RAILWAY NOISE IMPACT STUDY

Proposed Residential Development

"Innisfil Executive Estates – Phase 2"

Block 39 & 41, R.P. 51M-1045

Stroud, Ontario
Town of Innisfil, County of Simcoe

Prepared for:

1820839 Ontario Inc.

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EXECUTIVE SUMMARY

R. BOUWMEESTER & ASSOCIATES has been retained to assess the impact of rail traffic noise on residential uses within a proposed 21-lot subdivision in the village of Stroud, Town of Innisfil. The site lies within the north-east part of the village, north of Victoria Street (Tenth Line) and east of Yonge Street.

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 Town and Metrolinx.

The noise source of concern for this project is rail traffic noise from GO Transit operations on the Metrolinx (formerly GO Transit) railway line that abuts the site to the east.

Train traffic projection data were provided by Metrolinx. It is assumed that the traffic volumes apply to at least Year 2030, which provides the 10-year projection window required by MECP.

The predicted equivalent outdoor sound levels in certain areas at the subject site resulting from future rail traffic exceed the limits established by MECP and Metrolinx. Mitigation measures are required in order to bring outdoor and indoor sound levels down to acceptable levels as follows:

1. All lots require warning clauses registered on title (wording is provided).
2. A combination acoustic berm/fence is required along portions of the east limit of the site.
3. Certain dwellings require central air conditioning.
4. Certain dwellings require forced air heating systems with ductwork sized to accommodate the future installation of central air conditioning.
5. Certain dwellings require brick veneer or equivalent masonry construction from the foundation to the rafters.
6. Certain dwellings require special windows (specs are provided).

The above noise controls are summarized in Table 5 and detailed in Section 7 and Figure 4.

In summary, the subject development is acoustically feasible and can be developed in a manner that satisfies the acoustic requirements of the Town of Innisfil, Metrolinx and MECP guideline NPC-300.

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1. INTRODUCTION

R. BOUWMEESTER & ASSOCIATES has been retained to assess the impact of rail traffic noise on residential uses within a proposed 21-lot subdivision in the village of Stroud, Town of Innisfil. The site lies within the north-east part of the village, north of Victoria Street (Tenth Line) and east of Yonge Street. See Figure 1.

Our analysis is based on the configuration of a Draft Plan of Subdivision dated May 27, 2020, included herein as Figure 2.

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 Town and Metrolinx.

3. NOISE SOURCES

The noise source of concern for this project is rail traffic from GO Transit operations on the Metrolinx railway line known as the Newmarket Subdivision. The railway abuts the site to the east. Train traffic data were provided by Metrolinx. See Appendices.

A vibration analysis is being provided by others and is not discussed further herein.

4. GUIDELINES AND CRITERIA

Reference is made to the 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 sound level limits for various indoor and outdoor locations and uses.

4.1 Sound Level Limits

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

TABLE 1 - Sound Level Limits (Leq)

Location	Time Period		Limit (dBA)
Outdoors			
Outdoor Living Area	Day	0700-2300 hrs	55
Indoors			
Living/Dining Room	All	0700-0700 hrs	40
Bedroom (day)	Day	0700-2300 hrs	40
Bedroom (night)	Night	2300-0700 hrs	35

As compared to the pre-2013 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 m^2 (600 sq. ft.) in the case of single-family detached homes, 46 m^2 (500 sq. ft.) in the case of semi-detached units, and 37 m^2 (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 lots.

Under NPC-300, whistle noise is not included in the determination of outdoor day-time sound levels in OLAs.

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 daytime 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 a warning clause (Types B and C) must be registered on title against the affected dwelling units.

- For outdoor daytime 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 these units.

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.

Under NPC-300, whistle noise is not included in the plane of window sound levels for the determination of ventilation requirements.

Shielding by buildings, existing vegetation and any proposed noise barriers have not been accounted for in determining ventilation requirements.

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

4.2.3 Indoor Living Areas - Building Component Requirements

Given the high pass-by sound level for short periods and the low-frequency characteristic of diesel locomotive noise, the MECP indoor sound level limits for railway noise are 5 dBA lower than they are for road traffic noise. This difference results in a requirement for acoustically superior architectural components such as windows and walls.

If day-time sound levels outside living/dining/bedroom windows exceed 60 dBA (or night-time levels exceed 55 dBA) building components including windows, walls and doors must be designed so that the indoor sound levels meet the Table 1 limits.

Under NPC-300, whistle noise is included in the plane of window sound levels for the determination of building component requirements. Accordingly, all three noise sources, namely, locomotive, wheel/rail and whistle are included.

Shielding by buildings, existing vegetation and any proposed noise barriers have not been accounted for in determining building component requirements.

To help protect against the dominant low frequency of locomotive diesel engines, the MECP requires that the exterior walls of the first row of dwellings next to railway tracks (if within 100 m of the tracks and the 24-hour sound level at the night-time receiver location is greater than 60 dBA) are built with a minimum of brick veneer or masonry equivalent construction from the foundation to the rafters.

Notwithstanding the above, Metrolinx requires a brick veneer or masonry equivalent facade for the first row of dwellings regardless of sound level.

4.3 Summary of NPC-300 Sound Level Limits and Noise Controls

The above sound level limits and mitigation requirements are summarized in Table 2.

TABLE 2 - Sound Level Limits and Standard Mitigation Requirements

	Outdoor Sound Level Limits (dBA) Plane of Window		
Mitigation Requirement	**Day**	**Night**	**OLA**
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 Rail Noise	>60	>55	
Brick Veneer Ext. Walls (if <100 m) ***	>60 (24-hr)		

Notes:
* Warning Clause B required if the net resultant sound level is 56 dBA or greater (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).

*** Brick veneer exterior walls are required by MECP for the first row of dwellings if they are within 100 m of the centreline of tracks and the 24-hour sound level exceeds 60 dBA. (Notwithstanding the foregoing, Metrolinx requires brick veneer for the first row of dwellings whether or not the sound levels exceed 60 dBA.)

5. ANALYSIS PROCEDURES

5.1 Surroundings and Site Characteristics

The subject lands are located just north of Victoria Street east of Yonge Street in the village of Stroud; the railway abuts the site to the east. A recently developed residential subdivision abuts the site to the west and a strip of single-family homes fronting Victoria Street abuts the site to the south. There are pockets of single-family homes south of Victoria Street and east of the railway, although most of the lands to the south and east are vacant - Future Development to the south, Agricultural east of the railway. The site is vacant and slopes gently south.

5.2 Noise Sources

The noise concern for this project is rail traffic on the existing single-track GO Transit line. Metrolinx has classified the adjacent railway as a principal mainline (Newmarket Subdivision), and they provided the traffic data used in this study.

Road traffic on Victoria Street is not expected to be acoustically significant and no other significant noise sources have been identified.

Railway noise includes noise from the locomotive, wheel/rail interaction and whistling. Outdoor noise (in OLAs) for the determination of noise barrier requirements, takes into consideration two sources of railway noise, locomotive and wheel/rail. Indoor noise for

the determination of ventilation requirements also takes into consideration the above two noise sources while the determinations of building components consider the above plus whistle noise.

All noise source heights have been established per MECP criteria.

This analysis assumes that the railway is of infinite length and that the terrain between the railway and receivers is absorptive.

The minimum permitted setback from a principal main line right-of-way to a residential dwelling is 30 m as specified in various Metrolinx and CN/CP publications as well as the local zoning by-law. The minimum setback line is shown on the Draft Plan.

5.3 Traffic Data

Metrolinx provided day and night-time figures for passenger traffic based on a 10-year projection as required by MECP. There are 42 trains projected per day (36 day/ 6 night) with whistling at Victoria Street. See Appendix 'A' for details.

We understand that there is no anti-whistling by-law in effect in Innisfil. Accordingly, we have assumed that whistling occurs at the Victoria Street level crossing. As per NPC-300, our analysis includes whistling in the determination of indoor noise levels as it relates to building component design.

5.4 Study Periods

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

5.5 Sound Level Prediction Model

Noise level calculations were carried out following MECP guidelines (Environmental Noise Assessment in Land Use Planning, Training Manual, Ontario Ministry of the Environment, Conservation and Parks, 1987) and through the use of their railway noise model STEAM (Sound from Trains Environmental Analysis Method).

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) Railway segment lengths
b) Ground surface type
c) Source - receiver distances and heights
d) Whistling, and
f) Day/night split of 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 unit.

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

We have assumed that the terrain between the railway and the receptors is absorptive.

Shielding, by vegetation, existing and future buildings, and the recommended acoustic barrier (i.e. berm/fence combination) shown on the Figures, has not been accounted for in the determination of building ventilation and building component requirements. This provides for a conservative building component design and avoids the need to review the requirements after the site grading and berm/fence designs have been completed.

Decks and balconies are exempt from the MECP outdoor noise limits unless they are the only outdoor living area available to the resident, and they are at least 4.0 m deep, outside the building façade, and unenclosed.

Our analysis includes a sampling of noise levels that can be expected based on the locations of the proposed houses as shown on a Draft Site Grading Plan dated May 19, 2020, by WMI & Associates. The noise levels predicted at these house locations were used to determine the mitigation methods required and to flag those areas requiring more detailed analyses.

The need for special building component design is triggered by railway noise levels including whistling. As a result, this requirement is based on not only a dwelling's distance from the tracks but also its distance from a level crossing. As per the MECP guidelines, whistling is assumed to occur within 400 m of a crossing for 50% of the time.

As indicated in Section 4.2.3, exterior walls of the first row of dwellings adjacent to the tracks (if within 100 m of the tracks and if the 24-hour sound level at the night-time receiver location is greater than 60 dBA) must be built with a minimum of brick veneer or masonry equivalent construction from the foundation to the rafters.

Based on the above, we have determined that brick veneer walls are required for any dwellings within 78.5 m of the centreline of tracks.

Notwithstanding the above, Metrolinx requires a brick veneer or masonry equivalent facade for the first row of dwellings regardless of sound level.

The source-receiver distances used in our analysis are shown in Table 3. A summary of predicted outdoor day-time and night-time sound levels for each of the receptor locations

is presented in Table 4. (Receptor IDs correspond to Lot numbers e.g. R6 is Lot 6.)

TABLE 3 - Source-Receiver Distances

	Distance from Railway Centerline (m)	
Receptor	**wall**	**OLA**
R1	134.5	141.3
R2	118.7	-
R4	84.4	91.0
R5	64.6	70.6
R6	46.5	51.6
R7	46.5	52.3
R8	-	69.3
R9	-	89.6
R10	86.4	-
R15	67.8	85.2
R16	113.4	120.9
R17	134.3	-
R18	152.6	-
R19	197.3	-
R21	221.6	-

TABLE 4 - Predicted Outdoor Sound Levels (dBA) (unmitigated)

Receptor	**Noise Source**	**Outdoor Equivalent Sound Levels (Leq) Due to Rail Traffic (without barriers)**				
		With Whistle		**Without whistle**		
		Day	**Night**	**Day**	**Night**	**OLA**
R1	Railway	60	55	58	53	52
R2	Railway	61	56	58	54	<55
R4	Railway	63	59	61	56	57
R5	Railway	65	60	62	58	59
R6	Railway	67	63	65	60	62
R7	Railway	65	61	65	60	62
R8	Railway	-	-	-	-	59
R9	Railway	-	-	-	-	56
R10	Railway	62	57	60	56	<55
R15	Railway	65	60	62	57	51
R16	Railway	61	56	59	54	50
R17	Railway	60	55	58	53	<55
R18	Railway	59	54	57	52	<55
R19	Railway	57	52	55	50	<55
R21	Railway	57	52	54	49	<55

Note: The sound levels in Table 4 do not include the effect of the recommended railway noise barrier.

The results shown in Table 4 confirm that mitigation measures are required to bring OLA and indoor sound levels down to acceptable levels.

With the recommended noise berm/fence in place (see Figure 4), the OLA sound levels reduce to 55 dBA or less (see Table 4A), thereby meeting Metrolinx's requirements.

TABLE 4A - Predicted OLA Sound Levels (dBA) (mitigated – with berm/fence)

Block/Lot	Noise Source	Outdoor Equivalent Sound Levels (Leq) Due to Rail Traffic (without whistle) OLA
R4	Railway	53
R5	Railway	54
R6	Railway	55
R7	Railway	55
R8	Railway	55
R9	Railway	54

To achieve the OLA noise levels shown in Table 4A, we recommend minor increases to the top of berm elevations along Lots 6 and 7 as shown in Figure 3; alternatively, noise fences higher than 2.15 m could be used if acceptable to the Town. We note that the berm/fence design is subject to change and must be reviewed before the issuance of building permits once the site grading design is available and once the surveyed location and elevation of the tracks (top of rail) are available.

We have determined the minimum acoustic insulation factors (AIF) required for the worst-case second storey bedroom windows and walls at night. The calculations assume window and wall areas of 25% and 80% of the bedroom floor area, respectively.

As indicated in Section 4.2.3, the first row of dwellings adjacent to the railway requires brick veneer walls. Also, we have determined that brick veneer is required for any dwellings within 78.5 m of the centreline of tracks (see page 6); as a result, this applies to Lot 5 in addition to first-row Lots 6 to 15.

Because of the acoustically superior wall structure of brick veneer, window acoustic requirements can be reduced. For example, Lot 6 requires AIF 33 for the (east) wall facing the railway and AIF 30 for the walls perpendicular to the tracks. This requires double-glazed windows consisting of two 3 mm sheets of glass separated by a 25 mm airspace (i.e. 3(25)3) for the facing windows and 3(13)3 for the perpendicular windows.

For reference, the equivalent STC values for bedroom windows in houses built with brick veneer exteriors (i.e. on Lots 5 to 15) are about 33 for windows facing the railway and 30 for windows perpendicular to it.

Although the remaining lots do not require brick veneer, Lots 2, 3, 4 and 16 require building component design since the night-time sound levels exceed 55 dBA outside the bedroom windows. Using Lot 4 as the worst-case, the required AIF for bedrooms facing the railway is 32; this can be achieved with 3(20)3 double-glazed windows and any typical wall structure (e.g. vinyl siding) that meets the building code. For reference, the equivalent STC values required are about 32 for the windows and 38 for the walls.

See Appendix ‘C’ for sample building component calculations.

The following summarizes typical acoustic requirements and describes how they apply to this proposed development. See Section 7, Table 5 and Fig. 4 for detailed requirements.

Warning clauses must be registered on title and included in Agreements of Purchase and Sale where sound level limits are exceeded or where the lots lie within 300 m of the railway right-of-way. This applies to all lots. Suggested wording is given in Table 5.

Forced air heating systems, with ductwork sized to accommodate the future installation of central air conditioning, are required where the sound level due to rail 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 applies to Lots 1 to 5 and 16 to 18; see Table 5.

Central air conditioning is required where the outdoor sound level due to rail traffic exceeds 65 dBA daytime in the plane of a living/dining/bedroom window (or 60 dBA night-time). Central air conditioning is not meant to be a sound mitigating measure, although it does provide the dwelling occupants with the option of closing windows if so desired. Based on the predicted noise levels at the building envelopes, central air conditioning is not required for any units.

Notwithstanding the above, the Town of Innisfil requires central air for the first row of dwellings adjacent to railways regardless of sound level. This applies to Lots 6 to 15.

Special building component design, to ensure that indoor sound levels meet the limits specified in Section 4, is required for residential dwelling units where the day-time outdoor sound level in the plane of a living/dining/bedroom window due to rail traffic exceeds 60 dBA (55 dBA night) with whistling. Based on our assumptions and analysis, special building components are required for Lots 5 to 15. See below.

Firstly, Metrolinx requires brick veneer exterior walls for the first row of dwellings regardless of sound level (i.e. applies to Lots 6 to 15).

Secondly, MECP requires brick veneer exterior walls for the first row of dwelling units if within 100 m of the centreline of tracks and where the 24-hour sound level exceeds 60 dBA at night-time receptor locations. We have applied this to any dwellings potentially within 78.5 m of track centreline (i.e. this adds Lot 5 to the above list).

Thirdly, the outdoor sound levels warrant the design of building components. Standard double-glazed windows that meet the building code are acceptable on Lots 5 to 15 provided the STC value is at least 33. For those lots requiring special building component design but not necessarily brick veneer exterior walls, any typical wall structure (e.g. vinyl siding) that meets the building code is acceptable provided the STC value is at least 38.

Acoustic barriers, to protect outdoor living areas, are required by MECP where the day-time outdoor sound level in an OLA due rail traffic exceeds 60 dBA (without whistling). The MECP 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 (Warning Clause A). Residual noise levels (over 55 dBA), if applicable, must be covered through the use of an appropriate warning clause (Warning Clause B) to be included in the Development Agreement and Offer of Purchase and Sale for the subject lot and the clause is to be registered on title.

Notwithstanding the above, Metrolinx does not allow a 5 dBA excess; their OLA sound level objective is 55 dBA. The recommended barriers achieve this (see Table 4A).

The recommended berm/fence combination must extend north and south at least as far as shown in the Figures to achieve the OLA sound level limit of 55 dBA.

Also, the acoustic fence must meet the requirements of the Town, Metrolinx, and MECP. (The MECP requirements are given in the Notes to Table 5.)

7. RECOMMENDATIONS

Based on GO's traffic projections, the recommended concept for the noise berm/fence as shown in the Figures will result in outdoor living area sound levels that meet the acoustic requirements of the Town, Metrolinx and MECP. Since the barrier design is conceptual at this stage, we recommend that its height and extent be reviewed once the detailed grading design and the surveyed top of rail locations and elevations are available.

Mitigation measures are also required to bring indoor sound levels down to acceptable levels. They are summarized below.

Central air conditioning is required for the first row of dwellings adjacent to the GO Transit line. See Table 5 and Figure 4 for details.

Certain dwelling units require forced air heating systems with ductwork 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. The affected lots also require warning clauses registered on title; recommended wording is provided. See Table 5 and Figure 4 for details.

Based on the standard requirements of Metrolinx and MECP, Lots 5 to 15 require brick veneer walls from the foundation to the rafters and window STC ratings of 33 minimum. See Table 5 and Figure 4 for details.

Lots 2 to 4 and Lot 16 require standard double-glazed windows and any typical wall structure (e.g. vinyl siding) that meet the building code provided the STC values are at least 32 for the windows and 38 for the walls.

Special building component design is not required for any other lots.

All residential lots/blocks require Metrolinx's standard Warning Clause E registered on title since they lie within 300 m of the railway right-of-way; recommended wording is provided in Notes to Table 5.

Given that bedroom window and wall specifications have been provided herein, and given that they are conservative because they do not account for the noise barrier or shielding by adjacent houses, we recommend that no further review be required at the building permit stage provided the recommended STC values are met and provided the window and wall areas do not exceed the values assumed (i.e. windows 25% max. of floor area, walls 80% max. of floor area).

The berm/fence design is subject to change and must be reviewed before the issuance of building permits once the site grading design is available and once the surveyed location and elevation of the tracks (top of rail) are available.

The noise control requirements are summarized in Table 5 and Figure 4.

8. CONCLUSIONS

With the incorporation of the recommendations in Table 5 (see the following page), the MECP indoor noise guidelines will be met in all units, and sound exposure from rail traffic in outdoor living areas will be within the limits specified by the Town of Innisfil, Metrolinx and MECP.

In summary, the subject development is acoustically feasible and can be developed in a manner that satisfies the acoustic requirements of the Town of Innisfil, Metrolinx and MECP guideline NPC-300.

Respectfully submitted,

R. BOUWMEESTER & ASSOCIATES

Ralph Bouwmeester, P. Eng.
Principal

TABLE 5 - Summary of Noise Controls

Location	Central Air Conditioning	Exterior Windows, Walls and Doors	Acoustic Barrier	Warning Clauses
Lots 1, 17, 18	Provision for adding	OBC	No	A, B, C, E
Lots 2 - 4, 16	Provision for adding	STC 32 Windows STC 38 Walls	No	A, B, C, E
Lot 5	Provision for adding	STC 33 Windows Brick Veneer Walls	No	A, B, C, E
Lots 6, 7	Yes	STC 33 Windows Brick Veneer Walls	Yes	A, B, D, E
Lots 8 - 15	Yes	STC 33 Windows Brick Veneer Walls	No	A, B, D, E
Lots 19 - 21	No acoustic requirements			E

NOTES

1. Air-cooled condenser units should be located in a noise insensitive location.

2. 'OBC' indicates that construction meeting the minimum non-acoustical requirements of the Ontario Building Code will provide adequate sound insulation. 'STC' indicates that exterior building components such as windows, walls and doors have been specified.

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 a combination of both.

4. The following warning clauses must be registered on title and included in Agreements of Purchase and Sale or Lease for those lots and blocks as specified in Table 5:

   TYPE A: *"Purchasers/tenants are advised that sound levels due to increasing rail traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the noise criteria of the Municipality and the Ministry of the Environment, Conservation and Parks."*

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 rail traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the noise criteria of the Municipality and the Ministry of the Environment, Conservation and Parks."*

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 noise criteria of the Municipality and the Ministry of the Environment, Conservation and Parks. (Note: The location and installation of the outdoor air conditioning device should be done so as to comply with the 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 noise criteria of the Municipality and the Ministry of the Environment, Conservation and Parks."*

TYPE E: *"Warning: Metrolinx, carrying on business as GO Transit, and its assigns and successors in interest has or have a right-of-way within 300 metres from the land the subject hereof. There may be alterations to or expansions of the rail facilities on such right-of-way in the future including the possibility that GO Transit or any railway entering into an agreement with GO Transit to use the right-of-way or their assigns or successors as aforesaid may expand their operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). Metrolinx will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid right-of-way."*

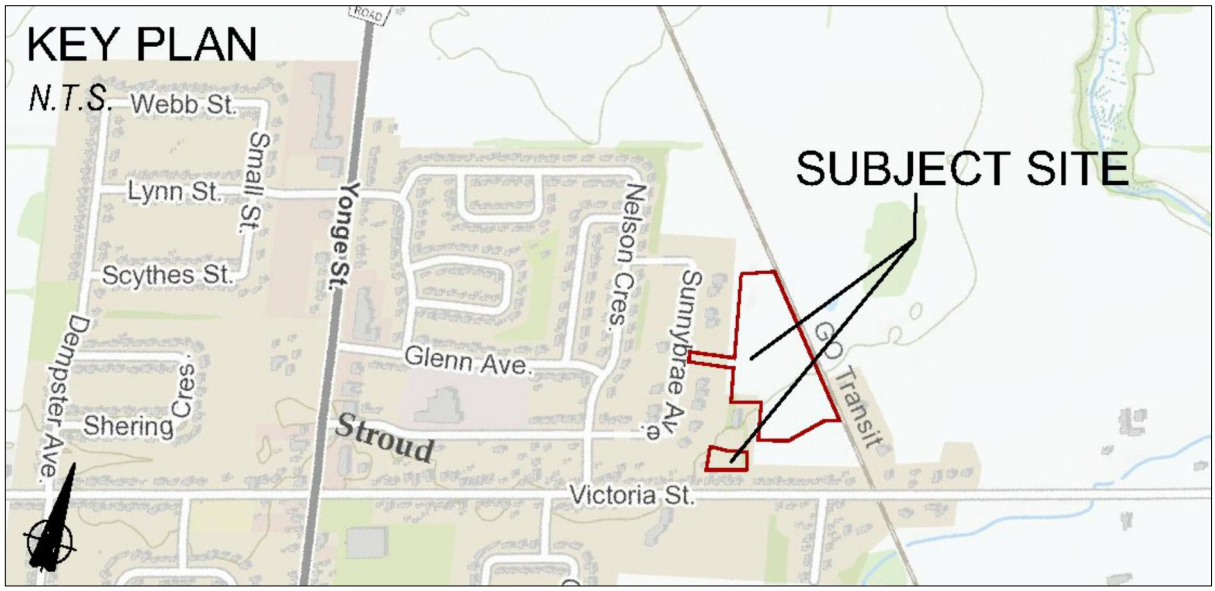
5. Conventional ventilated attic roof construction meeting OBC requirements are satisfactory.

6. All exterior doors must be fully weather-stripped.

REFERENCES

1. Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning (MECP Publication NPC-300, Aug 2013 ver. #22)
2. Environmental Noise Assessment in Land Use Planning (MECP Training Manual, 1987)
3. Road and Rail Noise: Effects on Housing (CMHC, Rev. 1981)
4. STEAM (Sound from Trains Environmental Analysis Method) (MECP, February 1993)
5. Principal Main Line Requirements, (GO Transit, June 2010)
6. Rail Traffic data (GO Transit, December 19, 2019)
7. Zoning By-law 080-13 (Town of Innisfil)

FIGURES



Location Plan

Scale: N.T.S.

FIG. 1

June 2020

R. Bouwmeester & Associates

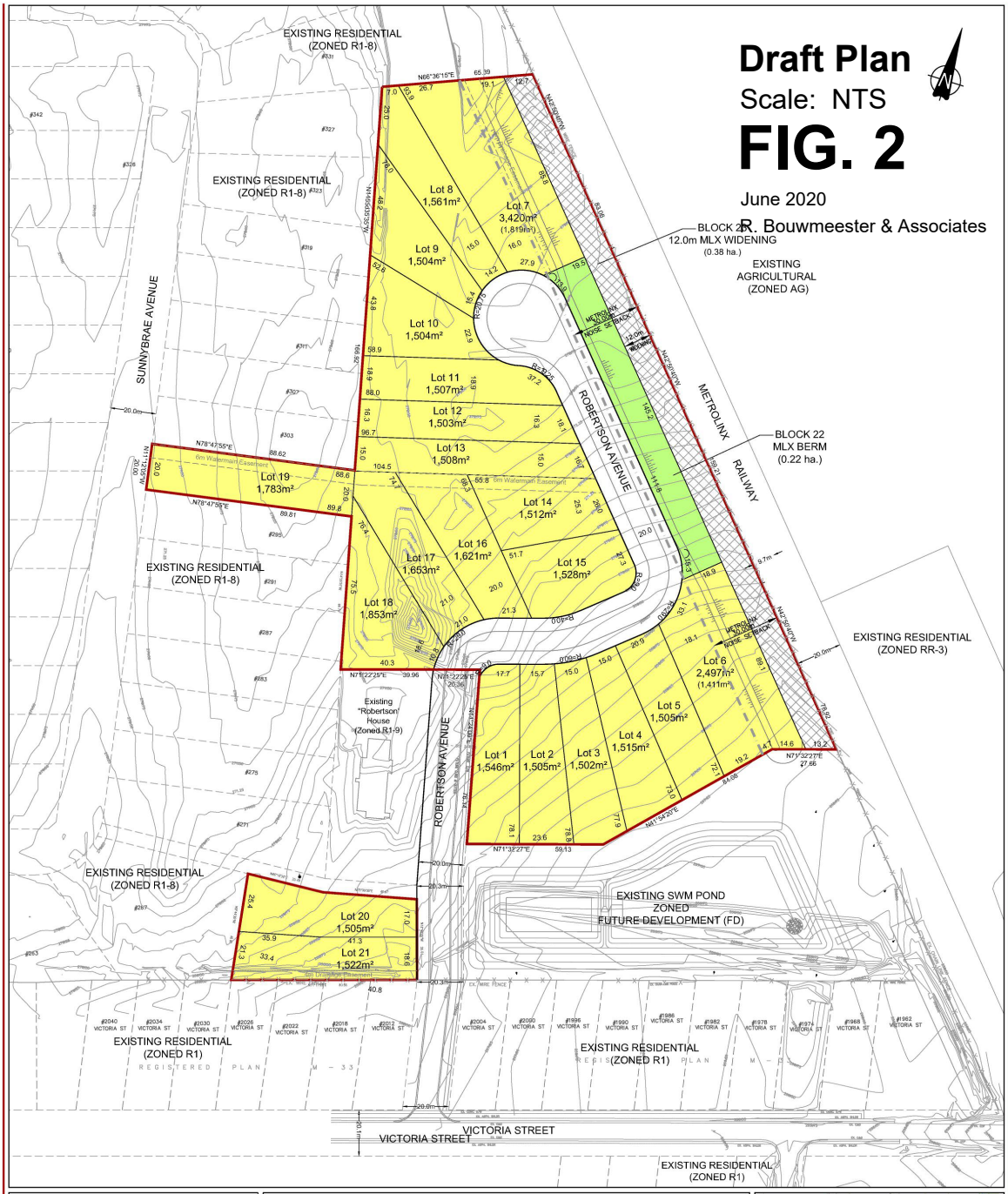
Draft Plan

Scale: NTS

FIG. 2

June 2020

R. Bouwmeester & Associates



ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT

a) SHOWN ON PLAN
b) SHOWN ON PLAN
c) SEE KEY PLAN
d) LOW DENSITY RESIDENTIAL
e) SHOWN ON PLAN
f) SHOWN ON PLAN
g) SHOWN ON PLAN
h) MUNICIPAL WATER SERVICES
i) SANDY LOAM
j) SHOWN ON PLAN
k) INDIVIDUAL ON-SITE SEWAGE SERVICES
l) NONE

LAND USE STATISTICS

Land Use	Lot / Block No.	Area (ha.)	Units	Density
RESIDENTIAL SINGLE LOT (R1)	1-21	3.60	21	5.9 uph/ 2.3 upac
MLX BERM	22	0.22		
MLX 12.0m WIDENING	23	0.39		
ROADS (20.0m)	Robertson Avenue	0.57		
TOTAL	Lots -21 Blocks - 2 Total - 23	4.78	21	

APPROVED SUBJECT TO CONDITIONS IN ACCORDANCE WITH SECTION 51 OF THE PLANNING ACT, RSO, CHAP. P.13, AS AMENDED,

THIS _____ DAY OF _____, 20___

_____
DIRECTOR OF GROWTH
TOWN OF INNISFIL

DRAFT PLAN OF SUBDIVISION

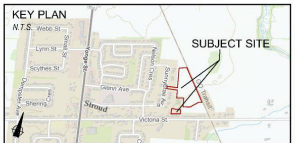
BLOCK 39 & 41, R.P. 51M-1045
FORMERLY IN THE GEOGRAPHIC TOWNSHIP OF INNISFIL
NOW IN THE
TOWN OF INNISFIL
COUNTY OF SIMCOE
2020

INNISFIL EXECUTIVE ESTATES PHASE 2

SCALE = 1:750

INNOVATIVE PLANNING SOLUTIONS
PLANNERS • PROJECT MANAGERS • LAND DEVELOPERS
647 WELLMAN RD., UNIT 9, BARRIE, ONTARIO, L4N 8X7
tel: 705 • 812 • 5281 fax: 705 • 812 • 3438 e: info@ipsconsultinginc.com www.ipsconsultinginc.com

KEY PLAN
N.T.S.



OWNER'S CERTIFICATE

I, THE UNDERSIGNED, BEING THE REGISTERED OWNER OF THE SUBJECT LANDS, HEREBY AUTHORIZE INNOVATIVE PLANNING SOLUTIONS TO PREPARE THIS DRAFT PLAN OF SUBDIVISION AND TO SUBMIT SAME TO THE TOWN OF INNISFIL FOR APPROVAL.

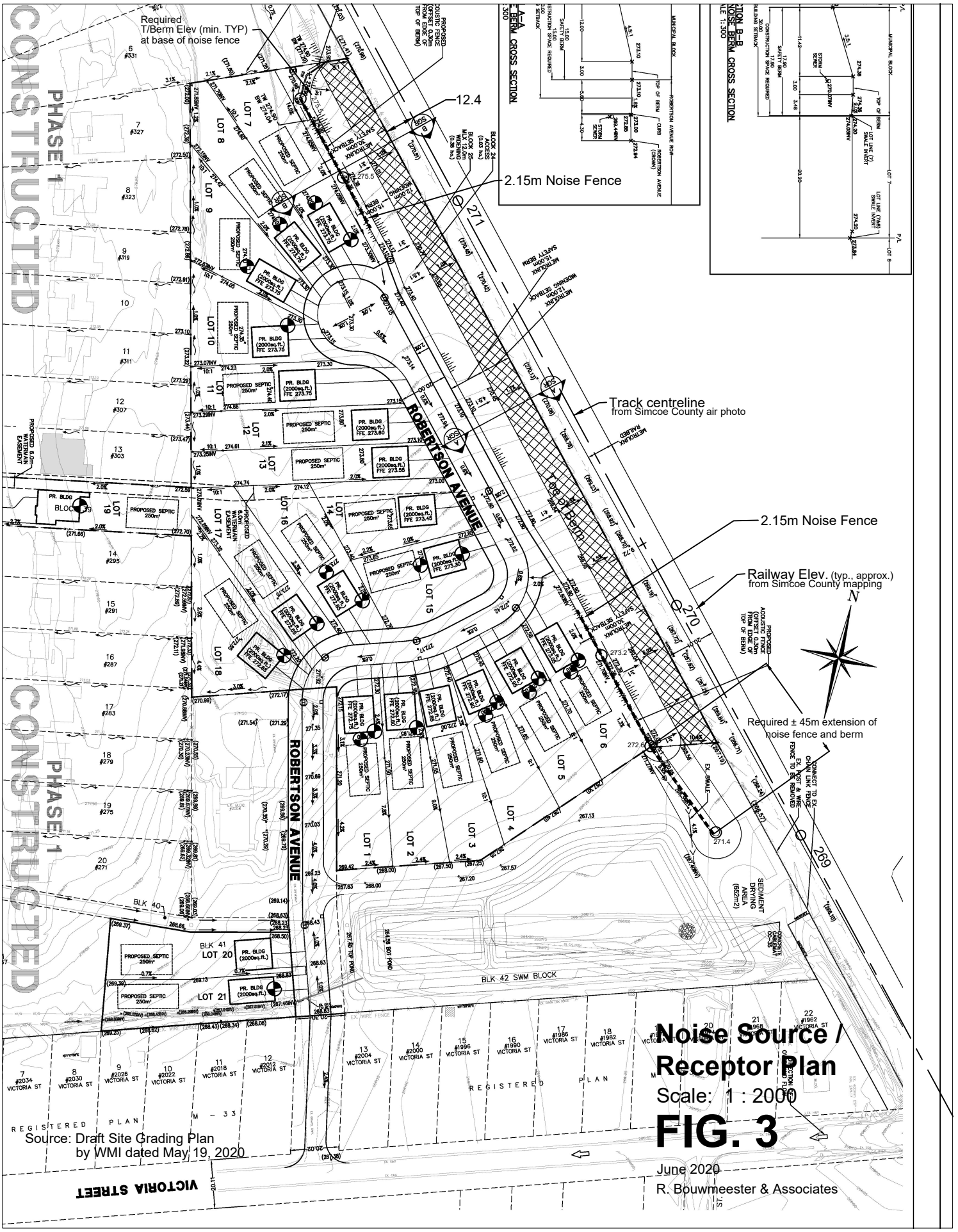
DATE _____ WAYNE EZEKEL, PRESIDENT 1820839 ONTARIO LIMITED

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.

DATE _____ RUDY MAK, OLS

Date: May 27, 2020	Drawn By: BH
Scale: 1:750 metric (Arch D)	Project No.: IEE - Phase 2



Noise Source / Receptor Plan

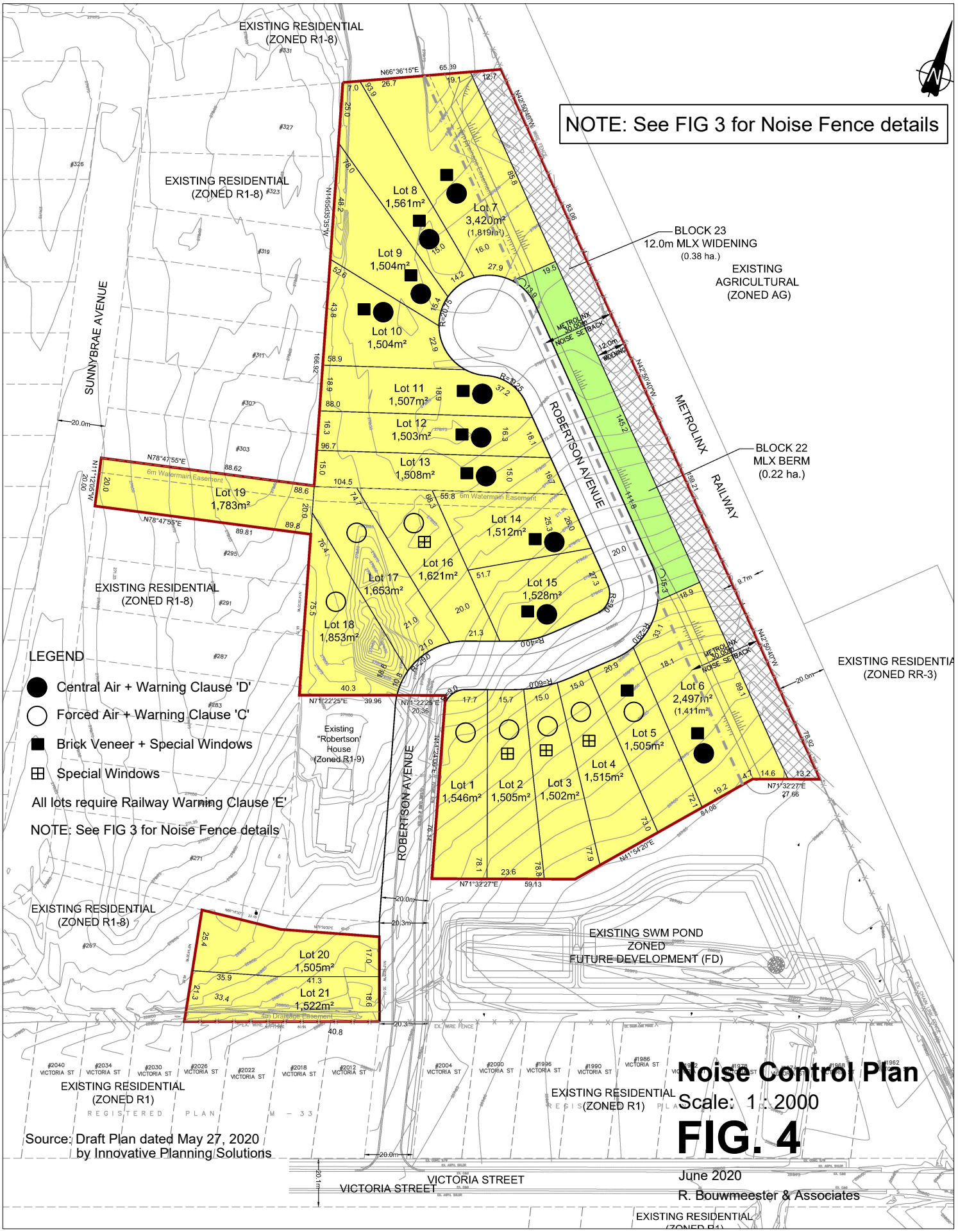
Scale: 1 : 2000

FIG. 3

June 2020

R. Bouwmeester & Associates

Source: Draft Site Grading Plan by WMI dated May 19, 2020



Source: Draft Plan dated May 27, 2020
by Innovative Planning Solutions

Noise Control Plan

Scale: 1 : 2000

FIG. 4

June 2020

R. Bouwmeester & Associates

APPENDICES

A. Rail Traffic Data
B. Sample Noise Level Calculations
C. Sample AIF Calculations and Building Component Design

APPENDIX "A"

RAIL TRAFFIC DATA

GO Transit (passenger trains)

- 42 trains/day - 36 daytime, 6 night-time
- 1 locomotive with 12 cars
- 129 kph

SUMMARY OF DATA USED IN THIS STUDY

For the purpose of this noise assessment, the following Year 2030 data apply:

	GO
Traffic volume	42/day
Day/night split	36 / 6
No. locomotives	1
No. cars	12
Operating speed	129 kph
Whistling [1.]	Yes

Notes:

1. Whistling occurs at the Victoria Street level crossing.

Subject: RE: Stroud, Town of Innisfil - Railway Noise Study Data
From: Rail Data Requests <RailDataRequests@metrolinx.com>
Date: 12/19/2019, 1:16 PM
To: Ralph Bouwmeester <rbouwmeester@rogers.com>

Hi Ralph,

Further to your request dated December 11, 2019, the subject lands (in the Village of Stroud, immediately north of Victoria Street and the rail corridor) are located adjacent to Metrolinx's Newmarket Subdivision which carries Barrie GO train service.

It's anticipated that GO service on this line will be comprised of electric trains within (at least) a 10-year time horizon. The preliminary midterm weekday train volume forecast at this location, including both revenue and equipment trips, is in the order of 42 trains – (36 day; 6 night). Trains will be comprised of a single locomotive and up to 12 passenger cars.

The maximum track design speed at this location on this corridor is 80 mph (129 km/h).

There are no anti-whistling by-laws in place around the subject property.

With respect to future electrified rail service, Metrolinx is committed to finding the most sustainable solution for electrifying the GO and UP Express rail network and we are currently working towards the next phase. Metrolinx has not made a final decision regarding the electric train technology or technologies to be deployed. We can, however, provide the following interim information which may be helpful;

1. At lower speeds, train noise is dominated by the powertrain. At higher speeds, train noise is dominated by the wheel- track interaction. Hence, at higher speeds, the noise level and spectrum of electric trains is expected to be very similar, if not identical, to those of equivalent diesel trains.

2. Along with electrification, Metrolinx will intensify service levels along all of its corridors to deliver the promised GO Expansion service. Everything else being equal, this will likely result in an overall increase in train noise emissions.

Given the above considerations, it would be prudent, for the purposes of acoustical analyses, to assume that the acoustical characteristics of electrified and diesel trains are equivalent. In light of the aforementioned information, acoustical models should employ diesel train parameters as the basis for analyses. We anticipate that additional information regarding specific operational parameters for electrified trains will become available in the future.

Operational information is subject to change and may be influenced by, among other factors, service planning priorities, operational considerations, funding availability, and passenger demand.

It should be noted that this information is only as it pertains to Metrolinx trains. It would be prudent to contact other rail operators in the area directly for their rail traffic information.

I trust this information is useful. Should you have any questions or concerns, please do not hesitate to contact me.

Best Regards,
Alexandra Goldstein

Third Party Projects Officer
Third Party Projects Review, Capital Projects Group
Metrolinx | 20 Bay Street | Suite 600 | Toronto | Ontario | M5J 2W3
T: 416.202.5708 C: 647.535.6760

APPENDIX 'B'

SAMPLE SOUND LEVEL CALCULATIONS

```
STAMSON 5.0        NORMAL REPORT        Date: 06-06-2020 22:48:02
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 933l1wo.te           Time Period: Day/Night 16/8 hours
Description: Lot 1 day/night w/o whistle


Rail data, segment # 1: GO Transit (day/night)
-----------------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
  1. passenger   !  36.0/6.0   ! 129.0 !  1.0 ! 12.0 !Diesel!  No

Data for Segment # 1: GO Transit (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  : 134.50 / 134.50 m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00

Results segment # 1: GO Transit (day)
-------------------------------------

LOCOMOTIVE (0.00 + 56.41 + 0.00) = 56.41 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.50  71.82 -14.24  -1.17   0.00   0.00   0.00  56.41
-------------------------------------------------------------------------

WHEEL (0.00 + 51.10 + 0.00) = 51.10 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.60  67.70 -15.24  -1.35   0.00   0.00   0.00  51.10
-------------------------------------------------------------------------

Segment Leq : 57.53 dBA

Total Leq All Segments: 57.53 dBA

Results segment # 1: GO Transit (night)
---------------------------------------

LOCOMOTIVE (0.00 + 51.64 + 0.00) = 51.64 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
```

```
   -90     90   0.50  67.05 -14.24  -1.17   0.00   0.00   0.00  51.64
-------------------------------------------------------------------------

WHEEL (0.00 + 46.33 + 0.00) = 46.33 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.60  62.93 -15.24  -1.35   0.00   0.00   0.00  46.33
-------------------------------------------------------------------------

Segment Leq : 52.76 dBA

Total Leq All Segments: 52.76 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.53
                           (NIGHT): 52.76
```

STAMSON 5.0 NORMAL REPORT Date: 06-06-2020 22:48:46
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 933l1ww.te Time Period: Day/Night 16/8 hours
Description: Lot 1 day/night w/whistle

Rail data, segment # 1: GO Transit (day/night)

Train Type	Trains (Left)	Trains (Right)	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	18.0/3.0	18.0/3.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 1: GO Transit (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	134.50 / 134.50 m	
Receiver height	4.50 / 4.50 m	
Topography	1	(Flat/gentle slope; no barrier)
Whistle Angle	63 deg	Track 1
Reference angle	0.00	

Results segment # 1: GO Transit (day)

LOCOMOTIVE (0.00 + 56.41 + 0.00) = 56.41 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	71.82	-14.24	-1.17	0.00	0.00	0.00	56.41

WHEEL (0.00 + 51.10 + 0.00) = 51.10 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	67.70	-15.24	-1.35	0.00	0.00	0.00	51.10

LEFT WHISTLE (0.00 + 56.29 + 0.00) = 56.29 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	63	0.50	73.11	-14.24	-2.58	0.00	0.00	0.00	56.29

RIGHT WHISTLE (0.00 + 45.81 + 0.00) = 45.81 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
63	79	0.50	73.11	-14.24	-13.06	0.00	0.00	0.00	45.81

Segment Leq : 60.13 dBA

Total Leq All Segments: 60.13 dBA

Results segment # 1: GO Transit (night)

LOCOMOTIVE (0.00 + 51.64 + 0.00) = 51.64 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	67.05	-14.24	-1.17	0.00	0.00	0.00	51.64

WHEEL (0.00 + 46.33 + 0.00) = 46.33 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	62.93	-15.24	-1.35	0.00	0.00	0.00	46.33

LEFT WHISTLE (0.00 + 51.52 + 0.00) = 51.52 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	63	0.50	68.34	-14.24	-2.58	0.00	0.00	0.00	51.52

RIGHT WHISTLE (0.00 + 41.04 + 0.00) = 41.04 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
63	79	0.50	68.34	-14.24	-13.06	0.00	0.00	0.00	41.04

Segment Leq : 55.36 dBA

Total Leq All Segments: 55.36 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.13
(NIGHT): 55.36

Filename: 9331ola.te Time Period: 16 hours
Description: Lot 1 OLA w/o barrier

Rail data, segment # 1: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 1: GO Transit

Angle1 Angle2	: -90.00 deg	17.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 5	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 141.30 m	
Receiver height	: 1.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 2: GO Transit

Angle1 Angle2	: 17.00 deg	30.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 141.30 m	
Receiver height	: 1.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 3: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 3: GO Transit

Angle1 Angle2	: 30.00 deg	43.00 deg

```
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 141.30 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00
```

Rail data, segment # 4: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars/Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 4: GO Transit

```
Angle1   Angle2           :  43.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 141.30 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00
```

Results segment # 1: GO Transit

LOCOMOTIVE (0.00 + 38.56 + 0.00) = 38.56 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	17	0.58	71.82	-15.44	-3.36	0.00	-14.46	0.00	38.56

WHEEL (0.00 + 33.61 + 0.00) = 33.61 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	17	0.66	67.70	-16.17	-3.46	0.00	-14.46	0.00	33.61

Segment Leq : 39.77 dBA

Results segment # 2: GO Transit

LOCOMOTIVE (0.00 + 44.74 + 0.00) = 44.74 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
17	30	0.58	71.82	-15.44	-11.64	0.00	0.00	0.00	44.74

WHEEL (0.00 + 39.86 + 0.00) = 39.86 dBA

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

```
-------------------------------------------------------------------------
    17     30   0.66  67.70 -16.17 -11.67   0.00   0.00   0.00  39.86
-------------------------------------------------------------------------

Segment Leq : 45.96 dBA

Results segment # 3: GO Transit
------------------------------

LOCOMOTIVE (0.00 + 44.40 + 0.00) = 44.40 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    30     43   0.58  71.82 -15.44 -11.97   0.00   0.00   0.00  44.40
-------------------------------------------------------------------------

WHEEL (0.00 + 39.48 + 0.00) = 39.48 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    30     43   0.66  67.70 -16.17 -12.05   0.00   0.00   0.00  39.48
-------------------------------------------------------------------------

Segment Leq : 45.61 dBA

Results segment # 4: GO Transit
------------------------------

LOCOMOTIVE (0.00 + 47.92 + 0.00) = 47.92 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    43     90   0.58  71.82 -15.44  -8.46   0.00   0.00   0.00  47.92
-------------------------------------------------------------------------

WHEEL (0.00 + 42.78 + 0.00) = 42.78 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    43     90   0.66  67.70 -16.17  -8.75   0.00   0.00   0.00  42.78
-------------------------------------------------------------------------

Segment Leq : 49.08 dBA

Total Leq All Segments: 52.21 dBA

TOTAL Leq FROM ALL SOURCES:       52.21
```

Filename: 9331ola.te Time Period: 16 hours
Description: Lot 1 OLA with barrier

Rail data, segment # 1: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 1: GO Transit

Angle1 Angle2	: -90.00 deg	17.00 deg	
Wood depth	: 0	(No woods.)	
No of house rows	: 5		
House density	: 95 %		
Surface	: 1	(Absorptive ground surface)	
Receiver source distance	: 141.30 m		
Receiver height	: 1.50 m		
Topography	: 1	(Flat/gentle slope; no barrier)	
No Whistle			
Reference angle	: 0.00		

Rail data, segment # 2: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 2: GO Transit

Angle1 Angle2	: 17.00 deg	30.00 deg	
Wood depth	: 0	(No woods.)	
No of house rows	: 0		
Surface	: 1	(Absorptive ground surface)	
Receiver source distance	: 141.30 m		
Receiver height	: 1.50 m		
Topography	: 2	(Flat/gentle slope; with barrier)	
No Whistle			
Barrier angle1	: 17.00 deg	Angle2 : 30.00 deg	
Barrier height	: 2.15 m		
Barrier receiver distance	: 104.10 m		
Source elevation	: 270.10 m		
Receiver elevation	: 271.90 m		
Barrier elevation	: 273.20 m		
Reference angle	: 0.00		

Rail data, segment # 3: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld

```
-----------------+-------------+-------+------+------+------+----
  1. passenger   !  36.0/6.0   ! 129.0 !  1.0 ! 12.0 !Diesel!  No

Data for Segment # 3: GO Transit
--------------------------------
Angle1   Angle2           :  30.00 deg   43.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 141.30 m
Receiver height           :   1.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            :  30.00 deg   Angle2 : 43.00 deg
Barrier height            :   2.15 m
Barrier receiver distance : 107.00 m
Source elevation          : 269.10 m
Receiver elevation        : 271.90 m
Barrier elevation         : 272.00 m
Reference angle           :   0.00

Rail data, segment # 4: GO Transit
----------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
  1. passenger   !  36.0/6.0   ! 129.0 !  1.0 ! 12.0 !Diesel!  No

Data for Segment # 4: GO Transit
--------------------------------
Angle1   Angle2           :  43.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 141.30 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00

Results segment # 1: GO Transit
-------------------------------

LOCOMOTIVE (0.00 + 38.56 + 0.00) = 38.56 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     17   0.58  71.82 -15.44  -3.36   0.00 -14.46   0.00  38.56
-------------------------------------------------------------------------

WHEEL (0.00 + 33.61 + 0.00) = 33.61 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     17   0.66  67.70 -16.17  -3.46   0.00 -14.46   0.00  33.61
-------------------------------------------------------------------------

Segment Leq : 39.77 dBA
```

Results segment # 2: GO Transit

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	1.50	0.72	273.92
0.50	1.50	-1.86	271.34

LOCOMOTIVE (0.00 + 39.45 + 0.00) = 39.45 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
17	30	0.46	71.82	-14.18	-11.59	0.00	0.00	-6.59	39.45

WHEEL (0.00 + 28.76 + 0.00) = 28.76 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
17	30	0.56	67.70	-15.20	-11.63	0.00	0.00	-12.11	28.76

Segment Leq : 39.81 dBA

Results segment # 3: GO Transit

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	1.50	1.17	273.17
0.50	1.50	-1.48	270.52

LOCOMOTIVE (0.00 + 40.05 + 0.00) = 40.05 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
30	43	0.46	71.82	-14.18	-11.85	0.00	0.00	-5.74	40.05

WHEEL (0.00 + 29.49 + 0.00) = 29.49 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
30	43	0.56	67.70	-15.20	-11.95	0.00	0.00	-11.05	29.49

Segment Leq : 40.42 dBA

Results segment # 4: GO Transit

LOCOMOTIVE (0.00 + 47.92 + 0.00) = 47.92 dBA

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

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
43	90	0.58	71.82	-15.44	-8.46	0.00	0.00	0.00	47.92

WHEEL (0.00 + 42.78 + 0.00) = 42.78 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
43	90	0.66	67.70	-16.17	-8.75	0.00	0.00	0.00	42.78

Segment Leq : 49.08 dBA

Total Leq All Segments: 50.45 dBA

TOTAL Leq FROM ALL SOURCES: 50.45

STAMSON 5.0 NORMAL REPORT Date: 06-06-2020 22:50:14
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 933l6wo.te Time Period: Day/Night 16/8 hours
Description: Lot 6 day/night w/o whistle

Rail data, segment # 1: GO Transit (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 1: GO Transit (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	46.50 / 46.50	m
Receiver height	4.50 / 4.50	m
Topography	1	(Flat/gentle slope; no barrier)

No Whistle
Reference angle : 0.00

Results segment # 1: GO Transit (day)

LOCOMOTIVE (0.00 + 63.31 + 0.00) = 63.31 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	71.82	-7.35	-1.17	0.00	0.00	0.00	63.31

WHEEL (0.00 + 58.48 + 0.00) = 58.48 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	67.70	-7.86	-1.35	0.00	0.00	0.00	58.48

Segment Leq : 64.54 dBA

Total Leq All Segments: 64.54 dBA

Results segment # 1: GO Transit (night)

LOCOMOTIVE (0.00 + 58.53 + 0.00) = 58.53 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	67.05	-7.35	-1.17	0.00	0.00	0.00	58.53

WHEEL (0.00 + 53.71 + 0.00) = 53.71 dBA

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

```
-------------------------------------------------------------------------
   -90     90   0.60  62.93  -7.86  -1.35   0.00   0.00   0.00  53.71
-------------------------------------------------------------------------

Segment Leq : 59.77 dBA

Total Leq All Segments: 59.77 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.54
                           (NIGHT): 59.77
```

STAMSON 5.0 NORMAL REPORT Date: 06-06-2020 22:50:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 933l6ww.te Time Period: Day/Night 16/8 hours
Description: Lot 6 day/night w/whistle

Rail data, segment # 1: GO Transit (day/night)

Train Type	Trains (Left)	Trains (Right)	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	18.0/3.0	18.0/3.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 1: GO Transit (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	46.50 / 46.50	m
Receiver height	4.50 / 4.50	m
Topography	1	(Flat/gentle slope; no barrier)
Whistle Angle	79 deg	Track 1
Reference angle	0.00	

Results segment # 1: GO Transit (day)

LOCOMOTIVE (0.00 + 63.31 + 0.00) = 63.31 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	71.82	-7.35	-1.17	0.00	0.00	0.00	63.31

WHEEL (0.00 + 58.48 + 0.00) = 58.48 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	67.70	-7.86	-1.35	0.00	0.00	0.00	58.48

LEFT WHISTLE (0.00 + 64.30 + 0.00) = 64.30 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	79	0.50	73.11	-7.35	-1.46	0.00	0.00	0.00	64.30

RIGHT WHISTLE (0.00 + 47.17 + 0.00) = 47.17 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
79	86	0.50	73.11	-7.35	-18.60	0.00	0.00	0.00	47.17

Segment Leq : 67.48 dBA

Total Leq All Segments: 67.48 dBA

Results segment # 1: GO Transit (night)

LOCOMOTIVE (0.00 + 58.53 + 0.00) = 58.53 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	67.05	-7.35	-1.17	0.00	0.00	0.00	58.53

WHEEL (0.00 + 53.71 + 0.00) = 53.71 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	62.93	-7.86	-1.35	0.00	0.00	0.00	53.71

LEFT WHISTLE (0.00 + 59.53 + 0.00) = 59.53 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	79	0.50	68.34	-7.35	-1.46	0.00	0.00	0.00	59.53

RIGHT WHISTLE (0.00 + 42.39 + 0.00) = 42.39 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
79	86	0.50	68.34	-7.35	-18.60	0.00	0.00	0.00	42.39

Segment Leq : 62.70 dBA

Total Leq All Segments: 62.70 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.48
(NIGHT): 62.70

Filename: 9336ola.te Time Period: 16 hours
Description: Lot 6 OLA w/o barrier

Rail data, segment # 1: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 1: GO Transit

Angle1 Angle2	-90.00 deg	-28.00 deg
Wood depth	0	(No woods.)
No of house rows	1	
House density	95 %	
Surface	1	(Absorptive ground surface)
Receiver source distance	51.60 m	
Receiver height	1.50 m	
Topography	1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	0.00	

Rail data, segment # 2: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 2: GO Transit

Angle1 Angle2	-28.00 deg	72.00 deg
Wood depth	0	(No woods.)
No of house rows	0	
Surface	1	(Absorptive ground surface)
Receiver source distance	51.60 m	
Receiver height	1.50 m	
Topography	1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	0.00	

Rail data, segment # 3: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 3: GO Transit

Angle1 Angle2	72.00 deg	77.00 deg

```
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  51.60 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00
```

Rail data, segment # 4: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars/Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 4: GO Transit

```
Angle1   Angle2          :  77.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  51.60 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00
```

Results segment # 1: GO Transit

LOCOMOTIVE (0.00 + 47.07 + 0.00) = 47.07 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-28	0.58	71.82	-8.50	-6.65	0.00	-9.60	0.00	47.07

WHEEL (0.00 + 42.34 + 0.00) = 42.34 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-28	0.66	67.70	-8.91	-6.86	0.00	-9.60	0.00	42.34

Segment Leq : 48.33 dBA

Results segment # 2: GO Transit

LOCOMOTIVE (0.00 + 60.20 + 0.00) = 60.20 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-28	72	0.58	71.82	-8.50	-3.11	0.00	0.00	0.00	60.20

WHEEL (0.00 + 55.61 + 0.00) = 55.61 dBA

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

```
-------------------------------------------------------------------------
   -28     72   0.66  67.70  -8.91  -3.18   0.00   0.00   0.00  55.61
-------------------------------------------------------------------------

Segment Leq : 61.50 dBA

Results segment # 3: GO Transit
------------------------------

LOCOMOTIVE (0.00 + 44.39 + 0.00) = 44.39 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    72     77   0.58  71.82  -8.50 -18.92   0.00   0.00   0.00  44.39
-------------------------------------------------------------------------

WHEEL (0.00 + 39.44 + 0.00) = 39.44 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    72     77   0.66  67.70  -8.91 -19.35   0.00   0.00   0.00  39.44
-------------------------------------------------------------------------

Segment Leq : 45.60 dBA

Results segment # 4: GO Transit
------------------------------

LOCOMOTIVE (0.00 + 46.12 + 0.00) = 46.12 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    77     90   0.58  71.82  -8.50 -17.19   0.00   0.00   0.00  46.12
-------------------------------------------------------------------------

WHEEL (0.00 + 40.92 + 0.00) = 40.92 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    77     90   0.66  67.70  -8.91 -17.88   0.00   0.00   0.00  40.92
-------------------------------------------------------------------------

Segment Leq : 47.27 dBA

Total Leq All Segments: 61.96 dBA

TOTAL Leq FROM ALL SOURCES:       61.96
```

Filename: 9336ola.te Time Period: 16 hours
Description: Lot 6 OLA with barrier

Rail data, segment # 1: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 1: GO Transit

Angle1 Angle2	-90.00 deg	-28.00 deg
Wood depth	0	(No woods.)
No of house rows	1	
House density	95 %	
Surface	1	(Absorptive ground surface)
Receiver source distance	51.60 m	
Receiver height	1.50 m	
Topography	1	(Flat/gentle slope; no barrier)

No Whistle
Reference angle : 0.00

Rail data, segment # 2: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 2: GO Transit

Angle1 Angle2	-28.00 deg	72.00 deg
Wood depth	0	(No woods.)
No of house rows	0	
Surface	1	(Absorptive ground surface)
Receiver source distance	51.60 m	
Receiver height	1.50 m	
Topography	2	(Flat/gentle slope; with barrier)

No Whistle
Barrier angle1 : -28.00 deg Angle2 : 72.00 deg
Barrier height : 2.15 m
Barrier receiver distance : 14.50 m
Source elevation : 270.00 m
Receiver elevation : 272.10 m
Barrier elevation : 273.20 m
Reference angle : 0.00

Rail data, segment # 3: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld

```
-----------------+-------------+-------+------+------+------+----
  1. passenger   !  36.0/6.0   ! 129.0 !  1.0 ! 12.0 !Diesel!  No

Data for Segment # 3: GO Transit
--------------------------------
Angle1   Angle2           :  72.00 deg   77.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  51.60 m
Receiver height           :   1.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            :  72.00 deg   Angle2 : 77.00 deg
Barrier height            :   2.15 m
Barrier receiver distance :  16.90 m
Source elevation          : 268.10 m
Receiver elevation        : 272.10 m
Barrier elevation         : 272.00 m
Reference angle           :   0.00

Rail data, segment # 4: GO Transit
----------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
  1. passenger   !  36.0/6.0   ! 129.0 !  1.0 ! 12.0 !Diesel!  No

Data for Segment # 4: GO Transit
--------------------------------
Angle1   Angle2           :  77.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  51.60 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00

Results segment # 1: GO Transit
-------------------------------

LOCOMOTIVE (0.00 + 47.07 + 0.00) = 47.07 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -28   0.58  71.82  -8.50  -6.65   0.00  -9.60   0.00  47.07
-------------------------------------------------------------------------

WHEEL (0.00 + 42.34 + 0.00) = 42.34 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -28   0.66  67.70  -8.91  -6.86   0.00  -9.60   0.00  42.34
-------------------------------------------------------------------------

Segment Leq : 48.33 dBA
```

Results segment # 2: GO Transit

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	1.50	0.51	273.71
0.50	1.50	-0.47	272.73

LOCOMOTIVE (0.00 + 52.21 + 0.00) = 52.21 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-28	72	0.46	71.82	-7.81	-3.00	0.00	0.00	-8.79	52.21

WHEEL (0.00 + 44.40 + 0.00) = 44.40 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-28	72	0.56	67.70	-8.38	-3.09	0.00	0.00	-11.83	44.40

Segment Leq : 52.88 dBA

Results segment # 3: GO Transit

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	1.50	1.11	273.11
0.50	1.50	-0.04	271.96

LOCOMOTIVE (0.00 + 40.18 + 0.00) = 40.18 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
72	77	0.46	71.82	-7.81	-18.18	0.00	0.00	-5.64	40.18

WHEEL (0.00 + 33.14 + 0.00) = 33.14 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
72	77	0.56	67.70	-8.38	-18.78	0.00	0.00	-7.40	33.14

Segment Leq : 40.96 dBA

Results segment # 4: GO Transit

LOCOMOTIVE (0.00 + 46.12 + 0.00) = 46.12 dBA

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

```
-------------------------------------------------------------------------
    77     90   0.58  71.82  -8.50 -17.19   0.00   0.00   0.00  46.12
-------------------------------------------------------------------------

WHEEL (0.00 + 40.92 + 0.00) = 40.92 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    77     90   0.66  67.70  -8.91 -17.88   0.00   0.00   0.00  40.92
-------------------------------------------------------------------------

Segment Leq : 47.27 dBA

Total Leq All Segments: 55.16 dBA

TOTAL Leq FROM ALL SOURCES:       55.16
```

STAMSON 5.0 NORMAL REPORT Date: 06-06-2020 22:51:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 933l7wo.te Time Period: Day/Night 16/8 hours
Description: Lot 7 day/night w/o whistle

Rail data, segment # 1: GO Transit (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 1: GO Transit (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	46.50 / 46.50	m
Receiver height	4.50 / 4.50	m
Topography	1	(Flat/gentle slope; no barrier)

No Whistle
Reference angle : 0.00

Results segment # 1: GO Transit (day)

LOCOMOTIVE (0.00 + 63.31 + 0.00) = 63.31 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	71.82	-7.35	-1.17	0.00	0.00	0.00	63.31

WHEEL (0.00 + 58.48 + 0.00) = 58.48 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	67.70	-7.86	-1.35	0.00	0.00	0.00	58.48

Segment Leq : 64.54 dBA

Total Leq All Segments: 64.54 dBA

Results segment # 1: GO Transit (night)

LOCOMOTIVE (0.00 + 58.53 + 0.00) = 58.53 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	67.05	-7.35	-1.17	0.00	0.00	0.00	58.53

WHEEL (0.00 + 53.71 + 0.00) = 53.71 dBA

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

```
-------------------------------------------------------------------------
   -90     90   0.60  62.93  -7.86  -1.35   0.00   0.00   0.00  53.71
-------------------------------------------------------------------------

Segment Leq : 59.77 dBA

Total Leq All Segments: 59.77 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 64.54
                           (NIGHT): 59.77
```

STAMSON 5.0 NORMAL REPORT Date: 06-06-2020 22:52:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 933l7ww.te Time Period: Day/Night 16/8 hours
Description: Lot 7 day/night w/whistle

Rail data, segment # 1: GO Transit (day/night)

Train Type	Trains (Left)	Trains (Right)	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	18.0/3.0	18.0/3.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 1: GO Transit (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	46.50 / 46.50	m
Receiver height	4.50 / 4.50	m
Topography	1	(Flat/gentle slope; no barrier)
Whistle Angle	84 deg	Track 1
Reference angle	0.00	

Results segment # 1: GO Transit (day)

LOCOMOTIVE (0.00 + 63.31 + 0.00) = 63.31 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	71.82	-7.35	-1.17	0.00	0.00	0.00	63.31

WHEEL (0.00 + 58.48 + 0.00) = 58.48 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	67.70	-7.86	-1.35	0.00	0.00	0.00	58.48

LEFT WHISTLE (0.00 + 57.53 + 0.00) = 57.53 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
42	84	0.50	73.11	-7.35	-8.23	0.00	0.00	0.00	57.53

RIGHT WHISTLE (0.00 + 42.29 + 0.00) = 42.29 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
84	87	0.50	73.11	-7.35	-23.47	0.00	0.00	0.00	42.29

Segment Leq : 65.35 dBA

Total Leq All Segments: 65.35 dBA

Results segment # 1: GO Transit (night)

LOCOMOTIVE (0.00 + 58.53 + 0.00) = 58.53 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	67.05	-7.35	-1.17	0.00	0.00	0.00	58.53

WHEEL (0.00 + 53.71 + 0.00) = 53.71 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	62.93	-7.86	-1.35	0.00	0.00	0.00	53.71

LEFT WHISTLE (0.00 + 52.76 + 0.00) = 52.76 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
42	84	0.50	68.34	-7.35	-8.23	0.00	0.00	0.00	52.76

RIGHT WHISTLE (0.00 + 37.52 + 0.00) = 37.52 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
84	87	0.50	68.34	-7.35	-23.47	0.00	0.00	0.00	37.52

Segment Leq : 60.58 dBA

Total Leq All Segments: 60.58 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.35
(NIGHT): 60.58

Filename: 93317ola.te Time Period: 16 hours
Description: Lot 7 OLA w/o barrier

Rail data, segment # 1: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 1: GO Transit

Angle1 Angle2	-90.00 deg	-70.00 deg
Wood depth	0	(No woods.)
No of house rows	0	
Surface	1	(Absorptive ground surface)
Receiver source distance	52.30 m	
Receiver height	1.50 m	
Topography	1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	0.00	

Rail data, segment # 2: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 2: GO Transit

Angle1 Angle2	-70.00 deg	28.00 deg
Wood depth	0	(No woods.)
No of house rows	0	
Surface	1	(Absorptive ground surface)
Receiver source distance	52.30 m	
Receiver height	1.50 m	
Topography	1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	0.00	

Rail data, segment # 3: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 3: GO Transit

Angle1 Angle2	28.00 deg	90.00 deg
Wood depth	0	(No woods.)

```
No of house rows          :      1
House density             :     95 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  52.30 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00

Results segment # 1: GO Transit
------------------------------

LOCOMOTIVE (0.00 + 48.98 + 0.00) = 48.98 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -70   0.58  71.82  -8.60 -14.24   0.00   0.00   0.00  48.98
-------------------------------------------------------------------------

WHEEL (0.00 + 43.91 + 0.00) = 43.91 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -70   0.66  67.70  -9.00 -14.79   0.00   0.00   0.00  43.91
-------------------------------------------------------------------------

Segment Leq : 50.16 dBA

Results segment # 2: GO Transit
------------------------------

LOCOMOTIVE (0.00 + 60.05 + 0.00) = 60.05 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -70     28   0.58  71.82  -8.60  -3.17   0.00   0.00   0.00  60.05
-------------------------------------------------------------------------

WHEEL (0.00 + 55.47 + 0.00) = 55.47 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -70     28   0.66  67.70  -9.00  -3.23   0.00   0.00   0.00  55.47
-------------------------------------------------------------------------

Segment Leq : 61.35 dBA

Results segment # 3: GO Transit
------------------------------

LOCOMOTIVE (0.00 + 46.99 + 0.00) = 46.99 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    28     90   0.58  71.82  -8.60  -6.65   0.00  -9.58   0.00  46.99
-------------------------------------------------------------------------

WHEEL (0.00 + 42.26 + 0.00) = 42.26 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    28     90   0.66  67.70  -9.00  -6.86   0.00  -9.58   0.00  42.26
```

```
-------------------------------------------------------------------------

Segment Leq : 48.25 dBA

Total Leq All Segments: 61.86 dBA

TOTAL Leq FROM ALL SOURCES:       61.86
```

Filename: 93317ola.te Time Period: 16 hours
Description: Lot 7 OLA with barrier

Rail data, segment # 1: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 1: GO Transit

Angle1	Angle2	: -90.00 deg	-70.00 deg
Wood depth		: 0	(No woods.)
No of house rows		: 0	
Surface		: 1	(Absorptive ground surface)
Receiver source distance		: 52.30 m	
Receiver height		: 1.50 m	
Topography		: 1	(Flat/gentle slope; no barrier)
No Whistle			
Reference angle		: 0.00	

Rail data, segment # 2: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 2: GO Transit

Angle1	Angle2	: -70.00 deg	28.00 deg
Wood depth		: 0	(No woods.)
No of house rows		: 0	
Surface		: 1	(Absorptive ground surface)
Receiver source distance		: 52.30 m	
Receiver height		: 1.50 m	
Topography		: 2	(Flat/gentle slope; with barrier)
No Whistle			
Barrier angle1		: -70.00 deg	Angle2 : 28.00 deg
Barrier height		: 2.15 m	
Barrier receiver distance		: 15.10 m	
Source elevation		: 271.20 m	
Receiver elevation		: 274.20 m	
Barrier elevation		: 275.50 m	
Reference angle		: 0.00	

Rail data, segment # 3: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld

```
  1. passenger   !  36.0/6.0   ! 129.0 !  1.0 ! 12.0 !Diesel!  No

Data for Segment # 3: GO Transit
--------------------------------
Angle1   Angle2           :  28.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1
House density             :     95 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  52.30 m
Receiver height           :   1.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            :  28.00 deg   Angle2 : 90.00 deg
Barrier height            :   2.15 m
Barrier receiver distance :  16.30 m
Source elevation          : 271.20 m
Receiver elevation        : 274.20 m
Barrier elevation         : 275.50 m
Reference angle           :   0.00

Results segment # 1: GO Transit
--------------------------------

LOCOMOTIVE (0.00 + 48.98 + 0.00) = 48.98 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -70   0.58  71.82  -8.60 -14.24   0.00   0.00   0.00  48.98
-------------------------------------------------------------------------

WHEEL (0.00 + 43.91 + 0.00) = 43.91 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -70   0.66  67.70  -9.00 -14.79   0.00   0.00   0.00  43.91
-------------------------------------------------------------------------

Segment Leq : 50.16 dBA

Results segment # 2: GO Transit
--------------------------------

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        1.50 !        0.06 !       275.56
       0.50 !        1.50 !       -0.95 !       274.55

LOCOMOTIVE (0.00 + 50.63 + 0.00) = 50.63 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -70     28   0.46  71.82  -7.90  -3.06   0.00   0.00 -10.23  50.63
-------------------------------------------------------------------------

WHEEL (0.00 + 42.98 + 0.00) = 42.98 dBA
```

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-70	28	0.56	67.70	-8.47	-3.15	0.00	0.00	-13.10	42.98

Segment Leq : 51.32 dBA

Results segment # 3: GO Transit

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	1.50	0.04	275.54
0.50	1.50	-1.05	274.45

LOCOMOTIVE (0.00 + 46.99 + 0.00) = 46.99 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
28	90	0.58	71.82	-8.60	-6.65	0.00	-9.58	0.00	46.99
28	90	0.46	71.82	-7.90	-6.27	0.00	0.00	-8.19	49.46

WHEEL (0.00 + 42.26 + 0.00) = 42.26 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
28	90	0.66	67.70	-9.00	-6.86	0.00	-9.58	0.00	42.26
28	90	0.56	67.70	-8.47	-6.58	0.00	0.00	-10.20	42.45

Segment Leq : 48.25 dBA

Total Leq All Segments: 54.86 dBA

TOTAL Leq FROM ALL SOURCES: 54.86

STAMSON 5.0 NORMAL REPORT Date: 06-06-2020 22:53:49
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 933l15wo.te Time Period: Day/Night 16/8 hours
Description: Lot 15 day/night w/o whistle

Rail data, segment # 1: GO Transit (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 1: GO Transit (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	67.80 / 67.80	m
Receiver height	4.50 / 4.50	m
Topography	1	(Flat/gentle slope; no barrier)

No Whistle
Reference angle : 0.00

Results segment # 1: GO Transit (day)

LOCOMOTIVE (0.00 + 60.86 + 0.00) = 60.86 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	71.82	-9.79	-1.17	0.00	0.00	0.00	60.86

WHEEL (0.00 + 55.86 + 0.00) = 55.86 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	67.70	-10.48	-1.35	0.00	0.00	0.00	55.86

Segment Leq : 62.05 dBA

Total Leq All Segments: 62.05 dBA

Results segment # 1: GO Transit (night)

LOCOMOTIVE (0.00 + 56.09 + 0.00) = 56.09 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	67.05	-9.79	-1.17	0.00	0.00	0.00	56.09

WHEEL (0.00 + 51.09 + 0.00) = 51.09 dBA

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

```
-------------------------------------------------------------------------
   -90     90   0.60  62.93 -10.48  -1.35   0.00   0.00   0.00  51.09
-------------------------------------------------------------------------

Segment Leq : 57.28 dBA

Total Leq All Segments: 57.28 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 62.05
                           (NIGHT): 57.28
```

STAMSON 5.0 NORMAL REPORT Date: 06-06-2020 22:54:35
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 933l15ww.te Time Period: Day/Night 16/8 hours
Description: Lot 15 day/night w/whistle

Rail data, segment # 1: GO Transit (day/night)

Train Type	Trains (Left)	Trains (Right)	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	18.0/3.0	18.0/3.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 1: GO Transit (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	67.80 / 67.80	m
Receiver height	4.50 / 4.50	m
Topography	1	(Flat/gentle slope; no barrier)
Whistle Angle	78 deg	Track 1
Reference angle	0.00	

Results segment # 1: GO Transit (day)

LOCOMOTIVE (0.00 + 60.86 + 0.00) = 60.86 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	71.82	-9.79	-1.17	0.00	0.00	0.00	60.86

WHEEL (0.00 + 55.86 + 0.00) = 55.86 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	67.70	-10.48	-1.35	0.00	0.00	0.00	55.86

LEFT WHISTLE (0.00 + 61.25 + 0.00) = 61.25 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-50	78	0.50	73.11	-9.79	-2.06	0.00	0.00	0.00	61.25

RIGHT WHISTLE (0.00 + 44.87 + 0.00) = 44.87 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
78	85	0.50	73.11	-9.79	-18.44	0.00	0.00	0.00	44.87

Segment Leq : 64.73 dBA

Total Leq All Segments: 64.73 dBA

Results segment # 1: GO Transit (night)

LOCOMOTIVE (0.00 + 56.09 + 0.00) = 56.09 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.50	67.05	-9.79	-1.17	0.00	0.00	0.00	56.09

WHEEL (0.00 + 51.09 + 0.00) = 51.09 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.60	62.93	-10.48	-1.35	0.00	0.00	0.00	51.09

LEFT WHISTLE (0.00 + 56.48 + 0.00) = 56.48 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-50	78	0.50	68.34	-9.79	-2.06	0.00	0.00	0.00	56.48

RIGHT WHISTLE (0.00 + 40.10 + 0.00) = 40.10 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
78	85	0.50	68.34	-9.79	-18.44	0.00	0.00	0.00	40.10

Segment Leq : 59.96 dBA

Total Leq All Segments: 59.96 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.73
(NIGHT): 59.96

Filename: 93315ola.te Time Period: 16 hours
Description: Lot 15 OLA

Rail data, segment # 1: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 1: GO Transit

Angle1 Angle2	: -90.00 deg	-52.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 1	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 85.20 m	
Receiver height	: 1.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 2: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 2: GO Transit

Angle1 Angle2	: -52.00 deg	77.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 1	
House density	: 95 %	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 85.20 m	
Receiver height	: 1.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 3: GO Transit

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. passenger	36.0/6.0	129.0	1.0	12.0	Diesel	No

Data for Segment # 3: GO Transit

```
Angle1   Angle2           :  77.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1
House density             :     70 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  85.20 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00

Results segment # 1: GO Transit
------------------------------

LOCOMOTIVE (0.00 + 40.92 + 0.00) = 40.92 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -52   0.58  71.82 -11.96  -9.88   0.00  -9.06   0.00  40.92
-------------------------------------------------------------------------

WHEEL (0.00 + 35.88 + 0.00) = 35.88 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -52   0.66  67.70 -12.52 -10.23   0.00  -9.06   0.00  35.88
-------------------------------------------------------------------------

Segment Leq : 42.10 dBA

Results segment # 2: GO Transit
------------------------------

LOCOMOTIVE (0.00 + 48.68 + 0.00) = 48.68 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -52     77   0.58  71.82 -11.96  -2.12   0.00  -9.06   0.00  48.68
-------------------------------------------------------------------------

WHEEL (0.00 + 43.92 + 0.00) = 43.92 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -52     77   0.66  67.70 -12.52  -2.19   0.00  -9.06   0.00  43.92
-------------------------------------------------------------------------

Segment Leq : 49.93 dBA

Results segment # 3: GO Transit
------------------------------

LOCOMOTIVE (0.00 + 38.15 + 0.00) = 38.15 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    77     90   0.58  71.82 -11.96 -17.19   0.00  -4.52   0.00  38.15
-------------------------------------------------------------------------

WHEEL (0.00 + 32.78 + 0.00) = 32.78 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
```

```
-------------------------------------------------------------------------
    77     90   0.66  67.70 -12.52 -17.88   0.00  -4.52   0.00  32.78
-------------------------------------------------------------------------

Segment Leq : 39.26 dBA

Total Leq All Segments: 50.90 dBA

TOTAL Leq FROM ALL SOURCES:       50.90
```

```
STAMSON 5.0        NORMAL REPORT        Date: 06-06-2020 22:57:25
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9033db60.te          Time Period: 24 hours
Description: 24-hr 60 dBA setback


Rail data, segment # 1: GO Transit
----------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
  1. passenger   !  42.0/0.0   ! 129.0 !  1.0 ! 12.0 !Diesel!  No

Data for Segment # 1: GO Transit
--------------------------------
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  :  78.50 m
Receiver height           :   4.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00

Results segment # 1: GO Transit
-------------------------------

LOCOMOTIVE (0.00 + 58.81 + 0.00) = 58.81 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.50  70.73 -10.75  -1.17   0.00   0.00   0.00  58.81
-------------------------------------------------------------------------

WHEEL (0.00 + 53.75 + 0.00) = 53.75 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.60  66.61 -11.50  -1.35   0.00   0.00   0.00  53.75
-------------------------------------------------------------------------

Segment Leq : 59.99 dBA

Total Leq All Segments: 59.99 dBA

TOTAL Leq FROM ALL SOURCES:       59.99
```

APPENDIX ‘C’

Sample Acoustic Insulation Factor (AIF) Calculations and

Building Component Design

Building Component Design - R. Bouwmeester & Associates

Project: Innisfil Executive Estates Phase 2 RBA File: A19033
Lot No: 4 Date: June 2020

STEP 1 **Night-time Noise Level at 2nd Floor Wall (dBA) (Iteration #1)**

Source	North	South	East	West
	Wall 1	Wall 2	Wall 3	Wall 4
1				
2				
GO		59	59	
4				
5				
Combined	0	59	59	0
Shielding	0	-3	0	0
Resultant	0	56	59	0

STEP 2 Number of wall components *

	WALL 1			WALL 2			WALL 3			WALL 4			Total No.
	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Comp.
BR				1	1		1	1					4
K													
Bath													
Lndy													

*Walls not incl when actual AIF more than 10 greater than required, or when dBA < 55.

STEP 3 Find AIF from Table 10.5

	WALL 1	WALL 2	WALL 3	WALL 4
BR		29	32	
K				
Bath				
Lndy				

STEP 4 AIF adjustment for source geometry

	WALL 1	WALL 2	WALL 3	WALL 4
Angle Range		0-90	0-90	
Adjustment		0	0	

STEP 5 **Required AIF**

	WALL 1	WALL 2	WALL 3	WALL 4
BR		29	32	
K				
Bath				
Lndy				

STEP 1 Component areas

	WALL 1			WALL 2			WALL 3			WALL 4			Room Flr
	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Area
BR				0.25	0.8		0.25	0.8					1.0
K													
Bath													
Lndy													

STEP 2 Component percentages

	WALL 1			WALL 2			WALL 3			WALL 4		
	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr
BR				25%	80%		25%	80%				
K												
Bath												
Lndy												

STEP 3 Component Selection

	WALL 1			WALL 2			WALL 3			WALL 4		
	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr
BR				3(6)3	EW1		3(20)3	EW1				
K												
Bath												
Lndy												

STEP 4 **Actual AIF**

	WALL 1			WALL 2			WALL 3			WALL 4		
	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr
BR				29	32		32	32				
K												
Bath												
Lndy												

Building Component Design - R. Bouwmeester & Associates

Project: Innisfil Executive Estates Phase 2 RBA File: A19033
Lot No: 6 Date: June 2020

STEP 1 **Night-time Noise Level at 2nd Floor Wall (dBA) (Iteration #1)**

Source	North	South	East	West
	Wall 1	Wall 2	Wall 3	Wall 4
1				
2				
GO		63	63	
4				
5				
Combined	0	63	63	0
Shielding	0	-3	0	0
Resultant	0	60	63	0

STEP 2 Number of wall components *

	WALL 1			WALL 2			WALL 3			WALL 4			Total No.
	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Comp.
BR				1	1		1	1					4
K													
Bath													
Lndy													

*Walls not incl when actual AIF more than 10 greater than required, or when dBA < 55.

STEP 3 Find AIF from Table 10.5

	WALL 1	WALL 2	WALL 3	WALL 4
BR		33	36	
K				
Bath				
Lndy				

STEP 4 AIF adjustment for source geometry

	WALL 1	WALL 2	WALL 3	WALL 4
Angle Range		0-90	0-90	
Adjustment		0	0	

STEP 5 **Required AIF**

	WALL 1	WALL 2	WALL 3	WALL 4
BR		33	36	
K				
Bath				
Lndy				

STEP 1 Component areas

	WALL 1			WALL 2			WALL 3			WALL 4			Room Flr
	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Area
BR				0.25	0.8		0.25	0.8					1.0
K													
Bath													
Lndy													

STEP 2 Component percentages

	WALL 1			WALL 2			WALL 3			WALL 4		
	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr
BR				25%	80%		25%	80%				
K												
Bath												
Lndy												

STEP 3 Component Selection

	WALL 1			WALL 2			WALL 3			WALL 4		
	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr
BR				3(25)3	EW5		3(50)3	EW5				
K												
Bath												
Lndy												

STEP 4 **Actual AIF**

	WALL 1			WALL 2			WALL 3			WALL 4		
	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr
BR				33	48		36	48				
K												
Bath												
Lndy												

continue to iteration #2 without walls...

Building Component Design - R. Bouwmeester & Associates

Project: Innisfil Executive Estates Phase 2 RBA File: A19033
Lot No: 6 Date: June 2020

STEP 1 **Night-time Noise Level at 2nd Floor Wall (dBA) (Iteration #2)**

Source	North Wall 1	South Wall 2	East Wall 3	West Wall 4
1				
2				
GO		63	63	
4				
5				
Combined	0	63	63	0
Shielding	0	-3	0	0
Resultant	0	60	63	0

STEP 2 Number of wall components *

	WALL 1			WALL 2			WALL 3			WALL 4			Total No.
	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Comp.
BR				1			1						2
K													
Bath													
Lndy													

*Walls not incl when actual AIF more than 10 greater than required, or when dBA < 55.

STEP 3 Find AIF from Table 10.5

	WALL 1	WALL 2	WALL 3	WALL 4
BR		30	33	
K				
Bath				
Lndy				

STEP 4 AIF adjustment for source geometry

	WALL 1	WALL 2	WALL 3	WALL 4
Angle Range		0-90	0-90	
Adjustment		0	0	

STEP 5 **Required AIF**

	WALL 1	WALL 2	WALL 3	WALL 4
BR		30	33	
K				
Bath				
Lndy				

STEP 1 Component areas

	WALL 1			WALL 2			WALL 3			WALL 4			Room Flr
	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Area
BR				0.25			0.25						1.0
K													
Bath													
Lndy													

STEP 2 Component percentages

	WALL 1			WALL 2			WALL 3			WALL 4		
	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr
BR				25%			25%					
K												
Bath												
Lndy												

STEP 3 Component Selection

	WALL 1			WALL 2			WALL 3			WALL 4		
	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr
BR				3(13)3			3(25)3					
K												
Bath												
Lndy												

STEP 4 **Actual AIF**

	WALL 1			WALL 2			WALL 3			WALL 4		
	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr	Wi	Wa	Dr
BR				30			33					
K												
Bath												
Lndy												