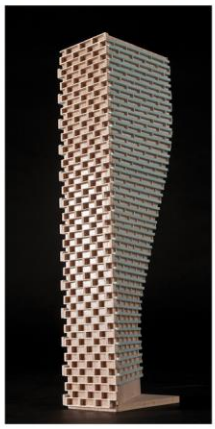
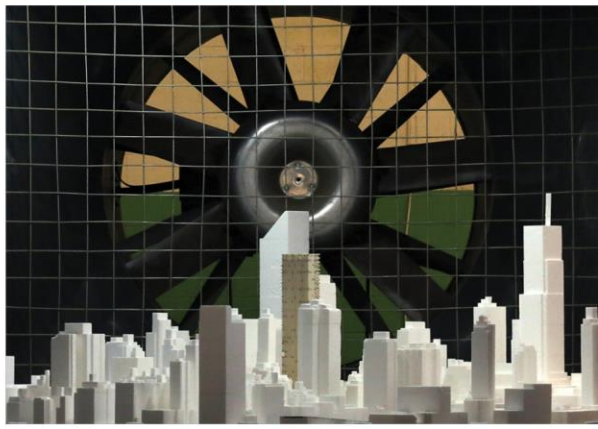
GRADIENTWIND
ENGINEERS & SCIENTISTS

ROADWAY TRAFFIC NOISE ASSESSMENT

1364-1370 Stittsville Main Street
Stittsville, Ontario

REPORT: GW22-021 – Traffic Noise





March 8, 2022

PREPARED FOR

Demarco Construction
195 Menten Place, Unit 103
Ottawa ON, K2H 9C1

PREPARED BY

Caleb Alexander, B.Eng., Junior Environmental Scientist
Joshua Foster, P.Eng., Lead Engineer

EXECUTIVE SUMMARY

This report describes a roadway traffic noise assessment undertaken in support of site plan application for a proposed 4-storey residential development at 1364-1370 Stittsville Main Street in Stittsville, Ontario. The study site is located on a parcel of land near the intersection of Stittsville Main Street and Beverley Street. The major sources of roadway traffic noise are Stittsville Main Street to the north and Beverley Street to the east. Figure 1 illustrates a complete site plan with surrounding context.

The assessment is based on (i) theoretical noise prediction methods that conform to the Ministry of the Environment, Conservation and Parks (MECP) 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 Mataj Architects Inc. in January 2022.

The results of the current analysis indicate that noise levels will range between 51 and 67 dBA during the daytime period (07:00-23:00) and between 43 and 59 dBA during the nighttime period (23:00-07:00). The highest noise level (67 dBA) occurs at the north façade, which is nearest and most exposed to Stittsville Main Street. Where noise levels exceed 65 dBA at the building façade, upgraded building components will be required. For all other façades, standard building components in conformance with the Ontario Building Code (OBC 2020) will provide sufficient noise attenuation.

Results of the calculations indicate that units with a window on the north façade will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. A 'Type D' Warning Clause[1] will also be required on all Lease, Purchase and Sale Agreements for these units. Although air conditioning is only required for units with windows on the north façade, it is expected to be provided to the entire building.

The surrounding area was evaluated for sources of stationary noise impacting the proposed development. Based on a review of satellite imagery, potential sources exist across the street from the study site, which could result stationary noise levels that approach the exclusionary limits for stationary noise outlined in

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

the ENCG. However, it is expected that noise from roadway traffic will dominate the background noise levels during the daytime and nighttime period, thus nearby stationary noise sources are not of concern. The building's own proposed HVAC equipment has the potential for noise impacts on surrounding buildings and the study building itself. Typically, noise levels can be controlled by judicious selection and placement of the equipment and the introduction of silencers or noise screens where needed. A stationary noise study will be performed once mechanical plans for the proposed building become available. This 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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1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Demarco Construction to undertake a roadway traffic noise assessment for a proposed 4-storey residential development located at 1364-1370 Stittsville Main Street in Stittsville, Ontario. This report summarizes the methodology, results, and recommendations related to the assessment of exterior and interior noise levels generated by local roadway traffic.

Our work is based on theoretical noise calculation methods conforming to the City of Ottawa[2] and Ministry of the Environment, Conservation and Parks (MECP)[3] guidelines. Noise calculations were based on architectural drawings prepared by Mataj Architect in January 2022 with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

2. TERMS OF REFERENCE

The focus of this traffic noise assessment is a proposed residential development at 1364-1370 Stittsville Main Street in Stittsville, Ontario. The study site is located on a parcel of land, near the intersection of Stittsville Main Street to the north, and Beverley Street to the east.

The proposed development comprises a four-storey residential building with an 'L' shaped floorplan, and outdoor parking which is partially covered by the west wing of the building. At grade the building contains residential units, a lobby, a commercial space, indoor amenities, and building maintenance spaces. The remaining floors contain residential units. Additionally, there is a floorplate change at level two to the south of the east wing. Private balconies which extend less than 4 metres from the façade do not require consideration as Outdoor Living Areas (OLA) in this study.

The site is surrounded by low-rise commercial buildings and residential buildings. The major sources of roadway traffic noise are Stittsville Main Street and Beverley Street. Roadways classified as arterial or collector which are located further than 100m from the study site are not required to be included in the assessment. Figure 1 illustrates a complete site plan with surrounding context.

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

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

4.2 Roadway Traffic Noise

4.2.1 Criteria for Roadway Traffic Noise

For surface roadway traffic noise, 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.

TABLE 1: INDOOR SOUND LEVEL CRITERIA (ROAD) [4]

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[5]. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor environment[6]. 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[7].

The sound level criterion for outdoor living areas is 55 dBA, which applies during the daytime (07:00 to 23:00). An excess of up to 5 dBA above the 55 dBA limit is acceptable in cases where mitigation is not technically or administratively feasible. Where noise levels exceed 60 dBA, mitigation must be provided.

[4] Adapted from ENCG 2016 – Tables 2.2b and 2.2c
[5] Burberry, P.B. (2014). Mitchell's Environment and Services. Routledge, Page 125
[6] MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8
[7] MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3

4.2.2 Theoretical Roadway Noise Predictions

Noise predictions were performed with the aid of the MECP computerized noise assessment program, STAMSON 5.04, for road analysis. Appendix A includes the STAMSON 5.04 input and output data. Roadway traffic noise calculations were performed by treating each roadway segment as separate line sources of noise. 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 streets was taken to be 92%/8%, respectively.
- Ground surfaces were taken to be reflective or absorptive based on intermediate surface characteristics for each receptor and roadway.
- Topography was assumed to be a flat/gentle slope surrounding the study building.
- Noise receptors were strategically placed at 7 locations around the study area (see Figure 2).
- Receptor height was taken to be 10.5 metres at Level 4 for the centre of the window (height to 4th floor slab + 1.5 metres) for Receptors 1-5.
- Receptor height was taken to be 7.5 metres at for the OLA at level 3 (height to 2nd floor slab + 1.5 metres), and 1.5 metres for the OLA's at grade.
- For select sources where appropriate Receptors 1-7 considered surrounding buildings as noise barriers, partially or fully obstructing exposure to the source as illustrated by exposure angles in Appendix Figures A1, A2 and A3.
- Receptor distances and exposure angles are illustrated in Appendix Figures A1, A2 and A3.

4.2.1 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[8] which provide additional details on future roadway expansions. Average Annual Daily Traffic (AADT) volumes

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

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
Stittsville Main Street	2 Lane Urban Arterial Undivided (2-UAU)	40	**15,000**
Beverley Street	2 Lane Urban Collector (2UCU)	40	**8,000**

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 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. The calculation procedure[9] 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

[9] Building Practice Note: Controlling Sound Transmission into Buildings by J.D. Quirt, National Research Council of Canada, September 1985

- Indoor sound level criteria, which varies according to the intended use of a space

Based on published research[10], 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, which was prepared for site plan approval, detailed floor layouts and building elevations 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. RESULTS AND DISCUSSION

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.

TABLE 3: EXTERIOR NOISE LEVELS DUE TO ROAD TRAFFIC

Receptor Number	Receptor Height Above Grade (m)	Receptor Location	STAMSON 5.04 Noise Level (dBA)	
			Day	Night
1	10.5	POW – 4th Level – North Façade	67	59
2	10.5	POW – 4th Level – East Façade	62	54
3	10.5	POW – 4th Level – East Façade	57	49
4	10.5	POW – 4th Level – South Façade	51	43
5	10.5	POW – 4th Level – West Façade	62	54
6	7.5	OLA – 3rd Level – Rooftop Terrace	55	N/A*
7	1.5	OLA – Grade Level – Outdoor Amenity	55	N/A*

*Nighttime noise levels not considered at OLA receptors, as per ENCG

[10] CMHC, Road & Rail Noise: Effects on Housing

The results of the current analysis indicate that noise levels will range between 51 and 67 dBA during the daytime period (07:00-23:00) and between 43 and 59 dBA during the nighttime period (23:00-07:00). The highest noise level (67 dBA) occurs at the north façade, which is nearest and most exposed to Stittsville Main Street.

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 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 3):

Bedroom Windows

(i) Bedroom windows facing north will require a minimum STC of 30.

(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 25

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

Retail Windows

(iii) Retail windows facing north will require a minimum STC of 20

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

Exterior Walls

(i) Exterior wall components on the north, south, and west façades will require a minimum STC of 45, which will be achieved with brick cladding or an acoustical equivalent according to NRC test data[11].

The STC requirements apply to windows, doors, spandrel panels and curtainwall elements. Exterior wall components on these façades are recommended to have a minimum STC of 45, where a punch window

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

and wall system is used. A review of window supplier literature indicates that the specified STC ratings can be achieved by a variety of window systems having a combination of glass thickness and inter-pane spacing. We have specified an example window configuration, however several manufacturers and various combinations of window components, such as those proposed, will offer the necessary sound attenuation rating. 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.

Results of the calculations indicate that units with a window on the north façade will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. A 'Type D' Warning Clause[12] will also be required on all Lease, Purchase and Sale Agreements for these units. Although air conditioning is only required for units with windows on the north façade, it is expected to be provided to the entire building.

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 51 and 67 dBA during the daytime period (07:00-23:00) and between 43 and 59 dBA during the nighttime period (23:00-07:00). The highest noise level (67 dBA) occurs at the north façade, which is nearest and most exposed to Stittsville Main Street. Where noise levels exceed 65 dBA at the building façade, upgraded building components will be required. For all other façades, standard building components in conformance with the Ontario Building Code (OBC 2020) will provide sufficient noise attenuation.

Results of the calculations indicate that units with a window on the north façade will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. The following 'Type D' Warning Clause[13] will also be required on all Lease, Purchase and Sale Agreements for these units:

[12] Ontario Ministry of the Environment and Climate Change – Environmental Noise Guidelines, Publication NPC-300, Queens Printer for Ontario, Toronto, 2013
[13] Ontario Ministry of the Environment and Climate Change – Environmental Noise Guidelines, Publication NPC-300, Queens Printer for Ontario, Toronto, 2013

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

Although air conditioning is only required for units with windows on the north façade, it is expected to be provided to the entire building.

The surrounding area was evaluated for sources of stationary noise impacting the proposed development. Based on a review of satellite imagery, potential sources exist across the street from the study site, which could result stationary noise levels that approach the exclusionary limits for stationary noise outlined in the ENCG. However, it is expected that noise from roadway traffic will dominate the background noise levels during the daytime and nighttime period, thus nearby stationary noise sources are not of concern. The building's own proposed HVAC equipment has the potential for noise impacts on surrounding buildings and the study building itself. Typically, noise levels can be controlled by judicious selection and placement of the equipment and the introduction of silencers or noise screens where needed. A stationary noise study will be performed once mechanical plans for the proposed building become available. This study will include recommendations for any noise control measures that may be necessary to ensure noise levels fall below ENCG limits.

This concludes our 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.

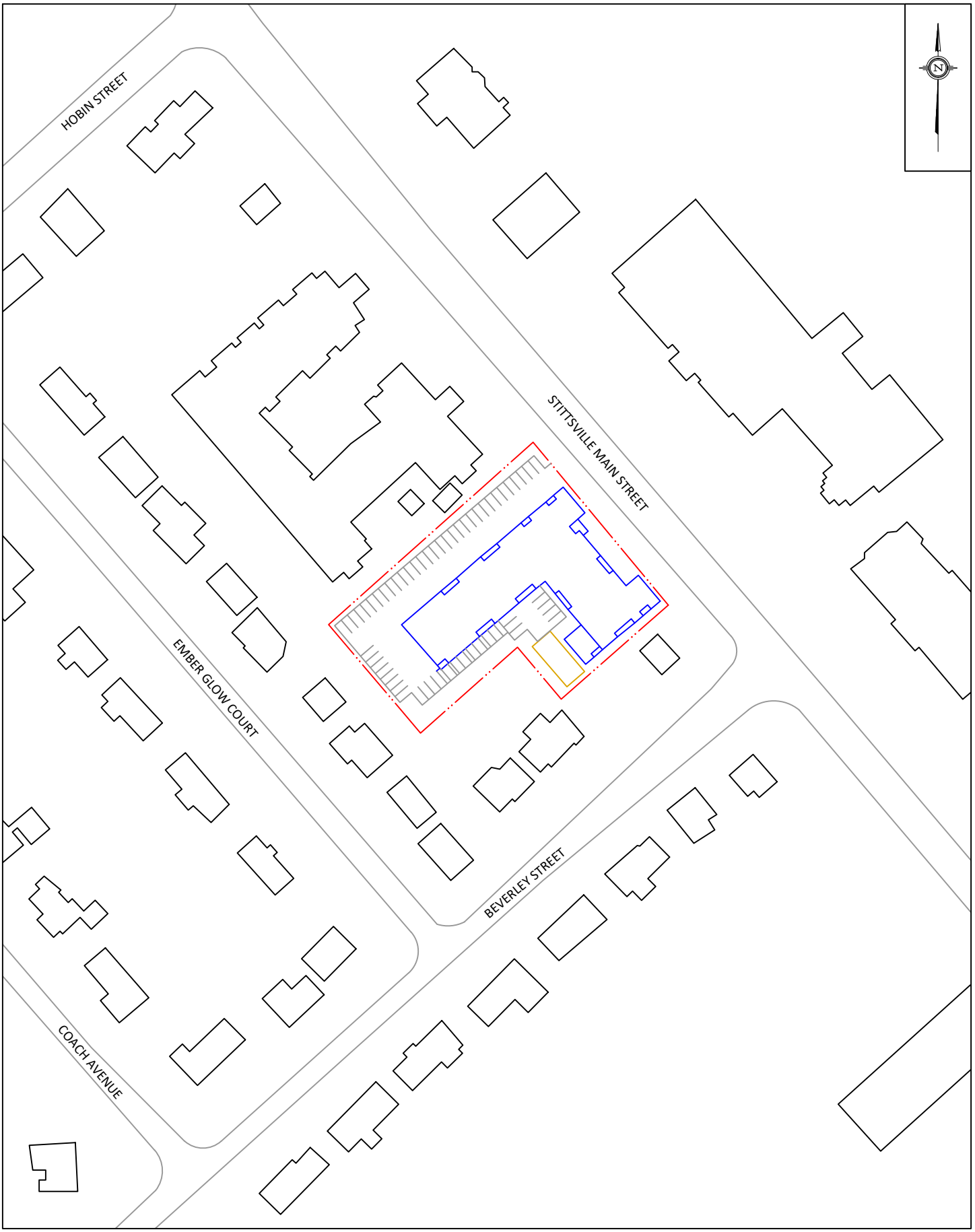
Sincerely,

Gradient Wind Engineering Inc.

Caleb Alexander
Junior Environmental Scientist

Joshua Foster, P.Eng.
Lead Engineer

Gradient Wind File #22-021 - Traffic Noise



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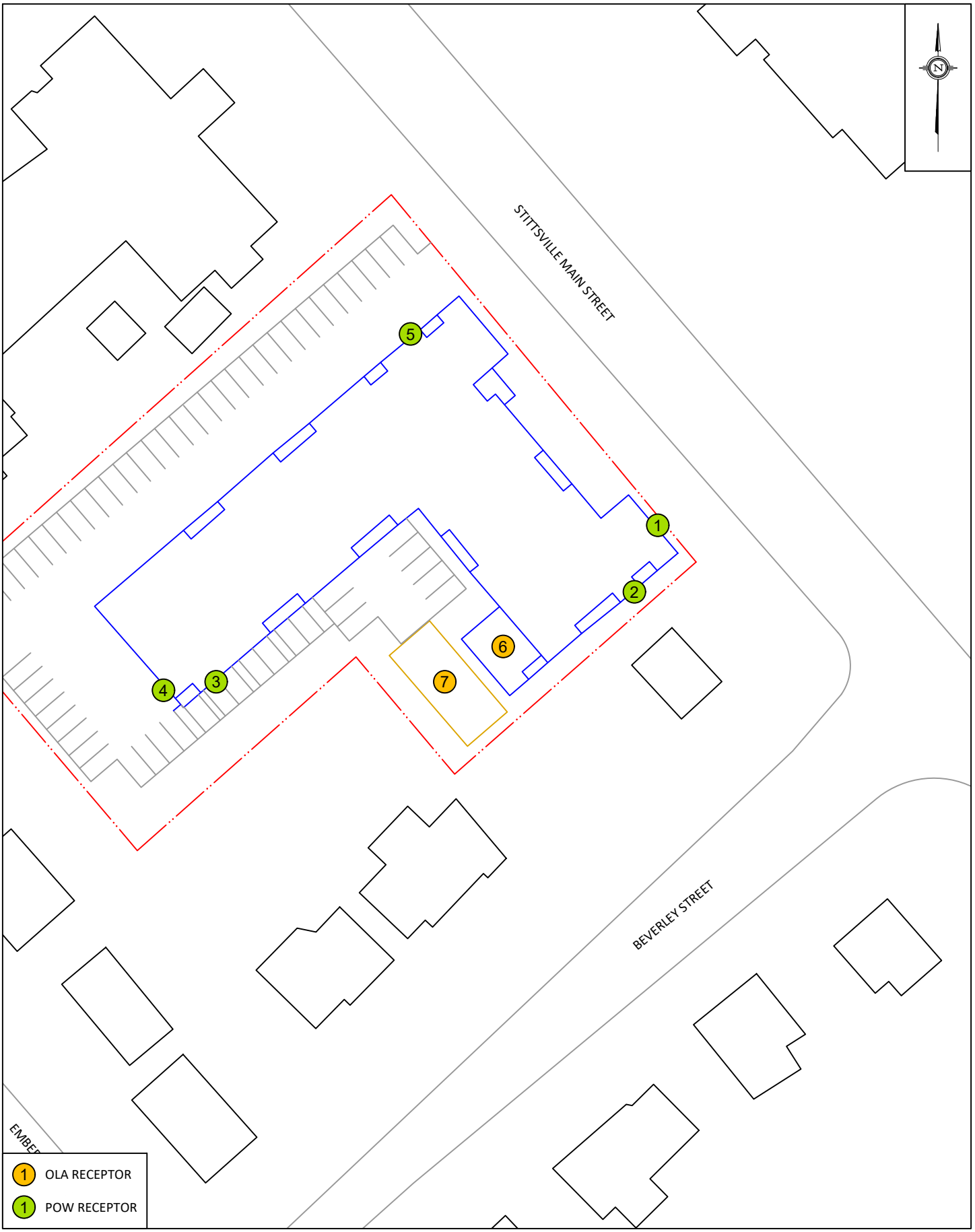
PROJECT	1364-1370 STITTSVILLE MAIN STREET, STITTSVILLE TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1700 (APPROX.)	DRAWING NO.	GW22-021-1
DATE	FEBRUARY 10, 2022	DRAWN BY	C.A.

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT



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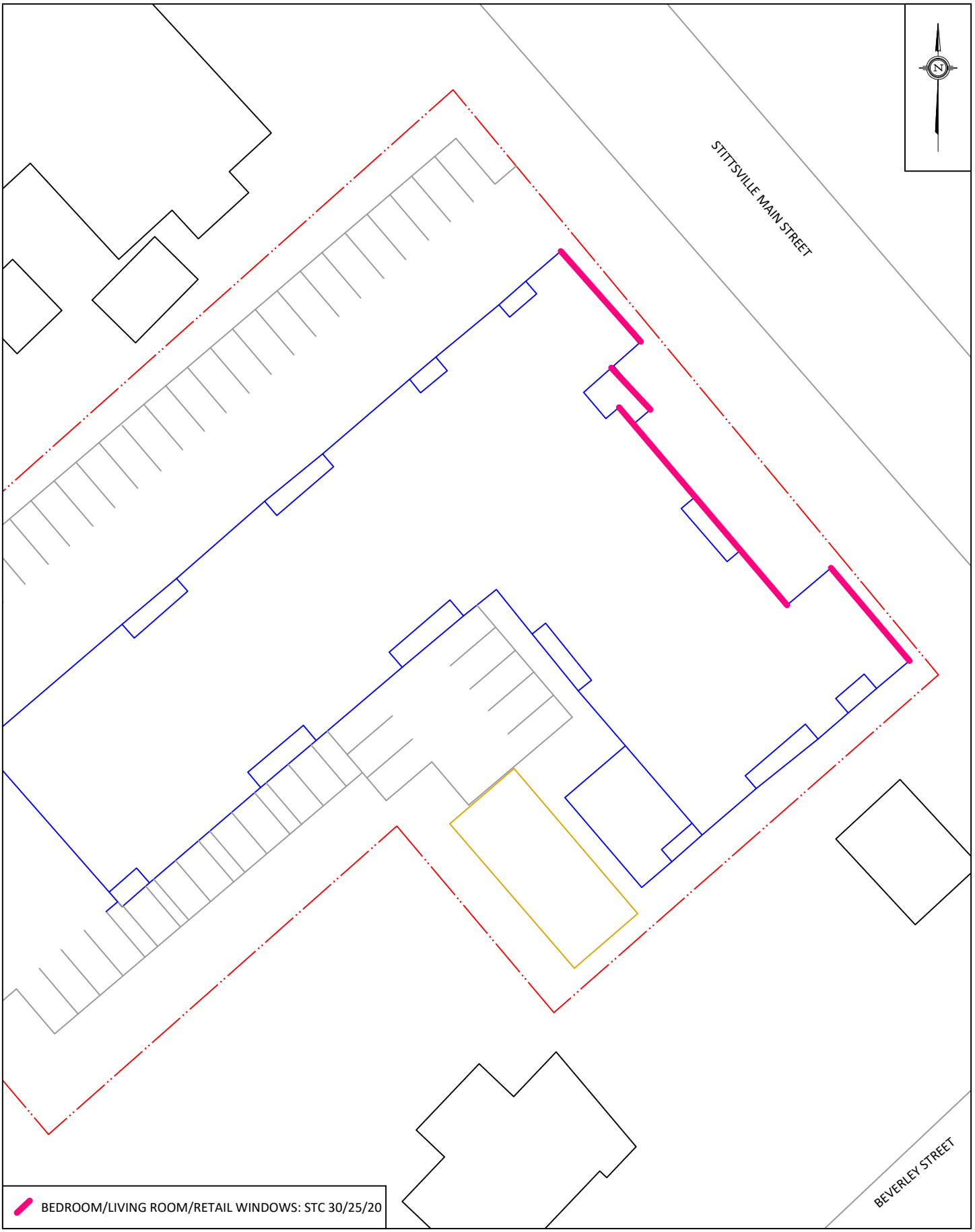
PROJECT	1364-1370 STITTSVILLE MAIN STREET, STITTSVILLE TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:700 (APPROX.)	DRAWING NO.	GW22-021-2
DATE	FEBRUARY 10, 2022	DRAWN BY	C.A.

FIGURE 2:
RECEPTOR LOCATION



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PROJECT	1364-1370 STITTSVILLE MAIN STREET, STITTSVILLE TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:500 (APPROX.)	DRAWING NO.	GW22-021-3
DATE	FEBRUARY 10, 2022	DRAWN BY	C.A.

FIGURE 3:
UPGRADED BUILDING COMPONENTS

APPENDIX A

STAMSON 5.04 – INPUT AND OUTPUT DATA

127 WALGREEN ROAD, OTTAWA, ON, CANADA K0A 1L0 | 613 836 0934
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```
STAMSON 5.0        NORMAL REPORT        Date: 10-02-2022 26:20:38
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Stit Main (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  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  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: Stit Main (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           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Beverley (day/night)
-------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Beverley (day/night)
------------------------------------------
Angle1   Angle2           : -18.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  42.00 / 42.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Stit Main (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 66.69 + 0.00) = 66.69 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  66.69   0.00   0.00   0.00   0.00   0.00   0.00  66.69
-------------------------------------------------------------------------------

Segment Leq : 66.69 dBA


Results segment # 2: Beverley (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 47.71 + 0.00) = 47.71 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -18      0   0.39  63.96   0.00  -6.22 -10.03   0.00   0.00   0.00  47.71
-------------------------------------------------------------------------------

Segment Leq : 47.71 dBA

Total Leq All Segments: 66.74 dBA


Results segment # 1: Stit Main (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 59.09 + 0.00) = 59.09 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  59.09   0.00   0.00   0.00   0.00   0.00   0.00  59.09
-------------------------------------------------------------------------------

Segment Leq : 59.09 dBA
```

```
Results segment # 2: Beverley (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 40.12 + 0.00) = 40.12 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -18      0   0.39  56.36   0.00  -6.22 -10.03   0.00   0.00   0.00  40.12
-------------------------------------------------------------------------------

Segment Leq : 40.12 dBA

Total Leq All Segments: 59.14 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 66.74
                           (NIGHT): 59.14
```

```
STAMSON 5.0        NORMAL REPORT        Date: 10-02-2022 26:20:49
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Stit Main (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  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  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: Stit Main (day/night)
--------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  23.00 / 23.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Beverley (day/night)
-------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Beverley (day/night)
------------------------------------------
Angle1   Angle2           : -31.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  37.00 / 37.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: Stit Main (day)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.13 + 0.00) = 60.13 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.39  66.69   0.00  -2.58  -3.97   0.00   0.00   0.00  60.13
-------------------------------------------------------------------------------

Segment Leq : 60.13 dBA
```

```
Results segment # 2: Beverley (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 56.06 + 0.00) = 56.06 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -31     90   0.39  63.96   0.00  -5.45  -2.44   0.00   0.00   0.00  56.06
-------------------------------------------------------------------------------

Segment Leq : 56.06 dBA

Total Leq All Segments: 61.57 dBA


Results segment # 1: Stit Main (night)
--------------------------------------

Source height = 1.50 m

ROAD (0.00 + 52.54 + 0.00) = 52.54 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.39  59.09   0.00  -2.58  -3.97   0.00   0.00   0.00  52.54
-------------------------------------------------------------------------------

Segment Leq : 52.54 dBA


Results segment # 2: Beverley (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 48.47 + 0.00) = 48.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -31     90   0.39  56.36   0.00  -5.45  -2.44   0.00   0.00   0.00  48.47
-------------------------------------------------------------------------------

Segment Leq : 48.47 dBA

Total Leq All Segments: 53.98 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 61.57
                           (NIGHT): 53.98
```

```
STAMSON 5.0        NORMAL REPORT        Date: 10-02-2022 26:21:01
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Stit Main (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  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  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: Stit Main (day/night)
--------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  76.00 / 76.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   0.00 deg   Angle2 : 38.00 deg
Barrier height            :  12.00 m
Barrier receiver distance :  37.00 / 37.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Beverley (day/night)
----------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Beverley (day/night)
----------------------------------------
Angle1   Angle2           : -51.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  67.00 / 67.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: Stit Main (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 !       10.50 !        6.12 !         6.12

ROAD (0.00 + 36.10 + 54.25) = 54.31 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     38   0.00  66.69   0.00  -7.05  -6.75   0.00   0.00 -16.78  36.10
-------------------------------------------------------------------------------
    38     90   0.00  66.69   0.00  -7.05  -5.39   0.00   0.00   0.00  54.25
-------------------------------------------------------------------------------

Segment Leq : 54.31 dBA
```

```
Results segment # 2: Beverley (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 53.17 + 0.00) = 53.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -51     90   0.39  63.96   0.00  -9.04  -1.75   0.00   0.00   0.00  53.17
-------------------------------------------------------------------------------

Segment Leq : 53.17 dBA

Total Leq All Segments: 56.79 dBA


Results segment # 1: Stit Main (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 !       10.50 !        6.12 !         6.12

ROAD (0.00 + 28.51 + 46.65) = 46.72 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     38   0.00  59.09   0.00  -7.05  -6.75   0.00   0.00 -16.78  28.51
-------------------------------------------------------------------------------
    38     90   0.00  59.09   0.00  -7.05  -5.39   0.00   0.00   0.00  46.65
-------------------------------------------------------------------------------

Segment Leq : 46.72 dBA
```

```
Results segment # 2: Beverley (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 45.58 + 0.00) = 45.58 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -51     90   0.39  56.36   0.00  -9.04  -1.75   0.00   0.00   0.00  45.58
-------------------------------------------------------------------------------

Segment Leq : 45.58 dBA

Total Leq All Segments: 49.20 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 56.79
                           (NIGHT): 49.20
```

```
STAMSON 5.0        NORMAL REPORT        Date: 10-02-2022 26:21:08
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Beverley (day/night)
---------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Beverley (day/night)
-------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  71.00 / 71.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Beverley (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 50.60 + 0.00) = 50.60 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.39  63.96   0.00  -9.39  -3.97   0.00   0.00   0.00  50.60
-------------------------------------------------------------------------------

Segment Leq : 50.60 dBA

Total Leq All Segments: 50.60 dBA


Results segment # 1: Beverley (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 43.00 + 0.00) = 43.00 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.39  56.36   0.00  -9.39  -3.97   0.00   0.00   0.00  43.00
-------------------------------------------------------------------------------

Segment Leq : 43.00 dBA

Total Leq All Segments: 43.00 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 50.60
                           (NIGHT): 43.00
```

```
STAMSON 5.0        NORMAL REPORT        Date: 10-02-2022 26:21:17
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Stit Main (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  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  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: Stit Main (day/night)
----------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  23.00 / 23.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Stit Main (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.82 + 0.00) = 61.82 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  66.69   0.00  -1.86  -3.01   0.00   0.00   0.00  61.82
-------------------------------------------------------------------------------

Segment Leq : 61.82 dBA

Total Leq All Segments: 61.82 dBA


Results segment # 1: Stit Main (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 54.22 + 0.00) = 54.22 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  59.09   0.00  -1.86  -3.01   0.00   0.00   0.00  54.22
-------------------------------------------------------------------------------

Segment Leq : 54.22 dBA

Total Leq All Segments: 54.22 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 61.82
                           (NIGHT): 54.22
```

```
STAMSON 5.0        NORMAL REPORT        Date: 10-02-2022 26:21:25
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Stit Main (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  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  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: Stit Main (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  42.00 / 42.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  12.00 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
```

```
Road data, segment # 2: Beverley (day/night)
------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Beverley (day/night)
------------------------------------------
Angle1   Angle2           : -28.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  44.00 / 44.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Stit Main (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 !        7.50 !        7.07 !         7.07

ROAD (0.00 + 45.10 + 0.00) = 45.10 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  66.69   0.00  -4.47   0.00   0.00   0.00 -17.12  45.10
-------------------------------------------------------------------------------

Segment Leq : 45.10 dBA


Results segment # 2: Beverley (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 54.34 + 0.00) = 54.34 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -28     90   0.48  63.96   0.00  -6.92  -2.70   0.00   0.00   0.00  54.34
-------------------------------------------------------------------------------

Segment Leq : 54.34 dBA

Total Leq All Segments: 54.83 dBA
```

```
Results segment # 1: Stit Main (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 !        7.50 !        7.07 !         7.07

ROAD (0.00 + 37.50 + 0.00) = 37.50 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  59.09   0.00  -4.47   0.00   0.00   0.00 -17.12  37.50
-------------------------------------------------------------------------------

Segment Leq : 37.50 dBA


Results segment # 2: Beverley (night)
---------------------------------------

Source height = 1.50 m

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
-------------------------------------------------------------------------------
   -28     90   0.48  56.36   0.00  -6.92  -2.70   0.00   0.00   0.00  46.75
-------------------------------------------------------------------------------

Segment Leq : 46.75 dBA

Total Leq All Segments: 47.24 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 54.83
                           (NIGHT): 47.24
```

```
STAMSON 5.0         NORMAL REPORT         Date: 10-02-2022 26:21:36
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Stit Main (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  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  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: Stit Main (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  42.00 / 42.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 53.00 deg
Barrier height            :  12.00 m
Barrier receiver distance :  13.00 / 13.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Beverley (day/night)
-------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Beverley (day/night)
------------------------------------------
Angle1   Angle2           : -48.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  46.00 / 46.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Stit Main (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 + 42.54 + 48.85) = 49.76 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     53   0.00  66.69   0.00  -4.47  -1.00   0.00   0.00 -18.67  42.54
-------------------------------------------------------------------------------
    53     90   0.66  66.69   0.00  -7.42 -10.42   0.00   0.00   0.00  48.85
-------------------------------------------------------------------------------

Segment Leq : 49.76 dBA


Results segment # 2: Beverley (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 53.68 + 0.00) = 53.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -48     90   0.66  63.96   0.00  -8.08  -2.19   0.00   0.00   0.00  53.68
-------------------------------------------------------------------------------

Segment Leq : 53.68 dBA

Total Leq All Segments: 55.16 dBA
```

```
Results segment # 1: Stit Main (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 + 34.95 + 41.25) = 42.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     53   0.00  59.09   0.00  -4.47  -1.00   0.00   0.00 -18.67  34.95
-------------------------------------------------------------------------------
    53     90   0.66  59.09   0.00  -7.42 -10.42   0.00   0.00   0.00  41.25
-------------------------------------------------------------------------------

Segment Leq : 42.16 dBA


Results segment # 2: Beverley (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 46.09 + 0.00) = 46.09 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -48     90   0.66  56.36   0.00  -8.08  -2.19   0.00   0.00   0.00  46.09
-------------------------------------------------------------------------------

Segment Leq : 46.09 dBA

Total Leq All Segments: 47.57 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 55.16
                           (NIGHT): 47.57
```

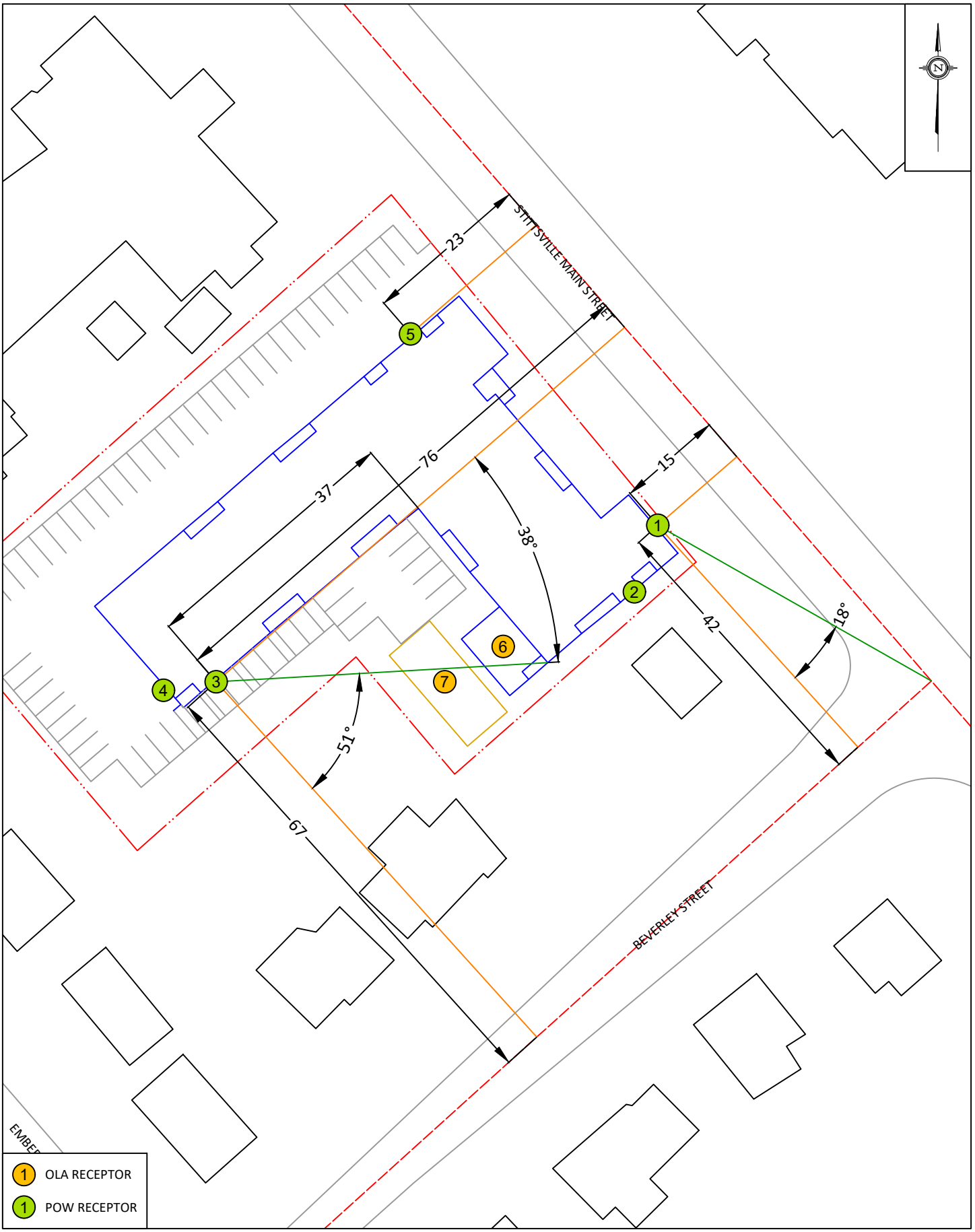

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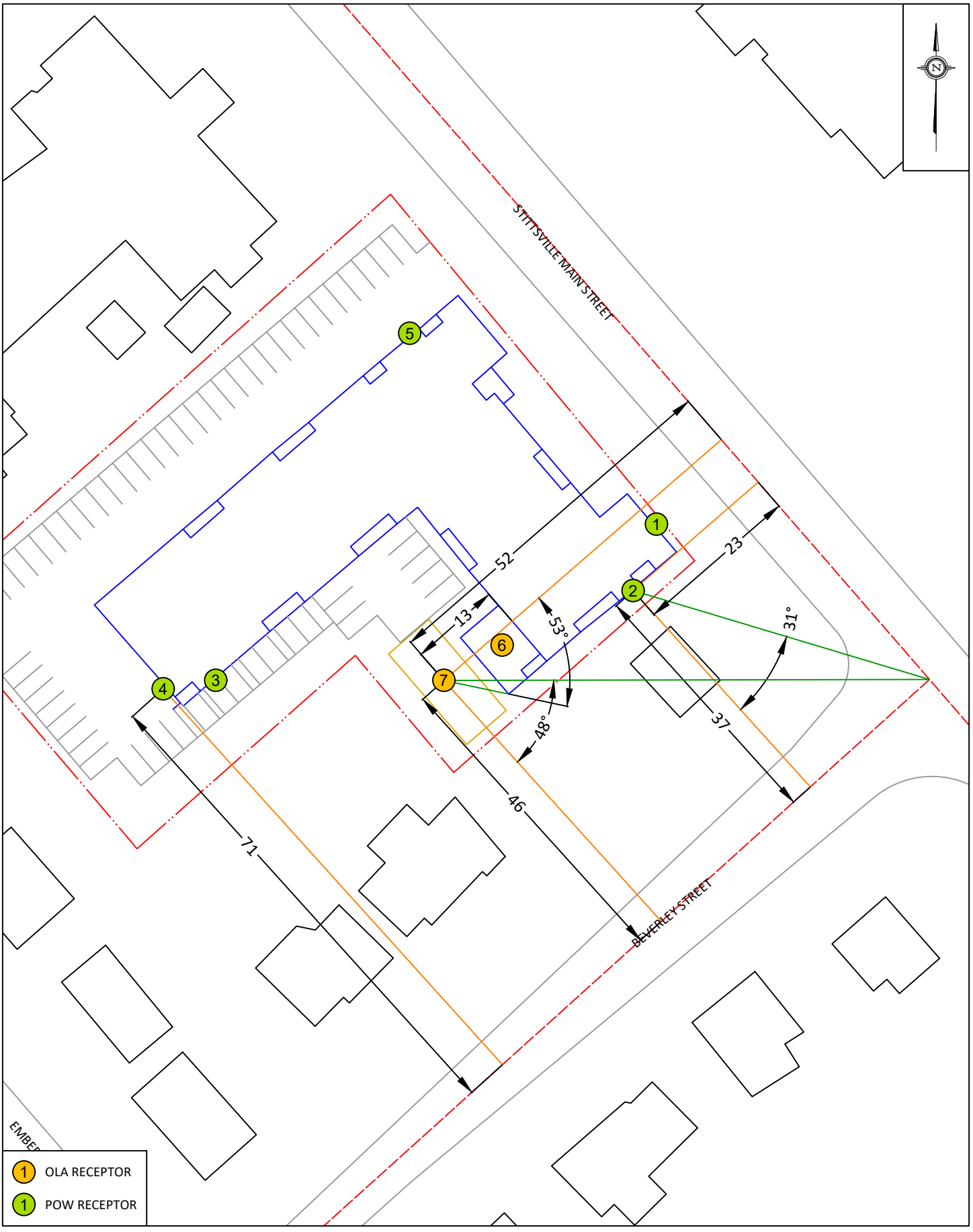
FIGURE A1:
STAMSON INPUT PARAMATERS
RECEPTORS 1,3,5



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SCALE	1:700 (APPROX.)
DRAWING NO.	GW22-021-A2
DATE	FEBRUARY 10, 2022
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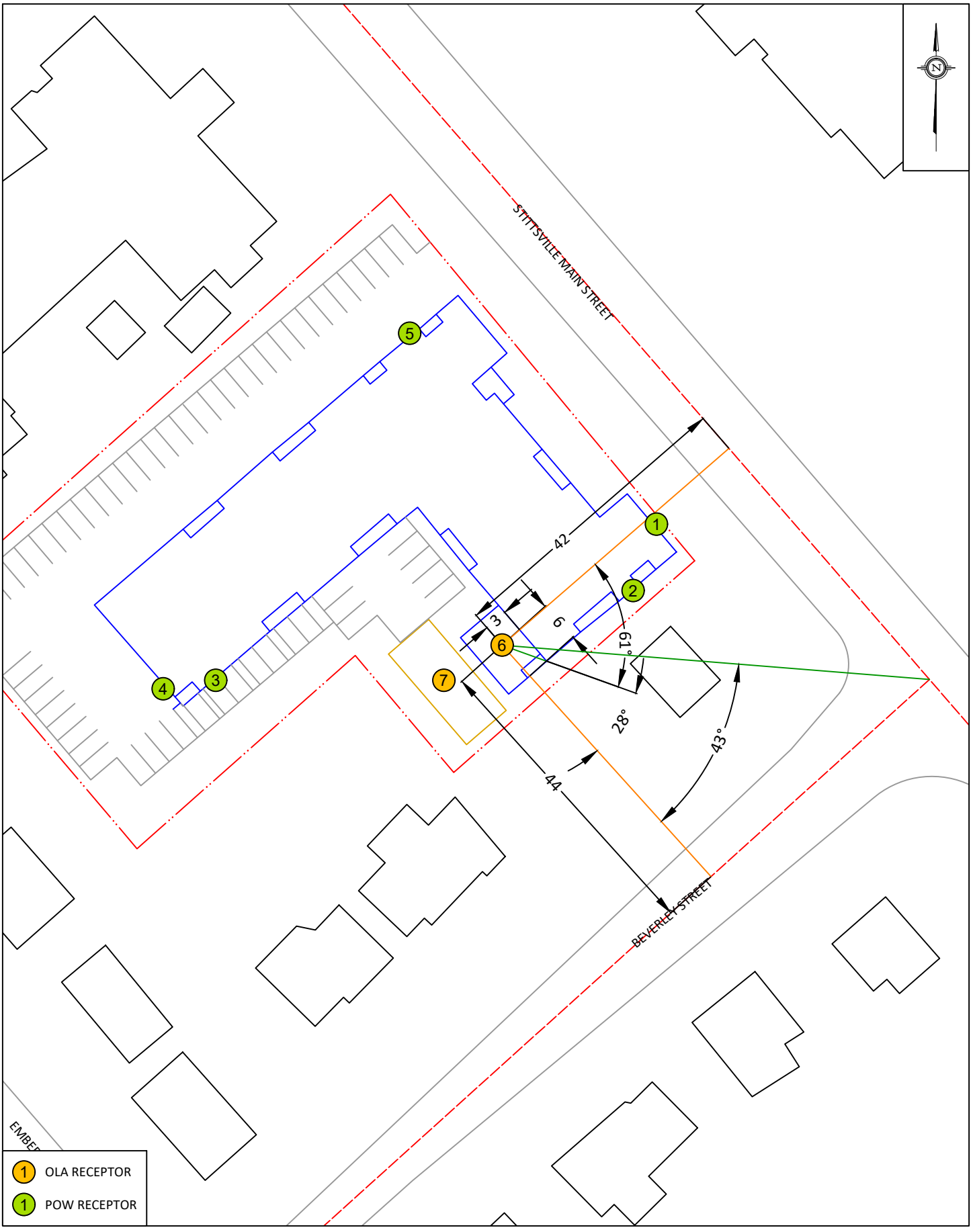
DESCRIPTION

FIGURE A2:
STAMSON INPUT PARAMATERS
RECEPTORS 2,7,4



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SCALE	1:700 (APPROX.)	DRAWING NO.	GW22-021-A3
DATE	FEBRUARY 10, 2022	DRAWN BY	C.A.

FIGURE A3:
STAMSON INPUT PARAMATERS
RECEPTOR 6