YCA engineering Limited

Phone: 416-894-3213
hava@ycaengineering.com

9251 Yonge Street, Suite 8557
Richmond Hill, ON L4C 9T3

ENVIRONMENTAL NOISE ASSESSMENT

NINTH LINE SOUTH (PHASE 1)

5150 NINTH LINE, CITY OF MISSISSAUGA
WEST OF NINTH LINE AND NORTH OF EGLINTON

PART OF LOT 1, CONCESSION 9

PREPARED FOR:

MATTAMY (5150 NINTH LINE) LIMITED

Revised November 2020
October 2019
Y1621B

TABLE OF CONTENTS

PAGE

1.0 INTRODUCTION

PURPOSE

This report evaluates the noise impact from the existing and proposed noise sources and recommends noise mitigation requirements in accordance with the Ministry of Environment, Conservation and Parks (MECP), Transportation (MTO), City of Mississauga and CP Guidelines for Phase 1 of the development.

The location of the study area is indicated in the Figure 1 below.

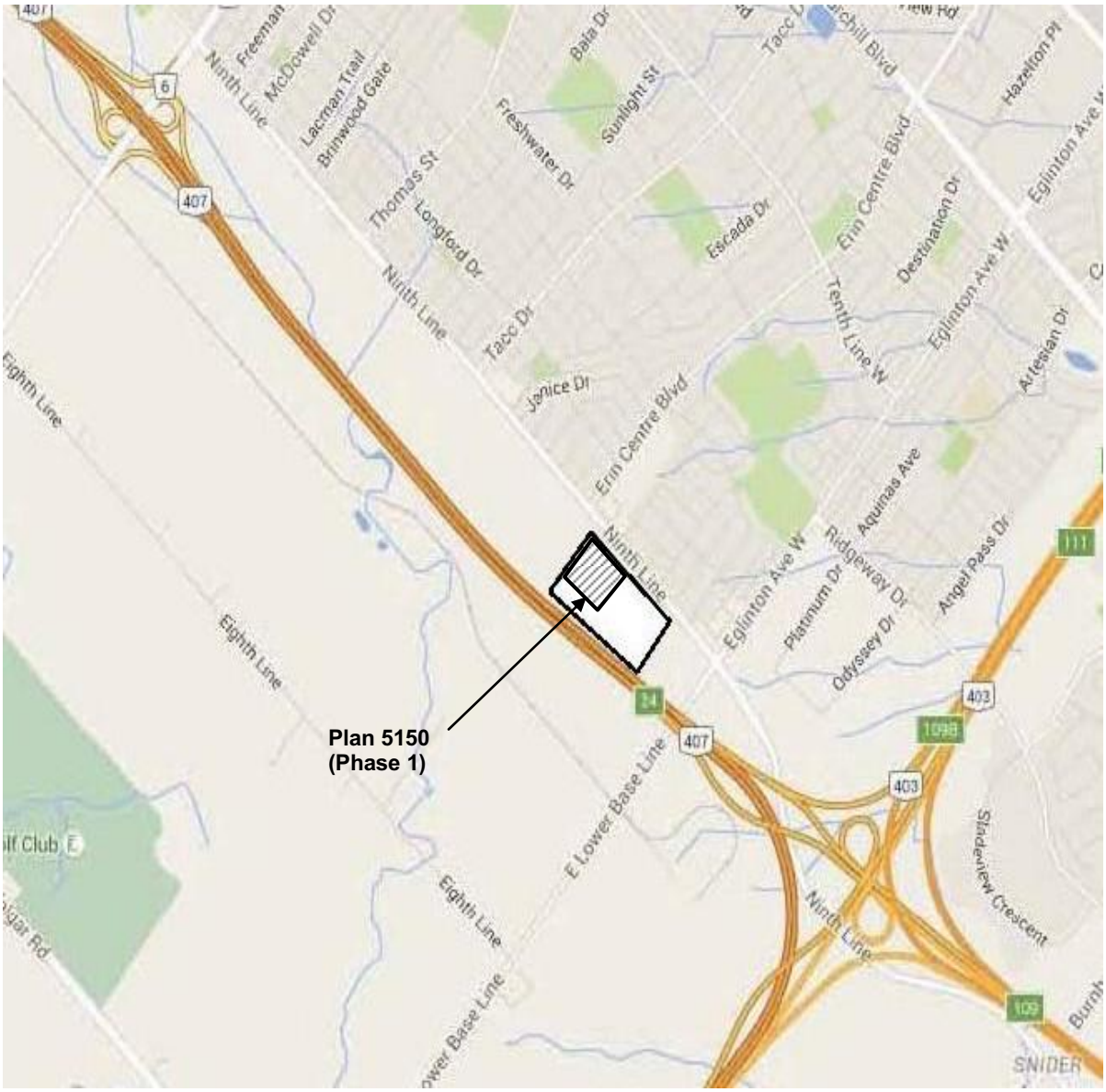


FIGURE 1 - STUDY AREA

2.0 NOISE SOURCES

The noise sources of concern impacting the subject site are Highway 407 to the west, CP Railway line at approximately 250m to the west, Ninth Line to the east, and the future Ninth Line Corridor Transitway to the west to be located east of Highway 407. Eglinton Avenue is located at approximately 350m to the south, therefore, Eglinton Avenue and all other roads within or near this site are considered acoustically insignificant due to low traffic volumes and distance separation.

ROAD TRAFFIC

Traffic volume information for Highway 407 was assumed based on the from the GTA West Corridor Planning and Environmental Assessment Study and projected to a future condition. The truck percentages were based on similar truck traffic on 400 series highways. The traffic data for Highway 407 is summarized in Table 1 below.

TABLE 1: HIGHWAY 407 TRAFFIC DATA	
Projected Annual Average Daily Traffic *	60,000
Percent Trucks	15%
Medium and Heavy trucks ratio	50:50[1]
Speed (km/hr)	100

* The forecasted traffic data assumed further to data from the GTA West Corridor Planning and EA Study.

[1] 50:50 Medium and Heavy trucks ratio or 7.5% Medium and 7.5% Heavy Trucks

The ultimate traffic volume information for Ninth Line was obtained from the City of Mississauga. The information is based on the ultimate road conditions with the road widening considered in the noise analysis. Ninth Line is expected to be widened to 35m in the future. The traffic data for Ninth Line is summarized in Table 2 below.

TABLE 2: NINTH LINE TRAFFIC DATA	
Projected Annual Average Daily Traffic **	36,000
Percent Trucks	5%
Medium and Heavy trucks ratio	55:45[1]
Speed (km/hr)	80
Number of Lanes	4
Day/Night Traffic Split	90/10
Road Gradient	<2%
Ultimate R.O.W.	35m

** The ultimate traffic data provided by the City of Mississauga

[1] 55:45 Medium and Heavy trucks ratio or 2.75% Medium and 2.25% Heavy Trucks

RAIL TRAFFIC

A Railway Line (Parkway Belt) is located at approximately 270m to the west extending south-north joining the Galt Subdivision railway west of Highway 407. This line is an industrial spur owned by Hydro One Networks and it is only used on occasion. Therefore, the following information has been assumed for the occasional south-north railway (Parkway Belt) and is summarized in Table 3 below.

TABLE 3: TRAFFIC PARAMETERS FOR CPR (PARKWAY BELT WEST OF HWY 407)					
TRAIN TYPE	**NO. OF TRAINS (DAYTIME)**	**NO. OF TRAINS (NIGHT-TIME)**	**MAX. SPEED (Km/hr)**	**MAX. NO. OF CARS PER TRAIN**	**MAX. NO. OF LOCOMOTIVES PER TRAIN**
Freight	1 (1.3)***	1 (1.3)***	81	30	2

*** 12 year projection was used to the year 2031 in noise calculations, based on 2.5% annual growth (assumed in accordance with M.O.E. policy).

FUTURE NINTH LINE CORRIDOR TRANSITWAY

The Ninth Line Transitway Corridor information is based on the "Ninth Line Corridor Protection and Land Use Study" dated May 2005.

TABLE 4: FUTURE NINTH LINE CORRIDOR TRANSITWAY	
Projected Bus Traffic (Day/Night) *	600/400
Speed (km/hr)	80

* Assumed Bus traffic based on 3 minutes intervals for worst case scenario.

VIBRATION

The proposed Transitway is expected to be a bus transit corridor which vibration would not be a concern. However, there is a possibility that Light Rail transit is to operate within the proposed Transitway. The vibration limit is described in the MOE and TTC Protocol Assessment Agreement with a vibration velocity limit of 0.1mm/sec.

The vibration measurements cannot be conducted at this time as the LRT Line is not available at the present. The measured results are based on the previous noise assessment studies conducted for based on a speed limit of 30km/hr and the LRT Line is expected to be located at the centre of the Transitway. The new LRT are expected to travel at a speed of 60km/hr. Therefore, the vibration results have been extrapolated and are summarized as per Table 5 below:

TABLE 5 - RMS VIBRATION LEVEL FROM POSSIBLE FUTURE LRT		
DISTANCE FROM LRT LINE (m)	**RMS VIBRATION LEVEL At 30km/h (mm/sec)**	**RMS VIBRATION LEVEL At 60km/h (mm/sec)**
2	0.06-0.13	0.12-0.26
4	0.04-0.11	0.08-0.22
6	0.01-0.08	0.02-0.16
8	0.00-0.06	0.01-0.12
10	0.00-0.04	0.00-0.08
12	0.00-0.01	0.00-0.02

Based on the draft plan, the nearest building within Phase 1 is at more than 45m from the proposed Transitway. Therefore, vibration from the Transitway is not expected to be a concern at the proposed development.

STATIONARY NOISE SOURCES

An existing commercial development (Churchill Meadows Animal Hospital) is located at the northeast corner of the proposed 5150 Ninth Line residential development. The commercial activities are indoors and there are no stationary noise sources of concern at the existing commercial development and no mechanical roof top units. In addition, the dominant noise source within the proposed development are the road traffic from Highway 407 and Ninth Line. Therefore, there are no noise activities of concern due to stationary noise sources from the existing commercial development.

A future community centre is proposed to be located to the north of the proposed residential development and mostly separated by the woodlot. The details of the future Community Centre is not available at this time. Further investigation is recommended at the Site Plan approval stage of the future Community Centre to ensure the sound levels from any stationary noise sources are not to exceed the sound level limits at the proposed 5150 Ninth Line development.

The proposed residential development is at more than 500m north of existing commercial and industrial developments located south of Eglinton Avenue West. Due to distance separation and high ambient noise from road traffic, the noise activities of theses commercial and industrial development are considered to be acoustically insignificant.

3.0 NOISE ASSESSMENT

FIGURE 2 is showing various noise analysis locations and noise mitigation measures within the Phase 1 of the proposed development based on the latest Concept Plan dated October 2020. Sound levels were calculated using the Ministry of Environment's Stamson 5.04 computer based noise prediction model.

The noise criteria and warning clauses are listed in Appendix 3. Table 6 lists the unattenuated sound levels at various locations based on the attached Plan.

TABLE 6: UNATTENUATED SOUND LEVELS

LOCATIONS	DISTANCE TO CENTRELINE OF ROAD (m)	DAYTIME 16 Hr. Leq dBA	NIGHT-TIME 8 Hr. Leq dBA
PHASE 1			
Block 3 (Front Wall)	356.0[1] 24.0[2] 263.0[3]	53.91 67.84 (69.93) 39.14	55.16 63.63 (64.22) 35.55
Block 4 (Rear Wall)	322.0[1] 58.0[2] 239.0[3]	54.43 63.77 (64.26) 39.79	55.79 57.93 (60.02) 36.26
Block 4 (Rear Yard)	328.0[1] 60.0[2] 164.0[3]	50.02 58.66 (59.24) 35.90	-
Block 6 (Rear Wall)	205.0[1] 145.0[2] 114.0[3]	58.45 54.48 (60.09) 46.17	59.64 48.99 (60.07) 42.34
Block 9 (Side Wall)	258.0[1] 92.0[2] 162.0[3]	57.04 60.61 (61.63) 41.71	58.68 54.95 (60.24) 38.75
Block 9 (Rear Yard)	260.0[1] 94.0[2] 164.0[3]	54.78 51.61 (56.49) 41.62	-
Block 12 (Side Wall)	250.0[1] 100.0[2] 154.0[3]	56.12 60.03 (61.57) 42.78	58.88 54.41 (60.24) 39.08
Block 12 (Rear Yard)	252.0[1] 102.0[2] 152.0[3]	54.81 55.49 (58.28) 42.16	-
Block 14 (Side Wall)	138.0[1] 220.0[2] 60.0[3] 393.0[4]	64.89 50.61 (65.31) 52.84 36.87	64.29 45.29 (65.05) 48.07 41.27
Block 14 (Rear Yard)	140.0[1] 222.0[2] 62.0[3] 395.0[4]	57.48 49.46 (58.44) 46.81 32.94	-

Block 19 (Side Wall)	348.0[1] 32.0[2] 255.0[3]	53.91 67.84 (68.02) 39.35	55.30 61.77 (62.66) 35.85
Block 19 (Rear Yard)	346.0[1] 34.0[2] 253.0[3]	52.57 69.09 (69.19) 38.57	-
Common Outdoor Amenity Area	195.0[1] 150.0[2] 90.0[3]	53.73 46.26 (54.66) 41.41	-

[1] Highway No. 407
[2] Ninth Line
[3] Transitway
[4] CP Railway (Includes the railway line West of Highway 407)

4.0 RECOMMENDED NOISE MITIGATION MEASURES

4.1 OUTDOOR AMENITY AREA

The outdoor amenity areas for all the Back to Back Townhouse units are considered to be the balconies above garages and roof Terraces with less than 4m in depth. As per the MECP requirements balconies of less than 4m in depth are not considered to be designated outdoor amenity areas requiring noise mitigation measures.

The sound level at the Common Outdoor Amenity Area is expected to meet the 55dBA sound level. Therefore, noise mitigation measures are not required for the Common Outdoor Amenity Area.

Based on the information in Table 6, the rear yard for the residential unit along Ninth Line (Block 19) is expected to be above 60 dBA.

The outdoor amenity areas for the Street Town Units and the Front Load Townhouses are the rear yards. Based on the sound level results in Table 6, the sound levels are expected to be between 55 dBA and 60 dBA for most of these locations.

The following Table 7 lists the sound barrier heights required for sound levels of 55dBA to 59dBA for all locations that are expected to have a sound level of over 55 dBA.

It should be noted that the fence heights recommended in this report were determined using the grades as per the latest grading plan prepared by Urbantech dated October 2020.

TABLE 7: ATTENUATED OUTDOOR SOUND LEVELS (55dBA OR LESS TO 59dBA)

	ACOUSTIC BARRIER HEIGHTS REQUIRED (m)				
	55 dBA	56 dBA	57dBA	58 dBA	59dBA
Block 4, East Unit*	**2.2**	2.0	**-**	-	-
Block 9, East Unit*	2.7	-	**-**	-	-
Blocks 10 and 12, East Unit*	3.0	2.7	2.4	-	**-**
Blocks 11 and 14, West Unit*	4.2	3.5	3.0	-	**-**
Block 19, East Unit*	4.4	4.0	3.6	**3.2**	3.0
Block 19, 2nd East Unit*	4.0	3.6	**3.0**	2.8	2.6

* Acoustic fence at the side/rear property (acoustic fence on top of the proposed grades as per the latest grading plan dated October 2020).

Block 4:

A 2.2m high acoustic fence is required along the side property line (East Unit) and returned along the rear property line (All Units). FIGURE 2 shows the extent and height of the acoustic barriers. The exact acoustic barrier heights can be determined once final plan and grading information are available.

Blocks 9, 10 and 12:

Due to distance separation and the future development shielding once considering the ultimate traffic volume, the sound levels are expected to be below the 55 dBA sound level limit. The acoustic barriers at this time are not recommended as the acoustic barriers would not effectively reduce the sound level results due to traffic noise from Ninth Line.

Blocks 11 and 14:

Due to high ambient noise from Highway 407, the sound levels at the rear yards of Blocks 11 and 14 are expected to be between 55dBA and 60 dBA. In order for the sound levels to be reduce, high acoustic barriers would be required to be effective. These acoustic barrier height would be unfeasible to reduce the sound levels to 55 dBA.Therefore, outdoor noise mitigation measures are not recommended for Blocks 11 and 14.

Block 19:

A 3.1m to 3.3m high acoustic barrier is required along the side property line (East Unit) flanking onto Ninth Line and returned along the rear property line (2 Easterly Units). FIGURE 2 shows the extent and height of the acoustic barriers. Therefore, a buffer would be required to accommodate an approximately 0.7m to 0.9m high berm and retaining wall at the side for the lot flanking onto Ninth Line and a retaining wall at the rear property line as shown on the preliminary grading plan prepared by Urbantech dated October 2020. The exact acoustic barrier heights can be determined once final plan and grading information are available.

4.2 VENTILATION REQUIREMENTS

Based on the information in Table 6, all locations are expected to be 65dBA or more during the daytime and/or above 60dBA during the nighttime.

Therefore, mandatory air conditioning will be required for all Residential Units and a Warning Clause Type D. Warning Clauses included in Appendix 3.

The air conditioning condenser units must comply with the MOE NPC-216 and must be in accordance with the City's zoning by-law.

4.3 BUILDING COMPONENTS

Building components within the proposed development were analyzed using the STC (Sound Transmission Class) method recommended by the M.E.C P. Based on the preliminary architectural plans the window to floor areas are expected to be less than 30%.

For the worst case location during daytime, (Block 3) daytime sound level of 70 dBA was calculated. To ensure acceptable daytime indoor sound levels of 45dBA, the building components must provide an STC rating of 33 for windows and STC 42 for exterior wall construction.

For the worst case location during night-time, (Block 3) night-time sound level of 64 dBA was calculated. To ensure acceptable night-time indoor sound levels of 40dBA, the building components must provide an STC rating of 30 for windows and STC 39 for exterior wall construction.

BUILDING COMPONENT REQUIREMENTS

The minimum standard window and exterior wall construction of the Ontario Building Code meets STC 30 and STC 38, respectively.

Therefore, upgrades are required for most of the window and exterior wall constructions in order to meet the indoor sound levels. See Table 8 for the STC ratings required.

For the Townhouse Units within Blocks 3, 15 and 20 (All Units) along Ninth Line and near the Transitway, the exterior walls will need to meet an STC 42 and the windows will need to be upgrade up to STC 33.

WINDOWS

The following are some window configurations meeting an STC rating of 33 for the worst case locations:

- double glazing 4mm/ 20mm air space/ 4mm (Sliders) or
- double glazing 3mm/ 13mm air space / 3mm (Fixed/Casement) or
- double glazing 4mm/ 6mm air space / 4mm (Fixed/Casement) or
- double glazing 6mm/ 16mm air space/ 6mm (Sliders) or
- any other window type yielding a similar or greater STC rating

EXTERIOR WALLS

The exterior wall constructions are expected to be a combination of brick/stone and stucco James Hardie panels wall constructions. The stucco and James Hardie panels wall constructions meet the STC 42 rating and the brick/stone wall constructions meet the STC 54 rating.

Sample window and exterior wall configurations are included in Appendix 4 for additional options. Please note that the final building components should be determined once the detailed building layout and plans become available.

4.4 WARNING CLAUSES

Warning clauses A and D are recommended to be incorporated for all the residential units within this development. Warning Clauses are included in Appendix 3.

5.0 SUMMARY OF NOISE MITIGATION MEASURES

The summary of noise abatement measures are listed in the following Table 8 identifying sound barriers, provision for central air conditioners, building components and warning clauses.

TABLE 8: SUMMARY OF NOISE MITIGATION MEASURES

LOCATIONS/ UNITS	VENTILATION REQUIREMENTS	BUILDING COMPONENTS	ACOUSTIC BARRIERS*	WARNING CLAUSES
Blocks 1 and 2 (All Units)	Mandatory air conditioning	Windows: STC 30 Walls: STC 40	-	Type A, D
Block 3 (All Units)	Mandatory air conditioning	Windows: STC 33 Walls: STC 42	-	Type A, D
Block 4 (All units)	Mandatory air conditioning	Windows: STC 30 Walls: STC 40	2.2m high acoustic barrier**	Type A, B, D
Blocks 5, 6, 7 (All units)	Mandatory air conditioning	Windows: STC 30 Walls: STC 40	-	Type A, D
Blocks 8 to13 (All units)	Mandatory air conditioning	Windows: STC 30 Walls: STC 40	-	Type A, D
Block 14 (All units)	Mandatory air conditioning	Windows: STC 33 Walls: STC 42	-	Type A, D
Blocks 15 and 16 (All Units)	Mandatory air conditioning	Windows: STC 30 Walls: STC 40	-	Type B, D
Blocks 17 and 18 (All units)	Mandatory air conditioning	Windows: STC 30 Walls: STC 40	-	Type A, D
Block 19 (2 easterly units)	Mandatory air conditioning	Windows: STC 33 Walls: STC 42	3.1m to 3.3m high acoustic barrier ***	Type A, B, D
Block 19 (Remaining units)	Mandatory air conditioning	Windows: STC 33 Walls: STC 42		Type A, D
Common Outdoor Amenity Area	-	-	No	-

* FIGURE 2 shows the extent and barrier heights.

** 2.2m high acoustic barrier (fence and berm combination).

*** 2.4m high acoustic fence on top of 0.7m to 0.9m high berm/retaining wall at the side for the lot flanking onto Ninth Line and a retaining wall at the rear property line as shown on the preliminary grading plan prepared by Urbantech dated October 2020. See the attached preliminary Cross-Section for details.

6.0 RECOMMEDATIONS AND CONCLUSION

RECOMMENDATIONS

1. Mandatory air conditioning will be required for all residential units. The air conditioning condenser units must comply with the MOE NPC-216 and must be in accordance with the City's zoning by-law.

2. Upgraded window and wall constructions will be required for some of the residential units as noted below:

   For the Townhouse Units within Blocks 3, 14 and 19, the exterior walls will need to meet an STC 42 and the windows will need to be upgrade to STC 33. Please note that the final building components should be determined once the detailed building layout and plans become available.

3. The outdoor amenity areas for all the Back to Back Townhouse units are considered to be the balconies above garages and roof Terraces with less than 4m in depth. As per the MECP requirements balconies of less than 4m in depth are not considered to be designated outdoor amenity areas requiring noise mitigation measures.

   The outdoor amenity areas for the Street Town Units and the Front Load Townhouses are the rear yards. The sound levels are expected to be between 55 dBA and 60 dBA for most of these locations. However, outdoor noise mitigation measures are not recommended as the acoustic barriers would not effectively reduce the sound level results due to traffic noise.

   For Block 4, a 2.2m high acoustic fence is required along the side property line (East Unit) and returned along the rear property line (All Units).

   For Block 19, a 3.1m to 3.3m high acoustic barrier is required along the side property line (East Unit) flanking onto Ninth Line and returned along the rear property line (2 Easterly Units). Therefore, a buffer would be required to accommodate an approximately 0.7m to 0.9m high berm and retaining wall at the side for the lot flanking onto Ninth Line and a retaining wall at the rear property line as shown on the preliminary grading plan prepared by Urbantech dated October 2020.

   FIGURE 2 shows the extent and height of the acoustic barriers.

   The exact acoustic barrier heights and locations can be determined once final plan and grading information are available.

CONCLUSION

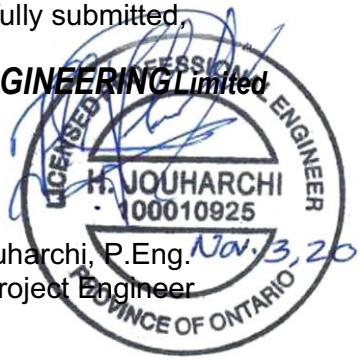
This report has determined that sound levels acceptable to the Ministry of Environment, Conservation and Parks, MTO and City of Mississauga can be achieved using the suggested options and abatement measures in Sections 5.0 and 6.0 of this report.

The noise requirements for Phase 2 of the development will be prepared shortly after Phase 1.

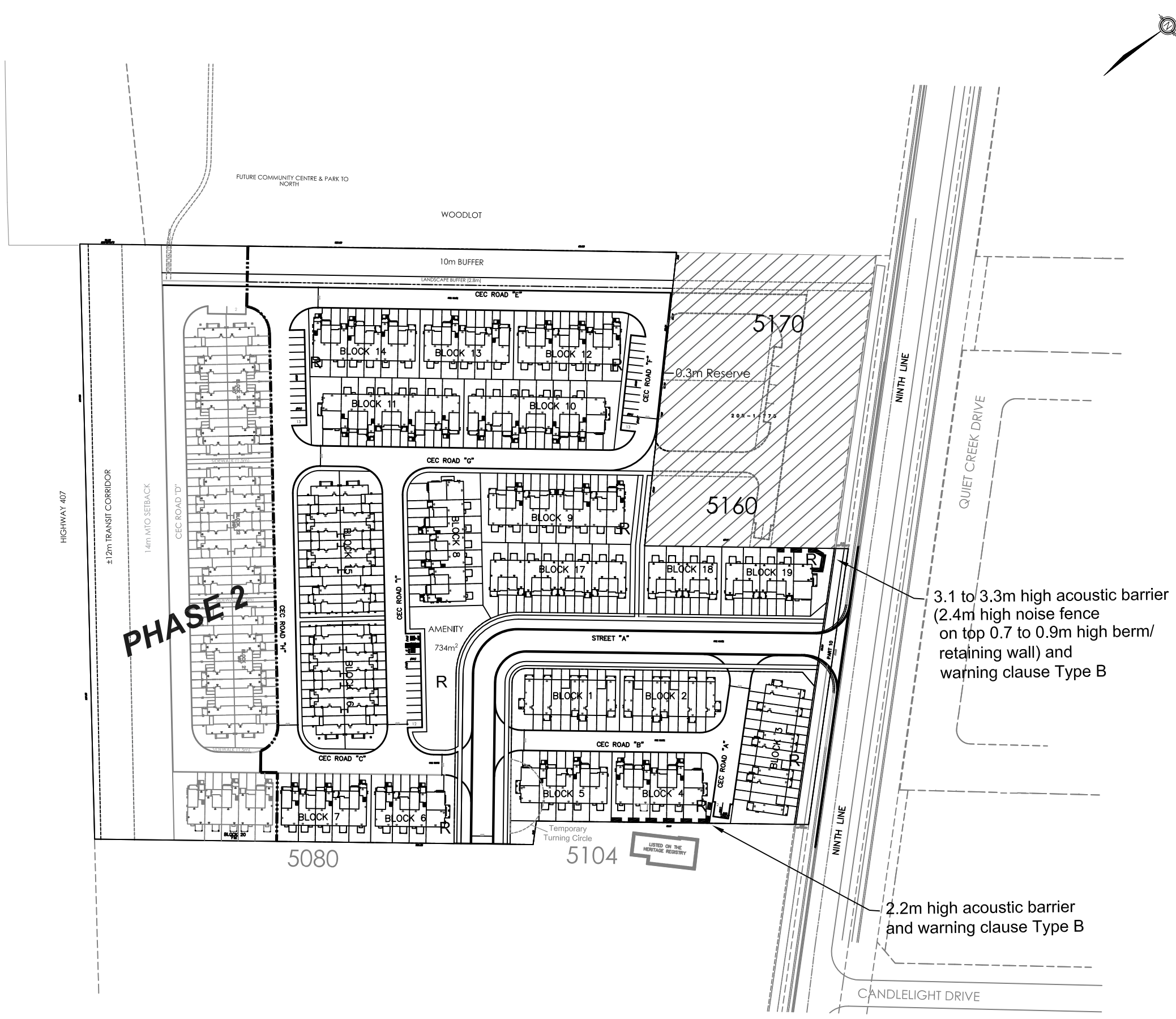
It is recommended that the noise mitigation measures to be reviewed once the final site plan, architectural plans and grading plans are available.

Respectfully submitted,

YCA ENGINEERING Limited



Hava Jouharchi, P.Eng. Nov. 3, 20
Senior Project Engineer



LEGEND:

■■■■■■■ PROPOSED NOISE BARRIER AND WARNING CLAUSE B

R RECEPTOR LOCATIONS ANALYZED

NOTE:

ALL BLOCKS/UNITS REQUIRE MANDATORY AC AND WARNING CLAUSE TYPE A

YCA ENGINEERING Limited
9251 Yonge Street, Suite 8557
Richmond Hill, ON, L4C 9T3
Tel: 416-894-3213
Email: hava@ycaengineering.com

CONCEPT PLAN NOISE MITIGATION MEASURES

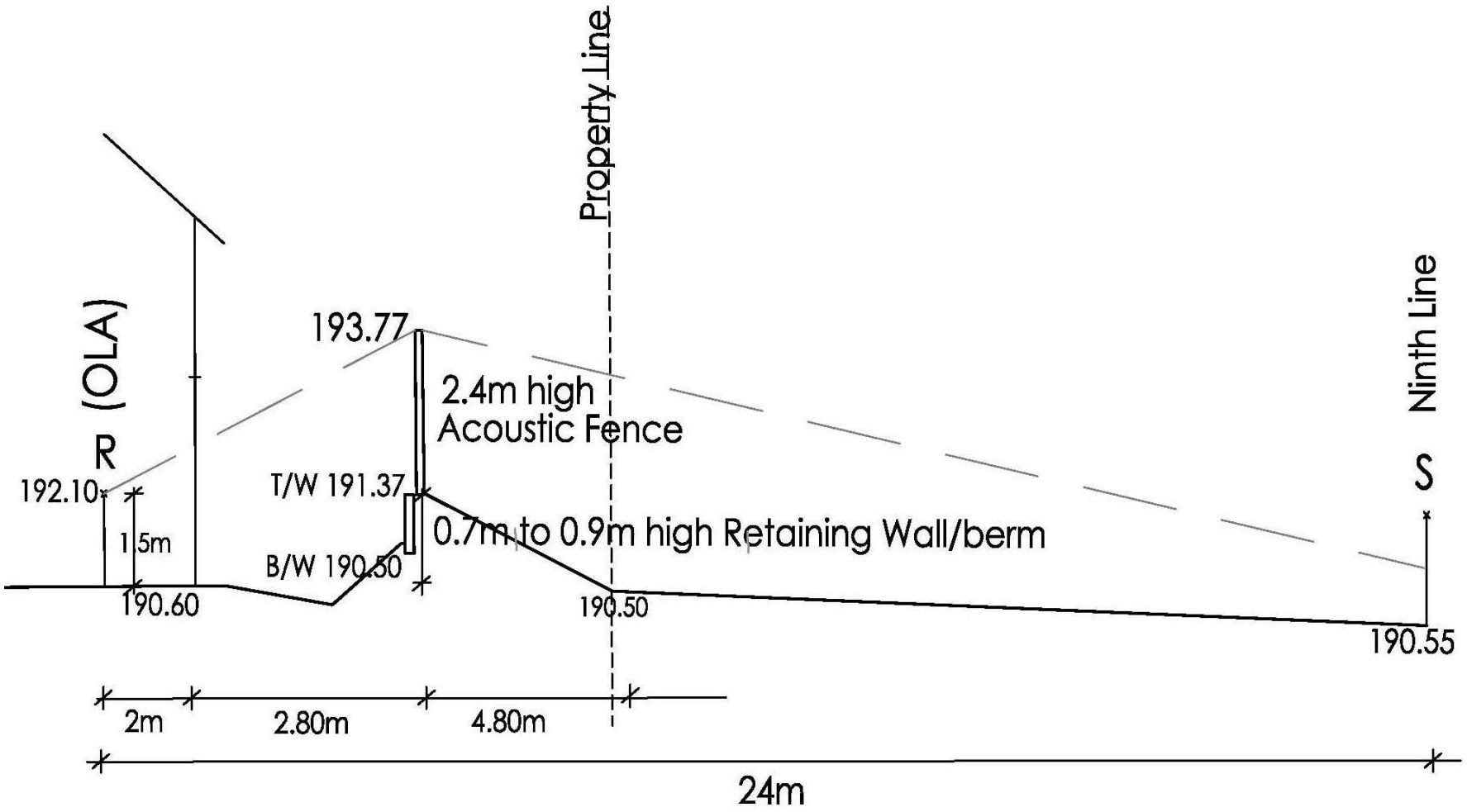
SOUTH NINTH LINE LANDS PLAN 5150 (PHASE 1)

City of Mississauga

FIGURE 2

Scale: NTS

DATE: October 2020



ACOUSTIC BARRIER CROSS-SECTION - Block 19

N.T.S.

APPENDIX 1

TRAFFIC DATA

Date:	12-Jul-16

REQUESTED BY:

Name:	Hava Jouharchi
Company	YCA Engineering Ltd.
Fax#:	(416) 894-3213

PREPARED BY:

Name:	L. Uy
Tel#:	(905) 615-3200

NOISE REPORT FOR PROPOSED DEVELOPMENT

CITY OF MISSISSAUGA

Location:	Eglinton Avenue W, East of Ninth Line & Ninth Line, North of Eglinton avenue W
Look Up ID#:	352

ON SITE TRAFFIC DATA

Specific	Street Names				
	Eglinton Ave. W, E of Ninth	Ninth Line, N of Eglinton			
AADT:	42,000	36,000			
# of Lanes:	7 lanes	4 lanes			
% Trucks:	5%	5%			
Medium/Heavy Trucks Ratio:	55/45	55/45			
Day/Night Traffic Split:	90/10	90/10			
Posted Speed Limit:	70km/h	80km/h			
Gradient of Road:	<2%	<2%			
Ultimate R O W:	35m	35m			

Comments:

Ultimate Traffic Data Only.

Please note Eglinton Avenue West, West of Ninth Line is under Halton/Oakville's jurisdiction.

Exhibit 3-16: Existing and 2031 PM Peak Hour Vehicle Demand at E-W Corridor Screenlines

Screenline Location	Existing Vehicle Capacity	Existing Vehicle Demand	2031 RTP Vehicle Demand	2031 ALU Vehicle Demand	2031 BAU Vehicle Demand
North of Highway 401 (NB) (Highway 24 to Brock Road)	8,850	6,300	8,800	8,900	7,100
South of Highway 401 (NB) (Highway 6 to Highway 25)	5,400	3,500	5,200	6,400	5,600
South of Highway 401 (NB) (Steeles Avenue to 9th Line)	10,700	5,100	12,900	12,000	12,100
South of Highway 401 (NB) (WC Blvd to Highway 403)	28,300	21,500	29,300	29,700	27,800
South of Highway 407 (NB) (WC Blvd to Highway 410)	19,100	16,300	22,900	24,000	23,000
South of Highway 407 (NB) (Tomken Road – Highway 50)	15,300	12,900	16,200	16,900	17,900
South of Mayfield Road (NB) (RR 25 to WC Blvd)	6,300	4,700	6,500	7,200	6,400
South of Mayfield Road (NB) (Heritage Rd. to Hurontario St.)	5,600	2,200	5,400	5,600	5,100
South of Mayfield Road (NB) (Kennedy Rd. to Highway 50)	10,100	7,000	15,700	17,000	16,400

3.4.2 Moving Goods – Commercial Vehicle and Rail Transportation

Goods movement is heavily reliant on the road network and on the use of commercial vehicles for all or part of most trips (rail/marine/air to truck). Within the GTA West Study Area, commercial vehicles represent a significant proportion of total existing traffic as summarized in **Exhibit 3-10**.

Exhibit 3-10: Percentage of Commercial Vehicles by Inter-Regional Facility (2006)

Highway Section	% Commercial Vehicles	Highway Section	% Commercial Vehicles
Highway 401		**Highway 403**	
- West of Highway 25	19%	- West of Hurontario St.	10%
- West of Highway 407	18%	- West of Winston Churchill	15%
- West of Highway 410	14%	- West of Highway 6	20%
- West of Highway 427	9%	**QEW**	
- West of Highway 400	10%	- West of Highway 403	15%
Highway 410		- West of RR 25 (Bronte Rd.)	15%
- North of Highway 401	10%	- Skyway Bridge	16%
- North of Steeles Ave.	9%	- West of Casablanca Blvd	14%
- North of Queen St.	4%	- West of Highway 406	13%
Highway 427		- Garden City Skyway	12%
- North of Highway 401	9%	- North of Highway 420	10%
- North of Highway 407	9%	- South of Highway 420	17%

Transit Headways and Speeds

Headways (the time between buses or trains on the same service line) and operating speeds of various transit modes as identified in the GGH Model Backgrounder are presented in **Exhibit 3-3.**

Exhibit 3-3: GGH Model Headways and Operating Speed Assumptions

Mode	Peak Period Headway (minutes)	Nominal Operating Speed (km/hr)
Regional Express	5	80
Commuter Rail (GO Rail)	10	50 - 60 *
Urban RT (LRT, BRT, Transitway)	2 – 3	30 - 80 **
Metro (Subway/SRT)	2	40

*50 km/hr on all-stop services and 60 km/h on express services
** 30 km/hr on surface LRT / BRT; 80 km/hr on grade separated Transitway

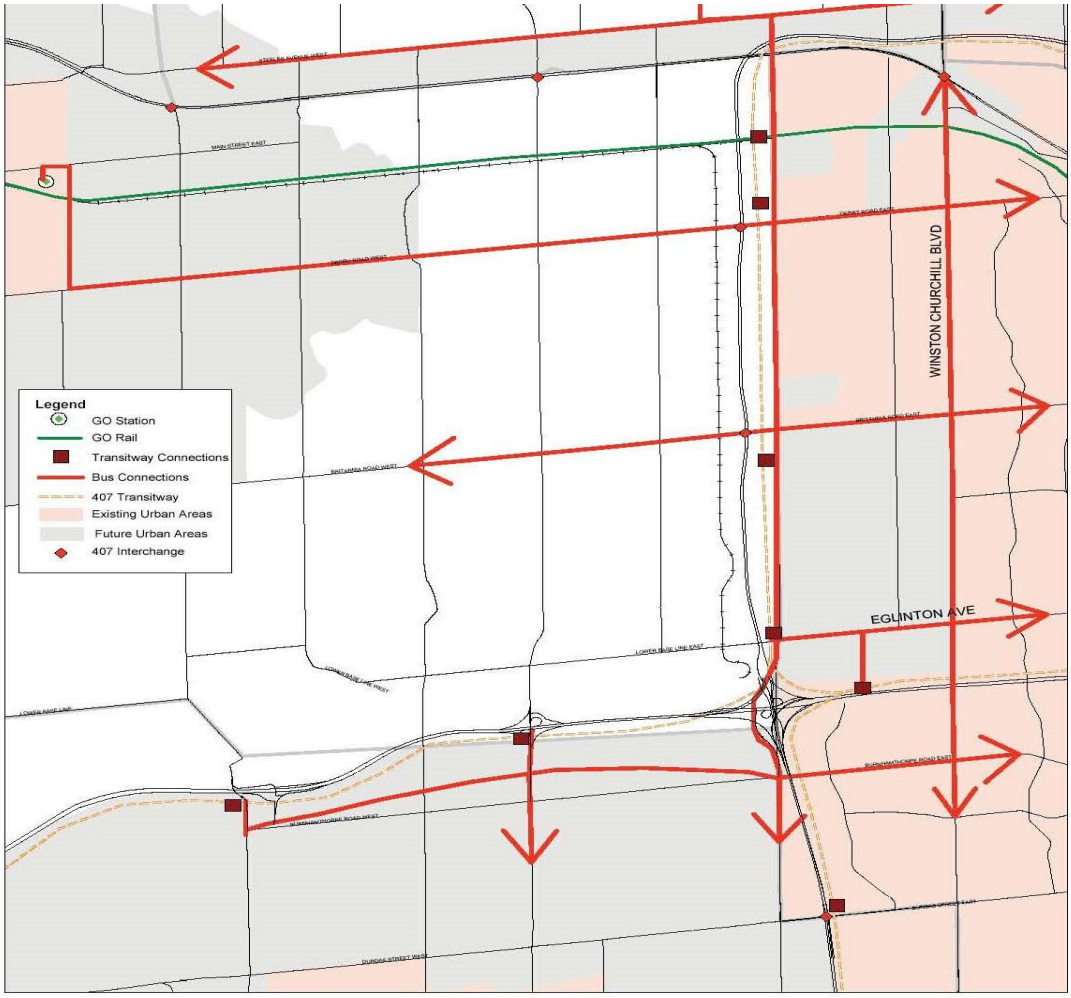


Figure 3 - Transitway Bus Connections
Ninth Line Corridor Protection and Land Use Study
Region of Halton

ENTRA CONSULTANTS

23-41fig04-06-01TrnstCnnct

From: Orest Rojik [Orest_Rojik@cpr.ca]
Sent: Wednesday, May 6, 2015 10:42 AM
To: Hava Jouharchi
Subject: CPR RAIL TRAFFIC INFORMATION – MILTON, ONTARIO

RE: CPR RAIL TRAFFIC INFORMATION – MISSISSAUGA/MILTON, ONTARIO

This has reference to your request for rail traffic data for the Canadian Pacific tracks in the vicinity of Highway 407 and Derry Road bordering the City of Mississauga and the Town of Milton. The study area is located near mile 25.9 of our Galt Subdivision, which is classified as a principle main line. To note, the north/south tracks paralleling Highway 407 is an industrial spur owned by Hydro One Networks and is only used on occasion.

The information requested is as follows:

1. Number of freight trains (0700 to 2300): 12 trains
   Number of freight trains (2300 to 0700): 7 trains
   Number of passenger trains (GO Transit*): 36 trains
   *GO Transit passenger service runs on weekdays between 0600 & 0830 and then between 1630 & 2030
2. Number of locomotives per train: 2 freight average (4 maximum), 1 passenger
3. Average number of cars per train: 72 freight average (144 maximum), 12 passenger
4. Maximum permissible speed: 50 mph freight and passenger
5. Whistle signals are not sounded approaching public crossings at grade but may be sounded if deemed necessary by the train crew for safety reasons.

The information provided is based on existing traffic and approximately represents rail traffic for the average day. Variations of the above may exist on a day-to-day basis. Specific measurements may also vary significantly depending on customer demands.

APPENDIX 2

STAMSON 5.04
SOUND LEVEL CALCULATIONS

```
STAMSON 5.04        SUMMARY REPORT        Date: 29-10-2019 16:57:07
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: d7fw.te              Time Period: Day/Night 16/8 hours
Description: Block 3, Front Wall

Road data, segment # 1: Highway 407 (day/night)
-----------------------------------------------
Car traffic volume  : 34002/16998 veh/TimePeriod  *
Medium truck volume :  3000/1500  veh/TimePeriod  *
Heavy truck volume  :  3000/1500  veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  60000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.50
    Heavy Truck  % of Total Volume     :   7.50
    Day (16 hrs) % of Total Volume     :  66.67
Data for Segment # 1: Highway 407 (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 2
House density             :     50 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 356.00 / 356.00 m
Receiver height           :   4.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 / 4.50   m
Source elevation          : 190.25 m
Receiver elevation        : 189.75 m
Barrier elevation         : 189.75 m
Road data, segment # 2: Ninth Line (day/night)
-----------------------------------------------
Car traffic volume  : 30780/3420  veh/TimePeriod  *
Medium truck volume :   891/99    veh/TimePeriod  *
Heavy truck volume  :   729/81    veh/TimePeriod  *
Posted speed limit  :    80 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  36000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.75
    Heavy Truck  % of Total Volume     :   2.25
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 2: Ninth Line (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  24.00 / 24.00  m
Receiver height           :   4.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 / 4.50   m
Source elevation          : 188.45 m
Receiver elevation        : 189.75 m
Barrier elevation         : 189.75 m
```

```
Result summary (day)
--------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Highway 407      !     1.65 !    53.76 !    53.76 *
 2.Ninth Line       !     1.22 !    69.82 !    69.82 *
--------------------+---------+---------+---------
                      Total                   69.93 dBA
  * Bright Zone  !
Result summary (night)
----------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Highway 407      !     1.65 !    55.16 !    55.16 *
 2.Ninth Line       !     1.22 !    63.63 !    63.63 *
--------------------+---------+---------+---------
                      Total                   64.21 dBA
  * Bright Zone  !
RT/Custom data, segment # 1: Transitway (day/night)
---------------------------------------------------
1 - Bus:
Traffic volume    :   600/100   veh/TimePeriod
Speed             :    80 km/h
Data for Segment # 1: Transitway (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 2
House density             :     50 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 263.00 / 263.00 m
Receiver height           :   4.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 / 4.50   m
Source elevation          : 191.50 m
Receiver elevation        : 189.75 m
Barrier elevation         : 189.75 m
Result summary (day)
--------------------
                    !  source  !   Gen    !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Transitway       !     0.50 !    39.14 !    39.14 *
--------------------+---------+---------+---------
                      Total                   39.14 dBA
  * Bright Zone  !
Result summary (night)
----------------------
                    !  source  !   Gen    !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Transitway       !     0.50 !    35.65 !    35.65 *
--------------------+---------+---------+---------
                      Total                   35.65 dBA
  * Bright Zone  !

TOTAL Leq FROM ALL SOURCES (DAY): 69.93
                           (NIGHT): 64.22
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 18-03-2020 17:07:52
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: bk4rw.te             Time Period: Day/Night 16/8 hours
Description: Block 4, Rear Wall

Road data, segment # 1: Highway 407 (day/night)
-----------------------------------------------
Car traffic volume  : 34002/16998 veh/TimePeriod  *
Medium truck volume :  3000/1500  veh/TimePeriod  *
Heavy truck volume  :  3000/1500  veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  60000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.50
    Heavy Truck  % of Total Volume     :   7.50
    Day (16 hrs) % of Total Volume     :  66.67
Data for Segment # 1: Highway 407 (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 2
House density             :     50 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 322.00 / 322.00 m
Receiver height           :   4.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)

Road data, segment # 2: Ninth Line (day/night)
-----------------------------------------------
Car traffic volume  : 30780/3420  veh/TimePeriod  *
Medium truck volume :   891/99    veh/TimePeriod  *
Heavy truck volume  :   729/81    veh/TimePeriod  *
Posted speed limit  :    80 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  36000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.75
    Heavy Truck  % of Total Volume     :   2.25
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 2: Ninth Line (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  58.00 / 58.00  m
Receiver height           :   4.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)

Result summary (day)
--------------------
                   !  source  !   Road   !  Total
                   !  height  !   Leq    !   Leq
                   !   (m)    !  (dBA)   !  (dBA)
-------------------+---------+---------+---------
 1.Highway 407     !     1.65 !    54.43 !    54.43
 2.Ninth Line      !     1.22 !    63.77 !    63.77
-------------------+---------+---------+---------
                     Total                  64.25 dBA
Result summary (night)
----------------------
```

```
                    !  source  !   Road    !  Total
                    !  height  !   Leq     !   Leq
                    !   (m)    !  (dBA)    !  (dBA)
--------------------+---------+---------+---------
 1.Highway 407      !     1.65 !    55.79 !    55.79
 2.Ninth Line       !     1.22 !    57.93 !    57.93
--------------------+---------+---------+---------
                      Total                   60.00 dBA

RT/Custom data, segment # 1: Transitway (day/night)
-------------------------------------------------
1 - Bus:
Traffic volume    :   600/100   veh/TimePeriod
Speed             :    80 km/h

Data for Segment # 1: Transitway (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 2
House density             :     50 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 239.00 / 239.00 m
Receiver height           :   4.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)

Result summary (day)
--------------------
                    !  source  !   Gen     !  Total
                    !  height  !   Leq     !   Leq
                    !   (m)    !  (dBA)    !  (dBA)
--------------------+---------+---------+---------
 1.Transitway       !     0.50 !    39.79 !    39.79
--------------------+---------+---------+---------
                      Total                   39.79 dBA
Result summary (night)
----------------------

                    !  source  !   Gen     !  Total
                    !  height  !   Leq     !   Leq
                    !   (m)    !  (dBA)    !  (dBA)
--------------------+---------+---------+---------
 1.Transitway       !     0.50 !    36.26 !    36.26
--------------------+---------+---------+---------
                      Total                   36.26 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 64.26
                           (NIGHT): 60.02
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 18-03-2020 08:55:57
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: bk4ry.te             Time Period: Day/Night 16/8 hours
Description: Block 4, Rear Yard

Road data, segment # 1: Highway 407 (day/night)
----------------------------------------------
Car traffic volume  : 34002/16998 veh/TimePeriod  *
Medium truck volume :  3000/1500  veh/TimePeriod  *
Heavy truck volume  :  3000/1500  veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  60000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.50
    Heavy Truck  % of Total Volume     :   7.50
    Day (16 hrs) % of Total Volume     :  66.67
Data for Segment # 1: Highway 407 (day/night)
----------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 324.00 / 324.00 m
Receiver height           :   1.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 0.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 / 4.50   m
Source elevation          : 193.75 m
Receiver elevation        : 191.94 m
Barrier elevation         : 191.74 m
Road data, segment # 2: Ninth Line (day/night)
----------------------------------------------
Car traffic volume  : 30780/3420  veh/TimePeriod  *
Medium truck volume :   891/99    veh/TimePeriod  *
Heavy truck volume  :   729/81    veh/TimePeriod  *
Posted speed limit  :    80 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  36000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.75
    Heavy Truck  % of Total Volume     :   2.25
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 2: Ninth Line (day/night)
----------------------------------------------
Angle1   Angle2           :  10.00 deg   70.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  60.00 / 60.00  m
Receiver height           :   1.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  10.00 deg   Angle2 : 70.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 / 4.50   m
Source elevation          : 191.74 m
Receiver elevation        : 191.94 m
Barrier elevation         : 191.74 m
Result summary (day)
--------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.Highway 407      !     1.65 !    50.02 !    50.02 *
 2.Ninth Line       !     1.22 !    58.66 !    58.66 *
```

```
--------------------+----------+----------+----------
                    Total                    59.22 dBA
  * Bright Zone  !
Barrier table for segment # 1: Highway 407 (day)
-----------------------------------------------
Barrier ! Elev of !  Road   ! Tot Leq !
Height  ! Barr Top!  dBA    !   dBA   !
--------+---------+---------+---------+
   2.00 !  193.74 !   50.02 !   50.02 !
   2.10 !  193.84 !   50.02 !   50.02 !
   2.20 !  193.94 !   50.02 !   50.02 !
   2.30 !  194.04 !   49.99 !   49.99 !
   2.40 !  194.14 !   49.74 !   49.74 !
   2.50 !  194.24 !   49.47 !   49.47 !

Barrier table for segment # 2: Ninth Line (day)
-----------------------------------------------
Barrier ! Elev of !  Road   ! Tot Leq !
Height  ! Barr Top!  dBA    !   dBA   !
--------+---------+---------+---------+
   2.00 !  193.74 !   53.98 !   53.98 !
   2.10 !  193.84 !   53.70 !   53.70 !
   2.20 !  193.94 !   53.37 !   53.37 !
   2.30 !  194.04 !   53.00 !   53.00 !
   2.40 !  194.14 !   52.60 !   52.60 !
   2.50 !  194.24 !   52.17 !   52.17 !
RT/Custom data, segment # 1: Transitway (day/night)
---------------------------------------------------
1 - Bus:
Traffic volume    :   600/100   veh/TimePeriod
Speed             :    80 km/h

Data for Segment # 1: Transitway (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 241.00 / 241.00 m
Receiver height           :   1.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 0.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 / 4.50   m
Source elevation          : 193.30 m
Receiver elevation        : 191.94 m
Barrier elevation         : 191.74 m
Result summary (day)
--------------------
                   !  source  !   Gen    !  Total
                   !  height  !   Leq    !   Leq
                   !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.Transitway      !     0.50 !    35.90 !    35.90 *
--------------------+----------+----------+----------
                    Total                    35.90 dBA
  * Bright Zone  !
Barrier table for segment # 1: Transitway (day)
-----------------------------------------------
Barrier ! Elev of ! RT/CUST ! Tot Leq !
Height  ! Barr Top!  dBA    !   dBA   !
--------+---------+---------+---------+
   2.00 !  193.74 !   35.82 !   35.82 !
   2.10 !  193.84 !   35.67 !   35.67 !
   2.20 !  193.94 !   35.47 !   35.47 !
   2.30 !  194.04 !   35.24 !   35.24 !
   2.40 !  194.14 !   34.97 !   34.97 !


TOTAL Leq FROM ALL SOURCES (DAY): 55.07 dBA
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 18-03-2020 17:04:43
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: d3sw.te              Time Period: Day/Night 16/8 hours
Description: Block 12, Side Wall

Road data, segment # 1: Highway 407 (day/night)
-----------------------------------------------
Car traffic volume  : 34002/16998 veh/TimePeriod  *
Medium truck volume :  3000/1500  veh/TimePeriod  *
Heavy truck volume  :  3000/1500  veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  60000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.50
    Heavy Truck  % of Total Volume     :   7.50
    Day (16 hrs) % of Total Volume     :  66.67
Data for Segment # 1: Highway 407 (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 1
House density             :     50 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 250.00 / 250.00 m
Receiver height           :   4.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 / 4.50   m
Source elevation          : 193.75 m
Receiver elevation        : 192.06 m
Barrier elevation         : 192.06 m

Road data, segment # 2: Ninth Line (day/night)
-----------------------------------------------
Car traffic volume  : 30780/3420  veh/TimePeriod  *
Medium truck volume :   891/99    veh/TimePeriod  *
Heavy truck volume  :   729/81    veh/TimePeriod  *
Posted speed limit  :    80 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  36000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.75
    Heavy Truck  % of Total Volume     :   2.25
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 2: Ninth Line (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 100.00 / 100.00 m
Receiver height           :   4.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 / 4.50   m
Source elevation          : 191.74 m
Receiver elevation        : 192.06 m
Barrier elevation         : 192.06 m

Result summary (day)
```

```
--------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Highway 407      !     1.65 !    56.12 !    56.12 *
 2.Ninth Line       !     1.22 !    60.03 !    60.03 *
--------------------+---------+---------+---------
                      Total                  61.51 dBA
  * Bright Zone  !
Result summary (night)
----------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Highway 407      !     1.65 !    58.88 !    58.88 *
 2.Ninth Line       !     1.22 !    54.41 !    54.41 *
--------------------+---------+---------+---------
                      Total                  60.21 dBA
  * Bright Zone  !

RT/Custom data, segment # 1: Transitway (day/night)
---------------------------------------------------
1 - Bus:
Traffic volume    :   600/100   veh/TimePeriod
Speed             :    80 km/h
Data for Segment # 1: Transitway (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 2
House density             :     50 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 154.00 / 154.00 m
Receiver height           :   4.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 / 4.50   m
Source elevation          : 193.30 m
Receiver elevation        : 192.06 m
Barrier elevation         : 192.06 m

Result summary (day)
--------------------
                    !  source  !   Gen    !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Transitway       !     0.50 !    42.78 !    42.78 *
--------------------+---------+---------+---------
                      Total                  42.78 dBA
  * Bright Zone  !
Result summary (night)
----------------------
                    !  source  !   Gen    !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Transitway       !     0.50 !    39.08 !    39.08 *
--------------------+---------+---------+---------
                      Total                  39.08 dBA
  * Bright Zone  !

TOTAL Leq FROM ALL SOURCES (DAY): 61.57
                           (NIGHT): 60.24
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 21-03-2020 17:05:17
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: d3ry.te              Time Period: Day/Night 16/8 hours
Description: Block 12, Rear Yard

Road data, segment # 1: Highway 407 (day/night)
-----------------------------------------------
Car traffic volume  : 34002/16998 veh/TimePeriod  *
Medium truck volume :  3000/1500  veh/TimePeriod  *
Heavy truck volume  :  3000/1500  veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  60000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.50
    Heavy Truck  % of Total Volume     :   7.50
    Day (16 hrs) % of Total Volume     :  66.67
Data for Segment # 1: Highway 407 (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 252.00 / 255.00 m
Receiver height           :   1.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 / 4.50   m
Source elevation          : 193.75 m
Receiver elevation        : 191.94 m
Barrier elevation         : 191.74 m

Road data, segment # 2: Ninth Line (day/night)
-----------------------------------------------
Car traffic volume  : 30780/3420  veh/TimePeriod  *
Medium truck volume :   891/99    veh/TimePeriod  *
Heavy truck volume  :   729/81    veh/TimePeriod  *
Posted speed limit  :    80 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  36000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.75
    Heavy Truck  % of Total Volume     :   2.25
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 2: Ninth Line (day/night)
-----------------------------------------------
Angle1   Angle2           : -80.00 deg   80.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 102.00 / 102.00 m
Receiver height           :   1.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -80.00 deg   Angle2 : 80.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 / 4.50   m
Source elevation          : 191.74 m
Receiver elevation        : 191.94 m
Barrier elevation         : 191.74 m
Reference angle           :   0.00

Result summary (day)
```

```
--------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Highway 407      !     1.65 !    54.81 !    54.81 *
 2.Ninth Line       !     1.22 !    55.49 !    55.49 *
--------------------+---------+---------+---------
                      Total                   58.17 dBA
  * Bright Zone  !

Barrier table for segment # 1: Highway 407 (day)
-----------------------------------------------
Barrier ! Elev of !  Road   ! Tot Leq !
Height  ! Barr Top!  dBA    !   dBA   !
--------+---------+---------+---------+
   2.10 !  193.84 !   54.81 !   54.81 !
   2.20 !  193.94 !   54.81 !   54.81 !
   2.30 !  194.04 !   54.68 !   54.68 !
   2.40 !  194.14 !   54.42 !   54.42 !
   2.50 !  194.24 !   54.15 !   54.15 !
   2.60 !  194.34 !   53.86 !   53.86 !
   2.70 !  194.44 !   53.57 !   53.57 !
   2.80 !  194.54 !   53.29 !   53.29 !
   2.90 !  194.64 !   53.00 !   53.00 !
   3.00 !  194.74 !   52.73 !   52.73 !

Barrier table for segment # 2: Ninth Line (day)
-----------------------------------------------
Barrier ! Elev of !  Road   ! Tot Leq !
Height  ! Barr Top!  dBA    !   dBA   !
--------+---------+---------+---------+
   1.80 !  193.54 !   54.86 !   54.86 !
   1.90 !  193.64 !   54.77 !   54.77 !
   2.00 !  193.74 !   54.61 !   54.61 !
   2.10 !  193.84 !   54.38 !   54.38 !
   2.20 !  193.94 !   54.10 !   54.10 !
   2.30 !  194.04 !   53.78 !   53.78 !
   2.40 !  194.14 !   53.43 !   53.43 !
   2.50 !  194.24 !   53.06 !   53.06 !
   2.60 !  194.34 !   52.68 !   52.68 !
   2.70 !  194.44 !   52.30 !   52.30 !
   2.80 !  194.54 !   51.91 !   51.91 !
   2.90 !  194.64 !   51.53 !   51.53 !
   3.00 !  194.74 !   51.16 !   51.16 !

RT/Custom data, segment # 1: Transitway (day/night)
---------------------------------------------------
1 - Bus:
Traffic volume    :   600/100   veh/TimePeriod
Speed             :    80 km/h

Data for Segment # 1: Transitway (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 152.00 / 165.00 m
Receiver height           :   1.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 / 6.50   m
Source elevation          : 193.30 m
Receiver elevation        : 191.94 m
Barrier elevation         : 191.74 m

Result summary (day)
```

	source height (m)	Gen Leq (dBA)	Total Leq (dBA)
1.Transitway	0.50	42.16	42.16 *
	Total		42.16 dBA

* Bright Zone !

Barrier table for segment # 1: Transitway (day)

Barrier Height	Elev of Barr Top	RT/CUST dBA	Tot Leq dBA
1.80	193.54	42.12	42.12
1.90	193.64	42.09	42.09
2.00	193.74	41.98	41.98
2.10	193.84	41.82	41.82
2.20	193.94	41.61	41.61
2.30	194.04	41.36	41.36
2.40	194.14	41.08	41.08
2.50	194.24	40.79	40.79
2.60	194.34	40.48	40.48
2.70	194.44	40.18	40.18
2.80	194.54	39.87	39.87
2.90	194.64	39.57	39.57
3.00	194.74	39.28	39.28

TOTAL Leq FROM ALL SOURCES (DAY): ***58.28 dBA (No barrier)***

57.07 dBA (2.4m high acoustic barrier)
56.10 dBA (2.7m high acoustic barrier)
55.14 dBA (3.0m high acoustic barrier)

```
STAMSON 5.04        SUMMARY REPORT        Date: 29-10-2019 16:55:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: d5sw.te              Time Period: Day/Night 16/8 hours
Description: Block 19, Side Wall

Road data, segment # 1: Highway 407 (day/night)
-----------------------------------------------
Car traffic volume  : 34002/16998 veh/TimePeriod  *
Medium truck volume :  3000/1500  veh/TimePeriod  *
Heavy truck volume  :  3000/1500  veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  60000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.50
    Heavy Truck  % of Total Volume     :   7.50
    Day (16 hrs) % of Total Volume     :  66.67
Data for Segment # 1: Highway 407 (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 2
House density             :     50 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 348.00 / 348.00 m
Receiver height           :   4.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 / 4.50   m

Road data, segment # 2: Ninth Line (day/night)
-----------------------------------------------
Car traffic volume  : 30780/3420  veh/TimePeriod  *
Medium truck volume :   891/99    veh/TimePeriod  *
Heavy truck volume  :   729/81    veh/TimePeriod  *
Posted speed limit  :    80 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  36000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.75
    Heavy Truck  % of Total Volume     :   2.25
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 2: Ninth Line (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  32.00 / 32.00  m
Receiver height           :   4.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 / 4.50   m

Result summary (day)
--------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
```

```
 1.Highway 407      !     1.65 !    53.91 !    53.91 *
 2.Ninth Line       !     1.22 !    67.84 !    67.84 *
--------------------+---------+---------+---------
                      Total                   68.01 dBA
  * Bright Zone  !
Result summary (night)
----------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Highway 407      !     1.65 !    55.30 !    55.30 *
 2.Ninth Line       !     1.22 !    61.77 !    61.77 *
--------------------+---------+---------+---------
                      Total                   62.65 dBA
  * Bright Zone  !
RT/Custom data, segment # 1: Transitway (day/night)
--------------------------------------------------
1 - Bus:
Traffic volume    :   600/100   veh/TimePeriod
Speed             :    80 km/h
Data for Segment # 1: Transitway (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 2
House density             :     50 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 255.00 / 255.00 m
Receiver height           :   4.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 / 4.50   m

Result summary (day)
--------------------
                    !  source  !   Gen    !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Transitway       !     0.50 !    39.35 !    39.35 *
--------------------+---------+---------+---------
                      Total                   39.35 dBA
  * Bright Zone  !
Result summary (night)
----------------------
                    !  source  !   Gen    !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Transitway       !     0.50 !    35.85 !    35.85 *
--------------------+---------+---------+---------
                      Total                   35.85 dBA
  * Bright Zone  !

TOTAL Leq FROM ALL SOURCES (DAY): 68.02
                           (NIGHT): 62.66
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 20-10-2020 10:46:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: d5ry.te              Time Period: Day/Night 16/8 hours
Description: Block 19, Rear Yard

Road data, segment # 1: Highway 407 (day/night)
-----------------------------------------------
Car traffic volume  : 34002/16998 veh/TimePeriod  *
Medium truck volume :  3000/1500  veh/TimePeriod  *
Heavy truck volume  :  3000/1500  veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  60000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.50
    Heavy Truck  % of Total Volume     :   7.50
    Day (16 hrs) % of Total Volume     :  66.67
Data for Segment # 1: Highway 407 (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 2
House density             :     50 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 346.00 m
Receiver height           :   1.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   5.00  m
Source elevation          : 192.50 m
Receiver elevation        : 190.60 m
Barrier elevation         : 191.37 m
Road data, segment # 2: Ninth Line (day/night)
-----------------------------------------------
Car traffic volume  : 30780/3420  veh/TimePeriod  *
Medium truck volume :   891/99    veh/TimePeriod  *
Heavy truck volume  :   729/81    veh/TimePeriod  *
Posted speed limit  :    80 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  36000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.75
    Heavy Truck  % of Total Volume     :   2.25
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 2: Ninth Line (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   -60.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  24.00 m
Receiver height           :   1.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -60.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 m
Source elevation          : 190.55 m
Receiver elevation        : 190.60 m
Barrier elevation         : 191.37 m
Road data, segment # 3: Ninth Line (day/night)
-----------------------------------------------
Car traffic volume  : 30780/3420  veh/TimePeriod  *
```

```
Medium truck volume :   891/99    veh/TimePeriod  *
Heavy truck volume  :   729/81    veh/TimePeriod  *
Posted speed limit  :    80 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  36000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.75
    Heavy Truck  % of Total Volume     :   2.25
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 3: Ninth Line (day/night)
--------------------------------------------
Angle1   Angle2           : -60.00 deg   60.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  24.00 m
Receiver height           :   1.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -60.00 deg   Angle2 : 60.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   6.00 m
Source elevation          : 190.55 m
Receiver elevation        : 190.60 m
Barrier elevation         : 191.37 m

Result summary (day)
--------------------
                     !  source  !   Road   !  Total
                     !  height  !   Leq    !   Leq
                     !   (m)    !  (dBA)   !  (dBA)
---------------------+----------+----------+----------
 1.Highway 407       !     1.65 !    52.57 !    52.57 *
 2.Ninth Line        !     1.22 !    59.07 !    59.07 *
 3.Ninth Line        !     1.22 !    68.64 !    68.64 *
---------------------+----------+----------+----------
                       Total                   69.19 dBA

  * Bright Zone  !
Barrier table for segment # 1: Highway 407 (day)
-----------------------------------------------
Barrier ! Elev of !  Road   ! Tot Leq !
Height  ! Barr Top!  dBA    !   dBA   !
--------+---------+---------+---------+
   2.40 !  194.00 !   50.05 !   50.05 !
   2.50 !  194.10 !   49.87 !   49.87 !
   2.60 !  194.20 !   49.70 !   49.70 !
   2.70 !  194.30 !   49.54 !   49.54 !
   2.80 !  194.40 !   49.38 !   49.38 !
   2.90 !  194.50 !   49.23 !   49.23 !
   3.00 !  194.60 !   49.09 !   49.09 !
   3.10 !  194.70 !   48.95 !   48.95 !
   3.20 !  194.80 !   48.81 !   48.81 !
   3.30 !  194.90 !   48.68 !   48.68 !
   3.40 !  195.00 !   48.56 !   48.56 !
   3.50 !  195.10 !   48.45 !   48.45 !
   3.60 !  195.20 !   48.34 !   48.34 !
   3.70 !  195.30 !   48.23 !   48.23 !
   3.80 !  195.40 !   48.13 !   48.13 !
   3.90 !  195.50 !   48.03 !   48.03 !
   4.00 !  195.60 !   47.94 !   47.94 !
   4.10 !  195.70 !   47.85 !   47.85 !
   4.20 !  195.80 !   47.77 !   47.77 !

Barrier table for segment # 2: Ninth Line (day)
```

```
-----------------------------------------------
Barrier ! Elev of !  Road   ! Tot Leq !
Height  ! Barr Top!  dBA    !   dBA   !
--------+---------+---------+---------+
   2.40 !  194.00 !   52.19 !   52.19 !
   2.50 !  194.10 !   52.03 !   52.03 !
   2.60 !  194.20 !   51.88 !   51.88 !
   2.70 !  194.30 !   51.73 !   51.73 !
   2.80 !  194.40 !   51.58 !   51.58 !
   2.90 !  194.50 !   51.43 !   51.43 !
   3.00 !  194.60 !   51.29 !   51.29 !
   3.10 !  194.70 !   51.15 !   51.15 !
   3.20 !  194.80 !   51.02 !   51.02 !
   3.30 !  194.90 !   50.89 !   50.89 !
   3.40 !  195.00 !   50.76 !   50.76 !
   3.50 !  195.10 !   50.63 !   50.63 !
   3.60 !  195.20 !   50.51 !   50.51 !
   3.70 !  195.30 !   50.39 !   50.39 !
   3.80 !  195.40 !   50.28 !   50.28 !
   3.90 !  195.50 !   50.17 !   50.17 !
   4.00 !  195.60 !   50.06 !   50.06 !
   4.10 !  195.70 !   49.95 !   49.95 !

Barrier table for segment # 3: Ninth Line (day)
-----------------------------------------------
Barrier ! Elev of !  Road   ! Tot Leq !
Height  ! Barr Top!  dBA    !   dBA   !
--------+---------+---------+---------+
   2.40 !  194.00 !   56.39 !   56.39 !
   2.50 !  194.10 !   56.00 !   56.00 !
   2.60 !  194.20 !   55.63 !   55.63 !
   2.70 !  194.30 !   55.27 !   55.27 !
   2.80 !  194.40 !   54.92 !   54.92 !
   2.90 !  194.50 !   54.58 !   54.58 !
   3.00 !  194.60 !   54.26 !   54.26 !
   3.10 !  194.70 !   53.95 !   53.95 !
   3.20 !  194.80 !   53.66 !   53.66 !
   3.30 !  194.90 !   53.37 !   53.37 !
   3.40 !  195.00 !   53.10 !   53.10 !
   3.50 !  195.10 !   52.83 !   52.83 !
   3.60 !  195.20 !   52.57 !   52.57 !
   3.70 !  195.30 !   52.33 !   52.33 !
   3.80 !  195.40 !   52.09 !   52.09 !
   3.90 !  195.50 !   51.86 !   51.86 !
   4.00 !  195.60 !   51.63 !   51.63 !
   4.10 !  195.70 !   51.42 !   51.42 !

RT/Custom data, segment # 1: Transitway (day/night)
-----------------------------------------------
1 - Bus:
Traffic volume    :   600/100   veh/TimePeriod
Speed             :    80 km/h

Data for Segment # 1: Transitway (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 2
House density             :     50 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 253.00 / 253.00 m
Receiver height           :   1.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :  10.00 / 10.00  m
```

Source elevation : 192.50 m
Receiver elevation : 190.60 m
Barrier elevation : 191.37 m

Result summary (day)

	source height (m)	Gen Leq (dBA)	Total Leq (dBA)
1.Transitway	0.50	38.57	38.57 *
Total			38.57 dBA

* Bright Zone !

Barrier table for segment # 1: Transitway (day)

Barrier Height	Elev of Barr Top	RT/CUST dBA	Tot Leq dBA
2.40	194.00	35.89	35.89
2.50	194.10	35.72	35.72
2.60	194.20	35.56	35.56
2.70	194.30	35.40	35.40
2.80	194.40	35.25	35.25
2.90	194.50	35.10	35.10
3.00	194.60	34.96	34.96
3.10	194.70	34.82	34.82
3.20	194.80	34.69	34.69
3.30	194.90	34.56	34.56
3.40	195.00	34.43	34.43
3.50	195.10	34.32	34.32
3.60	195.20	34.20	34.20
3.70	195.30	34.09	34.09
3.80	195.40	33.99	33.99
3.90	195.50	33.89	33.89
4.00	195.60	33.79	33.79
4.10	195.70	33.70	33.70

TOTAL Leq FROM ALL SOURCES (DAY): ***58.38 dBA*** (3.3m high acoustic barrier)

59.00 dBA (3.1m high acoustic barrier)
57.26 dBA (3.7m high acoustic barrier)
56.20 dBA (4.2m high acoustic barrier)
55.26 dBA (4.7m high acoustic barrier)

STAMSON 5.04 SUMMARY REPORT Date: 19-10-2020 09:19:00
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: Cola.te Time Period: Day/Night 16/8 hours
Description: **Common Outdoor Amenity**

Road data, segment # 1: Highway 407 (day/night)

Car traffic volume : 34002/16998 veh/TimePeriod *
Medium truck volume : 3000/1500 veh/TimePeriod *
Heavy truck volume : 3000/1500 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 2 %
Road pavement : 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
24 hr Traffic Volume (AADT or SADT): 60000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.50
Heavy Truck % of Total Volume : 7.50
Day (16 hrs) % of Total Volume : 66.67
Data for Segment # 1: Highway 407 (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 80 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 195.00 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 0.00 m
Barrier receiver distance : 4.50 m
Source elevation : 191.00 m
Receiver elevation : 190.65 m
Barrier elevation : 190.65 m

Road data, segment # 2: Ninth Line (day/night)

Car traffic volume : 30780/3420 veh/TimePeriod *
Medium truck volume : 891/99 veh/TimePeriod *
Heavy truck volume : 729/81 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 2 %
Road pavement : 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
24 hr Traffic Volume (AADT or SADT): 36000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 2.75
Heavy Truck % of Total Volume : 2.25
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Ninth Line (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 150.00 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 0.00 deg
Barrier height : 0.00 m
Barrier receiver distance : 4.50 m
Source elevation : 189.80 m
Receiver elevation : 190.65 m
Barrier elevation : 190.65 m
Result summary (day)

```
--------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Highway 407      !     1.65 !    53.73 !    53.73 *
 2.Ninth Line       !     1.22 !    46.26 !    46.26 *
--------------------+---------+---------+---------
                      Total                  54.45 dBA

  * Bright Zone  !

RT/Custom data, segment # 1: Transitway (day/night)
-------------------------------------------------
1 - Bus:
Traffic volume    :   600/100   veh/TimePeriod
Speed             :    80 km/h
Data for Segment # 1: Transitway (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 2
House density             :     80 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :   110.00 m
Receiver height           :   1.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   4.50 m
Source elevation          :   192.00 m
Receiver elevation        :   190.65 m
Barrier elevation         :   190.65 m

Result summary (day)
--------------------
                    !  source  !   Gen    !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Transitway       !     0.50 !    41.41 !    41.41 *
--------------------+---------+---------+---------
                      Total                  41.41 dBA
  * Bright Zone  !


TOTAL Leq FROM ALL SOURCES (DAY): 54.66 dBA
```

APPENDIX 3

NOISE CRITERIA
AND WARNING CLAUSES

MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS

ENVIRONMENTAL NOISE GUIDELINE
Stationary and Transportation Sources - Approval and Planning
Publication NPC-300

August 2013

Day-time Outdoor Sound Level Limit

Table C-1 gives the equivalent sound level (L_{eq}) limit for designated Outdoor Living Areas. The limit applies to the entire day-time period from 07:00 to 23:00.

TABLE C-1
Sound Level Limit for Outdoor Living Areas
Road and Rail

Time Period	*L_{eq}(16) (dBA)*
16 hr, 07:00 - 23:00	*55*

Indoor Sound Level Limit

Table C-2 gives the equivalent sound level (L_{eq}) limits and the applicable time periods for the indicated types of indoor space. The specified sound level criteria are minimum requirements and apply to the indicated indoor spaces with the windows and doors closed.

TABLE C- 2
Indoor Sound Level Limits (Road and Rail)

Type of Space	*Time Period*	*L_{eq} (Time Period) (dBA)*	
		Road	*Rail*
Living/dining, den areas of residences, nursing/retirement homes, hospitals, schools, day-care centers, etc.	*07:00-23:00*	*45*	*40*
Living/dining areas of residences, nursing/retirement homes, hospitals, etc. (except schools or daycare centres)	*23:00 - 07:00*	*45*	*40*
Sleeping quarters	*07:00-23:00*	*45*	*40*
Sleeping quarters	*23:00 - 07:00*	*40*	*35*

SUPPLEMENTARY NOISE LIMITS

Indoor limits for transportation sources applicable to noise sensitive land uses are specified in Table C-2 and Table C-9.

TABLE C-9

Indoor Sound Level Limits (Road and Rail)

Type of Space	*Time Period*	*L_{eq} (Time Period) (dBA)*	
		Road	*Rail*
General offices, reception areas, retail stores, etc.	*16 hours between 07:00-23:00*	*50*	*45*
Living/dining areas of residences, hospitals, schools, nursing/retirement, homes day-care centers, theatres, place of worship, libraries, individual or semi-private offices, conference rooms, reading rooms etc.	*16 hours between 07:00-23:00*	*45*	*40*
Sleeping quarters of hotels/motels	*8 hours between 23:00 - 07:00*	*45*	*40*
Sleeping quarters of residences, hospitals, nursing/retirement homes etc	*8 hours between 23:00 - 07:00*	*40*	*35*

SUMMARY OF MINIMUM NOISE CONTROL AND VENTILATION REQUIREMENTS FOR ROAD AND RAIL NOISE

TABLE 1

COMBINATION OF ROAD AND RAIL NOISE, DAY-TIME (0700 - 2300)

OUTDOOR, VENTILATION AND WARNING CLAUSE REQUIREMENTS

ASSESSMENT LOCATION	*L_{eq} (16 hr) (dBA)*	*VENTILATION REQUIREMENTS*	*OUTDOOR CONTROL MEASURES*	*WARNING CLAUSE*
OUTDOOR LIVING AREA (OLA)	*Less than or equal to 55 dBA*	*N/A*	*None required*	*Not required*
	Greater than 55 dBA to less than or equal to 60 dBA	*N/A*	*Control measures (barriers) not required but should be considered*	*Required if resultant L_{eq} exceeds 55 dBA Type A*
	Greater than 60 dBA	*N/A*	*Control measures (barriers) required to reduce the L_{eq} below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible*	*Required if resultant L_{eq} exceeds 55 dBA Type B*
PLANE OF LIVING ROOM WINDOW	*Greater than 50 dBA to less than or equal to 55 dBA*	*None required*	*N/A*	*Not required*
	Greater than 55 dBA to less than or equal to 65 dBA	*Forced air heating with provision for central air conditioning*	*N/A*	*Required Type C*
	Greater than 65 dBA	*Central air conditioning*	*N/A*	*Required Type D*

TABLE 2

COMBINATION OF ROAD AND RAIL NOISE, NIGHT-TIME (2300 - 0700)

VENTILATION AND WARNING CLAUSE REQUIREMENTS

ASSESSMENT LOCATION	*L_{eq}(8hr) (dBA)*	*VENTILATION REQUIREMENTS*	*WARNING CLAUSE*
PLANE OF BEDROOM WINDOW	*Greater than 50 dBA to less or equal to 60 dBA*	*Forced air heating with provision for central air conditioning*	*Required Type C*
	Greater than 60 dBA	*Central air conditioning*	*Required Type D*

TABLE 3
ROAD AND RAIL NOISE, DAY-TIME (0700 - 2300)
BUILDING COMPONENT REQUIREMENTS

ASSESSMENT LOCATION		*L_{eq} (16 hr)*	*BUILDING COMPONENT REQUIREMENTS*
PLANE OF LIVING ROOM WINDOW	*ROAD*	*Less than or equal to 65 dBA*	*Building compliant with the Ontario Building Code*
		Greater than 65 dBA	*Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria*
	RAIL	*Less than or equal to 60 dBA*	*Building compliant with the Ontario Building Code*
		Greater than 60 dBA	*Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria*

TABLE 4
ROAD AND RAIL NOISE, NIGHT-TIME (2300-0700)
BUILDING COMPONENT REQUIREMENTS

ASSESSMENT LOCATION		*L_{eq} (8 hr)*	*BUILDING COMPONENT REQUIREMENTS*
PLANE OF BEDROOM WINDOW	*ROAD*	*Less than or equal to 60 dBA*	*Building compliant with the Ontario Building Code*
		Greater than 65 dBA	*Building components (walls, windows, etc.) must bed designed to achieve indoor sound level criteria*
	RAIL	*Less than or equal to 60 dBA*	*Building compliant with the Ontario Building Code*
		Greater than 60 dBA	*Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria*

TABLE 5
FACADE REQUIREMENT FOR RAIL NOISE ONLY - 24 HOURS

ASSESSMENT LOCATION	*DISTANCE TO RAILWAY (m)*	*L_{eq} (24 hr) (dBA)*	*NOISE CONTROL REQUIREMENT*
PLANE OF BEDROOM WINDOW	*Less than 100 m*	*Less than or equal to 60 dBA*	*No additional requirement*
		Greater than 60 dBA	*Brick veneer or acoustically equivalent*
	Greater than 100 m	*Less than or equal to 60 dBA*	*No additional requirement*
		Greater than 60 dBA	*No additional requirement*

TABLE B- 1
Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq dBA)
Outdoor Points of Reception

Time of Day	*Class 1 Area*	*Class 2 Area*	*Class 3 Area*	*Class 4 Area*
07:00-19:00	*50*	*50*	*45*	*55*
19:00 -23:00	*50*	*45*	*40*	*55*

TABLE B- 2
Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq dBA)
Plane of Window of Noise Sensitive Spaces

Time of Day	*Class 1 Area*	*Class 2 Area*	*Class 3 Area*	*Class 4 Area*
07:00-19:00	*50*	*50*	*45*	*60*
19:00 -23:00	*50*	*50*	*40*	*60*
23:00-07:00	*45*	*45*	*40*	*55*

WARNING CLAUSES

The following warning clauses may be used individually or in combination:

TYPE A:

"Purchasers are advised that noise levels due to increasing road traffic and commercial developments may continue to be of concern, occasionally interfering with some activities of the dwelling occupants."

TYPE B:

"Purchasers are advised that despite the inclusion of noise control features in this development area and within the building units, noise levels from increasing road traffic and commercial developments may continue to be of concern, occasionally interfering with some activities of the dwelling occupants as the noise level exceeds the Municipality's and the Ministry of Environment's noise criteria."

"That the acoustical berm and/or barrier as installed shall be maintained, repaired or replaced by the owner. Any maintenance repair or replacement shall be with the same material, to the same standards, and having the same colour and appearance of the original'

TYPE D:

"This dwelling unit was fitted with a central air conditioning system in order to permit closing windows for noise control. (Note: The location and installation of the outdoor air conditioning device should be done so as to comply with noise criteria of MOE Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property)."

APPENDIX 4

SAMPLE WINDOW AND EXTERIOR WALL CONFIGURATIONS

WINDOW STC RATINGS

STC	Double Glazing of indicated glass thickness					Triple Glazing	
	2mm and 2mm glass	**3mm and 3mm glass**	**4mm and 4mm glass**	**3mm and 6mm glass**	**6mm and 6mm glass**	**3mm 3mm and 3mm glass**	**3mm 3mm and 6mm glass**
	Interpane Spacing (mm)					Interpane Spacing (mm)	
27	6						
28	13						
29	15	6					
30	18	13	6				
31	22	16	13	6	6	6,6	
32	28	20	16	13	13	6,10	6,6
33	35	25	20	16	16	6,15	6,10
34	42	32	25	20	20	6,20	6,15
35	50	40	32	25	24	6,30	6,20
36	63	50	40	32	30	6,40	6,30
37	80	63	50	40	37	6,50	6,40
38	100	80	63	55	50	6,65	6,50
39	125	100	80	75	70	6,80	6,65
40	150	125	100	95	90	6,100	6,80
41		150	125	110	100		6,100
42			150	135	125		

Source: National Research Council, Division of Building Research

EXPLANATORY NOTES:

1. STC data listed in the table are for the well-fitted weather-stripped units that can be opened. The STC values apply only when the windows are closed. For windows fixed and sealed to the frame, add three to the STC given in the table.

2. If the interpane spacing or glass thickness for a specific double-glazed window is not listed in the table, the nearest listed values should be used.

3. If the interpane spacing for a specific triple-glazed window are not listed in the table, use the listed case whose combined spacing are nearest the actual combined spacing.

4. The STC data listed in the table are for typical windows, but details of glass mounting, window seals, etc., may result in slightly different performance for some manufacturer's products. If the laboratory sound transmission loss data (conforming to ASTM test method E-90) are available, these should be used.

EXTERIOR WALL STC RATINGS

Wall Configuration	EW1	EW2	EW3	EW4	EW1R	EW2R	EW3R	EW5	EW4R	EW6	EW7 EW5R	EW8
STC Rating	**38**	**40**	**43**	**46**	**47**	**48**	**49**	**54**	**55**	**57**	**58**	**62**

Source: National Research Council, Division of Building Research

NOTES:

1 The common structure of walls EW1 to EW5 is composed of 12.7mm gypsum board, vapour barrier and 38x89 mm studs with 50 mm (or thicker) mineral wool or glass fibre batts in inter-stud cavities.

- EW1 denotes the common structure, plus sheathing, plus wood siding or metal siding and fibre backer board
- EW2 denotes the common structure, plus rigid insulation (25 to 30 mm), and wood siding or metal siding and fibre backer board.
- EW3 denotes simulated mansard with the common structure, plus sheathing, 28 X89 mm framing, sheathing and asphalt roofing material
- EW4 denotes the common structure, plus sheathing and 20 mm stucco.
- EW5 denotes the common structure, plus sheathing, 25 mm air space, 100mm brick veneer.
- EW6 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 100 mm back-up block 100 mm face brick.
- EW7 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 140mm back-up block, 100 mm face brick.
- EW8 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 200 mm concrete.

2 R signifies the mounting of the interior gypsum board on resilient clips.

3 An exterior wall conforming to rainscreen design principles and composed of 12.7 mm gypsum board, 100 mm concrete block, rigid insulation (25 to 50 mm), 25 mm air space, and 100 mm brick veneer has the same STC as EW6.

4 An exterior wall described in EW1 with the addition of rigid insulation (25 to 50 mm) between the sheathing and the external finish has the same STC as EW2.