Environmental Noise and Vibration Feasibility Study

1989 Appleby Line

Proposed Residential Development

City of Burlington

May 31, 2022
Project: 122-0252

Prepared for

Latch Developments

Prepared by



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VALCOUSTICS
Canada Ltd.

Version History

Version #	Date	Comments
1.0	May 31, 2022	Final – Issued to Client

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Environmental Noise and Vibration Feasibility Study

1989 Appleby Line

Proposed Residential Development

City of Burlington

1.0 INTRODUCTION

This Environmental Noise and Vibration Feasibility Study has been prepared to in support of the zoning and official plan amendment applications for the proposed residential development located at 1989 Appleby Line in The City of Burlington. The purpose is to determine appropriate mitigation measures required to meet the applicable Ministry of the Environment, Conservation and Parks (MECP) noise guidelines as well as the requirements of the City of Burlington and Region of Halton.

2.0 SITE AND SURROUNDING AREA

2.1 SITE LOCATION

The site is located close to the southeast corner of Appleby Line and Upper middle Road and is surrounded by:

- Appleby Line, with an existing commercial/retail development beyond, to the west;
- The existing Hydro Corridor, with Upper Middle Road and existing townhouse residential development beyond, to the north;
- An existing six-storey residential building, with Imperial Way and residential townhouse development beyond, to the east; and
- An existing 16-storey residential building, with Ironstone Drive and existing residential development beyond, to the south.

Figure 1 shows the key plan.

The site is currently occupied with an Esso Gas Station which will be demolished as part of this development.



Figure 1: Key Plan

2.2 PROPOSED DEVELOPMENT

The development consists of two twenty-storey towers atop a common 1-storey podium with a 6-storey connection between the towers. The eastern tower is Tower A and the western is Tower B. There is a common outdoor amenity area atop the 6-storey portion of the building, between the two towers. The development will have three levels of underground parking, retail uses and parking areas at grade and residential uses above.

The assessment is based on the Conceptual Site Plan with a file date of May 31, 2022 prepared by Raw Design Inc.

Appendix A contains the relevant drawings.

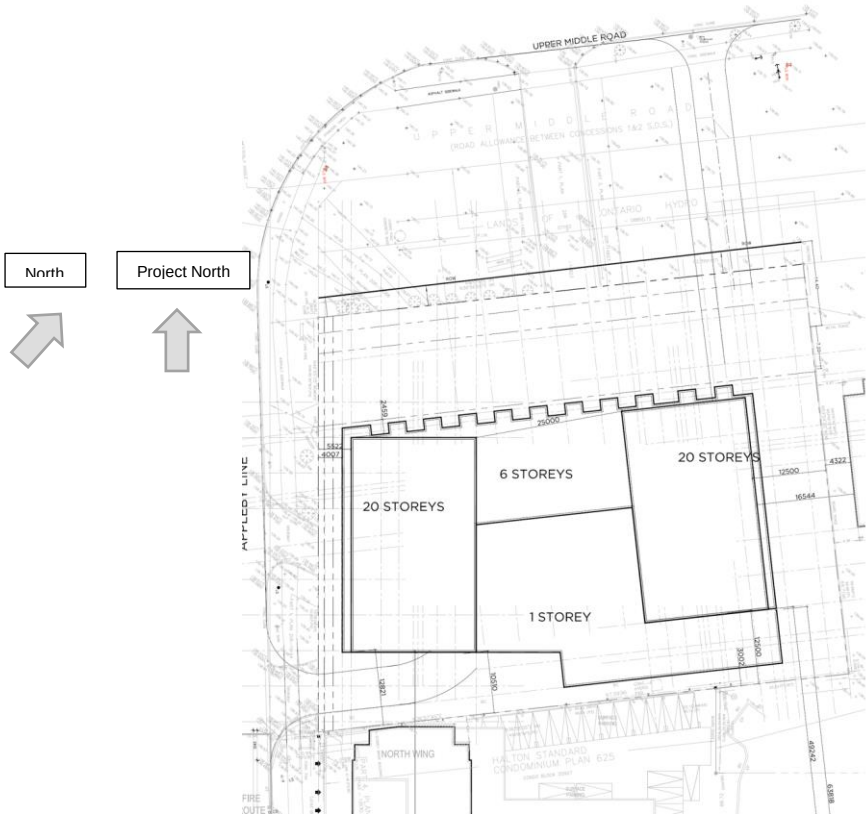


Figure 2: Conceptual Site Plan

3.0 NOISE SOURCES

3.1 TRANSPORTATION NOISE SOURCES

The primary transportation noise sources with potential to impact the site are road traffic on Upper Middle Road and Appleby Line. The Canadian National (CN) Halton Rail Subdivision is located around 450 m to the northwest of the site. Although sufficiently separated, the rail line was included in the assessment for completeness.

Ironstone Drive and Imperial Way are local roads, and sufficiently separated and screened (by existing development) from the site. As such, noise impact from these roads is expected to be insignificant relative to the primary sources listed above. Thus, these other roads were not included in the assessment.

Road and rail traffic data correspondence are included as Appendix B.

3.2 ROAD TRAFFIC

The road traffic data used in the assessment is shown in Table 1A.

TABLE 1A ROAD TRAFFIC DATA

Roadway	AADT(1)		% Trucks		Day/Night Split (%)	Speed (km/hr)
	Current(2)	Future(3)	Medium	Heavy		
Appleby Line	27 615	44 417	1.1	1.7	90/10	60
Upper Middle Road	16 175	25 506	0.6	1.5	90/10	60

Notes:

(1) AADT – Annual Average Daily Traffic.

(2) Current volume represents year 2018 TMC data for Appleby Line and year 2019 date for Upper Middle Road.

(3) Future volume has been projected to the year 2040 design condition (20-year projection, as per the Region of Halton requirements) using a 2% growth rate compounded annually.

Existing road traffic data in terms of Turning Movement Counts (TMCs) were provided by the traffic consultants on the project (Paradigm Transportation Solutions Limited). A 2018 TMC for Upper Middle Road and Appleby Line and a 2019 TMC for Appleby Line at Ironstone Drive were received. For Upper Middle Road, the higher volume data from 2019 was used in the assessment. The TMCs contained truck volumes.

The peak morning and afternoon hourly data was averaged and multiplied by a factor of 10 to determine the 24 hour volume for each road (i.e. the peak hour was assumed to be 10% of the 24 hr traffic volume). The 24-hour volume was escalated to the year 2040 (20 year future projection) as per the Region of Halton Noise Abatement Policy for regional roads.

3.3 RAIL TRAFFIC

The rail traffic data used in the assessment is shown in Table 1B.

TABLE 1B RAIL TRAFFIC DATA

Railway	Time Period	Train Type	Volume		# of Locomotives per Train	# of Cars per Train	Speed (km/hr)
			Current(1)	Future(2)			
CN Halton Subdivision	Daytime	Freight	10	12.1	4	140	80
		Way Freight	2	2.4	4	25	80
	Nighttime	Freight	4	4.9	4	140	80

Notes:

(1) Current (year 2019 data confirmed valid in 2022) data obtained from CN.

(2) Future (year 2032) projections calculated using a 2.5% growth rate compounded annually.

CN rail traffic for the Halton Subdivision applicable to the year 2019 was obtained directly from CN and confirmed by CN to still be valid in 2022. The rail traffic data was escalated to the year 2032 design condition (10-year future projection) at a rate of 2.5% compounded annually, as indicated in the traffic data correspondence from CN.

The CN Halton Subdivision contains two mainline tracks and is continuously welded throughout the study area.

3.4 STATIONARY SOURCES

There are existing residential buildings to the west and south of the site. The only noise sources from these buildings would be the mechanical equipment interfacing with the exterior. However, given the high ambient sound levels in the vicinity and the presence of other residential buildings at similar setback distances as the subject site, significant noise impact is not expected from these other buildings.

There is a commercial/retail plaza to the west, located on the west side of Appleby Line. Similar to the above, the only noise sources at these facilities would be rooftop packaged HVAC equipment. Aerial imagery for this area shows these units as small and given the setback distance and intervening busy roadway significant noise impact is not expected from these units.

Thus, stationary noise sources have not been considered further in this report.

3.5 VIBRATION SOURCES

The only anticipated source of environmental vibration in the vicinity is the CN Halton Subdivision. However, given the substantial set back distance (about 450 m), there is no significant impact expected. Thus, environmental vibration has not been considered further in this assessment.

4.0 ENVIRONMENTAL NOISE REQUIREMENTS

4.1 MECP ENVIRONMENTAL NOISE GUIDELINES

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

The environmental noise guidelines contained in NPC-300 are discussed briefly below and summarized in Appendix D.

4.1.1 Architectural Elements

During daytime hours (0700 to 2300 hours), the indoor criterion for road noise is $L_{eq,Day}$(1) of 45 dBA for sensitive spaces such as living/dining rooms, dens and bedrooms. At night (2300 to 0700 hours), the indoor criterion for road noise is $L_{eq,Night}$(2) of 45 dBA for sensitive spaces such as living/dining rooms and dens, and 40 dBA for bedrooms (i.e. sleeping quarters).

For rail noise, the indoor sound levels are $L_{eq\ Day}$ of 40 dBA for living/dining rooms and bedrooms, $L_{eq\ Night}$ of 40 dBA for living/dining rooms, and $L_{eq\ Night}$ of 35 dBA for bedrooms.

(1) 16-hour daytime (0700 to 2300 hours) equivalent continuous sound pressure level.

(2) 8-hour nighttime (2300 to 0700 hours) equivalent continuous sound pressure level.

The architectural design of the building envelope (walls, windows, etc.) must provide adequate sound isolation to achieve these indoor sound level limits.

4.1.2 Ventilation Requirements

In accordance with the MECP noise guidelines for transportation noise sources, if the daytime sound level ($L_{eq,Day}$) at the exterior facade of a noise sensitive window is greater than 65 dBA, means must be provided such that windows can be kept closed for noise control purposes, and central air conditioning is required. For daytime sound levels between 56 dBA and 65 dBA inclusive, there need only be the provision for adding air conditioning at a later date. A warning clause advising the occupants of the potential interference with some activities is also required. At nighttime, air conditioning would be required when the sound level exceeds 60 dBA ($L_{eq,Night}$) at a noise sensitive window. The provision for adding air conditioning is required when the nighttime sound level is greater than 50 dBA.

4.1.3 Outdoors

For OLA's the guideline sound level limit is a daytime 16-hour equivalent sound level ($L_{eq,Day}$) of 55 dBA, with an excess not more than 5 dBA considered acceptable if it is not feasible to achieve the 55 dBA objective for technical, economic or administrative reasons (i.e. an upper allowable design limit of 60 dBA). In these cases, warning clauses must be provided and registered on title. There are no nighttime sound level limits for OLAs.

The point of assessment for an elevated OLA is typically in the middle of the space at a height of 1.5 m above the floor slab. It should be noted that a balcony/terrace is only considered an OLA:

- if it is the only OLA for the occupant,
- it is unenclosed, and
- it is 4 m in depth or more.

4.2 REGION OF HALTON NOISE ABATEMENT GUIDELINES

The Region of Halton has published a Noise Attenuation Technical Policy for Regional Roads and New Developments (Report CS-69-06) as well as a Noise Abatement Guideline document. These policies indicate that the sound level criteria that should be met and are essentially the same as those outlined in the MECP noise guidelines (i.e., NPC-300). There are also some additional requirements for sound barriers and on the extrapolation of road traffic data in the Policy:

- Sound barriers must be installed on complete blocks and constructed on the Region's right-of-way (where feasible).
- The maximum height of a noise barrier wall is 3 metres measured from the base elevation, with higher noise barrier walls allowed by the Region subject to investigation of the aesthetics and depending on the availability of a wide right-of-way (R.O.W.) and deep residential lots.
- The Region also requires that noise assessments be based on a future 20-year design criterion, i.e., road traffic volumes are to be extrapolated 20 years in the future.

4.3 FEDERATION OF CANADIAN MUNICIPALITIES/RAILWAY ASSOCIATION OF CANADA

The Federation of Canadian Municipalities and Railway Association of Canada (FCM/RAC) published noise control guidelines in 2013. CN has adopted the use of these guidelines. The publication suggests a "standard" set of mitigation measures which include setbacks, a safety berm with acoustic fence atop. However, given the substantial setback distance of the site. These "standard" measures would not apply.

Aside from the above, the sound level design objectives of the FCM/RAC are similar to those of the MECP.

5.0 TRANSPORTATION NOISE ASSESSMENT

5.1 METHOD

Using the traffic data in Tables 1A and 1B, the sound levels in terms of $L_{eq\ Day}$ and $L_{eq\ Night}$ were determined using STAMSON V5.04 – ORNAMENT/STEAM, the computerized road and rail traffic noise prediction model of the MECP.

The daytime and nighttime sound levels were calculated at a worst-case top (20^{th}) storey height of 61.7 m above grade. The OLA sound level was calculated at the midpoint of the terrace at a height of 1.5 m above the top of the terrace slab. Note that at this receptor height, the ground surface, whether hard or soft, does not impact the calculation.

All private balconies or terraces are expected to be less than 4 m in depth and would thus, not be considered OLAs under MECP

Acoustical screening due to the orientation of the receptor to the noise source and inherent screening from the development itself were included in the assessment. However, to be conservative, acoustical screening from surrounding existing developments was not included in the assessment.

5.2 RESULTS

The highest predicted sound levels of 70 dBA during the daytime and 64 dBA during the nighttime are predicted to occur on the west facade of the western-most tower (Tower B)

The daytime sound level at the common outdoor amenity area is predicted to be 60 dBA.

Table 2 shows the predicted sound levels due to the transportation sources. Sample calculations are included in Appendix C.

TABLE 2 PREDICTED SOUND LEVELS DUE TO TRANSPORTATION SOURCES

Location[1]	Source	Distance (m)[2]	$L_{eq\ Day}$ (dBA)	$L_{eq\ Night}$ (dBA)
Tower A North Facade (Northwest Corner)	Appleby Line	70	62	55
	Upper Middle Road	72	62	55
	CN Rail Line	497	58	57
	TOTAL	**—**	**66**	**61**
Tower A West Facade (Northwest Corner)	Appleby Line	70	63	56
	Upper Middle Road	72	57	52
	CN Rail Line	497	59	57
	TOTAL	**—**	**69**	**60**
Tower B North Facade (Northwest Corner)	Appleby Line	25	66	59
	Upper Middle Road	71	62	55
	CN Rail Line	457	58	57
	TOTAL	**—**	**68**	**62**
Tower B West Facade (Northwest Corner)	Appleby Line	25	69	62
	Upper Middle Road	71	59	52
	CN Rail Line	457	60	59
	TOTAL	**—**	**70**	**64**
Common outdoor amenity areas	Appleby Line	59	53	N/A[3]
	Upper Middle Road	80	53	N/A[3]
	CN Rail Line	491	57	N/A[3]
	TOTAL	**—**	**60**	N/A[3]

Notes:

(1) Facade receptors taken at worst case 20 storey height. OLA receptor taken at 1.5 m above terrace slab.

(2) Distance measured from the receptor to the centreline of the roadway/railway.

(3) MECP guideline limits do not apply to OLAs during the nighttime.

5.3 TRANSPORTATION NOISE CONTROL MEASURES

The noise control measures for transportation noise sources include ventilation and architectural elements to protect the indoor noise environment, design features to protect OLAs, and appropriate warning clauses.

Table 3 and Figure 2 summarize the noise control measures for the site. These are also discussed in the following sections.

TABLE 3 NOISE ABATEMENT MEASURES

Dwelling	Air Conditioning(1)	Exterior Wall(2)	Exterior Window(2)(3)	Sound Barrier(4)	Warning Clause(5)
All Residential Suites	Mandatory	STC 54	STC 34	7th Floor Common Amenity Space: 1.4 m on north side; and 1.2 m on south side	A + B + C (For suites with private terraces/balconies)

Notes:

(1) Central air conditioning allows windows to remain closed for noise control purposes. Equipment interfacing with the exterior must meet the sound level limits in NPC-300.

(2) Window and exterior wall requirements were based on standard assumptions and should be reviewed once building (floor) plans are finalized.

(3) The window STC rating applies to the entire window assembly and not just the glazing. A sliding glass walkout door should be considered as a window and be included in the percentage of glazing.

The window supplier should provide acoustical laboratory test data (following a recognized test standard) for the intended windows indicated the STC ratings can be met.

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

(5) Standard example warning clauses to be registered on title and be included in Offers of Purchase and Sale and Leases on designated units:

A. "Purchasers are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound level may exceed the noise guidelines of the Municipality and the Ministry of the Environment."

B. "This dwelling unit has been designed with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that Ministry of the Environment."

C. "Purchasers/tenants are advised that the private terraces of each unit are less than 4.0m deep and therefore are not required to have mitigation measures installed to address noise, as per NPC-300. Sound levels due to road/rail traffic may interfere with some activities of the dwelling occupants use of their private terrace".

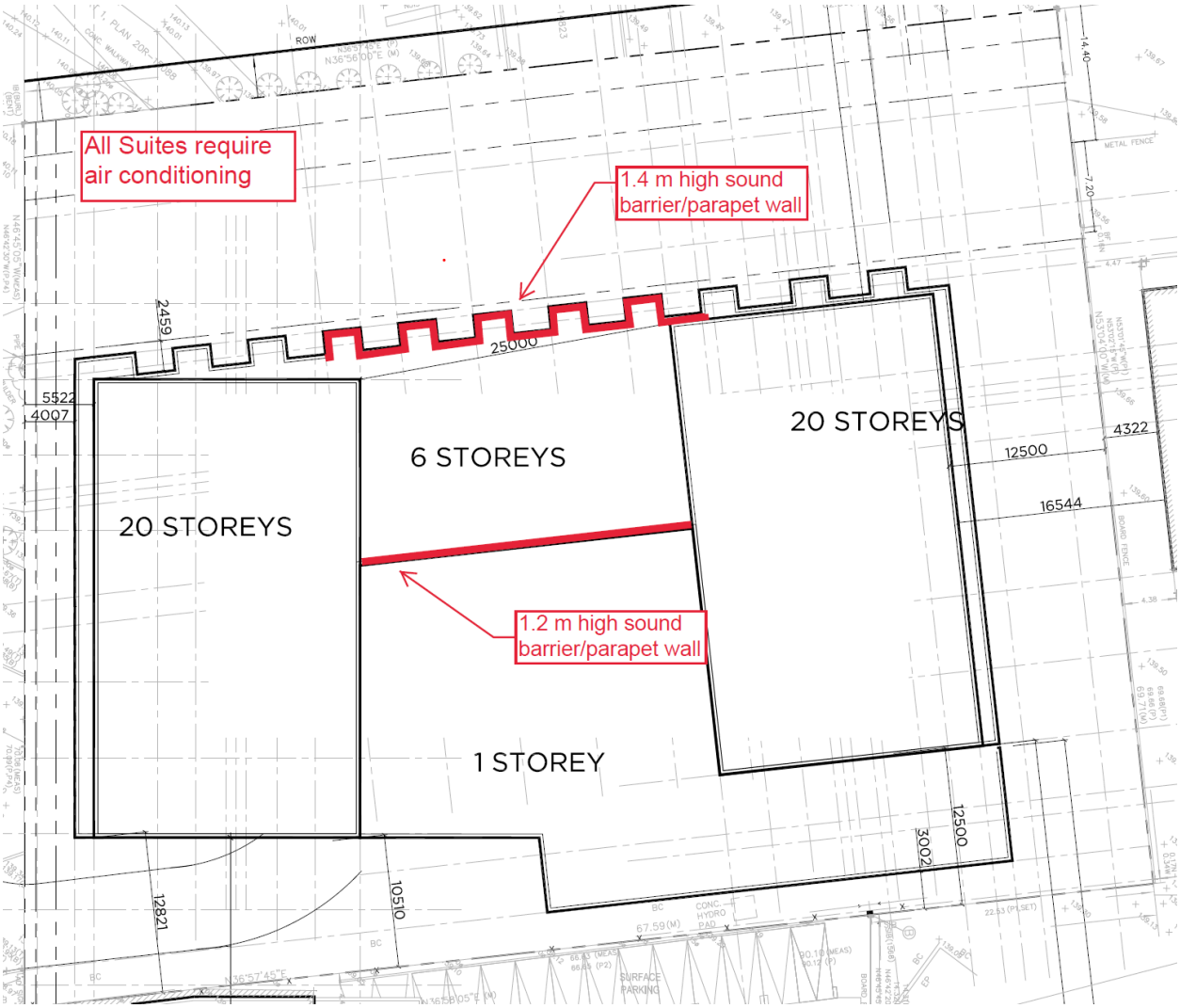


Figure 3: Noise Mitigation Measures

5.3.1 Ventilation Requirements

Air conditioning is mandatory for all residential suites to allow for windows and exterior doors to remain closed for noise control purposes.

5.3.2 Exterior Wall and Window Construction

The required Sound Transmission Class (STC) ratings for the exterior facades were calculated assuming windows have a surface area equalling 80% of the associated room floor area and exterior walls have a surface area equalling 20% of the associated room floor area.

Based on these assumptions, the following window and exterior wall constructions would be needed to meet the MECP indoor noise guideline limits:

- Exterior Facade Construction – STC 54

- Exterior Windows – Up to STC 34

The above requirements are based on assumed window and wall areas. The assessment should be updated and the STC requirements confirmed once detailed floor plan and elevation drawings are available.

5.3.3 Outdoors

The sound level at the 7th floor common amenity space is predicted to be 60 dBA. With a 1.4 m high parapet sound barrier on the north side and a 1.2 m high sound barrier parapet on the south side of the amenity space, as shown on Figure 3 above, the mitigated sound level would be 55 dBA. This meets the MECP objective sound level limit.

5.3.4 Warning Clauses

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

Table 3 and the notes to Table 3 summarize the recommended warning clauses.

6.0 NOISE IMPACT FROM THE DEVELOPMENT

The main source of noise associated with the development with the potential for adverse impact on surrounding buildings is the mechanical equipment interfacing with the exterior.

At this preliminary stage of the development application, the mechanical systems are not yet designed and thus, a detailed assessment of the noise impact cannot be done at this time. Regardless, the mechanical equipment interfacing with the exterior must comply with the MECP noise guideline limits in NPC-300. By proper engineering design, all requirements can be met, and no adverse noise impact would be created for surrounding uses. Appropriate choice of location, equipment type, and noise control features should be considered during detailed design for such items (including rooftop equipment, air intakes and exhausts and underground parking garage ventilation systems). Any parking garage air shafts located immediately adjacent to residential uses, in addition to appropriate choice of fan type, may need special noise control treatment such as acoustically lining the shaft or providing silencers.

For any emergency generators, appropriate steps should be taken to ensure that the equipment placement, treatment, and the routine testing schedule will not generate adverse noise impact on neighbouring properties. Indoor generators will require silencers on the intake and exhaust cooling air paths, as well as a muffler on the combustion exhaust. An outdoor generator will require an acoustical enclosure.

An assessment of the noise impact from the building onto neighbouring developments should be done once the relevant mechanical and electrical details are known. This is typically done as part of the detailed design of the building.

7.0 CONCLUSIONS

With appropriate acoustical design of the development, a suitable acoustical environment can be provided and the applicable MECP noise guideline requirements met.

The approvals and administrative procedures are available to ensure that the acoustical requirements are implemented. Warning clauses are recommended to advise the future occupants of the potential noise situation.

8.0 REFERENCES

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

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

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

4. "Road and Rail Noise: Effects on Housing", Canada Mortgage and Housing Corporation, Publication NHA 5156, 81/10.

5. “Environmental Noise Guideline, Stationary and Transportation Sources - Approval and Planning”, MOE Publication NPC-300, October 2013.

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APPENDIX A

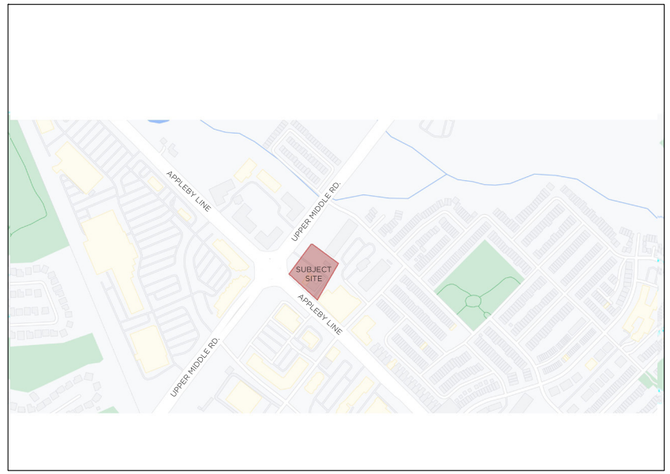
ARCHITECTURAL DRAWINGS

1989 APPLEBY LINE

1989 APPLEBY LINE,
BURLINGTON, ON

Project No. 21058
Date May 31, 2022
Issued For Rezoning





CONTEXT PLAN - NTS

ARCHITECTURAL DRAWING LIST

A001	COVER PAGE, SITE STATS.
A003	HEIGHT SURVEY ADJACENT BUILDINGS PLAN
A100	SITE PLAN
A101	PARKING PLAN - P3
A102	PARKING PLAN - P2
A103	PARKING PLAN - P1
A200	GROUND LEVEL PLAN
A202	2F PLAN
A203	3F-5F PLAN
A206	6F PLAN
A207	7F PLAN
A208	TOWER PLAN
A401	WEST BLDG ELEVATION
A402	SOUTH BLDG ELEVATION
A403	NORTH BLDG ELEVATION
A404	EAST BLDG ELEVATION
A500	BUILDING SECTION
A800	45 DEGREE ANGULAR PLANE
M001	WASTE MANAGEMENT PLAN

SITE STATISTICS

Gross Site Area	**6,009**	**m2**	**64,680**	**ft2**	
Roadway Converyance	**66**	**m2**	**705**	**ft2**	
Net Site Area	**5,944**	**m2**	**63,975**	**ft2**	**0.5944 ha**
Hardscape Landscape Lot Coverage	**9.6%**				
Softscape Landscape Lot Coverage	**10.1%**				
Units/ Hectare	**799**	**Units**			

Units North	1b	1B+D	2B	2B-L	3B	Total	GCA Residential m2	sf	Retail m2	sf	Total m2	sf	NSA RES Total m2	sf
P1											0		0	
1						0	589	6,340	871	9,375	1460	15,715		0
2	12		14		1	27	2150	23,143		0	2150	23,143	1865	20,075
3	15		15		1	31	2150	23,143		0	2150	23,143	1865	20,075
4	15		15		1	31	2150	23,143			2150	23,143	1865	20,075
5	15		15		1	31	2150	23,143			2150	23,143	1865	20,075
6	15		15		1	31	2150	23,143			2150	23,143	1865	20,075
7	4		8			12	1520	16,361			1520	16,361	796	8,568
8	8		16			24	1520	16,361			1520	16,361	1346	14,488
9	8		16			24	1520	16,361			1520	16,361	1346	14,488
10	8		16			24	1520	16,361			1520	16,361	1346	14,488
11	8		16			24	1520	16,361			1520	16,361	1346	14,488
12	8		16			24	1520	16,361			1520	16,361	1346	14,488
13	8		16			24	1520	16,361			1520	16,361	1346	14,488
14	8		16			24	1520	16,361			1520	16,361	1346	14,488
15	8		16			24	1520	16,361			1520	16,361	1346	14,488
16	8		16			24	1520	16,361			1520	16,361	1346	14,488
17	8		16			24	1520	16,361			1520	16,361	1346	14,488
18	8		16			24	1520	16,361			1520	16,361	1346	14,488
19	8		16			24	1520	16,361			1520	16,361	1346	14,488
20	8		16			24	1520	16,361			1520	16,361	1346	14,488
ph														
Totals	**180**	**0**	**290**	**0**	**5**	**475**	**32619**	351,111	**871**	9,375	**33490**	360,486	**27619**	297,291
	38%	0%	61%	0%	1%								84.67%	

Target Range						
FSI RES	**5.49**		Indoor Amenity prov	842		
FSI RETAIL	**0.15**		Outdoor Amenity prov	1074		
FSI TOTAL	**5.63**		Total	1916	4.03 m2 per unit	9.03 m2 per unit including balconies
Avg unit size Gross	68.7 m2	739.1809 sf				
Avg unit Net	57.7 m2	620.9119 sf				

Required Parking	1b	1B+D	2B	2B-L	3B	Maintenance		
Ratio	1	1	1.25	1.25	1.5	1/75		
	180	0	363	0	8	6	**556**	
	Visitor at 0.25/Unit						**119**	
	Retail 3.5/100m2						**30**	*shared with Visitors*
	Total						675	

Proposed Parking	Visitor	Retail	Resident	Total	BF
Ground	47	(see Visitor)	45	***92***	*3*
P1			136	***136***	4
P2			136	***136***	4
P3			138	***138***	4
Total	47	0	455	**502**	15
	0.098947	shared		*1.06* Per Unit	

Proposed Bike Parking	Mezz	Gr	P1	P2	Total		
Retail at Grede		16					
Visitors at Grade		32			32		
Residential		64	104	104	272		
Total					***304***	0.64	per unit

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ISSUED RECORD

05-31-22 ISSUED FOR RZ.

REVISION RECORD

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21058

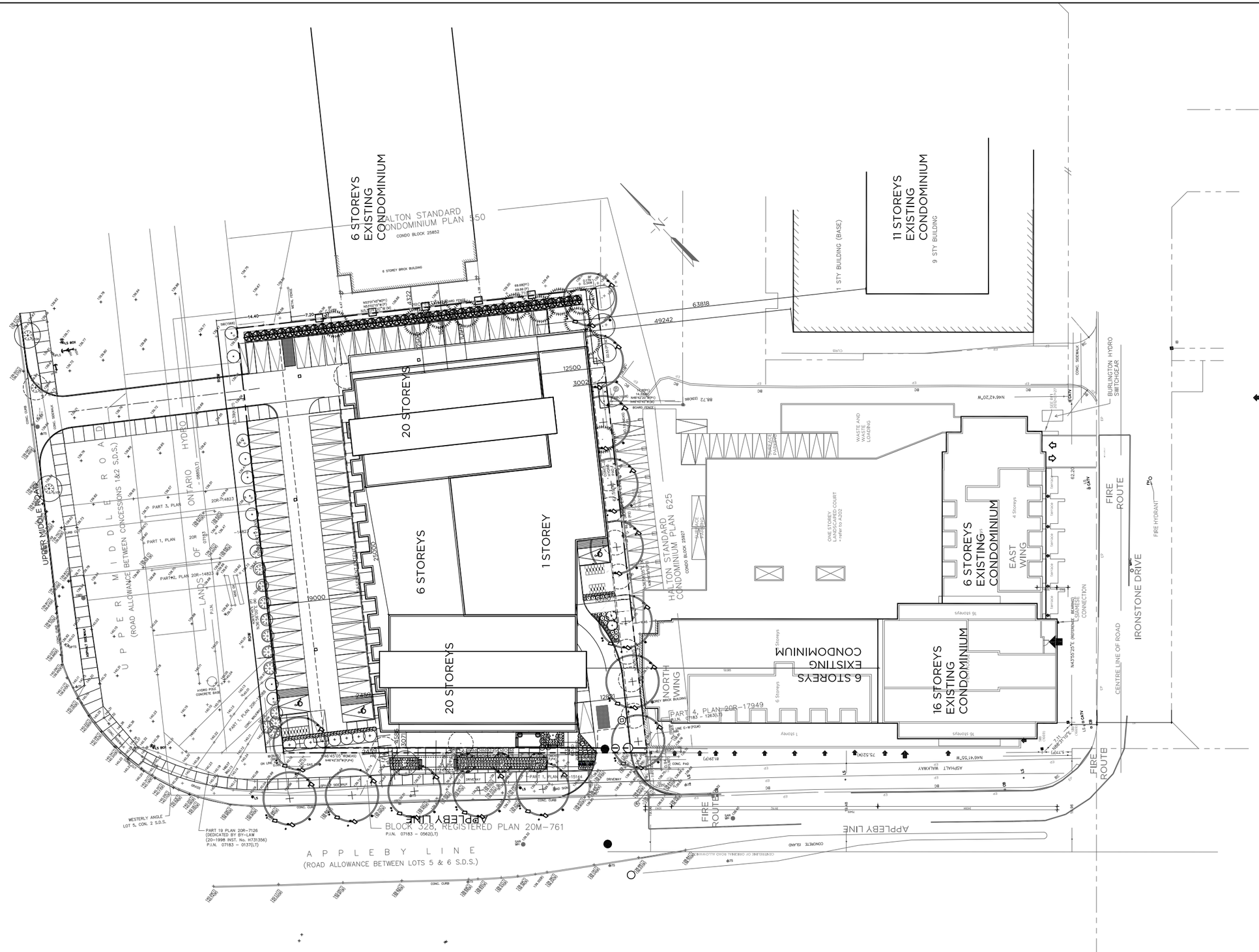
1989 Appleby Line
Burlington

Latch

COVER/ DRAWING LIST

1:750

A001



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ISSUED RECORD

05-31-22 ISSUED FOR RZ.

REVISION RECORD

NORTH

RAW

405-317 ADELAIDE ST. W.
TORONTO CANADA M5V 1P9
+1 416 599 9729
WWW.RAWDESIGN.CA

21058

1989 Appleby Line
Burlington

Latch

HEIGHT SURVEY
ADJACENT BUILDINGS
PLAN

1:750

A003

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ISSUED RECORD

05-31-22 ISSUED FOR RZ.

REVISION RECORD

NORTH

RAW

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1989 Appleby Line
Burlington

Latch

SITE
PLAN

1:750

A100



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ISSUED RECORD

05-31-22	ISSUED FOR RZ.

REVISION RECORD

NORTH

RAW

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1989 Appleby Line
Burlington

Latch

7 FLOOR
PLAN

1:300

A207

MATERIAL LEGEND

1. BRICK CLADDING
2. TEXTURED GREY PRECAST CLADDING
3. WHITE PRECAST CLADDING
4. WINDOW WALL GLAZING
5. GLASS BALCONY GUARD
6. PERFORATED METAL PANELS
7. BLACK METAL PANELS



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ISSUED RECORD

REVISION RECORD

NORTH

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1989 Appleby Line
Burlington

Latch

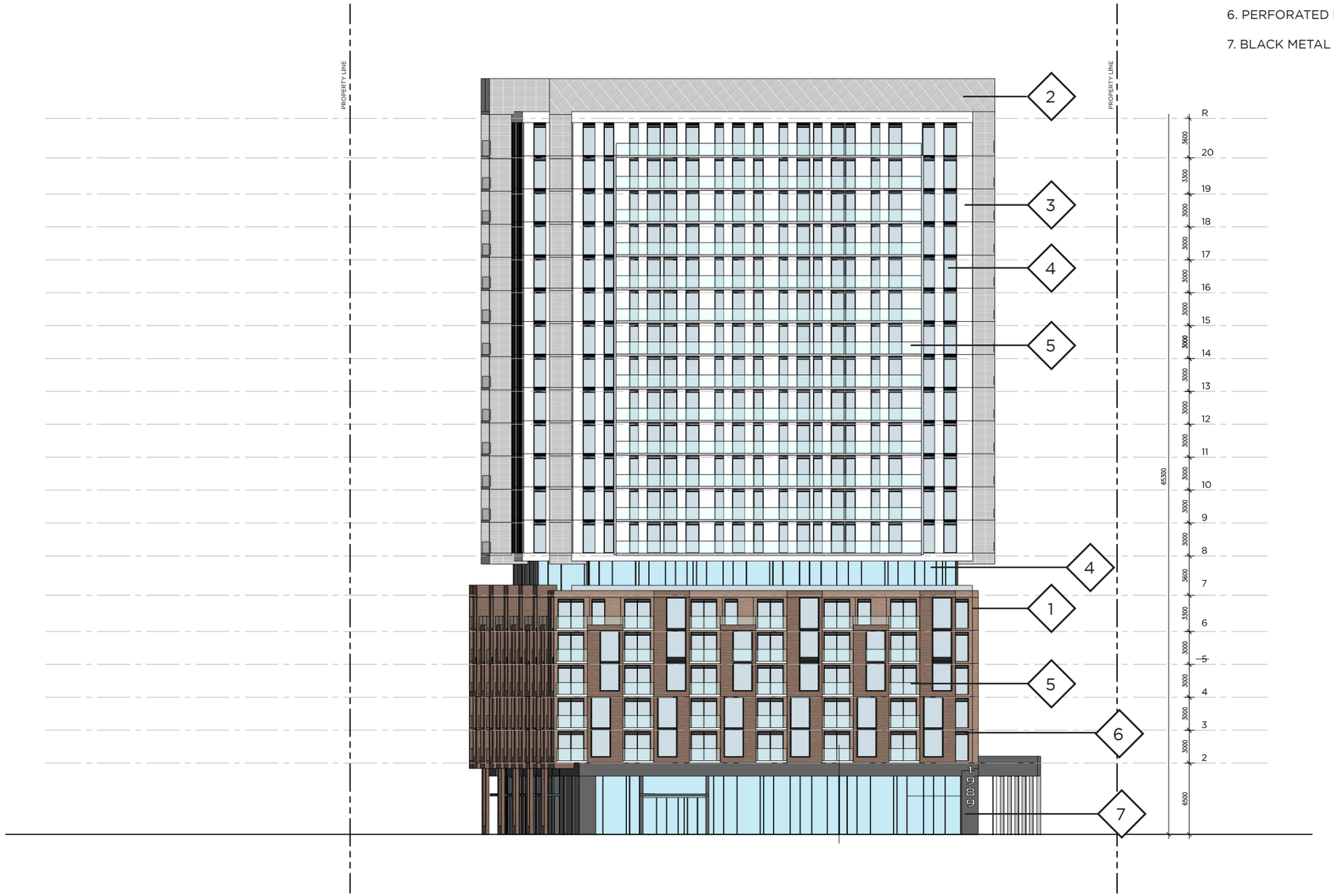
CONCEPTUAL
TOWER
ELEVATION

1:400

A401

MATERIAL LEGEND

1. BRICK CLADDING
2. TEXTURED GREY PRECAST CLADDING
3. WHITE PRECAST CLADDING
4. WINDOW WALL GLAZING
5. GLASS BALCONY GUARD
6. PERFORATED METAL PANELS
7. BLACK METAL PANELS



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ISSUED RECORD

REVISION RECORD

NORTH

RAW

405-317 ADELAIDE ST. W.
TORONTO CANADA M5V 1P9
+1 416 599 9729
WWW.RAWDESIGN.CA

21058

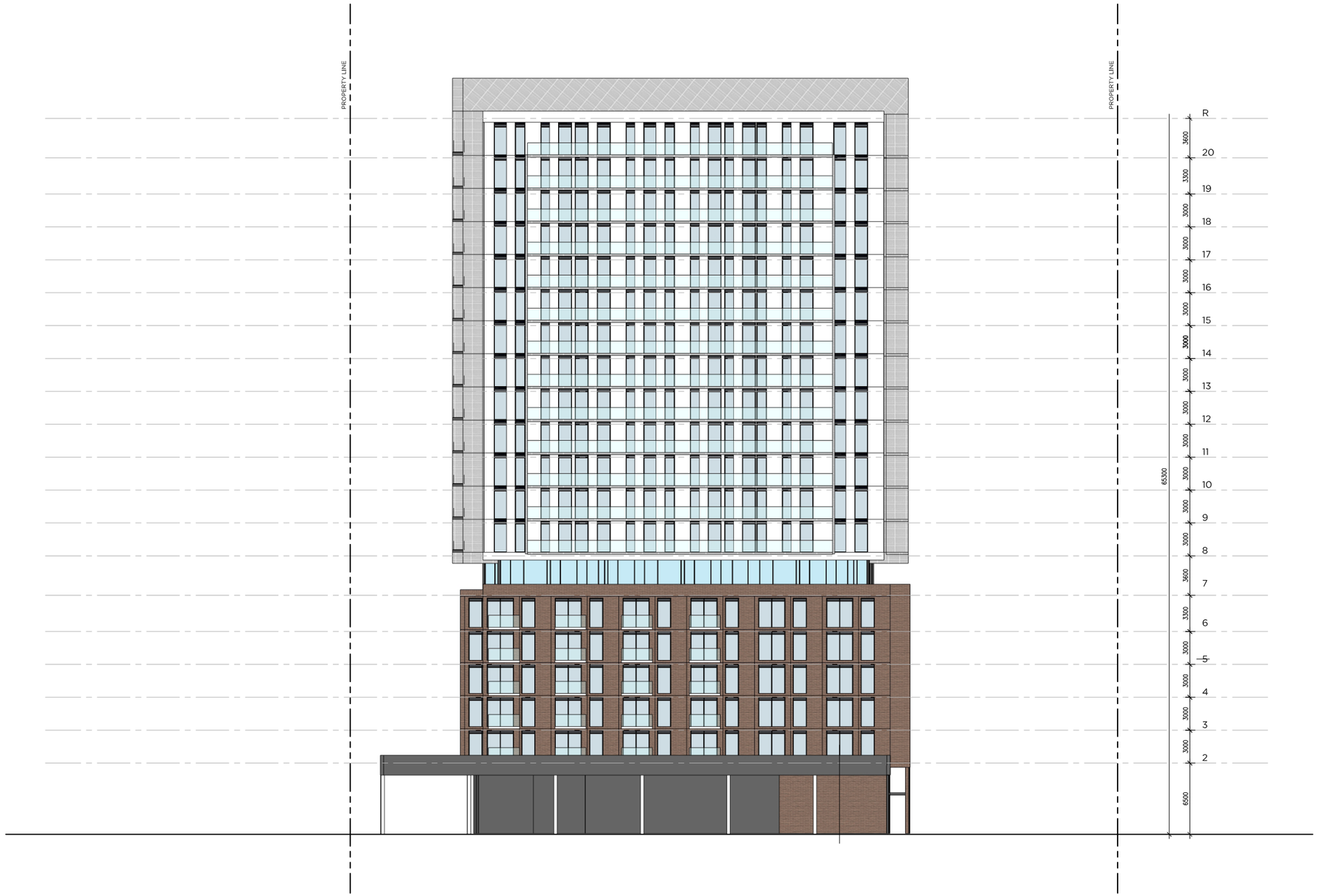
1989 Appleby Line
Burlington

Latch

CONCEPTUAL
TOWER
ELEVATION

1:400

A402



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ISSUED RECORD

REVISION RECORD

NORTH

405-317 ADELAIDE ST. W.
TORONTO CANADA M5V 1P9
+1 416 599 9729
WWW.RAWDESIGN.CA

21058

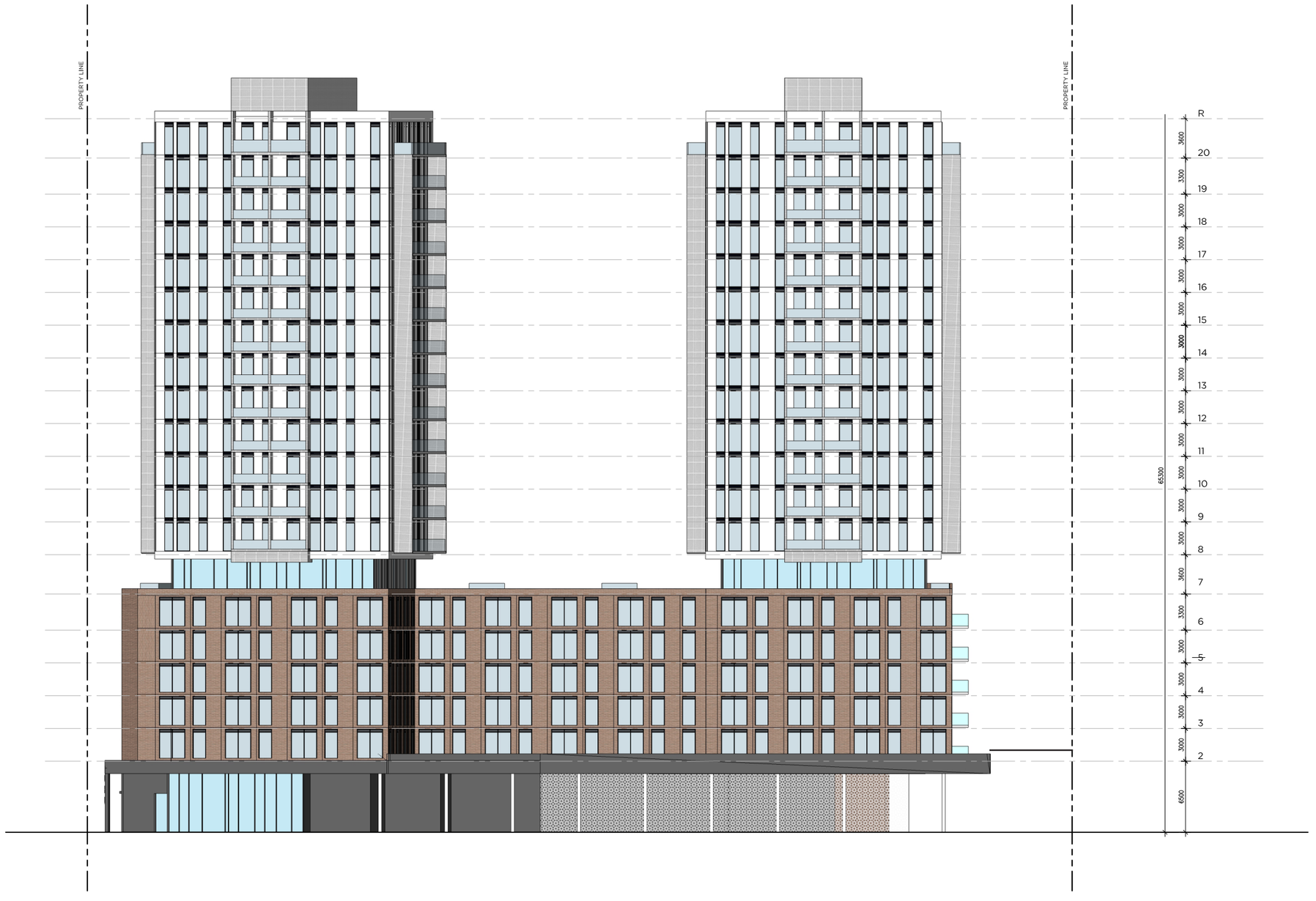
1989 Appleby Line
Burlington

Latch

CONCEPTUAL
TOWER
ELEVATION

1:400

A403



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ISSUED RECORD

REVISION RECORD

NORTH

405-317 ADELAIDE ST. W.
TORONTO CANADA M5V 1P9
+1 416 599 9729
WWW.RAWDESIGN.CA

21058

1989 Appleby Line
Burlington

Latch

CONCEPTUAL
TOWER
ELEVATION

1:400

A404

APPENDIX B

ROAD AND RAIL DATA CORESPONDENCE

Upper Middle Rd @ Appleby Line

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

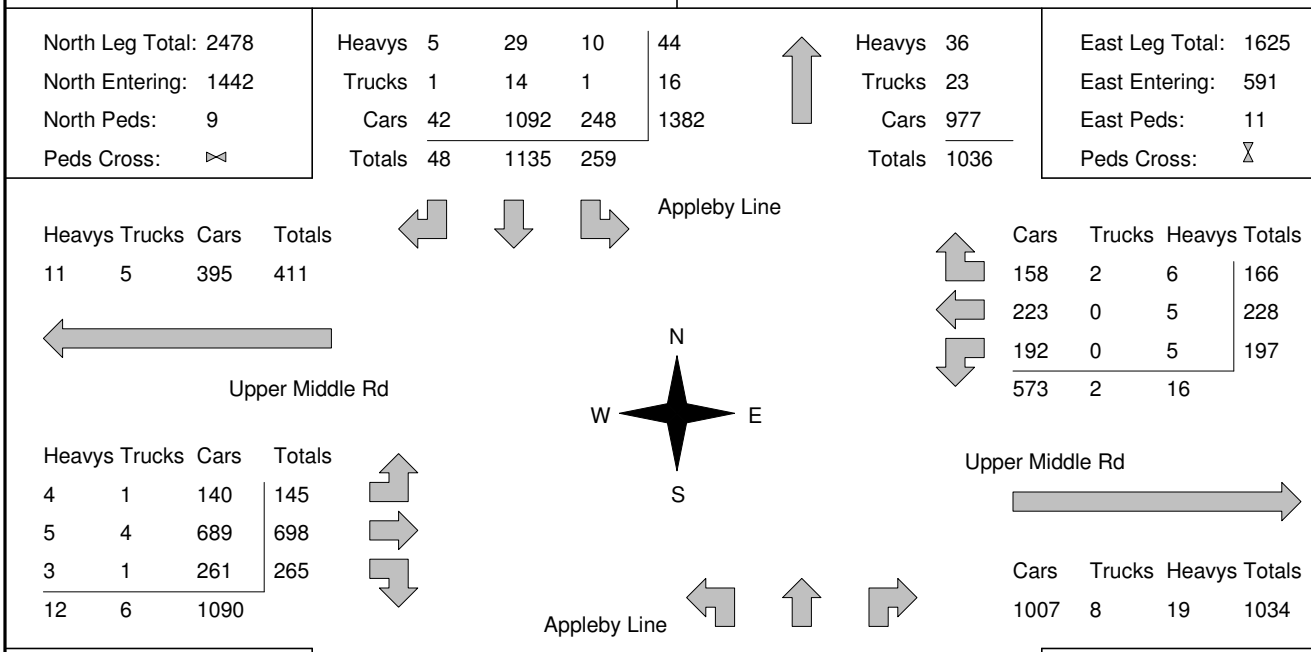
Municipality: Halton Region
Site #: 0000003287
Intersection: Appleby Line & Upper Middle Rd
TFR File #: 9
Count date: 29-Oct-2019

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Appleby Line runs N/S



Comments

Upper Middle Rd @ Appleby Line

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 17:00:00
To: 18:00:00

Municipality: Halton Region
Site #: 0000003287
Intersection: Appleby Line & Upper Middle Rd
TFR File #: 9
Count date: 29-Oct-2019

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Appleby Line runs N/S

North Leg Total:	2938			
North Entering:	1221			
North Peds:	16			
Peds Cross:	⋈			
Heavys	1	15	0	16
Trucks	1	9	2	12
Cars	190	807	196	1193
Totals	192	831	198	
Heavys	15			
Trucks	16			
Cars	1686			
Totals	1717			
East Leg Total:	1609			
East Entering:	999			
East Peds:	29			
Peds Cross:	⧖			

Appleby Line

Heavys	Trucks	Cars	Totals
4	4	1150	1158

Upper Middle Rd

Cars	Trucks	Heavys	Totals
301	1	0	302
614	2	1	617
75	1	4	80
990	4	5	

N
W E
S

Heavys	Trucks	Cars	Totals
2	0	169	171
3	2	338	343
1	4	222	227
6	6	729	

Upper Middle Rd

Cars	Trucks	Heavys	Totals
597	5	8	610

Appleby Line

Peds Cross:	⧖			
West Peds:	14			
West Entering:	741			
West Leg Total:	1899			
Cars	1104			
Trucks	14			
Heavys	20			
Totals	1138			
Cars	346	1216	63	1625
Trucks	1	15	1	17
Heavys	2	13	5	20
Totals	349	1244	69	
Peds Cross:	⋈			
South Peds:	14			
South Entering:	1662			
South Leg Total:	2800			

Comments

Appleby Line @ Ironstone Dr

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

Municipality: Halton Region
Site #: 1024830100
Intersection: Appleby Line & Ironstone Dr
TFR File #: 27
Count date: 10-Apr-2018

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Appleby Line runs N/S

North Leg Total:	2578			
North Entering:	1669			
North Peds:	2			
Peds Cross:	⋈			
Heavys	0	35	2	37
Trucks	0	17	1	18
Cars	36	1547	31	1614
Totals	36	1599	34	
Heavys	22			
Trucks	22			
Cars	865			
Totals	909			
East Leg Total:	275			
East Entering:	212			
East Peds:	10			
Peds Cross:	⧖			

Appleby Line

Heavys	Trucks	Cars	Totals
3	2	142	147

Ironstone Dr

Heavys	Trucks	Cars	Totals
0	3	37	40
1	0	15	16
4	2	79	85
5	5	131	

Cars	Trucks	Heavys	Totals
105	1	2	108
35	0	0	35
69	0	0	69
209	1	2	

N
W E
S

Ironstone Dr

Cars	Trucks	Heavys	Totals
57	1	5	63

Appleby Line

Peds Cross:	⧖			
West Peds:	2			
West Entering:	141			
West Leg Total:	288			
Cars	1695			
Trucks	19			
Heavys	39			
Totals	1753			
Cars	71	723	11	805
Trucks	2	18	0	20
Heavys	3	20	2	25
Totals	76	761	13	
Peds Cross:	⋈			
South Peds:	5			
South Entering:	850			
South Leg Total:	2603			

Comments

Appleby Line @ Ironstone Dr

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

Municipality: Halton Region
Site #: 1024830100
Intersection: Appleby Line & Ironstone Dr
TFR File #: 27
Count date: 10-Apr-2018

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Appleby Line runs N/S

North Leg Total:	2945			
North Entering:	1188			
North Peds:	8			
Peds Cross:	⋈			
Heavys	0	14	0	14
Trucks	0	10	0	10
Cars	59	1023	82	1164
Totals	59	1047	82	
Heavys	20			
Trucks	10			
Cars	1727			
Totals	1757			
East Leg Total:	326			
East Entering:	162			
East Peds:	14			
Peds Cross:	⧖			

Appleby Line

Heavys	Trucks	Cars	Totals
0	3	264	267

Cars	Trucks	Heavys	Totals
97	1	0	98
39	0	0	39
25	0	0	25
161	1	0	

Ironstone Dr

N
W E
S

Heavys	Trucks	Cars	Totals
1	0	91	92
0	0	41	41
0	1	85	86
1	1	217	

Ironstone Dr

Cars	Trucks	Heavys	Totals
164	0	0	164

Appleby Line

Peds Cross:	⧖			
West Peds:	9			
West Entering:	219			
West Leg Total:	486			
Cars	1133			
Trucks	11			
Heavys	14			
Totals	1158			
Cars	166	1539	41	1746
Trucks	3	9	0	12
Heavys	0	19	0	19
Totals	169	1567	41	
Peds Cross:	⋈			
South Peds:	4			
South Entering:	1777			
South Leg Total:	2935			

Comments

Date: 2019/10/28 Project Number: HAL-43.74- Dundas St, Burlington, ON

Dear Seema:

Re: Train Traffic Data – CN Halton Subdivision near Dundas St in Burlington, ON

The following is provided in response to Seema's 2019/08/22 request for information regarding rail traffic in the vicinity of Dundas St, in Burlington, ON at approximately Mile 43.74 on CN's Halton Subdivision.

Typical daily traffic volumes are recorded below. However, traffic volumes may fluctuate due to overall economic conditions, varying traffic demands, weather conditions, track maintenance programs, statutory holidays and traffic detours that when required may be heavy although temporary. For the purpose of noise and vibration reports, train volumes must be escalated by 2.5% per annum for a 10-year period.

Typical daily traffic volumes at this site location are as follows:

***Maximum train speed is given in Miles per Hour**

	0700-2300			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	10	140	50	4
Way Freight	2	25	50	4
Passenger	0	10	50	2

	2300-0700			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	4	140	50	4
Way Freight	0	25	50	4
Passenger	0	10	50	2

The volumes recorded reflect westbound and eastbound freight and passenger operations on CN's Halton Subdivision.

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. There are two (2) at-grade crossings in the immediate vicinity of the study area at Mile 41.63 Tremaine Rd and Mile 42.20 Burnhamthorpe Rd W. Anti-whistling bylaws are in effect at these crossings. Please note that engine warning whistles may be sounded in cases of emergency, as a safety and or warning precaution at station locations and pedestrian crossings and occasionally for operating requirements.

With respect to equipment restrictions, the gross weight of the heaviest permissible car is 286,000 lbs.

The double mainline track is considered to be continuously welded rail throughout the study area. The presence of three (3) switches located at Mile 42.98, Mile 43.20 and Mile 43.73 may exacerbate the noise and vibration caused by train movements.

The Canadian National Railway continues to be strongly opposed to locating developments near railway facilities and rights-of-way due to potential safety and environmental conflicts. Development adjacent to the Railway Right-of-Way is not appropriate without sound impact mitigation measures to reduce the incompatibility. For confirmation of the applicable rail noise, vibration and safety standards, Adjacent Development, Canadian National Railway Properties at Proximity@cn.ca should be contacted directly.

I trust the above information will satisfy your current request.

Sincerely,

Michael Vallins P.Eng
Manager of Public Works

From:	Umair Naveed on behalf of GLD-Permits
To:	Jessica Tsang
Subject:	RE: Train Traffic Data Request (VCL File: 1130425.400)
Date:	Thursday, January 27, 2022 9:49:16 AM
Attachments:	image001.jpg image002.jpg

Hi Jessica,

The attached data is still valid.

Thanks,

Team GLD

From: Jessica Tsang <jtsang@valcoustics.com>
Sent: Monday, January 24, 2022 5:30 PM
To: GLD-Permits <permits.gld@cn.ca>
Subject: Train Traffic Data Request (VCL File: 1130425.400)

CAUTION: This email originated from outside CN: DO NOT click links or open attachments unless you recognize the sender AND KNOW the content is safe.

AVERTISSEMENT : ce courriel provient d'une source externe au CN : NE CLIQUEZ SUR AUCUN lien ou pièce jointe à moins de reconnaitre l'expéditeur et d'avoir VÉRIFIÉ la sécurité du contenu.

Hello,

We are currently working on an updated noise report for a development located at Dundas Street and Tremaine Road in Burlington. Our previous analysis was based on the attached rail data provided to us October 2019. Can you please confirm whether or not this data is still valid and if not, provide updated data?

Thanks,

Jessica Tsang, B.A.Sc., E.I.T.
Acoustical EIT
Logo Colour for email
30 Wertheim Court, Unit 25
Richmond Hill, Ontario
Canada L4B 1B9
Tel: 905-764-5223 ext. 246
Fax: 905-764-6813
solutions@valcoustics.com
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APPENDIX C

SAMPLE CALCULATIONS

```
STAMSON 5.04        NORMAL REPORT        Date: 31-05-2022 18:51:32
MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS / NOISE ASSESSMENT

Filename: b3_n.te              Time Period: Day/Night 16/8 hours
Description: Tower B North Facade


Rail data, segment # 1: CN Halton (day/night)
-----------------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1. Freight     !  12.8/5.1   !  80.0 !  4.0 !140.0 !Diesel! Yes
* 2. Way Freight !   2.6/0.0   !  80.0 !  4.0 ! 25.0 !Diesel! Yes

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

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1. Freight        !  10.0/4.0   !    2.50  !   10.00  !
  2. Way Freight    !   2.0/0.0   !    2.50  !   10.00  !

Data for Segment # 1: CN Halton (day/night)
-------------------------------------------
Angle1   Angle2           : -25.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 457.00 / 457.00 m
Receiver height           :  61.70 / 61.70  m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00

Results segment # 1: CN Halton (day)
-----------------------------------

LOCOMOTIVE (0.00 + 57.53 + 0.00) = 57.53 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -25     90   0.00  74.31 -14.84  -1.95   0.00   0.00   0.00  57.53
-------------------------------------------------------------------------

WHEEL (0.00 + 50.79 + 0.00) = 50.79 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -25     90   0.00  67.57 -14.84  -1.95   0.00   0.00   0.00  50.79
-------------------------------------------------------------------------

Segment Leq : 58.36 dBA

Total Leq All Segments: 58.36 dBA
```

```
Results segment # 1: CN Halton (night)
---------------------------------------

LOCOMOTIVE (0.00 + 56.23 + 0.00) = 56.23 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -25     90   0.00  73.01 -14.84  -1.95   0.00   0.00   0.00  56.23
-------------------------------------------------------------------------

WHEEL (0.00 + 49.63 + 0.00) = 49.63 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -25     90   0.00  66.41 -14.84  -1.95   0.00   0.00   0.00  49.63
-------------------------------------------------------------------------

Segment Leq : 57.09 dBA


Total Leq All Segments: 57.09 dBA


Road data, segment # 1: Upper Middle (day/night)
------------------------------------------------
Car traffic volume  : 22474/2497  veh/TimePeriod  *
Medium truck volume :   138/15    veh/TimePeriod  *
Heavy truck volume  :   344/38    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):  16175
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  23.00
    Medium Truck % of Total Volume     :   0.60
    Heavy Truck  % of Total Volume     :   1.50
    Day (16 hrs) % of Total Volume     :  90.00


Data for Segment # 1: Upper Middle (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  :  71.00 / 71.00  m
Receiver height           :  61.70 / 61.70  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Appleby Line (day/night)
------------------------------------------------
Car traffic volume  : 38856/4317  veh/TimePeriod  *
Medium truck volume :   440/49    veh/TimePeriod  *
Heavy truck volume  :   680/76    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):  27615
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  24.00
    Medium Truck % of Total Volume     :   1.10
    Heavy Truck  % of Total Volume     :   1.70
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: Appleby Line (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  :  25.00 / 25.00  m
Receiver height           :  61.70 / 61.70  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: Upper Middle (day)
---------------------------------------
Source height = 1.11 m

ROAD (0.00 + 61.68 + 0.00) = 61.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  68.43   0.00  -6.75   0.00   0.00   0.00   0.00  61.68
-------------------------------------------------------------------------------
Segment Leq : 61.68 dBA

Results segment # 2: Appleby Line (day)
---------------------------------------

Source height = 1.14 m

ROAD (0.00 + 65.98 + 0.00) = 65.98 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  71.21   0.00  -2.22  -3.01   0.00   0.00   0.00  65.98
-------------------------------------------------------------------------------

Segment Leq : 65.98 dBA

Total Leq All Segments: 67.35 dBA
```

```
Results segment # 1: Upper Middle (night)
-----------------------------------------

Source height = 1.10 m

ROAD (0.00 + 55.13 + 0.00) = 55.13 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  61.89   0.00  -6.75   0.00   0.00   0.00   0.00  55.13
-------------------------------------------------------------------------------

Segment Leq : 55.13 dBA


Results segment # 2: Appleby Line (night)
-----------------------------------------

Source height = 1.14 m

ROAD (0.00 + 59.46 + 0.00) = 59.46 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  64.69   0.00  -2.22  -3.01   0.00   0.00   0.00  59.46
-------------------------------------------------------------------------------

Segment Leq : 59.46 dBA

Total Leq All Segments: 60.82 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 67.87
                           (NIGHT): 62.36
```

```
STAMSON 5.04        NORMAL REPORT        Date: 31-05-2022 18:52:10
MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS / NOISE ASSESSMENT

Filename: b4_w.te              Time Period: Day/Night 16/8 hours
Description: Tower B West Facade

Rail data, segment # 1: CN Halton (day/night)
-----------------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1. Freight     !  12.8/5.1   !  80.0 !  4.0 !140.0 !Diesel! Yes
* 2. Way Freight !   2.6/0.0   !  80.0 !  4.0 ! 25.0 !Diesel! Yes

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

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1. Freight        !  10.0/4.0   !    2.50  !   10.00  !
  2. Way Freight    !   2.0/0.0   !    2.50  !   10.00  !

Data for Segment # 1: CN Halton (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  : 457.00 / 457.00 m
Receiver height           :  61.70 / 61.70  m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00

Results segment # 1: CN Halton (day)
------------------------------------

LOCOMOTIVE (0.00 + 59.47 + 0.00) = 59.47 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  74.31 -14.84   0.00   0.00   0.00   0.00  59.47
-------------------------------------------------------------------------

WHEEL (0.00 + 52.73 + 0.00) = 52.73 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  67.57 -14.84   0.00   0.00   0.00   0.00  52.73
-------------------------------------------------------------------------

Segment Leq : 60.30 dBA

Total Leq All Segments: 60.30 dBA
```

```
Results segment # 1: CN Halton (night)
---------------------------------------

LOCOMOTIVE (0.00 + 58.17 + 0.00) = 58.17 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  73.01 -14.84   0.00   0.00   0.00   0.00  58.17
-------------------------------------------------------------------------

WHEEL (0.00 + 51.57 + 0.00) = 51.57 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  66.41 -14.84   0.00   0.00   0.00   0.00  51.57
-------------------------------------------------------------------------


Segment Leq : 59.03 dBA


Total Leq All Segments: 59.03 dBA

Road data, segment # 1: Upper Middle (day/night)
------------------------------------------------
Car traffic volume  : 22474/2497  veh/TimePeriod  *
Medium truck volume :   138/15    veh/TimePeriod  *
Heavy truck volume  :   344/38    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):  16175
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  23.00
    Medium Truck % of Total Volume     :   0.60
    Heavy Truck  % of Total Volume     :   1.50
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Upper Middle (day/night)
----------------------------------------------
Angle1   Angle2           : -90.00 deg   5.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  71.00 / 71.00  m
Receiver height           :  61.70 / 61.70  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Appleby Line (day/night)
------------------------------------------------
Car traffic volume  : 38856/4317  veh/TimePeriod  *
Medium truck volume :   440/49    veh/TimePeriod  *
Heavy truck volume  :   680/76    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):  27615
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  24.00
    Medium Truck % of Total Volume     :   1.10
    Heavy Truck  % of Total Volume     :   1.70
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: Appleby Line (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           :  61.70 / 61.70  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: Upper Middle (day)
---------------------------------------
Source height = 1.11 m

ROAD (0.00 + 58.91 + 0.00) = 58.91 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      5   0.00  68.43   0.00  -6.75  -2.78   0.00   0.00   0.00  58.91
-------------------------------------------------------------------------------
Segment Leq : 58.91 dBA

Results segment # 2: Appleby Line (day)
---------------------------------------

Source height = 1.14 m

ROAD (0.00 + 68.99 + 0.00) = 68.99 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  71.21   0.00  -2.22   0.00   0.00   0.00   0.00  68.99
-------------------------------------------------------------------------------

Segment Leq : 68.99 dBA

Total Leq All Segments: 69.40 dBA
```

```
Results segment # 1: Upper Middle (night)
-----------------------------------------

Source height = 1.10 m

ROAD (0.00 + 52.36 + 0.00) = 52.36 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      5   0.00  61.89   0.00  -6.75  -2.78   0.00   0.00   0.00  52.36
-------------------------------------------------------------------------------

Segment Leq : 52.36 dBA

Results segment # 2: Appleby Line (night)
-----------------------------------------

Source height = 1.14 m

ROAD (0.00 + 62.47 + 0.00) = 62.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  64.69   0.00  -2.22   0.00   0.00   0.00   0.00  62.47
-------------------------------------------------------------------------------

Segment Leq : 62.47 dBA

Total Leq All Segments: 62.87 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.90
                           (NIGHT): 64.37
```

```
STAMSON 5.04        NORMAL REPORT        Date: 31-05-2022 18:53:19
MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS / NOISE ASSESSMENT

Filename: a3_n.te              Time Period: Day/Night 16/8 hours
Description: Tower A North Facade


Rail data, segment # 1: CN Halton (day/night)
-----------------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1. Freight     !  12.8/5.1   !  80.0 !  4.0 !140.0 !Diesel! Yes
* 2. Way Freight !   2.6/0.0   !  80.0 !  4.0 ! 25.0 !Diesel! Yes

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

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1. Freight        !  10.0/4.0   !    2.50  !   10.00  !
  2. Way Freight    !   2.0/0.0   !    2.50  !   10.00  !

Data for Segment # 1: CN Halton (day/night)
-------------------------------------------
Angle1   Angle2           : -30.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 497.00 / 497.00 m
Receiver height           :  61.70 / 61.70  m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00

Results segment # 1: CN Halton (day)
------------------------------------

LOCOMOTIVE (0.00 + 57.35 + 0.00) = 57.35 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -30     90   0.00  74.31 -15.20  -1.76   0.00   0.00   0.00  57.35
-------------------------------------------------------------------

WHEEL (0.00 + 50.61 + 0.00) = 50.61 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -30     90   0.00  67.57 -15.20  -1.76   0.00   0.00   0.00  50.61
-------------------------------------------------------------------

Segment Leq : 58.18 dBA

Total Leq All Segments: 58.18 dBA
```

```
Results segment # 1: CN Halton (night)
---------------------------------------

LOCOMOTIVE (0.00 + 56.05 + 0.00) = 56.05 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -30     90   0.00  73.01 -15.20  -1.76   0.00   0.00   0.00  56.05
-------------------------------------------------------------------------

WHEEL (0.00 + 49.45 + 0.00) = 49.45 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -30     90   0.00  66.41 -15.20  -1.76   0.00   0.00   0.00  49.45
-------------------------------------------------------------------------


Segment Leq : 56.91 dBA


Total Leq All Segments: 56.91 dBA

Road data, segment # 1: Upper Middle (day/night)
------------------------------------------------
Car traffic volume  : 22474/2497  veh/TimePeriod  *
Medium truck volume :   138/15    veh/TimePeriod  *
Heavy truck volume  :   344/38    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):  16175
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  23.00
    Medium Truck % of Total Volume     :   0.60
    Heavy Truck  % of Total Volume     :   1.50
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Upper Middle (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  :  72.00 / 72.00  m
Receiver height           :  61.70 / 61.70  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Appleby Line (day/night)
------------------------------------------------
Car traffic volume  : 38856/4317  veh/TimePeriod  *
Medium truck volume :   440/49    veh/TimePeriod  *
Heavy truck volume  :   680/76    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):  27615
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  24.00
    Medium Truck % of Total Volume     :   1.10
    Heavy Truck  % of Total Volume     :   1.70
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: Appleby Line (day/night)
----------------------------------------------
Angle1   Angle2           :  -5.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  70.00 / 70.00  m
Receiver height           :  61.70 / 61.70  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: Upper Middle (day)
---------------------------------------
Source height = 1.11 m

ROAD (0.00 + 61.62 + 0.00) = 61.62 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  68.43   0.00  -6.81   0.00   0.00   0.00   0.00  61.62
-------------------------------------------------------------------------------
Segment Leq : 61.62 dBA

Results segment # 2: Appleby Line (day)
---------------------------------------

Source height = 1.14 m

ROAD (0.00 + 61.75 + 0.00) = 61.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    -5     90   0.00  71.21   0.00  -6.69  -2.78   0.00   0.00   0.00  61.75
-------------------------------------------------------------------------------

Segment Leq : 61.75 dBA

Total Leq All Segments: 64.70 dBA
```

```
Results segment # 1: Upper Middle (night)
-----------------------------------------

Source height = 1.10 m

ROAD (0.00 + 55.07 + 0.00) = 55.07 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  61.89   0.00  -6.81   0.00   0.00   0.00   0.00  55.07
-------------------------------------------------------------------------------

Segment Leq : 55.07 dBA

Results segment # 2: Appleby Line (night)
-----------------------------------------

Source height = 1.14 m

ROAD (0.00 + 55.23 + 0.00) = 55.23 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    -5     90   0.00  64.69   0.00  -6.69  -2.78   0.00   0.00   0.00  55.23
-------------------------------------------------------------------------------

Segment Leq : 55.23 dBA

Total Leq All Segments: 58.16 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.57
                           (NIGHT): 60.59
```

```
STAMSON 5.04        NORMAL REPORT        Date: 31-05-2022 18:54:00
MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS / NOISE ASSESSMENT

Filename: a4_w.te              Time Period: Day/Night 16/8 hours
Description: Tower A West Facade


Rail data, segment # 1: CN Halton (day/night)
-----------------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1. Freight     !  12.8/5.1   !  80.0 !  4.0 !140.0 !Diesel! Yes
* 2. Way Freight !   2.6/0.0   !  80.0 !  4.0 ! 25.0 !Diesel! Yes

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

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1. Freight        !  10.0/4.0   !    2.50  !   10.00  !
  2. Way Freight    !   2.0/0.0   !    2.50  !   10.00  !

Data for Segment # 1: CN Halton (day/night)
-------------------------------------------
Angle1   Angle2           : -30.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 497.00 / 497.00 m
Receiver height           :  61.70 / 61.70  m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00

Results segment # 1: CN Halton (day)
-----------------------------------

LOCOMOTIVE (0.00 + 57.35 + 0.00) = 57.35 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -30     90   0.00  74.31 -15.20  -1.76   0.00   0.00   0.00  57.35
-------------------------------------------------------------------------

WHEEL (0.00 + 50.61 + 0.00) = 50.61 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -30     90   0.00  67.57 -15.20  -1.76   0.00   0.00   0.00  50.61
-------------------------------------------------------------------------

Segment Leq : 58.18 dBA

Total Leq All Segments: 58.18 dBA
```

```
Results segment # 1: CN Halton (night)
---------------------------------------


LOCOMOTIVE (0.00 + 56.05 + 0.00) = 56.05 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -30     90   0.00  73.01 -15.20  -1.76   0.00   0.00   0.00  56.05
-------------------------------------------------------------------------


WHEEL (0.00 + 49.45 + 0.00) = 49.45 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -30     90   0.00  66.41 -15.20  -1.76   0.00   0.00   0.00  49.45
-------------------------------------------------------------------------


Segment Leq : 56.91 dBA


Total Leq All Segments: 56.91 dBA

Road data, segment # 1: Appleby S (day/night)
-----------------------------------------------
Car traffic volume  : 38856/4317  veh/TimePeriod  *
Medium truck volume :   440/49    veh/TimePeriod  *
Heavy truck volume  :   680/76    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):  27615
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  24.00
    Medium Truck % of Total Volume     :   1.10
    Heavy Truck  % of Total Volume     :   1.70
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Appleby S (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   -60.00 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           :  61.70 / 61.70  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Appleby N (day/night)
------------------------------------------
Car traffic volume  : 38856/4317  veh/TimePeriod  *
Medium truck volume :   440/49    veh/TimePeriod  *
Heavy truck volume  :   680/76    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):  27615
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  24.00
    Medium Truck % of Total Volume     :   1.10
    Heavy Truck  % of Total Volume     :   1.70
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: Appleby N (day/night)
-------------------------------------------
Angle1   Angle2           :  -5.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  70.00 / 70.00  m
Receiver height           :  61.70 / 61.70  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 3: Upper Middle (day/night)
------------------------------------------------
Car traffic volume  : 22474/2497  veh/TimePeriod  *
Medium truck volume :   138/15    veh/TimePeriod  *
Heavy truck volume  :   344/38    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):  16175
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  23.00
    Medium Truck % of Total Volume     :   0.60
    Heavy Truck  % of Total Volume     :   1.50
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 3: Upper Middle (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  :  72.00 / 72.00  m
Receiver height           :  61.70 / 61.70  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Appleby S (day)
-----------------------------------

Source height = 1.14 m

ROAD (0.00 + 56.74 + 0.00) = 56.74 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -60   0.00  71.21   0.00  -6.69  -7.78   0.00   0.00   0.00  56.74
-------------------------------------------------------------------------------

Segment Leq : 56.74 dBA

Results segment # 2: Appleby N (day)
-----------------------------------

Source height = 1.14 m

ROAD (0.00 + 61.75 + 0.00) = 61.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    -5     90   0.00  71.21   0.00  -6.69  -2.78   0.00   0.00   0.00  61.75
-------------------------------------------------------------------------------

Segment Leq : 61.75 dBA

Results segment # 3: Upper Middle (day)
---------------------------------------

Source height = 1.11 m

ROAD (0.00 + 58.61 + 0.00) = 58.61 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  68.43   0.00  -6.81  -3.01   0.00   0.00   0.00  58.61
-------------------------------------------------------------------------------

Segment Leq : 58.61 dBA

Total Leq All Segments: 64.30 dBA

Results segment # 1: Appleby S (night)
-------------------------------------

Source height = 1.14 m

ROAD (0.00 + 50.22 + 0.00) = 50.22 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -60   0.00  64.69   0.00  -6.69  -7.78   0.00   0.00   0.00  50.22
-------------------------------------------------------------------------------

Segment Leq : 50.22 dBA
```

```
Results segment # 2: Appleby N (night)
---------------------------------------

Source height = 1.14 m

ROAD (0.00 + 55.23 + 0.00) = 55.23 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    -5     90   0.00  64.69   0.00  -6.69  -2.78   0.00   0.00   0.00  55.23
-------------------------------------------------------------------------------

Segment Leq : 55.23 dBA

Results segment # 3: Upper Middle (night)
-----------------------------------------

Source height = 1.10 m

ROAD (0.00 + 52.06 + 0.00) = 52.06 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  61.89   0.00  -6.81  -3.01   0.00   0.00   0.00  52.06
-------------------------------------------------------------------------------

Segment Leq : 52.06 dBA

Total Leq All Segments: 57.78 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 65.25
                           (NIGHT): 60.38
```

```
STAMSON 5.04        NORMAL REPORT        Date: 31-05-2022 18:56:04
MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS / NOISE ASSESSMENT


Filename: o1.te                Time Period: Day/Night 16/8 hours
Description: 7TH Floor Common Amenity Space - Unmitigated


Rail data, segment # 1: CN Halton (day/night)
-----------------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1. Freight     !  12.8/5.1   !  80.0 !  4.0 !140.0 !Diesel! Yes
* 2. Way Freight !   2.6/0.0   !  80.0 !  4.0 ! 25.0 !Diesel! Yes

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

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1. Freight        !  10.0/4.0   !    2.50  !   10.00  !
  2. Way Freight    !   2.0/0.0   !    2.50  !   10.00  !


Data for Segment # 1: CN Halton (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  : 491.00 / 491.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
No Whistle
Barrier angle1            :   0.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Elevation                 :  21.80 m
Barrier receiver distance :   8.70 / 8.70   m
Source elevation          :   0.00 m
Receiver elevation        :  21.80 m
Barrier elevation         :  21.80 m
Reference angle           :   0.00
```

Results segment # 1: CN Halton (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	1.50	1.16	22.96
0.50	1.50	1.10	22.90

LOCOMOTIVE (0.00 + 56.15 + 0.00) = 56.15 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	74.31	-15.15	-3.01	0.00	0.00	-1.34	54.81*
0	90	0.00	74.31	-15.15	-3.01	0.00	0.00	0.00	56.15

* Bright Zone !

WHEEL (0.00 + 49.41 + 0.00) = 49.41 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	67.57	-15.15	-3.01	0.00	0.00	-1.61	47.80*
0	90	0.00	67.57	-15.15	-3.01	0.00	0.00	0.00	49.41

* Bright Zone !

Segment Leq : 56.98 dBA

Total Leq All Segments: 56.98 dBA

Results segment # 1: CN Halton (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	1.50	1.16	22.96
0.50	1.50	1.10	22.90

LOCOMOTIVE (0.00 + 54.85 + 0.00) = 54.85 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	73.01	-15.15	-3.01	0.00	0.00	-1.34	53.50*
0	90	0.00	73.01	-15.15	-3.01	0.00	0.00	0.00	54.85

* Bright Zone !

WHEEL (0.00 + 48.25 + 0.00) = 48.25 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	66.41	-15.15	-3.01	0.00	0.00	-1.61	46.64*
0	90	0.00	66.41	-15.15	-3.01	0.00	0.00	0.00	48.25

* Bright Zone !

Segment Leq : 55.71 dBA

Total Leq All Segments: 55.71 dBA

```
Road data, segment # 1: Appleby S (day/night)
---------------------------------------------
Car traffic volume  : 38856/4317  veh/TimePeriod  *
Medium truck volume :   440/49    veh/TimePeriod  *
Heavy truck volume  :   680/76    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):  27615
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  24.00
    Medium Truck % of Total Volume     :   1.10
    Heavy Truck  % of Total Volume     :   1.70
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Appleby S (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   -70.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  59.00 / 59.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -70.00 deg
Barrier height            :   0.00 m
Elevation                 :  21.80 m
Barrier receiver distance :   8.70 / 8.70   m
Source elevation          :   0.00 m
Receiver elevation        :  21.80 m
Barrier elevation         :  21.80 m
Reference angle           :   0.00

Road data, segment # 2: Appleby N (day/night)
---------------------------------------------
Car traffic volume  : 38856/4317  veh/TimePeriod  *
Medium truck volume :   440/49    veh/TimePeriod  *
Heavy truck volume  :   680/76    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):  27615
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  24.00
    Medium Truck % of Total Volume     :   1.10
    Heavy Truck  % of Total Volume     :   1.70
    Day (16 hrs) % of Total Volume     :  90.00
```

```
Data for Segment # 2: Appleby N (day/night)
-------------------------------------------
Angle1   Angle2           :  20.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  59.00 / 59.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  20.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Elevation                 :  21.80 m
Barrier receiver distance :  11.50 / 11.50  m
Source elevation          :   0.00 m
Receiver elevation        :  21.80 m
Barrier elevation         :  21.80 m
Reference angle           :   0.00

Road data, segment # 3: Upper Middle (day/night)
------------------------------------------------
Car traffic volume  : 22474/2497  veh/TimePeriod  *
Medium truck volume :   138/15    veh/TimePeriod  *
Heavy truck volume  :   344/38    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):  16175
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  23.00
    Medium Truck % of Total Volume     :   0.60
    Heavy Truck  % of Total Volume     :   1.50
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 3: Upper Middle (day/night)
----------------------------------------------
Angle1   Angle2           : -60.00 deg   60.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  80.00 / 80.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -60.00 deg   Angle2 : 60.00 deg
Barrier height            :   0.00 m
Elevation                 :  21.80 m
Barrier receiver distance :   8.30 / 8.30   m
Source elevation          :   0.00 m
Receiver elevation        :  21.80 m
Barrier elevation         :  21.80 m
Reference angle           :   0.00
```

```
Results segment # 1: Appleby S (day)
-----------------------------------
Source height = 1.14 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.14 !        1.50 !       -1.77 !        20.03

ROAD (0.00 + 49.37 + 0.00) = 49.37 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -70   0.00  71.21   0.00  -5.95  -9.54   0.00   0.00  -6.36  49.37
-------------------------------------------------------------------------------
Segment Leq : 49.37 dBA

Results segment # 2: Appleby N (day)
-----------------------------------
Source height = 1.14 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.14 !        1.50 !       -2.82 !        18.98

ROAD (0.00 + 51.04 + 0.00) = 51.04 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    20     90   0.02  71.21   0.00  -6.05  -4.17   0.00   0.00  -9.96  51.04
-------------------------------------------------------------------------------

Segment Leq : 51.04 dBA

Results segment # 3: Upper Middle (day)
--------------------------------------

Source height = 1.11 m

Barrier height for grazing incidence
-----------------------------------

Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.11 !        1.50 !       -0.80 !        21.00

ROAD (0.00 + 52.74 + 0.00) = 52.74 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -60     60   0.02  68.43   0.00  -7.40  -1.78   0.00   0.00  -6.51  52.74
-------------------------------------------------------------------------------

Segment Leq : 52.74 dBA

Total Leq All Segments: 56.04 dBA
```

```
Results segment # 1: Appleby S (night)
-------------------------------------
Source height = 1.14 m

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.14 !        1.50 !       -1.77 !        20.03

ROAD (0.00 + 42.84 + 0.00) = 42.84 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -70   0.00  64.69   0.00  -5.95  -9.54   0.00   0.00  -6.36  42.84
-------------------------------------------------------------------------------
Segment Leq : 42.84 dBA

Results segment # 2: Appleby N (night)
-------------------------------------
Source height = 1.14 m

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.14 !        1.50 !       -2.82 !        18.98

ROAD (0.00 + 44.52 + 0.00) = 44.52 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    20     90   0.02  64.69   0.00  -6.05  -4.17   0.00   0.00  -9.96  44.52
-------------------------------------------------------------------------------
Segment Leq : 44.52 dBA

Results segment # 3: Upper Middle (night)
----------------------------------------
Source height = 1.10 m

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.10 !        1.50 !       -0.80 !        21.00

ROAD (0.00 + 46.19 + 0.00) = 46.19 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -60     60   0.02  61.89   0.00  -7.40  -1.78   0.00   0.00  -6.51  46.19
-------------------------------------------------------------------------------

Segment Leq : 46.19 dBA

Total Leq All Segments: 49.50 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 59.54
                           (NIGHT): 56.64
```

STAMSON 5.04 NORMAL REPORT Date: 31-05-2022 18:57:20
MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS / NOISE ASSESSMENT

Filename: o1.te Time Period: Day/Night 16/8 hours
Description: **7TH Floor Common Amenity Space - Mitigated**

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1. Freight	12.8/5.1	80.0	4.0	140.0	Diesel	Yes
* 2. Way Freight	2.6/0.0	80.0	4.0	25.0	Diesel	Yes

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

Train type: No	Name	Unadj. Trains	Annual % Increase	Years of Growth
1.	Freight	10.0/4.0	2.50	10.00
2.	Way Freight	2.0/0.0	2.50	10.00

Data for Segment # 1: CN Halton (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	:	491.00 / 491.00 m
Receiver height	:	1.50 / 1.50 m
Topography	:	4 (Elevated; with barrier)
No Whistle		
Barrier angle1	:	0.00 deg Angle2 : 90.00 deg
Barrier height	:	1.40 m
Elevation	:	21.80 m
Barrier receiver distance	:	8.70 / 8.70 m
Source elevation	:	0.00 m
Receiver elevation	:	21.80 m
Barrier elevation	:	21.80 m
Reference angle	:	0.00

```
Results segment # 1: CN Halton (day)
-----------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        1.50 !        1.16 !        22.96
       0.50 !        1.50 !        1.10 !        22.90

LOCOMOTIVE (0.00 + 51.04 + 0.00) = 51.04 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
     0     90   0.00  74.31 -15.15  -3.01   0.00   0.00  -5.11  51.04
-------------------------------------------------------------------

WHEEL (0.00 + 44.23 + 0.00) = 44.23 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
     0     90   0.00  67.57 -15.15  -3.01   0.00   0.00  -5.18  44.23
-------------------------------------------------------------------

Segment Leq : 51.86 dBA

Total Leq All Segments: 51.86 dBA

Results segment # 1: CN Halton (night)
-------------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        1.50 !        1.16 !        22.96
       0.50 !        1.50 !        1.10 !        22.90

LOCOMOTIVE (0.00 + 49.74 + 0.00) = 49.74 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
     0     90   0.00  73.01 -15.15  -3.01   0.00   0.00  -5.11  49.74
-------------------------------------------------------------------

WHEEL (0.00 + 43.07 + 0.00) = 43.07 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
     0     90   0.00  66.41 -15.15  -3.01   0.00   0.00  -5.18  43.07
-------------------------------------------------------------------

Segment Leq : 50.59 dBA

Total Leq All Segments: 50.59 dBA
```

```
Road data, segment # 1: Appleby S (day/night)
----------------------------------------------
Car traffic volume  : 38856/4317  veh/TimePeriod  *
Medium truck volume :   440/49    veh/TimePeriod  *
Heavy truck volume  :   680/76    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):  27615
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  24.00
    Medium Truck % of Total Volume     :   1.10
    Heavy Truck  % of Total Volume     :   1.70
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Appleby S (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   -70.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  59.00 / 59.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -70.00 deg
Barrier height            :   1.20 m
Elevation                 :  21.80 m
Barrier receiver distance :   8.70 / 8.70   m
Source elevation          :   0.00 m
Receiver elevation        :  21.80 m
Barrier elevation         :  21.80 m
Reference angle           :   0.00

Road data, segment # 2: Appleby N (day/night)
----------------------------------------------
Car traffic volume  : 38856/4317  veh/TimePeriod  *
Medium truck volume :   440/49    veh/TimePeriod  *
Heavy truck volume  :   680/76    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):  27615
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  24.00
    Medium Truck % of Total Volume     :   1.10
    Heavy Truck  % of Total Volume     :   1.70
    Day (16 hrs) % of Total Volume     :  90.00
```

```
Data for Segment # 2: Appleby N (day/night)
-------------------------------------------
Angle1   Angle2           :  20.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  59.00 / 59.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  20.00 deg   Angle2 : 90.00 deg
Barrier height            :   1.40 m
Elevation                 :  21.80 m
Barrier receiver distance :  11.50 / 11.50  m
Source elevation          :   0.00 m
Receiver elevation        :  21.80 m
Barrier elevation         :  21.80 m
Reference angle           :   0.00

Road data, segment # 3: Upper Middle (day/night)
------------------------------------------------
Car traffic volume  : 22474/2497  veh/TimePeriod  *
Medium truck volume :   138/15    veh/TimePeriod  *
Heavy truck volume  :   344/38    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):  16175
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  23.00
    Medium Truck % of Total Volume     :   0.60
    Heavy Truck  % of Total Volume     :   1.50
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 3: Upper Middle (day/night)
----------------------------------------------
Angle1   Angle2           : -60.00 deg   60.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  80.00 / 80.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -60.00 deg   Angle2 : 60.00 deg
Barrier height            :   1.40 m
Elevation                 :  21.80 m
Barrier receiver distance :   8.30 / 8.30   m
Source elevation          :   0.00 m
Receiver elevation        :  21.80 m
Barrier elevation         :  21.80 m
Reference angle           :   0.00
```

```
Results segment # 1: Appleby S (day)
-----------------------------------

Source height = 1.14 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.14 !        1.50 !       -1.77 !        20.03

ROAD (0.00 + 47.71 + 0.00) = 47.71 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -70   0.00  71.21   0.00  -5.95  -9.54   0.00   0.00  -8.01  47.71
-------------------------------------------------------------------------------
Segment Leq : 47.71 dBA

Results segment # 2: Appleby N (day)
-----------------------------------

Source height = 1.14 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.14 !        1.50 !       -2.82 !        18.98

ROAD (0.00 + 48.81 + 0.00) = 48.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    20     90   0.00  71.21   0.00  -5.95  -4.10   0.00   0.00 -12.35  48.81
-------------------------------------------------------------------------------

Segment Leq : 48.81 dBA

Results segment # 3: Upper Middle (day)
--------------------------------------

Source height = 1.11 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.11 !        1.50 !       -0.80 !        21.00

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
-------------------------------------------------------------------------------
   -60     60   0.00  68.43   0.00  -7.27  -1.76   0.00   0.00 -11.77  47.63
-------------------------------------------------------------------------------

Segment Leq : 47.63 dBA

Total Leq All Segments: 52.86 dBA
```

```
Results segment # 1: Appleby S (night)
--------------------------------------
Source height = 1.14 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.14 !        1.50 !       -1.77 !        20.03

ROAD (0.00 + 41.19 + 0.00) = 41.19 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -70   0.00  64.69   0.00  -5.95  -9.54   0.00   0.00  -8.01  41.19
-------------------------------------------------------------------------------
Segment Leq : 41.19 dBA

Results segment # 2: Appleby N (night)
--------------------------------------

Source height = 1.14 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.14 !        1.50 !       -2.82 !        18.98

ROAD (0.00 + 42.29 + 0.00) = 42.29 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    20     90   0.00  64.69   0.00  -5.95  -4.10   0.00   0.00 -12.35  42.29
-------------------------------------------------------------------------------
Segment Leq : 42.29 dBA

Results segment # 3: Upper Middle (night)
-----------------------------------------

Source height = 1.10 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.10 !        1.50 !       -0.80 !        21.00

ROAD (0.00 + 41.08 + 0.00) = 41.08 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -60     60   0.00  61.89   0.00  -7.27  -1.76   0.00   0.00 -11.78  41.08
-------------------------------------------------------------------------------

Segment Leq : 41.08 dBA

Total Leq All Segments: 46.33 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 55.40
                           (NIGHT): 51.97
```

APPENDIX D

ENVIRONMENTAL NOISE GUIDELINES

APPENDIX D

ENVIRONMENTAL NOISE GUIDELINES

MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS (MECP)

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

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

…./cont'd

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

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

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

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