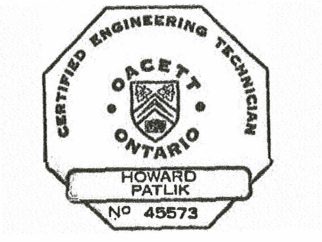
NOISE IMPACT FEASIBILITY STUDY
RESIDENTIAL SUBDIVISION
PART OF LOT 20, CONCESSION 11
20th LINE
TOWN OF ODESSA

FOR

DIV DEVELOPMENT (BARRIE) LIMITED

BY



Howard Patlik
HOWARD R. PATLIK, C.E.T.

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AUGUST 21, 2023

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INTRODUCTION

At the request of DIV Development (Barrie) Limited, J.E. COULTER ASSOCIATES LIMITED has reviewed the plans for the proposed residential subdivision located at Part of Lot 20, Concession 11. The site is bounded by 20th Sideroad to the east, Mapleview Drive East to the north, and Lockhart Road to the south in the City of Barrie (see Appendix A, Figure 1). The purpose of this noise impact feasibility study is to provide recommendations as applicable that satisfy the noise requirements of the Ministry of the Environment, Conservation and Parks (MECP).

The proposed development consists of the following residential types (see Appendix A, Figure 2):

6.5m B2B Townhouses:	126 units
6.5m Rear Lane Townhouses:	98 units
6.1 m Street Townhouses:	41 units
9.2m Single Detached:	72 units
10.1m Single Detached:	266 units
11.0m Single Detached:	131 units
Medium Density (Mapleview Drive):	181 units

This report will review the transportation and stationary noise sources that may impact this proposed development.

NOISE CRITERIA

Outdoor Living Areas

The Ministry of the Environment, Conservation and Parks' noise criterion for new residential developments is 55 dB L_{eq} daytime in the outdoor amenity areas. If the 16-Hour Equivalent Sound Level, L_{eq} (16) in the OLA is greater than 55 dB L_{eq} and less than or equal to 60 dBA, noise control measures may be applied to reduce the sound level to 55 dBA. If measures are not provided, prospective purchasers or tenants should be informed of potential noise problems by a warning clause Type A. If the 16-Hour Equivalent Sound Level, L_{eq} (16) in the OLA is greater than 60 dBA, noise control measures should be implemented to reduce the level to 55 dBA. Only in cases where the required noise control measures are not feasible for technical, economic, or administrative reasons would an excess above the limit (55 dBA) be acceptable with a warning clause Type B. In the above situations, any excess above the limit will not be acceptable if it exceeds 55 dBA.

Ventilation Requirements – Daytime Period, 0700–2300 Hours

Noise control measures may not be required if the L_{eq} (16) daytime sound level in the plane of a bedroom or living/dining room window is less than or equal to 55 dBA. If the sound level in the plane of a bedroom or living/dining room window is greater than 55 dBA and less than or equal to 65 dBA, the dwelling should be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. Warning clause Type C is also recommended.

If the daytime sound level in the plane of a bedroom or living/dining room window is greater than 65 dBA, installation of central air conditioning should be implemented with a warning clause Type D. In addition, building components including windows, walls and doors, where applicable, should be designed so that the indoor sound levels comply with the sound level limits in Table 1, below. The location and installation of the outdoor air conditioning device should comply with sound level limits of Publication *NPC-216* and guidelines contained in *Environmental Noise Guidelines for Installation of Residential Air Conditioning Devices* or should comply with other criteria specified by the municipality.

Ventilation Requirements – Nighttime Period, 2300–0700 Hours

Noise control measures may not be required if the L_{eq} (8) nighttime sound level in the plane of a bedroom or living/dining room window is less than or equal to 50 dBA. If the sound level in the plane of a bedroom or living/dining room window is greater than 50 dBA and less than or equal to 60 dBA, the dwelling should be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. Warning clause Type C is also recommended. If the nighttime sound level in the plane of a bedroom or living/dining room window is greater than 60 dBA, installation of central air conditioning should be implemented, with a warning clause Type D. In addition, building components including windows, walls and doors, where applicable, should be designed so that the indoor sound levels comply with the sound level limits in Table 1, below. The location and installation of the outdoor air conditioning device should comply with sound level limits of Publication *NPC-216* and guidelines contained in *Environmental Noise Guidelines for Installation of Residential Air Conditioning Devices*, or should comply with other criteria specified by the municipality.

The interior noise criteria limits as required by MECP are as follows:

Table 1: Indoor Sound Level Limits – Roadways

Type of Space	Time Period	L_{eq} (dBA)
		Road
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	07:00–23:00	45
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except, schools or daycare centres)	23:00–07:00	45
Sleeping quarters	07:00–23:00	45
	23:00–07:00	40

TRANSPORTATION NOISE SOURCES

Traffic projections for Mapleview Drive, 20th Sideroad, and Lockhart Road were provided by the Traffic Impact Study (TIS) by Dillon Consulting Limited to determine the projected sound levels at the proposed residential development. The MECP requires a minimum 10-year traffic projection. This analysis is based on the projection from the TIS for the year 2033. Peak hour volumes were used to calculate the 24-hour Average Annual Daily Traffic (AADT) and truck mix. It was assumed the trucks were evenly split between medium and heavy trucks.

The traffic data is summarized in Table 2, below.

Table 2: Projected Traffic Volume			
Roadway	**AADT or SAWDT**	**Truck Percentage**	**Speed Limit**
Mapleview Drive East, west of Street B (Year 2033)	10,989	2.5% Medium 2.5% Heavy	60 kph
Mapleview Drive East, east of Street B (Year 2033)	10,204	2.5% Medium 2.5% Heavy	60 kph
20th Sideroad, north of Street A (Year 2033)	1,505	1% Medium 1% Heavy	50 kph
20th Sideroad, south of Street J (Year 2033)	1,595	1% Medium 1% Heavy	80 kph
Lockhart Road, west of Street J (Year 2033)	11,980	2.5% Medium 2.5% Heavy	80 kph
Lockhart Road, east of Street J (Year 2033)	8,526	2.5% Medium 2.5% Heavy	80 kph

Notes:

1. The road traffic volume on 20th Sideroad is less than 3,200 vehicles and as per MECP's guidelines, the volume is too low to be considered and is not included in the analysis. The sound levels generated by 20th Sideroad will be within MECP's noise criteria at all dwellings and has not been included in the analysis.
2. The truck mixture on Mapleview Drive East and Lockhart Road were assumed to be 5% split evenly (2.5% medium and 2.5% heavy trucks).

PROJECTED SOUND LEVELS

The daytime (0700–2300 hours) and nighttime (2300–0700 hours) L_{eq} road traffic sound levels were calculated using the MECP's noise prediction programme (*STAMSON 5.04*). Details are provided in Appendix B.

Based on the conceptual plan and projected road traffic volumes, the following sound levels are expected (see Appendix A, Figure 2 for receiver locations):

Table 3: Projected Sound Levels (Unmitigated)						
Location	**Daytime L_{eq} Sound Levels**			**Nighttime L_{eq} Sound Levels**		
	Mapleview	**Lockhart**	**Total**	**Mapleview**	**Lockhart**	**Total**
Loc 1A – Stacked Towns along Mapleview – Rear yard	63	--	**63**	--	--	**--**
Loc 1B – Stacked Towns along Mapleview – North Façade, 3rd Level	63	--	**63**	56	--	**56**
Loc 2A – Stacked Towns along Mapleview – Rear yard	63	--	**63**	--	--	**--**
Loc 2B – Stacked Towns along Mapleview – North Façade, 3rd Level	63	--	**63**	56	--	**56**
Loc 3B – North Façade, 2nd Storey	46	--		39	--	**39**
Loc 4A – Rear yard	--	68	**68**	--	--	**--**
Loc 4B – Front Façade, 2nd Storey	--	66	**66**	--	60	**60**
Loc 5A – Rear yard	--	68	**68**	--	--	**--**
Loc 5B – Front Façade, 2nd Storey	--	66	**66**	--	60	**60**
Loc 6A – Rear yard	--	58	**58**	--	--	**--**
Loc 6B – South Façade	--	59	**59**	--	52	**52**
Loc 7B – South Façade, 2nd Storey, 2nd row from Lockhart	--	46	**46**	--	39	**39**
Loc 8B – South Façade, 2nd Storey, 2nd row from Lockhart	--	46	**46**	--	39	**39**
Loc 9A –Semi-detached, Rear yard	--	68	**68**	--	--	**--**
Loc 9B – South Façade, 2nd Storey	--	66	**66**	--	60	**60**

Note: Locations denoted as A and B refers to the rear yard and building façade, respectively. The locations refer to entire rear lane units in each block along the same roadway, not one specific dwelling unit.

From the sound levels summarized in Table 3, above, the potential noise impacts are primarily at those dwellings closest to Mapleview Drive to the north and Lockhart Road to the south. Most of the development meets MECP nose criteria without the need for any noise control measures. Standard noise control measures are expected including acoustic barriers, ventilation requirements, and warning clauses.

The sound levels generated by Mapleview Drive and Lockhart Drive were identified as exceeding MECP's noise criteria found in *NPC-300*. Noise control measures are recommended as described below.

EXTERIOR NOISE CONTROL MEASURES

The sound levels in the outdoor living areas closest to Lockhart Road and Mapleview Drive are above MECP's noise criterion of 55 dB L_{eq} daytime. It is recommended acoustic barriers be erected at these lots to shield the outdoor living areas. At this time, there are no grading plans or house sitings and thus our recommendations are general in nature. The sound level calculations have assumed the ground between the source (road) and receptor is flat. A final review of the grading plans will be needed to finalize the top-of-barrier elevations.

Locations 1A, 2A

At this time, there are no final layouts of the stacked townhouses in terms of the outdoor amenity areas. It has been assumed, at this time, the north side of the lots are grade level outdoor amenity areas (OLAs). Based on the projected sound levels, it is recommended a 2.5m high acoustic barrier be erected along the rear yards along Mapleview Drive (see Appendix A, Figure 3). This is applicable to all stacked townhouses along the north limit of the subdivision. This height of barrier (a combination of acoustic fence and/or earth berming) will meet 55 dB L_{eq} daytime. Consideration of a 1.8m high acoustic fence may be possible where the City will accept sound levels above 55 dB L_{eq} and less than or equal to 60 dB L_{eq} daytime as long as homeowners are provided with a warning clause (Warning Clause B).

Locations 4A and 5A

At the rear lane townhouses and the semi-detached dwellings (southern end) at Locations 4A and 5A adjacent to Lockhart Road, it is recommended a minimum 2.2m high acoustic barrier be erected along the rear yards parallel to Lockhart Road, with terminations at the east and west ends. The acoustic barrier will shield both rear yards (see Appendix A, Figure 4). Consideration was given to meeting 55 dB L_{eq} daytime, which would require a 3.3m acoustic barrier (a combination of acoustic fence and earth berm). Given the limited yard depths along Lockhart Road, constructing a barrier of this height may not be feasible where an earth berm is to be installed.

Location 6A

The rear lane townhouse units (Location 6A) along 20th Sideroad, closest to Lockhart Road, require a 1.8m high acoustic barrier be erected along the rear yards (see Appendix A, Figure 5).

The following table summarizes the exterior noise control measures.

Table 4: Projected Sound Levels (Mitigated)		
Location	**Daytime L_{eq} Sound Levels**	
	Acoustic Barrier Height (m)	**Daytime Sound Level (dB L_{eq})**
Location 1A (Rear yard)	1.8 – 2.5	55 – 58
Location 2A (Rear yard)	1.8 – 2.5	55 – 58
Location 4A (Rear yard)	2.2 – 3.3	55 – 60
Location 5A (Rear yard)	2.2 – 3.3	55 – 60
Location 6A (Rear yard)	1.8	53

Note: An acoustic barrier height of 1.8m may be considered for Locations 1A and 2A. At this height, the rear yard sound level is 58 dB L_{eq} daytime, marginally above the MECP's criterion. For Locations 4A and 5A, the lowest barrier height considered is 2.2m. In these cases, Locations 1A, 2A, 4A and 5A will require a warning clause (see Appendix C, Warning Clause Type B) notifying homeowners of the excess above the noise criteria.

ACOUSTIC BARRIER REQUIREMENTS

Generally, all acoustic fences are to be solid and without any gaps or openings along their lengths. The barriers are designed to at least break line-of-sight (i.e., minimum 5 dB barrier effect between the source and the receiving point). As required by the Ministry, the fence must have a minimum surface density of 20 kg/m² (4 lbs./ft.²). Acoustic fences may be constructed of heavy wood, vinyl-coated metal, or concrete. Where an acoustic fence is situated on top of an earth berm, it must be flush with the top of the berm, with no gaps.

VENTILATION AND WARNING CLAUSE REQUIREMENTS

The daytime and/or nighttime road sound levels are sufficient to require central air conditioning prior to occupancy for those dwellings closest to Lockhart Road. This is applicable to the rear lane townhouses and the southernmost townhouse units at Locations 4B and 5B (Lockhart Road). As required by MECP, a warning clause is to be inserted into all *Agreements of Purchase and Sale* or occupancy agreements for dwellings at Locations 4B and 5B (see Appendix C, Warning Clauses A and D).

The sound levels are sufficient to require the installation of a forced air heating system, with the provision of adding an air-cooled condenser unit at the homeowners' option for the following locations:

a. Locations 1B and 2B (all 8-, 10- and 12-unit stacked towns along Mapleview Drive)
b. Location 4B (all rear lane townhouses along Lockhart Road)
c. Location 5B (all rear lane townhouses along Lockhart Road)
d. Location 6B (6-unit rear lane townhouses, closest to Lockhart Road).

As required by MECP, all dwellings noted above require warning clauses to be inserted into all *Agreements of Purchase and Sale* or occupancy agreements (see Appendix C, Warning

Clauses A and C). Warning Clause B may be applicable to those lots where the rear yard sound levels are above 55 dB L_{eq} daytime

The final extent of the warning clauses is to be determined once a final Draft Plan of Subdivision is prepared.

All other lots/blocks not noted above meet MECP's *NPC-300* nose criteria and do not require any noise control measures.

FAÇADE COMPONENTS

Minimum OBC compatible construction will be sufficient to meet MECP's interior noise criteria in the bedrooms impacted by the roadways. Based on a bedroom window-area to floor-area ratio of 100% and the exterior walls being constructed with siding that achieves a minimum STC rating of 37, any Ontario Building Code compatible double glazing will meet the requirements. For living and dining rooms, minimum OBC compatible glazing is sufficient, based on a window-area to floor-area ratio of 150%. These are unusually large window-area to floor-areas ratios for most typical residential construction, thus any OBC compatible construction will suffice.

PUMPING STATION

At the northeast part of the site is a proposed pumping station. At this time, there are no details of the location of the structure, number and size of pumps, ventilation louvre sizes, and location. Given the anticipated setback to the closest housing (more than 175m), noise impacts are not expected (as per *NPC-300* – Stationary Sources) but should be reviewed once details of the pumping station are known.

RECOMMENDATIONS

To meet the requirements of the Ministry of the Environment, Conservation and Parks, the following noise mitigation measures are proposed:

1. At Location 1A, it is recommended a 2.5m high acoustic barrier be erected along the rear yards of the lots parallel to Mapleview Drive (see Appendix A, Figure 3). An acoustic barrier height of 1.8m may be considered. At this height, the rear yard sound level is 58 dB L_{eq} daytime, marginally above the MECP's criterion. In this case, Location 1A (all stacked townhouses adjacent to Mapleview Drive) will require a warning clause (see Appendix C, Warning Clause B).

2. At Locations 4A and 5A, it is recommended a minimum 2.2m high acoustic barrier be erected at the southernmost townhouse unit and the single-family dwelling (see Appendix A, Figure 4). At this height, the rear yard sound level is 60 dB L_{eq} daytime, meeting the upper limit of MECP's noise criterion. In these cases, Locations 4A and 5A will require a warning clause (see Appendix C, Warning Clause B). Consideration was given to meeting 55 dB L_{eq} daytime and requires a 3.3m acoustic barrier (a combination of acoustic fence and berm). Given the limited yard depths along Lockhart Road, constructing a barrier of this height may not be feasible where an earth berm is to be installed.

3. At Locations 6A, it is recommended a 1.8m high acoustic barrier be erected at the southmost townhouse block (see Appendix A, Figure 5). At this height, the rear yard sound level is less than 55 dB L_{eq} daytime, meeting MECP's noise criterion.

4. The acoustic barrier can be constructed from any combination of acoustic fence and/or earth berm. Once the final site grading plan is available, a final review will be needed to confirm the final barrier location and elevations. The final barriers height may change slightly from those noted in this report.

5. It is recommended the rear lane townhouses and the southmost townhouse units at Locations 4B and 5B (Lockhart Road) be supplied with central air conditioning prior to occupancy. As required by MECP, a warning clause is to be inserted into all *Agreements of Purchase and Sale* or occupancy agreements (see Appendix C, Warning Clauses A and D).

6. The sound levels are sufficient to require the installation of a forced air heating system with the provision of adding an air-cooled condenser unit at the homeowners' option for the following locations:

    a. Locations 1B and 2B (all 8-, 10- and 12-unit stacked towns along Mapleview Drive)
    b. Location 4B (all rear lane townhouses along Lockhart Road)
    c. Locations 5B (all rear lane townhouses along Lockhart Road)
    d. Locations 6B (6-unit rear lane townhouses, closest to Lockhart Road).

7. As required by MECP, all dwellings noted in Item 6 require warning clauses to be inserted into all *Agreements of Purchase and Sale* or occupancy agreements (see Appendix C, Warning Clauses A and C). Warning Clause B may be applicable to those lots where the rear yard sound levels are above 55 dB L_{eq} daytime.

8. The extent of the warning clauses is to be determined once a final Draft Plan of Subdivision is prepared.

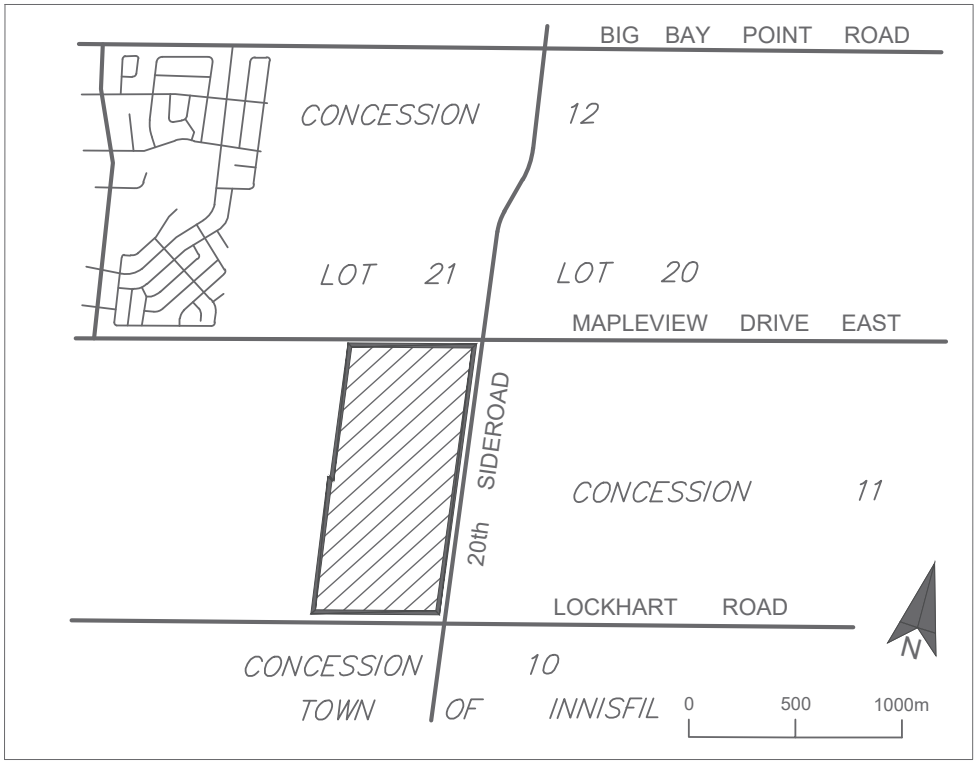
9. Minimum OBC compatible construction will be sufficient to meet MECP's interior noise criteria in the bedrooms impacted by the roadway. Based on a bedroom window-area to floor-area ratio of 150% and exterior walls being constructed with siding that achieves a minimum STC rating of 37, any Ontario Building Code compatible double glazing will meet the requirements. For living and dining rooms, minimum OBC compatible glazing is sufficient, based on a window-area to floor-area ratio of 150%. These are unusually large window-area to floor-areas ratios for most typical residential construction, thus any OBC compatible construction will suffice.

10. At the northeast part of the site is a proposed pumping station. At this time, there are no details of the location of the structure, number and size of pumps, ventilation louvre sizes and location. Given the anticipated setback to the closest housing (more than 175m), noise impacts are not expected but should be reviewed once details of the pumping station are known.

/hp/pt

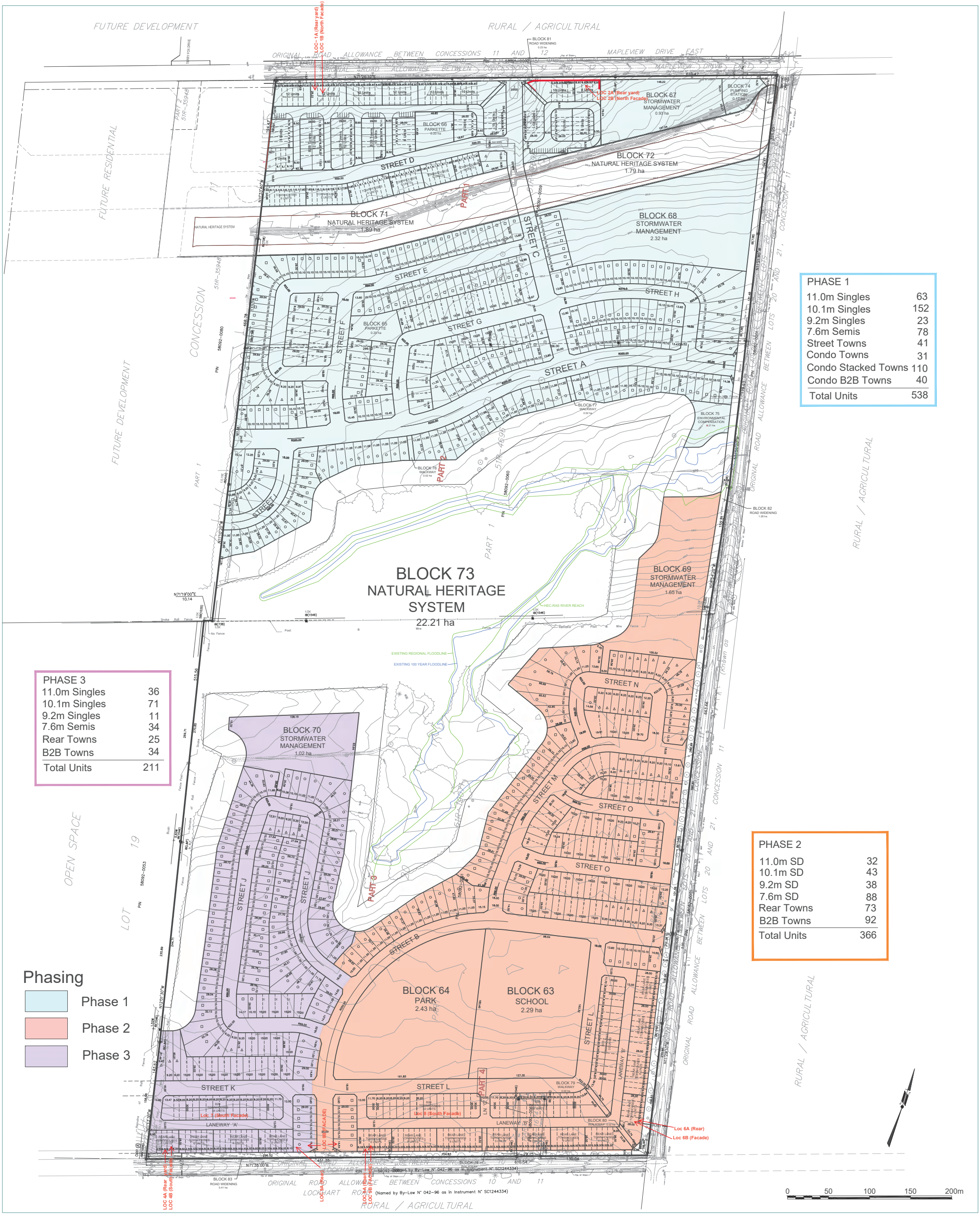
APPENDIX A: FIGURES

KEY PLAN



SUBJECT PROPERTY

FIGURE 1



PHASE 1	
11.0m Singles	63
10.1m Singles	152
9.2m Singles	23
7.6m Semis	78
Street Towns	41
Condo Towns	31
Condo Stacked Towns	110
Condo B2B Towns	40
Total Units	538

PHASE 2	
11.0m SD	32
10.1m SD	43
9.2m SD	38
7.6m SD	88
Rear Towns	73
B2B Towns	92
Total Units	366

PHASE 3	
11.0m Singles	36
10.1m Singles	71
9.2m Singles	11
7.6m Semis	34
Rear Towns	25
B2B Towns	34
Total Units	211

Phasing
- Phase 1
- Phase 2
- Phase 3

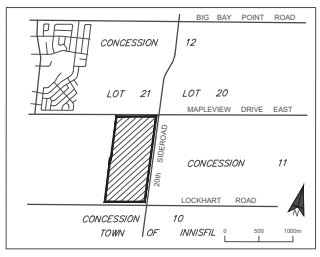
CONCEPTUAL LOTTING PLAN RECEIVER LOCATIONS (1-9)

Part of Lot 20
Concession 11
City of Barrie
Former Town of Innisfil, now
County of Simcoe

Prepared For:

DIV Development (Barrie) Ltd.

KEY PLAN



SUBJECT PROPERTY

SCHEDULE OF LAND USE

BLOCK	LAND USE		UNITS	AREA (ha)
	11.0m Single Detached		131 19.5%	21.78
	10.1m Single Detached		266 39.7%	
	9.2m Single Detached		72 10.7%	
	7.6m Semi Detached		200 30.1%	
	6.1m Street Townhouses		41	0.72
	6.5m Rear Lane Townhouses		98	1.95
	6.5m B2B Townhouses		126	1.69
	Medium Density		181	3.23
	Elementary School			2.29
	Park			2.43
	Parkettes			0.40
	Stormwater Management			5.90
	Natural Heritage System			25.89
	Pumping Station			0.17
	Environmental Compensation			0.21
	Walkways			0.10
	Road Widenings			1.90
	Public Roads	24.0m R.O.W. 630m 20.0m R.O.W. 955m 18.0m R.O.W. 3,845m 16.0m R.O.W. 60m 12.0m Lanways 825m		11.51
Totals		6,315m	1115	80.17

Date	Revision

MGP File No.: 12-2089
Date: July 25, 2023

Malone Given Parsons
140 Renfrew Drive, Suite 201 | Markham, ON | L3R 6B3
905 513 0170 | mgp.ca

FIGURE 2

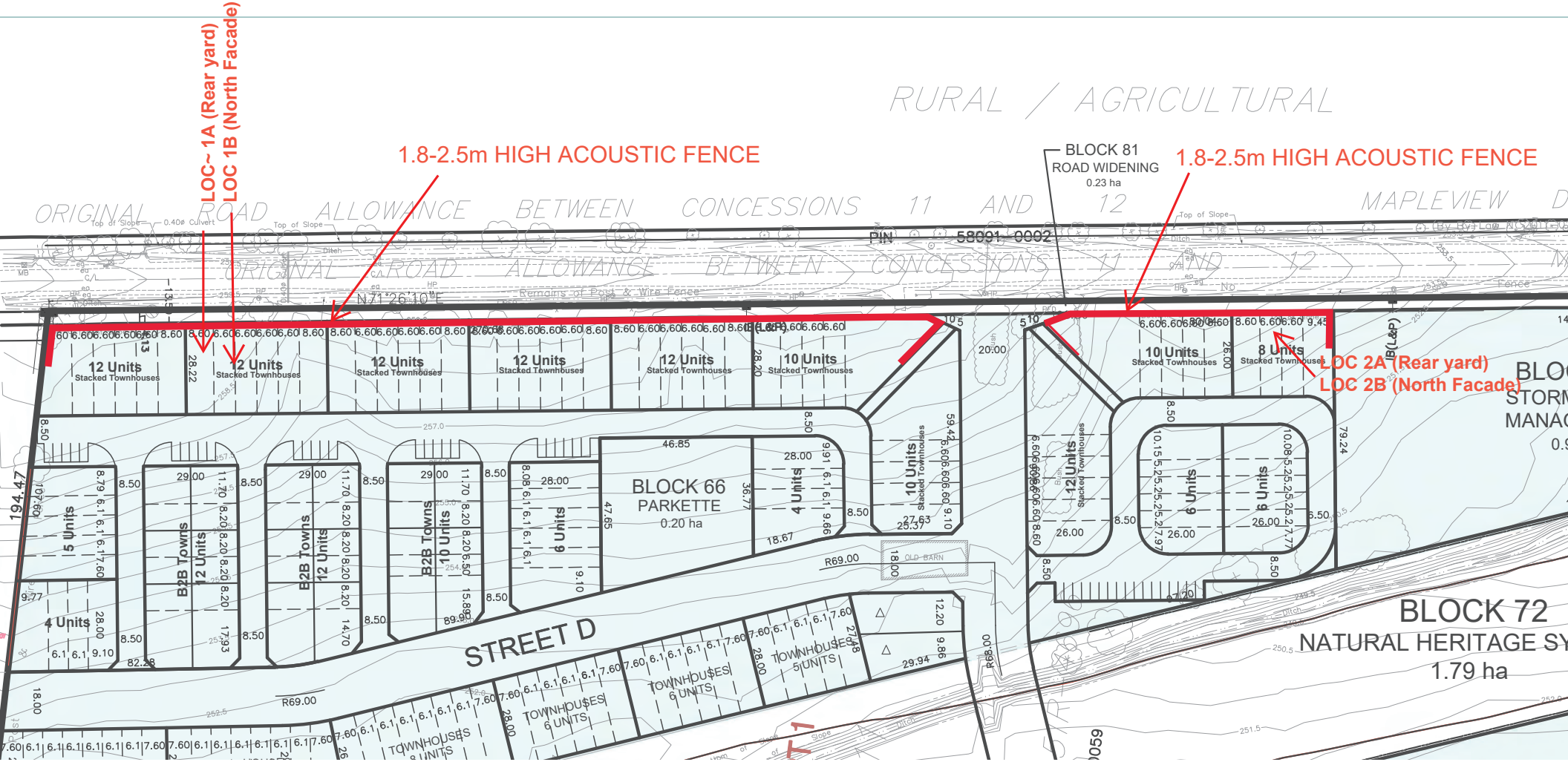

LOC~ 1A (Rear yard)
LOC 1B (North Facade)
1.8-2.5m HIGH ACOUSTIC FENCE
RURAL / AGRICULTURAL
ORIGINAL ROAD ALLOWANCE BETWEEN CONCESSIONS 11 AND 12
BLOCK 81
ROAD WIDENING
0.23 ha
1.8-2.5m HIGH ACOUSTIC FENCE
PIN 58091-0002
LOC 2A (Rear yard)
LOC 2B (North Facade)
12 Units
Stacked Townhouses
10 Units
8 Units
BLOCK 66
PARKETTE
0.20 ha
STREET D
B2B Towns
4 Units
5 Units
6 Units
TOWNHOUSES
BLOCK 72
NATURAL HERITAGE SY
1.79 ha
OLD BARN

FIGURE 3

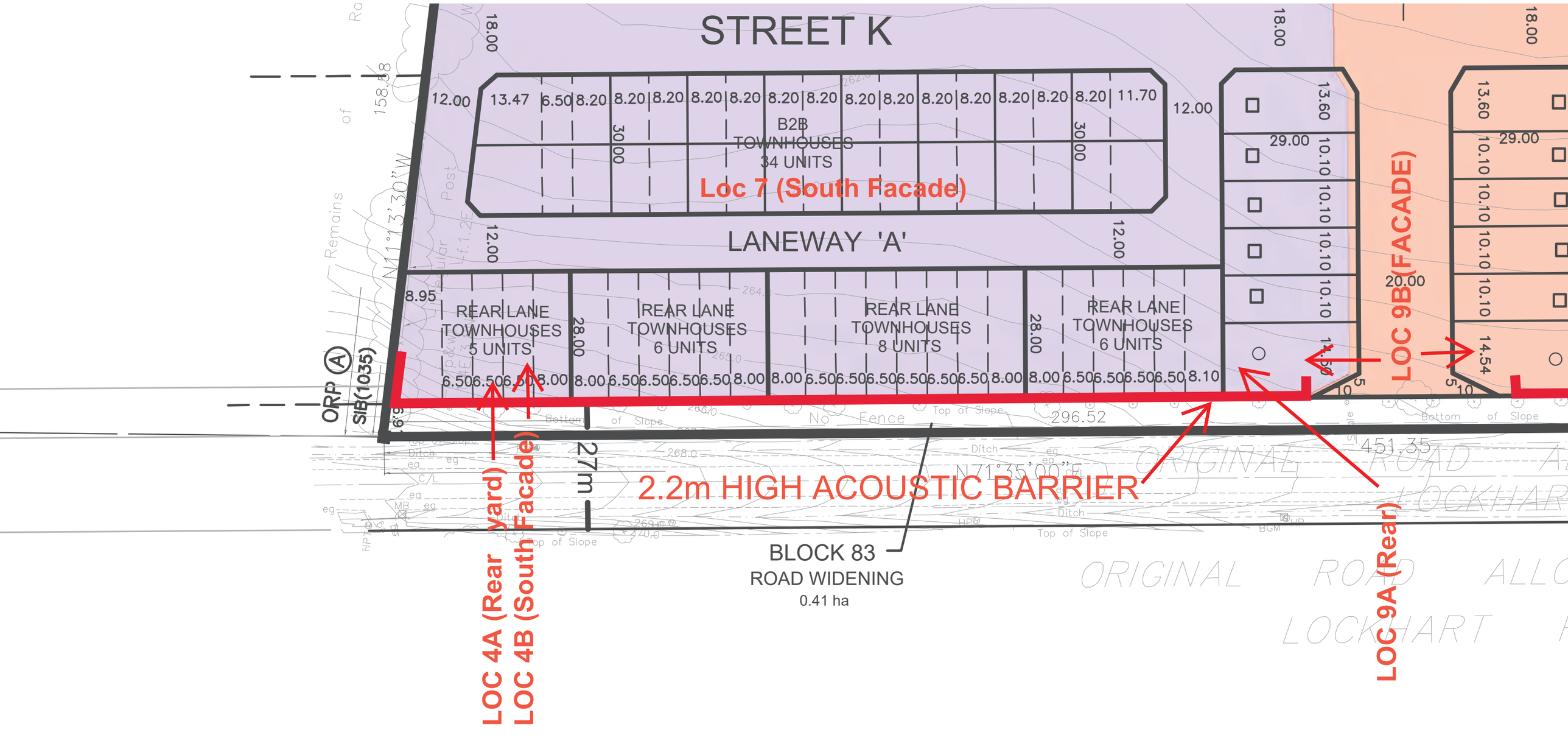

STREET K
18.00
12.00
13.47 6.50 8.20 8.20 8.20 8.20 8.20 8.20 8.20 8.20 8.20 8.20 8.20 8.20 8.20 11.70
30.00
B2B
TOWNHOUSES
34 UNITS
Loc 7 (South Facade)
LANEWAY 'A'
REAR LANE
TOWNHOUSES
5 UNITS
REAR LANE
TOWNHOUSES
6 UNITS
REAR LANE
TOWNHOUSES
8 UNITS
REAR LANE
TOWNHOUSES
6 UNITS
28.00
29.00
13.60
10.10
20.00
LOC 9B(FACADE)
14.54
LOC 9A (Rear yard)
LOC 4A (Rear yard)
LOC 4B (South Facade)
27m
2.2m HIGH ACOUSTIC BARRIER
BLOCK 83
ROAD WIDENING
0.41 ha
ORIGINAL ROAD ALLOWANCE
LOCKHART
N11°13'30"W
N71°35'00"E
296.52
451.35
158.48
No Fence
Top of Slope
Bottom of Slope
Ditch
C/L
Remains of Survey Post
SIB(1035)
ORP (A)

FIGURE 4

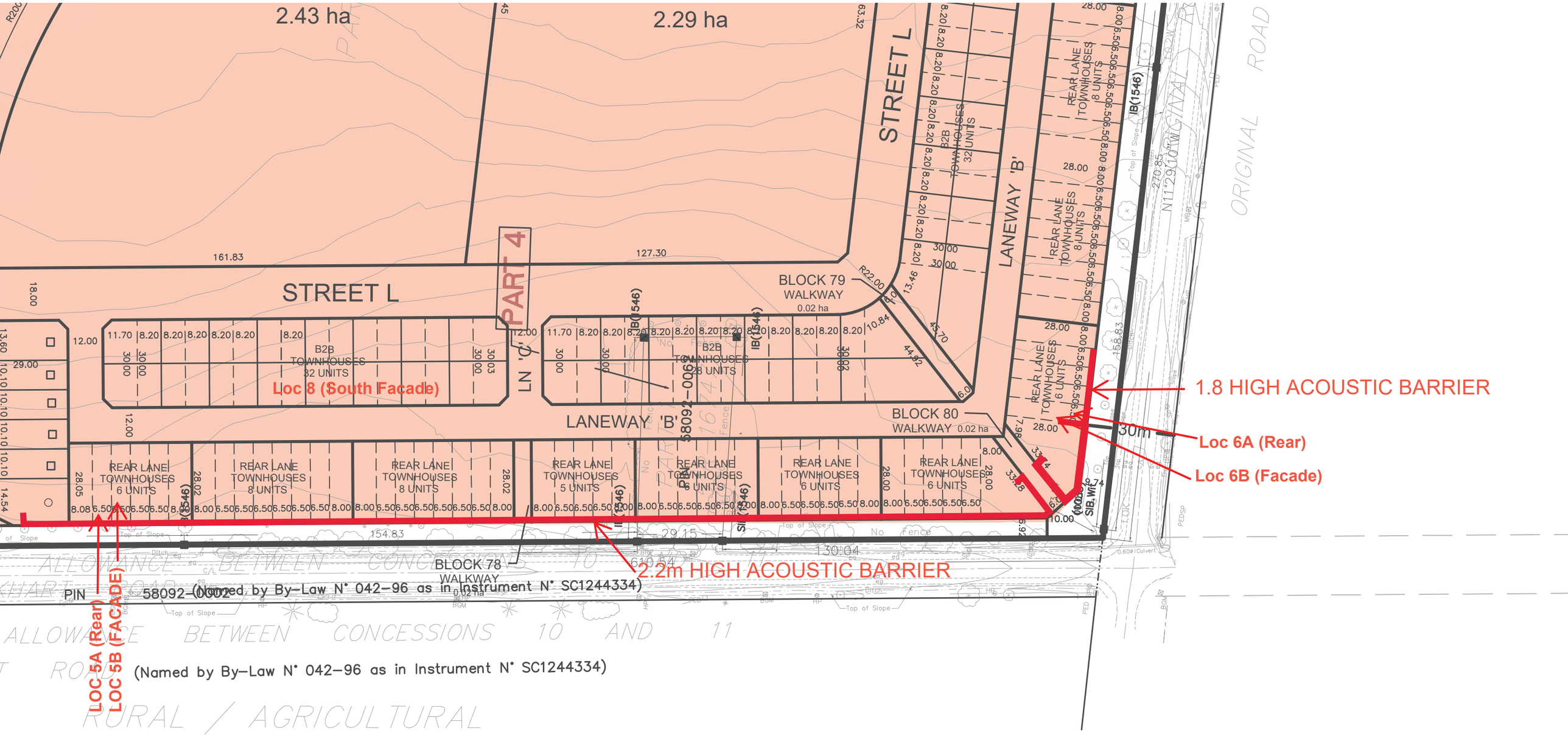

2.43 ha
2.29 ha
STREET L
LANEWAY 'B'
ORIGINAL ROAD
PART 4
LN 'D'
BLOCK 79
WALKWAY
0.02 ha
BLOCK 80
WALKWAY 0.02 ha
BLOCK 78
WALKWAY
0.02 ha
B2B TOWNHOUSES 32 UNITS
B2B TOWNHOUSES 28 UNITS
REAR LANE TOWNHOUSES 6 UNITS
REAR LANE TOWNHOUSES 8 UNITS
REAR LANE TOWNHOUSES 5 UNITS
IB(1546)
IB(1544)
SIB(1546)
DBM
Loc 8 (South Facade)
1.8 HIGH ACOUSTIC BARRIER
Loc 6A (Rear)
Loc 6B (Facade)
2.2m HIGH ACOUSTIC BARRIER
LOC 5A (Rear)
LOC 5B (FACADE)
PIN 58092-0002
(Named by By-Law N° 042-96 as in Instrument N° SC1244334)
ALLOWANCE BETWEEN CONCESSIONS 10 AND 11
RURAL / AGRICULTURAL

FIGURE 5

APPENDIX B: SOUND LEVEL CALCULATIONS

SUMMARY

DIVBar - 20th Line - 2033

N-S Roadway: Street J
E-W Roadway: Lockhart Rd.

TOTAL NORTH LEG

	Vehicles	Breakdown
Cars	3,721	97.32%
Med. Trucks	51	1.34%
Heavy Trucks	51	1.34%
24hr AADT	**3,823**	**100.00%**

TOTAL EAST LEG

	Vehicles	Breakdown
Cars	8,105	95.14%
Med. Trucks	207	2.43%
Heavy Trucks	207	2.43%
24hr AADT	**8,519**	**100.00%**

TOTAL WEST LEG

	Vehicles	Breakdown
Cars	11,462	95.67%
Med. Trucks	259	2.16%
Heavy Trucks	259	2.16%
24hr AADT	**11,980**	**100.00%**

TOTAL SOUTH LEG

	Vehicles	Breakdown
Cars	0	ERR
Med. Trucks	0	ERR
Heavy Trucks	0	ERR
24hr AADT	**0**	**ERR**

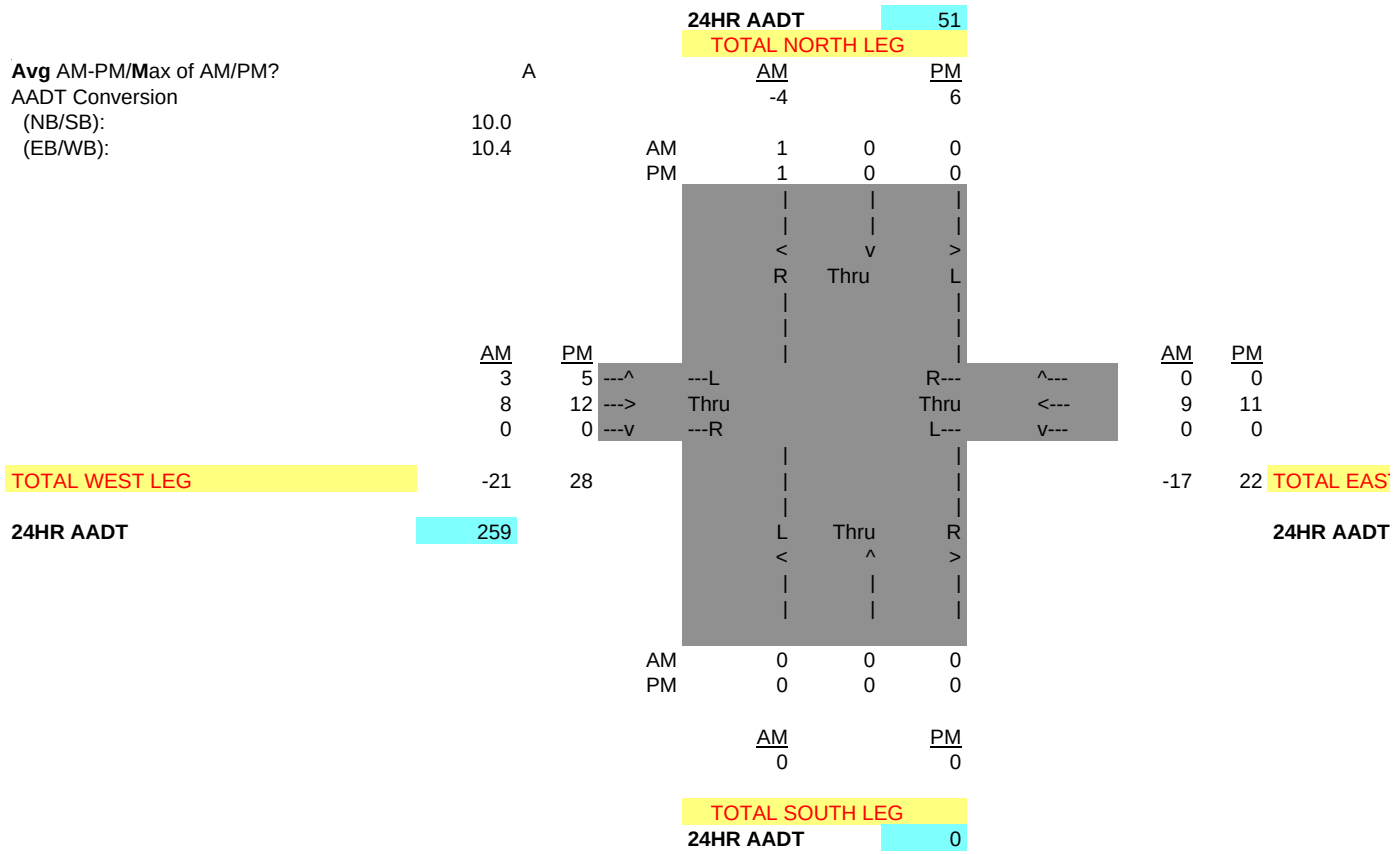
Note: 24hr AADT is calculated on averaging AM & PM values and multiplying results by conversion factor 10.4

21-Feb-23
04:02 PM

Traffic Intersection Calculator Version: 4.4
Project: DIVBar - 20th Line - 2033

HEAVY TRUCKS

	Street J (North Leg)			Street J (South Leg)			Lockhart Rd. (East Leg)		
	R	T	L	L	T	R	L	T	R
Heavy Trucks % (AM):	0.50	0.00	0.50	0.00	0.00	0.00	2.50	2.50	0.00
Heavy Trucks % (PM):	0.50	0.00	0.50	0.00	0.00	0.00	2.50	2.50	0.00



21-Feb-23
04:02 PM

Traffic Intersection Calculator Version: 4.4
Project: DIVBar - 20th Line - 2033

MEDIUM TRUCKS

	Street J (North Leg)			Street J (South Leg)			Lockhart Rd. (East Leg)		
	R	T	L	L	T	R	L	T	R
Medium Trucks % (AM):	0.50	0.00	0.50	0.00	0.00	0.00	2.50	2.50	0.00
Medium Trucks % (PM):	0.50	0.00	0.50	0.00	0.00	0.00	2.50	2.50	0.00

24HR AADT 51

TOTAL NORTH LEG

Avg AM-PM/**M**ax of AM/PM?	A			AM		PM
AADT Conversion				-4		6
(NB/SB):	10.0					
(EB/WB):	10.4		AM	1	0	0
			PM	1	0	0

	AM	PM					AM	PM	
	3	5	---^	---L		R---	^---	0	0	
	8	12	--->	Thru		Thru	<---	9	11	
	0	0	---v	---R		L---	v---	0	0	
TOTAL WEST LEG	-21	28						-17	22	TOTAL EAST LE
24HR AADT	259			L	Thru	R				**24HR AADT**

	<	^	>
AM	0	0	0
PM	0	0	0

AM	PM
0	0

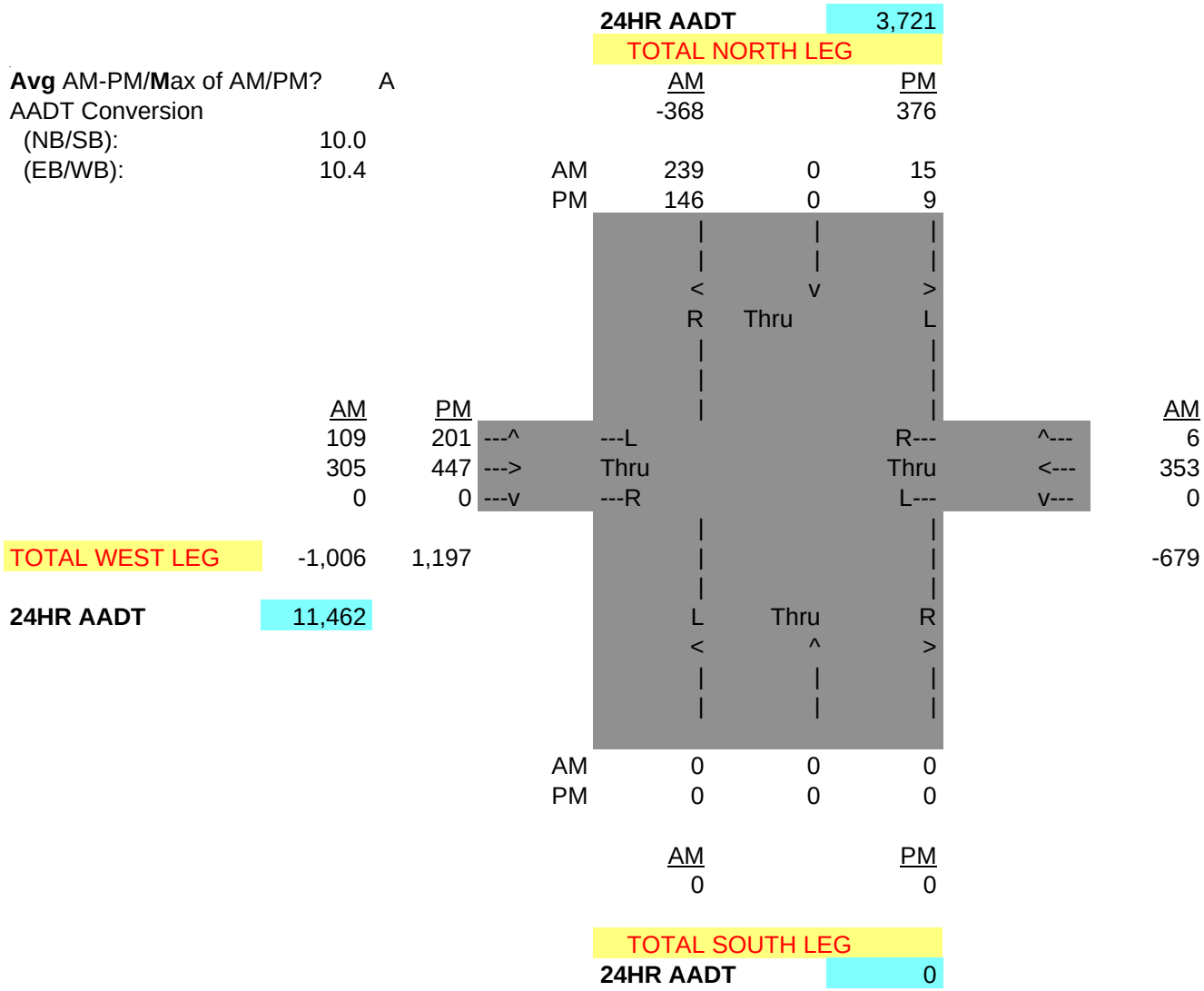
TOTAL SOUTH LEG

24HR AADT 0

21-Feb-23
04:02 PM

Traffic Intersection Calculator Version: 4.4
Project: DIVBar - 20th Line - 2033

CARS



Traffic Intersection Calculator Version: 4.4
Project: **DIVBar - 20th Line - 2033**

N-S Roadway: **Street J**
E-W Roadway: **Lockhart Rd.**

	Street J (North Leg)			Street J (South Leg)			Lockhart Rd. (East Leg		
	R	T	L	L	T	R	L	T	R
Medium Trucks % (AM):	**0.50**	**0.00**	**0.50**	**0.00**	**0.00**	**0.00**	**2.50**	**2.50**	**0.0**
Medium Trucks % (PM):	**0.50**	**0.00**	**0.50**	**0.00**	**0.00**	**0.00**	**2.50**	**2.50**	**0.0**
	R	T	L	L	T	R	L	T	R
Heavy Trucks % (AM):	**0.50**	**0.00**	**0.50**	**0.00**	**0.00**	**0.00**	**2.50**	**2.50**	**0.0**
Heavy Trucks % (PM):	**0.50**	**0.00**	**0.50**	**0.00**	**0.00**	**0.00**	**2.50**	**2.50**	**0.0**

ALL VEHICLES (100%)

24HR AADT 3,830

TOTAL NORTH LEG

Avg AM-PM/**M**ax of AM/PM?	**A**		AM	PM
AADT Conversion			-377	389
(NB/SB):	**10.0**			
(EB/WB):	**10.4**			

			AM	**241**	**0**	**15**				
			PM	**147**	**0**	**9**				
				|	|	|				
				|	|	|				
				<	v	>				
				R	Thru	L				
				|		|				
				|		|				
				|		|				
AM	PM								AM	PM	
115	**212**	---^	---L			R---	^---		**6**	**21**	
321	**470**	--->	Thru			Thru	<---		**372**	**425**	
0	**0**	---v	---R			L---	v---		**0**	**0**	
				|		|				
				|		|				
				|		|				
TOTAL WEST LEG	-1,049	1,254							-714	925	TOTAL EA
				|		|				
24HR AADT	11,980			L	Thru	R					**24HR AAD**
				<	^	>					
				|	|	|				
				|	|	|				
			AM	**0**	**0**	**0**					
			PM	**0**	**0**	**0**					

AM	PM
0	0

TOTAL SOUTH LEG
24HR AADT 0

21-Feb-23
04:02 PM

SUMMARY

DIVBar - 20th Line - 2033

N-S Roadway: Street B
E-W Roadway: Mapleview Dr.

TOTAL NORTH LEG

	Vehicles	Breakdown
Cars	0	ERR
Med. Trucks	0	ERR
Heavy Trucks	0	ERR
24hr AADT	**0**	**ERR**

TOTAL EAST LEG

	Vehicles	Breakdown
Cars	9,701	95.08%
Med. Trucks	251	2.46%
Heavy Trucks	251	2.46%
24hr AADT	**10,204**	**100.00%**

TOTAL WEST LEG

	Vehicles	Breakdown
Cars	10,485	95.41%
Med. Trucks	252	2.30%
Heavy Trucks	252	2.30%
24hr AADT	**10,989**	**100.00%**

TOTAL SOUTH LEG

	Vehicles	Breakdown
Cars	1,107	99.72%
Med. Trucks	2	0.14%
Heavy Trucks	2	0.14%
24hr AADT	**1,110**	**100.00%**

Note: 24hr AADT is calculated on averaging AM & PM values and multiplying results by conversion factor 10.1

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03:58 PM

Traffic Intersection Calculator Version: 4.4
Project: DIVBar - 20th Line - 2033

HEAVY TRUCKS

	Street B (North Leg)			Street B (South Leg)			Mapleview Dr. (East Leg		
	R	T	L	L	T	R	L	T	R
Heavy Trucks % (AM):	0.00	0.00	0.00	0.25	0.00	0.25	0.00	2.50	0.25
Heavy Trucks % (PM):	0.00	0.00	0.00	0.25	0.00	0.25	0.00	2.50	0.25

24HR AADT 0

TOTAL NORTH LEG

Avg AM-PM/**M**ax of AM/PM? A

	AM	PM
AADT Conversion	0	0
(NB/SB): 10.0		
(EB/WB): 10.1		
AM	0	0
PM	0	0

	AM	PM						AM	PM	
	0	0	---^	---L		R---	^---	0	0	
	12	16	--->	Thru		Thru	<---	12	10	
	0	0	---v	---R		L---	v---	0	0	
TOTAL WEST LEG	-24	26						-24	26	TOTAL EAS
24HR AADT	252									**24HR AADT**

	<	v	>
	R	Thru	L
	L	Thru	R
	<	^	>

	AM	PM
AM	0	0
PM	0	0
	AM	PM
	-0	0

TOTAL SOUTH LEG

24HR AADT 2

21-Feb-23
03:58 PM

Traffic Intersection Calculator Version: 4.4
Project: DIVBar - 20th Line - 2033

MEDIUM TRUCKS

	Street B (North Leg)			Street B (South Leg)			Mapleview Dr. (East Leg)		
	R	T	L	L	T	R	L	T	R
Medium Trucks % (AM):	0.25	0.00	0.25	0.25	0.00	0.25	0.00	2.50	0.25
Medium Trucks % (PM):	0.25	0.00	0.25	0.25	0.00	0.25	0.00	2.50	0.25

24HR AADT 0

TOTAL NORTH LEG

Avg AM-PM/**M**ax of AM/PM? A

	AM	PM
AADT Conversion	0	0
(NB/SB):	10.0	
(EB/WB):	10.1	

AM	0	0	0
PM	0	0	0

	|	|	|
	|	|	|
	<	v	>
	R	Thru	L
	|		|
	|		|
	|		|

	AM	PM					AM	PM
	0	0	---^	---L		R---	^---	0	0
	12	16	--->	Thru		Thru	<---	12	10
	0	0	---v	---R		L---	v---	0	0

TOTAL WEST LEG	-24	26	|	|	|	-24	26	TOTAL EAST LE
			|	|	|			
24HR AADT	252		L	Thru	R			**24HR AADT**	
			<	^	>				
			|	|	|			
			|	|	|			

AM	0	0	0
PM	0	0	0

AM	PM
-0	0

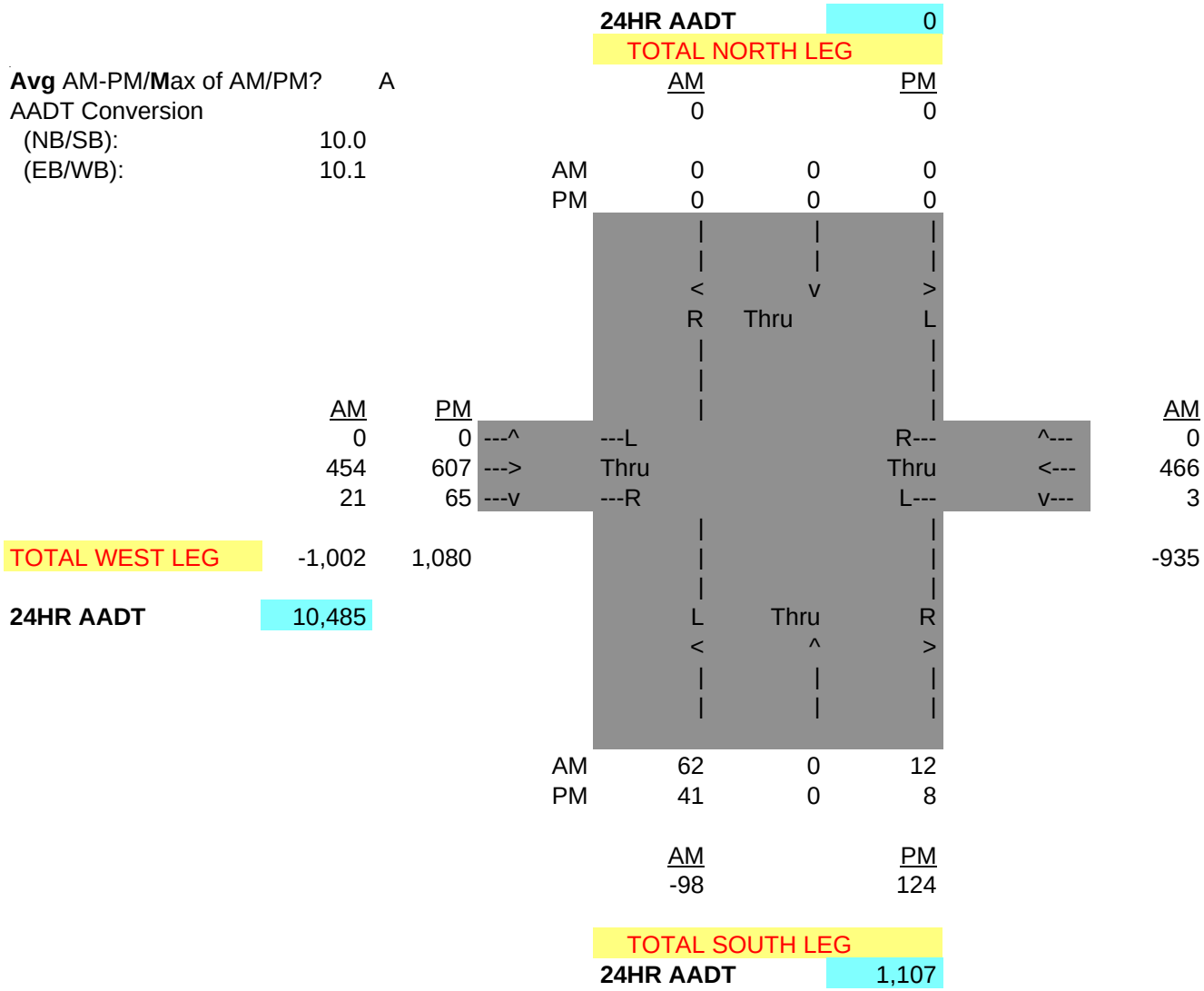
TOTAL SOUTH LEG

24HR AADT 2

21-Feb-23
03:58 PM

Traffic Intersection Calculator Version: 4.4
Project: DIVBar - 20th Line - 2033

CARS



Traffic Intersection Calculator Version: 4.4
Project: **DIVBar - 20th Line - 2033**

N-S Roadway: **Street B**
E-W Roadway: **Mapleview Dr.**

	Street B (North Leg)			Street B (South Leg)			Mapleview Dr. (East Le		
	R	T	L	L	T	R	L	T	R
Medium Trucks % (AM):	**0.25**	**0.00**	**0.25**	**0.25**	**0.00**	**0.25**	**0.00**	**2.50**	**0.2**
Medium Trucks % (PM):	**0.25**	**0.00**	**0.25**	**0.25**	**0.00**	**0.25**	**0.00**	**2.50**	**0.2**
	R	T	L	L	T	R	L	T	R
Heavy Trucks % (AM):	**0.00**	**0.00**	**0.00**	**0.25**	**0.00**	**0.25**	**0.00**	**2.50**	**0.2**
Heavy Trucks % (PM):	**0.00**	**0.00**	**0.00**	**0.25**	**0.00**	**0.25**	**0.00**	**2.50**	**0.2**

ALL VEHICLES (100%)

24HR AADT 0

TOTAL NORTH LEG

Avg AM-PM/**M**ax of AM/PM? **A**

	AM	PM
AADT Conversion	0	0

(NB/SB): **10.0**
(EB/WB): **10.1**

AM	**0**	**0**	**0**		
PM	**0**	**0**	**0**		
	|	|	|		
	|	|	|		
	<	v	>		
	R	Thru	L		
	|		|		
	|		|		
	|		|		

	AM	PM					AM	PM	
	0	**0**	---^	---L	R---	^---	**0**	**0**	
	478	**639**	--->	Thru	Thru	<---	**490**	**387**	
	21	**65**	---v	---R	L---	v---	**3**	**10**	
	|			|	|		|		
	|			|	|		|		
	|			|	|		|		
TOTAL WEST LEG	-1,051	1,132					-983	1,044	TOTAL EA
	|			|	|		|		
	|			|	|		|		
	|			|	|		|		
24HR AADT	10,989			L	Thru	R			**24HR AAI**
				<	^	>			
				|	|	|		
				|	|	|		

AM	**62**	**0**	**12**
PM	**41**	**0**	**8**

AM	PM
-98	124

TOTAL SOUTH LEG
24HR AADT 1,110

21-Feb-23
03:58 PM

STAMSON 5.0 NORMAL REPORT Date: 15-08-2023 14:56:45
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: loc1f.te Time Period: Day/Night 16/8 hours
Description: Loc 1 - North Facade

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

Car traffic volume : 9396/1044 veh/TimePeriod *
Medium truck volume : 247/27 veh/TimePeriod *
Heavy truck volume : 247/27 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 10989
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 2.50
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Mapleview (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 : 21.00 / 21.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Results segment # 1: Mapleview (day)

Source height = 1.26 m

ROAD (0.00 + 62.91 + 0.00) = 62.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.49	66.24	0.00	-2.17	-1.15	0.00	0.00	0.00	62.91

Segment Leq : 62.91 dBA

Total Leq All Segments: 62.91 dBA

Results segment # 1: Mapleview (night)

Source height = 1.25 m

ROAD (0.00 + 56.34 + 0.00) = 56.34 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.49	59.66	0.00	-2.17	-1.15	0.00	0.00	0.00	56.34

Segment Leq : 56.34 dBA

Total Leq All Segments: 56.34 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.91
(NIGHT): 56.34

STAMSON 5.0 NORMAL REPORT Date: 15-08-2023 14:56:55
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: loc2f.te Time Period: Day/Night 16/8 hours
Description: Loc 2 - North Facade

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

Car traffic volume : 9396/1044 veh/TimePeriod *
Medium truck volume : 247/27 veh/TimePeriod *
Heavy truck volume : 247/27 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 10989
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 2.50
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Mapleview (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 : 21.00 / 21.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Results segment # 1: Mapleview (day)

Source height = 1.26 m

ROAD (0.00 + 62.91 + 0.00) = 62.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.49	66.24	0.00	-2.17	-1.15	0.00	0.00	0.00	62.91

Segment Leq : 62.91 dBA

Total Leq All Segments: 62.91 dBA

Results segment # 1: Mapleview (night)

Source height = 1.25 m

ROAD (0.00 + 56.34 + 0.00) = 56.34 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.49	59.66	0.00	-2.17	-1.15	0.00	0.00	0.00	56.34

Segment Leq : 56.34 dBA

Total Leq All Segments: 56.34 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.91
(NIGHT): 56.34

STAMSON 5.0 NORMAL REPORT Date: 15-08-2023 14:57:19
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: loc3f.te Time Period: Day/Night 16/8 hours
Description: Loc 3 - North Facade - 2nd Row

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

Car traffic volume : 10243/1138 veh/TimePeriod *
Medium truck volume : 270/30 veh/TimePeriod *
Heavy truck volume : 270/30 veh/TimePeriod *
Posted speed limit : 80 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): 11980
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 2.50
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 95 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 60.00 / 60.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Results segment # 1: Lockhart (day)

Source height = 1.26 m

ROAD (0.00 + 49.10 + 0.00) = 49.10 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	69.31	0.00	-9.50	-1.32	0.00	-9.40	0.00	49.10

Segment Leq : 49.10 dBA

Total Leq All Segments: 49.10 dBA

Results segment # 1: Lockhart (night)

Source height = 1.26 m

ROAD (0.00 + 42.57 + 0.00) = 42.57 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	62.78	0.00	-9.50	-1.32	0.00	-9.40	0.00	42.57

Segment Leq : 42.57 dBA

Total Leq All Segments: 42.57 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 49.10
(NIGHT): 42.57

```
STAMSON 5.0        NORMAL REPORT        Date: 15-08-2023 14:57:40
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: loc4f.te             Time Period: Day/Night 16/8 hours
Description: Loc 4 - South Façade

Road data, segment # 1: Lockhart (day/night)
----------------------------------------
Car traffic volume  : 10243/1138  veh/TimePeriod  *
Medium truck volume :   270/30    veh/TimePeriod  *
Heavy truck volume  :   270/30    veh/TimePeriod  *
Posted speed limit  :    80 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):  11980
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   2.50
    Heavy Truck  % of Total Volume     :   2.50
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Lockhart (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  :  18.75 / 18.75  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)

Results segment # 1: Lockhart (day)
-----------------------------------

Source height = 1.26 m

ROAD (0.00 + 66.47 + 0.00) = 66.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.58  69.31   0.00  -1.53  -1.32   0.00   0.00   0.00  66.47
-------------------------------------------------------------------------------

Segment Leq : 66.47 dBA

Total Leq All Segments: 66.47 dBA

Results segment # 1: Lockhart (night)
-------------------------------------

Source height = 1.26 m

ROAD (0.00 + 59.93 + 0.00) = 59.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.58  62.78   0.00  -1.53  -1.32   0.00   0.00   0.00  59.93
-------------------------------------------------------------------------------
Segment Leq : 59.93 dBA

Total Leq All Segments: 59.93 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.47
                           (NIGHT): 59.93
```

STAMSON 5.0 NORMAL REPORT Date: 15-08-2023 14:57:56
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: loc5f.te Time Period: Day/Night 16/8 hours
Description: Loc 5 - South Facade

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

Car traffic volume : 10243/1138 veh/TimePeriod *
Medium truck volume : 270/30 veh/TimePeriod *
Heavy truck volume : 270/30 veh/TimePeriod *
Posted speed limit : 80 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): 11980
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 2.50
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Lockhart (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 : 18.75 / 18.75 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Results segment # 1: Lockhart (day)

Source height = 1.26 m

ROAD (0.00 + 66.47 + 0.00) = 66.47 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	69.31	0.00	-1.53	-1.32	0.00	0.00	0.00	66.47

Segment Leq : 66.47 dBA

Total Leq All Segments: 66.47 dBA

Results segment # 1: Lockhart (night)

Source height = 1.26 m

ROAD (0.00 + 59.93 + 0.00) = 59.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	62.78	0.00	-1.53	-1.32	0.00	0.00	0.00	59.93

Segment Leq : 59.93 dBA

Total Leq All Segments: 59.93 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.47
(NIGHT): 59.93

STAMSON 5.0 NORMAL REPORT Date: 15-08-2023 14:58:11
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: loc6f.te Time Period: Day/Night 16/8 hours
Description: Loc 6 - South Facade

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

Car traffic volume : 10243/1138 veh/TimePeriod *
Medium truck volume : 270/30 veh/TimePeriod *
Heavy truck volume : 270/30 veh/TimePeriod *
Posted speed limit : 80 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): 11980
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 2.50
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 90.00

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

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

Results segment # 1: Lockhart (day)

Source height = 1.26 m

ROAD (0.00 + 59.01 + 0.00) = 59.01 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.58	69.31	0.00	-8.11	-2.19	0.00	0.00	0.00	59.01

Segment Leq : 59.01 dBA

Total Leq All Segments: 59.01 dBA

Results segment # 1: Lockhart (night)

Source height = 1.26 m

ROAD (0.00 + 52.48 + 0.00) = 52.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.58	62.78	0.00	-8.11	-2.19	0.00	0.00	0.00	52.48

Segment Leq : 52.48 dBA

Total Leq All Segments: 52.48 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.01
(NIGHT): 52.48

STAMSON 5.0 NORMAL REPORT Date: 15-08-2023 14:58:25
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: loc7f.te Time Period: Day/Night 16/8 hours
Description: Loc 7 - South Facade

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

Car traffic volume : 9396/1044 veh/TimePeriod *
Medium truck volume : 247/27 veh/TimePeriod *
Heavy truck volume : 247/27 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 10989
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 2.50
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 95 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 65.00 / 65.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Results segment # 1: Mapleview (day)

Source height = 1.26 m

ROAD (0.00 + 45.54 + 0.00) = 45.54 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	66.24	0.00	-10.04	-1.32	0.00	-9.33	0.00	45.54

Segment Leq : 45.54 dBA

Total Leq All Segments: 45.54 dBA

Results segment # 1: Mapleview (night)

Source height = 1.25 m

ROAD (0.00 + 38.97 + 0.00) = 38.97 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	59.66	0.00	-10.05	-1.32	0.00	-9.33	0.00	38.97

Segment Leq : 38.97 dBA

Total Leq All Segments: 38.97 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 45.54
(NIGHT): 38.97

```
STAMSON 5.0        NORMAL REPORT        Date: 15-08-2023 14:58:36
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: loc8f.te             Time Period: Day/Night 16/8 hours
Description: Loc 8 - South Facade

Road data, segment # 1: Mapleview (day/night)
----------------------------------------------
Car traffic volume  :  9396/1044  veh/TimePeriod  *
Medium truck volume :   247/27    veh/TimePeriod  *
Heavy truck volume  :   247/27    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  10989
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :  10.00
    Medium Truck % of Total Volume     :   2.50
    Heavy Truck  % of Total Volume     :   2.50
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Mapleview (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     95 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  65.00 / 65.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)

Results segment # 1: Mapleview (day)
------------------------------------

Source height = 1.26 m

ROAD (0.00 + 45.54 + 0.00) = 45.54 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.58  66.24   0.00 -10.04  -1.32   0.00  -9.33   0.00  45.54
-------------------------------------------------------------------------------
Segment Leq : 45.54 dBA

Total Leq All Segments: 45.54 dBA

Results segment # 1: Mapleview (night)
--------------------------------------

Source height = 1.25 m

ROAD (0.00 + 38.97 + 0.00) = 38.97 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.58  59.66   0.00 -10.05  -1.32   0.00  -9.33   0.00  38.97
-------------------------------------------------------------------------------
Segment Leq : 38.97 dBA

Total Leq All Segments: 38.97 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 45.54
                           (NIGHT): 38.97
```

STAMSON 5.0 NORMAL REPORT Date: 15-08-2023 14:58:58
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: loc1r.te Time Period: Day/Night 16/8 hours
Description: Loc 1 - Rear yard - No Barrier

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

Car traffic volume : 9396/1044 veh/TimePeriod *
Medium truck volume : 247/27 veh/TimePeriod *
Heavy truck volume : 247/27 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 10989
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 2.50
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 90.00

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

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 : 19.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Results segment # 1: Mapleview (day)

Source height = 1.26 m

ROAD (0.00 + 63.08 + 0.00) = 63.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	66.24	0.00	-1.70	-1.46	0.00	0.00	0.00	63.08

Segment Leq : 63.08 dBA

Total Leq All Segments: 63.08 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.08

STAMSON 5.0 NORMAL REPORT Date: 15-08-2023 14:59:31
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: loc4r.te Time Period: Day/Night 16/8 hours
Description: Loc 4 - Rear yard - No Barrier

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

Car traffic volume : 10243/1138 veh/TimePeriod *
Medium truck volume : 270/30 veh/TimePeriod *
Heavy truck volume : 270/30 veh/TimePeriod *
Posted speed limit : 80 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): 11980
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 2.50
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 90.00

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

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 : 15.75 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Results segment # 1: Lockhart (day)

Source height = 1.26 m

ROAD (0.00 + 67.50 + 0.00) = 67.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	69.31	0.00	-0.35	-1.46	0.00	0.00	0.00	67.50

Segment Leq : 67.50 dBA

Total Leq All Segments: 67.50 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.50

STAMSON 5.0 NORMAL REPORT Date: 15-08-2023 14:59:40
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: loc5r.te Time Period: Day/Night 16/8 hours
Description: Loc 5 - Rear yard - No Barrier

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

Car traffic volume : 10243/1138 veh/TimePeriod *
Medium truck volume : 270/30 veh/TimePeriod *
Heavy truck volume : 270/30 veh/TimePeriod *
Posted speed limit : 80 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): 11980
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 2.50
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Lockhart (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 : 15.75 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 2.20 m
Barrier receiver distance : 2.25 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m

Results segment # 1: Lockhart (day)

Source height = 1.26 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.26	1.50	1.47	1.47

ROAD (0.00 + 59.70 + 0.00) = 59.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.54	69.31	0.00	-0.33	-1.24	0.00	0.00	-8.04	59.70

Segment Leq : 59.70 dBA

Total Leq All Segments: 59.70 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.70

STAMSON 5.0 NORMAL REPORT Date: 15-08-2023 14:59:56
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: loc6r.te Time Period: Day/Night 16/8 hours
Description: Loc 6 - Rear yard - No Barrier

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

Car traffic volume : 10243/1138 veh/TimePeriod *
Medium truck volume : 270/30 veh/TimePeriod *
Heavy truck volume : 270/30 veh/TimePeriod *
Posted speed limit : 80 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): 11980
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 2.50
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -90.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 53.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Results segment # 1: Lockhart (day)

Source height = 1.26 m

ROAD (0.00 + 57.92 + 0.00) = 57.92 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.66	69.31	0.00	-9.10	-2.29	0.00	0.00	0.00	57.92

Segment Leq : 57.92 dBA

Total Leq All Segments: 57.92 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.92

STAMSON 5.0 NORMAL REPORT Date: 15-08-2023 15:00:31
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: loc1r.te Time Period: Day/Night 16/8 hours
Description: Loc 1 - Rear yard - With Barrier

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

Car traffic volume : 9396/1044 veh/TimePeriod *
Medium truck volume : 247/27 veh/TimePeriod *
Heavy truck volume : 247/27 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 10989
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 2.50
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 90.00

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

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 : 19.00 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 2.50 m
Barrier receiver distance : 4.50 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m

Results segment # 1: Mapleview (day)

Source height = 1.26 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.26	1.50	1.44	1.44

ROAD (0.00 + 55.08 + 0.00) = 55.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.52	66.24	0.00	-1.56	-1.21	0.00	0.00	-8.39	55.08

Segment Leq : 55.08 dBA

Total Leq All Segments: 55.08 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.08

STAMSON 5.0 NORMAL REPORT Date: 15-08-2023 15:00:46
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: loc2r.te Time Period: Day/Night 16/8 hours
Description: Loc 2 - Rear yard - With Barrier

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

Car traffic volume : 9396/1044 veh/TimePeriod *
Medium truck volume : 247/27 veh/TimePeriod *
Heavy truck volume : 247/27 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 10989
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 2.50
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 90.00

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

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 : 19.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Results segment # 1: Mapleview (day)

Source height = 1.26 m

ROAD (0.00 + 63.08 + 0.00) = 63.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	66.24	0.00	-1.70	-1.46	0.00	0.00	0.00	63.08

Segment Leq : 63.08 dBA

Total Leq All Segments: 63.08 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.08

STAMSON 5.0 NORMAL REPORT Date: 15-08-2023 15:02:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: loc4r.te Time Period: Day/Night 16/8 hours
Description: Loc 4 - Rear yard - With Barrier

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

Car traffic volume : 10243/1138 veh/TimePeriod *
Medium truck volume : 270/30 veh/TimePeriod *
Heavy truck volume : 270/30 veh/TimePeriod *
Posted speed limit : 80 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): 11980
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 2.50
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 90.00

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

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 : 15.75 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 2.20 m
Barrier receiver distance : 2.25 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m

Results segment # 1: Lockhart (day)

Source height = 1.26 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.26	1.50	1.47	1.47

ROAD (0.00 + 59.70 + 0.00) = 59.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.54	69.31	0.00	-0.33	-1.24	0.00	0.00	-8.04	59.70

Segment Leq : 59.70 dBA

Total Leq All Segments: 59.70 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.70

STAMSON 5.0 NORMAL REPORT Date: 15-08-2023 15:02:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: loc5r.te Time Period: Day/Night 16/8 hours
Description: Loc 5 - Rear yard - With Barrier

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

Car traffic volume : 10243/1138 veh/TimePeriod *
Medium truck volume : 270/30 veh/TimePeriod *
Heavy truck volume : 270/30 veh/TimePeriod *
Posted speed limit : 80 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): 11980
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 2.50
Heavy Truck % of Total Volume : 2.50
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Lockhart (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 : 15.75 / 15.75 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 2.20 m
Barrier receiver distance : 2.25 / 2.25 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m

Results segment # 1: Lockhart (day)

Source height = 1.26 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.26	1.50	1.47	1.47

ROAD (0.00 + 59.70 + 0.00) = 59.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.54	69.31	0.00	-0.33	-1.24	0.00	0.00	-8.04	59.70

Segment Leq : 59.70 dBA

Total Leq All Segments: 59.70 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.70

APPENDIX C: WARNING CLAUSES

TYPE A:

"Purchasers are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the Municipality's and the Ministry of the Environment, Conservation and Parks' noise criteria."

TYPE B:

"Purchasers are advised that despite the inclusion of noise control features in the development and/or 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 Municipality's and the Ministry of the Environment, Conservation and Parks' noise criteria."

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 by the occupant 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 comply with noise criteria of MECP Publication *NPC-216*, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property.)"

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 Municipality's and the Ministry of the Environment, Conservation and Parks' noise criteria."

APPENDIX D: NOISE CRITERIA

The noise study will be based on the following criteria for residential units, as required by the Ministry of the Environment, Conservation and Parks (*NPC-300*):

TABLE C-2 SOUND LEVEL LIMITS ROADWAYS		
Type of Space	**Time Period**	**L_{eq} (dBA)**
		Road
INDOOR LIMITS		
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	07:00–23:00	45
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	23:00–07:00	45
Sleeping quarters	07:00–23:00	45
	23:00–07:00	40
OUTDOOR LIMITS		
Outdoor recreation areas[1]	07:00–23:00	55
Outside bedroom window	23:00–07:00	50
Outside living room window	07:00–23:00	55

[1] Up to 5 dB excess above criteria is allowed, provided a warning clause is given. Above 60 dB L_{eq}, exterior noise mitigation measures (i.e., noise barriers, intervening structures, additional setback from source) are required.

All sound level calculations were based on the Conceptual Plan by Malone Givens Parsons dated July 25, 2023.

L_{eq}

The L_{eq} is defined as the mean energy of the noise level averaged over the measurement period. It can be considered as the continuous steady noise level which would have the same acoustic energy as the real fluctuating noise measured over the same period of time.

APPENDIX E: REFERENCES

1. Ministry of the Environment's *STAMSON* Computer Programme *(Version 5.04*) for the IBM PC.

2. Ministry of the Environment, *ORNAMENT*, "Ontario Road Noise Analysis Method for Environment and Transportation," November 1988.

3. Quirt, D.J., "Controlling Sound Transmission into Buildings," National Research Council, *Building Practice Note 56.* BASIC computer program, Update 1.1.