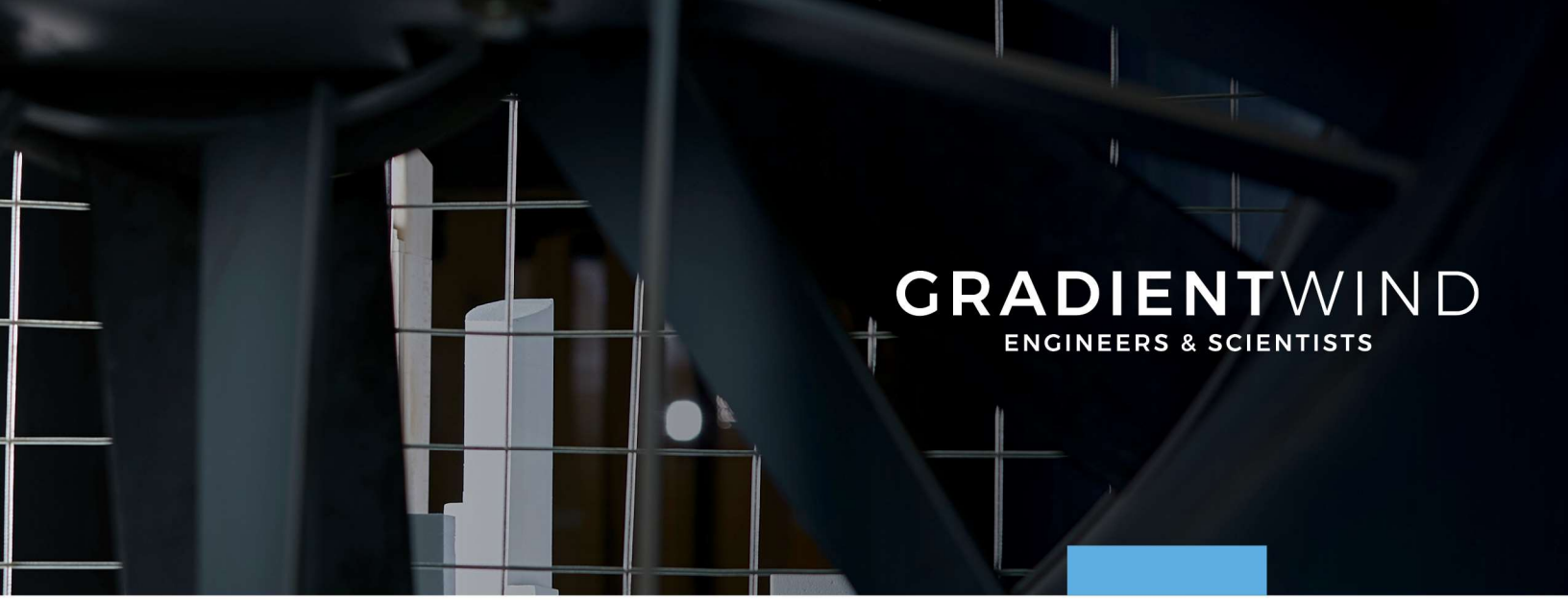

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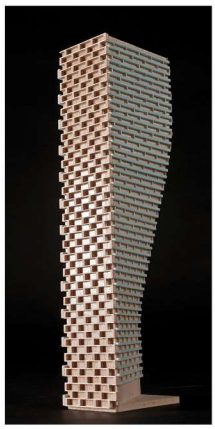
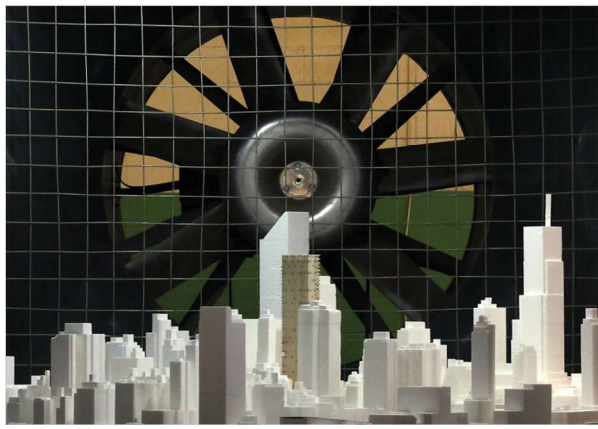
ROADWAY TRAFFIC NOISE ASSESSMENT

78-90 Beechwood Avenue &
69-93 Barrette Street
Ottawa, Ontario

Report: 20-069-Traffic Noise





December 17, 2020

PREPARED FOR

Minto Communities - Canada
200-180 Kent Street
Ottawa, ON K1P 0B6

PREPARED BY

Efser Kara, MSc, LEED GA, Acoustic Scientist
Joshua Foster, P.Eng., Principal

EXECUTIVE SUMMARY

This report describes a roadway traffic noise assessment to satisfy the City of Ottawa requirements for a site plan control application (SPA) submission, for the proposed development located at 78-90 Beechwood Avenue and 77-93 Barrette Street in Ottawa, Ontario. The development is a 9-storey mixed-use building with a C-shaped planform, aligned in the east-west direction. The major source of roadway traffic noise is Beechwood Avenue that lies to the north of the development site. In addition to Beechwood Avenue to the north, the development site is bounded by Barrette Street to the south and existing buildings to the east and west. The site is surrounded by low-rise residential and commercial buildings and high and mid-rise planned developments. Figure 1 illustrates the site plan with the surrounding context.

The assessment is based on (i) theoretical noise prediction methods that conform to the Ministry of the Environment, Conservation and Parks (MECP) and City of Ottawa requirements; (ii) noise level criteria as specified by the City of Ottawa's Environmental Noise Control Guidelines (ENCG); (iii) future vehicular traffic volumes based on the City of Ottawa's Official Plan roadway classifications; and (iv) architectural drawings prepared by RAW Design.

The results of the current analysis indicate that noise levels will range between 46 and 69 dBA at Plane of Window (POW) receptors during the daytime period (07:00-23:00) and 39 and 61 dBA during the nighttime period (23:00-07:00). The highest noise levels occur along the north façade, which is nearest and most exposed to Beechwood Avenue. Upgraded building components will be required at the north façade of the building as the noise levels exceed the 65 dBA ENCG criteria. For other façades, building components compliant with the Ontario Building Code (OBC 2012) will be sufficient.

The noise levels at the outdoor communal amenity areas do not exceed the 55 dBA criterion except at Receptor 12. A barrier investigation indicated that a 1.1 m high solid barrier without any gaps, which can be built as a solid guard rail, can provide the required noise levels at the terraces.

The results of the calculations also indicate that the building will require central air conditioning, or a similar ventilation system for the residential units, which will allow occupants to keep windows closed and

maintain a comfortable living environment. Warning clauses will also be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6.

With regards to stationary noise impacts, a stationary noise study will be performed once mechanical plans for the proposed building become available. This study would assess (i) stationary noise impacts on the study building from neighbouring rooftop mechanical units, and (ii) impacts of stationary noise from rooftop mechanical units serving the proposed building on surrounding noise-sensitive areas. This study will include recommendations for any noise control measures that may be necessary to ensure noise levels fall below ENCG limits.

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Appendix A – STAMSON 5.04 Input and Output Data and Supporting Information

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Minto Communities – Canada to undertake a roadway traffic noise assessment for the proposed mixed-use development located at 78-90 Beechwood Avenue and 77-93 Barrette Street in Ottawa, Ontario. This report summarizes the methodology, results and recommendations related to the assessment of exterior noise levels generated by local roadway traffic.

This assessment is based on theoretical noise calculation methods conforming to the City of Ottawa[1] and the Ministry of the Environment, Conservation and Parks (MECP)[2] guidelines. Noise calculations were based on architectural drawings prepared by RAW Design with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

2. TERMS OF REFERENCE

The subject site is located at 78-90 Beechwood Avenue and 69-93 Barrette Street in Ottawa on a rectangular parcel of land bounded by Beechwood Avenue to the northwest, St. Charles Street to the northeast, Barrette Street to the southeast, and Loyer Street to the southwest.

Architectural Rendering, Northwest Perspective (Courtesy of RAW Design)

The subject site comprises a 9-storey building with a C-shaped planform, open to the west. The south wing of the building is 7 storeys tall. It is recessed from all elevations on the 7th floor providing an outdoor amenity space. At the northeast end of the building, the building steps back from the southeast elevation at Level 9. Level 10 (the Mechanical Penthouse Level) features private terraces and mechanical and electrical equipment.

The ground floor comprises residential units and retail space along the north elevation, fronting Beechwood Avenue, as well lobby, leasing office, and building services space. The primary building

[1] City of Ottawa Environmental Noise Control Guidelines, January 2016
[2] Ontario Ministry of the Environment and Climate Change – Environmental Noise Guidelines, Publication NPC-300, Queens Printer for Ontario, Toronto, 2013

entrance is located at the east elevation, while retail entrances are located along the north elevation. Ground floor units also feature private entrances. Levels 2 and above comprise residential units.

Outdoor amenity space is provided at grade, within the inner courtyard. Balconies and terraces with a minimum depth of 4 metres are considered as outdoor living areas (OLA) as indicated in the ENCG. Provided that, the balconies and terrace areas with less than 4 metres depth aren't included in the study. The OLAs that were included in the study other than the communal outdoor amenity yard at grade is the west and east terrace at the north extension Level 9 rooftop (Penthouse Level), the 7th-floor rooftop/terrace, 6th floor communal outdoor amenity, southeast corner 6th floor terrace, and the 8th and 9th-floor terraces at the south side.

The major source of roadway traffic noise is Beechwood Avenue, which is situated along the north side of the development site. The site is surrounded by low-rise residential and commercial buildings. Figure 1 illustrates the site plan with the surrounding context.

3. OBJECTIVES

The principal objectives of this study are to (i) calculate the future noise levels on the study buildings produced by local roadway traffic, and (ii) ensure that interior and exterior noise levels do not exceed the allowable limits specified by the City of Ottawa's Environmental Noise Control Guidelines as outlined in Section 4.2 of this report.

4. METHODOLOGY

4.1 Background

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

of power results in a 3 dBA increase in measured noise levels and is just perceptible to most people. An increase of 10 dBA is often perceived to be twice as loud.

4.2 Roadway Traffic Noise

4.2.1 Criteria for Roadway Traffic Noise

For vehicular traffic, the equivalent sound energy level, L_{eq}, provides a measure of the time-varying noise levels, which is well correlated with the annoyance of sound. It is defined as the continuous sound level, which has the same energy as a time-varying noise level over a period of time. For roadways, the L_{eq} is commonly calculated on the basis of a 16-hour (L_{eq16}) daytime (07:00-23:00) / 8-hour (L_{eq8}) nighttime (23:00-07:00) split to assess its impact on residential buildings. The City of Ottawa's Environmental Noise Control Guidelines (ENCG) specifies that the recommended indoor noise limit range (that is relevant to this study) is 45 and 40 dBA for living rooms and sleeping quarters respectively for roadway, as listed in Table 1. Based on Gradient Wind's experience, more comfortable indoor noise levels should be targeted, towards 42 and 37, respectively, to control peak noise and deficiencies in building envelope construction.

TABLE 1: INDOOR SOUND LEVEL CRITERIA

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

Predicted noise levels at the plane of window (POW) dictate the action required to achieve the recommended sound levels. An open window is considered to provide a 10 dBA reduction in noise, while a standard closed window is capable of providing a minimum 20 dBA noise reduction[3]. A closed window

[3] Burberry, P.B. (2014). Mitchell's Environment and Services. Routledge, Page 125

due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor environment[4]. Therefore, where noise levels exceed 55 dBA daytime and 50 dBA nighttime, the ventilation for the building should consider the need for having windows and doors closed, which triggers the need for forced air heating with provision for central air conditioning. Where noise levels exceed 65 dBA daytime and 60 dBA nighttime, air conditioning will be required and building components will require higher levels of sound attenuation[5].

The sound level criterion for outdoor living areas is 55 dBA, which applies during the daytime (07:00 to 23:00). When noise levels exceed 55 dBA, mitigation must be provided to reduce noise levels where technically and administratively feasible to acceptable levels at or below the criterion. If these measures are not provided, prospective purchasers or tenants should be informed of potential excess noise levels by a warning clause.

4.2.2 Theoretical Roadway Noise Predictions

Noise predictions were performed with the aid of the Ministry of the Environment, Conservations and Parks' (MECP) computerized noise assessment program, STAMSON 5.04, for road analysis. Appendix A includes the STAMSON 5.04 input and output data.

Roadway traffic noise calculations were performed by treating each roadway segment as separate line sources of noise. Roadways that are more than a hundred metres away than the development site are not included in the calculations. In addition to the traffic volumes summarized in Table 2, theoretical noise predictions were based on the following parameters:

- Truck traffic on all roadways was taken to comprise 5% heavy trucks and 7% medium trucks, as per ENCG requirements for noise level predictions.
- The day/night split for all roads was taken to be 92% / 8%, respectively.
- Ground surfaces were taken to be reflective due to the presence of hard (paved) ground.
- Topography was assumed to be a flat/gentle slope surrounding the study building.

[4] MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8
[5] MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3

- The proposed development and the surrounding existing buildings were considered as barriers in the calculations.
- A total of fifteen (15) receptor locations were chosen around the study site; six (6) of them at the façades of the building as Plane of Window (POW) receptors and nine (9) are at the outdoor amenity areas including terraces as Outdoor Living Area (OLA) receptors.
- Receptors were taken 1.5 metres higher than the floor height or the terrace/ground floor.
- The receptor distances to roadway traffic and exposure angles are illustrated in Figures 3-6.

4.2.3 Roadway Traffic Volumes

The ENCG dictates that noise calculations should consider future sound levels based on a roadway's classification at the mature state of development. Therefore, traffic volumes are based on the roadway classifications outlined in the City of Ottawa's Official Plan (OP) and Transportation Master Plan[6] which provide additional details on future roadway expansions. Average Annual Daily Traffic (AADT) volumes are then based on data in Table B1 of the ENCG for each roadway classification. Table 2 (below) summarizes the AADT values used for each roadway included in this assessment.

TABLE 2: ROADWAY TRAFFIC DATA

Segment	Roadway Traffic Data	Speed Limit (km/h)	Traffic Volumes
Beechwood Avenue	2 Lane Urban Arterial (2-UAU)	50	**15,000**

4.3 Indoor Noise Calculations

The difference between outdoor and indoor noise levels is the noise attenuation provided by the building envelope. According to common industry practice, complete walls and individual wall elements are rated according to the Sound Transmission Class (STC). The STC ratings of common residential walls built in conformance with the Ontario Building Code (2012) typically exceed STC 35, depending on exterior cladding, thickness and interior finish details. For example, brick veneer walls can achieve STC 50 or more. Standard commercially sided exterior metal stud walls have around STC 45. Standard good quality double-glazed non-operable windows can have STC ratings ranging from 25 to 40, depending on the window

[6] City of Ottawa Transportation Master Plan, November 2013

manufacturer, pane thickness and inter-pane spacing. As previously mentioned, the windows are the known weak point in a partition.

As per Section 4.2, when daytime noise levels from road sources at the plane of the window exceed 65 dBA, calculations must be performed to evaluate the sound transmission quality of the building components to ensure acceptable indoor noise levels are achieved. The calculation procedure[7] considers:

- Window type and total area as a percentage of total room floor area
- Exterior wall type and total area as a percentage of the total room floor area
- Acoustic absorption characteristics of the room
- Outdoor noise source type and approach geometry
- Indoor sound level criteria, which varies according to the intended use of a space

Based on published research[8], exterior walls possess specific sound attenuation characteristics that are used as a basis for calculating the required STC ratings of windows in the same partition. Due to the limited information available at the time of the study, detailed floor layouts have not been finalized; therefore, detailed STC calculations could not be performed at this time. As a guideline, the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = Outdoor Noise Level – Targeted Indoor Noise Levels).

5. ROADWAY TRAFFIC NOISE RESULTS

5.1 Roadway Traffic Noise Levels

The results of the roadway traffic noise calculations are summarized in Table 3 below. A complete set of input and output data from all STAMSON 5.04 calculations are available in Appendix A.

[7] Building Practice Note: Controlling Sound Transmission into Buildings by J.D. Quirt, National Research Council of Canada, September 1985
[8] CMHC, Road & Rail Noise: Effects on Housing

TABLE 3: EXTERIOR NOISE LEVELS DUE TO ROADWAY TRAFFIC

Receptor Number	Receptor Height Above Grade (m)	Receptor Location	STAMSON 5.04 Noise Level (dBA)	
			Day	Night
1	12.20	POW North Façade – Level 4	69	61
2	24.60	POW North Façade – Level 8	68	60
3	18.40	POW West Façade – Level 6	64	57
4	24.60	POW East Façade – Level 8	64	57
5	1.50	OLA – Ground Floor Communal Outdoor Amenity	49	N/A*
6	18.40	OLA – Level 6 Communal Outdoor Amenity	49	N/A*
7	27.85	OLA – Level 9 South terrace	50	N/A*
8	31.40	OLA – Level 10 West Terrace	54	N/A*
9	24.60	OLA – Level 8 South terrace	51	N/A*
10	15.15	POW South Façade – Level 5	46	39
11	27.85	POW South Façade – Level 9	48	40
12	18.40	OLA – Level 6 Southeast Terrace	59	N/A*
13	6.30	OLA – Level 2 West terrace	48	N/A*
14	21.65	OLA – Level 7 Roof/Terrace (South)	48	N/A*
15	31.40	OLA – Level 10 East Terrace	52	N/A*

* OLA noise levels during the nighttime are not considered as per the ENCG

The results of the current analysis indicate that noise levels will range between 46 and 69 dBA at Plane of Window (POW) receptors during the daytime period (07:00-23:00) and 39 and 61 dBA during the nighttime period (23:00-07:00). The highest noise levels occur along the north façade, which is nearest and most exposed to Beechwood Avenue. Upgraded building components will be required at the north façade of the building as the noise levels exceed the 65 dBA ENCG criteria. Building components compliant with the Ontario Building Code (OBC 2012) will be sufficient for other façades.

The noise levels at the outdoor communal amenity areas do not exceed the 55 dBA criterion except at Receptor 12. A noise barrier investigation that was conducted in STAMSON indicated that a 1.1 m high solid barrier without any gaps, which can be built as a solid guard rail, can provide the required noise levels at the private rooftop terrace (see Figure 8).

5.2 Noise Control Measures

The noise levels predicted due to roadway traffic exceed the criteria listed in Section 4.2 for building components. As discussed in Section 4.3, the anticipated STC requirements for windows and walls have been estimated based on the overall noise reduction required for each intended use of space (STC = Outdoor Noise Level – Targeted Indoor Noise Levels). The STC requirements for the windows are summarized below for various units within the development (see Figure 7):

- **Bedroom Windows**

(i) Bedroom windows facing north will require a minimum STC of 32

(ii) All other bedroom windows are to satisfy Ontario Building Code (OBC 2012) requirements

- **Living Room Windows**

(i) Living room windows facing north will require a minimum STC of 27

(ii) All other living room windows are to satisfy Ontario Building Code (OBC 2012) requirements

- **Reception Area and Retail Windows**

(i) Reception area and retail windows facing east and north, respectively, will require a minimum STC of 22

(ii) All other windows are to satisfy Ontario Building Code (OBC 2012) requirements

- **Exterior Walls**

(i) Exterior wall components on the north façade will require a minimum STC of 45, which will be achieved with brick cladding or an acoustical equivalent according to NRC test data[9]

[9] J.S. Bradley and J.A. Birta. Laboratory Measurements of the Sound Insulation of Building Façade Elements, National Research Council October 2000.

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

The results of the calculations also indicate that the building will require central air conditioning, or a similar ventilation system for the residential units, which will allow occupants to keep windows closed and maintain a comfortable living environment. Warning clauses will also be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6.

5.3 Noise Barrier Calculation

Noise levels at OLA Receptor 12 is expected to exceed 55 dBA criteria during the daytime period. If this area is to be used as an outdoor living area, noise control measures are required to reduce the L_{eq} to 55 dBA. Further analysis investigated the noise mitigating impact of raising the guard rails to 1.1 m above the walking surface. Results of the investigation proved that noise levels can be reduced to 55 dBA with a solid guard rail or parapet wall of 1.1 metres. The guard rail should be built with solid elements having a minimum surface mass of 20 kg/m² and contain no gaps. Table 4 summarizes the results of the barrier investigation. The location of the noise barrier can be seen in Figure 8.

TABLE 4: RESULTS OF NOISE BARRIER INVESTIGATION

Receptor ID	Above Walking Surface Barrier Height (m)	Above Grade Receptor Height (m)	Receptor Location	Daytime L_{eq} Noise Levels (dBA)	
				Without Barrier	With Barrier
12	1.1	18.40	OLA – Level 6 Southeast Terrace	59	53

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 46 and 69 dBA at Plane of Window (POW) receptors during the daytime period (07:00-23:00) and 39 and 61 dBA during the nighttime period (23:00-07:00). The highest noise levels occur along the north façade, which is nearest and most exposed to Beechwood Avenue. Upgraded building components will be required at the north façade of the building as the noise levels exceed the 65 dBA ENCG criteria. For other façades, building components compliant with the Ontario Building Code (OBC 2012) will be sufficient.

The noise levels at the outdoor communal amenity areas do not exceed the 55 dBA criterion except at Receptor 12. A barrier investigation that was conducted in STAMSON indicated that a 1.1 m high solid barrier without any gaps, which can be built as a solid guard rail, can provide the required noise levels at the terraces.

The results of the calculations also indicate that the building will require central air conditioning, or a similar ventilation system for the residential units, which will allow occupants to keep windows closed and maintain a comfortable living environment. Warning clauses will also be required in all Lease, Purchase and Sale Agreements:

> *"Purchasers/tenants are advised that sound levels due to increasing roadway traffic will interfere with outdoor activities as the sound levels exceed the sound level limits of the City and the Ministry of the Environment.*
>
> *To help address the need for sound attenuation this development includes:*
>
> - *Multi-pane glazing with STC 32 for north bedroom windows*
> - *Multi-pane glazing with STC 27 for north living room windows*
> - *A 1.1-metre high acoustic barrier on the north and east sides of Level 6 southeast terrace*

To ensure that provincial sound level limits are not exceeded it is important to maintain these sound attenuation features.

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

With regards to stationary noise impacts, a stationary noise study will be performed once mechanical plans for the proposed building become available. This study would assess (i) stationary noise impacts on the study building from neighbouring rooftop mechanical units, and (ii) impacts of stationary noise from rooftop mechanical units serving the proposed building on surrounding noise-sensitive areas. This study will include recommendations for any noise control measures that may be necessary to ensure noise levels fall below ENCG limits.

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

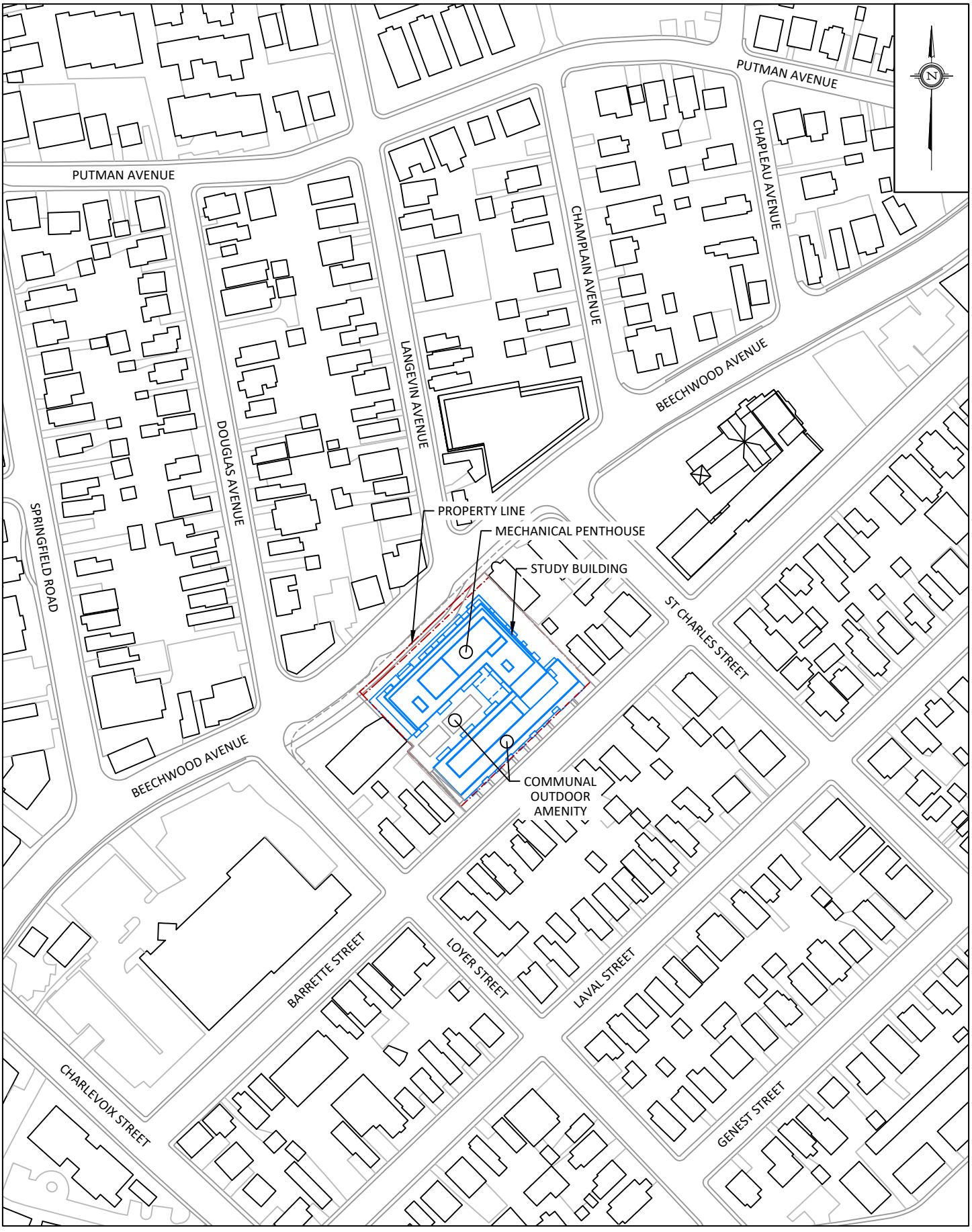
Sincerely,

Gradient Wind Engineering Inc.

Efser Kara, MSc, LEED GA
Acoustic Scientist

Joshua Foster, P.Eng.
Principal

Gradient Wind File #20-069-Traffic Noise



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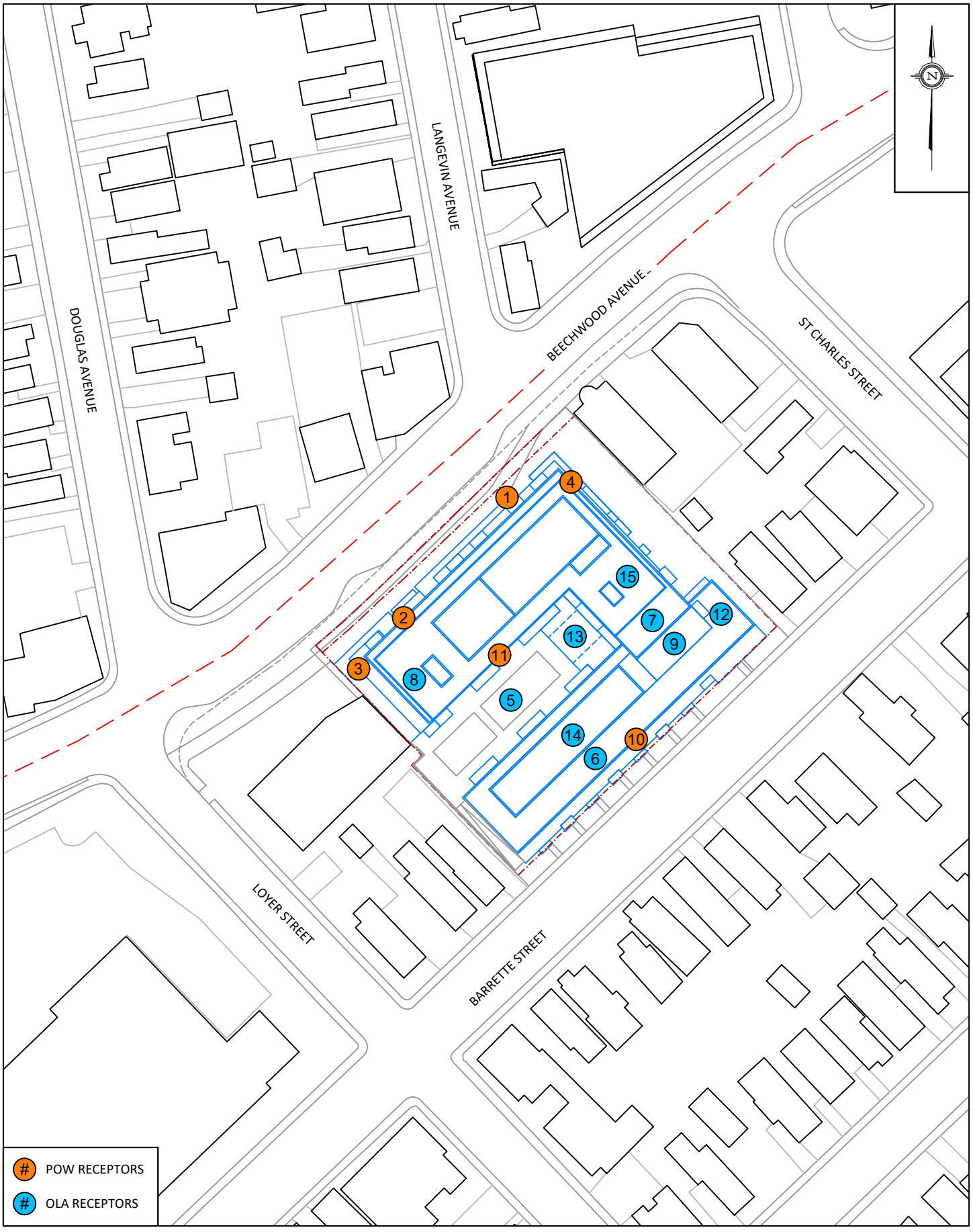
PROJECT	78-90 BEECHWOOD AVENUE & 77-93 BARETTE STREET, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:2000 (APPROX.)
DRAWING NO.	GW20-069-1
DATE	DECEMBER 16, 2020
DRAWN BY	E.K.
DESCRIPTION	FIGURE 1: SITE PLAN AND SURROUNDING CONTEXT



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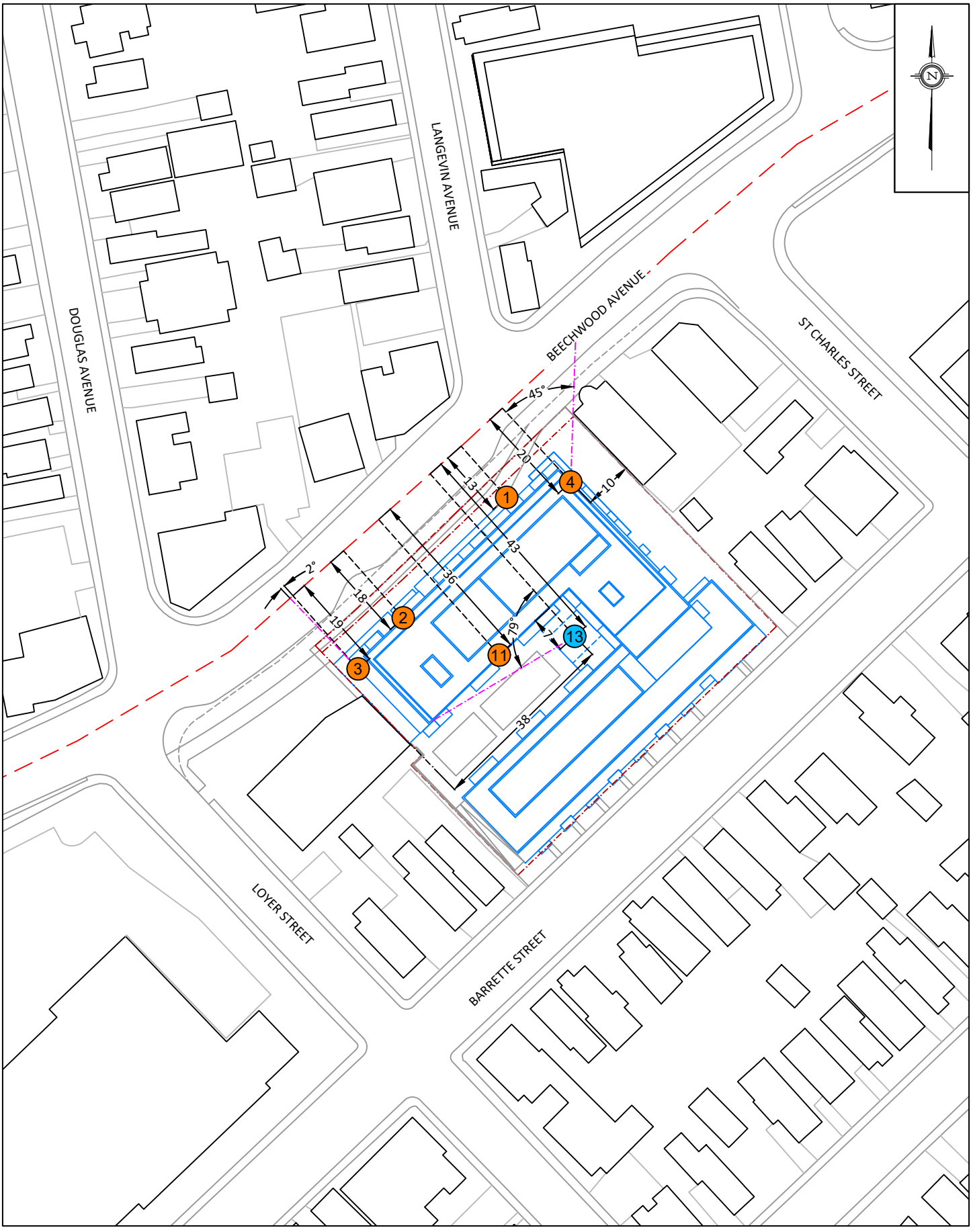
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW20-069-2
DATE	DECEMBER 16, 2020
DRAWN BY	E.K.
DESCRIPTION	FIGURE 2: RECEPTOR LOCATIONS



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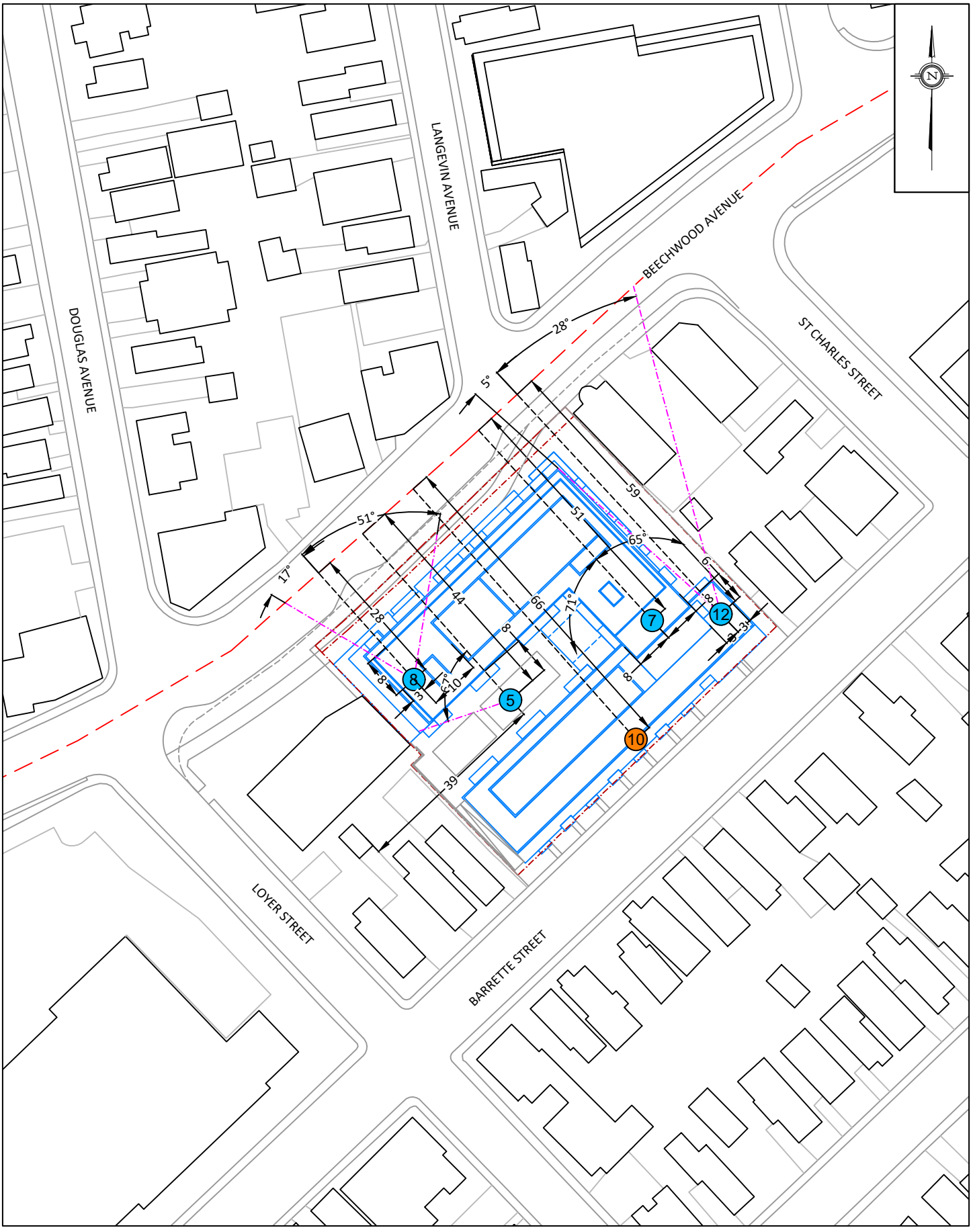
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW20-069-3
DATE	DECEMBER 16, 2020
DRAWN BY	E.K.

DESCRIPTION

FIGURE 3:
STAMSON INPUT DATA
FOR RECEPTORS 1, 2, 3, 4, 11 & 13



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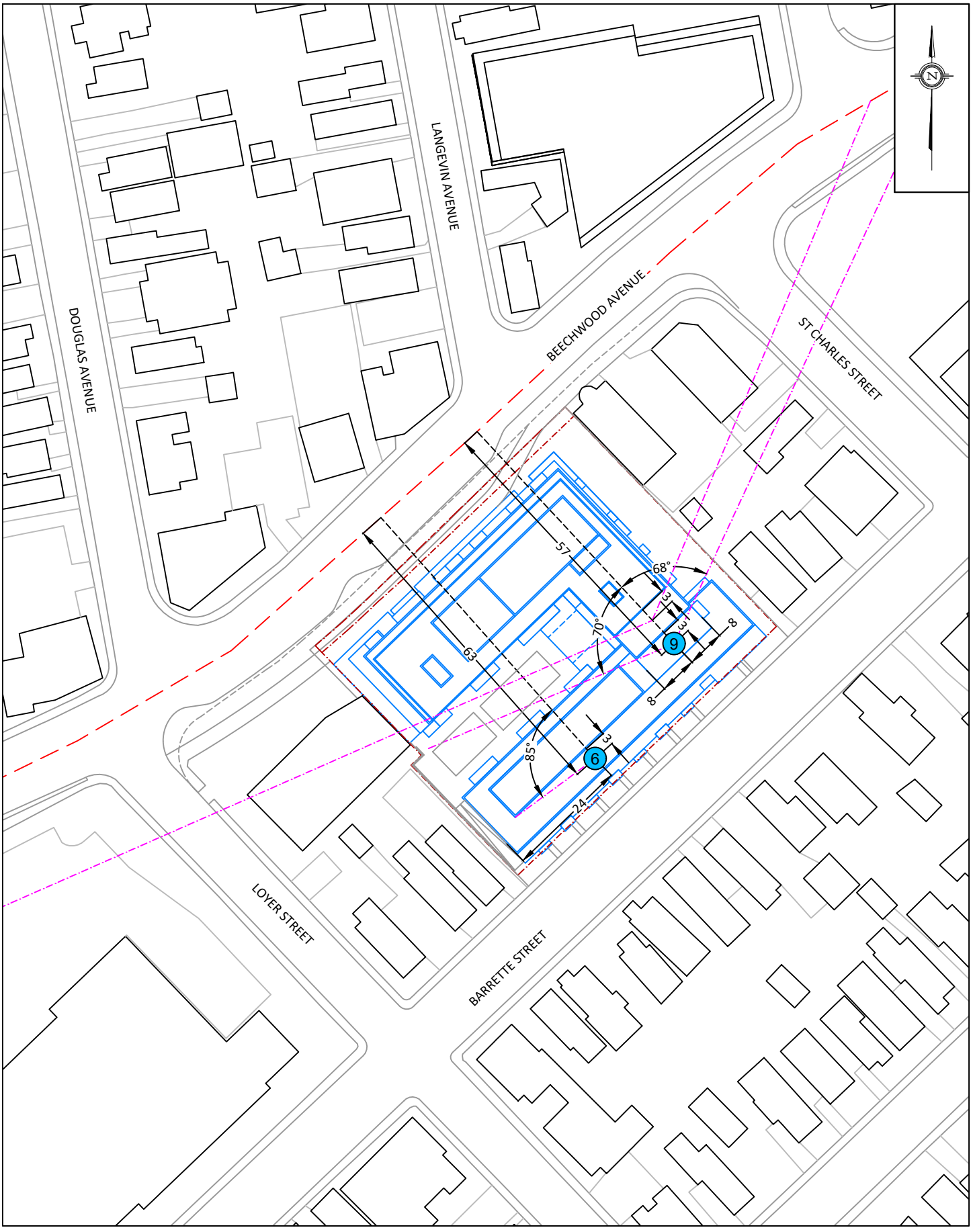
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW20-069-4
DATE	DECEMBER 16, 2020	DRAWN BY	E.K.

DESCRIPTION

FIGURE 4:
STAMSON INPUT DATA
FOR RECEPTOR 5, 7, 8, 10 & 12



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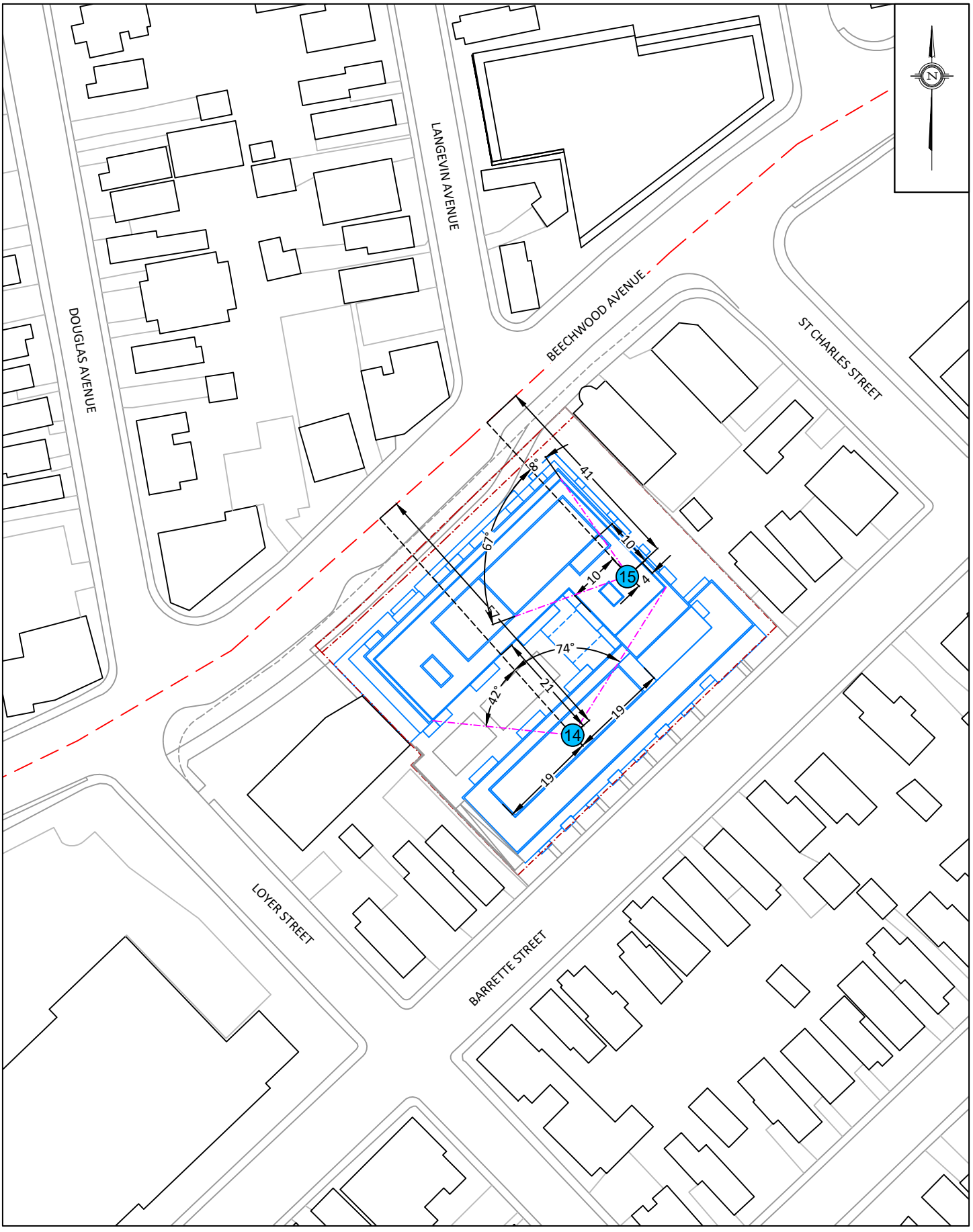
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW20-069-5
DATE	DECEMBER 16, 2020	DRAWN BY	E.K.

DESCRIPTION

FIGURE 5:
STAMSON INPUT DATA
FOR RECEPTOR 6 & 9



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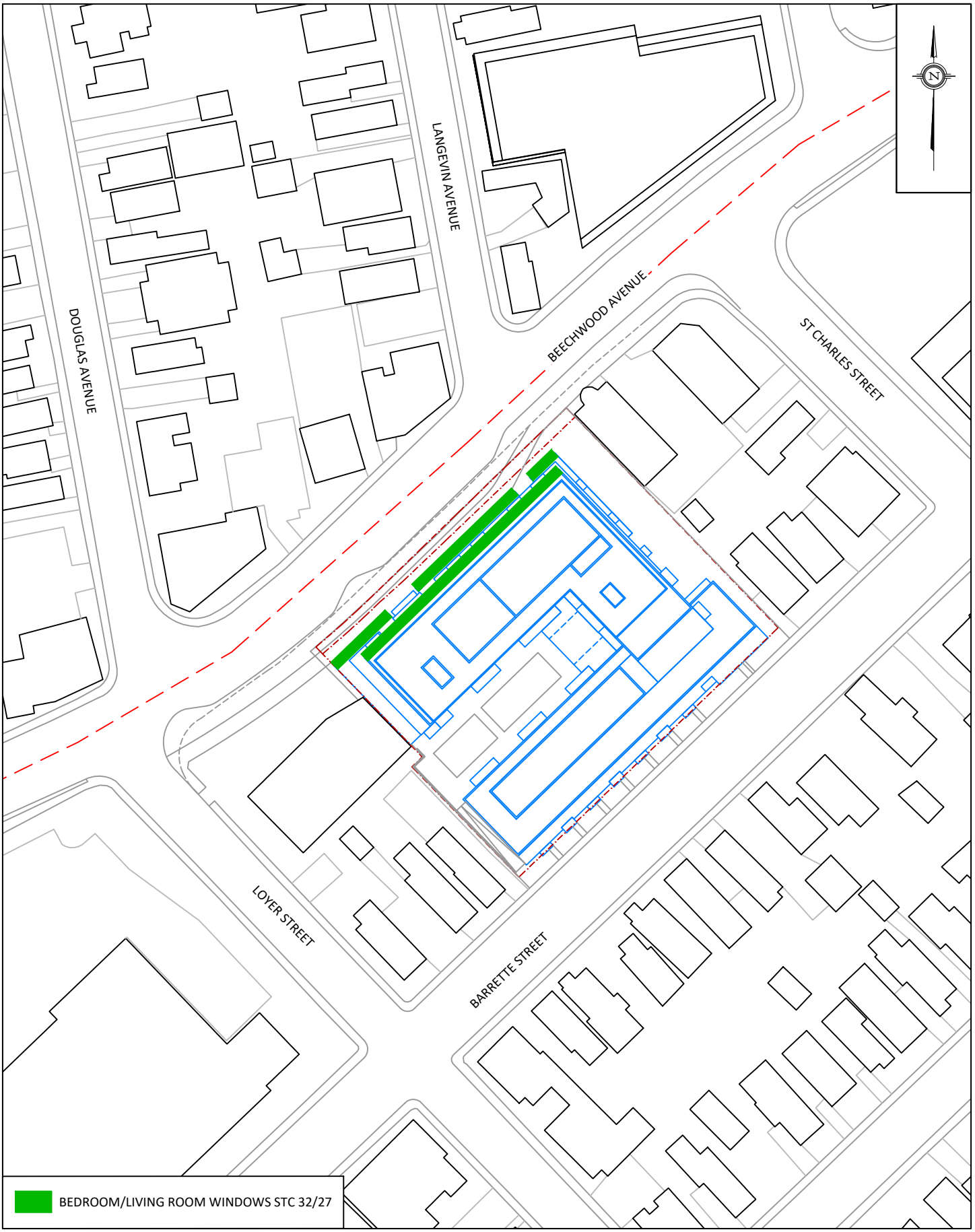
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW20-069-6
DATE	DECEMBER 16, 2020	DRAWN BY	E.K.

DESCRIPTION

FIGURE 6:
STAMSON INPUT DATA
FOR RECEPTOR 14 & 15



GRADIENTWIND
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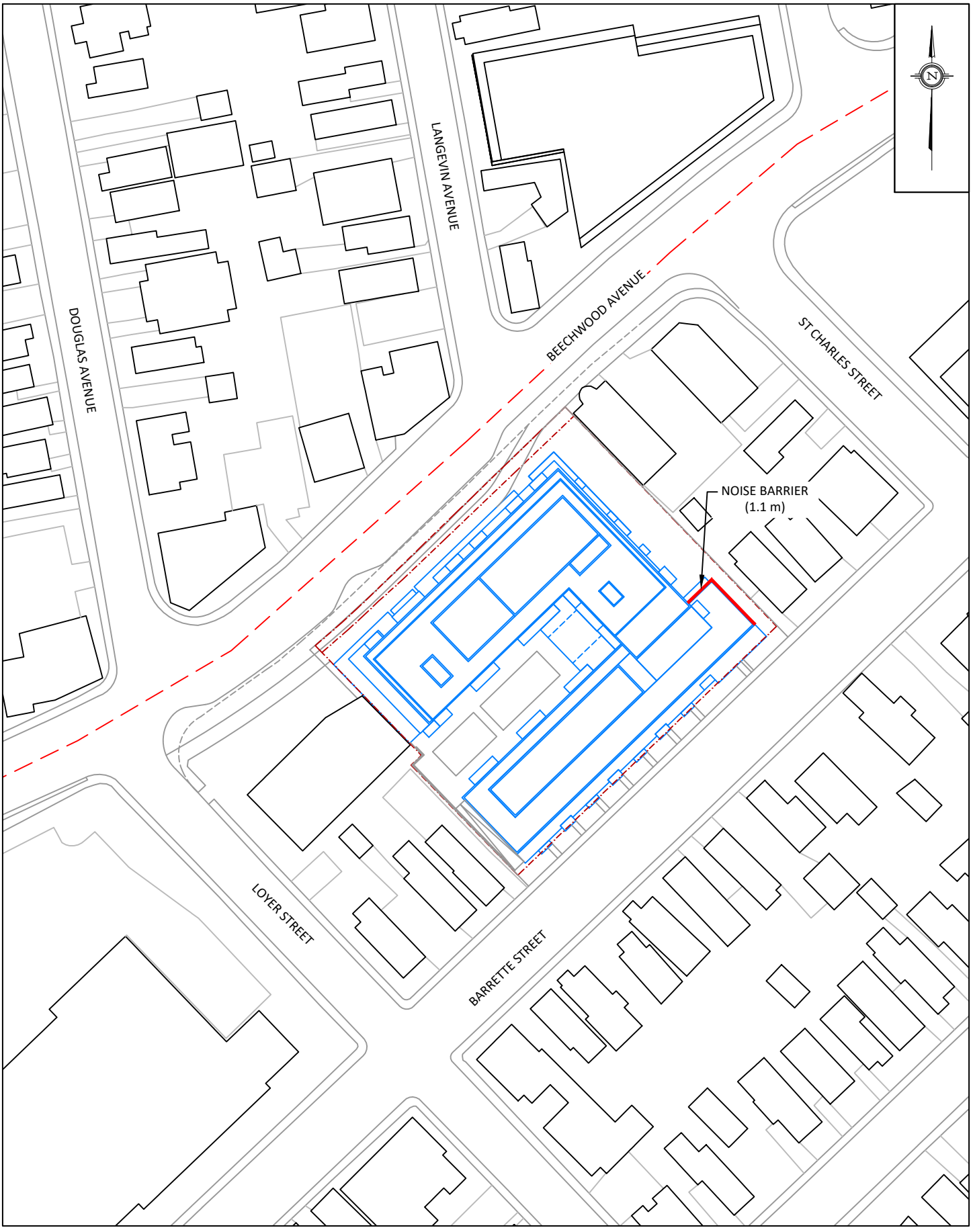
PROJECT	78-90 BEECHWOOD AVENUE & 77-93 BARETTE STREET, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW20-069-7
DATE	DECEMBER 16, 2020
DRAWN BY	E.K.
DESCRIPTION	FIGURE 7: STC REQUIREMENTS



GRADIENTWIND
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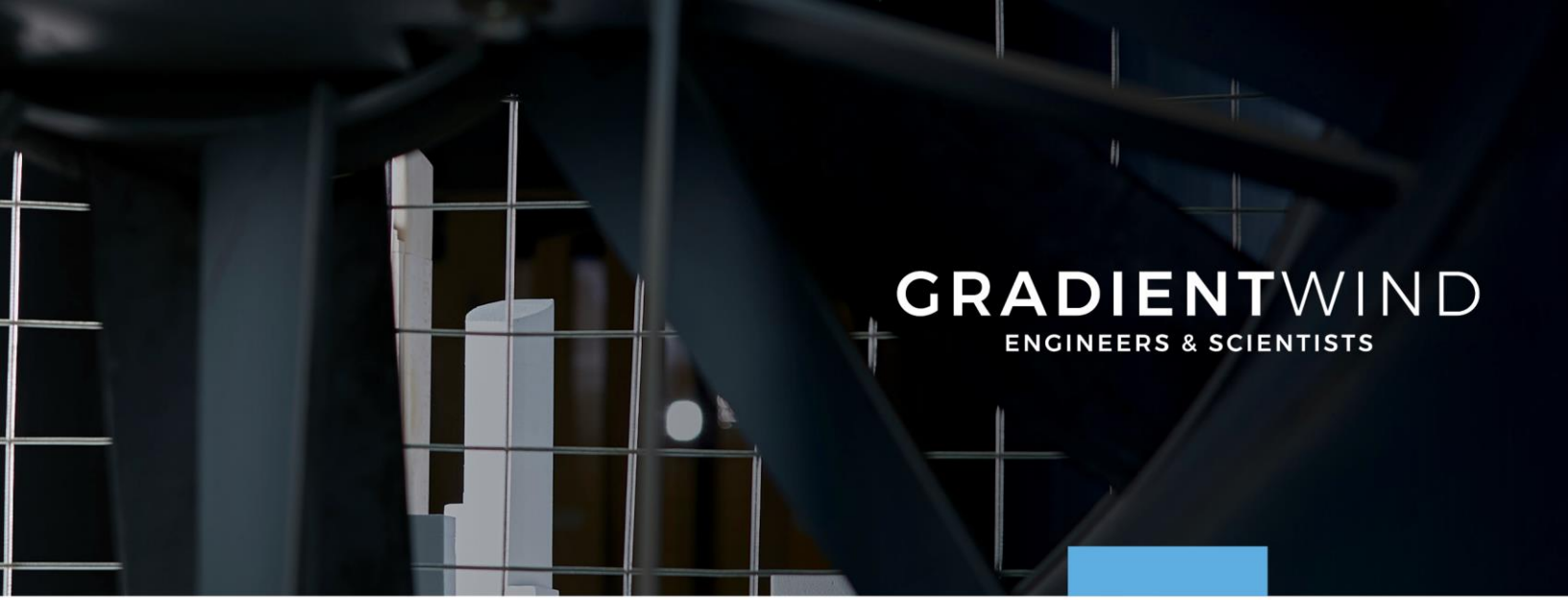
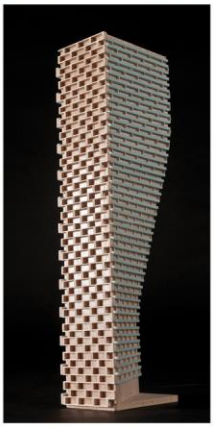
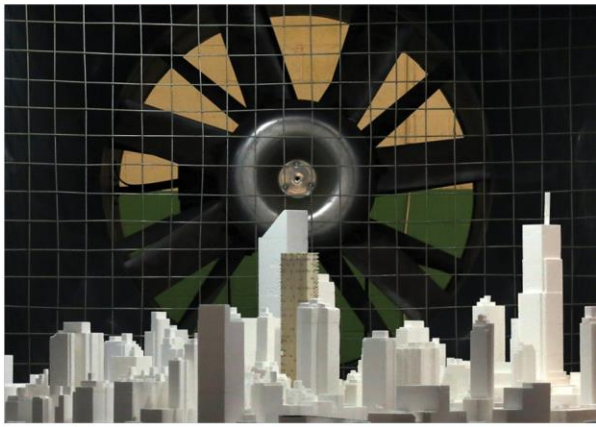
PROJECT	78-90 BEECHWOOD AVENUE & 77-93 BARETTE STREET, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW20-069-8
DATE	DECEMBER 16, 2020
DRAWN BY	E.K.

DESCRIPTION

FIGURE 8:
NOISE BARRIER LOCATION







APPENDIX A

STAMSON INPUT-OUTPUT DATA

127 WALGREEN ROAD, OTTAWA, ON, CANADA K0A 1L0 | 613 836 0934
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STAMSON 5.0 NORMAL REPORT Date: 16-12-2020 17:41:35
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Beechwood (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 : 15.00 / 15.00 m
Receiver height : 12.20 / 12.20 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Beechwood (day)

Source height = 1.50 m

ROAD (0.00 + 68.48 + 0.00) = 68.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	68.48	0.00	0.00	0.00	0.00	0.00	0.00	68.48

Segment Leq : 68.48 dBA

Total Leq All Segments: 68.48 dBA

Results segment # 1: Beechwood (night)

Source height = 1.50 m

ROAD (0.00 + 60.88 + 0.00) = 60.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	60.88	0.00	0.00	0.00	0.00	0.00	0.00	60.88

Segment Leq : 60.88 dBA

Total Leq All Segments: 60.88 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.48
(NIGHT): 60.88

STAMSON 5.0 NORMAL REPORT Date: 16-12-2020 17:58:37
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Beechwood (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 : 18.00 / 18.00 m
Receiver height : 24.60 / 24.60 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Beechwood (day)

Source height = 1.50 m

ROAD (0.00 + 67.69 + 0.00) = 67.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	68.48	0.00	-0.79	0.00	0.00	0.00	0.00	67.69

Segment Leq : 67.69 dBA

Total Leq All Segments: 67.69 dBA

Results segment # 1: Beechwood (night)

Source height = 1.50 m

ROAD (0.00 + 60.09 + 0.00) = 60.09 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	60.88	0.00	-0.79	0.00	0.00	0.00	0.00	60.09

Segment Leq : 60.09 dBA

Total Leq All Segments: 60.09 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.69
(NIGHT): 60.09

STAMSON 5.0 NORMAL REPORT Date: 16-12-2020 17:59:57
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -90.00 deg -2.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 19.00 / 19.00 m
Receiver height : 18.40 / 18.40 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Beechwood (day)

Source height = 1.50 m

ROAD (0.00 + 64.35 + 0.00) = 64.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-2	0.00	68.48	0.00	-1.03	-3.11	0.00	0.00	0.00	64.35

Segment Leq : 64.35 dBA

Total Leq All Segments: 64.35 dBA

Results segment # 1: Beechwood (night)

Source height = 1.50 m

ROAD (0.00 + 56.75 + 0.00) = 56.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-2	0.00	60.88	0.00	-1.03	-3.11	0.00	0.00	0.00	56.75

Segment Leq : 56.75 dBA

Total Leq All Segments: 56.75 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.35
(NIGHT): 56.75

STAMSON 5.0 NORMAL REPORT Date: 16-12-2020 18:03:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : 0.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 20.00 / 20.00 m
Receiver height : 24.60 / 24.60 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : 45.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 20.00 / 20.00 m
Receiver height : 24.60 / 24.60 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 45.00 deg Angle2 : 90.00 deg
Barrier height : 9.00 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Beechwood 1 (day)

Source height = 1.50 m

ROAD (0.00 + 61.21 + 0.00) = 61.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	45	0.00	68.48	0.00	-1.25	-6.02	0.00	0.00	0.00	61.21

Segment Leq : 61.21 dBA

Results segment # 2: Beechwood 2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	24.60	13.05	13.05

ROAD (0.00 + 61.21 + 0.00) = 61.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
45	90	0.00	68.48	0.00	-1.25	-6.02	0.00	0.00	-0.36	60.85*
45	90	0.00	68.48	0.00	-1.25	-6.02	0.00	0.00	0.00	61.21

* Bright Zone !

Segment Leq : 61.21 dBA

Total Leq All Segments: 64.22 dBA

Results segment # 1: Beechwood 1 (night)

Source height = 1.50 m

ROAD (0.00 + 53.61 + 0.00) = 53.61 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	45	0.00	60.88	0.00	-1.25	-6.02	0.00	0.00	0.00	53.61

Segment Leq : 53.61 dBA

Results segment # 2: Beechwood 2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	24.60	13.05	13.05

ROAD (0.00 + 53.61 + 0.00) = 53.61 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
45	90	0.00	60.88	0.00	-1.25	-6.02	0.00	0.00	-0.36	53.26*
45	90	0.00	60.88	0.00	-1.25	-6.02	0.00	0.00	0.00	53.61

* Bright Zone !

Segment Leq : 53.61 dBA

Total Leq All Segments: 56.62 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.22
(NIGHT): 56.62

STAMSON 5.0 NORMAL REPORT Date: 16-12-2020 18:04:42
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -90.00 deg -67.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 44.00 / 44.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -67.00 deg
Barrier height : 3.00 m
Barrier receiver distance : 39.00 / 39.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -67.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 44.00 / 44.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -67.00 deg Angle2 : 90.00 deg
Barrier height : 29.90 m
Barrier receiver distance : 8.00 / 8.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Beechwood 1 (day)

Source height = 1.50 m

Barrier height for grazing incidence

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

ROAD (0.00 + 47.92 + 0.00) = 47.92 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -67 0.00 68.48 0.00 -4.67 -8.94 0.00 0.00 -6.95 47.92

Segment Leq : 47.92 dBA

Results segment # 2: Beechwood 2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

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

ROAD (0.00 + 43.46 + 0.00) = 43.46 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-67 90 0.00 68.48 0.00 -4.67 -0.59 0.00 0.00 -19.76 43.46

Segment Leq : 43.46 dBA

Total Leq All Segments: 49.25 dBA

Results segment # 1: Beechwood 1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

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

ROAD (0.00 + 40.32 + 0.00) = 40.32 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -67 0.00 60.88 0.00 -4.67 -8.94 0.00 0.00 -6.95 40.32

Segment Leq : 40.32 dBA

Results segment # 2: Beechwood 2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

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

ROAD (0.00 + 35.86 + 0.00) = 35.86 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-67 90 0.00 60.88 0.00 -4.67 -0.59 0.00 0.00 -19.76 35.86

Segment Leq : 35.86 dBA

Total Leq All Segments: 41.65 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 49.25
(NIGHT): 41.65

STAMSON 5.0 NORMAL REPORT Date: 16-12-2020 18:06:07
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -90.00 deg -85.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 63.00 / 63.00 m
Receiver height : 18.40 / 18.40 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -85.00 deg
Barrier height : 16.90 m
Barrier receiver distance : 24.00 / 24.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -85.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 63.00 / 63.00 m
Receiver height : 18.40 / 18.40 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -85.00 deg Angle2 : 90.00 deg
Barrier height : 20.15 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Beechwood 1 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 18.40 ! 11.96 ! 11.96

ROAD (0.00 + 40.28 + 0.00) = 40.28 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -85 0.00 68.48 0.00 -6.23 -15.56 0.00 0.00 -6.40 40.28

Segment Leq : 40.28 dBA

Results segment # 2: Beechwood 2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 18.40 ! 17.60 ! 17.60

ROAD (0.00 + 47.79 + 0.00) = 47.79 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-85 90 0.00 68.48 0.00 -6.23 -0.12 0.00 0.00 -14.34 47.79

Segment Leq : 47.79 dBA

Total Leq All Segments: 48.50 dBA

Results segment # 1: Beechwood 1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 18.40 ! 11.96 ! 11.96

ROAD (0.00 + 32.68 + 0.00) = 32.68 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -85 0.00 60.88 0.00 -6.23 -15.56 0.00 0.00 -6.40 32.68

Segment Leq : 32.68 dBA

Results segment # 2: Beechwood 2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

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

1.50 ! 18.40 ! 17.60 ! 17.60

ROAD (0.00 + 40.19 + 0.00) = 40.19 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-85 90 0.00 60.88 0.00 -6.23 -0.12 0.00 0.00 -14.34 40.19

Segment Leq : 40.19 dBA

Total Leq All Segments: 40.90 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 48.50
(NIGHT): 40.90

STAMSON 5.0 NORMAL REPORT Date: 16-12-2020 18:06:51
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -90.00 deg -71.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 51.00 / 51.00 m
Receiver height : 27.85 / 27.85 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -71.00 deg
Barrier height : 26.35 m
Barrier receiver distance : 8.00 / 8.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -71.00 deg 65.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.00 / 57.00 m
Receiver height : 27.85 / 27.85 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -71.00 deg Angle2 : 65.00 deg
Barrier height : 29.90 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : 65.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.00 / 57.00 m
Receiver height : 27.85 / 27.85 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 65.00 deg Angle2 : 90.00 deg
Barrier height : 26.35 m
Barrier receiver distance : 8.00 / 8.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Beechwood 1 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 27.85 ! 23.72 ! 23.72

ROAD (0.00 + 46.00 + 0.00) = 46.00 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -71 0.00 68.48 0.00 -5.31 -9.77 0.00 0.00 -7.40 46.00

Segment Leq : 46.00 dBA

Results segment # 2: Beechwood 2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 27.85 ! 26.46 ! 26.46

ROAD (0.00 + 42.63 + 0.00) = 42.63 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-71 65 0.00 68.48 0.00 -5.80 -1.22 0.00 0.00 -18.83 42.63

Segment Leq : 42.63 dBA

Results segment # 3: Beechwood 3 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 27.85 ! 24.15 ! 24.15

ROAD (0.00 + 46.82 + 0.00) = 46.82 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
65 90 0.00 68.48 0.00 -5.80 -8.57 0.00 0.00 -7.29 46.82

Segment Leq : 46.82 dBA

Total Leq All Segments: 50.26 dBA

Results segment # 1: Beechwood 1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 27.85 ! 23.72 ! 23.72

ROAD (0.00 + 38.40 + 0.00) = 38.40 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -71 0.00 60.88 0.00 -5.31 -9.77 0.00 0.00 -7.40 38.40

Segment Leq : 38.40 dBA

Results segment # 2: Beechwood 2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 27.85 ! 26.46 ! 26.46

ROAD (0.00 + 35.03 + 0.00) = 35.03 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-71 65 0.00 60.88 0.00 -5.80 -1.22 0.00 0.00 -18.83 35.03

Segment Leq : 35.03 dBA

Results segment # 3: Beechwood 3 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 27.85 ! 24.15 ! 24.15

ROAD (0.00 + 39.23 + 0.00) = 39.23 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
65 90 0.00 60.88 0.00 -5.80 -8.57 0.00 0.00 -7.29 39.23

Segment Leq : 39.23 dBA

Total Leq All Segments: 42.67 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 50.26
(NIGHT): 42.67

STAMSON 5.0 NORMAL REPORT Date: 16-12-2020 18:08:53
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -90.00 deg -16.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 28.00 / 28.00 m
Receiver height : 31.40 / 31.40 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -16.00 deg
Barrier height : 29.90 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -16.00 deg 46.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 28.00 / 28.00 m
Receiver height : 31.40 / 31.40 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -16.00 deg Angle2 : 46.00 deg
Barrier height : 29.90 m
Barrier receiver distance : 8.00 / 8.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : 46.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 28.00 / 28.00 m
Receiver height : 31.40 / 31.40 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 46.00 deg Angle2 : 90.00 deg
Barrier height : 32.85 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Beechwood 1 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 31.40 ! 28.20 ! 28.20

ROAD (0.00 + 53.08 + 0.00) = 53.08 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -16 0.00 68.48 0.00 -2.71 -3.86 0.00 0.00 -8.83 53.08

Segment Leq : 53.08 dBA

Results segment # 2: Beechwood 2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 31.40 ! 22.86 ! 22.86

ROAD (0.00 + 41.32 + 0.00) = 41.32 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-16 46 0.00 68.48 0.00 -2.71 -4.63 0.00 0.00 -19.82 41.32

Segment Leq : 41.32 dBA

Results segment # 3: Beechwood 3 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 31.40 ! 20.72 ! 20.72

ROAD (0.00 + 43.12 + 0.00) = 43.12 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
46 90 0.00 68.48 0.00 -2.71 -6.12 0.00 0.00 -16.53 43.12

Segment Leq : 43.12 dBA

Total Leq All Segments: 53.75 dBA

Results segment # 1: Beechwood 1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 31.40 ! 28.20 ! 28.20

ROAD (0.00 + 45.48 + 0.00) = 45.48 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -16 0.00 60.88 0.00 -2.71 -3.86 0.00 0.00 -8.83 45.48

Segment Leq : 45.48 dBA

Results segment # 2: Beechwood 2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

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

1.50 ! 31.40 ! 22.86 ! 22.86

ROAD (0.00 + 33.72 + 0.00) = 33.72 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-16 46 0.00 60.88 0.00 -2.71 -4.63 0.00 0.00 -19.82 33.72

Segment Leq : 33.72 dBA

Results segment # 3: Beechwood 3 (night)

Source height = 1.50 m

Barrier height for grazing incidence

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

1.50 ! 31.40 ! 20.72 ! 20.72

ROAD (0.00 + 35.52 + 0.00) = 35.52 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
46 90 0.00 60.88 0.00 -2.71 -6.12 0.00 0.00 -16.53 35.52

Segment Leq : 35.52 dBA

Total Leq All Segments: 46.15 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.75
(NIGHT): 46.15

STAMSON 5.0 NORMAL REPORT Date: 16-12-2020 18:10:10
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Beechwood 1 (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 : 57.00 / 57.00 m
Receiver height : 24.60 / 24.60 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -70.00 deg
Barrier height : 23.10 m
Barrier receiver distance : 8.00 / 8.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -70.00 deg 68.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.00 / 57.00 m
Receiver height : 24.60 / 24.60 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -70.00 deg Angle2 : 68.00 deg
Barrier height : 26.30 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : 68.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.00 / 57.00 m
Receiver height : 24.60 / 24.60 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 68.00 deg Angle2 : 90.00 deg
Barrier height : 23.10 m
Barrier receiver distance : 8.00 / 8.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Beechwood 1 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 24.60 ! 21.36 ! 21.36

ROAD (0.00 + 46.75 + 0.00) = 46.75 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -70 0.00 68.48 0.00 -5.80 -9.54 0.00 0.00 -6.39 46.75

Segment Leq : 46.75 dBA

Results segment # 2: Beechwood 2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 24.60 ! 23.38 ! 23.38

ROAD (0.00 + 43.99 + 0.00) = 43.99 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-70 68 0.00 68.48 0.00 -5.80 -1.15 0.00 0.00 -17.53 43.99

Segment Leq : 43.99 dBA

Results segment # 3: Beechwood 3 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 24.60 ! 21.36 ! 21.36

ROAD (0.00 + 47.06 + 0.00) = 47.06 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
68 90 0.00 68.48 0.00 -5.80 -9.13 0.00 0.00 -6.50 47.06

Segment Leq : 47.06 dBA

Total Leq All Segments: 50.91 dBA

Results segment # 1: Beechwood 1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 24.60 ! 21.36 ! 21.36

ROAD (0.00 + 39.16 + 0.00) = 39.16 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -70 0.00 60.88 0.00 -5.80 -9.54 0.00 0.00 -6.39 39.16

Segment Leq : 39.16 dBA

Results segment # 2: Beechwood 2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 24.60 ! 23.38 ! 23.38

ROAD (0.00 + 36.40 + 0.00) = 36.40 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-70 68 0.00 60.88 0.00 -5.80 -1.15 0.00 0.00 -17.53 36.40

Segment Leq : 36.40 dBA

Results segment # 3: Beechwood 3 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 24.60 ! 21.36 ! 21.36

ROAD (0.00 + 39.46 + 0.00) = 39.46 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
68 90 0.00 60.88 0.00 -5.80 -9.13 0.00 0.00 -6.50 39.46

Segment Leq : 39.46 dBA

Total Leq All Segments: 43.31 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 50.91
(NIGHT): 43.31

STAMSON 5.0 NORMAL REPORT Date: 16-12-2020 18:22:51
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Beechwood (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 : 66.00 / 66.00 m
Receiver height : 15.15 / 15.15 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 16.90 m
Barrier receiver distance : 0.05 / 0.05 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Beechwood (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 15.15 ! 15.14 ! 15.14

ROAD (0.00 + 46.11 + 0.00) = 46.11 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 68.48 0.00 -6.43 0.00 0.00 0.00 -15.93 46.11

Segment Leq : 46.11 dBA

Total Leq All Segments: 46.11 dBA

Results segment # 1: Beechwood (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 15.15 ! 15.14 ! 15.14

ROAD (0.00 + 38.52 + 0.00) = 38.52 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 60.88 0.00 -6.43 0.00 0.00 0.00 -15.93 38.52

Segment Leq : 38.52 dBA

Total Leq All Segments: 38.52 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 46.11
(NIGHT): 38.52

STAMSON 5.0 NORMAL REPORT Date: 16-12-2020 18:25:18
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Beechwood (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 : 36.00 / 36.00 m
Receiver height : 27.85 / 27.85 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 29.90 m
Barrier receiver distance : 0.05 / 0.05 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Beechwood (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 27.85 ! 27.81 ! 27.81

ROAD (0.00 + 47.64 + 0.00) = 47.64 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 68.48 0.00 -3.80 0.00 0.00 0.00 -17.04 47.64

Segment Leq : 47.64 dBA

Total Leq All Segments: 47.64 dBA

Results segment # 1: Beechwood (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 27.85 ! 27.81 ! 27.81

ROAD (0.00 + 40.04 + 0.00) = 40.04 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 60.88 0.00 -3.80 0.00 0.00 0.00 -17.04 40.04

Segment Leq : 40.04 dBA

Total Leq All Segments: 40.04 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 47.64
(NIGHT): 40.04

STAMSON 5.0 NORMAL REPORT Date: 16-12-2020 18:29:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -90.00 deg -5.00 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 : 18.40 / 18.40 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -5.00 deg
Barrier height : 23.10 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -5.00 deg 28.00 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 : 18.40 / 18.40 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -5.00 deg Angle2 : 28.00 deg
Barrier height : 16.90 m
Barrier receiver distance : 6.00 / 6.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : 28.00 deg 90.00 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 : 18.40 / 18.40 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 28.00 deg Angle2 : 90.00 deg
Barrier height : 16.90 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Beechwood 1 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 18.40 ! 17.54 ! 17.54

ROAD (0.00 + 41.81 + 0.00) = 41.81 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -5 0.00 68.48 0.00 -5.95 -3.26 0.00 0.00 -17.46 41.81

Segment Leq : 41.81 dBA

Results segment # 2: Beechwood 2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 18.40 ! 16.68 ! 16.68

ROAD (0.00 + 49.96 + 0.00) = 49.96 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-5 28 0.00 68.48 0.00 -5.95 -7.37 0.00 0.00 -5.20 49.96

Segment Leq : 49.96 dBA

Results segment # 3: Beechwood 3 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 18.40 ! 17.54 ! 17.54

ROAD (0.00 + 57.90 + 0.00) = 57.90 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
28 90 0.00 68.48 0.00 -5.95 -4.63 0.00 0.00 -2.97 54.94*
28 90 0.00 68.48 0.00 -5.95 -4.63 0.00 0.00 0.00 57.90
---

* Bright Zone !

Segment Leq : 57.90 dBA

Total Leq All Segments: 58.64 dBA

Results segment # 1: Beechwood 1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 18.40 ! 17.54 ! 17.54

ROAD (0.00 + 34.22 + 0.00) = 34.22 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -5 0.00 60.88 0.00 -5.95 -3.26 0.00 0.00 -17.46 34.22

Segment Leq : 34.22 dBA

Results segment # 2: Beechwood 2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 18.40 ! 16.68 ! 16.68

ROAD (0.00 + 42.37 + 0.00) = 42.37 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-5 28 0.00 60.88 0.00 -5.95 -7.37 0.00 0.00 -5.20 42.37

Segment Leq : 42.37 dBA

Results segment # 3: Beechwood 3 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 18.40 ! 17.54 ! 17.54

ROAD (0.00 + 50.31 + 0.00) = 50.31 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
28 90 0.00 60.88 0.00 -5.95 -4.63 0.00 0.00 -2.97 47.34*
28 90 0.00 60.88 0.00 -5.95 -4.63 0.00 0.00 0.00 50.31
---

* Bright Zone !

Segment Leq : 50.31 dBA

Total Leq All Segments: 51.05 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.64
(NIGHT): 51.05

STAMSON 5.0 NORMAL REPORT Date: 17-12-2020 11:34:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -90.00 deg -79.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 43.00 / 43.00 m
Receiver height : 6.30 / 6.30 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -79.00 deg
Barrier height : 3.00 m
Barrier receiver distance : 38.00 / 38.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -79.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 43.00 / 43.00 m
Receiver height : 6.30 / 6.30 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -79.00 deg Angle2 : 90.00 deg
Barrier height : 29.90 m
Barrier receiver distance : 7.00 / 7.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Beechwood 1 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 6.30 ! 2.05 ! 2.05

ROAD (0.00 + 46.31 + 0.00) = 46.31 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -79 0.00 68.48 0.00 -4.57 -12.14 0.00 0.00 -5.46 46.31

Segment Leq : 46.31 dBA

Results segment # 2: Beechwood 2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 6.30 ! 5.52 ! 5.52

ROAD (0.00 + 43.89 + 0.00) = 43.89 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-79 90 0.00 68.48 0.00 -4.57 -0.27 0.00 0.00 -19.74 43.89

Segment Leq : 43.89 dBA

Total Leq All Segments: 48.28 dBA

Results segment # 1: Beechwood 1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 6.30 ! 2.05 ! 2.05

ROAD (0.00 + 38.71 + 0.00) = 38.71 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -79 0.00 60.88 0.00 -4.57 -12.14 0.00 0.00 -5.46 38.71

Segment Leq : 38.71 dBA

Results segment # 2: Beechwood 2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 6.30 ! 5.52 ! 5.52

ROAD (0.00 + 36.30 + 0.00) = 36.30 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-79 90 0.00 60.88 0.00 -4.57 -0.27 0.00 0.00 -19.74 36.30

Segment Leq : 36.30 dBA

Total Leq All Segments: 40.68 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 48.28
(NIGHT): 40.68

STAMSON 5.0 NORMAL REPORT Date: 17-12-2020 10:30:01
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -90.00 deg -42.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.00 / 57.00 m
Receiver height : 21.65 / 21.65 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -42.00 deg
Barrier height : 20.15 m
Barrier receiver distance : 19.00 / 19.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -42.00 deg 74.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.00 / 57.00 m
Receiver height : 21.65 / 21.65 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -42.00 deg Angle2 : 74.00 deg
Barrier height : 29.90 m
Barrier receiver distance : 21.00 / 21.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : 74.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.00 / 57.00 m
Receiver height : 21.65 / 21.65 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 74.00 deg Angle2 : 90.00 deg
Barrier height : 23.10 m
Barrier receiver distance : 19.00 / 19.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Beechwood 1 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 21.65 ! 14.93 ! 14.93

ROAD (0.00 + 45.35 + 0.00) = 45.35 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -42 0.00 68.48 0.00 -5.80 -5.74 0.00 0.00 -11.59 45.35

Segment Leq : 45.35 dBA

Results segment # 2: Beechwood 2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 21.65 ! 14.22 ! 14.22

ROAD (0.00 + 40.77 + 0.00) = 40.77 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-42 74 0.00 68.48 0.00 -5.80 -1.91 0.00 0.00 -20.00 40.77

Segment Leq : 40.77 dBA

Results segment # 3: Beechwood 3 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 21.65 ! 14.93 ! 14.93

ROAD (0.00 + 41.06 + 0.00) = 41.06 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
74 90 0.00 68.48 0.00 -5.80 -10.51 0.00 0.00 -11.11 41.06

Segment Leq : 41.06 dBA

Total Leq All Segments: 47.71 dBA

Results segment # 1: Beechwood 1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 21.65 ! 14.93 ! 14.93

ROAD (0.00 + 37.75 + 0.00) = 37.75 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -42 0.00 60.88 0.00 -5.80 -5.74 0.00 0.00 -11.59 37.75

Segment Leq : 37.75 dBA

Results segment # 2: Beechwood 2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 21.65 ! 14.22 ! 14.22

ROAD (0.00 + 33.18 + 0.00) = 33.18 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-42 74 0.00 60.88 0.00 -5.80 -1.91 0.00 0.00 -20.00 33.18

Segment Leq : 33.18 dBA

Results segment # 3: Beechwood 3 (night)

Source height = 1.50 m

Barrier height for grazing incidence

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

1.50 ! 21.65 ! 14.93 ! 14.93

ROAD (0.00 + 33.47 + 0.00) = 33.47 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
74 90 0.00 60.88 0.00 -5.80 -10.51 0.00 0.00 -11.11 33.47

Segment Leq : 33.47 dBA

Total Leq All Segments: 40.11 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 47.71
(NIGHT): 40.11

STAMSON 5.0 NORMAL REPORT Date: 17-12-2020 12:26:46
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -90.00 deg -67.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 41.00 / 41.00 m
Receiver height : 31.40 / 31.40 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -67.00 deg
Barrier height : 29.90 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -67.00 deg 8.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 41.00 / 41.00 m
Receiver height : 31.40 / 31.40 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -67.00 deg Angle2 : 8.00 deg
Barrier height : 34.40 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : 8.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 28.00 / 28.00 m
Receiver height : 31.40 / 31.40 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 8.00 deg Angle2 : 90.00 deg
Barrier height : 29.90 m
Barrier receiver distance : 4.00 / 4.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Beechwood 1 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 31.40 ! 24.11 ! 24.11

ROAD (0.00 + 44.45 + 0.00) = 44.45 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -67 0.00 68.48 0.00 -4.37 -8.94 0.00 0.00 -10.73 44.45

Segment Leq : 44.45 dBA

Results segment # 2: Beechwood 2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 31.40 ! 24.11 ! 24.11

ROAD (0.00 + 40.31 + 0.00) = 40.31 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-67 8 0.00 68.48 0.00 -4.37 -3.80 0.00 0.00 -20.00 40.31

Segment Leq : 40.31 dBA

Results segment # 3: Beechwood 3 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 31.40 ! 27.13 ! 27.13

ROAD (0.00 + 51.24 + 0.00) = 51.24 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
8 90 0.00 68.48 0.00 -2.71 -3.41 0.00 0.00 -11.11 51.24

Segment Leq : 51.24 dBA

Total Leq All Segments: 52.35 dBA

Results segment # 1: Beechwood 1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 31.40 ! 24.11 ! 24.11

ROAD (0.00 + 36.85 + 0.00) = 36.85 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -67 0.00 60.88 0.00 -4.37 -8.94 0.00 0.00 -10.73 36.85

Segment Leq : 36.85 dBA

Results segment # 2: Beechwood 2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 31.40 ! 24.11 ! 24.11

ROAD (0.00 + 32.71 + 0.00) = 32.71 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-67 8 0.00 60.88 0.00 -4.37 -3.80 0.00 0.00 -20.00 32.71

Segment Leq : 32.71 dBA

Results segment # 3: Beechwood 3 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 31.40 ! 27.13 ! 27.13

ROAD (0.00 + 43.65 + 0.00) = 43.65 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
8 90 0.00 60.88 0.00 -2.71 -3.41 0.00 0.00 -11.11 43.65

Segment Leq : 43.65 dBA

Total Leq All Segments: 44.75 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.35
(NIGHT): 44.75

STAMSON 5.0 NORMAL REPORT Date: 16-12-2020 18:31:42
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r12b.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -90.00 deg -5.00 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 : 18.40 / 18.40 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -5.00 deg
Barrier height : 23.10 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : -5.00 deg 28.00 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 : 18.40 / 18.40 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -5.00 deg Angle2 : 28.00 deg
Barrier height : 18.00 m
Barrier receiver distance : 6.00 / 6.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

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

Angle1 Angle2 : 28.00 deg 90.00 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 : 18.40 / 18.40 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 28.00 deg Angle2 : 90.00 deg
Barrier height : 18.00 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Beechwood 1 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 18.40 ! 17.54 ! 17.54

ROAD (0.00 + 41.81 + 0.00) = 41.81 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -5 0.00 68.48 0.00 -5.95 -3.26 0.00 0.00 -17.46 41.81

Segment Leq : 41.81 dBA

Results segment # 2: Beechwood 2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 18.40 ! 16.68 ! 16.68

ROAD (0.00 + 45.27 + 0.00) = 45.27 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-5 28 0.00 68.48 0.00 -5.95 -7.37 0.00 0.00 -9.90 45.27

Segment Leq : 45.27 dBA

Results segment # 3: Beechwood 3 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 18.40 ! 17.54 ! 17.54

ROAD (0.00 + 52.11 + 0.00) = 52.11 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
28 90 0.00 68.48 0.00 -5.95 -4.63 0.00 0.00 -5.79 52.11

Segment Leq : 52.11 dBA

Total Leq All Segments: 53.25 dBA

Results segment # 1: Beechwood 1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 18.40 ! 17.54 ! 17.54

ROAD (0.00 + 34.22 + 0.00) = 34.22 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -5 0.00 60.88 0.00 -5.95 -3.26 0.00 0.00 -17.46 34.22

Segment Leq : 34.22 dBA

Results segment # 2: Beechwood 2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 18.40 ! 16.68 ! 16.68

ROAD (0.00 + 37.67 + 0.00) = 37.67 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-5 28 0.00 60.88 0.00 -5.95 -7.37 0.00 0.00 -9.90 37.67

Segment Leq : 37.67 dBA

Results segment # 3: Beechwood 3 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.50 ! 18.40 ! 17.54 ! 17.54

ROAD (0.00 + 44.51 + 0.00) = 44.51 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
28 90 0.00 60.88 0.00 -5.95 -4.63 0.00 0.00 -5.79 44.51

Segment Leq : 44.51 dBA

Total Leq All Segments: 45.65 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.25
(NIGHT): 45.65