

Noise Feasibility Study

Proposed Residential Development

Mattamy Homes, 5520 and 5552 Eighth Line

Erin, Ontario

Prepared for:

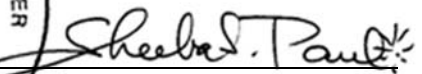
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Project Number: 02100750

Table of Contents

1	Introduction and Summary	1
2	Site Description and Sources of Sound.....	2
3	Sound Level Criteria	2
3.1	Criteria Governing Road Traffic Noise	2
4	Traffic Noise Assessment	3
4.1	Road Traffic Data	3
4.2	Traffic Noise Predictions.....	4
5	Discussion and Recommendations	5
5.1	Outdoor Living Areas.....	5
5.2	Indoor Living Areas and Ventilation Requirements.....	6
5.3	Building Facade Constructions.....	7
5.4	Warning Clauses.....	7
6	Summary and Recommendations	8
7	Implementation	9

Figure 1: Key Plan

Figure 2a: Draft Plan of Subdivision, 5520 Eighth Line

Figure 2b: Draft Plan of Subdivision, 5552 Eighth Line

Figure 3: Preliminary Composite Lotting Plan Showing Prediction Locations

Figure 4: Preliminary Composite Lotting Plan Showing Barrier and Ventilation Requirements

Appendix A: Road Traffic Data

Appendix B: Sample STAMSON 5.04 Output

1 Introduction and Summary

HGC Engineering was retained by Mattamy (Erin) Limited And 2779181 Ontario Inc. to perform a Noise Feasibility Study for a proposed residential development located in Erin, Ontario. The includes 5520 and 5552 Eighth Line, two distinct draft plans of subdivision. The development site is located south of 17 Sideroad and existing residences and west of Eighth Line. The purpose of this study is to determine the impact of future environmental noise from the surrounding roadways on the proposed development site and to determine the required acoustic requirements in accordance with the Ministry of Environment, Conservation, and Parks (MECP) guidelines. This study is required by the municipality as part of the planning and approvals process.

The primary noise source of noise was determined to be the road traffic on Eighth Line. A secondary source of road traffic is 17 Sideroad. Road traffic data was obtained from a Traffic Study for the development and was used to predict future sound levels at the proposed residences and in the proposed rear yards. The predicted sound levels were compared to the guidelines of the Ministry of the Environment, Conservation and Parks (MECP).

The results of the study indicate that future road traffic sound levels will exceed MECP guidelines at the proposed residences closest to Eighth Line. Feasible means exist to reduce the noise impact to below the acceptable limit. Forced-air ventilation systems with ducts sized to accommodate the future installation of central air conditioning by the occupant are required for the dwelling units adjacent to Eighth Line, and an acoustic barrier is recommended for the rear yards of the dwellings adjacent to Eighth Line. Warning clauses are also recommended in order to inform future owner/tenants of the sound level excesses. Any building construction meeting the minimum requirements of the Ontario Building Code will provide sufficient acoustical insulation for the interior spaces. A detailed noise study should be prepared when grading information and refined traffic data is available, including commercial vehicle percentages proposed for the roadways along with lot numbering to refine the acoustic requirements.

2 Site Description and Sources of Sound

The key plan for the site is attached as Figure 1. The site is located south of 17 Sideroad and existing residences. A draft plan of subdivision for 5520 Eighth Line prepared by Korsiak Urban Planning dated June 2, 2022 is provided as Figure 2a. A draft plan of subdivision for 5552 Eighth Line prepared by Korsiak Urban Planning dated May 18, 2022 is provided as Figure 2b. A preliminary composite lotted plan prepared by Korsiak Urban Planning dated June 2, 2022 is provided as Figure 3 and also includes prediction locations. The proposed development is composed of 392 single detached units and 116 townhome units.

A site visit was performed in May 2022 to investigate the site and the surrounding land uses. The subject site is currently agricultural use. There are existing residences in the area. East of the site and Eighth Line is Erin Heights Golf Course. Road traffic on 17 Sideroad and Eighth Line are the dominant noise sources. There are no other significant stationary sources of noise within 500 m of the subject site.

3 Sound Level Criteria

3.1 Criteria Governing Road Traffic Noise

Guidelines for acceptable levels of road traffic noise impacting residential developments are given in the MECP publication NPC-300, “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning”, release date October 21, 2013, and are listed in Table I below. The values in Table I are energy equivalent (average) sound levels [L_{EQ}] in units of A weighted decibels [dBA].

Table I: MECP Road Traffic Noise Criteria (dBA)

Area	Daytime L _{EQ} (16 hour)	Nighttime L _{EQ} (8hour)
Outdoor Living Area	55 dBA	--
Inside Living/Dining Room	45 dBA	45 dBA
Inside Bedroom	45 dBA	40 dBA

Daytime refers to the period between 07:00 and 23:00, while nighttime refers to the period between 23:00 and 07:00. The term “Outdoor Living Area” (OLA) is used in reference to an outdoor patio, a backyard, a terrace or other area where passive recreation is expected to occur. Balconies that are less than 4 m in depth are not considered to be outdoor living areas under MECP guidelines.

The guidelines in the MECP publication allow the daytime sound levels in an Outdoor Living Area to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in the purchase and rental agreements to the property.

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where nighttime sound levels outside bedroom or living/dining room windows exceed 60 dBA or daytime sound levels outside bedroom or living/dining room window exceed 65 dBA. Forced-air ventilation with ducts sized to accommodate the future installation of air conditioning by the occupant is required when nighttime sound levels at bedroom or living/dining room windows are in the range of 51 to 60 dBA or when daytime sound levels at bedroom or living/dining room windows are in the range of 56 to 65 dBA.

Building components such as walls, windows and doors must be designed to achieve indoor sound level criteria when the plane of window nighttime sound level is greater than 60 dBA or the daytime sound level is greater than 65 dBA due to road traffic noise.

Warning clauses to notify future residents of possible excesses are also required when nighttime sound levels exceed 50 dBA at the plane of bedroom or living/dining room window and daytime sound levels exceed 55 dBA in the outdoor living area and at the plane of bedroom or living/dining room window due to road traffic.

4 Traffic Noise Assessment

4.1 Road Traffic Data

Road traffic data for 17 Sideroad and Eighth Line were obtained from a Traffic Study. Raw data was provided by RV Anderson from their Traffic study for the Mattamy Erin development in the form of traffic volumes for the year 2031 and in an am and pm peak hour volume format. The raw data is included in Appendix A. This data represents 10% of the total road volume, projected to 2031. These

projections were then extended one year further to 2032 with a 2.5% growth rate to arrive at the forecasted road traffic data. Commercial vehicles percentages 5% for medium trucks and 8% for heavy trucks were used in the analysis for both roadways as a conservative estimate based on the Ministry of Transportation (MTO) commercial splits, since commercial vehicle information was not available at the time of this study. When forecasted commercial vehicle percentages are known for the roadways, the noise study should be refined. Currently the posted speed is 40 kph on 8th Line since it is a single lane road. The speed is expected to be posted at 60 kph which is typical of collector roads. A day/night split of 90%/10% was applied for the roadways. A posted speed of 60 kph was used for 17 Sideroad. Table II summarizes the traffic data used in the study.

Table II: Forecasted Road Traffic Data

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
17 Sideroad	Daytime	5 722	329	526	6 577
	Nighttime	636	37	58	731
	Total	6 358	366	584	7 308
Eighth Line	Daytime	2 416	139	222	2 777
	Nighttime	268	15	25	308
	Total	2 684	154	247	3 085

4.2 Traffic Noise Predictions

To assess the levels of road traffic noise which will impact the site in the future, predictions were made using STAMSON version 5.04, a computer algorithm developed by the MECP. Sample STAMSON output is included in Appendix B.

Predictions of the traffic sound levels were made in the rear yards and at the facades of various representative dwelling units to determine acoustic barrier requirements and ventilation requirements. Typical dwelling widths of 12 m and rear yard setbacks of 7 m rear yard, 4.5 m exterior side yard and 1.2 m interior side yard were used in the analysis where assumptions were necessary. Prediction locations are indicated in Figure 3. The results of these predictions are summarized in Table III. The acoustic requirements may be subject to modifications if the concept lotting plan is changed significantly.

Table III: Predicted Traffic Sound Levels, Without Mitigation, [dBA]

Prediction Location	Street	Description	Outdoor Living Area LEQ-16 hr	Daytime – at the Façade LEQ-16 hr	Nighttime – at the Façade LEQ-8 hr
A	G	East façade of dwelling backing onto Eighth Line	62	61	54
B	E	East façade of dwelling with flanking exposure to Eighth Line	58	62	55
C	C	North façade of dwelling with exposure to 17 Sideroad	<55	<55	<50

5 Discussion and Recommendations

The predictions indicate that traffic sound levels are expected to exceed MECP limits during the daytime hours at the dwelling units closest to Eighth Line. The following discussion and recommendations are provided.

5.1 Outdoor Living Areas

The predicted daytime sound levels in the rear yards of the dwelling units on Street G backing onto Eighth Line (Prediction Location A (OLA)) will be in excess of the 55 dBA OLA limit by 7 dBA. A 2.2 m high acoustic barrier is recommended to reduce the OLA sound level to below 55 dBA.

Similarly, the predicted daytime sound levels in rear yard of the closest dwellings on Street E with flanking exposure to Eighth Line (Prediction Location B (OLA)) will be in excess of the 55 dBA OLA limit by 3 dBA. Although this is within the acceptable limit, an acoustic barrier can reduce the sound level to below 55 dBA.

Figure 4 indicates the approximate location and extent of the recommended noise barriers. All noise barriers must return back to the dwelling units so that the rear yards are entirely shielded from the roadways. The acoustic barrier can be a combination of an acoustic wall and an earth berm. The wall component of the barrier should be of a solid construction with a surface density of no less than 20 kg/m². The walls may be constructed from a variety of materials such as wood, brick, pre-cast concrete or other concrete/wood composite systems provided that it is free of gaps or cracks. All

barrier heights are stated relative to the grade 3 m from the rear façade of the dwellings. The heights and extents of the barriers should be chosen to reduce the sound levels in the OLA's to as close to 55 dBA as is technically, administratively and economically feasible, subject to the approval of the municipality respecting any applicable fence height by-laws. Noise warning clauses to inform the future residents of the sound level excesses will also be required for all the lots in the proposed development.

The predicted daytime sound levels in the rear yard of the dwelling units with exposure to 17 Sideroad (Prediction Location C (OLA)) were found to be below 55 dBA and are therefore at an acceptable level.

5.2 Indoor Living Areas and Ventilation Requirements

Provision for Future Installation of Central Air Conditioning

The predicted future sound levels outside the plane of the bedroom/living/dining room windows will be between 51 and 60 dBA during the nighttime and 56 to 65 dBA during the daytime for the dwelling units backing onto Eighth Line and the dwelling units closest to Eighth Line with flanking exposure (Prediction Locations A and B). To address these excesses, the MECP guidelines recommend that these dwelling units be equipped with forced air ventilation systems with ducts sized to accommodate the future installation of air conditioning by the occupant. The location, installation and sound ratings of the outdoor air conditioning devices should minimize noise impacts and comply with criteria of MECP publication NPC-300.

Window or through-the-wall air conditioning units are not recommended for any commercial or residential units because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall noise insulating properties of the envelope. The guidelines also recommend warning clauses for these units. Figure 4 shows the units requiring forced air ventilation systems.

The remaining dwellings in the development have sound levels less than 50 dBA during the nighttime hours and less than 55 dBA during the daytime hours and there are no specific ventilation requirements.

5.3 Building Facade Constructions

The proposed dwelling units will have daytime and nighttime sound levels at the top storey façade that are less than 65 dBA and 60 dBA respectively. Any exterior wall and double glazed window construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation for the dwelling units. Any insulated metal exterior door meeting OBC requirements will be sufficient to provide noise insulation.

5.4 Warning Clauses

The MECP guidelines recommend that warning clauses be included in the property and tenancy agreements for the proposed dwelling units with anticipated traffic sound level excesses.

Suggested wording for future dwellings with sound levels exceeding the MECP criteria is given below.

Type A:

Purchasers/tenants are advised that sound levels due to increasing road traffic may on occasion 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, Conservation and Parks.

Suitable wording for future dwellings requiring acoustic barriers is given below.

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 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, Conservation and Parks.

Suitable wording for future dwellings requiring forced air ventilation systems is given below.

Type C:

This dwelling unit has been fitted with a forced air heating system and the ducting etc., was sized to accommodate central air conditioning. Installation of central air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the Municipality's and the Ministry of the Environment, Conservation and Parks' noise criteria. (Note: The location and installation of the outdoor air conditioning

device should be done so as to minimize the noise impacts and comply with criteria of MECP publication NPC-300.)

These sample clauses are provided by the MECP as examples and can be modified by the Municipality as required.

6 Summary and Recommendations

Sound levels due to road traffic will exceed MECP guidelines at the proposed lots closest to Eighth Line. The following recommendations and Table IV are provided with regard to noise mitigation.

1. A 2.2 m high acoustical barrier will be required for the rear yards of the dwelling units backing onto Eighth Line and the dwelling units closest to Eighth Line with flanking exposure. The acoustic barrier location is provided in Figure 4.
2. Forced air ventilation systems with ductwork sized for future installation of central air conditioning by the occupant will be required for dwelling units backing onto Eighth Line and the dwelling units closest to Eighth Line with flanking exposure. The location, installation and sound ratings of the air conditioning devices should comply with NPC-300.
3. Any building construction meeting the minimum requirements of the Ontario Building Code will provide adequate acoustical insulation for all units within the development.
4. Warning clauses are required to inform future residents and tenants of the traffic noise level excesses.
5. A detailed noise study should be prepared when grading information and refined traffic data is available, including commercial vehicle percentages proposed for the roadways along with lot numbering to refine the acoustic requirements.



Table IV: Summary of Noise Control Requirements and Noise Warning Clauses

Prediction Location	Street	Acoustic Barrier	Ventilation Requirements *	Types of Warning Clauses	Building Façade Construction
A	G	Y	Forced Air	A, B, C	OBC
B	E	Y	Forced Air	A, B, C	OBC
C	C	--	--	--	OBC
Remaining Units	--	--	--	--	OBC

Notes: -- No specific requirements.

*The location, installation and sound rating of the air conditioning condensers must be compliant with MECP guidelines NPC-300.

OBC – Ontario Building Code

7 Implementation

To ensure that the noise control recommendations outlined above are properly included in the building design and properly implemented in the final construction, it is recommended that:

1. Prior to the issuance of building permits for this development, the Municipality’s building inspector or a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario should certify that the noise control measures have been properly incorporated.
2. Prior to assumption of the subdivision, the Municipality’s building inspector or a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario should certify that the noise control measures have been properly installed and constructed.



SIDEROAD 7

SITE

24

Trafalgar Rd. N

County Road 124

Main St

Wellington Rd 52


25

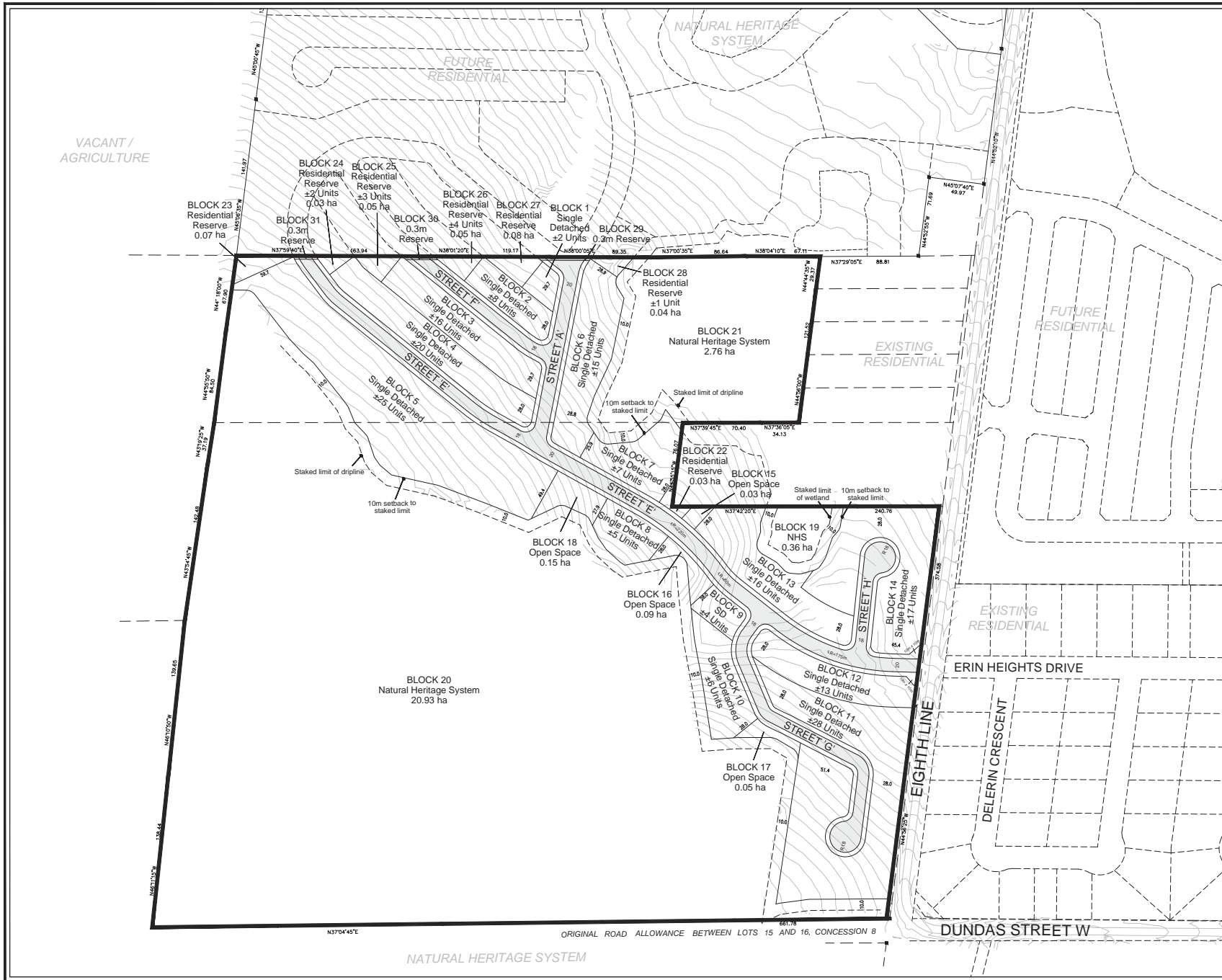
19

11

Town of Erin Subject Lands

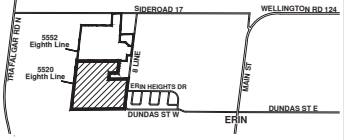


 Subject Lands



DRAFT PLAN OF SUBDIVISION 23T -

5520 Eighth Line
 PART OF LOT 16
 CONCESSION 8
 (GEOGRAPHIC TOWNSHIP OF ERIN)
 TOWN OF ERIN
 COUNTY OF WELLINGTON



KEY MAP
 N.T.S. SUBJECT PROPERTY

OWNER'S AUTHORIZATION
 I HEREBY AUTHORIZE KORSIAK URBAN PLANNING TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO WELLINGTON COUNTY FOR APPROVAL.

SIGNED _____ DATE _____
 Gary Langen
 2779-R Ontario Inc.

SURVEYOR'S CERTIFICATE
 I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE CORRECTLY AND ACCURATELY SHOWN.

SIGNED DATE May 10, 2022
 R. DenBroeder, Ontario Land Surveyor

eps R.P.E. SURVEYING LTD.
 PATRICIA LANG TOWN PLANNERS
 643 CHARLEA ROAD, SUITE 7, WOODBRIDGE, ONTARIO L4L 8A3
 Tel: (416) 925-2007 Fax: (416) 925-2001

- ADDITIONAL INFORMATION** (UNDER SECTION 51 (17) OF THE PLANNING ACT)
- A) SHOWN ON PLAN
 - B) SHOWN ON PLAN
 - C) SHOWN ON PLAN
 - D) SHOWN ON PLAN
 - E) SHOWN ON PLAN
 - F) SHOWN ON PLAN
 - G) SHOWN ON PLAN
 - H) MUNICIPAL AND Piped WATER TO BE PROVIDED
 - I) CLAY LOAM
 - J) SHOWN ON PLAN
 - K) SANITARY AND STORM SEWERS TO BE PROVIDED
 - L) SHOWN ON PLAN

LAND USE SCHEDULE

Land Use	Lots/Blocks	Block Total	Area (ha)	Units	SDE*
Residential (Single Detached)	1-14	14	8.60	182	182
Open Space	15-18	4	0.32		
Natural Heritage System (NHS)	19-21	3	24.05		
Residential Reserve	22-28	7	0.35	10	10
0.3m Reserve	29-31	3	0.00		
18m ROW (802m)			1.53		
20m ROW (581m)			1.17		
Total	31	31	36.02	192	192

*SDE Factors:
 Single Detached - 1.0

June 2, 2022	First Submission	A	KC
DATE	REVISION	DWG	BY

NOTES:
 * Local road/Local road corner radii = 6m
 * Pavement illustration is diagrammatic



SCALE 1:1500 June 2, 2022
 DRAWN BY: KC CHECKED BY: CR A



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Figure 2a: Draft Plan of Subdivision, 5520 Eighth Line

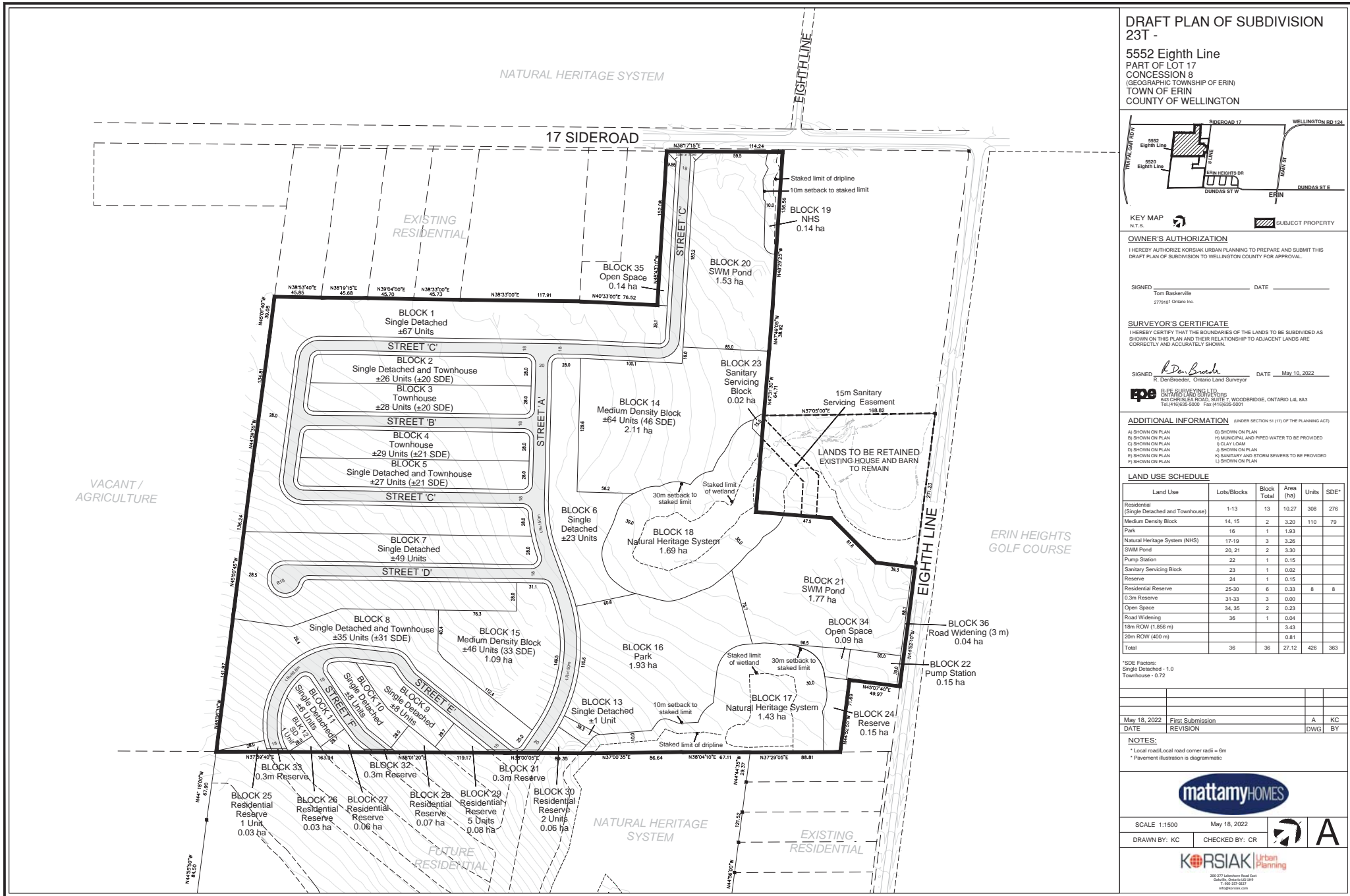
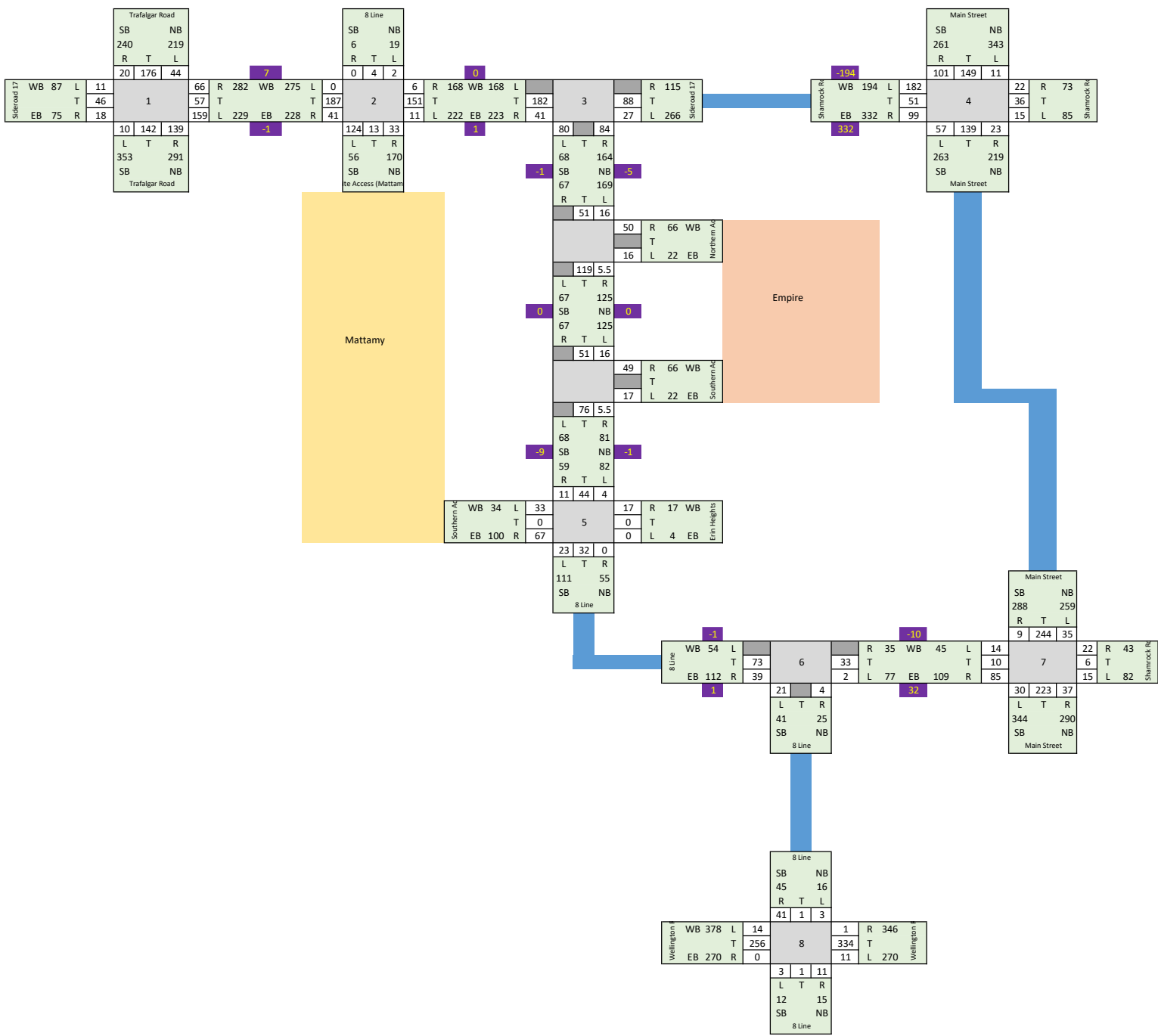


Figure 2b: Draft Plan of Subdivision, 5552 Eighth Line

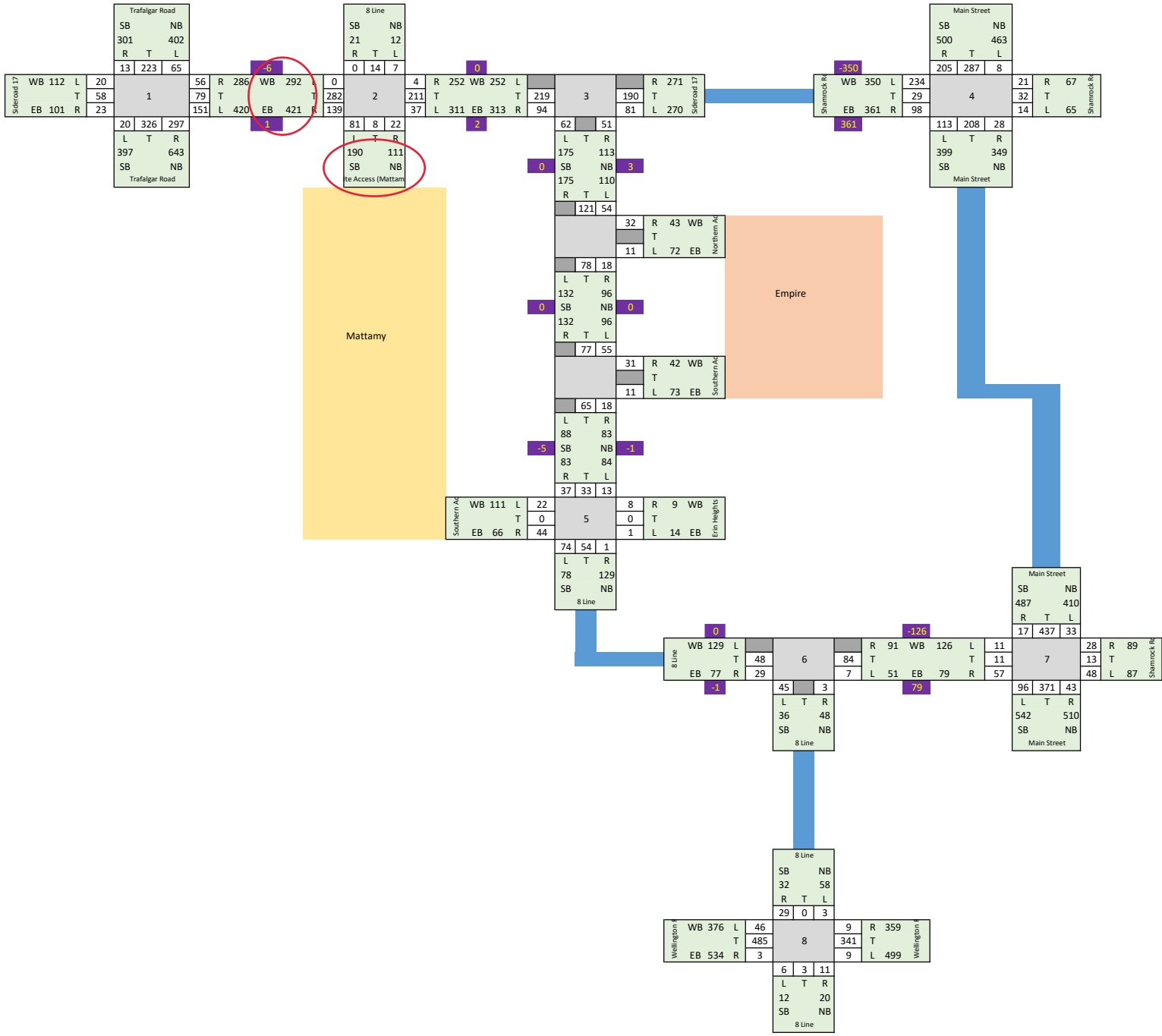
APPENDIX A

Road Traffic Information

2031 AM



2031 PM



APPENDIX B

Sample Stanson 5.04 Output

Filename: a.te Time Period: Day/Night 16/8 hours
 Description:

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

 Car traffic volume : 2416/280 veh/TimePeriod
 Medium truck volume : 139/15 veh/TimePeriod
 Heavy truck volume : 222/25 veh/TimePeriod
 Posted speed limit : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Eighth Line (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 20.00 / 20.00 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Eighth Line (day)

 Source height = 1.68 m

ROAD (0.00 + 60.85 + 0.00) = 60.85 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

 -90 90 0.56 64.09 0.00 -1.95 -1.29 0.00 0.00 0.00
 60.85

Segment Leq : 60.85 dBA

Total Leq All Segments: 60.85 dBA

Results segment # 1: Eighth Line (night)

 Source height = 1.67 m

ROAD (0.00 + 54.37 + 0.00) = 54.37 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

-90	90	0.56	57.62	0.00	-1.96	-1.29	0.00	0.00	0.00
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54.37

Segment Leq : 54.37 dBA

Total Leq All Segments: 54.37 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.85
 (NIGHT): 54.37

Filename: a_ola.te Time Period: 16 hours
Description:

Road data, segment # 1: Eighth Line

Car traffic volume : 2416 veh/TimePeriod *
Medium truck volume : 139 veh/TimePeriod *
Heavy truck volume : 222 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Eighth Line

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 16.50 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Eighth Line

Source height = 1.68 m

ROAD (0.00 + 61.96 + 0.00) = 61.96 dBA

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

SubLeq									

-90	90	0.65	64.09	0.00	-0.68	-1.45	0.00	0.00	0.00
61.96									

Segment Leq : 61.96 dBA

Total Leq All Segments: 61.96 dBA

TOTAL Leq FROM ALL SOURCES: 61.96