Environmental Noise Feasibility Study

Argo Humber Station

Proposed Mixed Use Subdivision

Town of Caledon

May 17, 2023
Project: 121-0102

Prepared for

Argo Humber Station Limited

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Version History

Version #	Date	Comments
1.0	September 21, 2021	Final – Issued to Client
2.0	December 13, 2021	Revised report issued to client for ROPA 30
3.0	May 17, 2023	Revised based on changes to Draft Plan

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EXECUTIVE SUMMARY

Valcoustics Canada Ltd. (VCL) prepared an Environmental Noise Feasibility Study, dated December 13, 2021, in support of the proposed mixed-use development. The proposed development will consist of a medium density residential block (Block 1), four mixed-use blocks (Block 2 to 5) and two blocks for GO Transit lands (Blocks 6 and 7).

Both transportation and stationary noise sources were considered in this study.

The sound levels on site have been determined and compared with the applicable Ministry of the Environment, Conservation and Parks (MECP), Region of Peel and Town of Caledon noise guideline limits to determine the need for noise mitigation.

To meet the noise guideline limits:

- Mandatory air conditioning is required for all dwelling units in the development to allow exterior windows to remain closed;
- Brick veneer or masonry equivalent exterior wall construction and upgraded windows with Sound Transmission Class (STC) ratings up to 42 for bedrooms and STC 36 for living rooms are required for Blocks 2 to 5. These STC requirements are for rooms with windows on a single facade. The STC requirements would be higher at corner rooms with windows on two facades. Methods to reduce the STC requirements are discussed in Section 5.1;
- The STC ratings above were calculated using assumed (typical) room dimensions, wall and window areas, building setback and receptor height. Exterior wall and window STC requirements should be checked once detailed site and building plans are available;
- It is expected that this type of development will have balconies or elevated terraces. Provided they are less than 4 m in depth, they are not considered OLA's according to the MECP guidelines and noise mitigation would not be needed. This should be confirmed once detailed building plans are available.
- No noise sensitive uses are currently planned for Blocks 6 and 7. Commercial uses within Blocks 6 and 7 would need to be designed so their sound emissions comply with the stationary source sound level limits in Publication NPC-300 at the surrounding residential uses including

those that are part of this proposed development. Detailed noise and vibration studies of Blocks 6 and 7 should be done as a condition of their site plan approval.

- Block 1 is the easternmost 0.01 hectares of a medium density block that lies mostly within the boundaries of the adjacent development. General guidance regarding the expected noise mitigation requirements for Block 1 is provided in Section 6.0.

1.0 INTRODUCTION

Valcoustics Canada Ltd. (VCL) has been retained by Argo Humber Station Limited (herein referred to as the 'Owner') to continue to advance the applications for Draft Plan of Subdivision (21T-22002) and for Amendment to the Zoning By-Law (RZ 2022-0003) which were originally submitted in March 2022. These applications seek planning approvals to implement redevelopment of the lands legally described as Part of Lot 11, Concession 5 (Albion), Town of Caledon (the 'Subject Lands') and are generally located on the east side of Humber Station Road, north of King Street.

It is important to note that the original applications submitted in March 2022 related to the ROPA 30 lands only and consisted of approximately 1.59 ha (3.93 ac) and were generally located east of Humber Station Road, north of King Street. Since the applications were submitted in March 2022, the Region of Peel 2051 Official Plan was approved by the Province (Nov., 2022) and surrounding lands have been added to the 2051 Urban Area, including additional lands owned by the Owner. Accordingly, the overall Subject Lands now consist of 5.61 ha (13.86 ac) and are now part of the subject Draft Plan of Subdivision and Rezoning applications.

The Subject Lands are entirely within the Region of Peel's Urban Area (ROP, Nov 2022) and the Region's Major Transit Station Area (MTSA). As well, the Subject Lands are currently part of the Caledon Station Secondary Plan process (POPA-2021-0002). The effect of the Secondary Plan will be to apply land use designations to the Subject Lands, including Mixed Use and GO Transit Hub. The subject Draft Plan of Subdivision and Zoning By-Law Amendment for the Subject Lands will ensure the creation of Mixed Use and Transit Hub Blocks of lands that will contribute towards the ultimate compact, pedestrian and transit-oriented development of the Subject Lands through implementation of the Secondary Plan policies.

It is also important to note that on March 5, 2021, the Province of Ontario issued a Ministerial Zoning Order ('MZO') under Ontario Regulation 171 / 21 ('O. Reg. 171 / 21') for the Subject Lands. This MZO established zoning for the Subject Lands as a 'Mobility Transit Hub Zone'. This Zone permits a public transit depot with accessory parking and service buildings as well as a variety of commercial, retail services and public uses.

This Environmental Noise Feasibility Study has been prepared on behalf of the Owner in support of a Draft Plan of Subdivision ('DPS') and Zoning By-law Amendment ('ZBA' or 'Amendment') resubmission to facilitate the development of the Draft Plan of Subdivision consisting of a sliver of an abutting Medium Density Block, Mixed Use Blocks, and GO Transit Hub Blocks.

The potential sound levels from the environmental noise sources have been predicted on site and compared to the applicable MECP, Region of Peel and Town of Caledon noise guideline limits. Where sound level excesses above these guideline limits occur, noise mitigation measures have been recommended.

It is anticipated that the residential and mixed use buildings on Blocks 1 to 5 will be greater than 75 m from the Canadian Pacific Railway (CPR) Mactier Subdivision. Thus, in accordance with CPR requirements, vibration from the railway was not considered further.

1.1 THE SITE AND SURROUNDING AREA

The site is located between Humber Station Road and the CPR Mactier subdivision, to the north of King Street, in the Town of Caledon. The site is bounded by:

- Existing agricultural land (proposed for future residential development and GO Transit lands) to the north;
- The CPR Mactier Subdivision, with existing agricultural land beyond, to the east;
- Existing agricultural land (proposed for future mixed-use development) to the south; and
- Humber Station Road, with existing agricultural land (proposed for future mixed use and residential development) beyond, to the west.

Note that the site is split into a northern and southern portion. The land in between the two portions will, in the future, be combined with Blocks 3 and 4 (mixed use) and Blocks 6 and 7 (GO Transit lands).

A Key Plan is included as Figure 1.

This report was prepared using the Draft Plan of Subdivision, prepared by Glen Schnarr & Associates Inc., dated May 5, 2023. The Draft Plan is included as Figure 2.

1.2 THE PROPOSED DEVELOPMENT

The proposed development will consist of a medium density residential block (Block 1), four mixed-use blocks (Block 2 to 5) and two blocks for GO Transit lands (Blocks 6 and 7). With the exception of Block 5, all blocks are part blocks that will be combined with the adjacent development proposals to create full blocks.

Since the site plans for the mixed-use blocks (Blocks 2 to 5) have not yet been prepared, the noise control requirements are an approximation determined using assumed setback distances. It is assumed that these blocks will have residential multi-unit buildings. The noise control requirements should be reviewed as part of the Site Plan Approval process for these blocks.

Block 1 is the easternmost 0.01 hectares of a medium density residential block that lies mostly within the boundaries of the adjacent development. It is understood that Blocks 6 and 7 (GO Transit lands) and intended for a GO station and associated uses. There are no residential uses planned for these blocks. General noise control requirements for these blocks are outlined in Section 6.0. Specific noise and vibration control requirements can be determined as part of the Site Plan Approval process for these blocks.

2.0 NOISE SOURCES

There are transportation and stationary noise sources in the area that could impact the proposed residential development.

2.1 TRANSPORTATION NOISE SOURCES

The transportation noise sources that could impact the proposed development are road traffic on Humber Station Road and the internal collector Streets 'A' and 'B' and rail traffic on the CPR Mactier Subdivision. The site lies outside the 25 NEF/NEP contour where assessment of aircraft noise is not required. Thus, aircraft noise has not been considered further in this assessment.

2.1.1 Road Traffic

Year 2041 traffic volumes for Humber Station Road and the internal collector streets were provided by BA Group, the traffic consultant for this project, in the form of peak hour turning movement count (TMC) data. The 24-hour traffic volumes were calculated by multiplying the higher of the AM or PM peak hour volumes by a factor of 10. The traffic volumes were projected to the year 2043 (20-year projection as required by Caledon) using a growth rate of 2%, compounded annually.

The medium and heavy truck percentages for Humber Station Road were assumed to be 3% and 2%, respectively, of the total volume. Medium and heavy truck percentages for the internal collector streets were assumed to be 1.2% and 0.8%, respectively, of the total volume. The traffic consultant indicated that the Town of Caledon identifies a desired operating speed for a residential collector road of 40 to 60 kph resulting in a posted speed limit of 30 to 50 kph. To be conservative, a speed limit of 50 kph was used in the assessment. The day/night split was assumed to be 90%/10%, as is typical for well travelled roadways.

The road traffic data correspondence is included as Appendix A and is summarized in Table 1A.

2.1.2 Rail Traffic

The rail traffic data is discussed below and is summarized in Table 1B. Rail traffic correspondence is included as Appendix A

2.1.2.1 CPR

CPR is no longer providing rail traffic data. Thus, 2016 rail traffic data for the CPR Mactier Subdivision for a site in Bolton at Highway 50 and Queen Street was used (see Appendix A). Rail traffic on the Mactier Subdivision consists of freight trains. The rail traffic data was escalated to the year 2043 design condition (20-year projection required by the Town of Caledon) using a growth rate of 2.5% compounded annually. This escalation rate is suggested by the railway authorities when preparing environmental noise studies.

2.1.2.2 Metrolinx

Metrolinx currently does not use the CPR Mactier corridor. However, there is a possibility Metrolinx may use this corridor in the future. Therefore, it was assumed that future GO train traffic volumes will be similar to those expected on the GO Barrie line. Thus, the rail volume expected with the GO Expansion program for the GO Barrie Line was used in the assessment to approximate the potential future rail traffic on the Mactier Subdivision.

2.2 STATIONARY NOISE SOURCES

There are existing stationary noise sources to the southeast of the site. The closest one, Cavalier Transportation Services located at 14091 Humber Station Road, is about 350 m from the site. All others are more than 350 m from the site. On April 8, 2021, VCL staff visited the general area to make subjective observations of the stationary noise sources.

Noise emissions from the closest stationary noise sources were inaudible at the development site and close to the stationary sources themselves except for Alliance Agri-Turf Inc. located at 8112 King Street West. Near Alliance Agri-Turf Inc., blower noise from the storage silos was occasionally audible at a location approximately 200 m away from the facility. When the blower noise was audible, an overall sound level of 46 dBA was measured which includes the blower noise and any other background noise as well. Since the development site is more than 350 m from Alliance Agri-Turf Inc., the blower noise sound level at the development site will be well below the MECP Class 1 nighttime stationary source exclusion limit of 45 dBA.

The noise sources at the other facilities that could impact the proposed development are occasional vehicle and equipment movements within their yards. Due to the large distance separation, sound levels from these activities are expected to be well below the MECP stationary source guideline limits.

Based on our observations and brief sound level measurements, sound emissions from the stationary noise sources are expected to be well below the MECP guideline limits at the noise sensitive portions of the proposed development and the stationary noise sources have not been considered further in this assessment.

3.0 ENVIRONMENTAL NOISE GUIDELINES

3.1 MECP PUBLICATION NPC-300

The applicable noise guidelines for new residential development are those in MECP Publication NPC-300, *"Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning"*.

The environmental noise guidelines of the MECP (Publication NPC-300) are discussed briefly below and are summarized in Appendix B.

3.1.1 Transportation Noise Sources

3.1.1.1 Architectural Elements

In the daytime (0700 to 2300), the indoor criterion for road noise is $L_{eq\ Day}$(1) of 45 dBA for sensitive spaces such as living/dining rooms, dens and bedrooms. At night, the indoor criterion for road noise is $L_{eq\ Night}$(2) of 45 dBA for sensitive spaces such as living/dining rooms and dens and 40 dBA for bedrooms. The indoor criteria for rail noise are 5 dBA lower than those for road noise; that is,

(1) $L_{eq,\ Day}$ 16-hour energy equivalent sound level (0700-2300 hours).
(2) $L_{eq,\ Night}$ 8-hour energy equivalent sound level (0700-2300 hours).

40 dBA for living/dining rooms, dens and bedrooms during the daytime and nighttime periods except for bedrooms where the nighttime indoor criterion is 35 dBA.

The architectural design of the building envelope (walls, windows, etc.) must provide adequate sound isolation to achieve the above indoor sound level limits applying the outdoor sound level predicted at the facades.

In addition, the MECP requires brick veneer exterior wall construction or masonry equivalent construction from the foundation to the rafters for the first row of dwellings within 100 m of the rail line when the $L_{eq\ 24}$ (1) is greater than 60 dBA.

3.1.1.2 Ventilation

When the daytime sound level ($L_{eq\ Day}$) at the exterior face of a noise sensitive window is greater than 65 dBA, means must be provided so that windows can be kept closed for noise control purposes and central air conditioning is required. For daytime sound levels between 56 dBA and 65 dBA inclusive, there need only be the provision for adding air conditioning. A warning clause advising the occupant of the potential interference with some activities is also required. At nighttime, air conditioning is required when the sound level exceeds 60 dBA ($L_{eq\ Night}$) at a noise sensitive window (provision for adding air conditioning is required when the sound level is greater than 50 dBA).

3.1.1.3 Outdoors

For outdoor amenity areas ("Outdoor Living Areas" – OLA's), the guideline objective is 55 dBA $L_{eq\ Day}$, with an excess not exceeding 5 dBA considered acceptable if it is not feasible to achieve the 55 dBA objective for technical, economic or administrative reasons, provided warning clauses are registered on title. Note, a balcony is not considered an OLA, unless it is:

- the only OLA for the occupant;
- at least 4 m in depth; and
- unenclosed.

3.2 REGION OF PEEL

The Region of Peel's noise guidelines are described in the "General Guidelines for the Preparation of Acoustical Reports in the Region of Peel" document (Reference 5). The Region of Peel noise guidelines are essentially the same as the MECP noise guidelines for transportation noise sources except that the nighttime sound level for triggering the air conditioning requirement is one dBA more stringent (i.e., less) than the sound level specified by the MECP; i.e., mandatory air conditioning for nighttime sound levels of 60 dBA or greater, and the provision for adding air conditioning for levels between 51 to 59 dBA inclusive.

The Peel guidelines also indicate a maximum desirable sound barrier height of 4.0 m (relative to roadway centreline) with a maximum acoustic fence height of 2.4 m, although a height no more than 2.0 m is preferred. To make up any additional height beyond that of the fence, a berm is to be used.

(1) $L_{eq,24}$ 24-hour energy equivalent sound level.

3.3 TOWN OF CALEDON

The Town of Caledon noise guidelines are described in the "Development Standards Manual" document (Reference 6). The Town of Caledon's general policy is not to accept the 5 dBA excess above the 55 dBA objective in OLA's. However, an excess may be acceptable if unreasonably high sound barriers are needed to meet the 55 dBA objective.

The Town's maximum acoustic fence height is 2.4 m. Higher barriers can be provided by using a combination of an acoustic fence and a berm. The maximum permitted sound barrier height according to the Town's Development Standards is 4.8 m (2.4 m fence atop a 2.4 m berm).

Road traffic noise levels are to be calculated using a minimum 20-year traffic forecast and a speed of 10 kph over the posted speed limit.

3.4 FEDERATION OF CANADIAN MUNICIPALITIES AND RAILWAY ASSOCIATION OF CANADA.

The standard noise mitigation measures required by the Federation of Canadian Municipalities and the Railway Association of Canada (FCM/RAC) are:

- a minimum setback of 30 m from the edge of the railway right-of-way to the closest dwelling facade;
- a safety berm at least 2.5 m above grade at the property line;
- an approximately 3.0 m high acoustic fence atop the safety berm (to achieve a total height of 5.5 m above the top of the rail);
- brick veneer exterior wall construction; and
- warning clauses specific to the railway for all dwellings within 300 m of the right-of-way.

Aside from the "standard" requirements regarding the setback of dwellings and safety berm/sound barrier configuration, the sound level design objectives of FCM/RAC are similar to those of the MECP. See Appendix B. Note that the FCM/RAC also permit modifications to their standard requirements where substantiated by a detailed noise impact assessment.

4.0 NOISE IMPACT ASSESSMENT

4.1 METHOD

The daytime and nighttime sound levels at the facades of Blocks 2 to 5 were calculated at a height of 15 m above grade representing a fifth storey plane of window.

Since detailed plans are not yet available, no OLA's have been assessed. It is expected that this type of development will have balconies or elevated terraces. Provided they are less than 4 m in depth, they are not considered OLA's according to the MECP guidelines and noise mitigation would not be needed.

Inherent screening of each building face due to its orientation to the noise source as well as screening provided by the subject development itself was taken into account. To be conservative, screening from the neighbouring buildings was not included.

4.2 RESULTS

The highest unmitigated daytime/nighttime sound levels of 72 dBA/72 dBA are predicted to occur at the east facades of Blocks 2 to 5, the closest to the CPR Mactier subdivision.

Table 2 summarizes the unmitigated daytime and nighttime sound level predictions.

Appendix C contains a sample sound level calculation.

5.0 NOISE ABATEMENT REQUIREMENTS

The noise control measures can generally be classified into two categories which are interrelated, but which can be treated separately for the most part:

a) The sound isolation performance of architectural elements to achieve the indoor noise guideline sound levels for transportation sources; and

b) design features to attenuate the sound levels in the OLA's.

Noise abatement requirements/recommendations are summarized in Table 3 and in the notes to Table 3.

5.1 INDOORS

5.1.1 Architectural Requirements

The indoor noise guideline sound levels can be achieved by using appropriate construction for exterior walls, windows and doors. In determining the worst-case architectural sound isolation requirements, exterior wall and window areas were each assumed to be 50% of the associated floor area, on each facade of a corner room with both facades exposed directly or at an angle to the transportation noise source(s).

The assessment shows that brick veneer or masonry equivalent exterior wall construction and upgraded windows are needed at Blocks 2 to 5:

- Up to STC 45 at corner bedrooms with windows on both facades;
- Up to STC 38 at corner living rooms with windows on both facades;
- Up to STC 42 at bedrooms with windows on a single facade; and
- Up to STC 36 at living rooms with windows on a single facade.

The STC requirements would be lower at suites that are farther setback and shielded from the rail noise due to the orientation of the building. The STC requirements would also be lower for rooms with smaller windows than those assumed above.

The STC requirements would be higher if the rooms are designed with larger window sizes relative to the floor area.

The window STC requirements are very high. Consideration should be given to:

- Reducing the size of the windows or ensuring that the exterior window area is small relative to floor area of the associated space.

- Designing the spaces so that the rooms at the northeast or southeast corners of the buildings have windows on only one facade (preferably, the north or south, not in the direction of the rail line).
- Designing the suites such that there are no bedrooms at the northeast and southeast corners (i.e., with both facades exposed to the rail line)
- Having non-noise sensitive space, such as a walk-in closets or washroom at the northeast or southeast corners of the buildings.
- Improving the exterior wall construction to provide greater than STC 54.

The above design measures can be used to reduce the window requirements and should be considered during the detailed design stages of the project.

Note, the window frames themselves must also be designed to ensure that the overall sound isolation performance for the entire window unit meets the sound isolation requirement. This must be confirmed by the window manufacturer through the submission of acoustical test data.

The final sound isolation requirements should be reviewed when detailed architectural plans are developed. Wall and window constructions should also be reviewed at this point to ensure that they will meet the required sound isolation performance. This is typically required by the Town at the time of building permit application.

5.1.2 Ventilation Requirements

All dwelling units require mandatory air conditioning to allow windows to remain closed for noise control purposes.

5.2 OUTDOORS

Since it is not known if OLA's will be provided, the sound barrier requirements should be confirmed at the Site Plan Approval stage. It is expected that the residential units will have balconies that are less than 4 m in depth. Thus, they would not be considered OLA's and noise mitigation would not be required.

6.0 BLOCKS 1, 6 AND 7 GENERAL REQUIREMENTS

It is expected that residential dwellings in Block 1 will require mandatory air conditioning due to the CPR Mactier Subdivision. Upgraded exterior wall construction (e.g. brick veneer) and/or upgraded exterior windows would also be needed.

It is anticipated that all balconies and terraces in Block 1 will be less than 4 m in depth and would therefore not qualify as OLA's under the MECP guidelines. Thus, sound barriers would not be required. If larger balconies or terraces are included in the site design, the sound barrier requirements should be reviewed.

It is understood that there are no noise sensitive uses currently planned for Blocks 6 and 7. However, if residential units are included in Blocks 6 and 7, then they must be designed to comply with the MECP transportation and stationary noise source guideline limits. Commercial uses within Blocks 6 and 7 would need to be designed so any sound emissions from these facilities comply with the stationary source sound level limits in Publication NPC-300, with consideration to the surrounding residential uses including those that are part of this proposed development. Detailed noise studies for these blocks should be done as a condition of Site Plan Approval.

7.0 WARNING CLAUSES

Warning clauses are a tool to inform prospective owners/occupants of potential annoyance due to existing noise sources. Where the guideline sound level limits are exceeded, appropriate warning clauses should be registered on title or included in the development agreement that is registered on title. The warning clauses should also be included in agreements of Offers of Purchase and Sale and lease/rental agreements to make future occupants aware of the potential noise situation.

Table 3 and the notes to Table 3 summarize the warning clauses for the site.

8.0 CONCLUSIONS

With the incorporation of the recommended noise mitigation measures, the applicable Town of Caledon, Peel Region and MECP noise guidelines can be met and a suitable acoustical environment provided for the occupants.

The approvals and administrative procedures are available to ensure that the noise requirements are implemented.

9.0 REFERENCES

1. PC STAMSON 5.04, “Computer Program for Road Traffic Noise Assessment”, Ontario Ministry of the Environment.

2. Building Practice Note No. 56: “Controlling Sound Transmission into Buildings”, by J. D. Quirt, Division of Building Research, National Council of Canada, September 1985.

3. “Environmental Noise Assessment in Land-Use Planning 1987”, Ontario Ministry of the Environment, February 1987, ISBN 0-7729-2804-5.

4. MECP Publication NPC-300, “Stationary and Transportation Sources – Approval and Planning” Ontario Ministry of the Environment, August 2013.

5. “General Guidelines for the Preparation of Acoustical Reports in the Region of Peel”, Region of Peel. November 2012.

6. “Development Standards Manual, Version 5.0”, Town of Caledon, 2019.

7. “Guidelines for New Development in Proximity to Railway Operations”, Prepared for The Federation of Canadian Municipalities and the Railway Association of Canada (FCM/RAC), May 2013.

8. “Environmental Noise Feasibility Study, Argo Humber Station, Proposed Mixed-Use Subdivision, Town of Caledon”, Valcoustics Canada Ltd., December 13, 2021, Project: 121-0102.

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TABLE 1A ROAD TRAFFIC DATA

Roadway	24-Hour Traffic Volume(1)	% Trucks		Speed Limit (kph)(3)	Day/Night Split (%)
		Medium	Heavy		
Humber Station Road(2)	20 160 (20 974)	3.0	2.0	50	90/10
Street 'A'(2)	8 320 (8 656)	1.2	0.8	50	90/10
Street 'B'(2)	7 500 (7 803)	1.2	0.8	50	90/10

Notes:

(1) The year 2041 24-hour traffic volumes were calculated from the future peak hour traffic volumes provided by BA Group. The peak hour volumes were converted to 24-hour volumes using a factor of 10. The traffic volumes were projected to the year 2043 using a growth rate of 2%, compounded annually. The projected volumes are shown in brackets.

(2) Speed limits provided by BA Group. Truck percentages and day/night split are assumed.

(3) Maximum expected speed limit shown. Vehicle speeds 10 kph higher than the indicated speed limit were used in the analysis, per Town of Caledon guidelines.

TABLE 1B RAIL TRAFFIC DATA

Track	Period	Train Type	Maximum # of Trains	Maximum # of Cars/Train	Maximum # of Locomotives/Train	Speed (kph)
CPR Mactier Subdivision(1)	Daytime	Freight	9 (17.5)	188	4	88
	Nighttime	Freight	5 (9.7)	188	4	88
Proposed GO Bolton Line(2)	Daytime	GO Passenger (1 locomotive)	60	12	1	88
		GO Passenger (2 locomotive)	8	12	2	88
	Nighttime	GO Passenger (1 locomotive)	12	12	1	88
		GO Passenger (2 locomotive)	2	12	2	88

Notes:

(1) Data obtained from CP for the year 2016. Values shown in brackets have been extrapolated to the Year 2043 design condition using a 2.5 % growth rate, compounded annually.

(2) Data obtained from the recent GO Barrie line extension. Speed was assumed to be the same as the CPR Mactier Subdivision.

TABLE 2 PREDICTED UNMITIGATED SOUND LEVELS OUTDOORS(1)

Location(1)	Source	Distance (m)(2)	$L_{eq\ Day}$ (dBA)	$L_{eq\ Night}$ (dBA)
Block 2 Northeast Corner (East Facade)	Street 'B'	19	62	55
	CPR Mactier	88	72	72
	TOTAL	-	**72**	**72**
Block 5 Southeast Corner (East Facade)	Street 'A'	18	59	53
	CPR Mactier	83	72	72
	TOTAL	-	**72**	**72**
Block 5 Southeast Corner (East Facade)	Humber Station Road	23	67	60
	Street 'A'	20	**59**	52
	TOTAL	-	**68**	**61**

Notes:

(1) See Figure 2.

(2) Distance indicated is from the centreline of the roadway/rail line to the facade.

TABLE 3 MINIMUM NOISE ABATEMENT MEASURES

Location[(1)]	Air Conditioning[(2)]	Exterior Wall[(3)]	Exterior Window[(4)]	Sound Barrier[(5)]	Warning Clauses[(6)]
All Dwelling Units	Mandatory	STC 54	Bedrooms: Up to STC 45 at corner rooms, up to STC 42 at non-corner rooms Living rooms: Up to STC 38 at corner rooms, up to STC 36 at non-corner rooms	To be determined at Site Plan Approval	A + B + C + D

Notes:

(1) See Figure 2.

(2) Where methods must be provided to allow windows to remain closed for noise control purposes, a commonly used technique is that of air conditioning.

(3) STC – Sound Transmission Class Rating (Reference ASTM E-413).

The requirements are based on the assumed percentages of wall and window area to associated floor area stated in Section 5.1.1 and should be reviewed once detailed floor plans are available

(4) STC – Sound Transmission Class Rating (Reference ASTM E-413). A sliding glass walkout door should be considered as a window and be included in the percentage of glazing.

The requirements were based on the assumed percentages of wall and window area to associated floor area stated in Section 5.1.1 and should be reviewed once detailed floor plans are available.

(5) Sound barriers must be of solid construction with no gaps cracks or holes, and must have a minimum surface density of 20 kg/m².

(6) Standard example warning clauses to be registered on title and be included in Offers of Purchase and Sale for designated lots:

A. "Purchases/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

B. "This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

C. "Purchasers/tenants are advised that due to the proximity of proposed GO Transit lands, noise from this facility may, at times, be audible."

D. "Canadian Pacific Railways, Metrolinx or its affiliated railway companies has or have a railway right-of-way within 300 m from this dwelling unit. There may be alterations to or expansions of the railway facilities of such right-of-way in the future, including the possibility that Canadian Pacific Railways, Metrolinx or its affiliated railway companies as aforesaid, or their assigns or successors may expand their business operations. Such expansion may affect the living and business environment of the residents, tenants and their visitors, employees, customers and patients in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating features in the design of the development. Canadian Pacific Railways, Metrolinx, its affiliated railway companies and their successors and assigns 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."

(7) Conventional ventilated attic roof construction meeting OBC requirements is satisfactory.

(8) All exterior doors shall be fully weather-stripped.

No.	Revision/Issue	Date

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Title
Key Plan

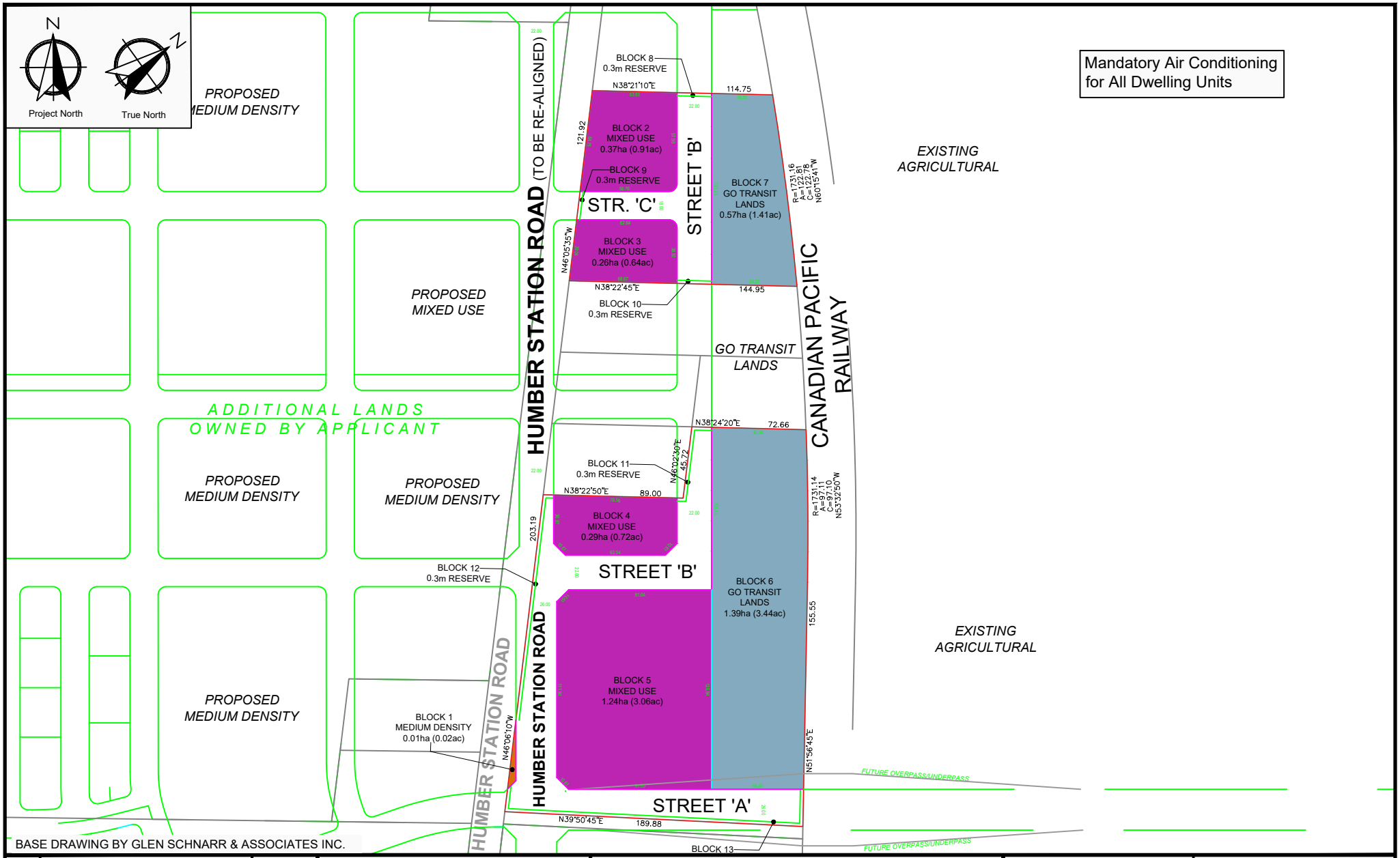
Project No.
121-0102

Date
May 10, 2023

Project Name
Argo Humber Station, Caledon

Scale
N.T.S.

Figure
1



BASE DRAWING BY GLEN SCHNARR & ASSOCIATES INC.

No.	Revision/Issue	Date

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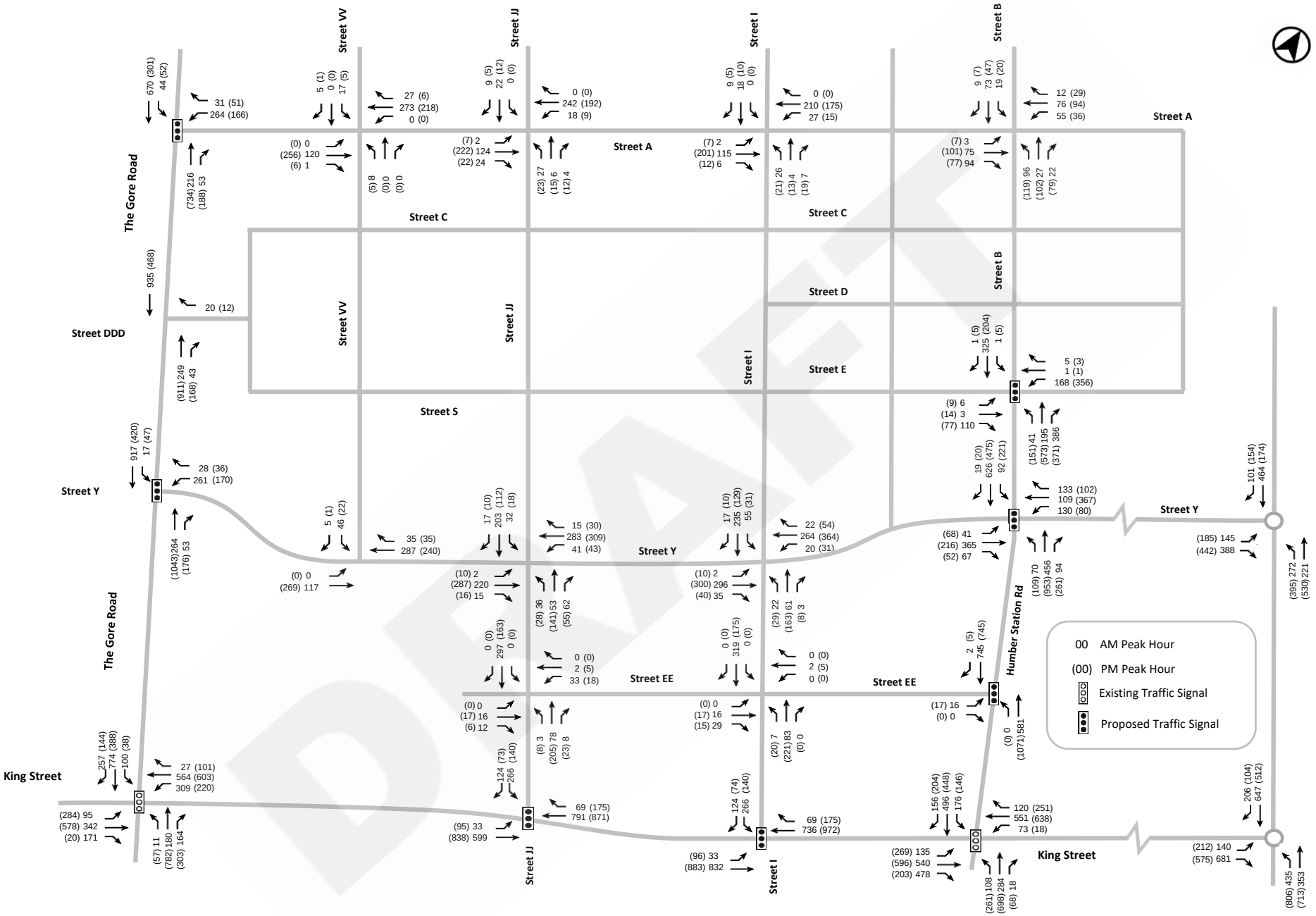
Title	Project No.	Date
Draft Plan of Subdivision	121-0102	May 15, 2023
Project Name	**Scale**	**Figure**
Argo Humber Station, Caledon	N.T.S.	2

APPENDIX A

TRAFFIC DATA CORRESPONDENCE



BAGROUP 7694-01

FIGURE - FUTURE TOTAL Reduced Units by 42% TRAFFIC VOLUMES

MACVILLE SECONDARY PLAN

Brett Lipson

From: Rail Data Requests <RailDataRequests@metrolinx.com>
Sent: January 23, 2021 1:18 PM
To: Seema Nagaraj
Cc: Terri Cowan
Subject: RE: Rail data confirmation - Yonge/Mapleview, Barrie

Hi Seema:

Sorry for the delay. Further to your request dated October 20, 2020, the subject lands (near Yonge St./Mapleview Dr.) are adjacent to the Metrolinx Newmarket Subdivision which carries Barrie GO rail service.

It's anticipated that GO rail service on these two Subdivisions will be comprised of electric trains. The GO rail fleet combination on this Subdivision will consist of up to 2 locomotives and 12 passenger cars. The typical GO rail weekday train volume forecast near the subject lands, including both revenue and equipment trips is in the order of 82 trains. The planned detailed trip breakdown is listed below:

	1 Electric Locomotive	2 Electric Locomotives		1 Electric Locomotive	2 Electric Locomotives
Day (0700-2300)	60	8	Night (2300-0700)	12	2

The current design track design speed near the subject lands is 60 mph (97 km/h).

There are *anti-whistling by-laws* in effect at the Mapleview Dr. at-grade crossing.

With respect to future electrified rail service, Metrolinx is committed to finding the most sustainable solution for electrifying the GO rail network and we are currently working towards the next phase. That's why, in addition to studying the environmental impacts of traditional electrification, Metrolinx has studied the feasibility of another form of electrification - hydrogen powered vehicles.

Both options have been studied as part of the Transit Project Assessment Process (TPAP) for the GO Expansion program, currently in the procurement phase. The successful proponent team will be responsible for selecting and delivering the right trains and infrastructure to unlock the benefits of GO Expansion. The contract is in a multi-year procurement process and teams are currently completing the bids that will close in 2021. GO Expansion construction will get underway in 2022.

Metrolinx has not made a final decision regarding the electric train technology or technologies to be deployed. However, we can advise that train noise is dominated by the powertrain at lower speeds and by the wheel- track interaction at higher speeds. Hence, the noise level and spectrum of electric trains is expected to be very similar at higher speeds, if not identical, to those of equivalent diesel trains.

Real Estate and Facility Management
800 – 1290 Central Parkway West
Mississauga, ON, L5C 4R3
www.cpr.ca

April 22, 2016

Via e-mail: Anthony@valcoustics.com

Valcoustics Canada Ltd.
30 Wertheim Court, Unit 25
Richmond Hill, Ontario L4B 1B9

Dear Sir/Madam:

Re: Rail Traffic Volumes, CP Mileage 20.48, Mactier Subdivision
Highway 50/Queen Street, Town of Caledon (Bolton), ON

This is in reference to your request for rail traffic data for a noise study in the vicinity of where Highway 50 intersects with the CP Rail corridor, being mile 20.48 of our Mactier Subdivision. The Mactier Subdivision is classified as a Principal Main Line.

The information requested is as follows:

1. Number of freight trains 0700 to 2300: 9
   Number of freight trains 2300 to 0700: 5

2. Average number of cars per train freight: 80
   Maximum cars per train freight: 188

3. Number of Locomotives per train: 2 (4 max)

4. Maximum permissible speed: 55 mph (88 kph)

5. The whistle signal is not routinely through the study area. Please note that the whistle may be sounded if deemed necessary by the train crew for safety reasons at any location.

6. There is one main line track with welded joints in the vicinity of the study area and one passing track with bolted joints along with an additional siding track north of the study area. Due to the additional tracks, trains will meet numerous times a day at in this area which may cause longer than usual train idling time while awaiting other trains to pass by.

The information provided is based on rail traffic over the past month to date. Variations of the above may exist on a day-to-day basis. Specific measurements may also vary significantly depending on customer needs.

Yours truly,

J Tomei

Josie Tomei
Specialist Real Estate Sales
& Acquisitions – Ontario
905-803-3429. josie_tomei@cpr.ca

APPENDIX B

ENVIRONMENTAL NOISE GUIDELINES

APPENDIX B

ENVIRONMENTAL NOISE GUIDELINES

MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS (MECP)

Reference: MECP Publication NPC-300, October 2013: *"Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning"*.

SPACE	SOURCE	TIME PERIOD	CRITERION
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	Road	07:00 to 23:00	45 dBA
	Rail	07:00 to 23:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 5
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	Road	23:00 to 07:00	45 dBA
	Rail	23:00 to 07:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 5
Sleeping quarters	Road	07:00 to 23:00	45 dBA
	Rail	07:00 to 23:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 0
Sleeping quarters	Road	23:00 to 07:00	40 dBA
	Rail	23:00 to 07:00	35 dBA
	Aircraft	24-hour period	NEF/NEP 0
Outdoor Living Areas	Road and Rail	07:00 to 23:00	55 dBA
Outdoor Point of Reception	Aircraft	24-hour period	NEF/NEP 30#
	Stationary Source		
	Class 1 Area	07:00 to 19:00(1)	50* dBA
		19:00 to 23:00(1)	50* dBA
	Class 2 Area	07:00 to 19:00(2)	50* dBA
		19:00 to 23:00(2)	45* dBA
	Class 3 Area	07:00 to 19:00(3)	45* dBA
		19:00 to 23:00(3)	40* dBA
	Class 4 Area	07:00 to 19:00(4)	55* dBA
		19:00 to 23:00(4)	55* dBA

…./cont'd

SPACE	SOURCE	TIME PERIOD	CRITERION
Plane of a Window of Noise Sensitive Spaces	Stationary Source		
	Class 1 Area	07:00 to 19:00(1)	50* dBA
		19:00 to 23:00(1)	50* dBA
		23:00 to 07:00(1)	45* dBA
	Class 2 Area	07:00 to 19:00(2)	50* dBA
		19:00 to 23:00(2)	50* dBA
		23:00 to 07:00(2)	45* dBA
	Class 3 Area	07:00 to 19:00(3)	45* dBA
		19:00 to 23:00(3)	45* dBA
		23:00 to 07:00(3)	40* dBA
	Class 4 Area	07:00 to 19:00(4)	60* dBA
		19:00 to 23:00(4)	60* dBA
		23:00 to 07:00(4)	55* dBA

\# may not apply to in-fill or re-development.
* or the minimum hourly background sound exposure $L_{eq(1)}$, due to road traffic, if higher.
(1) Class 1 Area: Urban.
(2) Class 2 Area: Urban during day; rural-like evening and night.
(3) Class 3 Area: Rural.
(4) Class 4 Area: Subject to land use planning authority's approval.

Reference: MECP Publication ISBN 0-7729-2804-5, 1987: *"Environmental Noise Assessment in Land-Use Planning"*.

EXCESS ABOVE RECOMMENDED SOUND LEVEL LIMITS (dBA)	CHANGE IN SUBJECTIVE LOUDNESS ABOVE	MAGNITUDE OF THE NOISE PROBLEM	NOISE CONTROL MEASURES (OR ACTION TO BE TAKEN)
No excess (<55 dBA)	—	No expected noise problem	None
1 to 5 inclusive (56 to 60 dBA)	Noticeably louder	Slight noise impact	If no physical measures are taken, then prospective purchasers or tenants should be made aware by suitable warning clauses.
6 to 10 inclusive (61 - 65 dBA)	Almost twice as loud	Definite noise impact	Recommended.
11 to 15 inclusive (66 - 70 dBA)	Almost three times as loud	Serious noise impact	Strongly Recommended.
16 and over (>70 dBA)	Almost four times as loud	Very serious noise impact	Strongly Recommended (may be mandatory).

APPENDIX C

SAMPLE SOUND LEVEL CALCULATIONS

```
STAMSON 5.04        NORMAL REPORT        Date: 17-05-2023 11:48:54
MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS / NOISE ASSESSMENT

Filename: hs2_ef.te            Time Period: Day/Night 16/8 hours
Description:  Block 2 Northeast Corner (East Facade)

Rail data, segment # 1: CPR Mactier (day/night)
-----------------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1. CPR Freight !  17.5/9.7   !  88.0 !  4.0 !188.0 !Diesel! Yes
* 2. GO 1 Loco   !  60.0/12.0  !  88.0 !  1.0 ! 12.0 !Diesel! Yes
* 3. GO 2 Loco   !   8.0/2.0   !  88.0 !  2.0 ! 12.0 !Diesel! Yes

* The identified number of trains have been adjusted for
  future growth using the following parameters:

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1. CPR Freight    !   9.0/5.0   !    2.50  !   27.00  !
  2. GO 1 Loco      !  60.0/12.0  !    2.50  !    0.00  !
  3. GO 2 Loco      !   8.0/2.0   !    2.50  !    0.00  !

Data for Segment # 1: CPR Mactier (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  88.00 / 88.00  m
Receiver height           :  15.00 / 15.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00

Results segment # 1: CPR Mactier (day)
--------------------------------------

LOCOMOTIVE (0.00 + 71.21 + 0.00) = 71.21 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -90     90   0.00  78.89  -7.68   0.00   0.00   0.00   0.00  71.21
-------------------------------------------------------------------
WHEEL (0.00 + 63.99 + 0.00) = 63.99 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -90     90   0.00  71.68  -7.68   0.00   0.00   0.00   0.00  63.99
-------------------------------------------------------------------

Segment Leq : 71.96 dBA


Total Leq All Segments: 71.96 dBA
```

```
Results segment # 1: CPR Mactier (night)
-----------------------------------------

LOCOMOTIVE (0.00 + 70.96 + 0.00) = 70.96 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  78.64  -7.68   0.00   0.00   0.00   0.00  70.96
-------------------------------------------------------------------------

WHEEL (0.00 + 63.83 + 0.00) = 63.83 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  71.51  -7.68   0.00   0.00   0.00   0.00  63.83
-------------------------------------------------------------------------

Segment Leq : 71.73 dBA

Total Leq All Segments: 71.73 dBA

Road data, segment # 1: Street B (day/night)
---------------------------------------------
Car traffic volume  :  6882/765   veh/TimePeriod  *
Medium truck volume :    84/9     veh/TimePeriod  *
Heavy truck volume  :    56/6     veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   7500
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :   2.00
    Medium Truck % of Total Volume     :   1.20
    Heavy Truck  % of Total Volume     :   0.80
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Street B (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  19.00 / 19.00  m
Receiver height           :  15.00 / 15.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Street B (day)

Source height = 0.94 m

ROAD (0.00 + 61.58 + 0.00) = 61.58 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	62.61	0.00	-1.03	0.00	0.00	0.00	0.00	61.58

Segment Leq : 61.58 dBA

Total Leq All Segments: 61.58 dBA

Results segment # 1: Street B (night)

Source height = 0.94 m

ROAD (0.00 + 54.99 + 0.00) = 54.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.02	0.00	-1.03	0.00	0.00	0.00	0.00	54.99

Segment Leq : 54.99 dBA

Total Leq All Segments: 54.99 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 72.34
(NIGHT): 71.82