

NOISE IMPACT STUDY
“AFFORDABLE HOUSING”
70 HOPE AVENUE
HAMILTON, ON

Prepared for:

City of Hamilton
Housing Services Division
350 King Street East, Unit 110
Hamilton, ON
L8N 3Y3

Prepared By:



Nicole Cleaver
Noise Consultant

Reviewed By:



Frank Westaway
Qualified Acoustical Consultant

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dBA Acoustical Consultants Inc.
P.O Box 32059
1447 Upper Ottawa Street, Unit 8
Hamilton, ON
L8W 3K0

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1.0 INTRODUCTION

dBA Acoustical Consultants Inc. has been retained to provide a noise impact study on behalf of the City of Hamilton, Housing Services Division, for the proposed 3-Storey Residential Building located at 70 Hope Avenue, Hamilton, ON.

The purpose of this noise study is to determine the road noise impact from Barton Street East, Kenilworth Avenue North, Britannia Avenue and Cannon Street East that may impact the proposed residential building as required for Site Plan Application (SPA) submission for the City of Hamilton.

Noise control measures will be recommended (if required) to meet Ministry of Environment, Conversation, and Parks, (MECP) Publication NPC-300 entitled “Stationary & Transportation Sources-Approval & Planning and CN/GO Rail guidelines while satisfying the planning requirements of the City of Hamilton. See Figure 1 Site Location.

CN Rail, GO Transit and CN Metals Distribution Centre (419 Parkdale Avenue North) were considered and are discussed under Section 2.0. Aircraft noise was not considered in this report as the proposed development is not within the minimum 25 NEF contour area of influence. There are no area stationary noise sources relative to the site plan and therefore not considered in the noise impact study.

2.0 SITE DESCRIPTION

Proposed for the site is a 3-storey apartment building with 54 units and a ground level green space to the east. The proposed building is situated in an area of existing 1-2 storey residential properties.

The proposed development property is located approximately 243m south of Barton Street East and is a 4-lane roadway with two-lanes running east and two-lanes running west. The posted speed limit is 50 km/hr. Kenilworth Avenue North is approximately 48m west and is a two-lane roadway running north and south. There is curbside paid parking in various locations on both sides of the roadway. The posted speed limit is 40 km/hr. Britannia Avenue is approximately 54m south and is a two-lane roadway running both east and west and has streetside parking. The posted speed limit is 40 km/hr. Cannon Street East is approximately 134m south and is a two-lane roadway running east and west with a centre turning lane as well as designated bike lanes on the north and south. The posted speed limit is 50 km/hr. See Figure 1 Key Map.

The CN Rail, GO Transit and CN Metals Distribution Center are located approximately 625m north of the proposed building and run east and west. CN requires a 1000m buffer from an active works yard and GO Transit requires train noise to be addressed for new structures within 500m of the rail property. The CN Metals Distribution Center is a rail yard that has very little activity during the day and nighttime hours. The CN locomotives are remote controlled by the engineer and generate very low impact noise levels when coupling the locomotives to the cars. This has been confirmed by on-site visits. Due to the distance separation of the CN Rail, density of commercial buildings separating the proposed building height, the CN Metals Distribution Center will not have an acoustical impact on the proposed building. A site visit confirmed that there are no HVAC units in the general area that will have an acoustical impact on the proposed development.

3.0 NOISE IMPACT ASSESSMENT

3.1 NOISE CRITERIA

The MECP specifies limits for road and rail noise relative to new residential developments. The MECP Publication NPC-300 entitled “Stationary & Transportation Sources-Approval & Planning, specifies the criteria, summarized as follows:

TABLE 1- Road Traffic Sound Levels Limits	
Time Period	Leq (dBA)
07:00 – 23:00 (16 hr.)	55 Outdoor Living area
07:00 – 23:00 (16 hr.)	55 Plane of Window
23:00 – 07:00 (8 hr.)	50 Plane of Bedroom window

Where noise levels estimated at windows are equal to or less than the values listed in Table 1, no noise control measures are required.

Where noise levels exceed Table 1 values, the following action is required:

TABLE 2 – Noise Control Requirements		
Time Period	Noise Level Leq (dBA)	Action Required
07:00 - 23:00 Daytime (OLA)	56 to 60	Warning Clause Type “A”
	> 60	Barrier & Warning Clause Type “B”
07:00 – 23:00 Daytime (POW)	> 55	Provision for A/C, Warning Clause “C”
	> 65	Central A/C, Warning Clause “D”
	> 65	Building Component Specification
23:00 to 07:00 Nighttime (POW)	> 50	Provision for A/C and Warning Clause Type “C”
	> 60	Building Component Specification
	> 60	Central Air and Warning Clause Type “D”

Where nighttime noise levels exceed 60 dBA, building components must be designed to meet Table 3 indoor sound level limits.

TABLE 3 - Indoor Road Sound Level Limits	
Indoor Location	Leq (dBA)
	Road
Living/Dining 7:00 - 23:00	45
Bedroom 23:00 - 07:00	40

3.2 ROAD NOISE

Predicted road traffic noise levels were calculated for Barton Street East (2022), Kenilworth Avenue North (2022), Britannia Avenue (2023) and Cannon Street East (2022), the main road noise sources in the proposed site area. The AADT road traffic volumes were obtained via email from Giancarlo Perez Miller, Database Technologist, Roadway Safety, Transportation Division, Public Works in the City of Hamilton. These are the most up to date AADT road traffic volumes available. The MECP computer program STAMSON version 5.04 was used to carry out prediction calculations (See Appendix “A”). Traffic data is summarized in Table 4.

The daytime/nighttime volume ratios relative to all roadways were calculated using a 90/10 split and a 16/8 hr assessment is required by the MECP. The percentage of annual growth was figured at 2% over 12 years for Barton Street East, Kenilworth Avenue North & Cannon Street East and 13 years for Britannia Avenue. The AADT (Annual Average Daily Traffic) volumes used are reflective of the worst-case scenario. Truck volumes were factored at 2% medium and 2% heavy of the total vehicle volumes for all roadways.

TABLE 4 – Future Road Traffic Volumes (2035)			
Barton Street East	AADT - 16312 Vehicles		
	Cars	Medium Trucks	Heavy Trucks
Day	14092	294	294
Night	1566	33	33
Kenilworth Avenue North	AADT - 13813 Vehicles		
	Cars	Medium Trucks	Heavy Trucks
Day	11933	249	249
Night	1326	28	28
Britannia Avenue	AADT - 15442 Vehicles		
	Cars	Medium Trucks	Heavy Trucks
Day	13342	278	278
Night	1482	31	31
Cannon Street East	AADT - 22941 Vehicles		
	Cars	Medium Trucks	Heavy Trucks
Day	19821	413	413
Night	2202	46	46

The following Table 5A represents the free field noise levels of road traffic from Barton Street East. 11 Receptor locations were considered for this report for the north, east, south and west facades. See Figure 3 Receptor Locations.

TABLE 5A – Predicted Future Traffic Noise (dBA) Barton Street East		
Location	07:00 – 23:00	23:00 – 07:00
R1 – North Façade 2 nd Floor (4.5m)	45 dBA	39 dBA
R2 – North Façade 3 rd Floor (7.5m)	35 dBA	29 dBA
R3 – Northeast Façade 2 nd Floor (4.5m)	31 dBA	24 dBA
R4 – Northeast Façade 3 rd Floor (7.5m)	32 dBA	25 dBA
R5 – East Façade Ground Floor Green Space (1.5m)	29 dBA	N/A
R6 – East Façade 2 nd Floor (4.5m)	N/A	N/A
R7 – East Façade 3 rd Floor (7.5m)	N/A	N/A
R8 – South Façade 1 st Floor (3m)	N/A	N/A
R9 – South Façade 3 rd Floor (7.5m)	N/A	N/A
R10 – West Façade 2 nd Floor (4.5m)	30 dBA	23 dBA
R11 – West Façade 3 rd Floor (7.5m)	31 dBA	24 dBA

The following Table 5B represents the free field noise levels of road traffic from Kenilworth Avenue North. 11 Receptor locations were considered for this report for the north, east, south and west facades. See Figure 3 Receptor Locations.

TABLE 5B – Predicted Future Traffic Noise (dBA) Kenilworth Avenue North		
Location	07:00 – 23:00	23:00 – 07:00
R1 – North Façade 2 nd Floor (4.5m)	48 dBA	41 dBA
R2 – North Façade 3 rd Floor (7.5m)	48 dBA	41 dBA
R3 – Northeast Façade 2 nd Floor (4.5m)	N/A	N/A
R4 – Northeast Façade 3 rd Floor (7.5m)	N/A	N/A
R5 – East Façade Ground Floor Green Space (1.5m)	N/A	N/A
R6 – East Façade 2 nd Floor (4.5m)	N/A	N/A
R7 – East Façade 3 rd Floor (7.5m)	N/A	N/A
R8 – South Façade 1 st Floor (3m)	N/A	N/A
R9 – South Façade 3 rd Floor (7.5m)	49 dBA	42 dBA
R10 – West Façade 2 nd Floor (4.5m)	45 dBA	39 dBA
R11 – West Façade 3 rd Floor (7.5m)	50 dBA	44 dBA

The following Table 5C represents the free field noise levels of road traffic from Britannia Avenue. 11 Receptor locations were considered for this report for the north, east, south and west facades. See Figure 3 Receptor Locations.

TABLE 5C – Predicted Future Traffic Noise (dBA) Britannia Avenue		
Location	07:00 – 23:00	23:00 – 07:00
R1 – North Façade 2 nd Floor (4.5m)	N/A	N/A
R2 – North Façade 3 rd Floor (7.5m)	N/A	N/A
R3 – Northeast Façade 2 nd Floor (4.5m)	33 dBA	27 dBA
R4 – Northeast Façade 3 rd Floor (7.5m)	41 dBA	35 dBA
R5 – East Façade Ground Floor Green Space (1.5m)	35 dBA	N/A
R6 – East Façade 2 nd Floor (4.5m)	36 dBA	30 dBA
R7 – East Façade 3 rd Floor (7.5m)	44 dBA	37 dBA
R8 – South Façade 1 st Floor (3m)	42 dBA	35 dBA
R9 – South Façade 3 rd Floor (7.5m)	49 dBA	42 dBA
R10 – West Façade 2 nd Floor (4.5m)	36 dBA	30 dBA
R11 – West Façade 3 rd Floor (7.5m)	37 dBA	31 dBA

The following Table 5D represents the free field noise levels of road traffic from Cannon Street East. 11 Receptor locations were considered for this report for the north, east, south and west facades. See Figure 3 Receptor Locations.

TABLE 5D – Predicted Future Traffic Noise (dBA) Cannon Street East		
Location	07:00 – 23:00	23:00 – 07:00
R1 – North Façade 2 nd Floor (4.5m)	N/A	N/A
R2 – North Façade 3 rd Floor (7.5m)	N/A	N/A
R3 – Northeast Façade 2 nd Floor (4.5m)	34 dBA	27 dBA
R4 – Northeast Façade 3 rd Floor (7.5m)	42 dBA	35 dBA
R5 – East Façade Ground Floor Green Space (1.5m)	34 dBA	N/A
R6 – East Façade 2 nd Floor (4.5m)	35 dBA	29 dBA
R7 – East Façade 3 rd Floor (7.5m)	43 dBA	38 dBA
R8 – South Façade 1 st Floor (3m)	39 dBA	33 dBA
R9 – South Façade 3 rd Floor (7.5m)	45 dBA	39 dBA
R10 – West Façade 2 nd Floor (4.5m)	35 dBA	29 dBA
R11 – West Façade 3 rd Floor (7.5m)	36 dBA	29 dBA

The following Table 5E represents the COMBINED free field noise levels of road traffic from Barton Street East, Kenilworth Avenue North, Britannia Avenue & Cannon Street East. 11 Receptor locations were considered for this report for the north, east, south and west facades. See Figure 3 Receptor Locations.

TABLE 5E – Predicted COMBINED Future Traffic Noise (dBA) All Roadways		
Location	07:00 – 23:00	23:00 – 07:00
R1 – North Façade 2 nd Floor (4.5m)	50 dBA	43 dBA
R2 – North Façade 3 rd Floor (7.5m)	48 dBA	41 dBA
R3 – Northeast Façade 2 nd Floor (4.5m)	38 dBA	31 dBA
R4 – Northeast Façade 3 rd Floor (7.5m)	45 dBA	38 dBA
R5 – East Façade Ground Floor Green Space (1.5m)	38 dBA	N/A
R6 – East Façade 2 nd Floor (4.5m)	39 dBA	32 dBA
R7 – East Façade 3 rd Floor (7.5m)	47 dBA	40 dBA
R8 – South Façade 1 st Floor (3m)	44 dBA	37 dBA
R9 – South Façade 3 rd Floor (7.5m)	52 dBA	46 dBA
R10 – West Façade 2 nd Floor (4.5m)	46 dBA	40 dBA
R11 – West Façade 3 rd Floor (7.5m)	51 dBA	44 dBA

3.3 VIBRATION

The City of Hamilton Construction Management Plan 2022 may require pre-condition surveys of area buildings within the area of influence, noise and vibration protocol, and vibration monitoring during all heavy construction activities prior to mobilizing of construction equipment due to the proximity of the neighbouring properties. Further information will be provided prior to the issuance of a building permit or as The City of Hamilton staff require the documents for approval.

4.0 RECOMMENDATIONS - NOISE CONTROL

4.1 OUTDOOR LIVING AREAS

Calculated road noise levels do not exceed the 55 dBA daytime criteria outlined in Table 1. The ground floor green space will not require any mitigation measures.

4.2 INDOOR NOISE LEVELS

Calculated nighttime road noise levels at the Plane of Window (POW) do not exceed the 50 dBA criteria outlined in Table 1 for indoor spaces. Ontario Building Code (OBC) will suffice for the proposed renovation. It is recommended that STC-28 non-acoustically tested windows be installed as they will achieve MECP NPC-300 Transportation and Stationary Sources Noise guidelines.

TABLE 6 – Recommended Door, Wall, and Window Construction			
LOCATION	Acoustically Tested Window STC	Exterior Wall STC	Patio Door Construction STC
All Units	Example	Example	Example
Bedroom	OBC	OBC	OBC
Living room	OBC	OBC	OBC

5.0 VENTILATION / WARNING CLAUSES

Ventilation and Warning Clause requirements for all residential apartment units are presented in Table 9 following. It is recommended that the appropriate Warning Clauses be inserted into all Offers and Agreements of Purchase and Sale or Lease. Specific building component requirements noted in Table 6 for all apartment units will satisfy the MECP criterion for noise control relative to indoor living space.

TABLE 6 - Ventilation and Warning Clause Requirements		
LOCATION	VENTILATION	WARNING CLAUSE
All Units	OBC	N/A

6.0 NOISE CONTROL REQUIREMENTS CONFIRMATION

The following Table 7 summarizes the highest roadway noise levels (Table 5) for the daytime/nighttime hours. Table 7 below As shown in the chart below, the window and exterior wall requirements are extremely low. STC-28 is the lowest STC requirement and anything less than that would be Ontario Builders Code (OBC). This chart also confirms that ventilation and warning clauses are not required for this project.

TABLE 7 - Noise Control Requirements Confirmation											
Time Period	Predicted Impact, Leq (dBA)	A/C Req.	Warning Clause	Indoor Limits, Leq (dBA)		Window / Floor Area Ratio (%)	Wall / Floor Area Ratio (%)	STC Requirements			
				Living, Dining, and Den Areas	Sleeping Quarters			Living, Dining, and Den Areas		Sleeping Quarters	
				Road	Road			Window	Wall	Window	Wall
Day	52	NO	NO	45	45	80%	100%	18	20	18	20
Night	46	NO	NO	45	40	80%	100%	12	14	16	18

7.0 SUMMARY OF RECOMMENDATIONS

The following noise control measures are required to satisfy the indoor and outdoors noise level criterion:

- OBC is sufficient for all windows, patio doors and exterior walls. (Table 7)
- A letter from the Window Supply Company confirming the appropriate STC values have been achieved and an Acoustical Certificate from the Qualified Acoustical Consultant be issued prior to issuance of the building plans.
- Qualified Acoustical Consultant certifies that the required noise control measures have been incorporated into the builder's plans prior to issuance of a building permit.
- Prior to issuance of an occupancy permit or equivalent, it is recommended the Qualified Acoustical Consultant certify that the approved noise control measures have been professionally installed.

8.0 CONCLUSIONS

dBA Acoustical Consultants Inc. has provided a noise impact study on behalf of the City of Hamilton, Housing Services Division, for the proposed 3-Storey Residential Building located at 70 Hope Avenue, Hamilton, ON.

The noise study determined the road noise impact from Barton Street East, Kenilworth Avenue North, Britannia Avenue and Cannon Street East, CN Rail and GO Transit on the proposed residential building as required for Site Plan Application (SPA) submission for the City of Hamilton.

This study detailed noise impact relative to the site plan and recommended noise control measures necessary (OBC for windows, patio doors and exterior walls) to meet MECP Publication NPC-300 guidelines entitled "Stationary & Transportation Sources-Approval & Planning while satisfying the planning requirements of the City of Hamilton.

FIGURE 1 SITE LOCATION

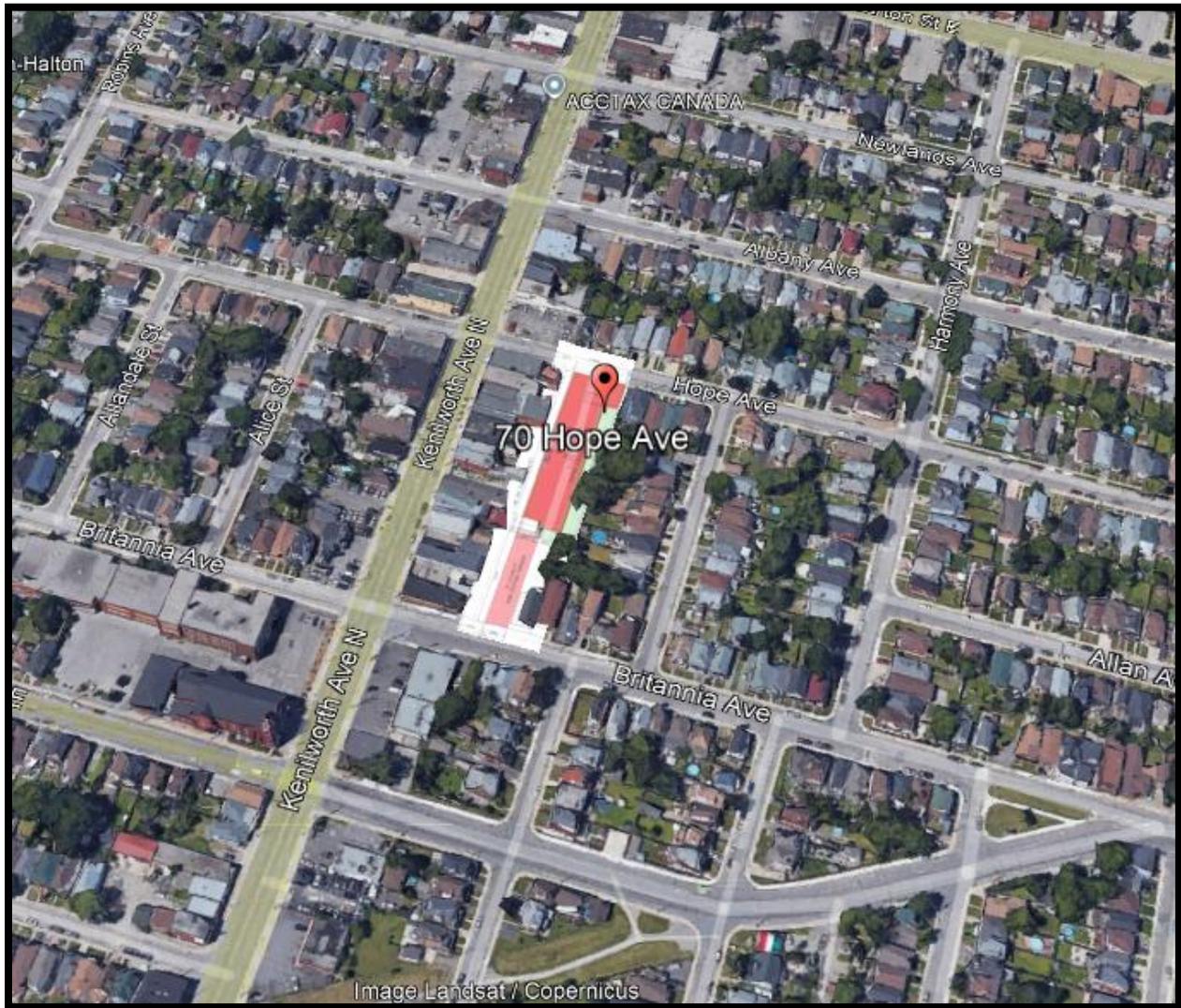


FIGURE 2 SITE PLAN

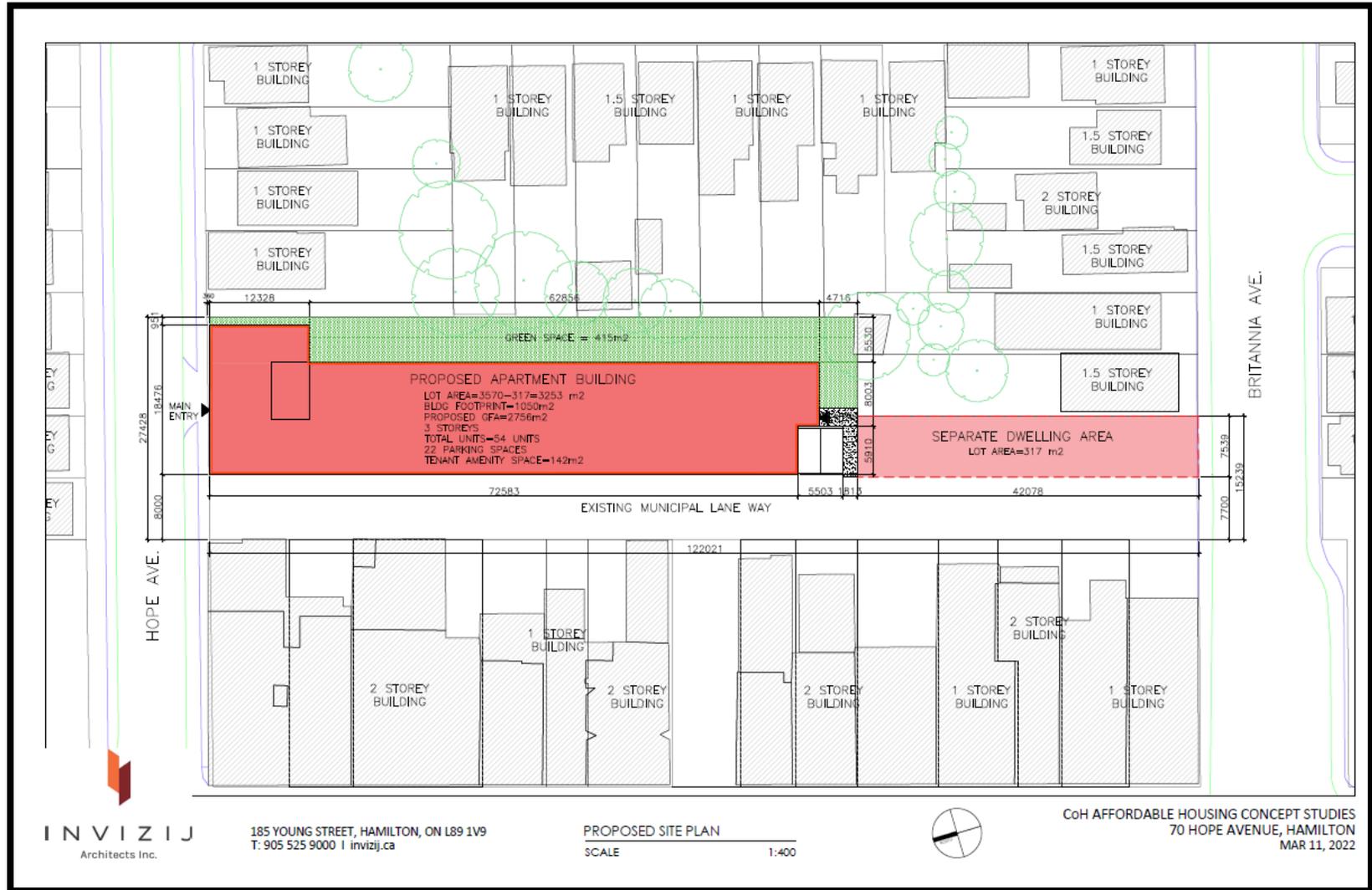
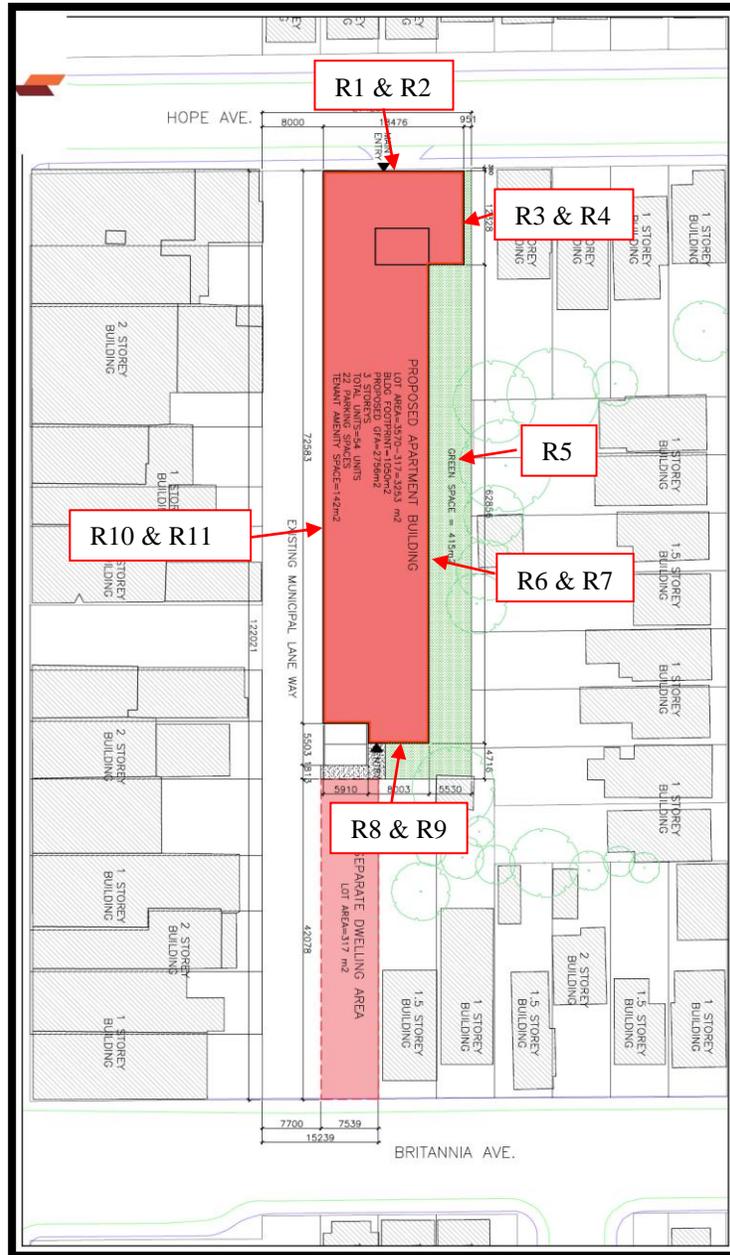


FIGURE 3 RECEPTOR LOCATIONS



APPENDIX “A”

CITY OF HAMILTON AADT TRAFFIC DATA

Hi Nicole,

This is what we can provide you from our Database for the requested area:

AADT Midblocks Report		
Description	2022	2023
HARMONY AV btwn ALBANY & HOPE		535
BARTON ST E btwn PALING & STRATHEARNE	12608	
KENILWORTH AV N btwn BRITANNIA & HOPE	10677	

Below I have attached intersection AADT's to further help:

AADT Intersection Report					
Description	2020	2021	2022	2023	2024
BARTON ST E @ COPE ST		11331	17807		
BARTON ST E @ FREDERICK AV		12914	10679		
BARTON ST E @ KENILWORTH AV N				20892	
BARTON ST E @ ROBINS AV					14698
BRITANNIA AV @ CANNON ST E		2714	2785		
BRITANNIA AV @ KENILWORTH AV N				12176	
CANNON ST E @ FREDERICK AV		3784	4386		
CANNON ST E @ GARSIDE AV N	2576				
CANNON ST E @ KENILWORTH AV N		12074	17734		
KENILWORTH AV N @ NEWLANDS AV					12934

Regards,

Giancarlo Perez Miller

Database Technologist
Roadway Safety
Transportation Division
Public Works



STAMSON CALCULATIONS

STAMSON 5.04 SUMMARY REPORT Date: 21-04-2025 09:46:19
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Description: R1 North Facade 2nd Floor

TOTAL Leq FROM ALL SOURCES

(DAY) : 49.71

(NIGHT) : 43.21

Road data, segment # 1: Barton St E (day/night)

Car traffic volume : 14092/1566 veh/TimePeriod *
Medium truck volume : 294/33 veh/TimePeriod *
Heavy truck volume : 294/33 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12608
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Barton St E (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 : 243.00 / 243.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)

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

Car traffic volume : 11933/1326 veh/TimePeriod *
Medium truck volume : 249/28 veh/TimePeriod *
Heavy truck volume : 249/28 veh/TimePeriod *
Posted speed limit : 40 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): 10677
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Kenilworth N (day/night)

Angle1 Angle2 : -20.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 56.00 / 56.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Result summary (day)

! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Barton St E ! 1.19 ! 45.30 ! 45.30
2.Kenilworth N ! 1.19 ! 47.76 ! 47.76
-----+-----+-----+-----
Total 49.71 dBA

Result summary (night)

! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Barton St E ! 1.19 ! 38.80 ! 38.80
2.Kenilworth N ! 1.19 ! 41.26 ! 41.26
-----+-----+-----+-----
Total 43.21 dBA

STAMSON 5.04 SUMMARY REPORT Date: 21-04-2025 09:52:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2hope.te Time Period: Day/Night 16/8 hours

Description: R2 North Facade 3rd Floor

TOTAL Leq FROM ALL SOURCES

(DAY) : 47.99

(NIGHT) : 41.49

Road data, segment # 1: Barton St E (day/night)

Car traffic volume : 14092/1566 veh/TimePeriod *
Medium truck volume : 294/33 veh/TimePeriod *
Heavy truck volume : 294/33 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12608
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Barton St E (day/night)

Angle1 Angle2 : -5.00 deg 5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 243.00 / 243.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

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

Car traffic volume : 11933/1326 veh/TimePeriod *
Medium truck volume : 249/28 veh/TimePeriod *
Heavy truck volume : 249/28 veh/TimePeriod *
Posted speed limit : 40 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): 10677
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Kenilworth N (day/night)

Angle1 Angle2 : -20.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 56.00 / 56.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Result summary (day)

! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Barton St E ! 1.19 ! 35.15 ! 35.15
2.Kenilworth N ! 1.19 ! 47.76 ! 47.76
-----+-----+-----+-----
Total 47.99 dBA

Result summary (night)

! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Barton St E ! 1.19 ! 28.65 ! 28.65
2.Kenilworth N ! 1.19 ! 41.26 ! 41.26
-----+-----+-----+-----
Total 41.49 dBA

STAMSON 5.04 SUMMARY REPORT Date: 21-04-2025 10:07:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r3hope.te Time Period: Day/Night 16/8 hours

Description: R3 Northeast Facade 2nd Floor

TOTAL Leq FROM ALL SOURCES

(DAY): 37.63

(NIGHT): 31.11

Road data, segment # 1: Barton St E (day/night)

Car traffic volume : 14092/1566 veh/TimePeriod *
Medium truck volume : 294/33 veh/TimePeriod *
Heavy truck volume : 294/33 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12608
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Barton St E (day/night)

Angle1 Angle2 : -5.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 251.00 / 251.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)

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

Car traffic volume : 13342/1482 veh/TimePeriod *
Medium truck volume : 278/31 veh/TimePeriod *
Heavy truck volume : 278/31 veh/TimePeriod *
Posted speed limit : 40 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): 12176
Percentage of Annual Growth : 2.00
Number of Years of Growth : 12.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

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

```
-----
Angle1   Angle2           :   -0.00 deg   5.00 deg
Wood depth           :           0       (No woods.)
No of house rows    :           0 / 0
Surface              :           1       (Absorptive ground surface)
Receiver source distance : 125.00 / 125.00 m
Receiver height      :           4.50 / 4.50 m
Topography           :           1       (Flat/gentle slope; no barrier)
```

Road data, segment # 3: Cannon St E (day/night)

```
-----
Car traffic volume   : 19821/2202 veh/TimePeriod *
Medium truck volume  :   413/46   veh/TimePeriod *
Heavy truck volume   :   413/46   veh/TimePeriod *
Posted speed limit   :    50 km/h
Road gradient         :    0 %
Road pavement        :    1 (Typical asphalt or concrete)
```

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

```

24 hr Traffic Volume (AADT or SADT): 17734
Percentage of Annual Growth         :    2.00
Number of Years of Growth           :   13.00
Medium Truck % of Total Volume      :    2.00
Heavy Truck % of Total Volume       :    2.00
Day (16 hrs) % of Total Volume      :   90.00
```

Data for Segment # 3: Cannon St E (day/night)

```
-----
Angle1   Angle2           :   -0.00 deg   5.00 deg
Wood depth           :           0       (No woods.)
No of house rows    :           0 / 0
Surface              :           1       (Absorptive ground surface)
Receiver source distance : 202.00 / 202.00 m
Receiver height      :           4.50 / 4.50 m
Topography           :           1       (Flat/gentle slope; no barrier)
```

Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Barton St E ! 1.19 ! 30.83 ! 30.83
2.Britannia ! 1.19 ! 33.39 ! 33.39
3.Cannon St E ! 1.19 ! 33.80 ! 33.80
-----+-----+-----+-----
Total 37.63 dBA
```

Result summary (night)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Barton St E ! 1.19 ! 24.33 ! 24.33
2.Britannia ! 1.19 ! 26.87 ! 26.87
3.Cannon St E ! 1.19 ! 27.27 ! 27.27
-----+-----+-----+-----
Total 31.11 dBA
```

STAMSON 5.04 SUMMARY REPORT Date: 21-04-2025 10:10:13
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r4hope.te Time Period: Day/Night 16/8 hours

Description: R4 Northeast Facade 3rd Floor

TOTAL Leq FROM ALL SOURCES

(DAY): 44.70

(NIGHT): 38.17

Road data, segment # 1: Barton St E (day/night)

Car traffic volume : 14092/1566 veh/TimePeriod *
Medium truck volume : 294/33 veh/TimePeriod *
Heavy truck volume : 294/33 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12608
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Barton St E (day/night)

Angle1 Angle2 : -5.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 251.00 / 251.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

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

Car traffic volume : 13342/1482 veh/TimePeriod *
Medium truck volume : 278/31 veh/TimePeriod *
Heavy truck volume : 278/31 veh/TimePeriod *
Posted speed limit : 40 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): 12176
Percentage of Annual Growth : 2.00
Number of Years of Growth : 12.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

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

```

-----
Angle1   Angle2           :  -0.00 deg   25.00 deg
Wood depth           :      0       (No woods.)
No of house rows     :      0 / 0
Surface              :      1       (Absorptive ground surface)
Receiver source distance : 125.00 / 125.00 m
Receiver height      :      7.50 / 7.50 m
Topography           :      1       (Flat/gentle slope; no barrier)
  
```

Road data, segment # 3: Cannon St E (day/night)

```

-----
Car traffic volume   : 19821/2202 veh/TimePeriod *
Medium truck volume  :   413/46   veh/TimePeriod *
Heavy truck volume   :   413/46   veh/TimePeriod *
Posted speed limit   :    50 km/h
Road gradient        :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
  
```

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

```

24 hr Traffic Volume (AADT or SADT): 17734
Percentage of Annual Growth       :    2.00
Number of Years of Growth         :   13.00
Medium Truck % of Total Volume    :    2.00
Heavy Truck % of Total Volume     :    2.00
Day (16 hrs) % of Total Volume    :   90.00
  
```

Data for Segment # 3: Cannon St E (day/night)

```

-----
Angle1   Angle2           :  -0.00 deg   25.00 deg
Wood depth           :      0       (No woods.)
No of house rows     :      0 / 0
Surface              :      1       (Absorptive ground surface)
Receiver source distance : 202.00 / 202.00 m
Receiver height      :      7.50 / 7.50 m
Topography           :      1       (Flat/gentle slope; no barrier)
  
```

Result summary (day)

```

-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Barton St E ! 1.19 ! 31.93 ! 31.93
2.Britannia ! 1.19 ! 41.14 ! 41.14
3.Cannon St E ! 1.19 ! 41.74 ! 41.74
-----+-----+-----+-----
Total 44.70 dBA
  
```

Result summary (night)

```

-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Barton St E ! 1.19 ! 25.43 ! 25.43
2.Britannia ! 1.19 ! 34.62 ! 34.62
3.Cannon St E ! 1.19 ! 35.21 ! 35.21
-----+-----+-----+-----
Total 38.17 dBA
  
```

STAMSON 5.04 SUMMARY REPORT Date: 21-04-2025 10:14:10
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5hope.te Time Period: Day/Night 16/8 hours

Description: R5 East Facade ground floor green space

TOTAL Leq FROM ALL SOURCES

(DAY): 37.98

(NIGHT): 31.46

Road data, segment # 1: Barton St E (day/night)

Car traffic volume : 14092/1566 veh/TimePeriod *
Medium truck volume : 294/33 veh/TimePeriod *
Heavy truck volume : 294/33 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12608
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Barton St E (day/night)

Angle1 Angle2 : -5.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 282.00 / 282.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)

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

Car traffic volume : 13342/1482 veh/TimePeriod *
Medium truck volume : 278/31 veh/TimePeriod *
Heavy truck volume : 278/31 veh/TimePeriod *
Posted speed limit : 40 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): 12176
Percentage of Annual Growth : 2.00
Number of Years of Growth : 12.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

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

```
-----
Angle1   Angle2           :  -0.00 deg   5.00 deg
Wood depth           :      0       (No woods.)
No of house rows    :      0 / 0
Surface             :      1       (Absorptive ground surface)
Receiver source distance :  94.00 / 94.00 m
Receiver height     :      1.50 / 1.50 m
Topography          :      1       (Flat/gentle slope; no barrier)
```

Road data, segment # 3: Cannon St E (day/night)

```
-----
Car traffic volume  : 19821/2202 veh/TimePeriod *
Medium truck volume :   413/46   veh/TimePeriod *
Heavy truck volume  :   413/46   veh/TimePeriod *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement      :     1 (Typical asphalt or concrete)
```

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

```

24 hr Traffic Volume (AADT or SADT): 17734
Percentage of Annual Growth       :   2.00
Number of Years of Growth         :  13.00
Medium Truck % of Total Volume    :   2.00
Heavy Truck % of Total Volume     :   2.00
Day (16 hrs) % of Total Volume    :  90.00
```

Data for Segment # 3: Cannon St E (day/night)

```
-----
Angle1   Angle2           :  -0.00 deg   5.00 deg
Wood depth           :      0       (No woods.)
No of house rows    :      0 / 0
Surface             :      1       (Absorptive ground surface)
Receiver source distance : 172.00 / 172.00 m
Receiver height     :      1.50 / 1.50 m
Topography          :      1       (Flat/gentle slope; no barrier)
```

Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Barton St E ! 1.19 ! 29.00 ! 29.00
2.Britannia ! 1.19 ! 34.70 ! 34.70
3.Cannon St E ! 1.19 ! 34.04 ! 34.04
-----+-----+-----+-----
Total 37.98 dBA
```

Result summary (night)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Barton St E ! 1.19 ! 22.50 ! 22.50
2.Britannia ! 1.19 ! 28.18 ! 28.18
3.Cannon St E ! 1.19 ! 27.52 ! 27.52
-----+-----+-----+-----
Total 31.46 dBA
```

STAMSON 5.04 SUMMARY REPORT Date: 21-04-2025 10:17:30
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r6hope.te Time Period: Day/Night 16/8 hours

Description: R6 East Facade 2nd Floor

TOTAL Leq FROM ALL SOURCES

(DAY) : 38.89

(NIGHT) : 32.37

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

Car traffic volume : 13342/1482 veh/TimePeriod *
Medium truck volume : 278/31 veh/TimePeriod *
Heavy truck volume : 278/31 veh/TimePeriod *
Posted speed limit : 40 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): 12176
Percentage of Annual Growth : 2.00
Number of Years of Growth : 12.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -0.00 deg 5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 82.00 / 82.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Road data, segment # 2: Cannon St E (day/night)

Car traffic volume : 19821/2202 veh/TimePeriod *
Medium truck volume : 413/46 veh/TimePeriod *
Heavy truck volume : 413/46 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17734
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Cannon St E (day/night)

Angle1 Angle2 : -0.00 deg 5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 159.00 / 159.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Result summary (day)

! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Britannia ! 1.19 ! 36.28 ! 36.28
2.Cannon St E ! 1.19 ! 35.44 ! 35.44
-----+-----+-----+-----
Total 38.89 dBA

Result summary (night)

! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Britannia ! 1.19 ! 29.76 ! 29.76
2.Cannon St E ! 1.19 ! 28.91 ! 28.91
-----+-----+-----+-----
Total 32.37 dBA

STAMSON 5.04 SUMMARY REPORT Date: 21-04-2025 10:20:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r7hope.te Time Period: Day/Night 16/8 hours

Description: R7 East Facade 3rd Floor

TOTAL Leq FROM ALL SOURCES

(DAY): 46.60

(NIGHT): 40.08

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

Car traffic volume : 13342/1482 veh/TimePeriod *
Medium truck volume : 278/31 veh/TimePeriod *
Heavy truck volume : 278/31 veh/TimePeriod *
Posted speed limit : 40 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): 12176
Percentage of Annual Growth : 2.00
Number of Years of Growth : 12.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -0.00 deg 25.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 82.00 / 82.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Road data, segment # 2: Cannon St E (day/night)

Car traffic volume : 19821/2202 veh/TimePeriod *
Medium truck volume : 413/46 veh/TimePeriod *
Heavy truck volume : 413/46 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17734
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Cannon St E (day/night)

Angle1 Angle2 : -0.00 deg 25.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 159.00 / 159.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Result summary (day)

! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----
1.Britannia ! 1.19 ! 43.87 ! 43.87
2.Cannon St E ! 1.19 ! 43.29 ! 43.29
-----+-----+-----
Total 46.60 dBA

Result summary (night)

! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----
1.Britannia ! 1.19 ! 37.35 ! 37.35
2.Cannon St E ! 1.19 ! 36.76 ! 36.76
-----+-----+-----
Total 40.08 dBA

STAMSON 5.04 SUMMARY REPORT Date: 21-04-2025 10:24:38
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r8hope.te Time Period: Day/Night 16/8 hours

Description: R8 South Facade 1st Floor

TOTAL Leq FROM ALL SOURCES

(DAY) : 43.77

(NIGHT) : 37.25

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

Car traffic volume : 13342/1482 veh/TimePeriod *
Medium truck volume : 278/31 veh/TimePeriod *
Heavy truck volume : 278/31 veh/TimePeriod *
Posted speed limit : 40 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): 12176
Percentage of Annual Growth : 2.00
Number of Years of Growth : 12.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -5.00 deg 5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 54.00 / 54.00 m
Receiver height : 3.00 / 3.00 m
Topography : 1 (Flat/gentle slope; no barrier)

Road data, segment # 2: Cannon St E (day/night)

Car traffic volume : 19821/2202 veh/TimePeriod *
Medium truck volume : 413/46 veh/TimePeriod *
Heavy truck volume : 413/46 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 17734
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Cannon St E (day/night)

Angle1 Angle2 : -5.00 deg 5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 134.00 / 134.00 m
Receiver height : 3.00 / 3.00 m
Topography : 1 (Flat/gentle slope; no barrier)

Result summary (day)

! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Britannia ! 1.19 ! 41.91 ! 41.91
2.Cannon St E ! 1.19 ! 39.19 ! 39.19
-----+-----+-----+-----
Total 43.77 dBA

Result summary (night)

! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Britannia ! 1.19 ! 35.39 ! 35.39
2.Cannon St E ! 1.19 ! 32.67 ! 32.67
-----+-----+-----+-----
Total 37.25 dBA

STAMSON 5.04 SUMMARY REPORT Date: 21-04-2025 10:34:10
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r9hope.te Time Period: Day/Night 16/8 hours

Description: R9 South Facade 3rd Floor

TOTAL Leq FROM ALL SOURCES

(DAY): 52.49

(NIGHT): 45.97

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

Car traffic volume : 11933/1326 veh/TimePeriod *
Medium truck volume : 249/28 veh/TimePeriod *
Heavy truck volume : 249/28 veh/TimePeriod *
Posted speed limit : 40 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): 10677
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -0.00 deg 25.00 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 : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

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

Car traffic volume : 13342/1482 veh/TimePeriod *
Medium truck volume : 278/31 veh/TimePeriod *
Heavy truck volume : 278/31 veh/TimePeriod *
Posted speed limit : 40 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): 12176
Percentage of Annual Growth : 2.00
Number of Years of Growth : 12.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

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

```
-----
Angle1   Angle2           : -20.00 deg   20.00 deg
Wood depth           :           0   (No woods.)
No of house rows    :           0 / 0
Surface              :           1   (Absorptive ground surface)
Receiver source distance : 54.00 / 54.00 m
Receiver height      :           7.50 / 7.50 m
Topography           :           1   (Flat/gentle slope; no barrier)
```

Road data, segment # 3: Cannon St E (day/night)

```
-----
Car traffic volume   : 19821/2202 veh/TimePeriod *
Medium truck volume :   413/46   veh/TimePeriod *
Heavy truck volume  :   413/46   veh/TimePeriod *
Posted speed limit  :    50 km/h
Road gradient        :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```

24 hr Traffic Volume (AADT or SADT): 17734
Percentage of Annual Growth       :    2.00
Number of Years of Growth         :   13.00
Medium Truck % of Total Volume    :    2.00
Heavy Truck % of Total Volume     :    2.00
Day (16 hrs) % of Total Volume    :   90.00
```

Data for Segment # 3: Cannon St E (day/night)

```
-----
Angle1   Angle2           : -15.00 deg   15.00 deg
Wood depth           :           0   (No woods.)
No of house rows    :           0 / 0
Surface              :           1   (Absorptive ground surface)
Receiver source distance : 134.00 / 134.00 m
Receiver height      :           7.50 / 7.50 m
Topography           :           1   (Flat/gentle slope; no barrier)
```

Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Kenilworth ! 1.19 ! 48.50 ! 48.50
2.Britannia ! 1.19 ! 48.64 ! 48.64
3.Cannon St E ! 1.19 ! 45.23 ! 45.23
-----+-----+-----+-----
Total 52.49 dBA
```

Result summary (night)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Kenilworth ! 1.19 ! 42.00 ! 42.00
2.Britannia ! 1.19 ! 42.12 ! 42.12
3.Cannon St E ! 1.19 ! 38.70 ! 38.70
-----+-----+-----+-----
Total 45.97 dBA
```

STAMSON 5.04 SUMMARY REPORT Date: 21-04-2025 10:53:55
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r10hope.te Time Period: Day/Night 16/8 hours

Description: R10 West Facade 2nd Floor

TOTAL Leq FROM ALL SOURCES

(DAY): 46.37

(NIGHT): 39.86

Road data, segment # 1: Barton St E (day/night)

Car traffic volume : 14092/1566 veh/TimePeriod *
Medium truck volume : 294/33 veh/TimePeriod *
Heavy truck volume : 294/33 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12608
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Barton St E (day/night)

Angle1 Angle2 : -0.00 deg 5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 291.00 / 291.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)

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

Car traffic volume : 11933/1326 veh/TimePeriod *
Medium truck volume : 249/28 veh/TimePeriod *
Heavy truck volume : 249/28 veh/TimePeriod *
Posted speed limit : 40 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): 10677
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -5.00 deg 5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 48.00 / 48.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Road data, segment # 3: Britannia (day/night)

Car traffic volume : 13342/1482 veh/TimePeriod *
Medium truck volume : 278/31 veh/TimePeriod *
Heavy truck volume : 278/31 veh/TimePeriod *
Posted speed limit : 40 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): 12176
Percentage of Annual Growth : 2.00
Number of Years of Growth : 12.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 3: Britannia (day/night)

Angle1 Angle2 : -5.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 81.00 / 81.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Road data, segment # 4: Cannon St E (day/night)

Car traffic volume : 19821/2202 veh/TimePeriod *
Medium truck volume : 413/46 veh/TimePeriod *
Heavy truck volume : 413/46 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

24 hr Traffic Volume (AADT or SADT): 17734
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 4: Cannon St E (day/night)

```

-----
Angle1   Angle2           :  -5.00 deg   0.00 deg
Wood depth           :      0       (No woods.)
No of house rows     :      0 / 0
Surface              :      1       (Absorptive ground surface)
Receiver source distance : 168.00 / 168.00 m
Receiver height       :    4.50 / 4.50 m
Topography           :      1       (Flat/gentle slope; no barrier)

```

Result summary (day)

```

-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Barton St E ! 1.19 ! 29.81 ! 29.81
2.Kenilworth ! 1.19 ! 45.42 ! 45.42
3.Britannia ! 1.19 ! 36.37 ! 36.37
4.Cannon St E ! 1.19 ! 35.06 ! 35.06
-----+-----+-----+-----
Total 46.37 dBA

```

Result summary (night)

```

-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Barton St E ! 1.19 ! 23.31 ! 23.31
2.Kenilworth ! 1.19 ! 38.92 ! 38.92
3.Britannia ! 1.19 ! 29.85 ! 29.85
4.Cannon St E ! 1.19 ! 28.54 ! 28.54
-----+-----+-----+-----
Total 39.86 dBA

```

STAMSON 5.04 SUMMARY REPORT Date: 21-04-2025 10:55:22
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Description: R11 West Facade 3rd Floor

TOTAL Leq FROM ALL SOURCES

(DAY) : 50.60

(NIGHT) : 44.10

Road data, segment # 1: Barton St E (day/night)

Car traffic volume : 14092/1566 veh/TimePeriod *
Medium truck volume : 294/33 veh/TimePeriod *
Heavy truck volume : 294/33 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12608
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Barton St E (day/night)

Angle1 Angle2 : -0.00 deg 5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 291.00 / 291.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

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

Car traffic volume : 11933/1326 veh/TimePeriod *
Medium truck volume : 249/28 veh/TimePeriod *
Heavy truck volume : 249/28 veh/TimePeriod *
Posted speed limit : 40 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): 10677
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -15.00 deg 15.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 48.00 / 48.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Road data, segment # 3: Britannia (day/night)

Car traffic volume : 13342/1482 veh/TimePeriod *
Medium truck volume : 278/31 veh/TimePeriod *
Heavy truck volume : 278/31 veh/TimePeriod *
Posted speed limit : 40 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): 12176
Percentage of Annual Growth : 2.00
Number of Years of Growth : 12.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 3: Britannia (day/night)

Angle1 Angle2 : -5.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 81.00 / 81.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Road data, segment # 4: Cannon St E (day/night)

Car traffic volume : 19821/2202 veh/TimePeriod *
Medium truck volume : 413/46 veh/TimePeriod *
Heavy truck volume : 413/46 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

24 hr Traffic Volume (AADT or SADT): 17734
Percentage of Annual Growth : 2.00
Number of Years of Growth : 13.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 4: Cannon St E (day/night)

```

-----
Angle1   Angle2           :  -5.00 deg   0.00 deg
Wood depth           :      0       (No woods.)
No of house rows     :      0 / 0
Surface              :      1       (Absorptive ground surface)
Receiver source distance : 168.00 / 168.00 m
Receiver height      :      7.50 / 7.50 m
Topography           :      1       (Flat/gentle slope; no barrier)

```

Result summary (day)

```

-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Barton St E ! 1.19 ! 30.97 ! 30.97
2.Kenilworth ! 1.19 ! 50.19 ! 50.19
3.Britannia ! 1.19 ! 37.03 ! 37.03
4.Cannon St E ! 1.19 ! 36.01 ! 36.01
-----+-----+-----+-----
Total 50.60 dBA

```

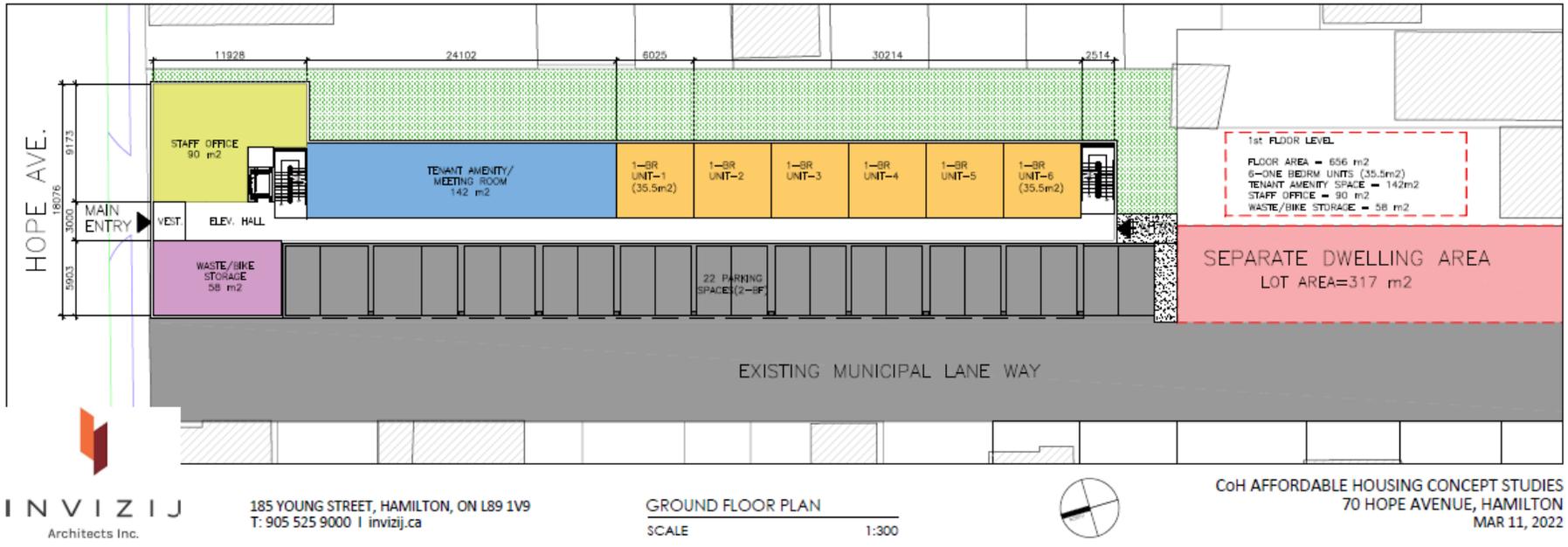
Result summary (night)

```

-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Barton St E ! 1.19 ! 24.47 ! 24.47
2.Kenilworth ! 1.19 ! 43.69 ! 43.69
3.Britannia ! 1.19 ! 30.51 ! 30.51
4.Cannon St E ! 1.19 ! 29.48 ! 29.48
-----+-----+-----+-----
Total 44.10 dBA

```

FLOOR PLANS



INVIZIJ
Architects Inc.

185 YOUNG STREET, HAMILTON, ON L8N 1V9
T: 905 525 9000 | invizij.ca

GROUND FLOOR PLAN
SCALE 1:300



CoH AFFORDABLE HOUSING CONCEPT STUDIES
70 HOPE AVENUE, HAMILTON
MAR 11, 2022

SITE STATISTICS

PROPOSED APARTMENT BUILDING

LOT AREA=3570-317=3253 m²

BLDG FOOTPRINT=1050m²

PROPOSED GFA=2756m²

3 STOREYS

TOTAL UNITS=54 UNITS

22 PARKING SPACES

TENANT AMENITY SPACE=142m²

EXTERIOR WALL STC RATINGS

EXTERIOR WALL STC RATINGS

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

Source: National Research Council, Division of Building Research

NOTES:

- The common structure of walls EW1 to EW5 is composed of 12.7mm gypsum board, vapour barrier and 38x89 mm studs with 50 mm (or thicker) mineral wool or glass fibre batts in inter-stud cavities.
 - EW1 denotes the common structure, plus sheathing, plus wood siding or metal siding and fibre backer board
 - EW2 denotes the common structure, plus rigid insulation (25 to 30 mm), and wood siding or metal siding and fibre backer board.
 - EW3 denotes simulated mansard with the common structure, plus sheathing, 28 X89 mm framing, sheathing and asphalt roofing material
 - ~~EW4 denotes the common structure, plus sheathing and 20 mm stucco.~~
 - EW5 denotes the common structure, plus sheathing, 25 mm air space, 100mm brick veneer.
 - EW6 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 100 mm back-up block 100 mm face brick.
 - EW7 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 140mm back-up block, 100 mm face brick.
 - EW8 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 200 mm concrete.
- R signifies the mounting of the interior gypsum board on resilient clips.
- An exterior wall conforming to rainscreen design principles and composed of 12.7 mm gypsum board, 100 mm concrete block, rigid insulation (25 to 50 mm), 25 mm air space, and 100 mm brick veneer has the same STC as EW6.
- An exterior wall described in EW1 with the addition of rigid insulation (25 to 50 mm) between the sheathing and the external finish has the same STC as EW2.