

**TRANSPORTATION TRAFFIC
NOISE ASSESSMENT**

805 Dundas Street East
Mississauga, Ontario

REPORT: GW22-164- Transportation Noise R1



May 24th, 2023

PREPARED FOR

KJC Properties Inc.

1940 Ellesmere Road

Scarborough, ON M1H 2V7

PREPARED BY

Essraa Alqassab, B.A.Sc., Junior Environmental Scientist

Joshua Foster, P.Eng., Lead Engineer

EXECUTIVE SUMMARY

This report describes a transportation noise assessment to satisfy the requirements of the City of Mississauga's site development submission requirements for the proposed multi-building development located at the 805 Dundas Street East in Mississauga, Ontario. The major sources of transportation noise are Dundas Street East, Haines Road, and the CP Freight railway. Figure 1 illustrates a complete site plan with surrounding context.

The assessment is based on (i) theoretical noise prediction methods that conform to the Ministry of the Environment, Conservation and Parks (MECP) requirements; (ii) future vehicular traffic volumes based on projected roadway traffic counts; (iii) train information assumed from Gradient Wind's previous experience; and (iv) architectural drawings received from Kirkor Architects and Planners, dated September 15th, 2022.

The results of the current analysis indicate that POW noise levels will range between 52 and 71 dBA during the daytime period (07:00-23:00) and between 48 and 68 dBA during the nighttime period (23:00-07:00). The highest noise levels (i.e. 71 dBA) occur along the southeast façade of Building A, which is nearest and most exposed to Dundas Street East and the CP rail line.

The noise levels predicted due to roadway and railway traffic exceed the criteria listed in Section 4.2 for building components. Upgraded building components, including STC rated glazing elements and exterior walls, will be required as described in Section 5.2 and indicated in Figure 3. Results of the calculations also indicate that Buildings A and D in the development will require central air conditioning, whereas Building B will require forced air heating with provisions for central air conditioning. This will allow occupants to keep windows closed and maintain a comfortable living/working environment. As noise levels remain below 55dBA for Building C, no ventilation requirements or Warning Clauses are recommended for noise mitigation purposes. Warning clauses are also required as per CP requirements, due to proximity of the proposed development to these railways, as summarized in Section 6.

Noise levels predicted due to roadway and railway traffic exceed the criteria listed in the NPC-300 at the Outdoor Living Areas (OLA) in the development. Therefore, noise control measures will be required to reduce the Leq to under 55 dBA. Results indicate that the noise level at the Building A Level 8 and Level



10 west terraces can be reduced to below 55 dBA if a 1.1m tall noise barrier is used. Results also indicate that the noise levels at the Building B and D rear yards can be reduced to below 55 dBA if a 2.2m high noise barrier is utilized.

Stationary noise impacts from the surroundings onto the proposed development are expected to be negligible as it is not in close proximity to any large mechanical equipment. To the east, north and west are low rise residential buildings and a cemetery. Across Dundas Street to the south are commercial / retail operations. Noise from associated mechanical equipment servicing surrounding buildings are expected to be attenuated by the setback distance, and masked by background noise levels due to Dundas Street East.

With regards to off-site stationary noise impacts and the impacts of the building on itself, the proposed mechanical systems will be designed to comply with the NPC-300 sound level limits. This will evolve the judicious selection and placement of the equipment and the introduction of silencers or noise screens where needed. A stationary noise study will be performed once mechanical plans for the proposed building become available.

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1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by KJC Properties Inc. to undertake a transportation noise assessment to satisfy the City of Mississauga's site development submission requirements for the proposed multi-building development located at 805 Dundas Street East in Mississauga, Ontario. This report summarizes the methodology, results, and recommendations related to a transportation noise assessment investigating exterior noise levels generated by local roadway and railway traffic.

The assessment was performed based on theoretical noise calculation methods conforming to the Ministry of the Environment, Conservation and Parks (MECP) NPC-300 guidelines. Noise calculations were based on architectural drawings received from Kirkor Architects and Planners, dated September 15th, 2022.

2. TERMS OF REFERENCE

The focus of this transportation noise study is the proposed mixed-use development located at 805 Dundas Street East in Mississauga, Ontario. The study site is situated on a plot of land bounded by Dundas Street East to the southeast, Cedar Creek Lane to the southwest, Haines Road to the northeast, and existing three-storey townhouses to the northwest.

The proposed development comprises a 12-storey mixed-use residential building (Building 'A') and three 3-storey townhouse buildings (Buildings 'B', 'C', and 'D' which comprise of 6, 8, and 6 townhouse units respectively) located to the north of Building A (relative to project north). All developments are accessible via a driveway connecting to Haines Road. Surface parking, two levels of below-grade parking, and a loading zone are also accessible via the noted driveway. Building A comprises two residential lobbies: one located near the southeast corner, and the second is located near the southwest corner. Retail entrances are present along the inner north façade and the south façade. Buildings B, C, and D are all accessed through private residential entrances along the south elevation. At Level 2 the building steps back from the inner north façade to provide an outdoor amenity terrace. The outdoor amenity terrace is accompanied by an attached indoor amenity space, while the rest of the floor, and the remainder of the building above, comprises residential occupancy. Above Level 2 the building rises with a uniform floor

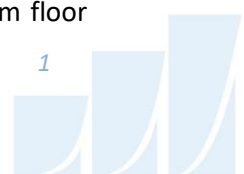


plate to Level 12 with additional step backs from the northeast and northwest segments at Levels 8 and 10. Above Level 12, the building is topped with two mechanical penthouses on the southwest and southeast corners of the building.

3. OBJECTIVES

The main goals of this work are to (i) calculate the future noise levels on the study building produced by local transportation sources, (ii) determine whether exterior noise levels exceed the allowable limits specified by the MECP Noise Control Guidelines – NPC-300, and (iii) explore mitigation as required.

4. METHODOLOGY

4.1 Background

Noise can be defined as any obtrusive sound. It is created at a source, transmitted through a medium, such as air, and intercepted by a receiver. Noise may be characterized in terms of the power of the source or the sound pressure at a specific distance. While the power of a source is characteristic of that particular source, the sound pressure depends on the location of the receiver and the path that the noise takes to reach the receiver. Measurement of noise is based on the decibel unit, dBA, which is a logarithmic ratio referenced to a standard noise level (2×10^{-5} Pascals). The 'A' suffix refers to a weighting scale, which better represents how the noise is perceived by the human ear. With this scale, a doubling of power results in a 3 dBA increase in measured noise levels and is just perceptible to most people. An increase of 10 dBA is often perceived to be twice as loud.

4.2 Transportation Noise

4.2.1 Criteria for Transportation Noise

For vehicle traffic, the equivalent sound energy level, L_{eq} , provides a measure of the time varying noise levels, which is well correlated with the annoyance of sound. It is defined as the continuous sound level, which has the same energy as a time varying noise level over a period of time. For roadways, the L_{eq} is commonly calculated on the basis of a 16-hour (L_{eq16}) daytime (07:00-23:00)/8-hour (L_{eq8}) nighttime (23:00-07:00) split to assess its impact on residential buildings. The NPC-300 guidelines specify that the recommended indoor noise limit range (that is relevant to this study) is 50, 45 and 40 dBA for office space,



residence living rooms and sleeping quarters respectively, as listed in Table 1. However, to account for deficiencies in building construction and to control peak noise, these levels should be targeted toward 47, 42 and 37 dBA. Indoor noise levels due to railway traffic are 5 dBA lower and should be targeted toward 42, 37, and 32 dBA.

TABLE 1: INDOOR SOUND LEVEL CRITERIA (ROAD) ¹

Type of Space	Time Period	L _{eq} (dBA)	
		Road	Rail
General offices, reception areas, retail stores, etc.	07:00 – 23:00	50	45
Living/dining/den areas of residences , hospitals, schools, nursing/retirement homes, day-care centres, theatres, places of worship, libraries, individual or semi-private offices, conference rooms, etc.	07:00 – 23:00	45	40
Sleeping quarters of hotels/motels	23:00 – 07:00	45	40
Sleeping quarters of residences , hospitals, nursing/retirement homes, etc.	23:00 – 07:00	40	35

Predicted noise levels at the plane of window (POW) dictate the action required to achieve the recommended sound levels. An open window is considered to provide a 10 dBA reduction in noise while a standard closed window is capable of providing a minimum 20 dBA noise reduction². Therefore, where noise levels exceed 55 dBA daytime and 50 dBA nighttime, the ventilation for the building should consider the need for having windows and doors closed, which normally triggers the need for central air conditioning (or similar systems). Where noise levels exceed 65 dBA daytime and 60 dBA nighttime building components will require higher levels of sound attenuation³.

Due to the characteristics of rail noise which occur over short periods (i.e. whistles, brake squealing), and a significant low frequency component produced by the movement of the locomotive along the track, road and rail traffic noise require separate analyses, particularly when assessing indoor sound levels. In

¹ Adapted from Table C-2, Part C, Section 3.2.3 of NPC-300

² Burberry, P.B. (2014). Mitchell’s Environment and Services. Routledge, Page 125

³ MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3



order to account for the special characteristics of railway sound, the indoor sound level criteria is more stringent by 5 dBA as compared to the roadway traffic criteria. This difference typically results in requirements for upgraded glazing elements to provide better noise attenuation from the building envelope. Interior noise level criteria include the influence from rail crossings and warning whistle bursts. As there are no level crossings in the vicinity of the study building, whistle noise was excluded from analysis.

For designated Outdoor Living Areas (OLAs), the sound level limit is 55 dBA during the daytime period. An excess of up to 5 dBA above the limit is acceptable only in cases where the required noise control measures are not feasible for technical, economic, or administrative reasons. In cases where noise levels at an OLA exceed 60 dBA, mitigation must be provided, were technically and administratively feasible. This development proposes multiple outdoor amenities that were identified in this study as OLAs: the Level 8 and 10 West and east terraces, the Level 2 outdoor amenity area and the rear yards for Buildings B-D .

4.2.2 Roadway and Railway Traffic Volumes

NPC-300 dictates that noise calculations should consider future sound levels based on a roadway's classification at the mature state of development. Therefore, roadway traffic volumes have been considered for the mature state of development based on information received from the City of Mississauga. As the City does not have the information for Haines Road, theoretical capacity was used in lieu of that information. Gradient Wind contacted the traffic consultant for this project, Crozier Consulting Engineers, and confirmed that the AADT information used is conservative. Appendix B contains the information obtained by the City of Mississauga and the correspondence with Crozier Consulting Engineers.

Rail information is based on Gradient Wind's previous experience, as CP rail no longer provides rail forecast to the public. Table 2 (below) summarizes the AADT values used for each roadway and railway line included in this assessment.

TABLE 2: ROADWAY AND RAILWAY TRAFFIC DATA

Segment	Roadway/Transit Type	Speed Limit (km/h)	Projected 2031 AADT Count
Dundas Street East	4 Lane Arterial	60	39,000
Haines	2-Lane Collector	50	8,000**
Canadian Pacific Railway	Railway	80	11/8*
Go Rail Line	Railway	113	23/0*

* - Daytime/nighttime volumes

** - Theoretical Capacity

4.2.3 Theoretical Transportation Noise Predictions

When an area is influenced by road and rail traffic, the criteria requires the outdoor noise impact from each source to be examined for comparison to respective criterion. Noise predictions were performed with the aid of the MECP computerized noise assessment program, STAMSON 5.04, for road analysis. Appendix A includes the STAMSON 5.04 input and output data. Roadway traffic noise calculations were performed by treating each roadway segment as separate line sources of noise. The impact from railway noise is then combined with roadway predictions using a logarithmic addition at each point of reception and compared to the relevant criteria.

In addition to the roadway and railway volumes summarized in Table 2, theoretical noise predictions were also based on the following parameters:

- Truck traffic on Haines Road was taken to comprise 5% heavy trucks and 7% medium trucks.
- Truck traffic on Dundas Street East was taken to comprise 2.2% heavy trucks and 1.8% medium trucks.
- The day/night split for all streets was taken to be 90%/10%, respectively.
- Reflective intermediate ground surfaces were assumed.
- Receptor heights are noted in Table 3.
- The study site was treated as having gently sloping topography.

- Noise receptors were strategically placed at 15 locations around the study area, as illustrated in Figure 2.
- CP rails were modeled with an average of 164 cars and 4 locomotives per train (80 km/h)
- For GO Transit, one locomotive was modelled per train, with an average of 13 cars and 1 locomotive per train (113 km/h).
- Rail lines are assumed to not be welded along the corridor next to the study site.
- Whistle events were not considered as there are no level crossings.

The noise generated from both on-road and railway traffic were combined for the 15 receptor locations identified in Figure 2. The combined outdoor noise levels from both road and rail were compared to the appropriate NPC-300 criteria stipulated in Table C-2 of the guideline.

5. RESULTS AND DISCUSSION

5.1 Transportation Noise Levels

The results of the roadway noise calculations are summarized in Table 3 below.

TABLE 3: EXTERIOR NOISE LEVELS DUE TO TRANSPORTATION SOURCES

Receptor Number	Receptor Height (m)	Receptor Location / Type	Roadway Noise Level (dBA)		Railway Noise Level (dBA)		Total Noise Level (dBA)	
			Day	Night	Day	Night	Day	Night
1	42	POW – Building A – East	67	60	61	61	68	64
2	42	POW – Building A – Northeast	68	61	63	64	69	66
3	42	POW – Building A – Southeast	69	63	66	66	71	68
4	42	POW – Building A – Southwest	66	59	64	64	68	65
5	7.7	POW – Building D – Northeast	66	59	53	54	66	60
6	7.7	POW – Building D – Southeast	64	57	54	54	64	59
7	7.7	POW – Building C – Southeast	50	44	46	46	52	48
8	7.7	POW – Building B – Southwest	60	54	54	55	61	57
9	32	OLA – Terrace at Level 10 - West	50	n/a*	59	n/a*	59	n/a*
10	25.7	OLA – Terrace at Level 8 - West	51	n/a*	59	n/a*	60	n/a*
11	6.5	OLA – Outdoor Amenity at Level 2	46	n/a*	45	n/a*	48	n/a*
12	32	OLA – Terrace at Level 10 - East	47	n/a*	45	n/a*	50	n/a*
13	25.7	OLA – Terrace at Level 10 - East	46	n/a*	46	n/a*	49	n/a*
14	1.5	OLA – Building D Rear Yard	56	n/a*	-	n/a*	56	n/a*
15	1.5	OLA – Building B Rear Yard	54	n/a*	56	n/a*	58	n/a*

* Nighttime noise levels are not considered at OLA receptors, per NPC-300 guidelines

The results of the current analysis indicate that POW noise levels will range between 52 and 71 dBA during the daytime period (07:00-23:00) and between 48 and 68 dBA during the nighttime period (23:00-07:00).

The highest noise levels (i.e. 71 dBA) occur along the southeast façade of Building A, which is nearest and most exposed to Dundas Street and the CP rail line.

The noise levels predicted due to roadway and railway traffic exceed the criteria listed in Section 4.2 for building components. Upgraded building components, including STC rated glazing elements and exterior walls, will be required where noise levels exceed 60 dBA (rail) and 65 dBA (road), as discussed in Section 4. Results of the calculations also indicate that Buildings A and D in the development will require central air conditioning, whereas Building B will require forced air heating with provisions for central air conditioning. This will allow occupants to keep windows closed and maintain a comfortable living/working environment. In addition to ventilation requirements, Warning Clauses will also be required be placed on all Lease, Purchase and Sale Agreements for Buildings A, B, and D, as summarized in Section 6. As noise levels remain below 55 dBA for Building C, no ventilation requirements or Warning Clauses are proposed for noise mitigation purposes.

Noise levels predicted due to roadway and railway traffic exceed the criteria listed in the NPC-300 at the Outdoor Living Areas (OLA) at the Level 8 and 10 western terraces in Building A and the rear yards of Buildings B and D. Therefore, noise control measures will be required to reduce the noise levels to under 60 dBA, and as close to 55 dBA as technically and administratively feasible. Investigation into the mitigating effect of a noise barriers is summarized in Section 5.2.2.

5.2 Noise Control Measures

5.2.1 Upgraded Building Components

The noise levels predicted due to roadway traffic exceed the criteria listed in Section 4 for building components. At the time of this study which was prepared for a ZBA application, window schedules, wall assemblies, and room layouts have not been finalized. Therefore, detailed STC calculations could not be performed at this time. The anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space ($STC = \text{outdoor noise level} - \text{targeted indoor noise levels}$). The estimated STC requirements for the windows are summarized below for various units within the development (see Figure 3):

TABLE 4: STC RECOMMENDATIONS

Building	Façade	Window STC (Bedroom/Living Room/Retail)	Exterior Wall STC
Building A	East	36/31/26	45
Building A	Northeast	37/32/27	45
Building A	Southeast	39/34/29	45
Building A	Southwest	36/31/26	45
Building D	Northeast	29/25/25	45

The STC requirements apply to windows, doors, spandrel panels and curtainwall elements. Exterior wall components on these façades are recommended to have a minimum STC of 45, where a stud wall system is used. A review of window supplier literature indicates that the specified STC ratings can be achieved by a variety of window systems having a combination of glass thickness and inter-pane spacing. It is the responsibility of the manufacturer to ensure that the specified window achieves the required STC. This can only be assured by using window configurations that have been certified by laboratory testing. The requirements for STC ratings assume that the remaining components of the building are constructed and installed according to the minimum standards of the Ontario Building Code. The specified STC requirements also apply to swinging and/or sliding patio doors.

5.2.2 Noise Barrier Investigation

Various barrier heights were tested, with the barrier located along the perimeters of the amenity areas, as indicated in Figure 4. Results indicate that the noise level at the Level 8 and Level 10 West Terraces can be reduced to below 55 dBA if a 1.1m noise barrier is used. Results also indicate that the noise levels at the Building B and D rear yards can be reduced to below 55 dBA if a 2.2m noise barrier is utilized. The results can be seen in Table 5:

TABLE 5: RESULTS OF NOISE BARRIER INVESTIGATION

Receptor ID	Location	Receptor Height Above Grade (m)	Daytime L _{eq} Noise Levels (dBA)	
			No Barrier	With 2.2m Barrier
R14	Building D Rear Yard	1.5	56	50
R15	Building B Rear Yard	1.5	57	52

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that POW noise levels will range between 52 and 71 dBA during the daytime period (07:00-23:00) and between 48 and 68 dBA during the nighttime period (23:00-07:00). The highest noise levels (i.e. 71 dBA) occur along the southeast façade of Building A, which is nearest and most exposed to Dundas Street and the CP rail line. The noise levels predicted due to roadway and railway traffic exceed the criteria listed in Section 4.2 for building components. Upgraded building components, including STC rated glazing elements and exterior walls, will be required as described in Section 5.2 and indicated in Figure 3.

Results of the calculations also indicate that Buildings A and D in the development will require central air conditioning, whereas Building B will require forced air heating with provisions for central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. As noise levels remain below 55 dBA for Building C, no ventilation requirements or Warning Clauses are proposed for noise mitigation purposes. The following Type D Warning Clause⁴ will also be required to be placed on all Lease, Purchase and Sale Agreements for Buildings A and D, as summarized below:

Type D:

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

⁴ Ministry of the Environment, Conservation and Parks - Publication NPC-300

The following Type C Warning Clause⁵ will also be required to be placed on all Lease, Purchase and Sale Agreements for Building B, as summarized below:

Type C:

"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."

Noise levels predicted due to roadway and railway traffic exceed the criteria listed in the NPC-300 at the Outdoor Living Areas (OLA) in the development. Therefore, noise control measures will be required to reduce the Leq to under 60 dBA. Results indicate that the noise level at the Building A Level 8 and Level 10 west terraces can be reduced to below 55 dBA if a 1.1m noise barrier is used. Results also indicate that the noise levels at the Building B and D rear yards can be reduced to below 55 dBA if a 2.2m noise barrier is utilized.

The following warning clauses are required as per CP requirements, due to proximity of the proposed development to these railways:

CP:

"Canadian Pacific Railway and/or its assigns or successors in interest has or have a railway right-of-way and/or yard located adjacent to the subject land hereof with operations conducted 24 hours a day, 7 days a week, including the shunting of trains and the idling of locomotives. There may be alterations to, or expansions of, the railway facilities and/or operations in the future, which alterations or expansions may affect the living environment of the residents in the vicinity. Notwithstanding the inclusion of any noise and/or vibration attenuating measures in the design of the development and individual dwellings, Canadian Pacific Railway will not be responsible for

⁵ Ministry of the Environment, Conservation and Parks - Publication NPC-300

complaints or claims arising from the use of its facilities and/or its operations on, over, or under the aforesaid right-of-way and/or yard.”

Stationary noise impacts from the surroundings onto the proposed development are expected to be negligible as it is not in close proximity to any large mechanical equipment. To the east, north and west are low rise residential buildings and a cemetery. Across Dundas Street to the south are commercial / retail operations. Noise from associated mechanical equipment servicing surrounding buildings is expected to be attenuated by the setback distance and masked by background noise levels due to Dundas Street East.

With regards to off-site stationary noise impacts and the impacts of the building on itself, the proposed mechanical systems will be designed to comply with the NPC-300 sound level limits. This will involve the judicious selection and placement of the equipment and the introduction of silencers or noise screens where needed. A stationary noise study will be performed once mechanical plans for the proposed building become available.

This concludes our assessment and report. If you have any questions or wish to discuss our findings, please advise us. In the interim, we thank you for the opportunity to be of service.

Sincerely,

Gradient Wind Engineering Inc.

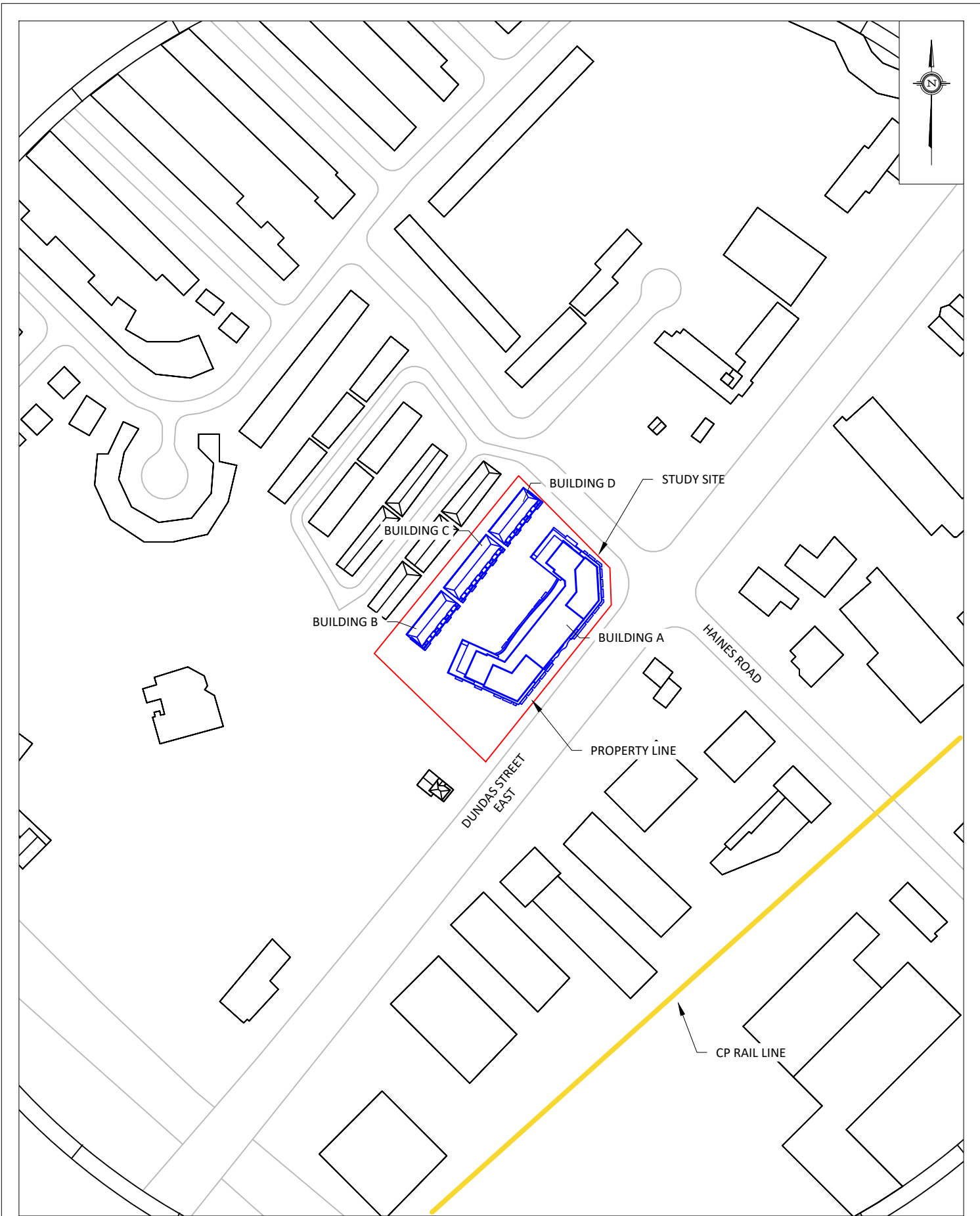


Essraa Alqassab, BASc
Junior Environmental Scientist

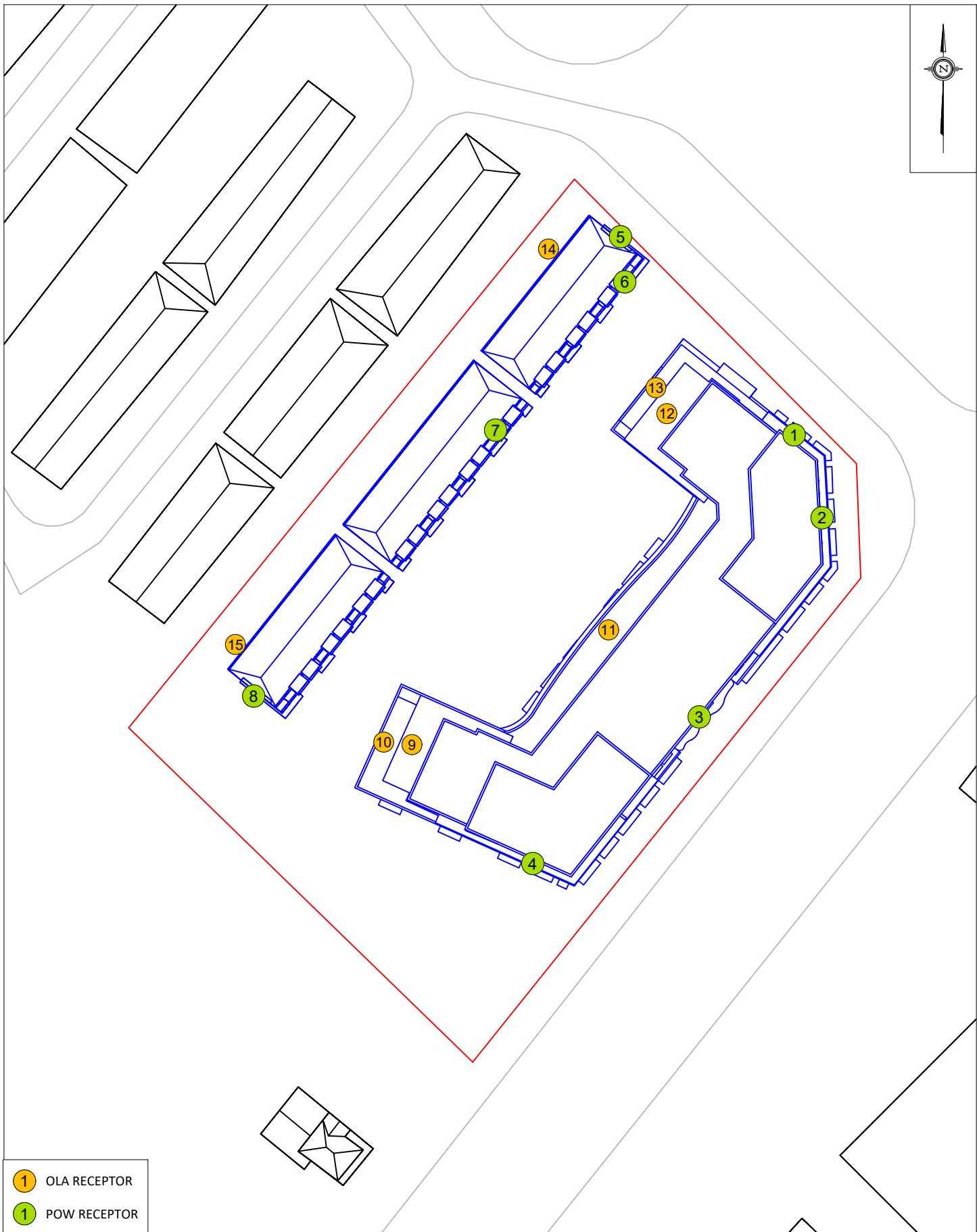
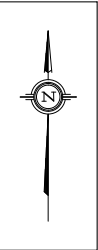


Joshua Foster, P.Eng.
Lead Engineer

Gradient Wind File No. 22-164 – Transportation Noise R1

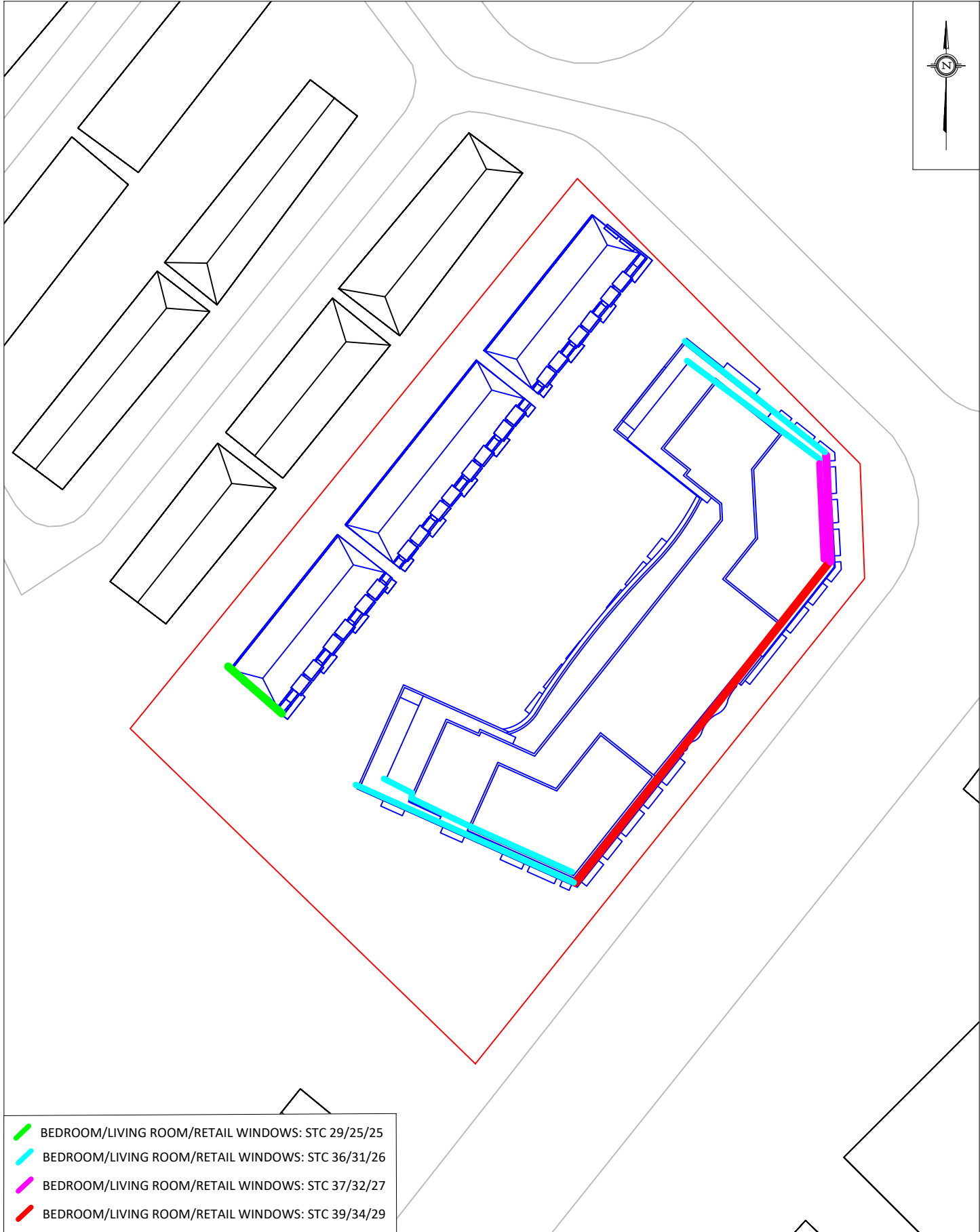
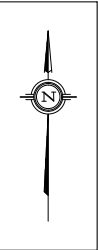


PROJECT	805 DUNDAS STREET EAST ROADWAY TRAFFIC ASSESSMENT	
SCALE	1:3000 (APPROX.)	DRAWING NO. GW22-164-1
DATE	SEPTEMBER 1, 2022	DRAWN BY E.A.



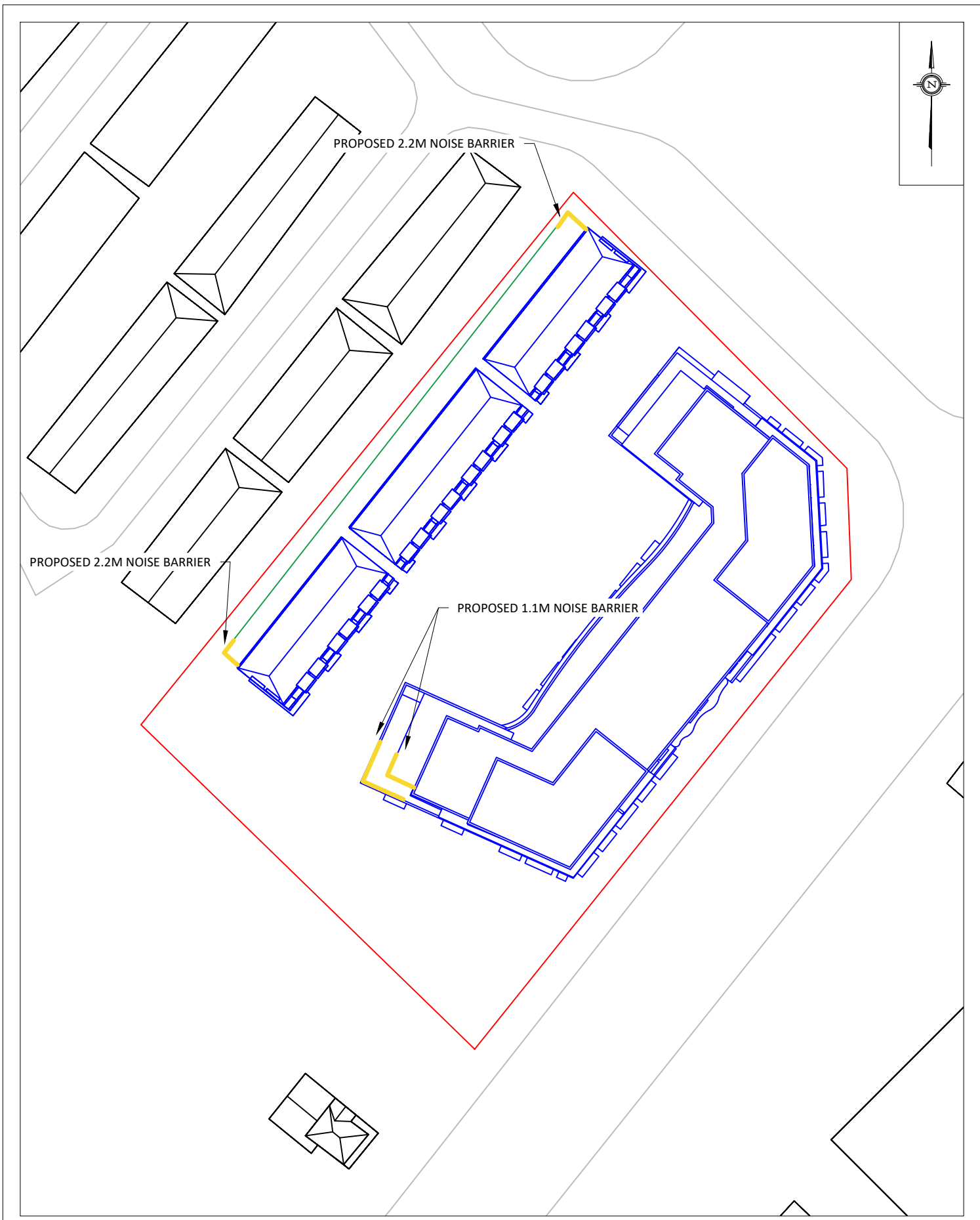
- 1 OLA RECEPTOR
- 1 POW RECEPTOR

PROJECT	805 DUNDAS STREET EAST ROADWAY TRAFFIC ASSESSMENT	
SCALE	1:1000 (APPROX.)	DRAWING NO. GW22-164-2
DATE	SEPTEMBER 1, 2022	DRAWN BY E.A.



- █ BEDROOM/LIVING ROOM/RETAIL WINDOWS: STC 29/25/25
- █ BEDROOM/LIVING ROOM/RETAIL WINDOWS: STC 36/31/26
- █ BEDROOM/LIVING ROOM/RETAIL WINDOWS: STC 37/32/27
- █ BEDROOM/LIVING ROOM/RETAIL WINDOWS: STC 39/34/29

PROJECT	805 DUNDAS STREET EAST TRANSPORTATION NOISE ASSESSMENT	
SCALE	1:1000 (APPROX.)	DRAWING NO. GW22-164-3
DATE	MAY 23, 2023	DRAWN BY E.A.



GRADIENTWIND ENGINEERS & SCIENTISTS 127 WALGREEN ROAD, OTTAWA, ON 613 836 0934 • GRADIENTWIND.COM	PROJECT	805 DUNDAS STREET EAST ROADWAY TRAFFIC ASSESSMENT	DESCRIPTION
	SCALE	1:1000 (APPROX.)	DRAWING NO. GW22-164-4
	DATE	SEPTEMBER 1, 2022	DRAWN BY E.A.

FIGURE 4:
NOISE BARRIER RECOMMENDATION

GRADIENTWIND

ENGINEERS & SCIENTISTS



APPENDIX A

STAMSON 5.04 – INPUT AND OUTPUT DATA

GRADIENTWIND

ENGINEERS & SCIENTISTS

STAMSON 5.0 NORMAL REPORT Date: 23-05-2023 09:55:34
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r1.te Time Period: Day/Night 16/8 hours
 Description:

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

Train Type	! Trains !	! Speed ! (km/h)	!# loc ! /Train!	!# Cars ! /Train!	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. Go	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

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

```

-----
Angle1    Angle2                    : -90.00 deg    0.00 deg
Wood depth                        :            0            (No woods.)
No of house rows                   :            0 / 0
Surface                            :            2            (Reflective ground surface)
Receiver source distance          : 230.00 / 230.00 m
Receiver height                    : 42.00 / 42.00 m
Topography                         :            2            (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1                     : -90.00 deg    Angle2 : 0.00 deg
Barrier height                     :            6.00 m
Barrier receiver distance         : 207.00 / 207.00 m
Source elevation                   :            0.00 m
Receiver elevation                 :            0.00 m
Barrier elevation                  :            0.00 m
Reference angle                    :            0.00
  
```

Results segment # 1: Rail (day)

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
4.00	! 42.00	! 7.80	! 7.80
0.50	! 42.00	! 4.65	! 4.65

LOCOMOTIVE (0.00 + 60.57 + 0.00) = 60.57 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	75.43	-11.86	-3.01	0.00	0.00	-1.39	59.18*
-90	0	0.00	75.43	-11.86	-3.01	0.00	0.00	0.00	60.57



GRADIENTWIND

ENGINEERS & SCIENTISTS

* Bright Zone !

WHEEL (0.00 + 50.48 + 0.00) = 50.48 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	71.54	-11.86	-3.01	0.00	0.00	-6.20	50.48

Segment Leq : 60.98 dBA

Total Leq All Segments: 60.98 dBA

Results segment # 1: Rail (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00 !	42.00 !	7.80 !	7.80
0.50 !	42.00 !	4.65 !	4.65

LOCOMOTIVE (0.00 + 61.00 + 0.00) = 61.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	75.86	-11.86	-3.01	0.00	0.00	-1.39	59.61*
-90	0	0.00	75.86	-11.86	-3.01	0.00	0.00	0.00	61.00

* Bright Zone !

WHEEL (0.00 + 50.97 + 0.00) = 50.97 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	72.03	-11.86	-3.01	0.00	0.00	-6.20	50.97

Segment Leq : 61.41 dBA

Total Leq All Segments: 61.41 dBA

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

Car traffic volume	:	6477/563	veh/TimePeriod
Medium truck volume	:	515/45	veh/TimePeriod
Heavy truck volume	:	368/32	veh/TimePeriod



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Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

Angle1 Angle2 : -72.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 19.00 / 19.00 m
Receiver height : 42.00 / 42.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 33696/3744 veh/TimePeriod *
Medium truck volume : 632/70 veh/TimePeriod *
Heavy truck volume : 772/86 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 39000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.80
Heavy Truck % of Total Volume : 2.20
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Dundas (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 46.00 / 46.00 m
Receiver height : 42.00 / 42.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Haines (day)

Source height = 1.50 m



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ROAD (0.00 + 64.27 + 0.00) = 64.27 dBA

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

--									
-72	90	0.00	65.75	0.00	-1.03	-0.46	0.00	0.00	0.00
64.27									

Segment Leq : 64.27 dBA

Results segment # 2: Dundas (day)

Source height = 1.22 m

ROAD (0.00 + 63.44 + 0.00) = 63.44 dBA

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

--									
-90	0	0.00	71.32	0.00	-4.87	-3.01	0.00	0.00	0.00
63.44									

Segment Leq : 63.44 dBA

Total Leq All Segments: 66.89 dBA

Results segment # 1: Haines (night)

Source height = 1.50 m

ROAD (0.00 + 56.67 + 0.00) = 56.67 dBA

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

--									
-72	90	0.00	58.16	0.00	-1.03	-0.46	0.00	0.00	0.00
56.67									

Segment Leq : 56.67 dBA

Results segment # 2: Dundas (night)

 Source height = 1.22 m

ROAD (0.00 + 56.91 + 0.00) = 56.91 dBA

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

--									
-90	0	0.00	64.79	0.00	-4.87	-3.01	0.00	0.00	0.00
56.91									

 --
 Segment Leq : 56.91 dBA

Total Leq All Segments: 59.80 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.88
 (NIGHT): 63.69



GRADIENTWIND

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STAMSON 5.0 NORMAL REPORT Date: 23-05-2023 09:57:22
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2.te Time Period: Day/Night 16/8 hours
 Description:

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

Train Type	! Trains !	! Speed ! (km/h)	!# loc ! /Train	!# Cars ! /Train	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

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

```

-----
Angle1    Angle2                    : -90.00 deg    48.00 deg
Wood depth                        :            0            (No woods.)
No of house rows                   :            0 / 0
Surface                             :            2            (Reflective ground surface)
Receiver source distance           : 214.00 / 214.00 m
Receiver height                    : 42.00 / 42.00 m
Topography                         :            2            (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1                     : -90.00 deg    Angle2 : 48.00 deg
Barrier height                     :            6.00 m
Barrier receiver distance          : 192.00 / 192.00 m
Source elevation                   :            0.00 m
Receiver elevation                 :            0.00 m
Barrier elevation                   :            0.00 m
Reference angle                    :            0.00
  
```

Results segment # 1: Rail (day)

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
4.00	! 42.00	! 7.91	! 7.91
0.50	! 42.00	! 4.77	! 4.77

LOCOMOTIVE (0.00 + 62.74 + 0.00) = 62.74 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	75.43	-11.54	-1.15	0.00	0.00	-0.71	62.03*
-90	48	0.00	75.43	-11.54	-1.15	0.00	0.00	0.00	62.74



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* Bright Zone !

WHEEL (0.00 + 52.64 + 0.00) = 52.64 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	71.54	-11.54	-1.15	0.00	0.00	-6.21	52.64

Segment Leq : 63.14 dBA

Total Leq All Segments: 63.14 dBA

Results segment # 1: Rail (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	42.00	7.91	7.91
0.50	42.00	4.77	4.77

LOCOMOTIVE (0.00 + 63.17 + 0.00) = 63.17 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	75.86	-11.54	-1.15	0.00	0.00	-0.71	62.46*
-90	48	0.00	75.86	-11.54	-1.15	0.00	0.00	0.00	63.17

* Bright Zone !

WHEEL (0.00 + 53.13 + 0.00) = 53.13 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	72.03	-11.54	-1.15	0.00	0.00	-6.21	53.13

Segment Leq : 63.58 dBA

Total Leq All Segments: 63.58 dBA

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

Car traffic volume	:	6477/563	veh/TimePeriod
Medium truck volume	:	515/45	veh/TimePeriod
Heavy truck volume	:	368/32	veh/TimePeriod



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Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

Angle1 Angle2 : -48.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 27.00 / 27.00 m
Receiver height : 42.00 / 42.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 33696/3744 veh/TimePeriod *
Medium truck volume : 632/70 veh/TimePeriod *
Heavy truck volume : 772/86 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 39000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.80
Heavy Truck % of Total Volume : 2.20
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Dundas (day/night)

Angle1 Angle2 : -90.00 deg 48.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 31.00 / 31.00 m
Receiver height : 42.00 / 42.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Haines (day)

Source height = 1.50 m



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ROAD (0.00 + 62.04 + 0.00) = 62.04 dBA

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

--
-48 90 0.00 65.75 0.00 -2.55 -1.15 0.00 0.00 0.00
62.04

--

Segment Leq : 62.04 dBA

Results segment # 2: Dundas (day)

Source height = 1.22 m

ROAD (0.00 + 67.01 + 0.00) = 67.01 dBA

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

--
-90 48 0.00 71.32 0.00 -3.15 -1.15 0.00 0.00 0.00
67.01

--

Segment Leq : 67.01 dBA

Total Leq All Segments: 68.21 dBA

Results segment # 1: Haines (night)

Source height = 1.50 m

ROAD (0.00 + 54.45 + 0.00) = 54.45 dBA

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

--
-48 90 0.00 58.16 0.00 -2.55 -1.15 0.00 0.00 0.00
54.45

--

Segment Leq : 54.45 dBA

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Results segment # 2: Dundas (night)

Source height = 1.22 m

ROAD (0.00 + 60.48 + 0.00) = 60.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------

SubLeq

--
-90 48 0.00 64.79 0.00 -3.15 -1.15 0.00 0.00 0.00
60.48

--

Segment Leq : 60.48 dBA

Total Leq All Segments: 61.45 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.39
(NIGHT): 65.65



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STAMSON 5.0 NORMAL REPORT Date: 23-05-2023 09:58:43
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r3.te Time Period: Day/Night 16/8 hours
 Description:

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

Train Type	! Trains !	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

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

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 202.00 / 202.00 m
 Receiver height : 42.00 / 42.00 m
 Topography : 2 (Flat/gentle slope; with barrier)
 No Whistle
 Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
 Barrier height : 6.00 m
 Barrier receiver distance : 167.00 / 167.00 m
 Source elevation : 0.00 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m
 Reference angle : 0.00

Results segment # 1: Rail (day)

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
4.00	! 42.00	! 10.58	! 10.58
0.50	! 42.00	! 7.69	! 7.69

LOCOMOTIVE (0.00 + 64.14 + 0.00) = 64.14 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.43	-11.29	0.00	0.00	0.00	-0.24	63.90*
-90	90	0.00	75.43	-11.29	0.00	0.00	0.00	0.00	64.14



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* Bright Zone !

WHEEL (0.00 + 60.25 + 0.00) = 60.25 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	71.54	-11.29	0.00	0.00	0.00	-3.00	57.25*
-90	90	0.00	71.54	-11.29	0.00	0.00	0.00	0.00	60.25

* Bright Zone !

Segment Leq : 65.63 dBA

Total Leq All Segments: 65.63 dBA

Results segment # 1: Rail (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00 !	42.00 !	10.58 !	10.58
0.50 !	42.00 !	7.69 !	7.69

LOCOMOTIVE (0.00 + 64.57 + 0.00) = 64.57 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.86	-11.29	0.00	0.00	0.00	-0.24	64.33*
-90	90	0.00	75.86	-11.29	0.00	0.00	0.00	0.00	64.57

* Bright Zone !

WHEEL (0.00 + 60.74 + 0.00) = 60.74 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	72.03	-11.29	0.00	0.00	0.00	-3.00	57.74*
-90	90	0.00	72.03	-11.29	0.00	0.00	0.00	0.00	60.74

* Bright Zone !

Segment Leq : 66.07 dBA

Total Leq All Segments: 66.07 dBA



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

Car traffic volume : 6477/563 veh/TimePeriod
Medium truck volume : 515/45 veh/TimePeriod
Heavy truck volume : 368/32 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 71.00 / 71.00 m
Receiver height : 42.00 / 42.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 33696/3744 veh/TimePeriod *
Medium truck volume : 632/70 veh/TimePeriod *
Heavy truck volume : 772/86 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 39000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.80
Heavy Truck % of Total Volume : 2.20
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Dundas (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 25.00 / 25.00 m
Receiver height : 42.00 / 42.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00



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Results segment # 1: Haines (day)

Source height = 1.50 m

ROAD (0.00 + 55.99 + 0.00) = 55.99 dBA

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

--									
-90	0	0.00	65.75	0.00	-6.75	-3.01	0.00	0.00	0.00
55.99									

Segment Leq : 55.99 dBA

Results segment # 2: Dundas (day)

Source height = 1.22 m

ROAD (0.00 + 69.10 + 0.00) = 69.10 dBA

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

--									
-90	90	0.00	71.32	0.00	-2.22	0.00	0.00	0.00	0.00
69.10									

Segment Leq : 69.10 dBA

Total Leq All Segments: 69.31 dBA

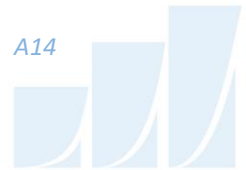
Results segment # 1: Haines (night)

Source height = 1.50 m

ROAD (0.00 + 48.40 + 0.00) = 48.40 dBA

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

--									
-90	0	0.00	58.16	0.00	-6.75	-3.01	0.00	0.00	0.00
48.40									



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Segment Leq : 48.40 dBA

Results segment # 2: Dundas (night)

Source height = 1.22 m

ROAD (0.00 + 62.57 + 0.00) = 62.57 dBA

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

--									
-90	90	0.00	64.79	0.00	-2.22	0.00	0.00	0.00	0.00
62.57									

--
Segment Leq : 62.57 dBA

Total Leq All Segments: 62.73 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 70.86
(NIGHT): 67.72



GRADIENTWIND

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STAMSON 5.0 NORMAL REPORT Date: 23-05-2023 10:00:39
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r4.te Time Period: Day/Night 16/8 hours
 Description:

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

Train Type	! Trains !	! Speed ! (km/h)	!# loc ! /Train	!# Cars ! /Train	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

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

Angle1 Angle2 : -21.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 202.00 / 202.00 m
 Receiver height : 42.00 / 42.00 m
 Topography : 2 (Flat/gentle slope; with barrier)
 No Whistle
 Barrier angle1 : -21.00 deg Angle2 : 90.00 deg
 Barrier height : 6.00 m
 Barrier receiver distance : 169.00 / 169.00 m
 Source elevation : 0.00 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m
 Reference angle : 0.00

Results segment # 1: Rail (day)

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
4.00	! 42.00	! 10.21	! 10.21
0.50	! 42.00	! 7.28	! 7.28

LOCOMOTIVE (0.00 + 62.04 + 0.00) = 62.04 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-21	90	0.00	75.43	-11.29	-2.10	0.00	0.00	-0.22	61.82*
-21	90	0.00	75.43	-11.29	-2.10	0.00	0.00	0.00	62.04



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* Bright Zone !

WHEEL (0.00 + 58.15 + 0.00) = 58.15 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-21	90	0.00	71.54	-11.29	-2.10	0.00	0.00	-3.81	54.35*
-21	90	0.00	71.54	-11.29	-2.10	0.00	0.00	0.00	58.15

* Bright Zone !

Segment Leq : 63.53 dBA

Total Leq All Segments: 63.53 dBA

Results segment # 1: Rail (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	42.00	10.21	10.21
0.50	42.00	7.28	7.28

LOCOMOTIVE (0.00 + 62.47 + 0.00) = 62.47 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-21	90	0.00	75.86	-11.29	-2.10	0.00	0.00	-0.22	62.25*
-21	90	0.00	75.86	-11.29	-2.10	0.00	0.00	0.00	62.47

* Bright Zone !

WHEEL (0.00 + 58.64 + 0.00) = 58.64 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-21	90	0.00	72.03	-11.29	-2.10	0.00	0.00	-3.81	54.84*
-21	90	0.00	72.03	-11.29	-2.10	0.00	0.00	0.00	58.64

* Bright Zone !

Segment Leq : 63.97 dBA

Total Leq All Segments: 63.97 dBA



GRADIENTWIND

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

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-----
Car traffic volume : 33696/3744 veh/TimePeriod *
Medium truck volume : 632/70 veh/TimePeriod *
Heavy truck volume : 772/86 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 39000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.80
Heavy Truck % of Total Volume : 2.20
Day (16 hrs) % of Total Volume : 90.00
```

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

```
-----
Angle1 Angle2 : -21.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 32.00 / 32.00 m
Receiver height : 42.00 / 42.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Results segment # 1: Dundas (day)

Source height = 1.22 m

ROAD (0.00 + 65.93 + 0.00) = 65.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-21	90	0.00	71.32	0.00	-3.29	-2.10	0.00	0.00	0.00

```
-----
--
65.93
-----
--
```

Segment Leq : 65.93 dBA

Total Leq All Segments: 65.93 dBA

Results segment # 1: Dundas (night)



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Source height = 1.22 m

ROAD (0.00 + 59.40 + 0.00) = 59.40 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------

SubLeq

--										
	-21	90	0.00	64.79	0.00	-3.29	-2.10	0.00	0.00	0.00
	59.40									

--

Segment Leq : 59.40 dBA

Total Leq All Segments: 59.40 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.90
(NIGHT): 65.27



GRADIENTWIND

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STAMSON 5.0 NORMAL REPORT Date: 23-05-2023 10:01:46
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5.te Time Period: Day/Night 16/8 hours
 Description:

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

Train Type	! Trains !	! Speed ! (km/h)	!# loc ! /Train!	!# Cars ! /Train!	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

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

 Angle1 Angle2 : -90.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 282.00 / 282.00 m
 Receiver height : 7.70 / 7.70 m
 Topography : 2 (Flat/gentle slope; with barrier)
 No Whistle
 Barrier angle1 : -90.00 deg Angle2 : 0.00 deg
 Barrier height : 6.00 m
 Barrier receiver distance : 259.00 / 259.00 m
 Source elevation : 0.00 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m
 Reference angle : 0.00

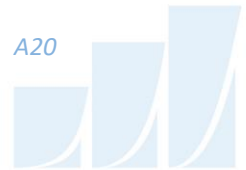
Results segment # 1: Rail (day)

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
4.00	! 7.70	! 4.30	! 4.30
0.50	! 7.70	! 1.09	! 1.09

LOCOMOTIVE (0.00 + 52.87 + 0.00) = 52.87 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	75.43	-12.74	-3.01	0.00	0.00	-6.81	52.87



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WHEEL (0.00 + 44.06 + 0.00) = 44.06 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	71.54	-12.74	-3.01	0.00	0.00	-11.74	44.06

Segment Leq : 53.41 dBA

Total Leq All Segments: 53.41 dBA

Results segment # 1: Rail (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	7.70	4.30	4.30
0.50	7.70	1.09	1.09

LOCOMOTIVE (0.00 + 53.31 + 0.00) = 53.31 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	75.86	-12.74	-3.01	0.00	0.00	-6.81	53.31

WHEEL (0.00 + 44.55 + 0.00) = 44.55 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	72.03	-12.74	-3.01	0.00	0.00	-11.74	44.55

Segment Leq : 53.85 dBA

Total Leq All Segments: 53.85 dBA

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

Car traffic volume : 6336/704 veh/TimePeriod *

Medium truck volume : 504/56 veh/TimePeriod *

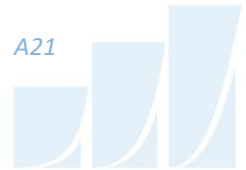
Heavy truck volume : 360/40 veh/TimePeriod *

Posted speed limit : 50 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

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



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24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -47.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 7.70 / 7.70 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 33696/3744 veh/TimePeriod *
Medium truck volume : 632/70 veh/TimePeriod *
Heavy truck volume : 772/86 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 39000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.80
Heavy Truck % of Total Volume : 2.20
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Dundas (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 97.00 / 97.00 m
Receiver height : 7.70 / 7.70 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Haines (day)



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Source height = 1.50 m

ROAD (0.00 + 64.47 + 0.00) = 64.47 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------

SubLeq

-47	90	0.00	65.65	0.00	0.00	-1.19	0.00	0.00	0.00
-----	----	------	-------	------	------	-------	------	------	------

64.47

Segment Leq : 64.47 dBA

Results segment # 2: Dundas (day)

Source height = 1.22 m

ROAD (0.00 + 60.20 + 0.00) = 60.20 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------

SubLeq

-90	0	0.00	71.32	0.00	-8.11	-3.01	0.00	0.00	0.00
-----	---	------	-------	------	-------	-------	------	------	------

60.20

Segment Leq : 60.20 dBA

Total Leq All Segments: 65.85 dBA

Results segment # 1: Haines (night)

Source height = 1.50 m

ROAD (0.00 + 57.94 + 0.00) = 57.94 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------

SubLeq

-47	90	0.00	59.12	0.00	0.00	-1.19	0.00	0.00	0.00
-----	----	------	-------	------	------	-------	------	------	------

57.94



Segment Leq : 57.94 dBA

Results segment # 2: Dundas (night)

Source height = 1.22 m

ROAD (0.00 + 53.67 + 0.00) = 53.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------

SubLeq

--									
-90	0	0.00	64.79	0.00	-8.11	-3.01	0.00	0.00	0.00
53.67									

--

Segment Leq : 53.67 dBA

Total Leq All Segments: 59.32 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.09
(NIGHT): 60.41



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STAMSON 5.0 NORMAL REPORT Date: 23-05-2023 10:04:21
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r6.te Time Period: Day/Night 16/8 hours
 Description:

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

Train Type	! Trains !	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

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

```

-----
Angle1    Angle2                    : -90.00 deg    0.00 deg
Wood depth                        :            0            (No woods.)
No of house rows                   :            0 / 0
Surface                            :            2            (Reflective ground surface)
Receiver source distance           : 275.00 / 275.00 m
Receiver height                    :    7.70 / 7.70    m
Topography                        :            2            (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1                     : -90.00 deg    Angle2 : 0.00 deg
Barrier height                     :    6.00 m
Barrier receiver distance          : 252.00 / 252.00 m
Source elevation                   :    0.00 m
Receiver elevation                 :    0.00 m
Barrier elevation                  :    0.00 m
Reference angle                    :    0.00
  
```

Results segment # 1: Rail (day)

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
4.00	! 7.70	! 4.31	! 4.31
0.50	! 7.70	! 1.10	! 1.10

LOCOMOTIVE (0.00 + 52.99 + 0.00) = 52.99 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	75.43	-12.63	-3.01	0.00	0.00	-6.80	52.99



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WHEEL (0.00 + 44.18 + 0.00) = 44.18 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	71.54	-12.63	-3.01	0.00	0.00	-11.72	44.18

Segment Leq : 53.53 dBA

Total Leq All Segments: 53.53 dBA

Results segment # 1: Rail (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	7.70	4.31	4.31
0.50	7.70	1.10	1.10

LOCOMOTIVE (0.00 + 53.43 + 0.00) = 53.43 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	75.86	-12.63	-3.01	0.00	0.00	-6.80	53.43

WHEEL (0.00 + 44.67 + 0.00) = 44.67 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	72.03	-12.63	-3.01	0.00	0.00	-11.72	44.67

Segment Leq : 53.97 dBA

Total Leq All Segments: 53.97 dBA

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

Car traffic volume : 6336/704 veh/TimePeriod *

Medium truck volume : 504/56 veh/TimePeriod *

Heavy truck volume : 360/40 veh/TimePeriod *

Posted speed limit : 50 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000

Percentage of Annual Growth : 0.00



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Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 21.00 / 21.00 m
Receiver height : 7.70 / 7.70 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 33696/3744 veh/TimePeriod *
Medium truck volume : 632/70 veh/TimePeriod *
Heavy truck volume : 772/86 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 39000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.80
Heavy Truck % of Total Volume : 2.20
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Dundas (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 90.00 / 90.00 m
Receiver height : 7.70 / 7.70 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Haines (day)

Source height = 1.50 m



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ROAD (0.00 + 61.18 + 0.00) = 61.18 dBA

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

--										
	0	90	0.00	65.65	0.00	-1.46	-3.01	0.00	0.00	0.00
61.18										

Segment Leq : 61.18 dBA

Results segment # 2: Dundas (day)

Source height = 1.22 m

ROAD (0.00 + 60.53 + 0.00) = 60.53 dBA

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

--										
	-90	0	0.00	71.32	0.00	-7.78	-3.01	0.00	0.00	0.00
60.53										

Segment Leq : 60.53 dBA

Total Leq All Segments: 63.88 dBA

Results segment # 1: Haines (night)

Source height = 1.50 m

ROAD (0.00 + 54.65 + 0.00) = 54.65 dBA

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

--										
	0	90	0.00	59.12	0.00	-1.46	-3.01	0.00	0.00	0.00
54.65										

Segment Leq : 54.65 dBA



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Results segment # 2: Dundas (night)

Source height = 1.22 m

ROAD (0.00 + 54.00 + 0.00) = 54.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------

SubLeq

--
-90 0 0.00 64.79 0.00 -7.78 -3.01 0.00 0.00 0.00
54.00

--

Segment Leq : 54.00 dBA

Total Leq All Segments: 57.35 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.26
(NIGHT): 58.99



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STAMSON 5.0 NORMAL REPORT Date: 23-05-2023 10:06:25
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r7.te Time Period: Day/Night 16/8 hours
 Description:

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

Train Type	! Trains !	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

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

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 270.00 / 270.00 m
 Receiver height : 7.70 / 7.70 m
 Topography : 2 (Flat/gentle slope; with barrier)
 No Whistle
 Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
 Barrier height : 43.90 m
 Barrier receiver distance : 66.00 / 66.00 m
 Source elevation : 0.00 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m
 Reference angle : 0.00

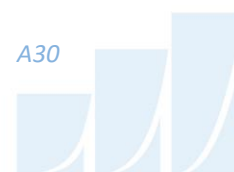
Results segment # 1: Rail (day)

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
4.00	! 7.70	! 6.80	! 6.80
0.50	! 7.70	! 5.94	! 5.94

LOCOMOTIVE (0.00 + 43.82 + 0.00) = 43.82 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.43	-12.55	0.00	0.00	0.00	-19.06	43.82



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WHEEL (0.00 + 39.89 + 0.00) = 39.89 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	71.54	-12.55	0.00	0.00	0.00	-19.10	39.89

Segment Leq : 45.30 dBA

Total Leq All Segments: 45.30 dBA

Results segment # 1: Rail (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	7.70	6.80	6.80
0.50	7.70	5.94	5.94

LOCOMOTIVE (0.00 + 44.25 + 0.00) = 44.25 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.86	-12.55	0.00	0.00	0.00	-19.06	44.25

WHEEL (0.00 + 40.38 + 0.00) = 40.38 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	72.03	-12.55	0.00	0.00	0.00	-19.10	40.38

Segment Leq : 45.74 dBA

Total Leq All Segments: 45.74 dBA

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

Car traffic volume : 6336/704 veh/TimePeriod *

Medium truck volume : 504/56 veh/TimePeriod *

Heavy truck volume : 360/40 veh/TimePeriod *

Posted speed limit : 50 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000



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Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : 0.00 deg 19.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 69.00 / 69.00 m
Receiver height : 7.70 / 7.70 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 33696/3744 veh/TimePeriod *
Medium truck volume : 632/70 veh/TimePeriod *
Heavy truck volume : 772/86 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 39000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.80
Heavy Truck % of Total Volume : 2.20
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Dundas (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 92.00 / 92.00 m
Receiver height : 7.70 / 7.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 43.90 m
Barrier receiver distance : 66.00 / 66.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m



Reference angle : 0.00

Results segment # 1: Haines (day)

Source height = 1.50 m

ROAD (0.00 + 49.26 + 0.00) = 49.26 dBA

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

--									
0	19	0.00	65.65	0.00	-6.63	-9.77	0.00	0.00	0.00
49.26									

Segment Leq : 49.26 dBA

Results segment # 2: Dundas (day)

Source height = 1.22 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.22	7.70	3.05	3.05

ROAD (0.00 + 43.84 + 0.00) = 43.84 dBA

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

--									
-90	90	0.00	71.32	0.00	-7.88	0.00	0.00	0.00	-19.60
43.84									

Segment Leq : 43.84 dBA

Total Leq All Segments: 50.36 dBA

Results segment # 1: Haines (night)



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Source height = 1.50 m

ROAD (0.00 + 42.73 + 0.00) = 42.73 dBA

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

```
-----
--
--      0      19      0.00  59.12      0.00  -6.63  -9.77      0.00      0.00      0.00
42.73
-----
--
```

Segment Leq : 42.73 dBA

Results segment # 2: Dundas (night)

Source height = 1.22 m

Barrier height for grazing incidence

```
-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height      (m) ! Height      (m) ! Height      (m) ! Barrier Top      (m)
-----+-----+-----+-----
          1.22 !           7.70 !           3.05 !           3.05
-----
```

ROAD (0.00 + 37.31 + 0.00) = 37.31 dBA

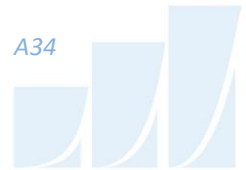
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
SubLeq

```
-----
--
--     -90      90      0.00  64.79      0.00  -7.88      0.00      0.00      0.00 -19.60
37.31
-----
--
```

Segment Leq : 37.31 dBA

Total Leq All Segments: 43.83 dBA

TOTAL Leq FROM ALL SOURCES (DAY) : 51.54
(NIGHT) : 47.90



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STAMSON 5.0 NORMAL REPORT Date: 23-05-2023 10:07:36
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r8.te Time Period: Day/Night 16/8 hours
 Description:

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

Train Type	! Trains !	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

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

```

-----
Angle1    Angle2                    :    0.00 deg    90.00 deg
Wood depth                        :            0            (No woods.)
No of house rows                   :            0 / 0
Surface                             :            2            (Reflective ground surface)
Receiver source distance           : 263.00 / 263.00 m
Receiver height                    :    7.70 / 7.70    m
Topography                         :            2            (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1                     :    0.00 deg    Angle2 : 90.00 deg
Barrier height                     :            6.00 m
Barrier receiver distance         : 231.00 / 231.00 m
Source elevation                   :            0.00 m
Receiver elevation                 :            0.00 m
Barrier elevation                  :            0.00 m
Reference angle                    :            0.00
  
```

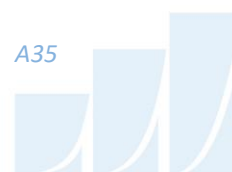
Results segment # 1: Rail (day)

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
4.00	! 7.70	! 4.45	! 4.45
0.50	! 7.70	! 1.38	! 1.38

LOCOMOTIVE (0.00 + 53.76 + 0.00) = 53.76 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	75.43	-12.44	-3.01	0.00	0.00	-6.23	53.76



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WHEEL (0.00 + 45.54 + 0.00) = 45.54 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	71.54	-12.44	-3.01	0.00	0.00	-10.56	45.54

Segment Leq : 54.37 dBA

Total Leq All Segments: 54.37 dBA

Results segment # 1: Rail (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	7.70	4.45	4.45
0.50	7.70	1.38	1.38

LOCOMOTIVE (0.00 + 54.19 + 0.00) = 54.19 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	75.86	-12.44	-3.01	0.00	0.00	-6.23	54.19

WHEEL (0.00 + 46.03 + 0.00) = 46.03 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	72.03	-12.44	-3.01	0.00	0.00	-10.56	46.03

Segment Leq : 54.81 dBA

Total Leq All Segments: 54.81 dBA

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

Car traffic volume : 33696/3744 veh/TimePeriod *

Medium truck volume : 632/70 veh/TimePeriod *

Heavy truck volume : 772/86 veh/TimePeriod *

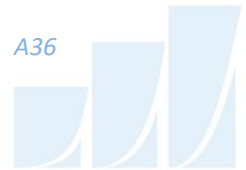
Posted speed limit : 60 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 39000



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```

Percentage of Annual Growth      : 0.00
Number of Years of Growth       : 0.00
Medium Truck % of Total Volume  : 1.80
Heavy Truck % of Total Volume   : 2.20
Day (16 hrs) % of Total Volume  : 90.00
    
```

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

```

-----
Angle1  Angle2      : 0.00 deg  90.00 deg
Wood depth          : 0          (No woods.)
No of house rows   : 0 / 0
Surface            : 2          (Reflective ground surface)
Receiver source distance : 95.00 / 95.00 m
Receiver height    : 7.70 / 7.70 m
Topography         : 1          (Flat/gentle slope; no barrier)
Reference angle    : 0.00
    
```

Results segment # 1: Dundas (day)

Source height = 1.22 m

ROAD (0.00 + 60.29 + 0.00) = 60.29 dBA

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

```

-----
--
0      90    0.00  71.32   0.00  -8.02  -3.01   0.00   0.00   0.00
60.29
-----
--
    
```

Segment Leq : 60.29 dBA

Total Leq All Segments: 60.29 dBA

Results segment # 1: Dundas (night)

Source height = 1.22 m

ROAD (0.00 + 53.76 + 0.00) = 53.76 dBA

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

```

-----
--
0      90    0.00  64.79   0.00  -8.02  -3.01   0.00   0.00   0.00
53.76
    
```



--
Segment Leq : 53.76 dBA

Total Leq All Segments: 53.76 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.28
(NIGHT): 57.33



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STAMSON 5.0 NORMAL REPORT Date: 23-05-2023 10:08:52
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r9.te Time Period: Day/Night 16/8 hours
 Description:

Rail data, segment # 1: Rail1 (day/night)

Train Type	! Trains !	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

Data for Segment # 1: Rail1 (day/night)

 Angle1 Angle2 : -90.00 deg 48.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 235.00 / 235.00 m
 Receiver height : 32.00 / 32.00 m
 Topography : 2 (Flat/gentle slope; with barrier)
 No Whistle
 Barrier angle1 : -90.00 deg Angle2 : 48.00 deg
 Barrier height : 44.00 m
 Barrier receiver distance : 4.00 / 4.00 m
 Source elevation : 0.00 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m
 Reference angle : 0.00

Rail data, segment # 2: Rail2 (day/night)

Train Type	! Trains !	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

Data for Segment # 2: Rail2 (day/night)

 Angle1 Angle2 : 48.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 235.00 / 235.00 m
 Receiver height : 32.00 / 32.00 m
 Topography : 2 (Flat/gentle slope; with barrier)



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No Whistle

```
Barrier angle1      : 48.00 deg   Angle2 : 90.00 deg
Barrier height     : 30.50 m
Barrier receiver distance : 4.00 / 4.00 m
Source elevation   : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation  : 0.00 m
Reference angle    : 0.00
```

Results segment # 1: Rail1 (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	32.00	31.52	31.52
0.50	32.00	31.46	31.46

LOCOMOTIVE (0.00 + 43.11 + 0.00) = 43.11 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	75.43	-11.95	-1.15	0.00	0.00	-19.22	43.11

WHEEL (0.00 + 39.21 + 0.00) = 39.21 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	71.54	-11.95	-1.15	0.00	0.00	-19.23	39.21

Segment Leq : 44.59 dBA

Results segment # 2: Rail2 (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	32.00	31.52	31.52
0.50	32.00	31.46	31.46

LOCOMOTIVE (0.00 + 57.16 + 0.00) = 57.16 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	75.43	-11.95	-6.32	0.00	0.00	-1.75	55.41*



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48 90 0.00 75.43 -11.95 -6.32 0.00 0.00 0.00 57.16

* Bright Zone !

WHEEL (0.00 + 53.27 + 0.00) = 53.27 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	71.54	-11.95	-6.32	0.00	0.00	-2.07	51.20*
48	90	0.00	71.54	-11.95	-6.32	0.00	0.00	0.00	53.27

* Bright Zone !

Segment Leq : 58.65 dBA

Total Leq All Segments: 58.82 dBA

Results segment # 1: Rail1 (night)

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
4.00 !	32.00 !	31.52 !	31.52
0.50 !	32.00 !	31.46 !	31.46

LOCOMOTIVE (0.00 + 43.54 + 0.00) = 43.54 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	75.86	-11.95	-1.15	0.00	0.00	-19.22	43.54

WHEEL (0.00 + 39.70 + 0.00) = 39.70 dBA

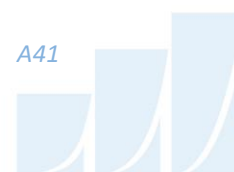
Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	72.03	-11.95	-1.15	0.00	0.00	-19.23	39.70

Segment Leq : 45.04 dBA

Results segment # 2: Rail2 (night)

Barrier height for grazing incidence

Source	! Receiver	! Barrier	! Elevation of
--------	------------	-----------	----------------



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Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
4.00	!	32.00	!	31.52	!	31.52
0.50	!	32.00	!	31.46	!	31.46

LOCOMOTIVE (0.00 + 57.59 + 0.00) = 57.59 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	75.86	-11.95	-6.32	0.00	0.00	-1.75	55.85*
48	90	0.00	75.86	-11.95	-6.32	0.00	0.00	0.00	57.59

* Bright Zone !

WHEEL (0.00 + 53.76 + 0.00) = 53.76 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	72.03	-11.95	-6.32	0.00	0.00	-2.07	51.69*
48	90	0.00	72.03	-11.95	-6.32	0.00	0.00	0.00	53.76

* Bright Zone !

Segment Leq : 59.09 dBA

Total Leq All Segments: 59.26 dBA

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

```

-----
Car traffic volume      : 33696/3744  veh/TimePeriod  *
Medium truck volume    :    632/70    veh/TimePeriod  *
Heavy truck volume     :    772/86    veh/TimePeriod  *
Posted speed limit     :    60 km/h
Road gradient          :    0 %
Road pavement         :    1 (Typical asphalt or concrete)
  
```

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

```

24 hr Traffic Volume (AADT or SADT): 39000
Percentage of Annual Growth       : 0.00
Number of Years of Growth         : 0.00
Medium Truck % of Total Volume    : 1.80
Heavy Truck % of Total Volume     : 2.20
Day (16 hrs) % of Total Volume    : 90.00
  
```

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

```

-----
Angle1   Angle2           : -90.00 deg   56.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
  
```



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Surface : 2 (Reflective ground surface)
Receiver source distance : 65.00 / 65.00 m
Receiver height : 32.00 / 32.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 56.00 deg
Barrier height : 44.00 m
Barrier receiver distance : 40.00 / 40.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 33696/3744 veh/TimePeriod *
Medium truck volume : 632/70 veh/TimePeriod *
Heavy truck volume : 772/86 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 39000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.80
Heavy Truck % of Total Volume : 2.20
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Dundas 2 (day/night)

Angle1 Angle2 : 56.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 65.00 / 65.00 m
Receiver height : 32.00 / 32.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 56.00 deg Angle2 : 90.00 deg
Barrier height : 30.50 m
Barrier receiver distance : 9.00 / 9.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Dundas 1 (day)



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Source height = 1.22 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.22 !       32.00 !       13.06 !       13.06
  
```

ROAD (0.00 + 44.46 + 0.00) = 44.46 dBA

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

```

-----
--
-90      56      0.00  71.32   0.00  -6.37  -0.91   0.00   0.00  -19.59
44.46
-----
--
  
```

Segment Leq : 44.46 dBA

Results segment # 2: Dundas 2 (day)

Source height = 1.22 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.22 !       32.00 !       27.74 !       27.74
  
```

ROAD (0.00 + 49.20 + 0.00) = 49.20 dBA

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

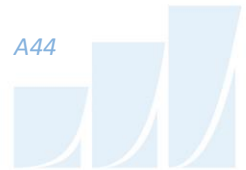
```

-----
--
 56      90      0.00  71.32   0.00  -6.37  -7.24   0.00   0.00  -8.51
49.20
-----
--
  
```

Segment Leq : 49.20 dBA

Total Leq All Segments: 50.46 dBA

Results segment # 1: Dundas 1 (night)



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Source height = 1.22 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.22	32.00	13.06	13.06

ROAD (0.00 + 37.93 + 0.00) = 37.93 dBA

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

-90	56	0.00	64.79	0.00	-6.37	-0.91	0.00	0.00	-19.59
37.93									

Segment Leq : 37.93 dBA

Results segment # 2: Dundas 2 (night)

Source height = 1.22 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.22	32.00	27.74	27.74

ROAD (0.00 + 42.68 + 0.00) = 42.68 dBA

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

56	90	0.00	64.79	0.00	-6.37	-7.24	0.00	0.00	-8.51
42.68									

Segment Leq : 42.68 dBA

Total Leq All Segments: 43.93 dBA



TOTAL Leq FROM ALL SOURCES (DAY) : 59.41
(NIGHT) : 59.38



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STAMSON 5.0 COMPREHENSIVE REPORT Date: 23-05-2023 10:22:55
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r9b.te Time Period: Day/Night 16/8 hours
 Description:

Rail data, segment # 1: Rail1 (day/night)

Train Type	! Trains !	! Speed ! (km/h)	!# loc ! /Train!	!# Cars ! /Train!	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

Data for Segment # 1: Rail1 (day/night)

 Angle1 Angle2 : -90.00 deg 48.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 235.00 / 235.00 m
 Receiver height : 32.00 / 32.00 m
 Topography : 2 (Flat/gentle slope; with barrier)
 No Whistle
 Barrier angle1 : -90.00 deg Angle2 : 48.00 deg
 Barrier height : 44.00 m
 Barrier receiver distance : 4.00 / 4.00 m
 Source elevation : 0.00 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m
 Reference angle : 0.00

Rail data, segment # 2: Rail2 (day/night)

Train Type	! Trains !	! Speed ! (km/h)	!# loc ! /Train!	!# Cars ! /Train!	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

Data for Segment # 2: Rail2 (day/night)

 Angle1 Angle2 : 48.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 235.00 / 235.00 m
 Receiver height : 32.00 / 32.00 m



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```

Topography           :           2           (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1       :   48.00 deg   Angle2 : 90.00 deg
Barrier height       :   31.60 m
Barrier receiver distance :   4.00 / 4.00   m
Source elevation     :   0.00 m
Receiver elevation   :   0.00 m
Barrier elevation    :   0.00 m
Reference angle      :   0.00
  
```

Train # 1: CP, Segment # 1: Rail1 (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	32.00	31.52	31.52
0.50	32.00	31.46	31.46

LOCOMOTIVE (0.00 + 41.92 + 0.00) = 41.92 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	74.24	-11.95	-1.15	0.00	0.00	-19.22	41.92

WHEEL (0.00 + 38.07 + 0.00) = 38.07 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	70.41	-11.95	-1.15	0.00	0.00	-19.23	38.07

Segment Leq : 43.42 dBA

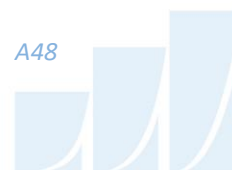
Train # 2: GO, Segment # 1: Rail1 (day)

LOCOMOTIVE (0.00 + 36.92 + 0.00) = 36.92 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	69.24	-11.95	-1.15	0.00	0.00	-19.22	36.92

WHEEL (0.00 + 32.84 + 0.00) = 32.84 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	65.17	-11.95	-1.15	0.00	0.00	-19.23	32.84



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Segment Leq : 38.35 dBA

Train # 1: CP, Segment # 2: Rail2 (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	32.00	31.52	31.52
0.50	32.00	31.46	31.46

LOCOMOTIVE (0.00 + 50.95 + 0.00) = 50.95 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	74.24	-11.95	-6.32	0.00	0.00	-5.01	50.95

WHEEL (0.00 + 47.09 + 0.00) = 47.09 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	70.41	-11.95	-6.32	0.00	0.00	-5.04	47.09

Segment Leq : 52.45 dBA

Train # 2: GO, Segment # 2: Rail2 (day)

LOCOMOTIVE (0.00 + 45.96 + 0.00) = 45.96 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	69.24	-11.95	-6.32	0.00	0.00	-5.01	45.96

WHEEL (0.00 + 41.86 + 0.00) = 41.86 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	65.17	-11.95	-6.32	0.00	0.00	-5.04	41.86

Segment Leq : 47.39 dBA

Total Leq All Segments: 54.14 dBA

Train # 1: CP, Segment # 1: Rail1 (night)



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 Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)			
4.00	!	32.00	!	31.52	!	31.52
0.50	!	32.00	!	31.46	!	31.46

LOCOMOTIVE (0.00 + 43.54 + 0.00) = 43.54 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	75.86	-11.95	-1.15	0.00	0.00	-19.22	43.54

WHEEL (0.00 + 39.70 + 0.00) = 39.70 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	72.03	-11.95	-1.15	0.00	0.00	-19.23	39.70

Segment Leq : 45.04 dBA

Train # 2: GO, Segment # 1: Rail1 (night)

LOCOMOTIVE (0.00 + -32.32 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	0.00	-11.95	-1.15	0.00	0.00	-19.22	-32.32

WHEEL (0.00 + -32.33 + 0.00) = 0.00 dBA

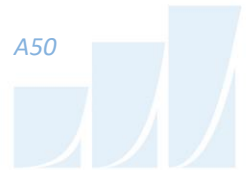
Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	0.00	-11.95	-1.15	0.00	0.00	-19.23	-32.33

Segment Leq : 0.00 dBA

Train # 1: CP, Segment # 2: Rail2 (night)

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)			
	!		!		!	



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```

4.00 !           32.00 !           31.52 !           31.52
0.50 !           32.00 !           31.46 !           31.46

```

LOCOMOTIVE (0.00 + 52.58 + 0.00) = 52.58 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	75.86	-11.95	-6.32	0.00	0.00	-5.01	52.58

WHEEL (0.00 + 48.72 + 0.00) = 48.72 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	72.03	-11.95	-6.32	0.00	0.00	-5.04	48.72

Segment Leq : 54.08 dBA

Train # 2: GO, Segment # 2: Rail2 (night)

LOCOMOTIVE (0.00 + -23.28 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	0.00	-11.95	-6.32	0.00	0.00	-5.01	-23.28

WHEEL (0.00 + -23.31 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	0.00	-11.95	-6.32	0.00	0.00	-5.04	-23.31

Segment Leq : 0.00 dBA

Total Leq All Segments: 54.59 dBA

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

```

Car traffic volume   : 33696/3744   veh/TimePeriod  *
Medium truck volume  :    632/70    veh/TimePeriod  *
Heavy truck volume   :    772/86    veh/TimePeriod  *
Posted speed limit   :     60 km/h
Road gradient         :      0 %
Road pavement        :      1 (Typical asphalt or concrete)

```

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

```

24 hr Traffic Volume (AADT or SADT): 39000
Percentage of Annual Growth         : 0.00

```



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Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.80
Heavy Truck % of Total Volume : 2.20
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -90.00 deg 56.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 65.00 / 65.00 m
Receiver height : 32.00 / 32.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 56.00 deg
Barrier height : 44.00 m
Barrier receiver distance : 40.00 / 40.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 33696/3744 veh/TimePeriod *
Medium truck volume : 632/70 veh/TimePeriod *
Heavy truck volume : 772/86 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 39000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.80
Heavy Truck % of Total Volume : 2.20
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Dundas 2 (day/night)

Angle1 Angle2 : 56.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 65.00 / 65.00 m
Receiver height : 32.00 / 32.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 56.00 deg Angle2 : 90.00 deg



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```
Barrier height           : 31.60 m
Barrier receiver distance : 9.00 / 9.00 m
Source elevation         : 0.00 m
Receiver elevation       : 0.00 m
Barrier elevation        : 0.00 m
Reference angle          : 0.00
```

Segment # 1: Dundas 1 (day)

Source height = 1.22 m

Barrier height for grazing incidence

```
-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.22 !       32.00 !       13.06 !       13.06
```

ROAD (0.00 + 44.46 + 0.00) = 44.46 dBA

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

```
-----
--
-90      56    0.00  71.32   0.00  -6.37  -0.91   0.00   0.00 -19.59
44.46
-----
--
```

Segment Leq : 44.46 dBA

Segment # 2: Dundas 2 (day)

Source height = 1.22 m

Barrier height for grazing incidence

```
-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.22 !       32.00 !       27.74 !       27.74
```

ROAD (0.00 + 47.49 + 0.00) = 47.49 dBA

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



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```

    56    90    0.00  71.32    0.00  -6.37  -7.24    0.00    0.00  -10.22
47.49
-----
--

```

Segment Leq : 47.49 dBA

Total Leq All Segments: 49.24 dBA

Segment # 1: Dundas 1 (night)

Source height = 1.22 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.22	32.00	13.06	13.06

ROAD (0.00 + 37.93 + 0.00) = 37.93 dBA

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

SubLeq

```

   -90    56    0.00  64.79    0.00  -6.37  -0.91    0.00    0.00  -19.59
37.93
-----
--

```

Segment Leq : 37.93 dBA

Segment # 2: Dundas 2 (night)

Source height = 1.22 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.22	32.00	27.74	27.74

ROAD (0.00 + 40.96 + 0.00) = 40.96 dBA

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

SubLeq



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--

56	90	0.00	64.79	0.00	-6.37	-7.24	0.00	0.00	-10.22
----	----	------	-------	------	-------	-------	------	------	--------

40.96

--

Segment Leq : 40.96 dBA

Total Leq All Segments: 42.71 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.36
(NIGHT): 54.86

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STAMSON 5.0 NORMAL REPORT Date: 23-05-2023 10:10:53
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r10.te Time Period: Day/Night 16/8 hours
 Description:

Rail data, segment # 1: Rail1 (day/night)

Train Type	! Trains !	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

Data for Segment # 1: Rail1 (day/night)

 Angle1 Angle2 : -90.00 deg 43.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 239.00 / 239.00 m
 Receiver height : 25.70 / 25.70 m
 Topography : 2 (Flat/gentle slope; with barrier)
 No Whistle
 Barrier angle1 : -90.00 deg Angle2 : 43.00 deg
 Barrier height : 44.00 m
 Barrier receiver distance : 9.00 / 9.00 m
 Source elevation : 0.00 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m
 Reference angle : 0.00

Rail data, segment # 2: Rail2 (day/night)

Train Type	! Trains !	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

Data for Segment # 2: Rail2 (day/night)

 Angle1 Angle2 : 43.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 239.00 / 239.00 m
 Receiver height : 25.70 / 25.70 m
 Topography : 2 (Flat/gentle slope; with barrier)



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No Whistle

```
Barrier angle1      : 43.00 deg   Angle2 : 90.00 deg
Barrier height     : 24.20 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation   : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation  : 0.00 m
Reference angle    : 0.00
```

Results segment # 1: Rail1 (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	25.70	24.88	24.88
0.50	25.70	24.75	24.75

LOCOMOTIVE (0.00 + 42.72 + 0.00) = 42.72 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	43	0.00	75.43	-12.02	-1.31	0.00	0.00	-19.38	42.72

WHEEL (0.00 + 38.82 + 0.00) = 38.82 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	43	0.00	71.54	-12.02	-1.31	0.00	0.00	-19.39	38.82

Segment Leq : 44.20 dBA

Results segment # 2: Rail2 (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	25.70	24.79	24.79
0.50	25.70	24.65	24.65

LOCOMOTIVE (0.00 + 57.58 + 0.00) = 57.58 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
43	90	0.00	75.43	-12.02	-5.83	0.00	0.00	-4.61	52.97*



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43 90 0.00 75.43 -12.02 -5.83 0.00 0.00 0.00 57.58

* Bright Zone !

WHEEL (0.00 + 53.69 + 0.00) = 53.69 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
43	90	0.00	71.54	-12.02	-5.83	0.00	0.00	-4.79	48.90*
43	90	0.00	71.54	-12.02	-5.83	0.00	0.00	0.00	53.69

* Bright Zone !

Segment Leq : 59.07 dBA

Total Leq All Segments: 59.21 dBA

Results segment # 1: Rail1 (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	25.70	24.88	24.88
0.50	25.70	24.75	24.75

LOCOMOTIVE (0.00 + 43.15 + 0.00) = 43.15 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	43	0.00	75.86	-12.02	-1.31	0.00	0.00	-19.38	43.15

WHEEL (0.00 + 39.31 + 0.00) = 39.31 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	43	0.00	72.03	-12.02	-1.31	0.00	0.00	-19.39	39.31

Segment Leq : 44.65 dBA

Results segment # 2: Rail2 (night)

Barrier height for grazing incidence

Source	Receiver	Barrier	Elevation of



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Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
4.00	!	25.70	!	24.79	!	24.79
0.50	!	25.70	!	24.65	!	24.65

LOCOMOTIVE (0.00 + 58.01 + 0.00) = 58.01 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
43	90	0.00	75.86	-12.02	-5.83	0.00	0.00	-4.61	53.40*
43	90	0.00	75.86	-12.02	-5.83	0.00	0.00	0.00	58.01

* Bright Zone !

WHEEL (0.00 + 54.18 + 0.00) = 54.18 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
43	90	0.00	72.03	-12.02	-5.83	0.00	0.00	-4.79	49.39*
43	90	0.00	72.03	-12.02	-5.83	0.00	0.00	0.00	54.18

* Bright Zone !

Segment Leq : 59.51 dBA

Total Leq All Segments: 59.65 dBA

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

```

-----
Car traffic volume : 33696/3744 veh/TimePeriod *
Medium truck volume : 632/70 veh/TimePeriod *
Heavy truck volume : 772/86 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
  
```

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

```

24 hr Traffic Volume (AADT or SADT): 39000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.80
Heavy Truck % of Total Volume : 2.20
Day (16 hrs) % of Total Volume : 90.00
  
```

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

```

-----
Angle1 Angle2 : -90.00 deg 52.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
  
```



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Surface : 2 (Reflective ground surface)
Receiver source distance : 70.00 / 70.00 m
Receiver height : 25.70 / 25.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 52.00 deg
Barrier height : 44.00 m
Barrier receiver distance : 9.00 / 9.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 33696/3744 veh/TimePeriod *
Medium truck volume : 632/70 veh/TimePeriod *
Heavy truck volume : 772/86 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

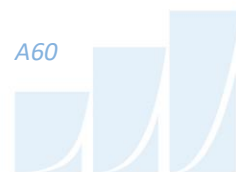
* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 39000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.80
Heavy Truck % of Total Volume : 2.20
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Dundas 2 (day/night)

Angle1 Angle2 : 52.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 70.00 / 70.00 m
Receiver height : 25.70 / 25.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 52.00 deg Angle2 : 90.00 deg
Barrier height : 24.30 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Dundas 1 (day)



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Source height = 1.22 m

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
1.22	25.70	22.55	22.55

ROAD (0.00 + 44.00 + 0.00) = 44.00 dBA

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

-90	52	0.00	71.32	0.00	-6.69	-1.03	0.00	0.00	-19.60
44.00	-	-	-	-	-	-	-	-	-

Segment Leq : 44.00 dBA



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Results segment # 2: Dundas 2 (day)

Source height = 1.22 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.22	25.70	22.20	22.20

ROAD (0.00 + 50.29 + 0.00) = 50.29 dBA

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

52	90	0.00	71.32	0.00	-6.69	-6.75	0.00	0.00	-7.59
50.29									

Segment Leq : 50.29 dBA

Total Leq All Segments: 51.21 dBA

Results segment # 1: Dundas 1 (night)

Source height = 1.22 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.22	25.70	22.55	22.55

ROAD (0.00 + 37.47 + 0.00) = 37.47 dBA

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

-90	52	0.00	64.79	0.00	-6.69	-1.03	0.00	0.00	-19.60
37.47									

Segment Leq : 37.47 dBA



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Results segment # 2: Dundas 2 (night)

Source height = 1.22 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.22	25.70	22.20	22.20

ROAD (0.00 + 43.76 + 0.00) = 43.76 dBA

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

52	90	0.00	64.79	0.00	-6.69	-6.75	0.00	0.00	-7.59
----	----	------	-------	------	-------	-------	------	------	-------

Segment Leq : 43.76 dBA

Total Leq All Segments: 44.68 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.85
(NIGHT): 59.79



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STAMSON 5.0 COMPREHENSIVE REPORT Date: 23-05-2023 10:28:40
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r10b.te Time Period: Day/Night 16/8 hours
 Description:

Rail data, segment # 1: Rail1 (day/night)

Train Type	! Trains !	! Speed ! (km/h)	!# loc ! /Train!	!# Cars ! /Train!	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 8.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

Data for Segment # 1: Rail1 (day/night)

 Angle1 Angle2 : -90.00 deg 43.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 239.00 / 239.00 m
 Receiver height : 25.70 / 25.70 m
 Topography : 2 (Flat/gentle slope; with barrier)
 No Whistle
 Barrier angle1 : -90.00 deg Angle2 : 43.00 deg
 Barrier height : 44.00 m
 Barrier receiver distance : 9.00 / 9.00 m
 Source elevation : 0.00 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m
 Reference angle : 0.00

Rail data, segment # 2: Rail2 (day/night)

Train Type	! Trains !	! Speed ! (km/h)	!# loc ! /Train!	!# Cars ! /Train!	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

Data for Segment # 2: Rail2 (day/night)

 Angle1 Angle2 : 43.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 239.00 / 239.00 m
 Receiver height : 25.70 / 25.70 m



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Topography           :      2      (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1      :  43.00 deg   Angle2 : 90.00 deg
Barrier height      :  25.40 m
Barrier receiver distance :  10.00 / 10.00 m
Source elevation    :  0.00 m
Receiver elevation  :  0.00 m
Barrier elevation   :  0.00 m
Reference angle     :  0.00
  
```

Train # 1: CP, Segment # 1: Rail1 (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	25.70	24.88	24.88
0.50	25.70	24.75	24.75

LOCOMOTIVE (0.00 + 41.46 + 0.00) = 41.46 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	43	0.00	74.17	-12.02	-1.31	0.00	0.00	-19.38	41.46

WHEEL (0.00 + 37.78 + 0.00) = 37.78 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	43	0.00	70.51	-12.02	-1.31	0.00	0.00	-19.39	37.78

Segment Leq : 43.01 dBA

Train # 2: GO, Segment # 1: Rail1 (day)

LOCOMOTIVE (0.00 + 36.53 + 0.00) = 36.53 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	43	0.00	69.24	-12.02	-1.31	0.00	0.00	-19.38	36.53

WHEEL (0.00 + 32.45 + 0.00) = 32.45 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	43	0.00	65.17	-12.02	-1.31	0.00	0.00	-19.39	32.45



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Segment Leq : 37.96 dBA

Train # 1: CP, Segment # 2: Rail2 (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	25.70	24.79	24.79
0.50	25.70	24.65	24.65

LOCOMOTIVE (0.00 + 51.01 + 0.00) = 51.01 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
43	90	0.00	74.24	-12.02	-5.83	0.00	0.00	-5.37	51.01

WHEEL (0.00 + 46.99 + 0.00) = 46.99 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
43	90	0.00	70.41	-12.02	-5.83	0.00	0.00	-5.56	46.99

Segment Leq : 52.46 dBA

Train # 2: GO, Segment # 2: Rail2 (day)

LOCOMOTIVE (0.00 + 46.02 + 0.00) = 46.02 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
43	90	0.00	69.24	-12.02	-5.83	0.00	0.00	-5.37	46.02

WHEEL (0.00 + 41.76 + 0.00) = 41.76 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
43	90	0.00	65.17	-12.02	-5.83	0.00	0.00	-5.56	41.76

Segment Leq : 47.40 dBA

Total Leq All Segments: 54.11 dBA

Train # 1: CP, Segment # 1: Rail1 (night)



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Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
4.00	25.70	24.88	24.88
0.50	25.70	24.75	24.75

LOCOMOTIVE (0.00 + 43.08 + 0.00) = 43.08 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	43	0.00	75.80	-12.02	-1.31	0.00	0.00	-19.38	43.08

WHEEL (0.00 + 39.41 + 0.00) = 39.41 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	43	0.00	72.14	-12.02	-1.31	0.00	0.00	-19.39	39.41

Segment Leq : 44.63 dBA

Train # 2: GO, Segment # 1: Rail1 (night)

LOCOMOTIVE (0.00 + -32.72 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	43	0.00	0.00	-12.02	-1.31	0.00	0.00	-19.38	-32.72

WHEEL (0.00 + -32.73 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	43	0.00	0.00	-12.02	-1.31	0.00	0.00	-19.39	-32.73

Segment Leq : 0.00 dBA

Train # 1: CP, Segment # 2: Rail2 (night)

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)



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4.00 ! 25.70 ! 24.79 ! 24.79
 0.50 ! 25.70 ! 24.65 ! 24.65

LOCOMOTIVE (0.00 + 52.64 + 0.00) = 52.64 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
43	90	0.00	75.86	-12.02	-5.83	0.00	0.00	-5.37	52.64

WHEEL (0.00 + 48.62 + 0.00) = 48.62 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
43	90	0.00	72.03	-12.02	-5.83	0.00	0.00	-5.56	48.62

Segment Leq : 54.09 dBA

Train # 2: GO, Segment # 2: Rail2 (night)

LOCOMOTIVE (0.00 + -23.23 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
43	90	0.00	0.00	-12.02	-5.83	0.00	0.00	-5.37	-23.23

WHEEL (0.00 + -23.41 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
43	90	0.00	0.00	-12.02	-5.83	0.00	0.00	-5.56	-23.41

Segment Leq : 0.00 dBA

Total Leq All Segments: 54.56 dBA

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

 Car traffic volume : 33696/3744 veh/TimePeriod *
 Medium truck volume : 632/70 veh/TimePeriod *
 Heavy truck volume : 772/86 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 39000
 Percentage of Annual Growth : 0.00



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Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.80
Heavy Truck % of Total Volume : 2.20
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -90.00 deg 52.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 70.00 / 70.00 m
Receiver height : 25.70 / 25.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 52.00 deg
Barrier height : 44.00 m
Barrier receiver distance : 9.00 / 9.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 33696/3744 veh/TimePeriod *
Medium truck volume : 632/70 veh/TimePeriod *
Heavy truck volume : 772/86 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 39000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.80
Heavy Truck % of Total Volume : 2.20
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Dundas 2 (day/night)

Angle1 Angle2 : 52.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 70.00 / 70.00 m
Receiver height : 25.70 / 25.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 52.00 deg Angle2 : 90.00 deg



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Barrier height           : 25.40 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation         : 0.00 m
Receiver elevation       : 0.00 m
Barrier elevation        : 0.00 m
Reference angle          : 0.00
```

Segment # 1: Dundas 1 (day)

Source height = 1.22 m

Barrier height for grazing incidence

```
-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.22 !      25.70 !      22.55 !      22.55
```

ROAD (0.00 + 44.00 + 0.00) = 44.00 dBA

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

```
-----
--
-90     52     0.00  71.32   0.00  -6.69  -1.03   0.00   0.00 -19.60
44.00
```

Segment Leq : 44.00 dBA

Segment # 2: Dundas 2 (day)

Source height = 1.22 m

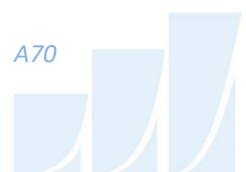
Barrier height for grazing incidence

```
-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.22 !      25.70 !      22.20 !      22.20
```

ROAD (0.00 + 48.41 + 0.00) = 48.41 dBA

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

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    52    90    0.00  71.32    0.00  -6.69  -6.75    0.00    0.00   -9.47
48.41
-----
--

```

Segment Leq : 48.41 dBA

Total Leq All Segments: 49.75 dBA

Segment # 1: Dundas 1 (night)

Source height = 1.22 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.22 !          25.70 !          22.55 !          22.55

```

ROAD (0.00 + 37.47 + 0.00) = 37.47 dBA

```

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

```

```

    -90    52    0.00  64.79    0.00  -6.69  -1.03    0.00    0.00  -19.60
37.47
-----
--

```

Segment Leq : 37.47 dBA

Segment # 2: Dundas 2 (night)

Source height = 1.22 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.22 !          25.70 !          22.20 !          22.20

```

ROAD (0.00 + 41.88 + 0.00) = 41.88 dBA

```

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

```



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--										
	52	90	0.00	64.79	0.00	-6.69	-6.75	0.00	0.00	-9.47
41.88										

--

Segment Leq : 41.88 dBA

Total Leq All Segments: 43.22 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.46
(NIGHT): 54.86



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STAMSON 5.0 NORMAL REPORT Date: 23-05-2023 10:16:01
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r11.te Time Period: Day/Night 16/8 hours
 Description:

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

Train Type	! Trains !	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 80.0	! 1.0	! 13.0	!Diesel!	No

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

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 226.00 / 226.00 m
 Receiver height : 6.50 / 6.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 No Whistle
 Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
 Barrier height : 44.00 m
 Barrier receiver distance : 3.00 / 3.00 m
 Source elevation : 0.00 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m
 Reference angle : 0.00

Results segment # 1: Rail (day)

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
4.00	! 6.50	! 6.47	! 6.47
0.50	! 6.50	! 6.42	! 6.42

LOCOMOTIVE (0.00 + 43.59 + 0.00) = 43.59 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.02	-11.78	0.00	0.00	0.00	-19.66	43.59



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WHEEL (0.00 + 39.66 + 0.00) = 39.66 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	71.10	-11.78	0.00	0.00	0.00	-19.66	39.66

Segment Leq : 45.07 dBA

Total Leq All Segments: 45.07 dBA

Results segment # 1: Rail (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	6.50	6.47	6.47
0.50	6.50	6.42	6.42

LOCOMOTIVE (0.00 + 44.43 + 0.00) = 44.43 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.86	-11.78	0.00	0.00	0.00	-19.66	44.43

WHEEL (0.00 + 40.59 + 0.00) = 40.59 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	72.03	-11.78	0.00	0.00	0.00	-19.66	40.59

Segment Leq : 45.93 dBA

Total Leq All Segments: 45.93 dBA

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

Car traffic volume : 33696/3744 veh/TimePeriod *

Medium truck volume : 632/70 veh/TimePeriod *

Heavy truck volume : 772/86 veh/TimePeriod *

Posted speed limit : 60 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 39000



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Percentage of Annual Growth      : 0.00
Number of Years of Growth       : 0.00
Medium Truck % of Total Volume  : 1.80
Heavy Truck % of Total Volume   : 2.20
Day (16 hrs) % of Total Volume  : 90.00
  
```

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

```

-----
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth      : 0 (No woods.)
No of house rows : 0 / 0
Surface         : 2 (Reflective ground surface)
Receiver source distance : 50.00 / 50.00 m
Receiver height  : 6.50 / 6.50 m
Topography      : 2 (Flat/gentle slope; with barrier)
Barrier angle1   : -90.00 deg   Angle2 : 90.00 deg
Barrier height   : 44.00 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle  : 0.00
  
```

Results segment # 1: Dundas (day)

Source height = 1.22 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.22 !         6.50 !         6.18 !         6.18
  
```

ROAD (0.00 + 46.35 + 0.00) = 46.35 dBA

```

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

```

--
-90     90     0.00  71.32   0.00  -5.23   0.00   0.00   0.00  -19.74
46.35
-----
  
```

Segment Leq : 46.35 dBA

Total Leq All Segments: 46.35 dBA



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Results segment # 1: Dundas (night)

Source height = 1.22 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.22	6.50	6.18	6.18

ROAD (0.00 + 39.82 + 0.00) = 39.82 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-90	90	0.00	64.79	0.00	-5.23	0.00	0.00	0.00	-19.74

SubLeq

39.82

Segment Leq : 39.82 dBA

Total Leq All Segments: 39.82 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 48.77
(NIGHT): 46.88



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STAMSON 5.0 COMPREHENSIVE REPORT Date: 23-05-2023 10:18:27
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r12.te Time Period: Day/Night 16/8 hours
 Description:

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

Train Type	! Trains !	! Speed ! (km/h)	! # loc ! /Train	! # Cars ! /Train	! Eng ! type	! Cont ! weld
1. CP	! 11.0/8.0 !	! 80.0 !	! 4.0 !	! 164.0 !	! Diesel !	! No
2. GO	! 23.0/0.0 !	! 113.0 !	! 1.0 !	! 13.0 !	! Diesel !	! No

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

Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 250.00 / 250.00 m
 Receiver height : 32.00 / 32.00 m
 Topography : 2 (Flat/gentle slope; with barrier)
 No Whistle
 Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
 Barrier height : 44.00 m
 Barrier receiver distance : 33.00 / 33.00 m
 Source elevation : 0.00 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m
 Reference angle : 0.00

Train # 1: CP, Segment # 1: Rail (day)

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
4.00 !	32.00 !	28.30 !	28.30
0.50 !	32.00 !	27.84 !	27.84

LOCOMOTIVE (0.00 + 44.46 + 0.00) = 44.46 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	74.24	-12.22	0.00	0.00	0.00	-17.56	44.46



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WHEEL (0.00 + 40.52 + 0.00) = 40.52 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	70.41	-12.22	0.00	0.00	0.00	-17.67	40.52

Segment Leq : 45.93 dBA

Train # 2: GO, Segment # 1: Rail (day)

LOCOMOTIVE (0.00 + 39.46 + 0.00) = 39.46 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	69.24	-12.22	0.00	0.00	0.00	-17.56	39.46

WHEEL (0.00 + 35.29 + 0.00) = 35.29 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	65.17	-12.22	0.00	0.00	0.00	-17.67	35.29

Segment Leq : 40.87 dBA

Total Leq All Segments: 47.11 dBA

Train # 1: CP, Segment # 1: Rail (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	32.00	28.30	28.30
0.50	32.00	27.84	27.84

LOCOMOTIVE (0.00 + 46.08 + 0.00) = 46.08 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.86	-12.22	0.00	0.00	0.00	-17.56	46.08

WHEEL (0.00 + 42.15 + 0.00) = 42.15 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	72.03	-12.22	0.00	0.00	0.00	-17.67	42.15



Segment Leq : 47.56 dBA

Train # 2: GO, Segment # 1: Rail (night)

LOCOMOTIVE (0.00 + -29.78 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	0.00	-12.22	0.00	0.00	0.00	-17.56	-29.78

WHEEL (0.00 + -29.89 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	0.00	-12.22	0.00	0.00	0.00	-17.67	-29.89

Segment Leq : 0.00 dBA

Total Leq All Segments: 47.56 dBA

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

Car traffic volume : 33696/3744 veh/TimePeriod *

Medium truck volume : 632/70 veh/TimePeriod *

Heavy truck volume : 772/86 veh/TimePeriod *

Posted speed limit : 60 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 39000

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 1.80

Heavy Truck % of Total Volume : 2.20

Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -90.00 deg 90.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 2 (Reflective ground surface)

Receiver source distance : 68.00 / 68.00 m

Receiver height : 32.00 / 32.00 m

Topography : 2 (Flat/gentle slope; with barrier)



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Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 44.00 m
Barrier receiver distance : 44.00 / 44.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 6336/704 veh/TimePeriod *
Medium truck volume : 504/56 veh/TimePeriod *
Heavy truck volume : 360/40 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Haines (day/night)

Angle1 Angle2 : -51.00 deg 10.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 33.00 / 33.00 m
Receiver height : 32.00 / 32.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -51.00 deg Angle2 : 10.00 deg
Barrier height : 30.50 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Segment # 1: Dundas (day)

Source height = 1.22 m

Barrier height for grazing incidence



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```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.22 !          32.00 !          12.08 !          12.08
  
```

ROAD (0.00 + 45.39 + 0.00) = 45.39 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

```

-----
--
-90      90      0.00  71.32   0.00  -6.56   0.00   0.00   0.00  -19.36
45.39
-----
--
  
```

Segment Leq : 45.39 dBA

Segment # 2: Haines (day)

Source height = 1.50 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.50 !          32.00 !          22.76 !          22.76
  
```

ROAD (0.00 + 37.63 + 0.00) = 37.63 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
 SubLeq

```

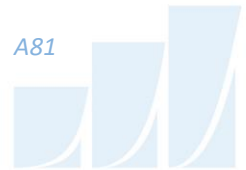
-----
--
-51      10      0.00  65.65   0.00  -3.42  -4.70   0.00   0.00  -19.90
37.63
-----
--
  
```

Segment Leq : 37.63 dBA

Total Leq All Segments: 46.06 dBA

Segment # 1: Dundas (night)

Source height = 1.22 m



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Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.22	32.00	12.08	12.08

ROAD (0.00 + 38.86 + 0.00) = 38.86 dBA

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

-90	90	0.00	64.79	0.00	-6.56	0.00	0.00	0.00	-19.36
38.86									

Segment Leq : 38.86 dBA

Segment # 2: Haines (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.50	32.00	22.76	22.76

ROAD (0.00 + 31.10 + 0.00) = 31.10 dBA

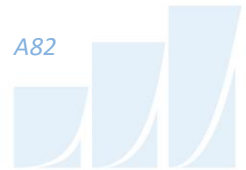
Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-51	10	0.00	59.12	0.00	-3.42	-4.70	0.00	0.00	-19.90
31.10									

Segment Leq : 31.10 dBA

Total Leq All Segments: 39.53 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 49.63
(NIGHT): 48.20



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STAMSON 5.0 COMPREHENSIVE REPORT Date: 23-05-2023 10:19:39
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r13.te Time Period: Day/Night 16/8 hours
 Description:

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

Train Type	! Trains !	! Speed ! (km/h)	! # loc ! /Train	! # Cars ! /Train	! Eng ! type	! Cont ! weld
1. CP	! 11.0/8.0 !	! 80.0 !	! 4.0 !	! 164.0 !	! Diesel !	! No
2. GO	! 23.0/0.0 !	! 113.0 !	! 1.0 !	! 13.0 !	! Diesel !	! No

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

```

-----
Angle1    Angle2                    : -90.00 deg    90.00 deg
Wood depth                    :            0            (No woods.)
No of house rows              :            0 / 0
Surface                        :            2            (Reflective ground surface)
Receiver source distance      : 255.00 / 255.00 m
Receiver height                : 25.00 / 25.70 m
Topography                    :            2            (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1                 : -90.00 deg    Angle2 : 90.00 deg
Barrier height                 : 44.00 m
Barrier receiver distance      : 49.00 / 49.00 m
Source elevation               : 0.00 m
Receiver elevation              : 0.00 m
Barrier elevation               : 0.00 m
Reference angle                : 0.00
    
```

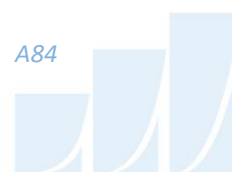
Train # 1: CP, Segment # 1: Rail (day)

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
4.00	! 25.00 !	20.96	! 20.96 !
0.50	! 25.00 !	20.29	! 20.29 !

LOCOMOTIVE (0.00 + 43.64 + 0.00) = 43.64 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	74.24	-12.30	0.00	0.00	0.00	-18.29	43.64



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WHEEL (0.00 + 39.73 + 0.00) = 39.73 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	70.41	-12.30	0.00	0.00	0.00	-18.37	39.73

Segment Leq : 45.12 dBA

Train # 2: GO, Segment # 1: Rail (day)

LOCOMOTIVE (0.00 + 38.65 + 0.00) = 38.65 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	69.24	-12.30	0.00	0.00	0.00	-18.29	38.65

WHEEL (0.00 + 34.50 + 0.00) = 34.50 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	65.17	-12.30	0.00	0.00	0.00	-18.37	34.50

Segment Leq : 40.06 dBA

Total Leq All Segments: 46.30 dBA

Train # 1: CP, Segment # 1: Rail (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	25.70	21.53	21.53
0.50	25.70	20.86	20.86

LOCOMOTIVE (0.00 + 45.34 + 0.00) = 45.34 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.86	-12.30	0.00	0.00	0.00	-18.22	45.34

WHEEL (0.00 + 41.43 + 0.00) = 41.43 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	72.03	-12.30	0.00	0.00	0.00	-18.30	41.43



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Segment Leq : 46.82 dBA

Train # 2: GO, Segment # 1: Rail (night)

LOCOMOTIVE (0.00 + -30.52 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	0.00	-12.30	0.00	0.00	0.00	-18.22	-30.52

WHEEL (0.00 + -30.61 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	0.00	-12.30	0.00	0.00	0.00	-18.30	-30.61

Segment Leq : 0.00 dBA

Total Leq All Segments: 46.82 dBA

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

Car traffic volume : 33696/3744 veh/TimePeriod *
Medium truck volume : 632/70 veh/TimePeriod *
Heavy truck volume : 772/86 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 39000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.80
Heavy Truck % of Total Volume : 2.20
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 73.00 / 73.00 m
Receiver height : 25.70 / 25.70 m



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Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 49.00 m
Barrier receiver distance : 44.00 / 44.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 6336/704 veh/TimePeriod *
Medium truck volume : 504/56 veh/TimePeriod *
Heavy truck volume : 360/40 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Haines (day/night)

Angle1 Angle2 : -48.00 deg 10.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 31.00 / 31.00 m
Receiver height : 25.70 / 25.70 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -48.00 deg Angle2 : 10.00 deg
Barrier height : 24.20 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Segment # 1: Dundas (day)

Source height = 1.22 m



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Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.22	25.70	10.94	10.94

ROAD (0.00 + 44.90 + 0.00) = 44.90 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-90	90	0.00	71.32	0.00	-6.87	0.00	0.00	0.00	-19.55

SubLeq
44.90

Segment Leq : 44.90 dBA

Segment # 2: Haines (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	25.70	17.89	17.89

ROAD (0.00 + 38.12 + 0.00) = 38.12 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-48	10	0.00	65.65	0.00	-3.15	-4.92	0.00	0.00	-19.47

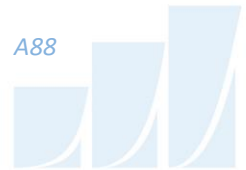
SubLeq
38.12

Segment Leq : 38.12 dBA

Total Leq All Segments: 45.73 dBA

Segment # 1: Dundas (night)

Source height = 1.22 m



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Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.22 !       25.70 !       10.94 !       10.94
  
```

ROAD (0.00 + 38.37 + 0.00) = 38.37 dBA

```

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

```

-----
--
-90     90    0.00  64.79   0.00  -6.87   0.00   0.00   0.00  -19.55
38.37
-----
--
  
```

Segment Leq : 38.37 dBA

Segment # 2: Haines (night)

Source height = 1.50 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.50 !       25.70 !       17.89 !       17.89
  
```

ROAD (0.00 + 31.58 + 0.00) = 31.58 dBA

```

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

```

-----
--
-48     10    0.00  59.12   0.00  -3.15  -4.92   0.00   0.00  -19.47
31.58
-----
--
  
```

Segment Leq : 31.58 dBA

Total Leq All Segments: 39.20 dBA



TOTAL Leq FROM ALL SOURCES (DAY) : 49.03
(NIGHT) : 47.51



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STAMSON 5.0 SUMMARY REPORT Date: 02-09-2022 09:45:36
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r14.te Time Period: Day/Night 16/8 hours
 Description:

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

```
-----
Car traffic volume : 6336/704   veh/TimePeriod  *
Medium truck volume : 504/56    veh/TimePeriod  *
Heavy truck volume : 360/40     veh/TimePeriod  *
Posted speed limit : 50 km/h
Road gradient      : 0 %
Road pavement     : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth         : 0.00
Number of Years of Growth           : 0.00
Medium Truck % of Total Volume      : 7.00
Heavy Truck % of Total Volume       : 5.00
Day (16 hrs) % of Total Volume      : 90.00
```

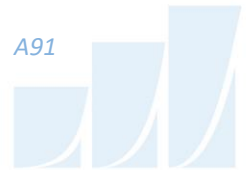
Data for Segment # 1: Haines (day/night)

```
-----
Angle1  Angle2      : -32.00 deg   6.00 deg
Wood depth      : 0           (No woods.)
No of house rows : 0 / 0
Surface         : 2           (Reflective ground surface)
Receiver source distance : 27.00 / 27.00 m
Receiver height  : 1.50 / 1.50 m
Topography      : 1           (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+
1.Haines ! 1.50 ! 56.35 ! 56.35
-----+-----+-----+
Total 56.35 dBA
```

Result summary (night)



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	! source !	Road !	Total !
	! height !	Leq !	Leq !
	! (m) !	(dBA) !	(dBA) !
-----+-----+-----+-----			
1.Haines	! 1.50 !	49.81 !	49.81
-----+-----+-----+-----			
	Total		49.81 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.35
(NIGHT): 49.81



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STAMSON 5.0 NORMAL REPORT Date: 02-09-2022 09:49:58
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r14b.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 6336/704 veh/TimePeriod *
Medium truck volume : 504/56 veh/TimePeriod *
Heavy truck volume : 360/40 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -32.00 deg 6.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 27.00 / 27.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -32.00 deg Angle2 : 6.00 deg
Barrier height : 2.20 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Haines (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of



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```

Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.50 !          1.50 !          1.50 !          1.50
  
```

ROAD (0.00 + 49.63 + 0.00) = 49.63 dBA

```

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

```

--
-32      6    0.00  65.65    0.00  -2.55  -6.75    0.00    0.00  -6.71
49.63
-----
  
```

Segment Leq : 49.63 dBA

Total Leq All Segments: 49.63 dBA

Barrier table for segment # 1: Haines (day)

```

Barrier ! Elev of ! Road ! Tot Leq !
Height ! Barr Top! dBA  ! dBA  !
-----+-----+-----+-----
  3.70 !   3.70 !  43.01 !  43.01 !
  4.20 !   4.20 !  41.32 !  41.32 !
  4.70 !   4.70 !  39.89 !  39.89 !
  5.20 !   5.20 !  38.66 !  38.66 !
  5.70 !   5.70 !  37.59 !  37.59 !
  6.20 !   6.20 !  36.65 !  36.65 !
  6.70 !   6.70 !  36.35 !  36.35 !
  7.20 !   7.20 !  36.35 !  36.35 !
  7.70 !   7.70 !  36.35 !  36.35 !
  8.20 !   8.20 !  36.35 !  36.35 !
  
```

Results segment # 1: Haines (night)

Source height = 1.50 m

Barrier height for grazing incidence

```

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

ROAD (0.00 + 43.10 + 0.00) = 43.10 dBA



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Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------

SubLeq

--									
-32	6	0.00	59.12	0.00	-2.55	-6.75	0.00	0.00	-6.71

43.10

--

Segment Leq : 43.10 dBA

Total Leq All Segments: 43.10 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 49.63
(NIGHT): 43.10

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STAMSON 5.0 COMPREHENSIVE REPORT Date: 23-05-2023 10:21:02
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r15.te Time Period: Day/Night 16/8 hours
 Description:

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

Train Type	! Trains !	! Speed ! (km/h)	!# loc ! /Train	!# Cars ! /Train	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0 !	! 80.0 !	! 4.0 !	!164.0 !	!Diesel!	No
2. GO	! 23.0/0.0 !	! 113.0 !	! 1.0 !	! 13.0 !	!Diesel!	No

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

 Angle1 Angle2 : -90.00 deg -66.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 273.00 / 273.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 No Whistle
 Reference angle : 0.00

Train # 1: CP, Segment # 1: Rail (day)

 LOCOMOTIVE (0.00 + 52.89 + 0.00) = 52.89 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	74.24	-12.60	-8.75	0.00	0.00	0.00	52.89

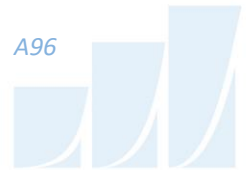
WHEEL (0.00 + 49.06 + 0.00) = 49.06 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	70.41	-12.60	-8.75	0.00	0.00	0.00	49.06

Segment Leq : 54.39 dBA

Train # 2: GO, Segment # 1: Rail (day)

 LOCOMOTIVE (0.00 + 47.89 + 0.00) = 47.89 dBA



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Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	69.24	-12.60	-8.75	0.00	0.00	0.00	47.89

WHEEL (0.00 + 43.82 + 0.00) = 43.82 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	65.17	-12.60	-8.75	0.00	0.00	0.00	43.82

Segment Leq : 49.33 dBA

Total Leq All Segments: 55.57 dBA

Train # 1: CP, Segment # 1: Rail (night)

LOCOMOTIVE (0.00 + 54.51 + 0.00) = 54.51 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	75.86	-12.60	-8.75	0.00	0.00	0.00	54.51

WHEEL (0.00 + 50.68 + 0.00) = 50.68 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	72.03	-12.60	-8.75	0.00	0.00	0.00	50.68

Segment Leq : 56.01 dBA

Train # 2: GO, Segment # 1: Rail (night)

LOCOMOTIVE (0.00 + -21.35 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	0.00	-12.60	-8.75	0.00	0.00	0.00	-21.35

WHEEL (0.00 + -21.35 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	0.00	-12.60	-8.75	0.00	0.00	0.00	-21.35

Segment Leq : 0.00 dBA



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Total Leq All Segments: 56.01 dBA

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

```

-----
Car traffic volume : 33696/3744 veh/TimePeriod *
Medium truck volume : 632/70 veh/TimePeriod *
Heavy truck volume : 772/86 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
  
```

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

```

24 hr Traffic Volume (AADT or SADT): 39000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.80
Heavy Truck % of Total Volume : 2.20
Day (16 hrs) % of Total Volume : 90.00
  
```

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

```

-----
Angle1 Angle2 : -90.00 deg -66.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 104.00 / 104.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
  
```

Segment # 1: Dundas (day)

Source height = 1.22 m

ROAD (0.00 + 54.16 + 0.00) = 54.16 dBA

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

54.16	-90	-66	0.00	71.32	0.00	-8.41	-8.75	0.00	0.00	0.00
-------	-----	-----	------	-------	------	-------	-------	------	------	------

Segment Leq : 54.16 dBA

Total Leq All Segments: 54.16 dBA



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Segment # 1: Dundas (night)

Source height = 1.22 m

ROAD (0.00 + 47.63 + 0.00) = 47.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------

SubLeq

--
-90 -66 0.00 64.79 0.00 -8.41 -8.75 0.00 0.00 0.00
47.63

--

Segment Leq : 47.63 dBA

Total Leq All Segments: 47.63 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.93
(NIGHT): 56.60



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STAMSON 5.0 COMPREHENSIVE REPORT Date: 23-05-2023 11:21:46
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r15b.te Time Period: Day/Night 16/8 hours
 Description:

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

Train Type	! Trains !	! Speed ! (km/h)	!# loc !/Train	!# Cars !/Train	! Eng ! type	!Cont !weld
1. CP	! 11.0/8.0	! 80.0	! 4.0	!164.0	!Diesel!	No
2. GO	! 23.0/0.0	! 113.0	! 1.0	! 13.0	!Diesel!	No

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

Angle1 Angle2 : -90.00 deg -66.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 273.00 / 273.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 No Whistle
 Barrier angle1 : -90.00 deg Angle2 : -66.00 deg
 Barrier height : 2.20 m
 Barrier receiver distance : 4.00 / 4.00 m
 Source elevation : 0.00 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m
 Reference angle : 0.00

Train # 1: CP, Segment # 1: Rail (day)

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
4.00	! 1.50	! 1.54	! 1.54
0.50	! 1.50	! 1.49	! 1.49

LOCOMOTIVE (0.00 + 47.33 + 0.00) = 47.33 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	74.24	-12.60	-8.75	0.00	0.00	-5.56	47.33



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WHEEL (0.00 + 43.41 + 0.00) = 43.41 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	70.41	-12.60	-8.75	0.00	0.00	-5.64	43.41

Segment Leq : 48.81 dBA

Train # 2: GO, Segment # 1: Rail (day)

LOCOMOTIVE (0.00 + 42.34 + 0.00) = 42.34 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	69.24	-12.60	-8.75	0.00	0.00	-5.56	42.34

WHEEL (0.00 + 38.18 + 0.00) = 38.18 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	65.17	-12.60	-8.75	0.00	0.00	-5.64	38.18

Segment Leq : 43.75 dBA

Total Leq All Segments: 49.99 dBA

Train # 1: CP, Segment # 1: Rail (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	1.50	1.54	1.54
0.50	1.50	1.49	1.49

LOCOMOTIVE (0.00 + 48.95 + 0.00) = 48.95 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	75.86	-12.60	-8.75	0.00	0.00	-5.56	48.95

WHEEL (0.00 + 45.04 + 0.00) = 45.04 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	72.03	-12.60	-8.75	0.00	0.00	-5.64	45.04



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Segment Leq : 50.43 dBA

Train # 2: GO, Segment # 1: Rail (night)

LOCOMOTIVE (0.00 + -26.91 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	0.00	-12.60	-8.75	0.00	0.00	-5.56	-26.91

WHEEL (0.00 + -26.99 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	0.00	-12.60	-8.75	0.00	0.00	-5.64	-26.99

Segment Leq : 0.00 dBA

Total Leq All Segments: 50.43 dBA

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

Car traffic volume : 33696/3744 veh/TimePeriod *

Medium truck volume : 632/70 veh/TimePeriod *

Heavy truck volume : 772/86 veh/TimePeriod *

Posted speed limit : 60 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 39000

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 1.80

Heavy Truck % of Total Volume : 2.20

Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -90.00 deg -66.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 2 (Reflective ground surface)

Receiver source distance : 104.00 / 104.00 m

Receiver height : 1.50 / 1.50 m

Topography : 2 (Flat/gentle slope; with barrier)



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```
Barrier angle1      : -90.00 deg   Angle2 : -66.00 deg
Barrier height     : 2.20 m
Barrier receiver distance : 4.00 / 4.00 m
Source elevation   : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation  : 0.00 m
Reference angle    : 0.00
```

Segment # 1: Dundas (day)

Source height = 1.22 m

Barrier height for grazing incidence

```
-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.22 !          1.50 !          1.49 !          1.49
```

ROAD (0.00 + 48.51 + 0.00) = 48.51 dBA

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

```
-----
--
-90    -66    0.00  71.32   0.00  -8.41  -8.75   0.00   0.00  -5.65
48.51
-----
--
```

Segment Leq : 48.51 dBA

Total Leq All Segments: 48.51 dBA

Segment # 1: Dundas (night)

Source height = 1.22 m

Barrier height for grazing incidence

```
-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.22 !          1.50 !          1.49 !          1.49
```

ROAD (0.00 + 41.98 + 0.00) = 41.98 dBA

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



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--										
	-90	-66	0.00	64.79	0.00	-8.41	-8.75	0.00	0.00	-5.65
	41.98									

--

Segment Leq : 41.98 dBA

Total Leq All Segments: 41.98 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.32
(NIGHT): 51.01

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APPENDIX B

ROADWAY TRAFFIC AADT INFORMATION

NOISE REPORT FOR PROPOSED DEVELOPMENT

Date: 03-May-23

REQUESTED BY:

Name: Essraa Alqassab

Company: Gradient Wind

PREPARED BY:

Name: Naveda Dukhan

Tel#: 905-615-3200 ext.8948

Location: 1. Dundas St. E



ID# 590

ON SITE TRAFFIC DATA

<i>Specific</i>	<i>Street Names</i>				
	1. Dundas St. E				
AADT:	39000				
# of Lanes:	4 Lanes				
% Trucks:	4%				
Medium/Heavy Trucks Ratio:	45/55				
Day/Night Split:	90/10				
Posted Speed Limit:	60km/hr				
Gradient Of Road:	2%				
Ultimate R.O.W:	43m				

Comments: Ultimate Traffic Only (2041)

Good Morning,

Based on the traffic data we have, we estimate the AADT to be approximately 3000 for existing conditions and 3750 with the addition of the development. Please note that our discussions with the City indicated a 0% growth on Haines Roads so the change between the two numbers is only the addition of the development's expected generated trips.

Regards,
Ian

Vacation Alert: Please be advised that I will be away starting Friday, May 19th in the afternoon and returning Monday, May 29th

Ian Lindley, M.A.Sc., P.Eng.
Project Engineer, Transportation
55 Wyndham Street North, Suite 215 | Guelph, ON N1H 7T8
T: 548.708.0022



Crozier Connections: [f](#) [t](#) [in](#) [@](#)

Read our latest news and announcements [here](#).

From: Essraa Alqassab <essraa.alqassab@gradientwind.com>
Sent: Thursday, May 18, 2023 9:09 AM
To: Aaron Wignall <awignall@cfcrozier.ca>
Cc: Joshua Foster <joshua.foster@gradientwind.com>
Subject: Re: 805 Dundas St E - Roadway Traffic Volumes

Hi Aaron,

I'm wondering if there are any updates on this?

Thanks,



ESSRAA ALQASSAB, BAsC.

Junior Environmental Scientist

essraa.alqassab@gradientwind.com

M 289 218 9557

127 Walgreen Road, Ottawa, ON, Canada K0A 1L0

GRADIENTWIND.COM



From: Mathew Frieberg <mfrieberg@gmail.com>

Sent: Tuesday, May 9, 2023 10:03 AM

To: Essraa Alqassab <essraa.alqassab@gradientwind.com>

Cc: Joshua Foster <joshua.foster@gradientwind.com>; Aaron Wignall <awignall@cfcrozier.ca>

Subject: Re: 805 Dundas St E - Roadway Traffic Volumes

CAUTION: This email originated from outside of Gradient Wind. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Essraa,

Thanks for reaching out.

I am cc'ing Aaron Wignall from Crozier. He is the traffic consultant on the project and should be able to provide you with the data you need. His phone number is 905-693-7834 if you want to call him directly.

Aaron - please provide whatever information Gradient needs for their analysis.

Thank you.

Mathew

On Tue, May 9, 2023 at 9:59 AM Essraa Alqassab <essraa.alqassab@gradientwind.com> wrote:

Good morning Mathew,

As per the city's comment on the transportation noise and vibration assessment, we have requested the roadway traffic volume information for the two main sources of traffic noise impacting the site: Dundas St E and Haines Road. However, the city does not have information



for Haines Road. As a result, we would like to connect with the traffic consultant for this project.

For Haines Rd, we have used the theoretical capacity of a 2-lane collector (AADT of 8,000) in our previous assessment. We believe that this is a conservative estimate but would like to have this confirmed by the traffic consultant.

Alternatively, we would require the projected 10-year horizon / mature state for the roadway AADT, of Haines Rd, specifically.

Thank you,

ESSRAA ALQASSAB, BAsC.

Junior Environmental Scientist

essraa.alqassab@gradientwind.com

M 289 218 9557

127 Walgreen Road, Ottawa, ON, Canada K0A 1L0

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