

NOISE IMPACT STUDY

Proposed Residential Subdivision

“460 Lockhart Road”

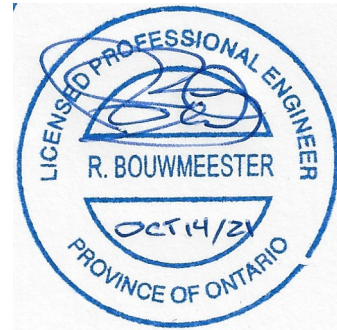
City of Barrie

Prepared for:

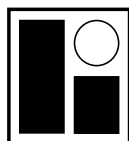
**Lockhart Innisfil
Investments II Ltd.**

Prepared by:

Ralph Bouwmeester, P. Eng.



October 14, 2021



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RBA File: A20026

EXECUTIVE SUMMARY

R. BOUWMEESTER & ASSOCIATES has been retained to assess potential noise impacts on residential uses within a proposed residential subdivision on the north side of Lockhart Road midway between Huronia Road and Yonge Street in the Hewitt's Secondary Plan area.

The goals and objectives of this study are four-fold, namely:

1. To identify noise sources and noise-sensitive land uses.
2. To recommend mitigation measures, if and where required.
3. To identify those areas, if any, requiring more detailed studies.
4. To satisfy the development approval requirements of the City of Barrie.

The noise source potentially impacting this project is future traffic on Lockhart Road.

Traffic data were provided by the City of Barrie. Roadway noise from cars and medium and heavy trucks has been accounted for in this analysis. The traffic volumes apply to Year 2031 thereby providing the 10-year minimum projection window required by the MECP.

The predicted equivalent outdoor sound levels at the subject site resulting from road traffic exceed the limits established by the MECP in certain areas. Mitigation measures are required in order to bring day and night-time sound levels down to acceptable levels.

The noise control requirements are summarized in Section 7, in Table 4, and on Figures 3 and 4.

Certain dwellings require forced air heating systems with duct work sized to accommodate the future installation of central air conditioning at the owners' option and expense. Construction meeting the minimum non-acoustical requirements of the Ontario Building Code will provide adequate sound insulation for these units. Dwellings within this zone also require warning clauses registered on title; wording is provided. See Section 7, Table 4, and Figure 3 for details.

Lot 194 and the south end unit of Block 197 require:

1. central air conditioning, and
2. building component design (for exterior windows, walls and doors).

Lot 194 also requires a 2.15 m high acoustic fence along the street line and rear lot line. See Figures 3 and 4.

In summary, the subject development as proposed can be developed in a manner that satisfies the requirements of MECP noise guideline NPC-300.

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1. INTRODUCTION

R. BOUWMEESTER & ASSOCIATES has been retained to assess potential noise impacts on residential uses within a proposed residential subdivision on the north side of Lockhart Road midway between Huronia Road and Yonge Street in southeast Barrie. See Fig 1.

Our analysis is based on the configuration of the development as shown on a Draft Plan of Subdivision prepared by Jones Consulting dated July 29, 2021. See Appendix 'C'.

2. GOALS AND OBJECTIVES

The goals and objectives of this study are four-fold, namely:

1. To identify noise sources and noise-sensitive land uses.
2. To recommend mitigation measures, if and where required.
3. To identify those areas, if any, requiring more detailed studies.
4. To satisfy the development approval requirements of the City of Barrie.

3. NOISE SOURCES

The noise source potentially impacting this project is future traffic on Lockhart Road. Traffic data were provided by the City of Barrie. See Appendix 'A'.

4. GUIDELINES AND CRITERIA

Reference is made to Ministry of the Environment, Conservation and Parks (MECP) publication, Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning (Publication NPC-300, Aug 2013 ver. #22) which recommends the following sound level limits for indoor and outdoor settings.

4.1 Sound Level Limits

The following NPC-300 sound level limits apply to road traffic:

TABLE 1 - Sound Level Limits (Leq)

Location	Time Period		Limit (dBA)
<u>Outdoor</u>			
Outdoor Living Area	Day	0700-2300 hrs	55
<u>Indoor</u>			
Living/Dining Room	All	0700-0700 hrs	45
Bedroom (day)	Day	0700-2300 hrs	45
Bedroom (night)	Night	2300-0700 hrs	40

As compared to earlier MECP noise guidelines, NPC-300 has set indoor sound level limits in bedrooms for the day-time period in addition to night-time.

4.2 Noise Control Measures

NPC-300 states that *“Noise control measures are not required if the sound level estimated in the OLA is 55 dBA or less during the daytime and 50 dBA or less in the plane of bedroom windows during either daytime or nighttime”*.

4.2.1 Outdoor Living Areas

The above-noted outdoor limit of 55 dBA applies to a protected Outdoor Living Area (OLA) of at least 56 m² (600 sq. ft.) in the case of single family detached homes, 46 m² (500 sq. ft.) in the case of semi-detached units, and 37 m² (400 sq. ft.) in the case of row or townhouse units.

The MECP guidelines indicate that *“Noise control measures are not required if the sound level estimated in the OLA is 55 dBA or less during the daytime”*.

The guidelines state that if the sound level is greater than 55 dBA 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”*.

The guidelines further state that if the sound level in the Outdoor Living Area 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 5 dBA.”* Acoustic barriers typically provide the mitigation needed, and warning clauses are required to be registered on title against the affected units.

4.2.2 Plane of Window - Ventilation Requirements

Ventilation requirements to reduce indoor sound levels, by allowing windows to remain closed if so desired by the occupants, include the following:

- For outdoor day-time sound levels in the plane of living/dining/bedroom windows greater than 55 dBA and less than or equal to 65 dBA, dwelling units must be equipped with forced air heating systems with ducting sized for the future installation of central air conditioning. Window, wall, and door components meeting normal Ontario Building Code requirements are typically adequate under these conditions, although warning clauses (Types B and C) must be registered on title against the affected lots.
- For outdoor day-time sound levels in the plane of living/dining/bedroom windows greater than 65 dBA, dwelling units must be equipped with central air conditioning. Warning clauses (Types B and D) must be registered on title against the affected lots.

Ventilation requirements under night-time conditions are similar to the above except that 50 and 60 dBA are used in place of 55 dBA and 65 dBA, respectively.

The location and installation of outdoor air conditioning devices must comply with the sound level limits of Publication NPC-216 and guidelines contained in Environmental Noise Guidelines for Installation of Residential Air Conditioning Devices or such other criteria as specified by the municipality.

4.2.3 Indoor Living Areas - Building Component Requirements

If day-time sound levels outside living/dining/bedroom windows exceed 65 dBA (or night-time levels exceed 60 dBA) building components including windows, walls and doors must be designed so that the indoor sound levels meet the sound level limits quoted in Table 1.

The above sound level limits and mitigation requirements can be summarized as follows:

TABLE 2 - Sound Level Limits and Standard Mitigation Requirements

	<u>Outdoor Sound Level Limits (dBA)</u>		
	<u>Plane of Window</u>		OLA
	Day	Night	
Do nothing	≤55	≤50	≤55
Noise barrier or Warning Clause A			56 - 60
Mandatory noise barrier *			>60
Provision for future A/C **	56 - 65	51 - 60	
Mandatory A/C **	>65	>60	
Special building component design	>65	>60	

Notes:

* Warning Clause B is required if the net resultant sound level is 56-60 dBA (to the max. allowable 60 dBA).

** Warning clauses required (A, B and C for future central air; A, B and D for mandatory central air).

5. ANALYSIS PROCEDURES

5.1 Surroundings and Site Characteristics

The subject site is located on the north side of Lockhart Road midway between Huronia Road and Yonge Street in the Hewitt's Secondary Plan area. See Figure 1. Vacant lands (future residential subdivisions) abut on the site to the east and west.

The proposed development calls for 395 residential units consisting of a mix of singles and townhomes along with a number of blocks for various miscellaneous uses (e.g. future lots, road widenings, etc.). The site is 32.10 ha in size.

Private outdoor living space is generally proposed in the rear yards of the singles and street towns. We understand that although the street townhouses on Blocks 196 and 197 front Street 'E', the units will be designed to appear as though they front Ball Gate. Outdoor amenity space will be provided by way of roof decks on the Street 'E' side.

5.2 Noise Sources

The noise source of concern is future traffic on Lockhart Road. Yonge Street and Huronia Road lie over 1 km from the site and are considered acoustically insignificant. Similarly, the proposed internal streets are assumed insignificant.

Roadway noise from cars and medium and heavy trucks has been accounted for in this analysis. The noise source heights used are in accordance with MECP criteria.

This analysis assumes that Lockhart Road is of infinite length.

Lockhart Road adjacent to the subject site is currently a 2-lane rural road within a 20 m right-of-way. It is proposed for future widening to a 5-lane cross-section consisting of two lanes of through traffic in each direction and a centre left turn lane.

For roads with up to four lanes of through traffic, the MECP allows an even directional split in traffic with noise levels assumed to originate from centreline. For more than four through lanes, separate analyses must be carried out for each direction of travel (in sets of up to four lanes each).

The ultimate right-of-way width in this area is 31.0 m with all widening proposed from the north side given that the lands to the south lie within the Town of Innisfil.

We understand from JD Engineering that the future centreline of travel will be 19.2 m south of the north limit of the widened right-of-way.

5.3 Traffic Data

The City of Barrie provided current (Year 2017) traffic counts, truck percentages, and projected annual growth rates to Year 2031 for Lockhart Road. Our analysis is based on Year 2031 traffic volumes which provide the 10-year minimum projection window required by the MECP.

We have assumed that truck traffic is split 50/50 between medium and heavy trucks.

The MECP requires increased truck noise on uphill grades to be accounted for when the grade is at least 2% and where the climb exceeds 6 m. This applies to Lockhart Road adjacent to the subject site where the average grade is about 3.0%.

The MECP-recommended percentage splits for day and night time traffic volumes were used in this study (i.e. 90/10 for arterial roads).

The posted speed limit on Lockhart Road adjacent to the site is currently 60/80 kph, and the City has advised that the entire segment can be assumed to be 60 kph by 2031.

See Appendix 'A' for further road traffic details.

5.4 Study Periods

The study periods, as per MECP guidelines, are the 16-hour day-time period between 7:00 AM and 11:00 PM, and the 8-hour night-time period from 11:00 PM and 7:00 AM.

5.5 Sound Level Prediction Model

Noise level calculations were carried out in accordance with MECP guidelines (Environmental Noise Assessment in Land Use Planning, Training Manual, Ontario Ministry of the Environment, 1987) and through the use of their road noise model ORNAMENT. See References.

5.6 Correction Factors

The corrections required by the MECP to be applied to the noise levels have been taken into account where applicable. These include corrections such as:

- a) Road segment lengths
- b) Ground surface type
- c) Source - receiver distance
- d) Height of elevated source/receiver, and
- e) Day/night split in traffic volumes.

6. CALCULATED EQUIVALENT SOUND LEVELS

Indoor sound levels are typically estimated by calculating outdoor levels along the face of a wall exposed to the noise source (i.e. in the plane of windows). Under NPC-300, day and night-time receiver heights are set at bedroom windows which are typically 4.5 m above grade in a typical single or semi-detached house or townhouse.

Shielding by the proposed dwellings was accounted for in the determination of sound levels along the building faces and within the OLAs. Shielding by vegetation was not taken into account.

OLA sound levels are typically calculated for receivers 3.0 m from the mid-point of the rear wall of a dwelling at a height of 1.5 m above finished grade.

Decks and balconies are exempt from the MECP outdoor noise limits unless they are the only outdoor living area available, and they are at least 4.0 m deep, outside the building façade, and unenclosed. Accordingly, the proposed decks on Block 197 are exempt.

Our analysis includes a sampling of noise levels that can be expected in OLAs and along the building faces based on the lotting configuration shown on the Draft Plan. These noise level predictions were used to flag those areas requiring a more detailed analysis.

Building envelopes were assumed based on typical setbacks of 3.0 m front, 5.0 m rear, and 2.0 m exterior side (per the zoning standards for the Hewitt's Secondary Plan area as contained in Section 14 of the City's Zoning By-Law 2009-141 – see Appendix 'D').

An overall summary of the predicted outdoor day-time and night-time sound levels for each of the receptor locations is presented in Table 3. See Figure 2 for receptor locations and Appendix 'B' for sample calculations.

TABLE 3 - Predicted Outdoor Sound Levels (dBA)

Receptor	Source	Source / Receiver Dist. (m) (Wall / OLA)	Outdoor Equivalent Sound Levels (Leq) Due to Road Traffic (dBA)			
			Day	Night	OLA unmitigated	OLA mitigated
Lot 188	Lockhart	77.7 / ----	55	48	<55	<55
Lot 193	Lockhart	----- / 34.7	--	--	61	59
Lot 194	Lockhart	21.2 / 25.6	67	60	64	58
Block 196	Lockhart	74.2 / ----	55	48	-	-
Block 197	Lockhart	21.6 / ---	66	60	-	-
Block 206	Lockhart	84.6 / ----	48	42	<55	<55
Block 211	Lockhart	38.6 / ----	62	56	-	-

Notes: 1. Source-Receiver distances are to future C/L of travel along Lockhart Road.
2. Block number suffix denotes unit number (read from left to right as viewed from front)
3. Mitigated OLA sound levels on Lot 193 include the 2.15 m noise barrier on Lot 194.

The results shown in Table 3 confirm that mitigation measures are required in order to ensure that the predicted sound levels meet the MECP criteria.

For example, we have determined that a 2.15 m noise fence along the street line and rear lot line of Lot 194 will reduce the sound levels to below 60 dBA on this lot and the adjacent lots to the north. See Figure 4 for noise fence locations.

The following summarizes typical acoustic requirements and describes how they apply to this proposed development. See Section 7 and Figure 3 for detailed requirements.

Warning clauses must be registered on title and included in Agreements of Purchase and Sale or Lease where sound level limits are exceeded. Based on the predicted noise levels at the building faces, warning clauses are required for certain dwelling units (see Table 4 and Figure 3) - suggested wording is given in the Notes to Table 4.

Central air conditioning is required where the sound level due to road traffic in the plane of a living/dining/bedroom window exceeds 65 dBA day-time or 60 dBA night-time. Air cooled condenser units should be located in a noise insensitive location. Central air conditioning is not meant to be a sound mitigating measure, although it does provide the dwelling occupants the option of closing windows if so desired. This requirement applies to the two dwellings flanking Lockhart Road.

Special building component design, to ensure that indoor sound levels due to road traffic meet the limits specified in Section 4, is required for residential dwelling units

where the sound level in the plane of a living/dining/bedroom window exceeds 65 dBA day-time or 60 dBA night-time. This requirement applies to the two dwellings flanking Lockhart Road.

Forced air heating systems, with duct work sized to accommodate the future installation of central air conditioning, are required where the sound level due to road traffic in the plane of a living/dining/bedroom window exceeds 55 dBA day-time or 50 dBA night-time. Future air cooled condenser units should be located in a noise insensitive location. Construction meeting the minimum non-acoustical requirements of the Ontario Building Code will provide adequate sound insulation. This requirement applies to a number of dwellings. See Section 7, Table 4 and Figure 3 for details.

Acoustic barriers, to protect outdoor living areas, are required where the day-time outdoor sound level in the OLA exceeds 60 dBA. The MECP's sound level objective for outdoor living areas is 55 dBA; however, sound level excesses of up to 5 dBA are permitted with an appropriate warning clause. Residual noise levels (in excess of 55 dBA) resulting from reduced fence heights must be covered through the use of an appropriately worded warning clause to be included in the Site Plan Agreement and in all Offers of Purchase and Sale or Lease for the affected units, and the clause is to be registered on title against those units.

Based on the configuration of the proposed Draft Plan, acoustic barriers are required for Lot 194. A 2.15 m high noise fence (see Figure 4) results in sound levels below 60 dBA on this lot and those to the north.

7. **RECOMMENDATIONS**

1. Certain Lots and Blocks require warning clauses registered on title and included in all Development Agreements and Agreements of Purchase and Sale or Lease. See Figure 3 and Table 4 for the specific lots, and see Notes to Table 4 for wording.
2. The dwelling on Lot 194 and the unit at the south end of Block 197 must be equipped with central air conditioning; their building components (exterior windows, walls and doors) must be reviewed by an acoustic engineer prior to building permit issuance.
3. Dwellings on Lots 189-193, Block 197 Units 2-8, and Blocks 209-214 require forced air heating systems sized for the future installation of central air conditioning at the dwelling owners' option and expense. See Figure 3 and Table 4 for details.
4. Lot 194 requires 2.15 m high acoustic fences (as per Barrie Standard BSD- 1200) along the street line and rear lot line. See Figures 3 and 4 for locations. The fences must return and connect to the dwelling as shown; optional gates must be to acoustic standards (as per Barrie Standard BSD-1202). Alternatively, the acoustic fence may extend along streetline to overlap a minimum of 5 m with the dwelling, and a maximum gap of 1 m is permitted immediately adjacent to the dwelling (with no acoustic gate required). See Figure 4.
5. The height, location and extent of the acoustic fences required on Lot 194 should be reviewed and confirmed by an acoustic engineer prior to final approval and/or building permit issuance when proposed grading details are available

8. CONCLUSIONS

With the incorporation of the recommended noise controls summarized in Section 7 and as contained in Table 4 and shown on Figures 3 and 4, the MECP noise guidelines can be met in all dwelling units and outdoor living areas.

In summary, the subject development as proposed can be developed in a manner that satisfies the requirements of MECP noise guideline NPC-300.

Respectfully submitted,

R. BOUWMEESTER & ASSOCIATES



Ralph Bouwmeester, P. Eng.
Principal

TABLE 4 - Summary of Noise Controls

Lot / Block ^{1.}	Central Air Conditioning	Exterior Windows, Walls and Doors	Acoustic Barrier	Warning Clauses ^{2.}
194	Yes	Special	Yes ^{3.}	A + B + D
197-1	Yes	Special	No	A + B + D
189 – 193 197-2 – 197-8 209 – 214	Provision for Adding	OBC	No	A + B + C
Remainder	No acoustic requirements			

Notes:

1. Block number suffix denotes unit number (read from left to right as viewed from front of building).
2. See Notes to Table 4 on following page for wording.
3. 2.15 m high as per Barrie Standards BSD-1200 and BSD-1202. See Recommendations 4 and 5, and Figures 3 and 4.

NOTES TO TABLE 4

1. Air cooled condenser units should be located in a noise insensitive location. In addition, the location and installation of outdoor air conditioning devices must comply with the sound level limits of Publication NPC-216 and guidelines contained in Environmental Noise Guidelines for Installation of Residential Air Conditioning Devices or such other criteria as specified by the municipality.
2. 'OBC' indicates that construction meeting the minimum non-acoustical requirements of the Ontario Building Code will provide adequate sound insulation. 'Special' indicates that exterior building components such as windows, walls and doors have to be determined by an acoustic consultant when house plans are available and prior to building permit issuance.
3. Acoustic barriers shall be of solid construction with no cracks, holes or gaps, and having a surface density of no less than 20 kg/sm. Any gaps under the noise barrier that are necessary for drainage purposes must be minimized and localized, and must not deteriorate the acoustical performance. A barrier may consist of a berm, a fence, or both.
4. The following warning clauses must be registered on title and included in the Subdivision Agreement and in all Agreements of Purchase and Sale or Lease for those lots and blocks as specified in Table 4:

TYPE A: *"Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."*

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."*

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."*

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."*

5. Conventional ventilated attic roof construction meeting OBC requirements is satisfactory.
6. All exterior doors must be fully weather-stripped.

REFERENCES

1. Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning (MOE Publication NPC-300, Aug 2013 ver. #22)
2. Environmental Noise Assessment in Land Use Planning (MOE Training Manual, 1987)
3. Road and Rail Noise: Effects on Housing (CMHC, Rev. 1981)
4. ORNAMENT (Ontario Road Noise Analysis Method for Environment and Transportation) (MOE, October 1989)
5. Traffic data (City of Barrie, 2017)
6. Zoning By-law 2009-141 (see Appendix ‘D’)

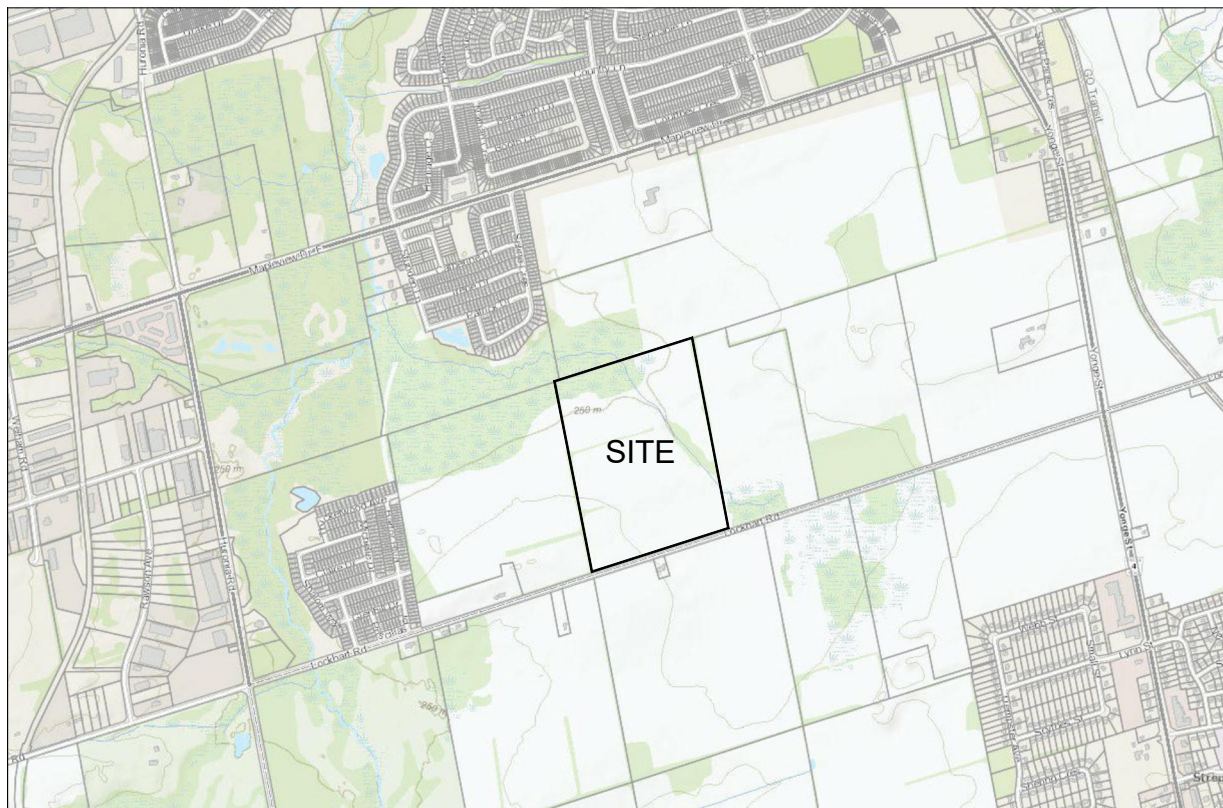
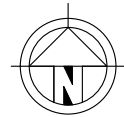
FIGURES

Figure 1 - Location Plan

Figure 2 - Receptor Plan

Figure 3 - Noise Control Plan

Figure 4 - Noise Barrier Details



Location Plan

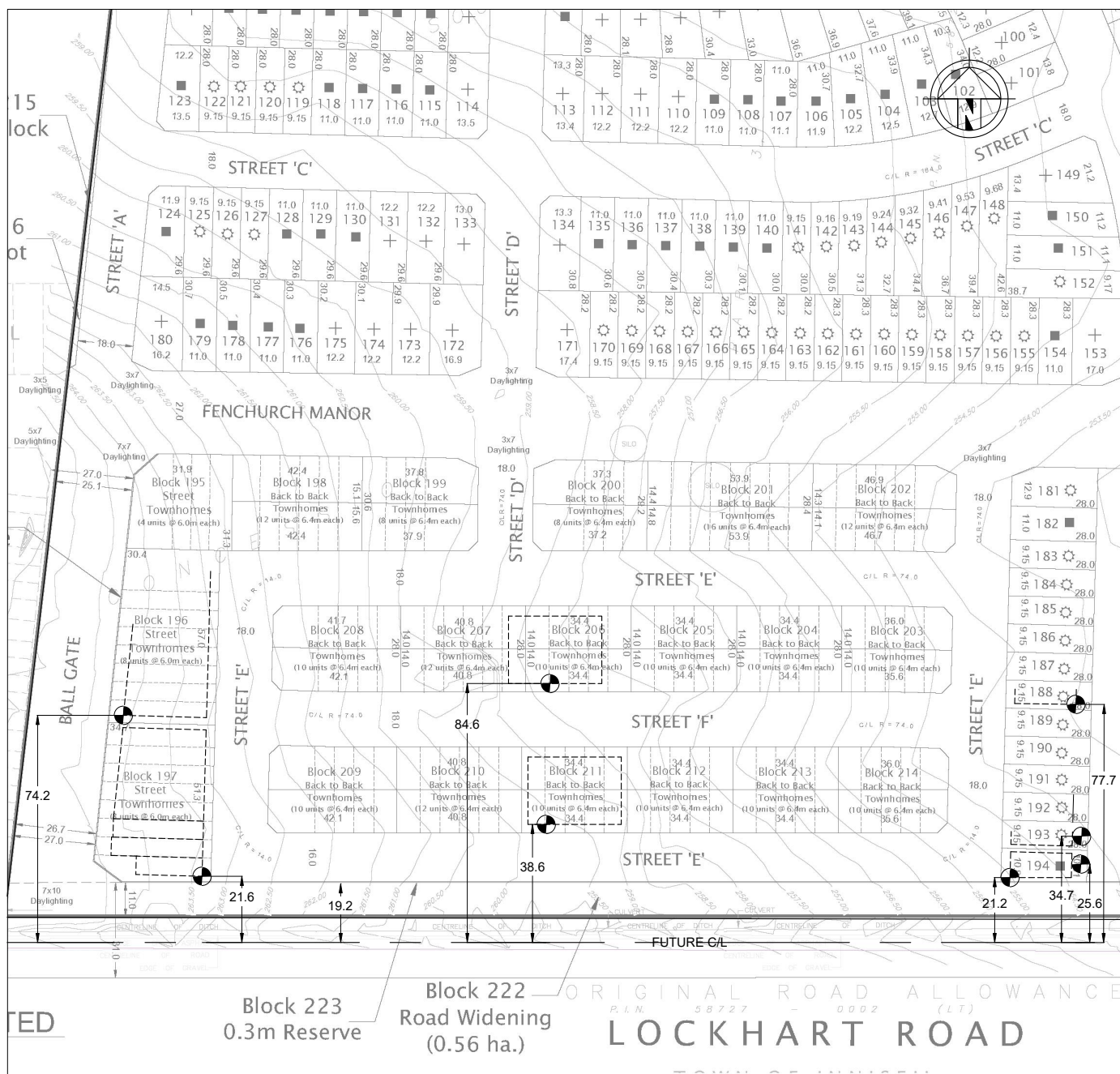
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FIG. 1

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Base map source: Simcoe County



LEGEND



Building envelope and Receptor Location

Receptor Plan

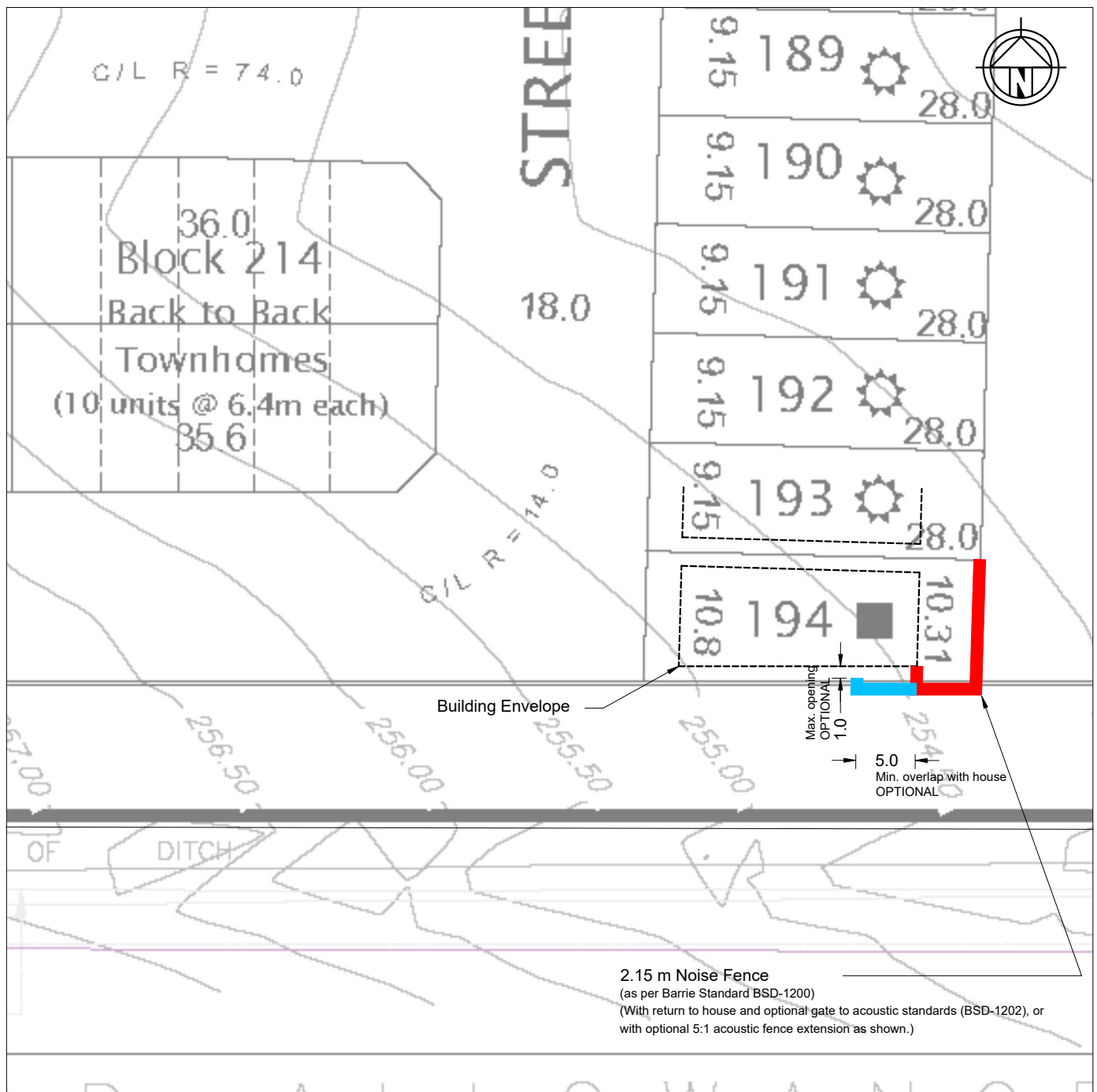
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FIG. 2

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Draft Plan source: Jones Consulting



Noise Barrier Details

Scale: 1 : 500

FIG. 4

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APPENDICES

- A. Road Traffic Data
- B. Sample Sound Level Calculations
- C. Draft Plan (source: Jones Consulting)
- D. Zoning Info (source: Zoning By-Law 2009-141)

APPENDIX ‘A’

ROAD TRAFFIC DATA

City of Barrie

- Lockhart Road (Huronion to Yonge):
 - Current (Yr. 2017) ADT is 4,844 with 7% commercial and heavy vehicles.
 - Growth rate of 10.5%* compounded annually to a horizon year of 2031.
 - 60 kph (assumed by Year 2031 – currently partially 60 kph, partially 80 kph).

*The background traffic growth rate was calculated based on the 2016 traffic projections in the City’s 2014 MMATMP and the 2031 traffic projections from the City’s 2019 TMP. (See email thread following.)

Ministry of the Environment, Conservation and Parks

The MECP recommended splits for day/night traffic are:

- arterial roads – 90/10

SUMMARY OF DATA USED IN THIS STUDY

For the purpose of this noise assessment, the following Year 2031 data apply:

	Lockhart
Traffic volume (AADT) *	19,601
Day/night split (%)	90 / 10
Percent trucks M / H **	3.5 / 3.5
Posted Speed (kph)	60 (future)
Number of lanes	4 (future, + centre left turn lane)
ROW width (m)	31 (future)
Road Grade (%)	3.0
Pavement Type	normal asphalt

* Note: Year 2031 AADT derived as follows:
 $4844 \times (1.105^{14}) = 19,601$

**Note: assumed split 50/50

Subject: RE: 560 Lockhart - future road width
From: John Northcote <john.northcote@jdengineering.ca>
Date: 1/18/2021, 3:02 PM
To: Ralph Bouwmeester <rbouwmeester@rogers.com>
CC: "cmatson (cmatson@mmland.ca)" <cmatson@mmland.ca>, Kayly Robbins <KRobbins@jonesconsulting.com>, Ray Duhamel <RDuhamel@jonesconsulting.com>

Hi Ralph,

I have confirmed the following approach with Justin:

The 2031 ADT on Lockhart Road at the subject site is 19,600 vehicles.

This was calculated by applying a background traffic growth rate (10.5% / year) to the City's 2017 ADT for Lockhart Road at the subject site (4,844 vehicles). The background traffic growth rates was calculated based on the 2016 traffic projections in the City's 2014 MMATMP and the 2031 traffic projections from the City's 2019 TMP.

Justin has asked that you include the above description in your report.

We have reviewed historic truck traffic data provided by the City and some counts we had from the area. There is significant variation in the truck traffic volume on Lockhart Road. Will the 7% commercial and heavy truck percentage cause issues? I think this is high for 2031, but if it is not an issue, we will not push back on it.

Thanks,

John Northcote, P.Eng.

JD Engineering

Phone: (705) 725-4035

Subject: Re: Future Traffic Data Request - Lockhart Road
From: Justin MacDonald <Justin.MacDonald@barrie.ca>
Date: 1/18/2021, 10:02 AM
To: Ralph Bouwmeester <rbouwmeester@rogers.com>

Good morning Ralph,

I double checked the growth rates for this segment of roadway and the growth rate is 16.6%. This growth rate is based on the 2019 TMP, the 2018 report by Valcoustics would have been based on growth rates from 2014 TMP. There was an increase in population and employment from the 2014 to 2019 TMP's which would account increase in growth rate.

Regarding the percentage heavy trucks, I was about to find a more detailed study for this area from 2018 which highlights 7% commercial and heavy.

Subject: RE: 560 Lockhart - future road width
From: John Northcote <john.northcote@jdengineering.ca>
Date: 1/15/2021, 2:30 PM
To: Ralph Bouwmeester <rbouwmeester@rogers.com>
CC: "cmatson (cmatson@mmland.ca)" <cmatson@mmland.ca>, Kayly Robbins
<KRobbins@jonesconsulting.com>, Ray Duhamel <RDuhamel@jonesconsulting.com>

Hi Ralph,

The 2031 AADT on Lockhart, just east of Huronia is 21,400, which was based on the City's 2019 Emme model.

The 2031 Emme traffic volume on Lockhart Road, directly adjacent to this site is 15,560. If you need 2041 volumes, please let me know.

Based on counts from 2015, which is the latest the City has, the heavy traffic on Lockhart (east of Huronia) is 4%. This includes commercial and heavy trucks.

The latest information I have is a 4-lane cross-section on Lockhart with the centre of the road 19.2 metres south of the new ROW (31m total width). This is from the ESR drawings.

If you need anything else, or if the City responds with different information, please let me know.

Thanks,

John Northcote, P.Eng.

JD Engineering

Phone: (705) 725-4035

Subject: RE: 560 Lockhart - future road width
From: Kayly Robbins <KRobbins@jonesconsulting.com>
Date: 1/14/2021, 3:42 PM
To: Ralph Bouwmeester <rbouwmeester@rogers.com>
CC: Ray Duhamel <RDuhamel@jonesconsulting.com>, "cmatson (cmatson@mmland.ca)" <cmatson@mmland.ca>

Hi Ralph,

Same to you.

See below for a comment from City staff during the Conformity Review process which explains the 31 metre road widening.

" According to a right of way Map developed by the City in 2017 for the Salem & Hewitt's Secondary Plan Mid-Block Right of Ways, a 34 metre right of way is required for Lockhart Road. Through discussions with the landowners Groups the City agreed in 2018 to reduce the widening requirement for a portion of Lockhart Road between Huronia Road and Yonge Street to 31 metres providing that the roadway drainage is accommodated within the development lands. In this regard, the owner will be responsible to dedicated a right of way widening to the City of Barrie across the full frontage of Lockhart Road of 11.00 metres to achieve the 31.0 metre width."

I hope this answers your question. I should also note the Draft Plan has been revised and we are waiting for final approval but I will be sure to send it to you as soon as it is finalized.

Thanks.

Kayly Robbins, M.Pl
Planner
The Jones Consulting Group Ltd.
229 Maplevue Drive East, Unit 1 Barrie, ON L4N 0W5
Phone: (705) 734-2538 ext 234 Cell: 705-795-3909
Fax: (705) 734-1056
Email: krobbins@jonesconsulting.com

From: Ralph Bouwmeester <rbouwmeester@rogers.com>
Sent: January 14, 2021 3:23 PM
To: Kayly Robbins <KRobbins@jonesconsulting.com>
Subject: 560 Lockhart - future road width

Hi Kayly -

Hope you're keeping well. Wishing you a safe, healthy and happy 2021.

On your draft plan, what was the 11.1m widening and overall 31.1m ROW width based on? I need to confirm where future C/L will be and can't seem to correlate the Draft Plan dimensions with the City's plans. Is the ultimate ROW width 34m and if so will the remaining 2.9m be taken from the south side?

--

Regards -
Ralph

Ralph Bouwmeester, P. Eng.
rbouwmeester@rogers.com

R. BOUWMEESTER & ASSOCIATES
Land Development Engineering
Barrie, ON Canada
tel/fax 705-726-3392

Subject: Re: Future Traffic Data Request - Lockhart Road
From: Justin MacDonald <Justin.MacDonald@barrie.ca>
Date: 12/17/2020, 2:11 PM
To: Ralph Bouwmeester <rbouwmeester@rogers.com>

I have checked counts from both 2018 and 2020 and the numbers are between 16% and 18% - there is an active gravel pit out there and a lot of construction along this stretch of Lockhart Road.

I would assume the entire segment would be 60km/h by 2031 once the subdivisions have been constructed.

I have not seen detail designs for Lockhart Road, but I believe the roadway is shifting north as the southern side of Lockhart is a neighbouring municipality.

APPENDIX 'B'

SAMPLE SOUND LEVEL CALCULATIONS

STAMSON 5.0 NORMAL REPORT Date: 11-02-2021 14:53:45
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 2026186o.te Time Period: 16 hours
Description: Lot 193 OLA w/o barrier

Road data, segment # 1: Lockhart

Car traffic volume : 16406 veh/TimePeriod *
Medium truck volume : 617 veh/TimePeriod *
Heavy truck volume : 617 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 3 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Lockhart

Angle1 Angle2 : -90.00 deg 14.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 34.70 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Lockhart

Source height = 1.37 m

ROAD (0.00 + 60.58 + 0.00) = 60.58 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	14	0.66	70.25	0.00	-6.05	-3.62	0.00	0.00	0.00	60.58

Segment Leq : 60.58 dBA

Total Leq All Segments: 60.58 dBA

TOTAL Leq FROM ALL SOURCES: 60.58

Filename: 2026186b.te Time Period: 16 hours
 Description: Lot 193 OLA w/barrier on Lot 194

Road data, segment # 1: Lockhart

```
-----
Car traffic volume : 16406 veh/TimePeriod *
Medium truck volume : 617 veh/TimePeriod *
Heavy truck volume : 617 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 3 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: Lockhart

```
-----
Angle1 Angle2 : -90.00 deg -23.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 34.70 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Road data, segment # 2: Lockhart

```
-----
Car traffic volume : 16406 veh/TimePeriod *
Medium truck volume : 617 veh/TimePeriod *
Heavy truck volume : 617 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 3 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 2: Lockhart

```
-----
Angle1 Angle2 : -23.00 deg -6.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 34.70 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -23.00 deg Angle2 : -6.00 deg
Barrier height : 2.15 m
Barrier receiver distance : 9.90 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00
```

Road data, segment # 3: Lockhart

```

-----
Car traffic volume : 16406 veh/TimePeriod *
Medium truck volume : 617 veh/TimePeriod *
Heavy truck volume : 617 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 3 %
Road pavement : 1 (Typical asphalt or concrete)

```

Data for Segment # 3: Lockhart

```

-----
Angle1 Angle2 : -6.00 deg 14.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 34.70 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -6.00 deg Angle2 : 14.00 deg
Barrier height : 2.15 m
Barrier receiver distance : 15.40 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

```

Results segment # 1: Lockhart

Source height = 1.37 m

```

ROAD (0.00 + 57.85 + 0.00) = 57.85 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-90 -23 0.66 70.25 0.00 -6.05 -6.35 0.00 0.00 0.00 57.85
-----

```

Segment Leq : 57.85 dBA

Results segment # 2: Lockhart

Source height = 1.37 m

Barrier height for grazing incidence

```

-----
Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
1.37 ! 1.50 ! 1.46 ! 1.46

```

```

ROAD (0.00 + 47.82 + 0.00) = 47.82 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-23 -6 0.53 70.25 0.00 -5.59 -10.33 0.00 0.00 -6.51 47.82
-----

```

Segment Leq : 47.82 dBA

Results segment # 3: Lockhart

Source height = 1.37 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.37	1.50	1.44	1.44

ROAD (0.00 + 48.72 + 0.00) = 48.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-6	14	0.53	70.25	0.00	-5.59	-9.56	0.00	0.00	-6.38	48.72

Segment Leq : 48.72 dBA

Total Leq All Segments: 58.72 dBA

TOTAL Leq FROM ALL SOURCES: 58.72

Filename: 2026187w.te Time Period: Day/Night 16/8 hours
 Description: Lot 194 day/night at wall

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

 Car traffic volume : 16406/1823 veh/TimePeriod *
 Medium truck volume : 617/69 veh/TimePeriod *
 Heavy truck volume : 617/69 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 3 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 4844
 Percentage of Annual Growth : 10.50
 Number of Years of Growth : 14.00
 Medium Truck % of Total Volume : 3.50
 Heavy Truck % of Total Volume : 3.50
 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 : 21.20 / 21.20 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Lockhart (day)

 Source height = 1.37 m

ROAD (0.00 + 66.57 + 0.00) = 66.57 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	70.25	0.00	-2.36	-1.31	0.00	0.00	0.00	66.57

Segment Leq : 66.57 dBA

Total Leq All Segments: 66.57 dBA

Results segment # 1: Lockhart (night)

Source height = 1.37 m

ROAD (0.00 + 60.06 + 0.00) = 60.06 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.73	0.00	-2.36	-1.31	0.00	0.00	0.00	60.06

Segment Leq : 60.06 dBA

Total Leq All Segments: 60.06 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.57
(NIGHT): 60.06

Filename: 2026187o.te Time Period: 16 hours
 Description: Lot 194 OLA w/o barrier

Road data, segment # 1: Lockhart

 Car traffic volume : 16406 veh/TimePeriod *
 Medium truck volume : 617 veh/TimePeriod *
 Heavy truck volume : 617 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 3 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Lockhart

 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 : 25.60 m
 Receiver height : 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Lockhart

 Source height = 1.37 m

ROAD (0.00 + 64.10 + 0.00) = 64.10 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.66	70.25	0.00	-3.85	-2.29	0.00	0.00	0.00	64.10

Segment Leq : 64.10 dBA

Total Leq All Segments: 64.10 dBA

TOTAL Leq FROM ALL SOURCES: 64.10

Filename: 2026187b.te Time Period: 16 hours
 Description: Lot 194 OLA w/barrier

Road data, segment # 1: Lockhart

```
-----
Car traffic volume : 16406 veh/TimePeriod *
Medium truck volume : 617 veh/TimePeriod *
Heavy truck volume : 617 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 3 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: Lockhart

```
-----
Angle1 Angle2 : -90.00 deg -17.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 25.60 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -17.00 deg
Barrier height : 2.15 m
Barrier receiver distance : 3.20 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00
```

Road data, segment # 2: Lockhart

```
-----
Car traffic volume : 16406 veh/TimePeriod *
Medium truck volume : 617 veh/TimePeriod *
Heavy truck volume : 617 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 3 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 2: Lockhart

```
-----
Angle1 Angle2 : -17.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 25.60 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -17.00 deg Angle2 : 45.00 deg
Barrier height : 2.15 m
Barrier receiver distance : 6.30 m
```

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

Results segment # 1: Lockhart

Source height = 1.37 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.37	1.50	1.48	1.48

ROAD (0.00 + 54.39 + 0.00) = 54.39 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-17	0.53	70.25	0.00	-3.56	-5.50	0.00	0.00	-6.80	54.39

Segment Leq : 54.39 dBA

Results segment # 2: Lockhart

Source height = 1.37 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.37	1.50	1.47	1.47

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
-17	45	0.53	70.25	0.00	-3.56	-4.82	0.00	0.00	-7.02	54.85

Segment Leq : 54.85 dBA

Total Leq All Segments: 57.64 dBA

TOTAL Leq FROM ALL SOURCES: 57.64

Filename: 2026881w.te Time Period: Day/Night 16/8 hours
 Description: Block 197-1 day/night at wall

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

 Car traffic volume : 16406/1823 veh/TimePeriod *
 Medium truck volume : 617/69 veh/TimePeriod *
 Heavy truck volume : 617/69 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 3 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 4844
 Percentage of Annual Growth : 10.50
 Number of Years of Growth : 14.00
 Medium Truck % of Total Volume : 3.50
 Heavy Truck % of Total Volume : 3.50
 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 : 21.60 / 21.60 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Lockhart (day)

 Source height = 1.37 m

ROAD (0.00 + 66.44 + 0.00) = 66.44 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	70.25	0.00	-2.49	-1.31	0.00	0.00	0.00	66.44

Segment Leq : 66.44 dBA

Total Leq All Segments: 66.44 dBA

Results segment # 1: Lockhart (night)

Source height = 1.37 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	0.57	63.73	0.00	-2.49	-1.31	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): 66.44
(NIGHT): 59.93

Filename: 2026891w.te Time Period: Day/Night 16/8 hours
 Description: Block 196-1 day/night at wall

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

 Car traffic volume : 16406/1823 veh/TimePeriod *
 Medium truck volume : 617/69 veh/TimePeriod *
 Heavy truck volume : 617/69 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 3 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 4844
 Percentage of Annual Growth : 10.50
 Number of Years of Growth : 14.00
 Medium Truck % of Total Volume : 3.50
 Heavy Truck % of Total Volume : 3.50
 Day (16 hrs) % of Total Volume : 90.00

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

 Angle1 Angle2 : 0.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 74.20 / 74.20 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Lockhart (day)

 Source height = 1.37 m

ROAD (0.00 + 55.00 + 0.00) = 55.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.57	70.25	0.00	-10.93	-4.32	0.00	0.00	0.00	55.00

Segment Leq : 55.00 dBA

Total Leq All Segments: 55.00 dBA

Results segment # 1: Lockhart (night)

Source height = 1.37 m

ROAD (0.00 + 48.49 + 0.00) = 48.49 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.57	63.73	0.00	-10.93	-4.32	0.00	0.00	0.00	48.49

Segment Leq : 48.49 dBA

Total Leq All Segments: 48.49 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.00
(NIGHT): 48.49

Filename: 2026915w.te Time Period: Day/Night 16/8 hours
 Description: Lot 188 day/night at wall

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

 Car traffic volume : 16406/1823 veh/TimePeriod *
 Medium truck volume : 617/69 veh/TimePeriod *
 Heavy truck volume : 617/69 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 3 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 4844
 Percentage of Annual Growth : 10.50
 Number of Years of Growth : 14.00
 Medium Truck % of Total Volume : 3.50
 Heavy Truck % of Total Volume : 3.50
 Day (16 hrs) % of Total Volume : 90.00

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

 Angle1 Angle2 : -90.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 77.70 / 77.70 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Lockhart (day)

 Source height = 1.37 m

ROAD (0.00 + 54.68 + 0.00) = 54.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.57	70.25	0.00	-11.24	-4.32	0.00	0.00	0.00	54.68

Segment Leq : 54.68 dBA

Total Leq All Segments: 54.68 dBA

Results segment # 1: Lockhart (night)

Source height = 1.37 m

ROAD (0.00 + 48.17 + 0.00) = 48.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.57	63.73	0.00	-11.24	-4.32	0.00	0.00	0.00	48.17

Segment Leq : 48.17 dBA

Total Leq All Segments: 48.17 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.68
(NIGHT): 48.17

Filename: 2026200w.te Time Period: Day/Night 16/8 hours
 Description: Block 206 day/night at wall

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

 Car traffic volume : 16406/1823 veh/TimePeriod *
 Medium truck volume : 617/69 veh/TimePeriod *
 Heavy truck volume : 617/69 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 3 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 4844
 Percentage of Annual Growth : 10.50
 Number of Years of Growth : 14.00
 Medium Truck % of Total Volume : 3.50
 Heavy Truck % of Total Volume : 3.50
 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 : 84.60 / 84.60 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Lockhart (day)

 Source height = 1.37 m

ROAD (0.00 + 48.04 + 0.00) = 48.04 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	70.25	0.00	-11.82	-1.31	0.00	-9.07	0.00	48.04

Segment Leq : 48.04 dBA

Total Leq All Segments: 48.04 dBA

Results segment # 1: Lockhart (night)

Source height = 1.37 m

ROAD (0.00 + 41.53 + 0.00) = 41.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.73	0.00	-11.82	-1.31	0.00	-9.07	0.00	41.53

Segment Leq : 41.53 dBA

Total Leq All Segments: 41.53 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 48.04
(NIGHT): 41.53

Filename: 2026205w.te Time Period: Day/Night 16/8 hours
 Description: Block 211 day/night at wall

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

 Car traffic volume : 16406/1823 veh/TimePeriod *
 Medium truck volume : 617/69 veh/TimePeriod *
 Heavy truck volume : 617/69 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 3 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 4844
 Percentage of Annual Growth : 10.50
 Number of Years of Growth : 14.00
 Medium Truck % of Total Volume : 3.50
 Heavy Truck % of Total Volume : 3.50
 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 : 38.60 / 38.60 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Lockhart (day)

 Source height = 1.37 m

ROAD (0.00 + 62.48 + 0.00) = 62.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	70.25	0.00	-6.46	-1.31	0.00	0.00	0.00	62.48

Segment Leq : 62.48 dBA

Total Leq All Segments: 62.48 dBA

Results segment # 1: Lockhart (night)

Source height = 1.37 m

ROAD (0.00 + 55.96 + 0.00) = 55.96 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.73	0.00	-6.46	-1.31	0.00	0.00	0.00	55.96

Segment Leq : 55.96 dBA

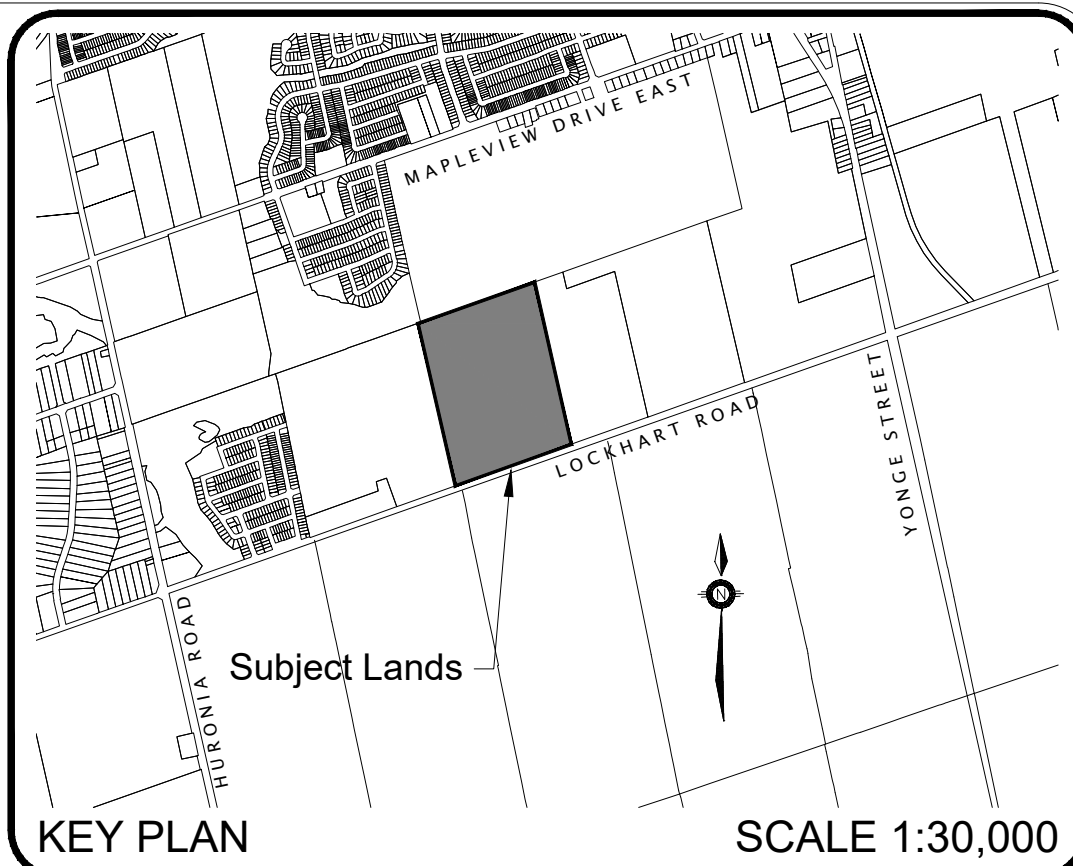
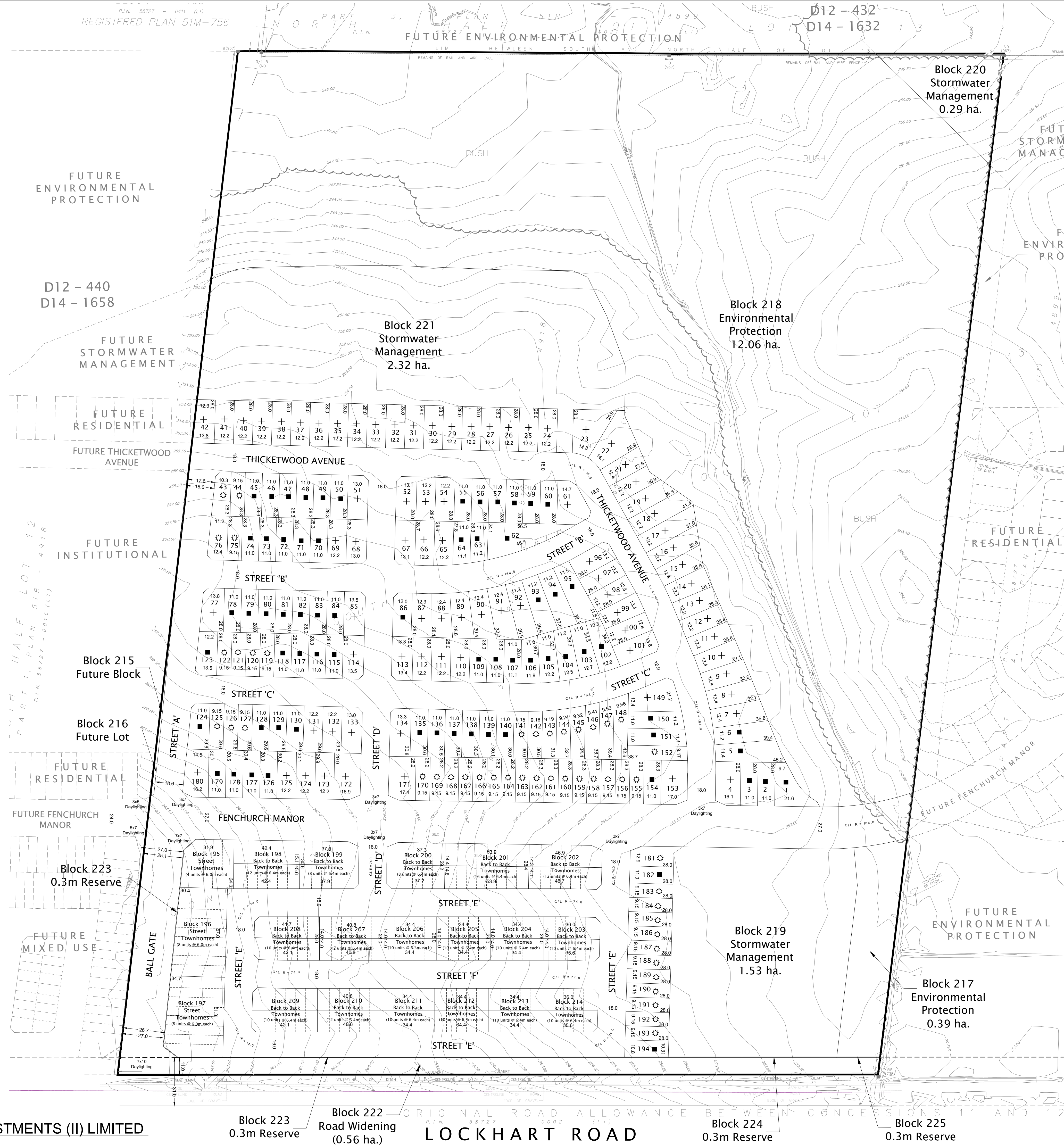
Total Leq All Segments: 55.96 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.48
(NIGHT): 55.96

APPENDIX 'C'

DRAFT PLAN

(Source: Jones Consulting)



Draft Plan of Subdivision

South Half Lot 13, Concession 11
(Geographic Township of Innisfil)
City of Barrie
2021

OWNER'S CERTIFICATE
I, THE UNDERSIGNED, BEING THE REGISTERED OWNER OF THE SUBJECT LANDS, HEREBY AUTHORIZE THE JONES CONSULTING GROUP LTD., TO PREPARE THIS DRAFT PLAN OF SUBDIVISION AND TO SUBMIT SAME TO THE CITY OF BARRIE FOR APPROVAL.

July 16, 2021
DATE
LOCKHART INNISFIL INVESTMENTS (II) LIMITED

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

July 16, 2021
DATE
J. D. BARNES LIMITED
ONTARIO LAND SURVEYORS

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT
a) SHOWN ON DRAFT PLAN
b) SHOWN ON DRAFT PLAN
c) SHOWN ON KEY PLAN
d) RESIDENTIAL, SWM, & EP
e) SHOWN ON DRAFT PLAN
f) SHOWN ON DRAFT PLAN
g) SHOWN ON DRAFT PLAN
h) MUNICIPAL PIPED WATER TO BE PROVIDED
i) SANDY CLAY LOAM
j) SHOWN ON DRAFT PLAN
k) ALL MUNICIPAL SERVICES TO BE PROVIDED
l) SHOWN ON DRAFT PLAN

STATISTICS	Area (ha.)	Units
+ 12.2m Singles (LOTS 4, 7 - 42, 51 - 54, 61, 65 - 69, 77, 85, 87 - 92, 96 - 101, 110 - 114, 131 - 134, 149, 153, 171 - 175 & 180)	2.99 ha.	78 units
■ 11.0m Singles (LOTS 1-3, 5 & 6, 45-50, 55-60, 62-64, 70-74, 78-84, 86, 93-95, 102-109, 115-118, 123 & 124, 128-130, 135-140, 150 & 151, 154, 176 - 179, 182 & 194)	2.34 ha.	68 units
⊗ 9.15m Singles (LOTS 43 & 44, 75 & 76, 119 - 122, 125 - 127, 141 - 148, 152, 155 - 170, 181, & 183 - 193)	1.31 ha.	48 units
Street Townhomes (6.0m/unit) (BLOCK 195 - 197)	0.47 ha.	20 units
Back to Back Townhomes (6.4m/unit) (BLOCKS 198 - 214)	1.88 ha.	180 units
Future Lots and Blocks (LOTS/BLOCKS 215 - 216)	0.02 ha.	1 units
Environmental Protection (BLOCKS 217 & 218)	12.43 ha.	
Stormwater Management (BLOCKS 219 - 221)	4.14 ha.	
Reserves & Widening (BLOCKS 222 - 225)	0.58 ha.	
Roads Major Collector - Fenchurch Manor - Ball Gate Local Roads Thicketwood Avenue, Streets 'A', 'B', 'C', 'D', 'E', & 'F'	5.94 ha.	

TOTAL	32.10 ha.	395 units
-------	-----------	-----------

0 10 50 100M
SCALE 1 : 1250 (A1)
Lockhart Innisfil Investments (II) Limited
Draft Plan of Subdivision

Raymond J. Dufresne
REGISTERED PROFESSIONAL PLANNER
R.P.P.

Date Issued: JULY 29, 2021
Checked By: RD
Project No.: GOL-20538
Drawn By: m.c.r.
Drawing Name: GOL-20538-DP-4b.dwg

JONES
CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
225 Mapleview Drive East, Unit 1, Barrie, Ontario L4M 9W5
Phone: 705-734-2538 Fax: 705-734-1056
www.jonesconsulting.com

APPENDIX 'D'

ZONING INFO

(Source: City of Barrie Zoning By-Law 2009-141)

Table 14.5.2		
Uses	Zones	
	Neighbourhood Residential R5	Neighbourhood Multiple Residential RM3
Residential Uses		
<i>Single Detached Dwelling</i>	X	
<i>Two Unit Dwelling</i>	X	
<i>Three or More Unit Dwelling</i>		X
<i>Back-to-Back Townhouse</i>		X
<i>Block/Cluster/Street/Townhouse</i>	X	X
<i>Stacked Townhouse</i>		X
<i>Walk-up Apartment</i>		X
<i>Apartment Dwelling</i>		X
<i>Boarding, Lodging, Rooming House (Small)</i>	X	X
<i>Boarding, Lodging, Rooming House (Large)</i>		X
Accessory Uses		
<i>Day Nursery</i>	X ⁽²⁾	X
<i>Home Occupation</i>	X	X
<i>Second Suite⁽¹⁾⁽³⁾</i>	X	X
Institutional Uses		
<i>Social Services Facility</i>		X
<i>Dormitory</i>		X
<i>Group Home</i>	X	X
<i>Library</i>		X
<i>Assisted Living Facility</i>		X
<i>Place of Worship</i>	X ⁽²⁾	X
Commercial Uses		
<i>Local Convenience Retail</i>	X ⁽²⁾	X
Open Space Uses		
<i>Urban or Village Square</i>	X	X

(1) A second suite in the RM3 Zone is not permitted in a Walk-Up Apartment or Apartment Dwelling.

(2) Permitted only where these uses are located on major collector and arterial roads.

(3) *Second suites and detached accessory dwelling units* in the R5 Zone and RM3 Zone shall be permitted in accordance with the provisions and standards of Section 5.2.9. (By-law 2019-115)

14.5.3 Block/Cluster/Street/Stacked and Back-to-Back Townhouse Development and Walk-up Apartments

14.5.3.1 Standards

- Within the R5 and RM3 zones, where a private driveway is proposed, a minimum driveway length of 5.5 metres shall be required.
- The provisions of Section 5.2.5.1 and 5.2.5.2 b) and d) do not apply to lands zoned R5 or RM3.

14.5.6 Residential Standards

Table 14.5.6

	Zones						
	Neighbourhood Residential R5 Zone			Neighbourhood Residential Multiple Zone RM3			
	Single	Semi	Street Townhouse	Back To Back Townhouse	Block/ Cluster/ Street ⁽³⁾ Townhouse	Walk-Up Apartments	Apartments
Lot Frontage (min)	9.0m	7.2m	4.5m	5.5m	11.0m	18.0m	24.0m
Front Yard Setback (min.)⁽¹⁾	3.0m	3.0m	3.0m	3.0m	3.0m	3.0m	3.0m
Exterior Side Yards Setback (min.)⁽¹⁾	2.0m	2.0m	2.0m	2.0m	2.0m	2.0m	2.0m
Interior Side Yards Setback (min.) one side	1.2m	1.2m	0.0m	0.0m	0.0m	1.2m	5.0m
Interior Side Yards Setback (min.) opposite side	0.6m	0.0m	0.0m	0.0m	0.0m	1.2m	5.0m
Interior Side Yard Setback s where balconies or terraces face the side property line	--	--	--	--	--	5.0m	5.0m
Rear Yard (min.)⁽²⁾	5.0m	5.0m	5.0m	5.0m	5.0m	5.0m	5.0m
End Unit Interior Side Yard Setback	--	--	1.2m	1.2m	1.2m	--	--
Landscaped open space (min. % of lot area)	--	--	--	--	25	25	25
Minimum General Amenity Area per Unit	--	--	--	--	10m ²	10m ²	10m ²
Dwelling unit floor area (min.)	90m ²	90m ²	90m ²	35m ² /dwelling unit + 10m ² /bedroom			
Lot Coverage (max. % of lot area)	60	60	70	N/A	50	50	50
Gross floor area (max. % of lot area)	--	--	--	250%	250%	250%	250%