

**NOISE AND VIBRATION IMPACT STUDY
PROPOSED RESIDENTIAL MIXED-USE DEVELOPMENT
1785 BLOOR STREET
MISSISSAUGA, ONTARIO**

FOR

1785 BLOOR HOLDINGS INC.

PREPARED BY



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1.0 INTRODUCTION

At the request of 1785 Bloor Holdings Inc., J.E. COULTER ASSOCIATES LIMITED has completed a noise and vibration impact study of the proposed 14-storey (excluding mechanical penthouse) residential development to be located at 1785 Bloor Street in Mississauga, Ontario. See Figure 1 in Appendix A for an Area Plan. The proposed development is to be built to the north of an existing residential building. The proposed development will be entirely surrounded by residential uses.

The purpose of the study is to prepare recommendations to address noise/vibration issues in support of the subject property's rezoning application. This report will show that applicable MECP and City of Mississauga noise guidelines can be met with modest noise control measures. These recommendations will take into consideration the sound from the surrounding roadways. Please see Figure 2 in Appendix A for a Site Plan.

This report also briefly reviews the impact of the development on itself and surrounding areas.

A review of the area indicates there are no sources of stationary noise that have the potential to exceed the applicable guidelines at the future building itself. As a result, stationary noise sources are not considered further within this report. There are similarly no nearby sources of vibration. This report focuses on the transportation noise impacts.

2.0 APPLICABLE CRITERIA

The Ministry of the Environment, Conservation, and Parks' (MECP) applicable criteria to a site such as this are found in its publication *NPC-300* "Environmental Guide for Noise, Stationary and Transportation Sources – Approval and Planning".

As per *NPC-300*, this development would be considered a Class 1 – Urban area.

2.1 Transportation Noise Guidelines

Transportation noise sources addressed by *NPC-300* include aircraft, rail traffic, and roadway traffic (which include cars, trucks, buses, etc.).

Where the sound levels exceed 55 dB L_{eq} in private outdoor living areas (OLA), MECP requires noise mitigation measures to be incorporated into the subdivision design (i.e., intervening structures such as acoustic barriers or buildings and/or greater setbacks from the noise source). However, MECP will permit sound levels up to 60 dB L_{eq} daytime (5 dB above the criterion level of 55 dB L_{eq}) in private outdoor living areas (OLA), if it is not technically feasible to achieve 55 dB. Where the criterion levels are marginally exceeded, a warning clause is required in the *Agreement of Purchase and Sale* and the subdivision agreement. With respect to condominiums or townhouses, balconies are considered OLAs only if they are 4m or greater in depth. There are no private terraces or balconies greater than 4m in depth. Grade level amenity areas accessible to both existing and future residents are proposed. These include a off-leash dog run, a kids play area, and an amenity area. The proposed development includes a common outdoor amenity area on the 11th floor.

For residential buildings, the Ministry's ventilation requirements are based on the sound level at the exterior building façade. Where the sound levels at the exterior of the building façade exceed

55 dB L_{eq} daytime at the living room window or 50 dB L_{eq} nighttime at the bedroom window, the unit must be provided with forced air heating, with a provision for future air conditioning by the owner. An excess up to 10 dB is permissible, provided a warning clause is given. Where the sound levels exceed this limit (i.e., 65 dB L_{eq} daytime or 60 dB L_{eq} nighttime), air conditioning must be incorporated into the building design prior to occupancy. Warning clauses are also applicable.

Air-conditioning requirements are applied so that adequate interior sound levels can be maintained with the windows closed.

The MECP also stipulates acceptable indoor sound levels limits, which vary depending on whether they are railway noise sources or roadway noise sources.

The applicable MECP criteria are summarized in Table 1, below.

Table 1: Noise Criteria Summary

Type of Space	Road		Rail	
	Daytime (dB L_{eq}) (0700–2300)	Nighttime (dB L_{eq}) (2300–0700)	Daytime (dB L_{eq}) (0700–2300)	Nighttime (dB L_{eq}) (2300–0700)
Outdoor Living Area (O.L.A.)	55	N/A	55	N/A
Bedrooms	45	40	40	35
Living/Dining	45	45	40	40
Kitchen/Baths	45	45	40	40

Note: OLAs for condominiums are terraces/balconies greater than 4m in depth and common amenity areas such as rooftop patios intended for quiet enjoyment and readily accessible from the building.

Transportation noise sources in the vicinity of the proposed development include road traffic on Bloor Street and to a much lesser extent Fieldgate Drive and Bridgewood Drive.

3.0 TRANSPORTATION NOISE SOURCES

3.1 Roadway Noise Sources

The building is not located immediately adjacent to any roadways. It is approximately 68m from the centreline of Bloor Street, 80m west of Bridgewood Drive, and 240m east of Fieldgate Drive. Ultimate traffic volumes were provided by the City of Mississauga as shown in Table 2, below.

Table 2: Roadway Traffic Volumes

Roadway	AADT	Day/Night Split	Medium/Heavy Split	Speed Limit (km/h)
Bloor Street	18,700	90/10	55/45	50
Fieldgate Drive	6,000	90/10	55/45	50
Bridgewood Drive	3,000	90/10	55/45	50

4.0 TRANSPORTATION NOISE ASSESSMENT

Based on the volumes provided in Section 3.0, the sound levels have been calculated at several locations of the proposed development. The calculated sound levels are summarized in Table 3, below.

Table 3: Transportation Noise Summary

Location	Description	Road	
		Daytime (dBA L _{eq,16hr})	Nighttime (dBA L _{eq,8hr})
1	South Façade	59	52
2	11 th Floor Amenity	45	n/a
3	Off-Leash Dog Run	58	n/a
4	Kids Play Area	53	n/a
5	Amenity	51	n/a

Please see Appendix B for sample calculations. The calculation locations are shown in Figure 2 in Appendix A.

4.1 Noise Control Recommendations

The calculated sound levels slightly exceed the MECP guidelines. As a result, noise control measures will be required.

Ventilation Upgrades

As the sound levels exceed 55 dBA L_{eq} during the daytime and 50 dBA L_{eq} during the nighttime, the entire development should be provided with forced air heating with the provision to allow for future central air conditioning. All of the affected units will need to be supplied with Warning Clause C (see Appendix C) in their *Agreements of Purchase and Sale or Lease*. The use of central air conditioning is fairly standard for new residential developments, which will exceed these requirements.

Exterior Glazing and Walls/Panels

Due to the modest sound levels, all glazing and exterior wall construction may use standard OBC-compliant assemblies. Special upgrades are not required, as per *NPC-300*.

Noise Barriers

The sound levels on the 11th floor amenity area are predicted to be well below the 55 dBA L_{eq,16hr} criteria due to the additional setback distance and screening offered by the building itself. Noise control measures such as noise barriers are not required for this amenity area.

Sound levels at the Kids Play Area and Amenity area at grade-level are expected to be below the 55 dBA L_{eq,16hr} criteria due to the shielding offered by the existing apartment building on the site. Noise barriers are not required.

The sound levels at the Off-Leash Dog Run area are expected to be 58 dBA $L_{eq,16hr}$ due to lack of shielding from the existing building. The amenity area would need a 1.5m high noise barrier as shown in Figure 3. With this barrier in place, the sound level in the amenity area is predicted to be 53 dBA $L_{eq,16hr}$, meeting the MECP limits. Given the noise barrier would visually close this area off, and given that a dog run is not a quiet space, the noise barrier is not recommended. The sound levels are still below the maximum MECP limit of 60 dBA $L_{eq,16hr}$ for outdoor amenity areas. All units should instead be provided with Warning Clause 'B'. Note that residents have access to 3 other amenity areas that provide a place for quiet enjoyment of the outdoors.

5.0 IMPACT OF THE DEVELOPMENT ON ITSELF AND SURROUNDING AREA

The City requests that new developments consider the noise impact of the development both on itself and the surrounding area.

There are existing residential receptors located to the north, south, east (beyond the Hydro corridor), and west of the site. Typically, for a development such as this, exhaust fans and other mechanical equipment are the major noise generators.

In terms of the impact of the development on itself, the development's own mechanical/electrical equipment needs to be considered.

The mechanical design of the development has not yet progressed to the point where the impact of the development on itself or its surroundings can be accurately quantified. As plans mature, a review of the impacts of the development on itself as well as on the surrounding area can be completed. In most cases, the most critical receptors are often the building's own future occupants.

Noise control measures for the development's mechanical equipment can be readily incorporated into the design. In many cases, equipment can also be selected to avoid a noise impact entirely. It is recommended that a review of the outdoor noise impact of the development be completed at such a time when the mechanical design is completed, prior to the building permit application.

6.0 CONCLUSIONS

The proposed development is in an area with minimal transportation noise due to the distance from nearby roadways. The transportation sound levels slightly exceed the MECP guidelines, and noise control measures in the form of ventilation upgrades will be required.

This analysis has been completed to demonstrate the development's feasibility.

Overall, the transportation noise study demonstrates that the proposed development is technically feasible from a noise and vibration perspective. There are no major noise and/or vibration issues that would prove challenging to address at later stages of the design.

7.0 SUMMARY OF RECOMMENDATIONS

To meet the requirements of the Ministry of the Environment, Conservation and Parks and the City of Mississauga, the following noise control measures will be required:

1. All units will be supplied with forced-air heating with the provision for future central air conditioning. Warning Clause Type C will be inserted into the *Agreements of Purchase and Sale or Lease* for all units.
2. Terraces and private balconies greater than 4m in depth are not currently proposed and should be avoided on the south side of the building. If included, such areas will need to be addressed to ensure the guidelines are met.
3. The 11th floor amenity area, ground floor kids play area, and ground floor amenity area all meet the MECP limit of 55 dBA $L_{eq,16hr}$ without the need for noise control measures.
4. The ground floor off-leash dog run area is predicted to exceed the 55 dBA limit but be below the 60 dBA maximum limit for outdoor amenity areas. A noise barrier is not recommended for this area. All units should be supplied with Warning Clause B in the *Agreements of Purchase and Sale or Lease*.
5. As per *NPC-300*, exterior wall and glazing upgrades are not required due to the modest transportation sound levels.
6. Prior to the building permit application, a review of the proposed development's mechanical and electrical equipment should be completed to ensure that applicable noise guidelines are met at the surrounding areas as well as at the future development itself.

APPENDIX A: FIGURES

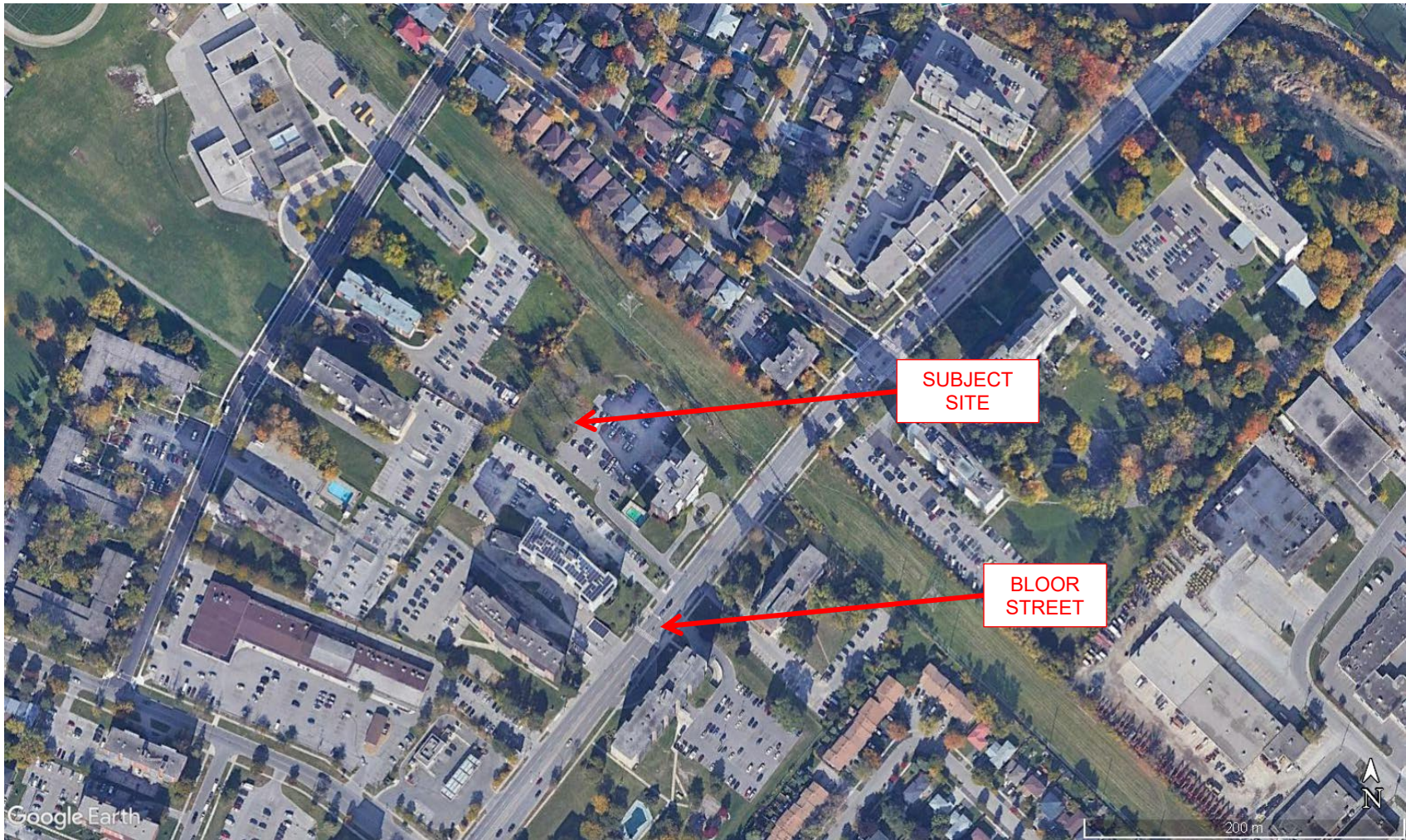


Figure 1: Key Plan

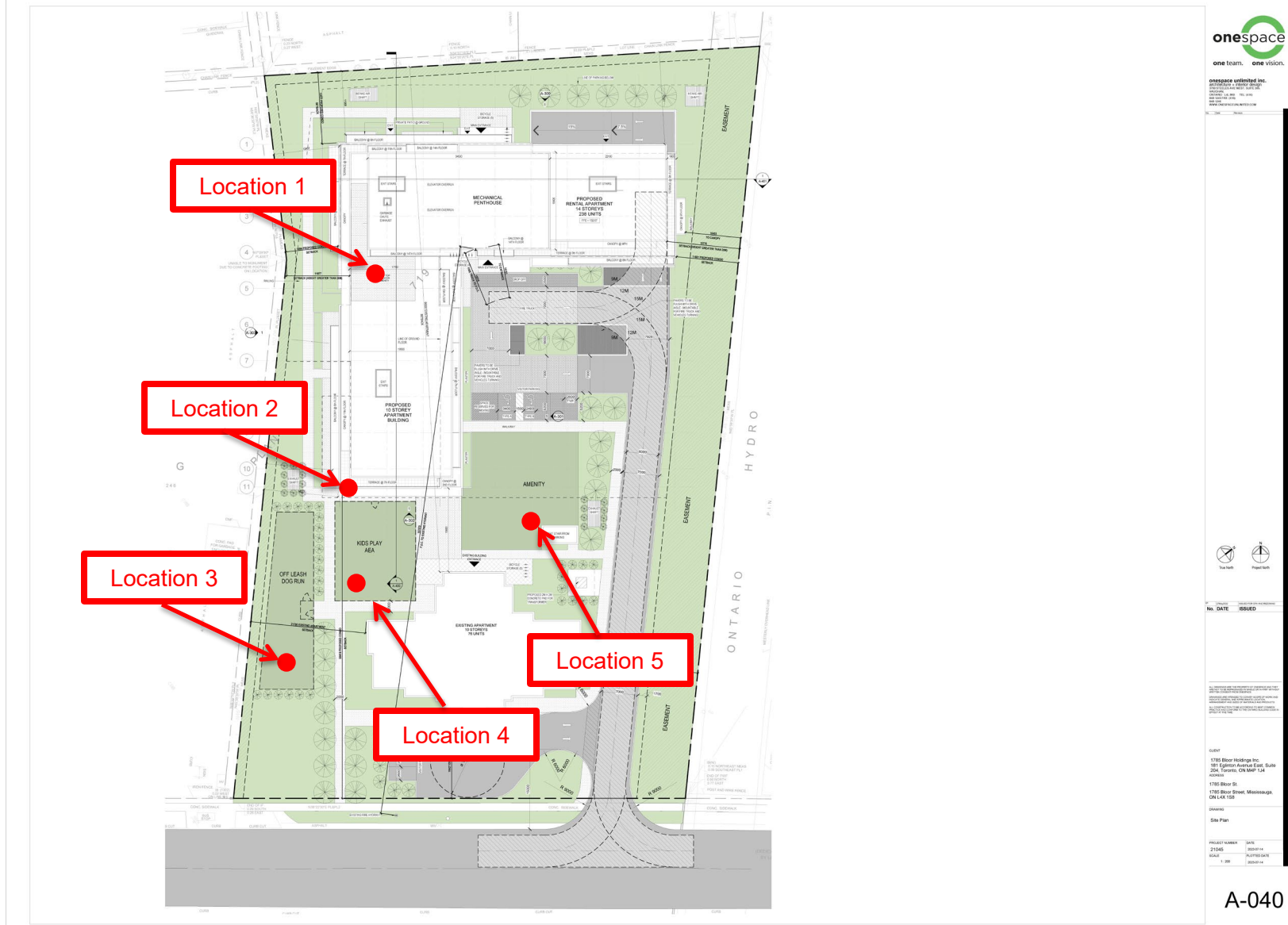



Figure 2: Site Plan

APPENDIX B: DATA AND SAMPLE CALCULATIONS

NOISE REPORT FOR PROPOSED DEVELOPMENT					
Date:	22-Dec-21				
REQUESTED BY:					
Name:	Sam Kulendran, B.A.Sc., P.Eng.		Location:	Bloor Street - Fieldgate Drive to City East Limits Fieldgate Drive (1) - north of Bloor Street Fieldgate Drive (2) - south of Bloor Street Bridgewood Drive - north of Bloor Street	
Company:	J.E. Coulter Associates Ltd.				
PREPARED BY:					
Name:	Steven Guan				
Tel#:	905-615-3200 ext. 5933				
 MISSISSAUGA			ID:	530	
ON SITE TRAFFIC DATA					
Specific	Street Names				
	Bloor St	Fieldgate Dr (1)	Fieldgate Dr (2)	Bridgewood Dr	
AADT:	18,700	6,000	4,000	3,000	
# of Lanes:	4 Lanes	2 Lanes	2 Lanes	2 Lanes	
% Trucks:	3%	3%	3%	3%	
Medium/Heavy Trucks Ratio:	55/45	55/45	55/45	55/45	
Day/Night Split:	90/10	90/10	90/10	90/10	
Posted Speed Limit:	50 km/h	50 km/h*	50 km/h	50 km/h	
Gradient Of Road:	<2%	<2%	<2%	<2%	
Ultimate R.O.W.:	30 m	26 m	26 m	20 m	
Comments:	Ultimate traffic data only (2041). *Note: Fieldgate Drive transitions from 50 km/h to 40 km/h north of Bloor Street.				

Filename: sajblo.te Time Period: Day/Night 16/8 hours
 Description: South Facade Sound Levels

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

```
-----
Car traffic volume : 16325/1814 veh/TimePeriod *
Medium truck volume : 278/31 veh/TimePeriod *
Heavy truck volume : 227/25 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): 18700
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 1.65
Heavy Truck % of Total Volume : 1.35
Day (16 hrs) % of Total Volume : 90.00
```

Data for Segment # 1: Bloor (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 : 1.50 / 15.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Results segment # 1: Bloor (day)

Source height = 1.08 m

ROAD (0.00 + 58.89 + 0.00) = 58.89 dBA

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

```
-----
--
-90 90 0.00 65.45 0.00 -6.56 0.00 0.00 0.00 0.00
58.89
-----
--
```

Segment Leq : 58.89 dBA

Total Leq All Segments: 58.89 dBA

Results segment # 1: Bloor (night)

Source height = 1.08 m

ROAD (0.00 + 52.34 + 0.00) = 52.34 dBA

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

SubLeq

--
-90 90 0.00 58.91 0.00 -6.56 0.00 0.00 0.00 0.00
52.34

--
Segment Leq : 52.34 dBA

Total Leq All Segments: 52.34 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.89
(NIGHT): 52.34

Filename: sajblo2.te Time Period: Day/Night 16/8 hours
Description: 11th Floor Amenity Area

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

Car traffic volume : 16325/1814 veh/TimePeriod *
Medium truck volume : 278/31 veh/TimePeriod *
Heavy truck volume : 227/25 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): 18700
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 1.65
Heavy Truck % of Total Volume : 1.35
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Bloor (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 : 105.00 / 68.00 m
Receiver height : 1.50 / 15.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 0.00 m
Barrier receiver distance : 20.00 / 8.00 m
Source elevation : 0.00 m
Receiver elevation : 33.00 m
Barrier elevation : 33.00 m
Reference angle : 0.00

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

Car traffic volume : 3492/388 veh/TimePeriod *
Medium truck volume : 59/7 veh/TimePeriod *
Heavy truck volume : 49/5 veh/TimePeriod *
Posted speed limit : 100 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): 4000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 10.00
 Medium Truck % of Total Volume : 1.65
 Heavy Truck % of Total Volume : 1.35
 Day (16 hrs) % of Total Volume : 90.00

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

```

-----
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth           :      0       (No woods.)
No of house rows    :      0 / 0
Surface             :      1       (Absorptive ground surface)
Receiver source distance : 160.00 / 15.00 m
Receiver height      :   1.50 / 4.50 m
Topography          :      2       (Flat/gentle slope; with barrier)
Barrier angle1      : -90.00 deg   Angle2 : 90.00 deg
Barrier height      :   3.00 m
Barrier receiver distance : 15.00 / 10.00 m
Source elevation    :   0.00 m
Receiver elevation   :  33.00 m
Barrier elevation    :  33.00 m
Reference angle     :   0.00
  
```

Results segment # 1: Bloor (day)

Source height = 1.08 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.08 !         1.50 !        -4.87 !          28.13
  
```

ROAD (0.00 + 44.75 + 0.00) = 44.75 dBA

```

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
SubLeq
-----
--
-90     90     0.00  65.45  0.00  -8.45  0.00  0.00  0.00 -12.25
44.75
-----
--
  
```

Segment Leq : 44.75 dBA

Results segment # 2: Bridgeland (day)

Source height = 1.08 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.08	1.50	-1.63	31.37

ROAD (0.00 + 36.57 + 0.00) = 36.57 dBA

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

--
-90 90 0.49 65.80 0.00 -15.34 -1.16 0.00 0.00 -12.72
36.57

--

Segment Leq : 36.57 dBA

Total Leq All Segments: 45.36 dBA

Results segment # 1: Bloor (night)

Source height = 1.08 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.08	15.00	9.48	42.48

ROAD (0.00 + 52.34 + 0.00) = 52.34 dBA

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

--
-90 90 0.00 58.91 0.00 -6.56 0.00 0.00 0.00 -0.03
52.31*
-90 90 0.00 58.91 0.00 -6.56 0.00 0.00 0.00 0.00
52.34

--

* Bright Zone !

Segment Leq : 52.34 dBA

Results segment # 2: Bridgeland (night)

Source height = 1.06 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
1.06 ! 4.50 ! -19.80 ! 13.20

ROAD (0.00 + 40.07 + 0.00) = 40.07 dBA

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

--
-90 90 0.40 59.22 0.00 0.00 -0.99 0.00 0.00 -18.16
40.07

--

Segment Leq : 40.07 dBA

Total Leq All Segments: 52.59 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 45.36
(NIGHT): 52.59

Filename: sajblo3.te Time Period: Day/Night 16/8 hours
 Description: Off-Leash Dog Run

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

```
-----
Car traffic volume   : 16325/1814   veh/TimePeriod *
Medium truck volume  :   278/31    veh/TimePeriod *
Heavy truck volume   :   227/25    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): 18700
Percentage of Annual Growth         : 0.00
Number of Years of Growth           : 10.00
Medium Truck % of Total Volume       : 1.65
Heavy Truck % of Total Volume        : 1.35
Day (16 hrs) % of Total Volume       : 90.00
```

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

```
-----
Angle1  Angle2      : -90.00 deg   90.00 deg
Wood depth      : 0 (No woods.)
No of house rows : 0 / 0
Surface         : 1 (Absorptive ground surface)
Receiver source distance : 36.00 / 50.00 m
Receiver height  : 1.50 / 15.00 m
Topography      : 1 (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

Results segment # 1: Bloor (day)

Source height = 1.08 m

ROAD (0.00 + 57.68 + 0.00) = 57.68 dBA

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

```
-----
--
-90      90      0.66  65.45   0.00  -6.31  -1.46   0.00   0.00   0.00
57.68
-----
--
```

Segment Leq : 57.68 dBA

Total Leq All Segments: 57.68 dBA

Results segment # 1: Bloor (night)

Source height = 1.08 m

ROAD (0.00 + 51.58 + 0.00) = 51.58 dBA

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

SubLeq

--

-90	90	0.27	58.91	0.00	-6.63	-0.70	0.00	0.00	0.00
-----	----	------	-------	------	-------	-------	------	------	------

51.58

--

Segment Leq : 51.58 dBA

Total Leq All Segments: 51.58 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.68
(NIGHT): 51.58

Filename: sajblo4.te Time Period: Day/Night 16/8 hours
Description: Kids Play Area

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

Car traffic volume : 16325/1814 veh/TimePeriod *
Medium truck volume : 278/31 veh/TimePeriod *
Heavy truck volume : 227/25 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): 18700
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 1.65
Heavy Truck % of Total Volume : 1.35
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 58.00 / 58.00 m
Receiver height : 1.50 / 15.00 m
Topography : 0 (Define your own alpha.)
Barrier angle1 : -90.00 deg Angle2 : 0.00 deg
Barrier height : 20.00 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Alpha : 0.33
Reference angle : 0.00

Results segment # 1: Bloor (day)

Source height = 1.08 m

Barrier height for grazing incidence

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

```

-----+-----+-----+-----
          1.08 !          1.50 !          1.43 !          1.43

```

ROAD (0.00 + 34.64 + 53.80) = 53.85 dBA

```

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

```

```

-----
--
-90      0    0.33  65.45   0.00  -7.81  -3.85   0.00   0.00 -19.15
34.64

```

```

-----
--
  0      90    0.33  65.45   0.00  -7.81  -3.85   0.00   0.00  0.00
53.80

```

Segment Leq : 53.85 dBA

Total Leq All Segments: 53.85 dBA

Barrier table for segment # 1: Bloor (day)

```

-----
Barrier ! Elev of ! Road  ! Tot Leq !
Height  ! Barr Top!  dBA   ! dBA    !
-----+-----+-----+-----
  21.50 !  21.50 !  53.85 !  53.85 !
  22.00 !  22.00 !  53.85 !  53.85 !
  22.50 !  22.50 !  53.85 !  53.85 !
  23.00 !  23.00 !  53.85 !  53.85 !
  23.50 !  23.50 !  53.85 !  53.85 !
  24.00 !  24.00 !  53.85 !  53.85 !
  24.50 !  24.50 !  53.85 !  53.85 !
  25.00 !  25.00 !  53.84 !  53.84 !
  25.50 !  25.50 !  53.84 !  53.84 !
  26.00 !  26.00 !  53.84 !  53.84 !

```

Results segment # 1: Bloor (night)

Source height = 1.08 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver  ! Barrier  ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.08 !          15.00 !          12.60 !          12.60

```

ROAD (0.00 + 30.30 + 47.25) = 47.34 dBA

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

SubLeq

--									
-90	0	0.33	58.91	0.00	-7.81	-3.85	0.00	0.00	-16.95
30.30									
--									
0	90	0.33	58.91	0.00	-7.81	-3.85	0.00	0.00	0.00
47.25									
--									
--									

Segment Leq : 47.34 dBA

Total Leq All Segments: 47.34 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.85
(NIGHT): 47.34

Filename: sajblo5.te Time Period: Day/Night 16/8 hours
 Description: Ground Floor Amenity

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

```
-----
Car traffic volume : 16325/1814 veh/TimePeriod *
Medium truck volume : 278/31 veh/TimePeriod *
Heavy truck volume : 227/25 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): 18700
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 1.65
Heavy Truck % of Total Volume : 1.35
Day (16 hrs) % of Total Volume : 90.00
```

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

```
-----
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 60.00 / 60.00 m
Receiver height : 1.50 / 15.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -45.00 deg Angle2 : 30.00 deg
Barrier height : 20.00 m
Barrier receiver distance : 20.00 / 20.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00
```

Results segment # 1: Bloor (day)

Source height = 1.08 m

Barrier height for grazing incidence

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

1.08 ! 1.50 ! 1.36 ! 1.36

ROAD (46.41 + 35.63 + 48.38) = 50.65 dBA

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

```
-----
--
  -90    -45    0.66  65.45   0.00  -9.99  -9.05   0.00   0.00   0.00
46.41
-----
--
  -45     30    0.00  65.45   0.00  -6.02  -3.80   0.00   0.00 -20.00
35.63
-----
--
   30     90    0.66  65.45   0.00  -9.99  -7.08   0.00   0.00   0.00
48.38
-----
--
```

Segment Leq : 50.65 dBA

Total Leq All Segments: 50.65 dBA

Barrier table for segment # 1: Bloor (day)

```
-----
Barrier ! Elev of ! Road ! Tot Leq !
Height ! Barr Top! dBA  ! dBA  !
-----+-----+-----+-----+
  21.50 !  21.50 !  50.65 !  50.65 !
  22.00 !  22.00 !  50.65 !  50.65 !
  22.50 !  22.50 !  50.65 !  50.65 !
  23.00 !  23.00 !  50.65 !  50.65 !
  23.50 !  23.50 !  50.65 !  50.65 !
  24.00 !  24.00 !  50.65 !  50.65 !
  24.50 !  24.50 !  50.65 !  50.65 !
  25.00 !  25.00 !  50.65 !  50.65 !
  25.50 !  25.50 !  50.65 !  50.65 !
  26.00 !  26.00 !  50.65 !  50.65 !
```

Results segment # 1: Bloor (night)

Source height = 1.08 m

Barrier height for grazing incidence

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

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
43.90	-90	0.27	58.91	0.00	-7.63	-7.38	0.00	0.00	0.00
29.08	-45	0.00	58.91	0.00	-6.02	-3.80	0.00	0.00	-20.00
45.44	30	0.27	58.91	0.00	-7.63	-5.83	0.00	0.00	0.00

Segment Leq : 47.81 dBA

Total Leq All Segments: 47.81 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 50.65
(NIGHT): 47.81

APPENDIX C: WARNING CLAUSES

- TYPE A:** “Purchasers/tenants are advised that sound levels due to increasing road traffic and rail traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks.”
- TYPE B:** “Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic and rail traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks.”
- 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, Conservation and Parks.”
- 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, Conservation and Parks.”
- TYPE E:** “Purchasers/tenants are advised that due to the proximity of the adjacent industry, noise from the industry may at times be audible.”

APPENDIX D: REFERENCES

1. Ministry of the Environment, "Model Municipal Noise Control By-Law, Final Report", August 1978.
2. Ontario Ministry of the Environment, Environmental Approvals and Land Use Planning Branch, "Guidelines for Road Traffic Noise Assessment", July 1986.
3. Ministry of the Environment's *STAMSON* Computer Programme (Version 5.03) for the IBM PC.
4. Ministry of the Environment, *ORNAMENT*, "Ontario Road Noise Analysis Method for Environment and Transportation", November 1988.
5. Quirt, D.J., "Controlling Sound Transmission into Buildings", National Research Council, Building Practice Note 56, Update 1.1.
6. Ministry of the Environment, *STEAM* "Sound from Trains Environmental Analysis Method", July 1990.
7. Ministry of the Environment, "Environmental Noise Guideline: Stationary and Transportation Sources – Approval and Planning", Publication NPC-300, August 2013.