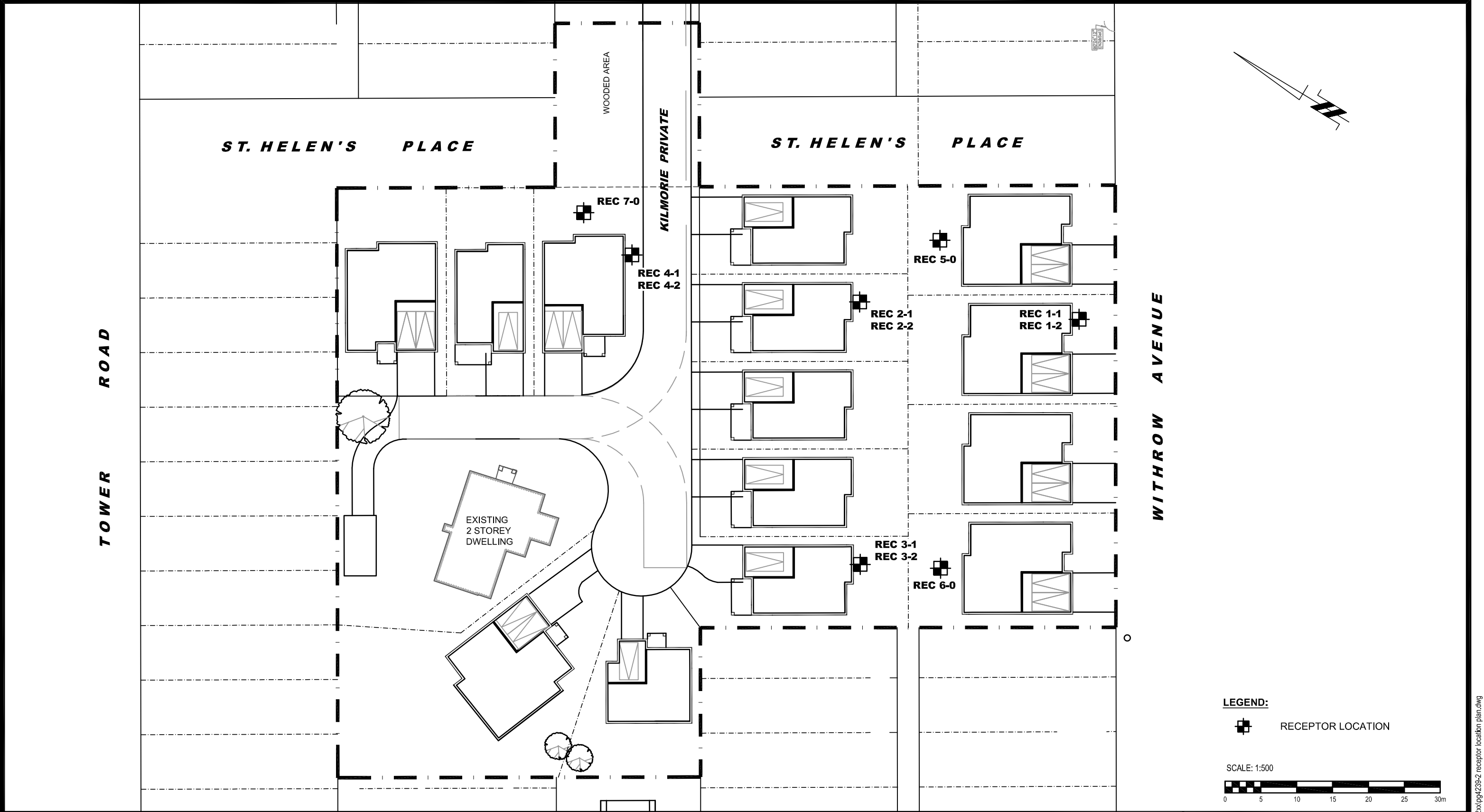
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RECEPTOR LOCATION PLAN

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# **APPENDIX 1**

## **TABLE 8 - SUMMARY OF RECEPTION POINTS AND GEOMETRY**

### **DRAWING PG4239-1 - SITE PLAN**

**DRAWING PG4239-1A - SITE GEOMETRY (REC 1-1 AND REC 1-2)**

**DRAWING PG4239-1B - SITE GEOMETRY (REC 2-1 AND REC 2-2)**

**DRAWING PG4239-1C - SITE GEOMETRY (REC 3-1 AND REC 3-2)**

**DRAWING PG4239-1D - SITE GEOMETRY (REC 4-1 AND REC 4-2)**

**DRAWING PG4239-1E - SITE GEOMETRY (REC 5-0)**

**DRAWING PG4239-1F - SITE GEOMETRY (REC 6-0)**

**DRAWING PG4239-1G - SITE GEOMETRY (REC 7-0)**

**DRAWING PG4239-2 - RECEPTOR LOCATIONS**



# **APPENDIX 2**

## **STAMSON RESULTS**

Filename: rec11R.te Time Period: Day/Night 16/8 hours  
 Description: Reception Point 1-1 Revision 1

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

-----  
 Car traffic volume : 6477/563 veh/TimePeriod \*  
 Medium truck volume : 515/45 veh/TimePeriod \*  
 Heavy truck volume : 368/32 veh/TimePeriod \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

-----  
 Angle1 Angle2 : -85.00 deg 83.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive 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: Withrow (day)

Source height = 1.50 m

ROAD (0.00 + 62.44 + 0.00) = 62.44 dBA  

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-85	83	0.66	63.96	0.00	0.00	-1.51	0.00	0.00	0.00	62.44

Segment Leq : 62.44 dBA

Total Leq All Segments: 62.44 dBA

♀  
 Results segment # 1: Withrow (night)

Source height = 1.50 m

ROAD (0.00 + 54.85 + 0.00) = 54.85 dBA  

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-85	83	0.66	56.36	0.00	0.00	-1.51	0.00	0.00	0.00	54.85

REC11R.TXT

Segment Leq : 54.85 dBA

Total Leq All Segments: 54.85 dBA

♀  
†

TOTAL Leq FROM ALL SOURCES (DAY): 62.44  
(NIGHT): 54.85

♀  
†

Filename: rec12R.te Time Period: Day/Night 16/8 hours  
 Description: Reception Point 1-2 Revision 1

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

-----  
 Car traffic volume : 6477/563 veh/TimePeriod \*  
 Medium truck volume : 515/45 veh/TimePeriod \*  
 Heavy truck volume : 368/32 veh/TimePeriod \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

-----  
 Angle1 Angle2 : -85.00 deg 83.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 15.00 / 15.00 m  
 Receiver height : 4.50 / 4.50 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Reference angle : 0.00

♀  
 Results segment # 1: Withrow (day)

Source height = 1.50 m

ROAD (0.00 + 62.58 + 0.00) = 62.58 dBA  

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-85	83	0.57	63.96	0.00	0.00	-1.37	0.00	0.00	0.00	62.58

 -----

Segment Leq : 62.58 dBA

Total Leq All Segments: 62.58 dBA

♀  
 Results segment # 1: Withrow (night)

Source height = 1.50 m

ROAD (0.00 + 54.99 + 0.00) = 54.99 dBA  

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-85	83	0.57	56.36	0.00	0.00	-1.37	0.00	0.00	0.00	54.99

 -----

REC12R.TXT

Segment Leq : 54.99 dBA

Total Leq All Segments: 54.99 dBA

♀  
†

TOTAL Leq FROM ALL SOURCES (DAY): 62.58  
(NIGHT): 54.99

♀  
†

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

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

-----  
 Car traffic volume : 6477/563    veh/TimePeriod    \*  
 Medium truck volume : 515/45    veh/TimePeriod    \*  
 Heavy truck volume : 368/32    veh/TimePeriod    \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

-----  
 Angle1    Angle2 : -71.00 deg    -35.00 deg  
 Wood depth : 0    (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1    (Absorptive ground surface)  
 Receiver source distance : 48.00 / 48.00 m  
 Receiver height : 1.50 / 1.50 m  
 Topography : 2    (Flat/gentle slope; with barrier)  
 Barrier angle1 : -71.00 deg    Angle2 : -35.00 deg  
 Barrier height : 7.50 m  
 Barrier receiver distance : 20.00 / 20.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

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

-----  
 Car traffic volume : 6477/563    veh/TimePeriod    \*  
 Medium truck volume : 515/45    veh/TimePeriod    \*  
 Heavy truck volume : 368/32    veh/TimePeriod    \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

REC21R.TXT

```

Angle1  Angle2      : -35.00 deg   57.00 deg
Wood depth      :      0          (No woods.)
No of house rows :      0 / 0
Surface         :      1          (Absorptive ground surface)
Receiver source distance : 48.00 / 48.00 m
Receiver height  :      1.50 / 1.50 m
Topography      :      1          (Flat/gentle slope; no barrier)
Reference angle  :      0.00
  
```

♀  
 Road data, segment # 3: Withrow (day/night)

```

-----
Car traffic volume : 6477/563   veh/TimePeriod  *
Medium truck volume : 515/45    veh/TimePeriod  *
Heavy truck volume : 368/32     veh/TimePeriod  *
Posted speed limit : 40 km/h
Road gradient      : 0 %
Road pavement     : 1 (Typical asphalt or concrete)
  
```

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

```

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth         : 0.00
Number of Years of Growth           : 0.00
Medium Truck % of Total Volume      : 7.00
Heavy Truck % of Total Volume       : 5.00
Day (16 hrs) % of Total Volume      : 92.00
  
```

Data for Segment # 3: Withrow (day/night)

```

-----
Angle1  Angle2      : 57.00 deg   72.00 deg
Wood depth      :      0          (No woods.)
No of house rows :      0 / 0
Surface         :      1          (Absorptive ground surface)
Receiver source distance : 48.00 / 48.00 m
Receiver height  :      1.50 / 1.50 m
Topography      :      2          (Flat/gentle slope; with barrier)
Barrier angle1   : 57.00 deg   Angle2 : 72.00 deg
Barrier height   : 7.50 m
Barrier receiver distance : 47.00 / 47.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle  : 0.00
  
```

♀  
 Results segment # 1: Withrow (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	1.50	1.50

ROAD (0.00 + 33.47 + 0.00) = 33.47 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-71	-35	0.21	63.96	0.00	-6.11	-7.49	0.00	0.00	-16.88	33.47

# REC21R.TXT

Segment Leq : 33.47 dBA

♀

Results segment # 2: Withrow (day)

Source height = 1.50 m

ROAD (0.00 + 52.28 + 0.00) = 52.28 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	57	0.66	63.96	0.00	-8.39	-3.29	0.00	0.00	0.00	52.28

Segment Leq : 52.28 dBA

♀

Results segment # 3: Withrow (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	1.50	1.50

ROAD (0.00 + 26.27 + 0.00) = 26.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
57	72	0.21	63.96	0.00	-6.11	-11.57	0.00	0.00	-20.00	26.27

Segment Leq : 26.27 dBA

Total Leq All Segments: 52.35 dBA

♀

Results segment # 1: Withrow (night)

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	1.50	1.50

ROAD (0.00 + 25.88 + 0.00) = 25.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-71	-35	0.21	56.36	0.00	-6.11	-7.49	0.00	0.00	-16.88	25.88

Segment Leq : 25.88 dBA

♀

Results segment # 2: Withrow (night)



-----  
 Source height = 1.50 m

ROAD (0.00 + 44.68 + 0.00) = 44.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	57	0.66	56.36	0.00	-8.39	-3.29	0.00	0.00	0.00	44.68

-----

Segment Leq : 44.68 dBA

♀

Results segment # 3: Withrow (night)

-----

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	1.50	1.50

ROAD (0.00 + 18.68 + 0.00) = 18.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
57	72	0.21	56.36	0.00	-6.11	-11.57	0.00	0.00	-20.00	18.68

-----

Segment Leq : 18.68 dBA

Total Leq All Segments: 44.75 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 52.35  
 (NIGHT): 44.75

♀  
 ♀

Filename: rec22.te Time Period: Day/Night 16/8 hours  
 Description: Reception Point 2-2 Revision 1

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

-----  
 Car traffic volume : 6477/563 veh/TimePeriod \*  
 Medium truck volume : 515/45 veh/TimePeriod \*  
 Heavy truck volume : 368/32 veh/TimePeriod \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

-----  
 Angle1 Angle2 : -71.00 deg -35.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 48.00 / 48.00 m  
 Receiver height : 4.50 / 4.50 m  
 Topography : 2 (Flat/gentle slope; with barrier)  
 Barrier angle1 : -71.00 deg Angle2 : -35.00 deg  
 Barrier height : 7.50 m  
 Barrier receiver distance : 20.00 / 20.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

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

-----  
 Car traffic volume : 6477/563 veh/TimePeriod \*  
 Medium truck volume : 515/45 veh/TimePeriod \*  
 Heavy truck volume : 368/32 veh/TimePeriod \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

REC22R.TXT

```

Angle1  Angle2      : -35.00 deg   57.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 48.00 / 48.00 m
Receiver height  : 4.50 / 4.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00
  
```

♀

Road data, segment # 3: Withrow (day/night)

```

-----
Car traffic volume : 6477/563   veh/TimePeriod  *
Medium truck volume : 515/45    veh/TimePeriod  *
Heavy truck volume  : 368/32     veh/TimePeriod  *
Posted speed limit  : 40 km/h
Road gradient       : 0 %
Road pavement       : 1 (Typical asphalt or concrete)
  
```

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

```

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth         : 0.00
Number of Years of Growth           : 0.00
Medium Truck % of Total Volume      : 7.00
Heavy Truck % of Total Volume       : 5.00
Day (16 hrs) % of Total Volume      : 92.00
  
```

Data for Segment # 3: Withrow (day/night)

```

-----
Angle1  Angle2      : 57.00 deg   72.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 48.00 / 48.00 m
Receiver height  : 4.50 / 4.50 m
Topography      :      2      (Flat/gentle slope; with barrier)
Barrier angle1   : 57.00 deg   Angle2 : 72.00 deg
Barrier height   : 7.50 m
Barrier receiver distance : 47.00 / 47.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle  : 0.00
  
```

♀

Results segment # 1: Withrow (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	4.50	3.25	3.25

ROAD (0.00 + 37.02 + 0.00) = 37.02 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-71	-35	0.12	63.96	0.00	-5.66	-7.28	0.00	0.00	-13.99	37.02

Segment Leq : 37.02 dBA

♀

Results segment # 2: Withrow (day)

Source height = 1.50 m

ROAD (0.00 + 52.78 + 0.00) = 52.78 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	57	0.57	63.96	0.00	-7.93	-3.24	0.00	0.00	0.00	52.78

Segment Leq : 52.78 dBA

♀

Results segment # 3: Withrow (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	4.50	1.56	1.56

ROAD (0.00 + 27.08 + 0.00) = 27.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
57	72	0.12	63.96	0.00	-5.66	-11.24	0.00	0.00	-19.97	27.08

Segment Leq : 27.08 dBA

Total Leq All Segments: 52.91 dBA

♀

Results segment # 1: Withrow (night)

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	4.50	3.25	3.25

ROAD (0.00 + 29.43 + 0.00) = 29.43 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-71	-35	0.12	56.36	0.00	-5.66	-7.28	0.00	0.00	-13.99	29.43

Segment Leq : 29.43 dBA

♀

Results segment # 2: Withrow (night)



Filename: rec31r.te                      Time Period: Day/Night 16/8 hours  
 Description: Reception Point 3-1 Revision 1

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

-----  
 Car traffic volume : 6477/563    veh/TimePeriod    \*  
 Medium truck volume : 515/45    veh/TimePeriod    \*  
 Heavy truck volume : 368/32    veh/TimePeriod    \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

-----  
 Angle1    Angle2                      : -76.00 deg    -64.00 deg  
 Wood depth : 0    (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1    (Absorptive ground surface)  
 Receiver source distance : 48.00 / 48.00 m  
 Receiver height : 1.50 / 1.50 m  
 Topography : 2    (Flat/gentle slope; with barrier)  
 Barrier angle1 : -76.00 deg    Angle2 : -64.00 deg  
 Barrier height : 7.50 m  
 Barrier receiver distance : 47.00 / 47.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

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

-----  
 Car traffic volume : 6477/563    veh/TimePeriod    \*  
 Medium truck volume : 515/45    veh/TimePeriod    \*  
 Heavy truck volume : 368/32    veh/TimePeriod    \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

REC31R.TXT

```

Angle1  Angle2      : -64.00 deg   26.00 deg
Wood depth      :      0          (No woods.)
No of house rows :      0 / 0
Surface         :      1          (Absorptive ground surface)
Receiver source distance : 48.00 / 48.00 m
Receiver height  :      1.50 / 1.50 m
Topography      :      1          (Flat/gentle slope; no barrier)
Reference angle  :      0.00
  
```

♀

Road data, segment # 3: Withrow (day/night)

```

-----
Car traffic volume : 6477/563   veh/TimePeriod  *
Medium truck volume : 515/45    veh/TimePeriod  *
Heavy truck volume  : 368/32    veh/TimePeriod  *
Posted speed limit  : 40 km/h
Road gradient       : 0 %
Road pavement       : 1 (Typical asphalt or concrete)
  
```

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

```

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth         : 0.00
Number of Years of Growth           : 0.00
Medium Truck % of Total Volume      : 7.00
Heavy Truck % of Total Volume       : 5.00
Day (16 hrs) % of Total Volume      : 92.00
  
```

Data for Segment # 3: Withrow (day/night)

```

-----
Angle1  Angle2      : 26.00 deg   68.00 deg
Wood depth      :      0          (No woods.)
No of house rows :      0 / 0
Surface         :      1          (Absorptive ground surface)
Receiver source distance : 48.00 / 48.00 m
Receiver height  :      1.50 / 1.50 m
Topography      :      2          (Flat/gentle slope; with barrier)
Barrier angle1   : 26.00 deg   Angle2 : 68.00 deg
Barrier height   : 7.50 m
Barrier receiver distance : 47.00 / 47.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle  : 0.00
  
```

♀

Results segment # 1: Withrow (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	1.50	1.50

ROAD (0.00 + 25.31 + 0.00) = 25.31 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-76	-64	0.21	63.96	0.00	-6.11	-12.75	0.00	0.00	-19.78	25.31

REC31R.TXT

Segment Leq : 25.31 dBA

♀

Results segment # 2: Withrow (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
-64	26	0.66	63.96	0.00	-8.39	-3.49	0.00	0.00	0.00	52.08

Segment Leq : 52.08 dBA

♀

Results segment # 3: Withrow (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	1.50	1.50

ROAD (0.00 + 31.13 + 0.00) = 31.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
26	68	0.21	63.96	0.00	-6.11	-6.71	0.00	0.00	-20.00	31.13

Segment Leq : 31.13 dBA

Total Leq All Segments: 52.12 dBA

♀

Results segment # 1: Withrow (night)

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	1.50	1.50

ROAD (0.00 + 17.71 + 0.00) = 17.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-76	-64	0.21	56.36	0.00	-6.11	-12.75	0.00	0.00	-19.78	17.71

Segment Leq : 17.71 dBA

♀

Results segment # 2: Withrow (night)



# REC31R.TXT

Source height = 1.50 m

ROAD (0.00 + 44.49 + 0.00) = 44.49 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-64	26	0.66	56.36	0.00	-8.39	-3.49	0.00	0.00	0.00	44.49

Segment Leq : 44.49 dBA

♀

Results segment # 3: Withrow (night)

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	1.50	1.50

ROAD (0.00 + 23.54 + 0.00) = 23.54 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
26	68	0.21	56.36	0.00	-6.11	-6.71	0.00	0.00	-20.00	23.54

Segment Leq : 23.54 dBA

Total Leq All Segments: 44.53 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 52.12  
(NIGHT): 44.53

♀  
♀

Filename: rec32r.te Time Period: Day/Night 16/8 hours  
 Description: Reception Point 3-2 Revision 1

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

-----  
 Car traffic volume : 6477/563 veh/TimePeriod \*  
 Medium truck volume : 515/45 veh/TimePeriod \*  
 Heavy truck volume : 368/32 veh/TimePeriod \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

-----  
 Angle1 Angle2 : -76.00 deg -65.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 48.00 / 48.00 m  
 Receiver height : 4.50 / 4.50 m  
 Topography : 2 (Flat/gentle slope; with barrier)  
 Barrier angle1 : -76.00 deg Angle2 : -65.00 deg  
 Barrier height : 7.50 m  
 Barrier receiver distance : 47.00 / 47.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

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

-----  
 Car traffic volume : 6477/563 veh/TimePeriod \*  
 Medium truck volume : 515/45 veh/TimePeriod \*  
 Heavy truck volume : 368/32 veh/TimePeriod \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

REC32R.TXT

```

Angle1  Angle2      : -65.00 deg   26.00 deg
Wood depth      :      0          (No woods.)
No of house rows :      0 / 0
Surface         :      1          (Absorptive ground surface)
Receiver source distance : 48.00 / 48.00 m
Receiver height  : 4.50 / 4.50 m
Topography      :      1          (Flat/gentle slope; no barrier)
Reference angle  :      0.00
  
```

♀  
 Road data, segment # 3: Withrow (day/night)

```

-----
Car traffic volume : 6477/563   veh/TimePeriod  *
Medium truck volume : 515/45    veh/TimePeriod  *
Heavy truck volume  : 368/32     veh/TimePeriod  *
Posted speed limit  : 40 km/h
Road gradient       : 0 %
Road pavement       : 1 (Typical asphalt or concrete)
  
```

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

```

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth         : 0.00
Number of Years of Growth           : 0.00
Medium Truck % of Total Volume      : 7.00
Heavy Truck % of Total Volume       : 5.00
Day (16 hrs) % of Total Volume      : 92.00
  
```

Data for Segment # 3: Withrow (day/night)

```

-----
Angle1  Angle2      : 26.00 deg   68.00 deg
Wood depth      :      0          (No woods.)
No of house rows :      0 / 0
Surface         :      1          (Absorptive ground surface)
Receiver source distance : 48.00 / 48.00 m
Receiver height  : 4.50 / 4.50 m
Topography      :      2          (Flat/gentle slope; with barrier)
Barrier angle1   : 26.00 deg   Angle2 : 68.00 deg
Barrier height   : 7.50 m
Barrier receiver distance : 47.00 / 47.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle  : 0.00
  
```

♀  
 Results segment # 1: Withrow (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	4.50	1.56	1.56

ROAD (0.00 + 25.97 + 0.00) = 25.97 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-76	-65	0.12	63.96	0.00	-5.66	-12.72	0.00	0.00	-19.61	25.97

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Segment Leq : 25.97 dBA

♀

Results segment # 2: Withrow (day)

Source height = 1.50 m

ROAD (0.00 + 52.63 + 0.00) = 52.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-65	26	0.57	63.96	0.00	-7.93	-3.40	0.00	0.00	0.00	52.63

Segment Leq : 52.63 dBA

♀

Results segment # 3: Withrow (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	4.50	1.56	1.56

ROAD (0.00 + 31.75 + 0.00) = 31.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
26	68	0.12	63.96	0.00	-5.66	-6.54	0.00	0.00	-20.00	31.75

Segment Leq : 31.75 dBA

Total Leq All Segments: 52.67 dBA

♀

Results segment # 1: Withrow (night)

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	4.50	1.56	1.56

ROAD (0.00 + 18.38 + 0.00) = 18.38 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-76	-65	0.12	56.36	0.00	-5.66	-12.72	0.00	0.00	-19.61	18.38

Segment Leq : 18.38 dBA

♀

Results segment # 2: Withrow (night)

Source height = 1.50 m

ROAD (0.00 + 45.03 + 0.00) = 45.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-65	26	0.57	56.36	0.00	-7.93	-3.40	0.00	0.00	0.00	45.03

Segment Leq : 45.03 dBA

♀

Results segment # 3: Withrow (night)

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	4.50	1.56	1.56

ROAD (0.00 + 24.16 + 0.00) = 24.16 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
26	68	0.12	56.36	0.00	-5.66	-6.54	0.00	0.00	-20.00	24.16

Segment Leq : 24.16 dBA

Total Leq All Segments: 45.07 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 52.67  
(NIGHT): 45.07

♀  
♀

Filename: rec41R.te Time Period: Day/Night 16/8 hours  
 Description: Reception Point 4-1 Revision 1

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

-----  
 Car traffic volume : 6477/563 veh/TimePeriod \*  
 Medium truck volume : 515/45 veh/TimePeriod \*  
 Heavy truck volume : 368/32 veh/TimePeriod \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

-----  
 Angle1 Angle2 : -58.00 deg -13.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 80.00 / 80.00 m  
 Receiver height : 1.50 / 1.50 m  
 Topography : 2 (Flat/gentle slope; with barrier)  
 Barrier angle1 : -58.00 deg Angle2 : -13.00 deg  
 Barrier height : 7.50 m  
 Barrier receiver distance : 20.00 / 20.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

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

-----  
 Car traffic volume : 6477/563 veh/TimePeriod \*  
 Medium truck volume : 515/45 veh/TimePeriod \*  
 Heavy truck volume : 368/32 veh/TimePeriod \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

REC41R.TXT

```

Angle1  Angle2      : -13.00 deg   42.00 deg
Wood depth      :      0          (No woods.)
No of house rows :      0 / 0
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 # 3: Withrow (day/night)

```

-----
Car traffic volume : 6477/563   veh/TimePeriod  *
Medium truck volume : 515/45    veh/TimePeriod  *
Heavy truck volume  : 368/32    veh/TimePeriod  *
Posted speed limit  : 40 km/h
Road gradient       : 0 %
Road pavement       : 1 (Typical asphalt or concrete)
  
```

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

```

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth         : 0.00
Number of Years of Growth           : 0.00
Medium Truck % of Total Volume      : 7.00
Heavy Truck % of Total Volume       : 5.00
Day (16 hrs) % of Total Volume      : 92.00
  
```

Data for Segment # 3: Withrow (day/night)

```

-----
Angle1  Angle2      : 42.00 deg   63.00 deg
Wood depth      :      0          (No woods.)
No of house rows :      0 / 0
Surface         :      1          (Absorptive ground surface)
Receiver source distance : 80.00 / 80.00 m
Receiver height  :      1.50 / 1.50 m
Topography      :      2          (Flat/gentle slope; with barrier)
Barrier angle1   : 42.00 deg   Angle2 : 63.00 deg
Barrier height   :      7.50 m
Barrier receiver distance : 79.00 / 79.00 m
Source elevation :      0.00 m
Receiver elevation :      0.00 m
Barrier elevation :      0.00 m
Reference angle  :      0.00
  
```

♀  
 Results segment # 1: Withrow (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	1.50	1.50

ROAD (0.00 + 31.70 + 0.00) = 31.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-58	-13	0.21	63.96	0.00	-8.80	-6.24	0.00	0.00	-17.22	31.70

REC41R.TXT

Segment Leq : 31.70 dBA

♀

Results segment # 2: Withrow (day)

Source height = 1.50 m

ROAD (0.00 + 46.53 + 0.00) = 46.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-13	42	0.66	63.96	0.00	-12.07	-5.36	0.00	0.00	0.00	46.53

Segment Leq : 46.53 dBA

♀

Results segment # 3: Withrow (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	1.50	1.50

ROAD (0.00 + 25.36 + 0.00) = 25.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
42	63	0.21	63.96	0.00	-8.80	-9.80	0.00	0.00	-20.00	25.36

Segment Leq : 25.36 dBA

Total Leq All Segments: 46.70 dBA

♀

Results segment # 1: Withrow (night)

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	1.50	1.50

ROAD (0.00 + 24.10 + 0.00) = 24.10 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-58	-13	0.21	56.36	0.00	-8.80	-6.24	0.00	0.00	-17.22	24.10

Segment Leq : 24.10 dBA

♀

Results segment # 2: Withrow (night)



-----  
 Source height = 1.50 m

ROAD (0.00 + 38.94 + 0.00) = 38.94 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-13	42	0.66	56.36	0.00	-12.07	-5.36	0.00	0.00	0.00	38.94

-----

Segment Leq : 38.94 dBA

♀

Results segment # 3: Withrow (night)

-----  
 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	1.50	1.50

-----

ROAD (0.00 + 17.77 + 0.00) = 17.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
42	63	0.21	56.36	0.00	-8.80	-9.80	0.00	0.00	-20.00	17.77

-----

Segment Leq : 17.77 dBA

Total Leq All Segments: 39.11 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 46.70  
 (NIGHT): 39.11

♀  
 ♀

Filename: rec42.te Time Period: Day/Night 16/8 hours  
 Description: Reception Point 4-2 Revision 1

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

-----  
 Car traffic volume : 6477/563 veh/TimePeriod \*  
 Medium truck volume : 515/45 veh/TimePeriod \*  
 Heavy truck volume : 368/32 veh/TimePeriod \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

-----  
 Angle1 Angle2 : -58.00 deg -13.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 80.00 / 80.00 m  
 Receiver height : 4.50 / 4.50 m  
 Topography : 2 (Flat/gentle slope; with barrier)  
 Barrier angle1 : -58.00 deg Angle2 : -13.00 deg  
 Barrier height : 7.50 m  
 Barrier receiver distance : 20.00 / 20.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

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

-----  
 Car traffic volume : 6477/563 veh/TimePeriod \*  
 Medium truck volume : 515/45 veh/TimePeriod \*  
 Heavy truck volume : 368/32 veh/TimePeriod \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

REC42R.TXT

```

Angle1  Angle2      : -13.00 deg   42.00 deg
Wood depth      :      0          (No woods.)
No of house rows :      0 / 0
Surface         :      1          (Absorptive ground surface)
Receiver source distance : 80.00 / 80.00 m
Receiver height  :      4.50 / 4.50 m
Topography      :      1          (Flat/gentle slope; no barrier)
Reference angle  :      0.00
  
```

♀  
 Road data, segment # 3: Withrow (day/night)

```

-----
Car traffic volume : 6477/563   veh/TimePeriod  *
Medium truck volume : 515/45    veh/TimePeriod  *
Heavy truck volume : 368/32     veh/TimePeriod  *
Posted speed limit : 40 km/h
Road gradient      : 0 %
Road pavement      : 1 (Typical asphalt or concrete)
  
```

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

```

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth         : 0.00
Number of Years of Growth           : 0.00
Medium Truck % of Total Volume      : 7.00
Heavy Truck % of Total Volume       : 5.00
Day (16 hrs) % of Total Volume      : 92.00
  
```

Data for Segment # 3: Withrow (day/night)

```

-----
Angle1  Angle2      : 42.00 deg   63.00 deg
Wood depth      :      0          (No woods.)
No of house rows :      0 / 0
Surface         :      1          (Absorptive ground surface)
Receiver source distance : 80.00 / 80.00 m
Receiver height  :      4.50 / 4.50 m
Topography      :      2          (Flat/gentle slope; with barrier)
Barrier angle1   : 42.00 deg   Angle2 : 63.00 deg
Barrier height   :      7.50 m
Barrier receiver distance : 79.00 / 79.00 m
Source elevation :      0.00 m
Receiver elevation :      0.00 m
Barrier elevation :      0.00 m
Reference angle  :      0.00
  
```

♀  
 Results segment # 1: Withrow (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	4.50	3.75	3.75

ROAD (0.00 + 36.36 + 0.00) = 36.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-58	-13	0.12	63.96	0.00	-8.14	-6.15	0.00	0.00	-13.30	36.36

REC42R.TXT

Segment Leq : 36.36 dBA

♀

Results segment # 2: Withrow (day)

Source height = 1.50 m

ROAD (0.00 + 47.21 + 0.00) = 47.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-13	42	0.57	63.96	0.00	-11.41	-5.33	0.00	0.00	0.00	47.21

Segment Leq : 47.21 dBA

♀

Results segment # 3: Withrow (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	4.50	1.53	1.53

ROAD (0.00 + 26.22 + 0.00) = 26.22 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
42	63	0.12	63.96	0.00	-8.14	-9.60	0.00	0.00	-20.00	26.22

Segment Leq : 26.22 dBA

Total Leq All Segments: 47.59 dBA

♀

Results segment # 1: Withrow (night)

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	4.50	3.75	3.75

ROAD (0.00 + 28.77 + 0.00) = 28.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-58	-13	0.12	56.36	0.00	-8.14	-6.15	0.00	0.00	-13.30	28.77

Segment Leq : 28.77 dBA

♀

Results segment # 2: Withrow (night)

-----  
 Source height = 1.50 m

ROAD (0.00 + 39.62 + 0.00) = 39.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-13	42	0.57	56.36	0.00	-11.41	-5.33	0.00	0.00	0.00	39.62

-----

Segment Leq : 39.62 dBA

♀

Results segment # 3: Withrow (night)

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	4.50	1.53	1.53

ROAD (0.00 + 18.62 + 0.00) = 18.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
42	63	0.12	56.36	0.00	-8.14	-9.60	0.00	0.00	-20.00	18.62

-----

Segment Leq : 18.62 dBA

Total Leq All Segments: 39.99 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 47.59  
 (NIGHT): 39.99

♀

♀

Filename: rec50.te Time Period: Day/Night 16/8 hours  
 Description: Reception Point 5-0 Revision 1

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

-----  
 Car traffic volume : 6477/563 veh/TimePeriod \*  
 Medium truck volume : 515/45 veh/TimePeriod \*  
 Heavy truck volume : 368/32 veh/TimePeriod \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

-----  
 Angle1 Angle2 : -75.00 deg -30.00 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 : 2 (Flat/gentle slope; with barrier)  
 Barrier angle1 : -75.00 deg Angle2 : -30.00 deg  
 Barrier height : 7.50 m  
 Barrier receiver distance : 30.00 / 30.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

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

-----  
 Car traffic volume : 6477/563 veh/TimePeriod \*  
 Medium truck volume : 515/45 veh/TimePeriod \*  
 Heavy truck volume : 368/32 veh/TimePeriod \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

REC50R.TXT

```

Angle1  Angle2      : -30.00 deg   69.00 deg
Wood depth      :      0          (No woods.)
No of house rows :      0 / 0
Surface         :      1          (Absorptive ground surface)
Receiver source distance : 35.00 / 35.00 m
Receiver height  : 1.50 / 1.50 m
Topography      :      1          (Flat/gentle slope; no barrier)
Reference angle  :      0.00
  
```

♀  
 Road data, segment # 3: Withrow (day/night)

```

-----
Car traffic volume : 6477/563   veh/TimePeriod  *
Medium truck volume : 515/45    veh/TimePeriod  *
Heavy truck volume  : 368/32    veh/TimePeriod  *
Posted speed limit  : 40 km/h
Road gradient       : 0 %
Road pavement       : 1 (Typical asphalt or concrete)
  
```

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

```

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth         : 0.00
Number of Years of Growth           : 0.00
Medium Truck % of Total Volume      : 7.00
Heavy Truck % of Total Volume       : 5.00
Day (16 hrs) % of Total Volume      : 92.00
  
```

Data for Segment # 3: Withrow (day/night)

```

-----
Angle1  Angle2      : 69.00 deg   75.00 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      :      2          (Flat/gentle slope; with barrier)
Barrier angle1   : 69.00 deg   Angle2 : 75.00 deg
Barrier height   : 7.50 m
Barrier receiver distance : 34.00 / 34.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle  : 0.00
  
```

♀  
 Results segment # 1: Withrow (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	1.50	1.50

ROAD (0.00 + 33.48 + 0.00) = 33.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-75	-30	0.21	63.96	0.00	-4.45	-6.53	0.00	0.00	-19.49	33.48

REC50R.TXT

Segment Leq : 33.48 dBA

♀

Results segment # 2: Withrow (day)

Source height = 1.50 m

ROAD (0.00 + 54.69 + 0.00) = 54.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	69	0.66	63.96	0.00	-6.11	-3.16	0.00	0.00	0.00	54.69

Segment Leq : 54.69 dBA

♀

Results segment # 3: Withrow (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	1.50	1.50

ROAD (0.00 + 23.84 + 0.00) = 23.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
69	75	0.21	63.96	0.00	-4.45	-15.85	0.00	0.00	-19.82	23.84

Segment Leq : 23.84 dBA

Total Leq All Segments: 54.73 dBA

♀

Results segment # 1: Withrow (night)

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	1.50	1.50

ROAD (0.00 + 25.89 + 0.00) = 25.89 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-75	-30	0.21	56.36	0.00	-4.45	-6.53	0.00	0.00	-19.49	25.89

Segment Leq : 25.89 dBA

♀

Results segment # 2: Withrow (night)



-----  
 Source height = 1.50 m

ROAD (0.00 + 47.09 + 0.00) = 47.09 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	69	0.66	56.36	0.00	-6.11	-3.16	0.00	0.00	0.00	47.09

-----

Segment Leq : 47.09 dBA

♀

Results segment # 3: Withrow (night)

-----  
 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	1.50	1.50

-----

ROAD (0.00 + 16.25 + 0.00) = 16.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
69	75	0.21	56.36	0.00	-4.45	-15.85	0.00	0.00	-19.82	16.25

-----

Segment Leq : 16.25 dBA

Total Leq All Segments: 47.13 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 54.73  
 (NIGHT): 47.13

♀

♀

Filename: rec60a.te                      Time Period: Day/Night 16/8 hours  
 Description: Reception Point 6-0 Revision 1 With Houses

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

-----  
 Car traffic volume : 6477/563    veh/TimePeriod    \*  
 Medium truck volume : 515/45    veh/TimePeriod    \*  
 Heavy truck volume : 368/32    veh/TimePeriod    \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

-----  
 Angle1    Angle2 : -79.00 deg    -72.00 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 : 2    (Flat/gentle slope; with barrier)  
 Barrier angle1 : -79.00 deg    Angle2 : -72.00 deg  
 Barrier height : 7.50 m  
 Barrier receiver distance : 34.00 / 34.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

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

-----  
 Car traffic volume : 6477/563    veh/TimePeriod    \*  
 Medium truck volume : 515/45    veh/TimePeriod    \*  
 Heavy truck volume : 368/32    veh/TimePeriod    \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

REC60AR.TXT

```

Angle1  Angle2      : -72.00 deg   36.00 deg
Wood depth      :      0          (No woods.)
No of house rows :      1 / 0
Surface         :      1          (Absorptive ground surface)
Receiver source distance : 35.00 / 35.00 m
Receiver height  : 1.50 / 1.50 m
Topography      :      1          (Flat/gentle slope; no barrier)
Reference angle  :      0.00
  
```

♀

Road data, segment # 3: Withrow (day/night)

```

-----
Car traffic volume : 6477/563   veh/TimePeriod  *
Medium truck volume : 515/45    veh/TimePeriod  *
Heavy truck volume  : 368/32     veh/TimePeriod  *
Posted speed limit  : 40 km/h
Road gradient       : 0 %
Road pavement       : 1 (Typical asphalt or concrete)
  
```

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

```

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth         : 0.00
Number of Years of Growth           : 0.00
Medium Truck % of Total Volume      : 7.00
Heavy Truck % of Total Volume       : 5.00
Day (16 hrs) % of Total Volume      : 92.00
  
```

Data for Segment # 3: Withrow (day/night)

```

-----
Angle1  Angle2      : 36.00 deg   73.00 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      :      2          (Flat/gentle slope; with barrier)
Barrier angle1   : 36.00 deg   Angle2 : 73.00 deg
Barrier height   : 7.50 m
Barrier receiver distance : 25.00 / 25.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle  : 0.00
  
```

♀

Results segment # 1: Withrow (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	1.50	1.50

ROAD (0.00 + 25.11 + 0.00) = 25.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	-72	0.21	63.96	0.00	-4.45	-15.37	0.00	0.00	-19.02	25.11

Segment Leq : 25.11 dBA

♀

Results segment # 2: Withrow (day)

Source height = 1.50 m

ROAD (0.00 + 52.93 + 0.00) = 52.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-72	36	0.66	63.96	0.00	-6.11	-2.83	0.00	-2.08	0.00	52.93

Segment Leq : 52.93 dBA

♀

Results segment # 3: Withrow (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	1.50	1.50

ROAD (0.00 + 33.53 + 0.00) = 33.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
36	73	0.21	63.96	0.00	-4.45	-7.41	0.00	0.00	-18.57	33.53

Segment Leq : 33.53 dBA

Total Leq All Segments: 52.99 dBA

♀

Results segment # 1: Withrow (night)

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	1.50	1.50

ROAD (0.00 + 17.52 + 0.00) = 17.52 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	-72	0.21	56.36	0.00	-4.45	-15.37	0.00	0.00	-19.02	17.52

Segment Leq : 17.52 dBA

♀

Results segment # 2: Withrow (night)

-----  
 Source height = 1.50 m

ROAD (0.00 + 47.42 + 0.00) = 47.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-72	36	0.66	56.36	0.00	-6.11	-2.83	0.00	0.00	0.00	47.42

-----

Segment Leq : 47.42 dBA

♀  
 Results segment # 3: Withrow (night)  
 -----

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	1.50	1.50

-----

ROAD (0.00 + 25.93 + 0.00) = 25.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
36	73	0.21	56.36	0.00	-4.45	-7.41	0.00	0.00	-18.57	25.93

-----

Segment Leq : 25.93 dBA

Total Leq All Segments: 47.46 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 52.99  
 (NIGHT): 47.46

♀  
 ♀

Filename: rec70.te                      Time Period: Day/Night 16/8 hours  
 Description: Reception Point 7-0 Revision 1

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

-----  
 Car traffic volume : 6477/563    veh/TimePeriod    \*  
 Medium truck volume : 515/45    veh/TimePeriod    \*  
 Heavy truck volume : 368/32    veh/TimePeriod    \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

-----  
 Angle1    Angle2 : -54.00 deg    -6.00 deg  
 Wood depth : 0    (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1    (Absorptive ground surface)  
 Receiver source distance : 85.00 / 85.00 m  
 Receiver height : 1.50 / 1.50 m  
 Topography : 2    (Flat/gentle slope; with barrier)  
 Barrier angle1 : -54.00 deg    Angle2 : -6.00 deg  
 Barrier height : 7.50 m  
 Barrier receiver distance : 20.00 / 20.00 m  
 Source elevation : 0.00 m  
 Receiver elevation : 0.00 m  
 Barrier elevation : 0.00 m  
 Reference angle : 0.00

♀

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

-----  
 Car traffic volume : 6477/563    veh/TimePeriod    \*  
 Medium truck volume : 515/45    veh/TimePeriod    \*  
 Heavy truck volume : 368/32    veh/TimePeriod    \*  
 Posted speed limit : 40 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000  
 Percentage of Annual Growth : 0.00  
 Number of Years of Growth : 0.00  
 Medium Truck % of Total Volume : 7.00  
 Heavy Truck % of Total Volume : 5.00  
 Day (16 hrs) % of Total Volume : 92.00

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

REC70R.TXT

```

Angle1  Angle2      :  -6.00 deg   42.00 deg
Wood depth      :      0           (No woods.)
No of house rows :      0 / 0
Surface         :      1           (Absorptive 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 # 3: Withrow (day/night)

```

-----
Car traffic volume :  6477/563   veh/TimePeriod  *
Medium truck volume :  515/45    veh/TimePeriod  *
Heavy truck volume :  368/32     veh/TimePeriod  *
Posted speed limit :    40 km/h
Road gradient      :      0 %
Road pavement      :      1 (Typical asphalt or concrete)
  
```

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

```

24 hr Traffic Volume (AADT or SADT):  8000
Percentage of Annual Growth         :  0.00
Number of Years of Growth           :  0.00
Medium Truck % of Total Volume      :  7.00
Heavy Truck % of Total Volume       :  5.00
Day (16 hrs) % of Total Volume      :  92.00
  
```

Data for Segment # 3: Withrow (day/night)

```

-----
Angle1  Angle2      :  42.00 deg   62.00 deg
Wood depth      :      0           (No woods.)
No of house rows :      0 / 0
Surface         :      1           (Absorptive ground surface)
Receiver source distance :  85.00 / 85.00 m
Receiver height  :      1.50 / 1.50 m
Topography      :      2           (Flat/gentle slope; with barrier)
Barrier angle1   :  42.00 deg   Angle2 : 62.00 deg
Barrier height   :      7.50 m
Barrier receiver distance :  60.00 / 60.00 m
Source elevation :      0.00 m
Receiver elevation :      0.00 m
Barrier elevation :      0.00 m
Reference angle  :      0.00
  
```

♀  
 Results segment # 1: Withrow (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	1.50	1.50

ROAD (0.00 + 31.52 + 0.00) = 31.52 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-54	-6	0.21	63.96	0.00	-9.12	-5.91	0.00	0.00	-17.42	31.52

Segment Leq : 31.52 dBA

♀

Results segment # 2: Withrow (day)

Source height = 1.50 m

ROAD (0.00 + 45.48 + 0.00) = 45.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-6	42	0.66	63.96	0.00	-12.51	-5.97	0.00	0.00	0.00	45.48

Segment Leq : 45.48 dBA

♀

Results segment # 3: Withrow (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	1.50	1.50

ROAD (0.00 + 29.35 + 0.00) = 29.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
42	62	0.21	63.96	0.00	-9.12	-10.00	0.00	0.00	-15.49	29.35

Segment Leq : 29.35 dBA

Total Leq All Segments: 45.75 dBA

♀

Results segment # 1: Withrow (night)

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	1.50	1.50

ROAD (0.00 + 23.92 + 0.00) = 23.92 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-54	-6	0.21	56.36	0.00	-9.12	-5.91	0.00	0.00	-17.42	23.92

Segment Leq : 23.92 dBA

♀

Results segment # 2: Withrow (night)



-----  
 Source height = 1.50 m

ROAD (0.00 + 37.89 + 0.00) = 37.89 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-6	42	0.66	56.36	0.00	-12.51	-5.97	0.00	0.00	0.00	37.89

-----

Segment Leq : 37.89 dBA

♀

Results segment # 3: Withrow (night)

-----

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	1.50	1.50

-----

ROAD (0.00 + 21.76 + 0.00) = 21.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
42	62	0.21	56.36	0.00	-9.12	-10.00	0.00	0.00	-15.49	21.76

-----

Segment Leq : 21.76 dBA

Total Leq All Segments: 38.16 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 45.75  
 (NIGHT): 38.16

♀

♀