

# **PRELIMINARY ENVIRONMENTAL NOISE ASSESSMENT**

**SOUTH NINTH LINE LANDS  
WEST OF NINTH LINE AND NORTH OF EGLINTON  
PLAN 5150  
(PHASES 1 AND 2)  
CITY OF MISSISSAUGA**

**PREPARED FOR:  
MATTAMY HOMES**

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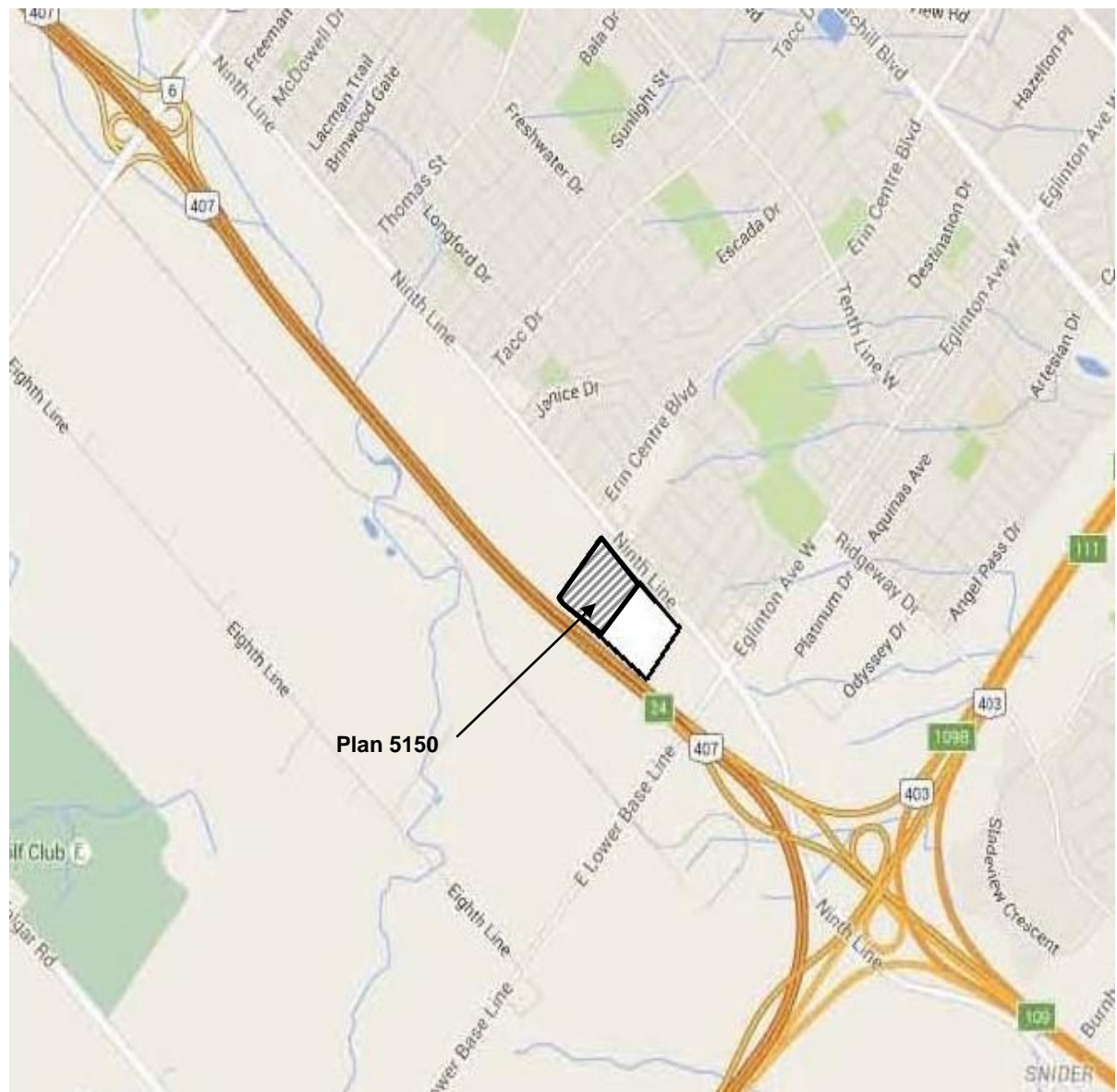
## 1.0 INTRODUCTION

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### 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 and Phase 2 of the development.

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



**FIGURE 1 - STUDY AREA**

## 2.0 NOISE SOURCES

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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.

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

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

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.

<b>TABLE 2: NINTH LINE TRAFFIC DATA</b>	
Projected Annual Average Daily Traffic **	36,000
Percent Trucks	5%
Heavy and Medium trucks ratio	55:45
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

### 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.

<b>TABLE 3: FUTURE NINTH LINE CORRIDOR TRANSITWAY</b>	
Projected Bus Traffic (Day/Night) *	600/400
Speed (km/hr)	80

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

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 4 below.

<b>TABLE 4: TRAFFIC PARAMETERS FOR CPR (PARKWAY BELT WEST OF HWY 407)</b>					
<b>TRAIN TYPE</b>	<b>NO. OF TRAINS (DAYTIME)</b>	<b>NO. OF TRAINS (NIGHT-TIME)</b>	<b>MAX. SPEED (Km/hr)</b>	<b>MAX. NO. OF CARS PER TRAIN</b>	<b>MAX. NO. OF LOCOMOTIVES PER TRAIN</b>
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).

### 3.0 NOISE ASSESSMENT

Drawing Y1621 is showing various noise analysis locations and noise mitigation measures within the proposed development. 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 5 lists the unattenuated sound levels at various locations based on the attached Plan.

<b>TABLE 5: UNATTENUATED SOUND LEVELS</b>			
<b>LOCATIONS</b>	<b>DISTANCE TO CENTRELINE OF ROAD (m)</b>	<b>DAYTIME 16 Hr. Leq dBA</b>	<b>NIGHT-TIME 8 Hr. Leq dBA</b>
Location 1 (Rear Wall)	116.0 <sup>1</sup>	67.88	64.03
	242.0 <sup>2</sup>	49.98 (68.73)	44.70 (64.78)
	24.0 <sup>3</sup>	60.84	56.07
	271.0 <sup>4</sup>	42.13	46.39
Location 2 (Side Wall)	138.0 <sup>1</sup>	64.29	64.29
	220.0 <sup>2</sup>	50.61 (64.88)	45.29 (64.50)
	46.0 <sup>3</sup>	54.33	49.56
	393.0 <sup>4</sup>	36.87	41.27
Location 2 (Rear Yard)	138.0 <sup>1</sup>	57.66	-
	220.0 <sup>2</sup>	49.46 (58.65)	
	46.0 <sup>3</sup>	47.63	
	393.0 <sup>4</sup>	35.48	
Location 3 (Side Wall)	255.0 <sup>1</sup>	55.98	58.76
	105.0 <sup>2</sup>	59.70 (61.30)	54.09 (60.06)
	165.0 <sup>3</sup>	42.31	38.63
Location 3 (Rear Yard)	253.0 <sup>1</sup>	54.78	-
	107.0 <sup>2</sup>	56.91 (59.06)	
	163.0 <sup>3</sup>	41.67	
Location 4 (Side Wall)	258.0 <sup>1</sup>	55.91	58.68
	102.0 <sup>2</sup>	59.90 (61.42)	54.28 (60.06)
	162.0 <sup>3</sup>	42.43	38.75
Location 5 (Side Wall)	348.0 <sup>1</sup>	53.91	55.30
	32.0 <sup>2</sup>	67.84 (68.02)	61.77 (62.66)
	255.0 <sup>3</sup>	39.35	35.85
Location 5 (Rear Yard)	346.0 <sup>1</sup>	52.57	-
	34.0 <sup>2</sup>	66.58 (66.76)	
	253.0 <sup>3</sup>	38.57	
Location 7 (Front Wall)	356.0 <sup>1</sup>	53.91	55.16
	24.0 <sup>2</sup>	67.84 (69.93)	63.63 (64.22)
	263.0 <sup>3</sup>	39.14	35.55
Location 8 (Front Wall)	205.0 <sup>1</sup>	62.06	62.06
	135.0 <sup>2</sup>	53.89 (62.88)	48.38 (62.35)
	114.0 <sup>3</sup>	49.23	44.46
	360.0 <sup>4</sup>	37.54	41.90

- 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**

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### **4.1 OUTDOOR AMENITY AREA**

Based on the information in Table 5, the rear yard for the residential unit along Ninth Line is expected to be above 60 dBA.

A 3.2m high noise barrier is required along the side (east) property line of the Townhouse unit flanking onto Ninth Line (Location 5) and returned along the rear (north) property line. Drawing Y1621 shows the extent and height of the noise barriers. Therefore, a buffer would be required to accommodate a 0.8m to 1.2 high berm 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 2019. The exact noise barrier heights can be determined once final plan and grading information are available.

The outdoor amenity areas for all the Back to Back Townhouse units and Rear Lane 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. Based on the sound level results in Table 5, the sound levels are expected to be between 55 dBA and 60 dBA for these locations. Therefore, outdoor noise mitigation measures are not required, however a warning clause is recommended for all locations.

### **4.2 VENTILATION REQUIREMENTS**

Based on the information in Table 5, 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.

### **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.

For the worst case location during daytime, (Location 7) daytime sound level of 70 dBA was calculated. To ensure acceptable daytime indoor sound levels of 40dBA from rail and road noise sources, the building components must provide an STC rating of 33 for windows and STC 40 for exterior wall construction.

For the worst case location during night-time, (Location 7) night-time sound level of 64 dBA was calculated. To ensure acceptable night-time indoor sound levels of 35dBA from rail and road noise sources, the building components must provide an STC rating of 31 for windows and STC 38 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 6 for the STC ratings required.

For the Stacked Townhouse Units along Ninth Line and along the Transitway, the exterior walls will need to meet an STC 40 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 following exterior wall constructions meets the STC 54 rating;

common structure, plus sheathing, 12.7mm gypsum board, 25mm air space and 100mm brick veneer

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 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 6 identifying sound barriers, provision for central air conditioners, building components and warning clauses.

<b>TABLE 6: SUMMARY OF NOISE MITIGATION MEASURES</b>				
<b>LOCATIONS/ UNITS</b>	<b>VENTILATION REQUIREMENTS</b>	<b>BUILDING COMPONENTS</b>	<b>NOISE BARRIERS*</b>	<b>WARNING CLAUSES</b>
Location 1 (Back to Back units along the Transitway)	Mandatory air conditioning	Windows: STC 33 Walls: STC 40	-	Type B, D
Location 2 (Front Load Townhouse units)	Mandatory air conditioning	Windows: STC 33 Walls: STC 40	-	Type B, D
Location 3 (Front Load Townhouse units)	Mandatory air conditioning	Windows: OBC Walls: OBC	-	Type A, D
Location 4 (Front Load Townhouse units)	Mandatory air conditioning	Windows: OBC Walls: OBC	-	Type A, D
Location 5 (Street Town, east unit)	Mandatory air conditioning	Windows: STC 33 Walls: STC 40	3.2m high noise barrier **	Type A, D
Location 6 (Street Town units)	Mandatory air conditioning	Windows: OBC Walls: OBC		Type A, D
Location 7 (Rear Lane Town units)	Mandatory air conditioning	Windows: STC 33 Walls: STC 40	-	Type A, D
Location 8 (Front Load Townhouse units)	Mandatory air conditioning	Windows: OBC Walls: OBC	-	Type A, D

\* Drawing Y1621 shows the extent and barrier heights.

\*\* 2.0m to 2.4m high noise fence on top of 0.8m to 1.2m high berm 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 2019.

## 6.0 RECOMMENDATIONS AND CONCLUSION

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### RECOMMENDATIONS

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

For the Townhouse Units along Ninth Line and along the Transitway, the exterior walls will need to meet an STC 40 and the windows will need to be upgrade up to STC 33. Please note that the final building components should be determined once the detailed building layout and plans become available.

3. A 3.2m high noise barrier is required along the side (east) property line of the Townhouse unit flanking onto Ninth Line (Location 5) and returned along the rear (north) property line. Drawing Y1621 shows the extent and height of the noise barriers. Therefore, a buffer would be required to accommodate a 0.8m to 1.2 high berm 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 2019.

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

The outdoor amenity areas for all the Back to Back Townhouse units and Rear Lane 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 these locations. Therefore, outdoor noise mitigation measures are not required.

### 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.

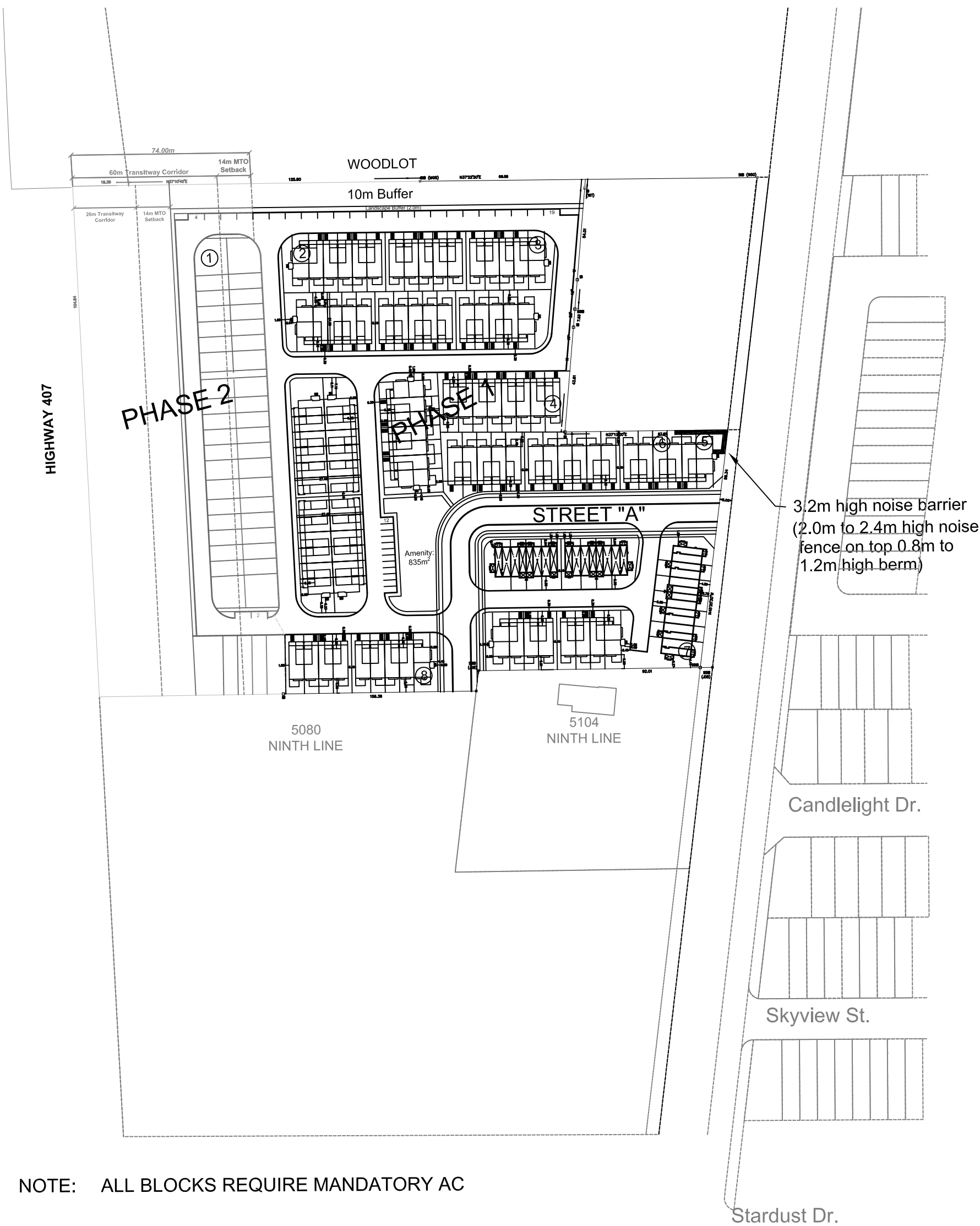
Respectfully submitted,

**YCA ENGINEERING Limited**

Hava Jouharchi, P.Eng.  
Senior Project Engineer




DRAWING Y1621



# **APPENDIX 1**

## **TRAFFIC DATA**

<b>Date:</b>	12-Jul-16	<b>NOISE REPORT FOR PROPOSED DEVELOPMENT</b>	
<b>REQUESTED BY:</b>			
<b>Name:</b>	Hava Jouharchi		
<b>Company:</b>	YCA Engineering Ltd.		
<b>Fax#:</b>	(416) 894-3213	<b>Location:</b>	Eglinton Avenue W, East of Ninth Line & Ninth Line, North of Eglinton avenue W
<b>PREPARED BY:</b>		<b>Look Up ID#:</b>	352
<b>Name:</b>	L. Uy		
<b>Tel#:</b>	(905) 615-3200		

## ON SITE TRAFFIC DATA

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

<b>Comments:</b>	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**

<b>Screenline Location</b>	<b>Existing Vehicle Capacity</b>	<b>Existing Vehicle Demand</b>	<b>2031 RTP Vehicle Demand</b>	<b>2031 ALU Vehicle Demand</b>	<b>2031 BAU Vehicle Demand</b>
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 9 <sup>th</sup> 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
<b>Highway 401</b>		<b>Highway 403</b>	
- 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%	<b>QEW</b>	
- West of Highway 400	10%	- West of Highway 403	15%
<b>Highway 410</b>		- 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%
<b>Highway 427</b>		- 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

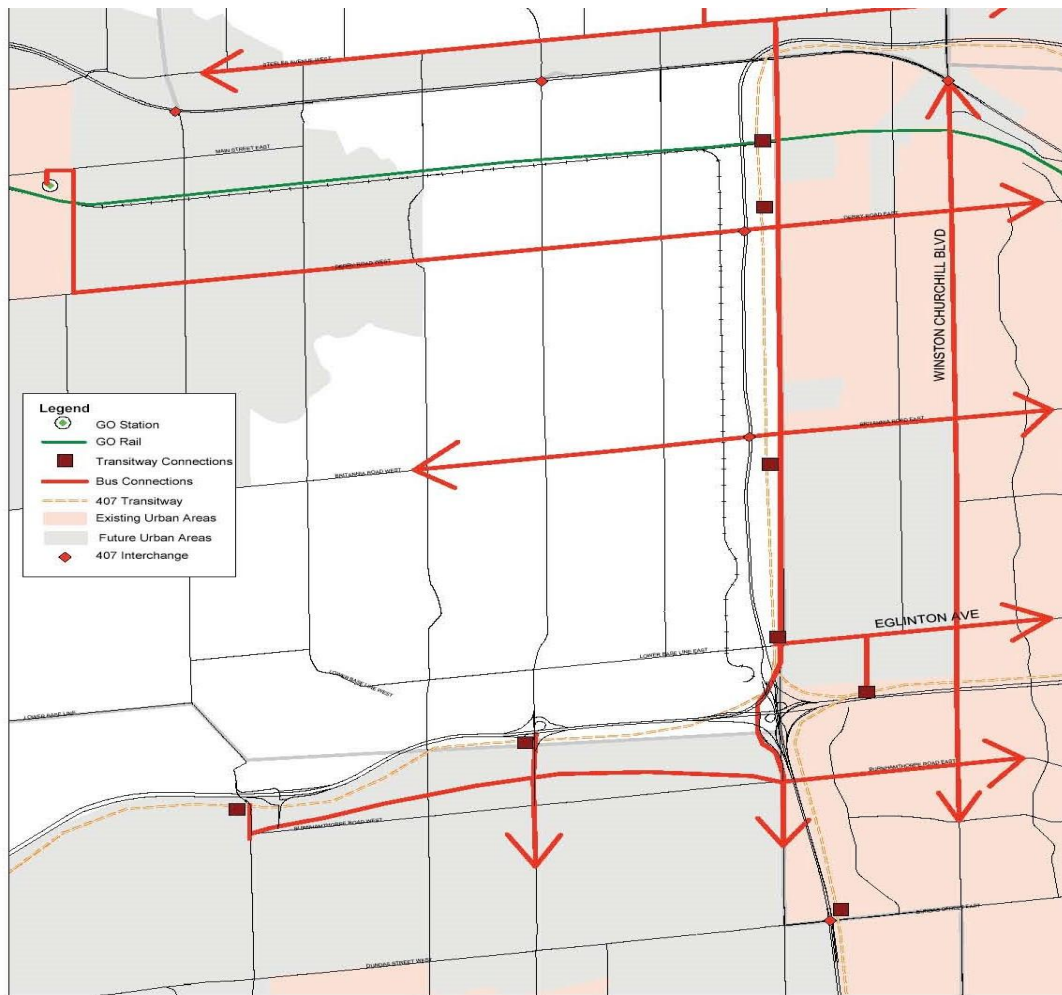
Headways (the time between buses or trains on the same service line) and operating speeds of various transit modes as identified in the GGH Model Backgrounder are presented in **Exhibit 3-3**.

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

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

23-41fig04-06-01TrnstCnct



**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 16:46:19  
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT  
 Filename: d2sw.te Time Period: Day/Night 16/8 hours  
 Description: Block 2, Side Wall

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

```

-----
Train      ! Trains      ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type       ! (Left)       ! (Right)     ! (km/h) !/Train!/Train! type !weld
-----+-----+-----+-----+-----+-----+-----+-----
* 1. Freight ! 1.3/1.3 ! 0.0/0.0 ! 81.0 ! 2.0 ! 30.0 ! Diesel! Yes
* The identified number of trains have been adjusted for
  future growth using the following parameters:
Train type: ! Unadj. Trains ! Annual % ! Years of !
No Name     ! Left ! Right ! Increase ! Growth !
-----+-----+-----+-----+-----+-----+-----
1. Freight  ! 1.0/1.0 ! 0.0/0.0 ! 2.50 ! 12.00 !
  
```

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

```

-----
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 50 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 393.00 / 393.00 m
Receiver height : 4.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Whistle Angle : 0 deg Track 1
Result summary (day)
  
```

```

-----
! Loc ! Wheel ! Whistle ! Whistle ! Total
! Leq ! Leq ! Left Leq ! Right Leq ! Leq
! (dBA) ! (dBA) ! (dBA) ! (dBA) ! (dBA)
-----+-----+-----+-----+-----+-----
1.CPR ! 33.32 ! 24.53 ! 33.87 ! 0.00 ! 36.87 *
-----+-----+-----+-----+-----+-----
Total 36.87 dBA
  
```

\* Bright Zone !  
 Result summary (night)

```

-----
! Loc ! Wheel ! Whistle ! Whistle ! Total
! Leq ! Leq ! Left Leq ! Right Leq ! Leq
! (dBA) ! (dBA) ! (dBA) ! (dBA) ! (dBA)
-----+-----+-----+-----+-----+-----
1.CPR ! 37.78 ! 28.98 ! 38.20 ! 0.00 ! 41.27 *
-----+-----+-----+-----+-----+-----
Total 41.27 dBA
  
```

\* Bright Zone !

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 : 1 / 1  
 House density : 50 %  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 138.00 / 138.00 m  
 Receiver height : 4.50 / 7.50 m  
 Topography : 0 (Define your own alpha.)  
 Barrier angle1 : -90.00 deg Angle2 : 90.00 deg  
 Barrier height : 0.00 m  
 Barrier receiver distance : 10.00 / 10.00 m  
 Source elevation : 193.75 m  
 Receiver elevation : 192.25 m  
 Barrier elevation : 192.25 m  
 Alpha : 0.33

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 : 2 / 2  
 House density : 50 %  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 220.00 / 220.00 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	!	64.29	!	64.29
2.Ninth Line	!	1.22	!	50.61	!	50.61

 -----  

Total				64.47 dBA		
-------	--	--	--	-----------	--	--

Result summary (night)

-----  

	!	source	!	Road	!	Total
	!	height	!	Leq	!	Leq
	!	(m)	!	(dBA)	!	(dBA)

 -----  

1.Highway 407	!	1.65	!	64.29	!	64.29
2.Ninth Line	!	1.22	!	45.29	!	45.29

 -----  

Total				64.34 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 :      1 / 1
House density    :     50 %
Surface         :      1           (Absorptive ground surface)
Receiver source distance : 46.00 / 46.00 m
Receiver height  :   4.50 / 7.50 m
Topography      :      0           (Define your own alpha.)
Barrier angle1   : -90.00 deg   Angle2 : 90.00 deg
Barrier height   :   0.00 m
Barrier receiver distance : 10.00 / -6.00 m
Source elevation : 193.35 m
Receiver elevation : 192.25 m
Barrier elevation : 192.25 m
Alpha           :   0.33

```

Result summary (day)

```

-----
! source ! Gen ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+
1.Transitway ! 0.50 ! 54.33 ! 54.33
-----+-----+-----+
Total 54.33 dBA

```

Result summary (night)

```

-----
! source ! Gen ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+
1.Transitway ! 0.50 ! 49.56 ! 49.56
-----+-----+-----+
Total 49.56 dBA

```

TOTAL Leq FROM ALL SOURCES (DAY): 64.88  
(NIGHT): 64.50

STAMSON 5.04 SUMMARY REPORT Date: 30-10-2019 17:34:31  
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT  
 Filename: d2ry.te Time Period: Day/Night 16/8 hours  
 Description: Location 2, Rear Yard

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

Train Type	! Trains ! (Left)	! Trains ! (Right)	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng ! type	!Cont !weld
* 1. Freight	1.3/1.3	0.0/0.0	81.0	2.0	30.0	Diesel	Yes
* The identified number of trains have been adjusted for future growth using the following parameters:							
Train type:	! Unadj. Trains	! Annual %	! Years of	!			
No Name	! Left	! Right	! Increase	! Growth	!		
1. Freight	1.0/1.0	0.0/0.0	2.50	12.00	!		

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

Angle1 Angle2 : -90.00 deg 90.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 1 / 1  
 House density : 50 %  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 395.00 / 395.00 m  
 Receiver height : 1.50 / 7.50 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Whistle Angle : 0 deg Track 1

Result summary (day)

	! Loc ! Leq ! (dBA)	! Wheel ! Leq ! (dBA)	! Whistle ! Left Leq ! (dBA)	! Whistle ! Right Leq ! (dBA)	! Total ! Leq ! (dBA)
1.CPR	31.85	23.54	32.50	0.00	35.48 *
Total					35.48 dBA

\* Bright Zone !

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 : 0 / 1  
 House density : 50 %  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 140.00 / 138.00 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 : 3.00 m  
 Barrier receiver distance : 10.00 / 10.00 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 : 2 / 2
House density : 50 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 222.00 / 220.00 m
Receiver height : 1.50 / 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 ! 57.66 ! 57.66
2.Ninth Line ! 1.22 ! 49.46 ! 49.46
-----+-----+-----+-----
Total 58.27 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 : 0 / 1
House density : 50 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 48.00 / 46.00 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 : 3.00 m
Barrier receiver distance : 10.00 / -6.00 m
Source elevation : 193.35 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 ! 47.63 ! 47.63
-----+-----+-----+-----
Total 47.63 dBA

```

TOTAL Leq FROM ALL SOURCES (DAY): 58.65

STAMSON 5.04                      SUMMARY REPORT                      Date: 29-10-2019 16:46:37  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT  
Filename: d3sw.te                      Time Period: Day/Night 16/8 hours  
Description: Block 3, 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 : 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  
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 : 105.00 / 105.00 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 !	55.98 !	55.98 *
2.Ninth Line	! 1.22 !	59.70 !	59.70 *
Total			61.24 dBA

\* Bright Zone !

Result summary (night)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.Highway 407	! 1.65 !	58.76 !	58.76 *
2.Ninth Line	! 1.22 !	54.09 !	54.09 *
Total			60.03 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 : 165.00 / 165.00 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 !	42.31 !	42.31 *
Total			42.31 dBA

\* Bright Zone !

Result summary (night)

	! source !	Gen !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.Transitway	! 0.50 !	38.63 !	38.63 *
Total			38.63 dBA

\* Bright Zone !

TOTAL Leq FROM ALL SOURCES (DAY): 61.30  
(NIGHT): 60.06

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 5, 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  
Source elevation : 192.00 m  
Receiver elevation : 190.95 m  
Barrier elevation : 191.00 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  
Source elevation : 190.55 m  
Receiver elevation : 190.95 m  
Barrier elevation : 191.70 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  
Source elevation : 191.85 m  
Receiver elevation : 190.95 m  
Barrier elevation : 191.00 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 5.04                      SUMMARY REPORT                      Date: 29-10-2019 16:54:27  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT  
Filename: d5ry.te                      Time Period: Day/Night 16/8 hours  
Description: Block 5, 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 / 348.00 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 : 2.40 m  
Barrier receiver distance : 8.00 / 4.50 m  
Source elevation : 192.00 m  
Receiver elevation : 190.95 m  
Barrier elevation : 191.00 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 : 34.00 / 34.00 m  
Receiver height : 1.50 / 7.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -60.00 deg  
Barrier height : 2.40 m  
Barrier receiver distance : 8.00 / 8.00 m  
Source elevation : 190.55 m  
Receiver elevation : 190.95 m  
Barrier elevation : 191.00 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 : 34.00 / 34.00 m  
 Receiver height : 1.50 / 7.50 m  
 Topography : 2 (Flat/gentle slope; with barrier)  
 Barrier angle1 : -60.00 deg Angle2 : 60.00 deg  
 Barrier height : 2.40 m  
 Barrier receiver distance : 6.00 / 6.00 m  
 Source elevation : 190.55 m  
 Receiver elevation : 190.95 m  
 Barrier elevation : 191.70 m  
 Result summary (day)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.Highway 407	! 1.65 !	52.24 !	52.24
2.Ninth Line	! 1.22 !	51.66 !	51.66
3.Ninth Line	! 1.22 !	54.87 !	54.87
Total			57.93 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 : 253.00 / 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 : 2.40 m  
 Barrier receiver distance : 10.00 / 4.50 m  
 Source elevation : 192.50 m  
 Receiver elevation : 190.95 m  
 Barrier elevation : 191.00 m

Result summary (day)

	! source !	Gen !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.Transitway	! 0.50 !	37.88 !	37.88
Total			37.88 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.97

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 7, 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

## **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**

<i>Time Period</i>	<i><math>L_{eq}(16)</math> (dBA)</i>
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)**

<i>Type of Space</i>	<i>Time Period</i>	<i><math>L_{eq}</math> (Time Period) (dBA)</i>	
		<i>Road</i>	<i>Rail</i>
<i>Living/dining, den areas of residences, nursing/retirement homes, hospitals, schools, day-care centers, etc.</i>	<i>07:00-23:00</i>	45	40
<i>Living/dining areas of residences, nursing/retirement homes, hospitals, etc. (except schools or daycare centres)</i>	<i>23:00 - 07:00</i>	45	40
<i>Sleeping quarters</i>	<i>07:00-23:00</i>	45	40
<i>Sleeping quarters</i>	<i>23:00 - 07:00</i>	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 <sub>eq</sub> (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 <sub>eq</sub> (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 <sub>eq</sub> exceeds 55 dBA Type A
	Greater than 60 dBA	N/A	Control measures (barriers) required to reduce the L <sub>eq</sub> below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible	Required if resultant L <sub>eq</sub> 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 <sub>eq</sub> (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	R	Less than or equal to 65 dBA	Building compliant with the Ontario Building Code
	O		
	A	Greater than 65 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
	D		
	R	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
	A		
	I	Greater than 60 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
	L		

**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	R	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
	O		
	A	Greater than 65 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
	D		
	R	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
	A		
	I	Greater than 60 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
	L		

**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 ( $L_{eq}$  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 ( $L_{eq}$  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: locate air cooled condenser unit in a noise sensitive area and ensure that unit has a maximum ARI rating of 7.6 Bels for 3.5 tons or less.)"*

## **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
<b>STC Rating</b>	<b>38</b>	<b>40</b>	<b>43</b>	<b>46</b>	<b>47</b>	<b>48</b>	<b>49</b>	<b>54</b>	<b>55</b>	<b>57</b>	<b>58</b>	<b>62</b>

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.