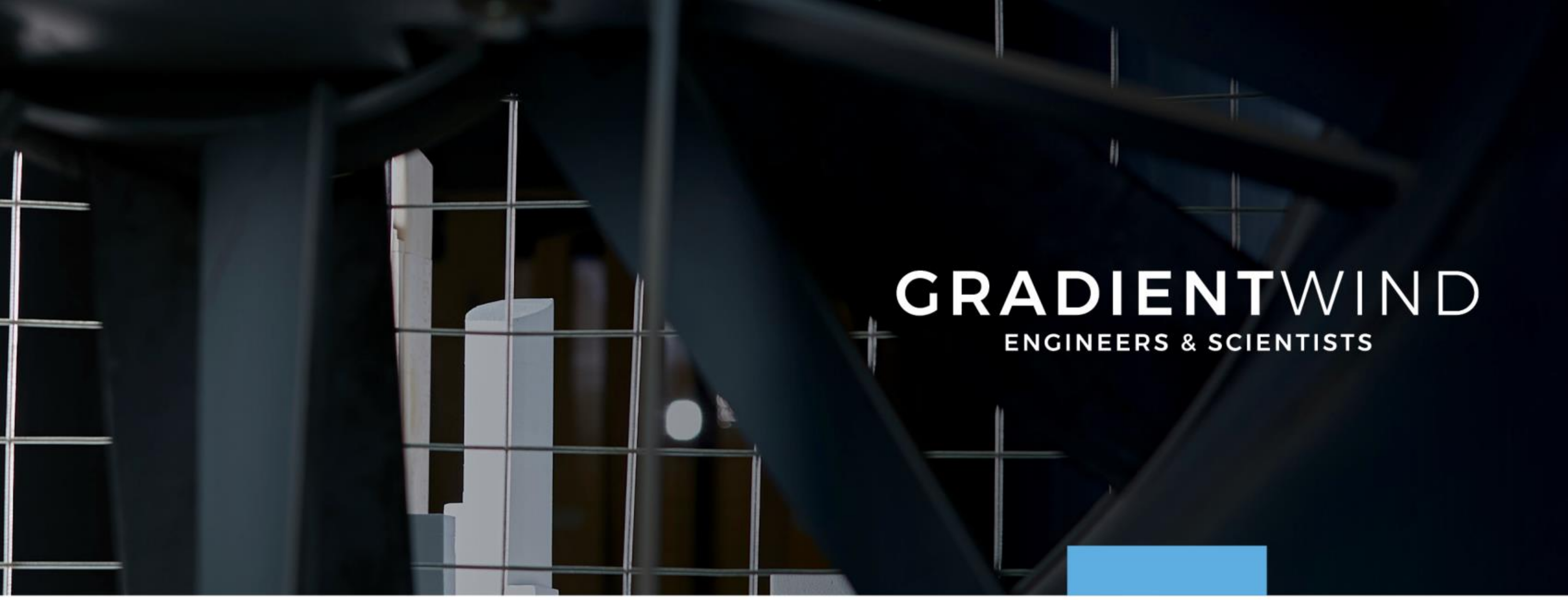
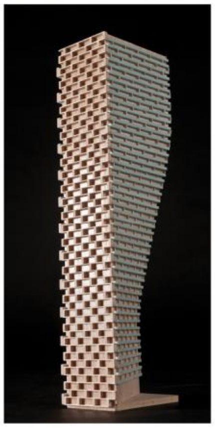
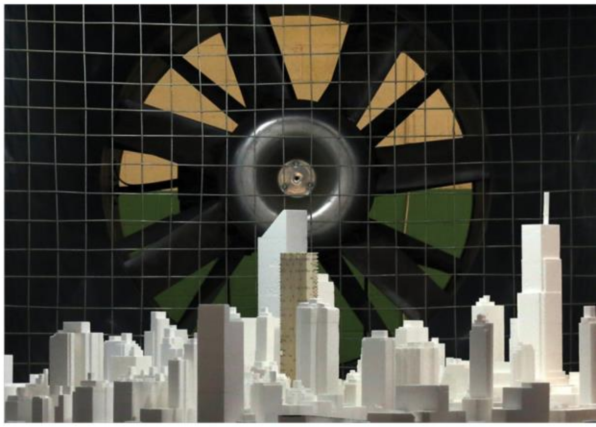


ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT

Green West & East Lands
Ottawa, Ontario

REPORT: 20-081-Green West & East Traffic Noise R1





April 20, 2022

PREPARED FOR
Caivan Communities
2934 Baseline Road, Suite 302
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Attn: Zeyad Hassan, Manager, Land Development
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PREPARED BY
Michael Lafortune, C.E.T., Environmental Scientist
Joshua Foster, P.Eng., Lead Engineer

EXECUTIVE SUMMARY

This report describes a roadway traffic noise feasibility assessment undertaken in support of a rezoning and draft plan of subdivision application for the proposed residential subdivisions referred to as Green Lands East and West, located on the north side of Perth Street west of the town of Richmond in Ottawa, Ontario. The proposed Green Lands subdivision comprises two rectangular parcels of land, Green East and Green West, north of Perth Street, forming a square parcel of land when combined with the intervening Fox Run subdivision. The east parcel of land, Green East, located near the intersection of Perth Street and Rochelle Drive, includes a mixture of detached homes and townhouses. The west parcel, Green West, includes the same mixture of detached homes and townhouses on one half of the parcel (the north side) as well as a park. Townhouses are located on the south half of the parcel closest to Perth Street. Major sources of noise impacting the site include roadway traffic along Perth Street and Oldenburg Street. The site is surrounded by farmland and existing and proposed low-rise residential properties. Figure 1 illustrates the 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) draft site plan drawings provided by Gerrard Design.

Results of the roadway traffic noise calculations indicate that dwellings within the 55 dBA to 65 dBA contour (red and orange areas in contours) will require forced air heating with provision for air conditioning (see Figure 3). Results of the roadway traffic noise calculations also indicate that outdoor living areas on blocks adjacent to and having direct exposure to Perth Street will likely require noise control measures (see Figure 3). These measures are briefly described in Section 5.2, with the aim to reduce the L_{eq} to as close to 55 dBA as technically, economically and administratively feasible. It should be noted that dwellings within the subdivision will benefit from the blockage provided by the surrounding dwellings. A detailed roadway traffic noise study will be required at the time of subdivision registration to determine specific noise control measures for the development. Warning Clauses will also be required on purchase, sale, and lease agreements. Specific mitigation will be determined during the detailed design assessment.

TABLE OF CONTENTS

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Caivan Communities to undertake a roadway traffic noise feasibility assessment in support of a draft plan of subdivision application for the proposed residential subdivisions, referred to as Green Lands West and East, located on the north side of Perth Street west of the town of Richmond in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to a roadway traffic noise feasibility assessment and was prepared in consideration of the client's draft plan of subdivision application. Gradient Wind's scope of work involved assessing exterior noise levels throughout the site, generated by local roadway traffic.

The assessment was performed on the basis of theoretical noise calculation methods conforming to the City of Ottawa[1] and Ministry of the Environment, Conservation and Parks (MECP)[2] guidelines. Noise calculations were based on draft site plan drawings provided by Gerrard Design, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

2. TERMS OF REFERENCE

The proposed Green Lands subdivision comprises two rectangular parcels of land, Green East and Green West, north of Perth Street, forming a square parcel of land when combined with the intervening Fox Run subdivision. The east parcel of land, Green East, located near the intersection of Perth Street and Rochelle Drive, includes a mixture of detached homes and townhouses. The west parcel, Green West, includes the same mixture of detached homes and townhouses on one half of the parcel (the north side) as well as a park. Townhouses are located on the south half of the parcel closest to Perth Street.

Major sources of noise impacting the site include roadway traffic along Perth Street and Oldenburg Street. The site is surrounded by farmland and existing and proposed low-rise residential properties. Figure 1 illustrates the site plan with surrounding context.

---

[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

3. OBJECTIVES

The principal objective of this work is to calculate the future noise levels on the study site produced by local roadway traffic and explore potential for noise mitigation where required, noise calculations are based on initial concept plan provided by Caivan Communities, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

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 predicted noise levels at the plane of window (POW) dictate the action required to achieve the recommended indoor sound levels. 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[3].

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. This is typically done with noise control measures outlined in Section 5.2. When noise levels at these areas exceed the criteria, specific Warning Clause requirements may apply. As this is a preliminary assessment, noise control recommendations are of a general nature. Specific mitigation requirements would be the work of a future study.

4.2.2 Theoretical Roadway Noise Predictions

Noise predictions were determined by computer modelling using two programs. To provide a general sense of noise across the site, the employed software program was Predictor-Lima (TNM calculation), which incorporates the United States Federal Highway Administration's (FHWA) Transportation Noise Model (TNM) 2.5. This computer program is capable of representing three-dimensional surface and first reflections of sound waves over a suitable spectrum for human hearing. A receptor grid with 5 × 5 m spacing was placed across the study site, along with a number of discrete receptors at key sensitive areas.

Although this program outputs noise contours, it is not the approved model for roadway predictions by the City of Ottawa. Therefore, the results were confirmed by performing discrete noise calculations with the Ministry of the Environment, Conservations and Parks (MECP) computerized noise assessment program, STAMSON 5.04, at key receptor locations coinciding with receptor locations in Predictor as shown in Figure 2, as well as receptor distances. Appendix A includes the STAMSON 5.04 input and output data.

[3] MOECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3

Roadway noise calculations were performed by treating each road segment as separate line sources of noise. In addition to the traffic volumes summarized in Table 1 below, 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 was taken to be 92% / 8% respectively for all streets.
- Receptor heights taken to be 4.5 m above grade, representative of a 2nd-floor window.
- Absorptive and reflective intermediate ground surfaces based on specific source-receiver path ground characteristics.
- The study site was treated as having flat or gently sloping topography.
- Three receptors were strategically placed throughout the study area.
- Receptor distances and exposure angles are illustrated in Figure 2.

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[4] 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. It should be noted that Oldenburg Street is technically a rural collector which will have reduced traffic volumes compared to an urban collector. Traffic count estimates for these roadways are based on prior experience with other developments in the area, as well as confirmation from CGH Transportation Inc. Table 1 (below) summarizes the AADT values used for each roadway included in this assessment.

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

TABLE 1: ROADWAY TRAFFIC DATA

Roadway	Roadway Traffic Data	Speed Limit (km/h)	Traffic Volumes
Perth Street	2-UAU	50	**15,000**
Oldenburg Street	2-RCU	40	**6,140**

5. RESULTS AND DISCUSSION

5.1 Roadway Traffic Noise Levels

The results of the roadway traffic noise calculations for the daytime period, covering the entire study site, are shown in Figure 4-7 at ground level and 4.5 m above grade. Discrete receptors were also placed at key locations throughout the site. The noise contours were generated using TNM and verified with discrete receptors using STAMSON 5.04, as shown in Figure 2, and summarized in Table 2 below. Appendix A contains the complete set of input and output data from all STAMSON 5.04 calculations.

TABLE 2: EXTERIOR NOISE LEVELS DUE TO ROAD TRAFFIC

Receptor Number	Receptor Height Above Grade (m)	Receptor Location	STAMSON 5.04 Noise Level (dBA)		Predictor-Lima Noise Level (dBA)	
			Day	Night	Day	Night
1	4.5	POW – Green West Lands	56	48	57	50
2	4.5	POW – Green East Lands	55	48	55	48
3	4.5	POW – Green West Lands	63	55	62	55

As shown above, the results calculated from TNM have good correlation with calculations performed in STAMSON 5.04. A tolerance of 3 dBA between models is generally considered acceptable given human hearing cannot detect a change in sound level of less than 3 dBA. Results of the roadway traffic noise calculations indicated that dwellings within the 55 dBA contour (red and orange areas in contours) will require forced air heating with provision for air conditioning (see Figure 3). Results of the roadway traffic noise calculations also indicate that outdoor living areas on blocks adjacent to and having direct exposure to Perth Street will likely require noise control measures (see Figure 3). These measures are briefly described in Section 5.2, with the aim to reduce the L_{eq} to as to below 60 dBA as technically, economically and administratively feasible, as has been the adopted standard for other parts of this community. It should be noted that dwellings within the subdivision will benefit from the blockage provided by the surrounding dwellings. A detailed roadway traffic noise study will be required at the time of subdivision registration to determine specific noise control measures for the development. Warning Clauses will also be required on purchase, sale, and lease agreements. Specific mitigation will be determined during the detailed design assessment.

5.2 Noise Control Measures

The noise levels predicted due to roadway traffic, at a number of receptors, exceed the criteria listed in the ENCG for outdoor living areas, as discussed in Section 4.2. Therefore, noise control measures as described below, subscribing to Table 2.3a in the ENCG and listed in order of preference, will be required to reduce the L_{eq} to below 60 dBA and a close to 55 dBA as technically and administratively feasible:

- Distance setback with soft ground
- Insertion of noise insensitive land uses between the source and sensitive points of reception
- Orientation of buildings to provide sheltered zones in rear yards
- Shared outdoor amenity areas
- Earth berms (sound barriers)
- Acoustic barriers

6. CONCLUSIONS AND RECOMMENDATIONS

Results of the roadway traffic noise calculations indicate that dwellings within the 55 dBA contour (red and orange areas in contours) will require forced air heating with provision for air conditioning (see Figure 4 and 5). Results of the roadway traffic noise calculations also indicate that outdoor living areas on blocks adjacent to and having direct exposure to Perth Street will likely require noise control measures (see Figure 4). These measures are briefly described in Section 5.2, with the aim to reduce the L_{eq} to as close to 55 dBA as technically, economically and administratively feasible. It should be noted that dwellings within the subdivision will benefit from the blockage provided by the surrounding dwellings. A detailed roadway traffic noise study will be required at the time of subdivision registration to determine specific noise control measures for the development. Warning Clauses will also be required on purchase, sale, and lease agreements. Specific mitigation will be determined during the detailed design assessment.

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,

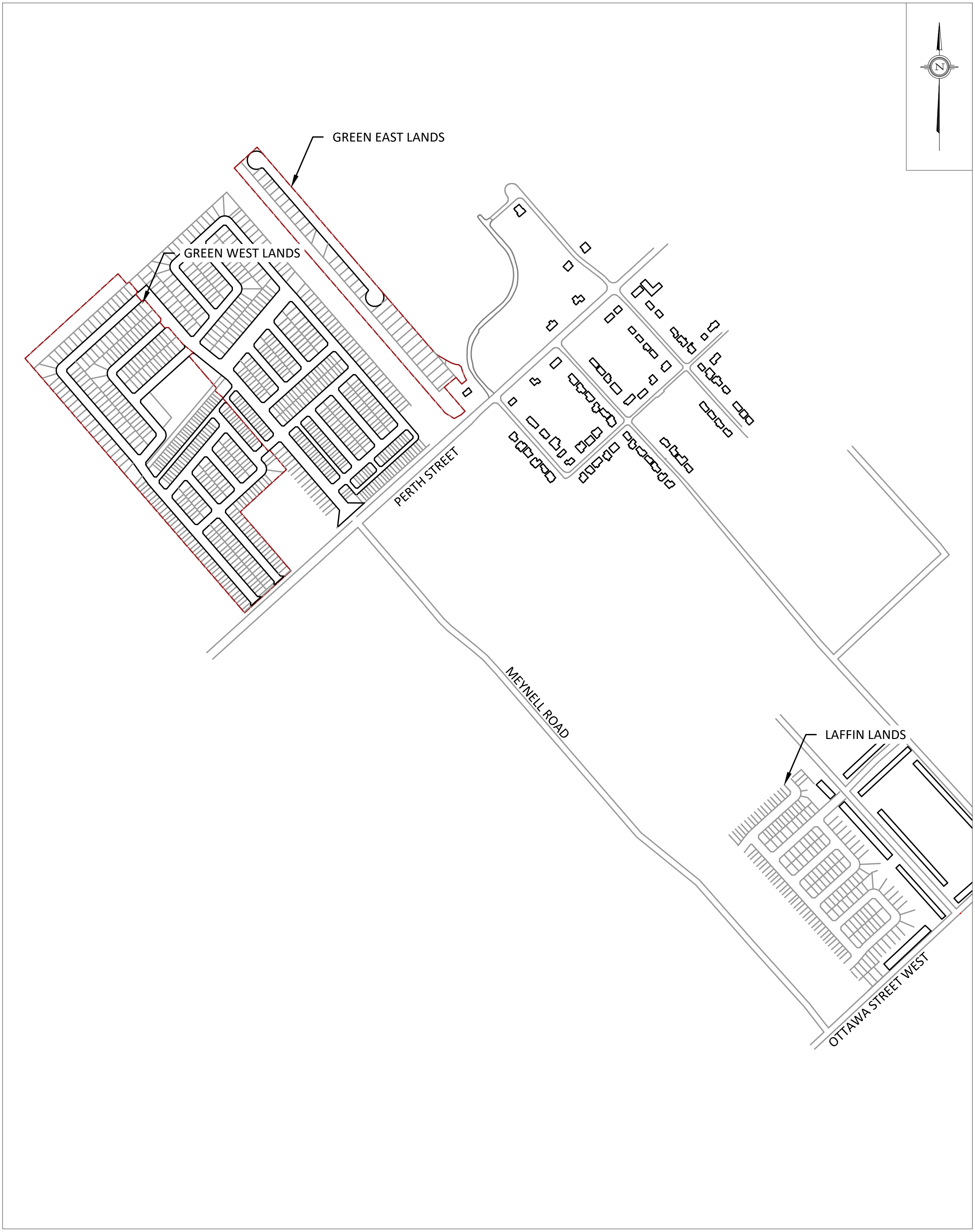
Gradient Wind Engineering Inc.

LICENSED PROFESSIONAL ENGINEER
J. R. FOSTER
100155655
April 20, 2022
PROVINCE OF ONTARIO

Michael Lafortune, C.E.T.
Environmental Scientist

Joshua Foster, P.Eng.
Lead Engineer

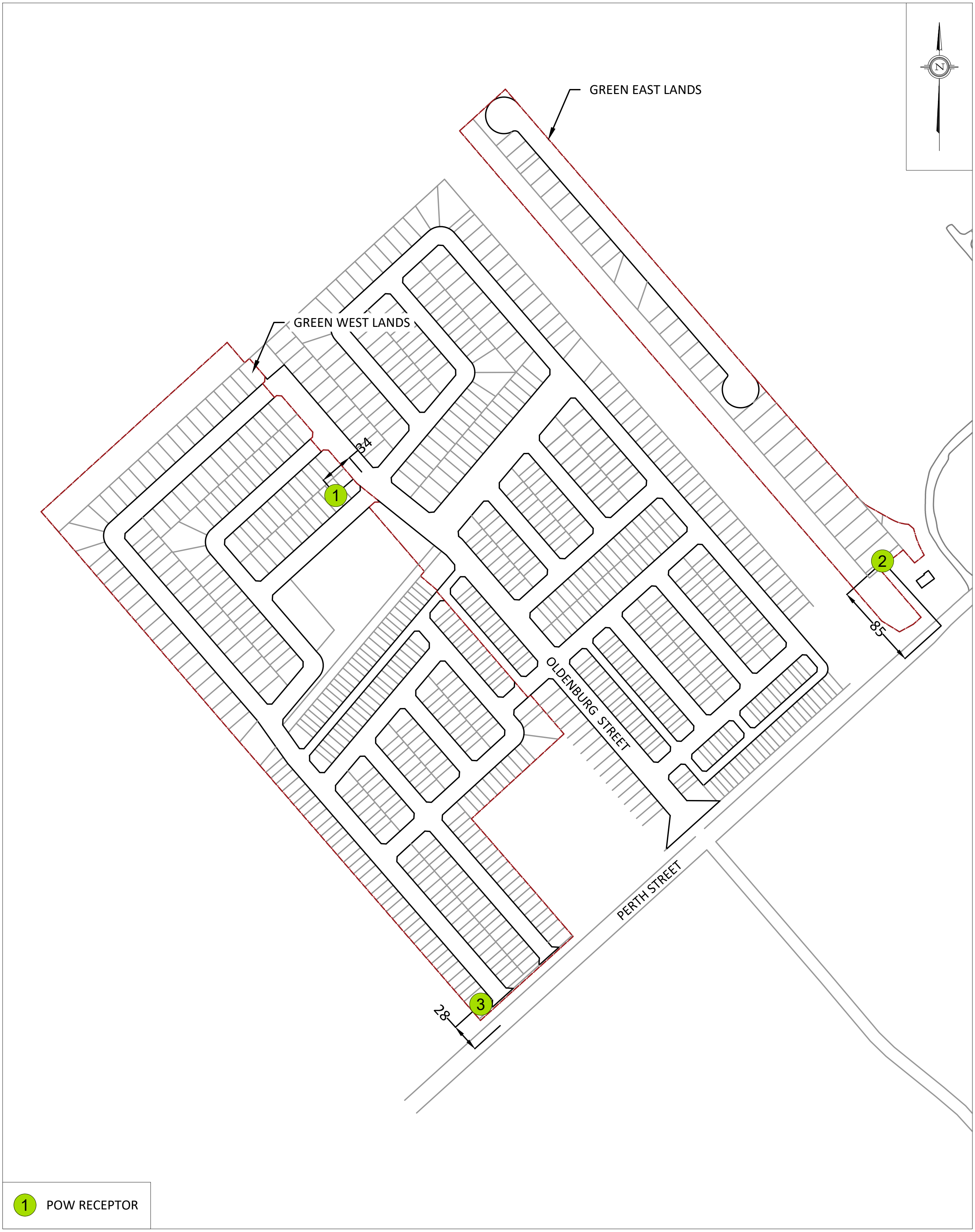
Gradient Wind File #20-081-Green West & East Traffic Noise R1



GRADIENTWIND
ENGINEERS & SCIENTISTS

127 WALGREEN ROAD , OTTAWA, ON
613 836 0934 • GRADIENTWIND.COM

PROJECT	GREEN WEST & EAST LANDS, OTTAWA ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT
SCALE	1:10000 (APPROX.)
DRAWING NO.	GW20-081-GREEN-1
DATE	APRIL 20, 2022
DRAWN BY	M.L.
DESCRIPTION	FIGURE 1: SITE PLAN AND SURROUNDING CONTEXT



1 POW RECEPTOR

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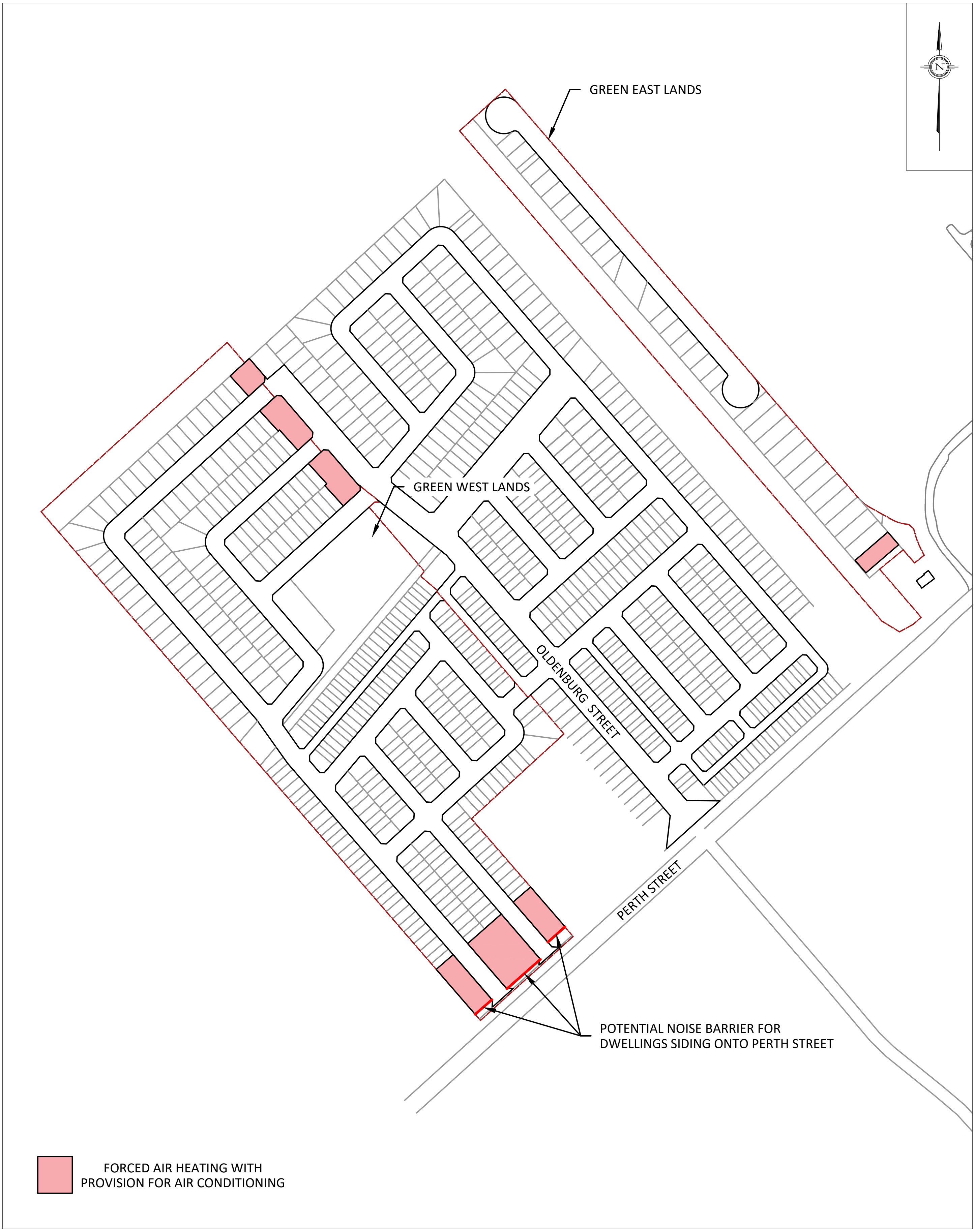
PROJECT	GREEN WEST & EAST LANDS, OTTAWA ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT		
SCALE	1:5000 (APPROX.)	DRAWING NO.	GW20-081-GREEN-2
DATE	APRIL 20, 2022	DRAWN BY	M.L.

DESCRIPTION

FIGURE 2:
RECEPTOR LOCATIONS AND STAMSON INPUT



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PROJECT	GREEN WEST & EAST LANDS, OTTAWA ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT		DESCRIPTION
SCALE	1:5000 (APPROX.)	DRAWING NO. GW20-081-GREEN-3	FIGURE 3: VENTILATION AND NOISE BARRIER REQUIREMENTS
DATE	APRIL 20, 2022	DRAWN BY M.L.	

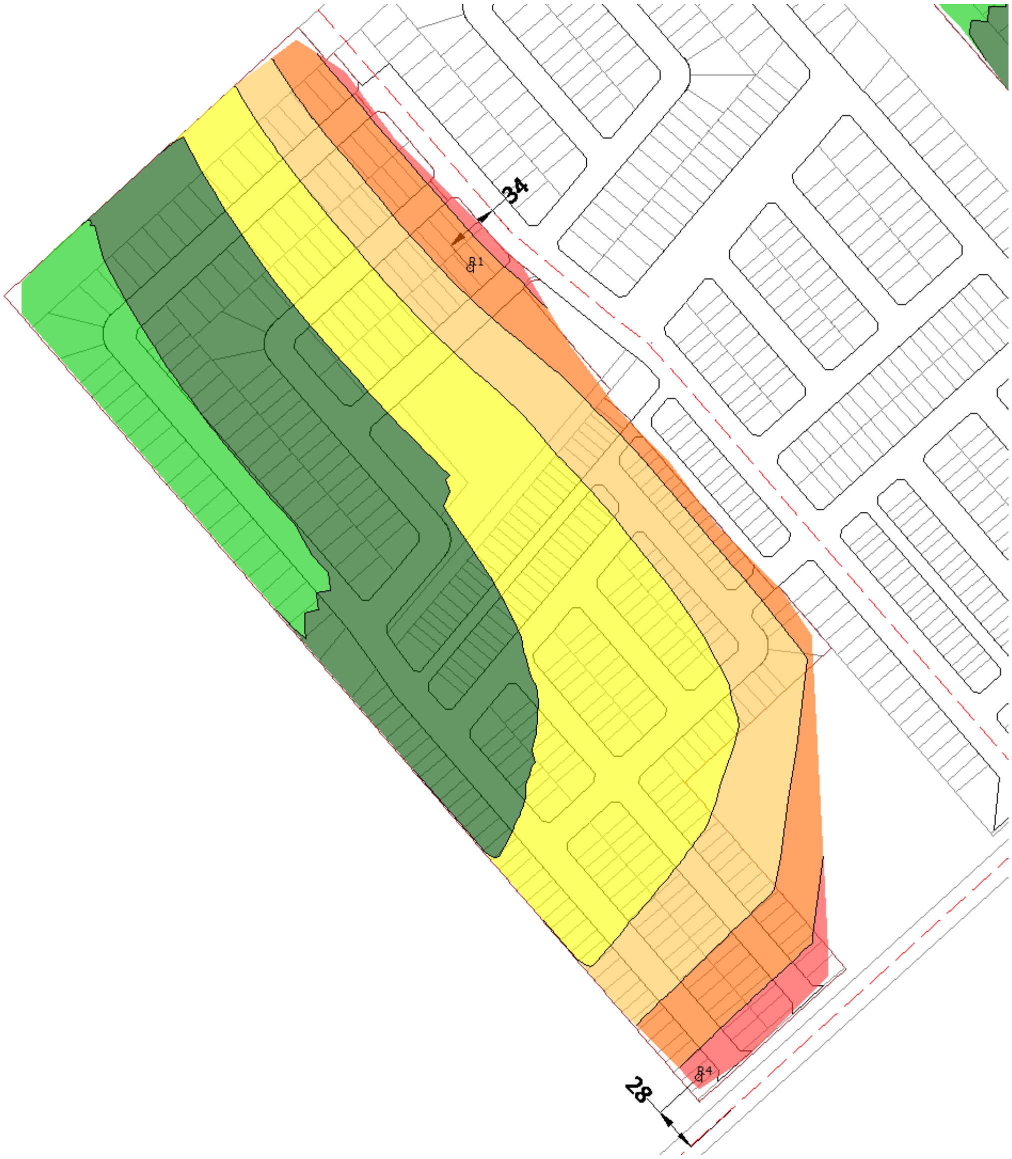


FIGURE 4: GROUND LEVEL NOISE CONTOURS FOR THE GREEN WEST SITE (DAYTIME PERIOD)

80 – 85 dB
75 – 80 dB
70 – 75 dB
65 – 70 dB
60 – 65 dB
55 – 60 dB
50 – 55 dB
45 – 50 dB
40 – 45 dB
35 – 40 dB
0 – 35 dB

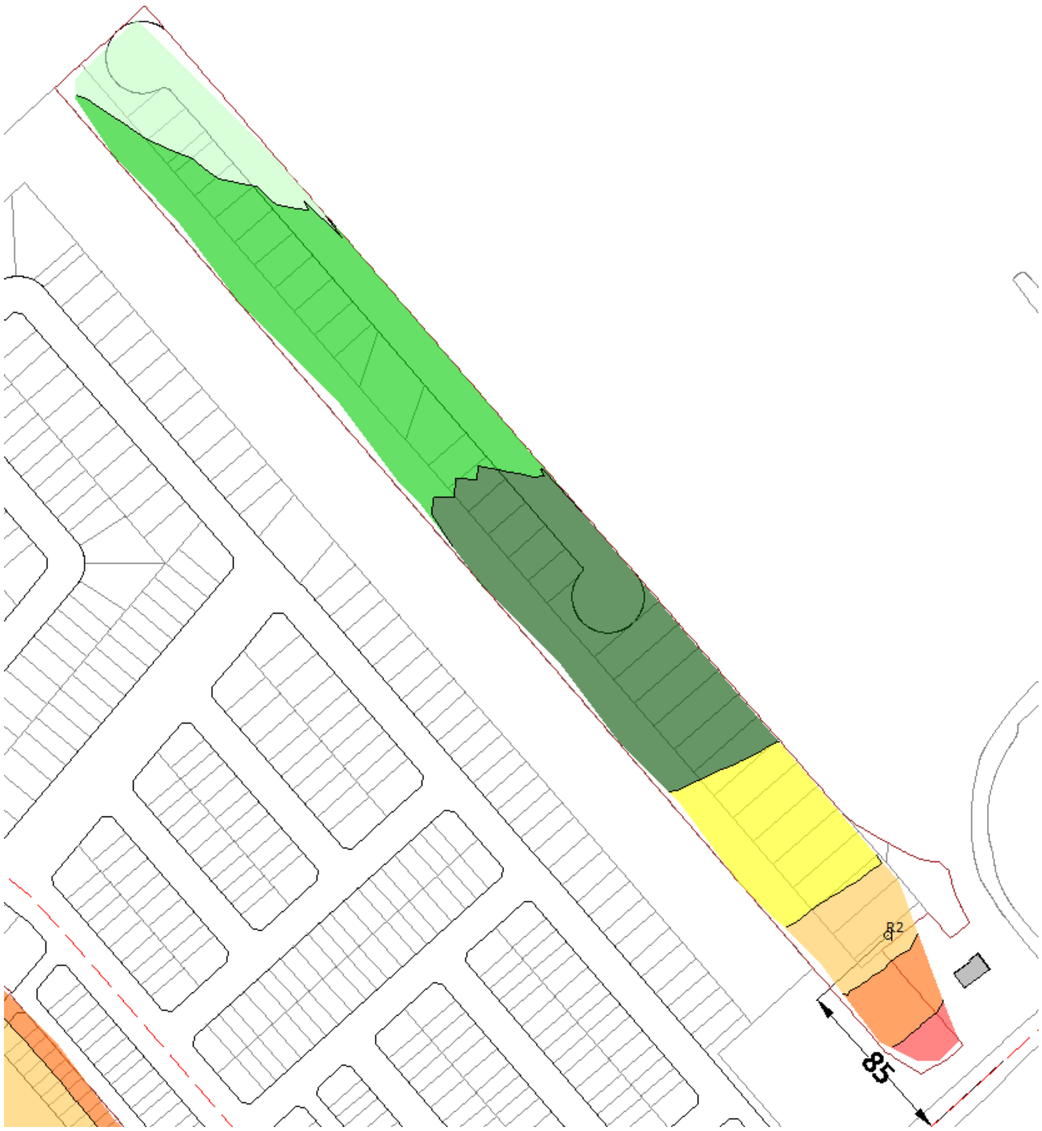


FIGURE 5: GROUND LEVEL NOISE CONTOURS FOR THE GREEN EAST SITE (DAYTIME PERIOD)

80 – 85 dB
75 – 80 dB
70 – 75 dB
65 – 70 dB
60 – 65 dB
55 – 60 dB
50 – 55 dB
45 – 50 dB
40 – 45 dB
35 – 40 dB
0 – 35 dB

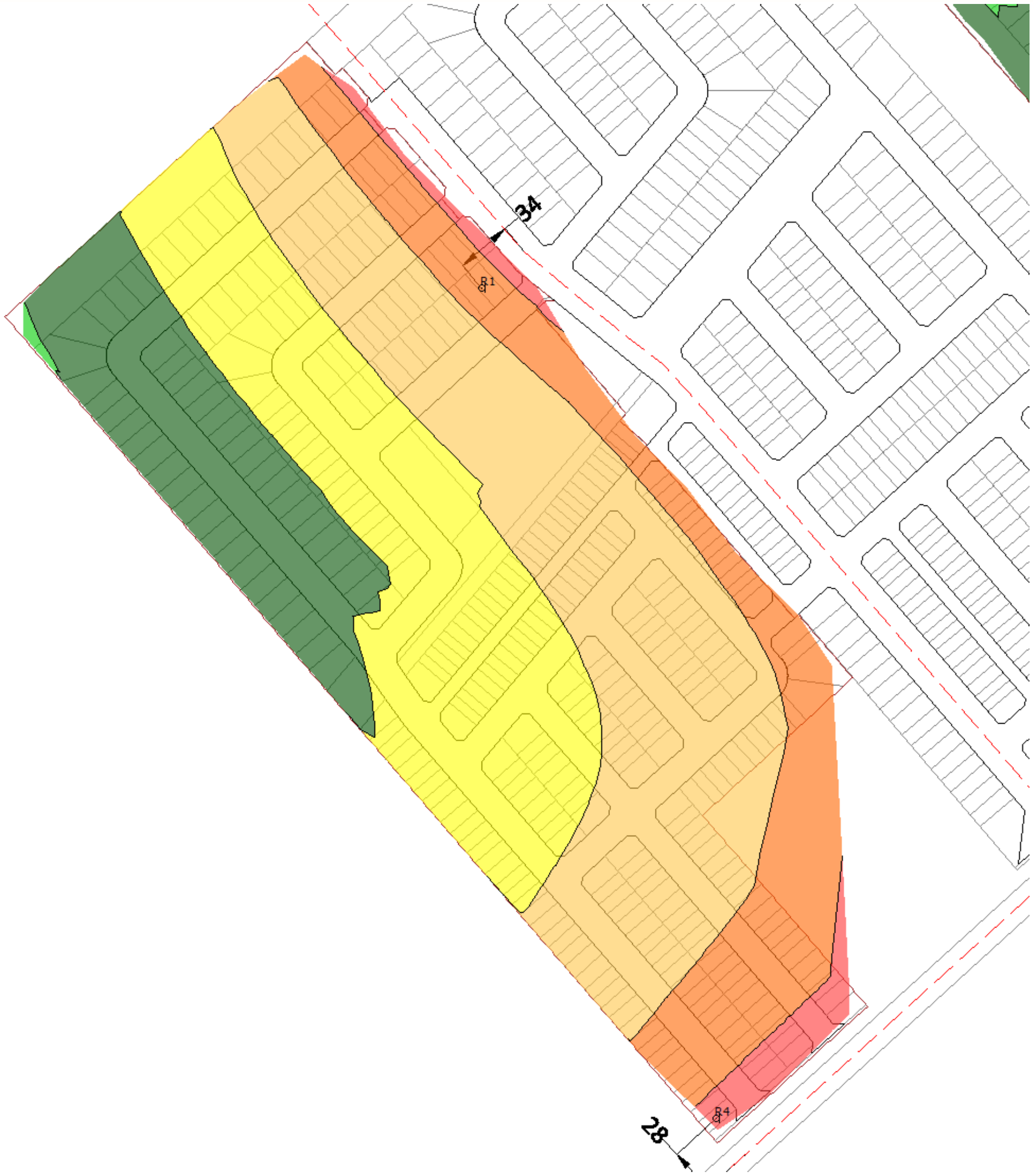


FIGURE 6: 4.5 M NOISE CONTOURS FOR THE GREEN WEST SITE (DAYTIME PERIOD)

80 – 85 dB
75 – 80 dB
70 – 75 dB
65 – 70 dB
60 – 65 dB
55 – 60 dB
50 – 55 dB
45 – 50 dB
40 – 45 dB
35 – 40 dB
0 – 35 dB

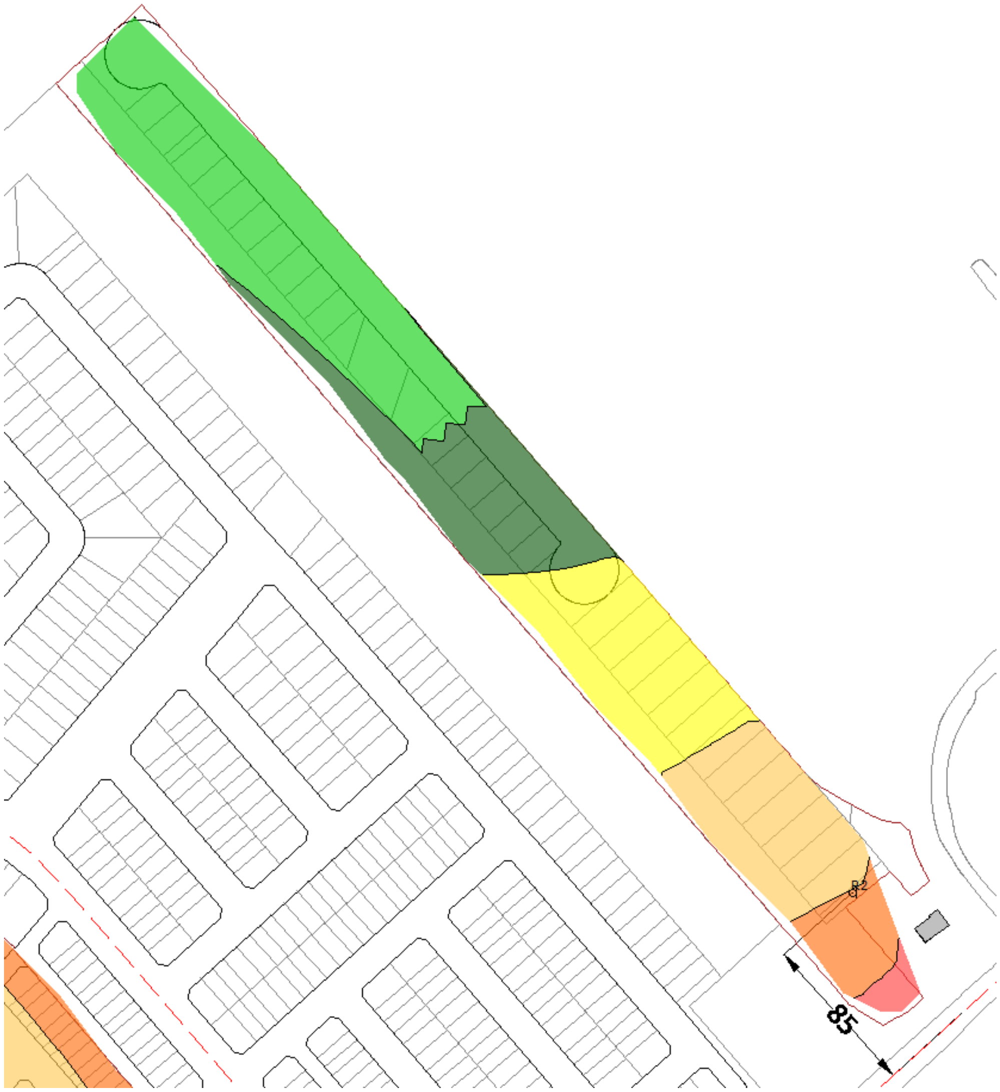
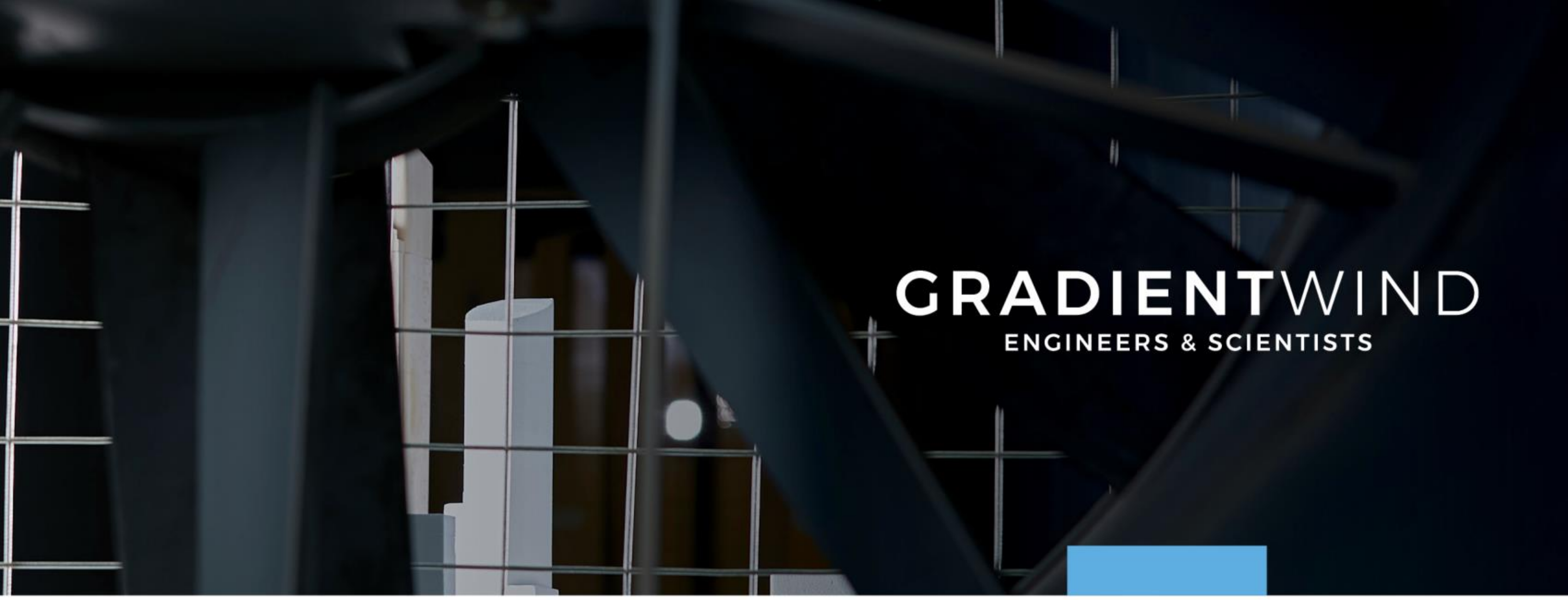
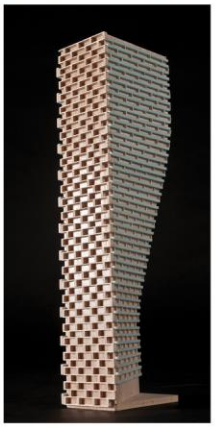
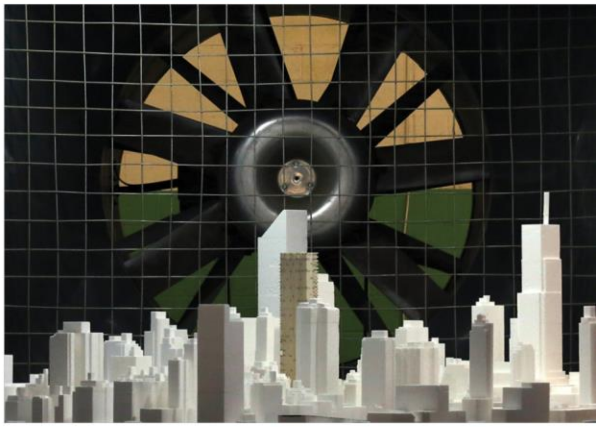


FIGURE 7: 4.5 M NOISE CONTOURS FOR THE GREEN EAST SITE (DAYTIME PERIOD)

80 – 85 dB
75 – 80 dB
70 – 75 dB
65 – 70 dB
60 – 65 dB
55 – 60 dB
50 – 55 dB
45 – 50 dB
40 – 45 dB
35 – 40 dB
0 – 35 dB







APPENDIX A

STAMSON 5.04 – INPUT AND OUTPUT DATA

127 WALGREEN ROAD, OTTAWA, ON, CANADA K0A 1L0 | 613 836 0934
GRADIENTWIND.COM

```
STAMSON 5.0        NORMAL REPORT        Date: 20-04-2022 14:24:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Meynell (day/night)
-------------------------------------------
Car traffic volume  :  4971/432   veh/TimePeriod  *
Medium truck volume :   395/34    veh/TimePeriod  *
Heavy truck volume  :   282/25    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):   6140
    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: Meynell (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  :  34.00 / 34.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.49 m

ROAD (0.00 + 55.92 + 0.00) = 55.92 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
----------------------------------------------------------------------------
   -90     90   0.57  62.80   0.00  -5.58  -1.30   0.00   0.00   0.00  55.92
----------------------------------------------------------------------------

Segment Leq : 55.92 dBA

Total Leq All Segments: 55.92 dBA


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

Source height = 1.50 m

ROAD (0.00 + 48.37 + 0.00) = 48.37 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
----------------------------------------------------------------------------
   -90     90   0.57  55.25   0.00  -5.58  -1.30   0.00   0.00   0.00  48.37
----------------------------------------------------------------------------

Segment Leq : 48.37 dBA

Total Leq All Segments: 48.37 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 55.92
                         (NIGHT): 48.37
```

```
STAMSON 5.0        NORMAL REPORT        Date: 15-05-2020 15:13:25
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Perth (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: Perth (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  :  85.00 / 85.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 55.35 + 0.00) = 55.35 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
----------------------------------------------------------------------------
   -90     90   0.57  68.48   0.00 -11.83  -1.30   0.00   0.00   0.00  55.35
----------------------------------------------------------------------------

Segment Leq : 55.35 dBA

Total Leq All Segments: 55.35 dBA


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

Source height = 1.50 m

ROAD (0.00 + 47.75 + 0.00) = 47.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
----------------------------------------------------------------------------
   -90     90   0.57  60.88   0.00 -11.83  -1.30   0.00   0.00   0.00  47.75
----------------------------------------------------------------------------

Segment Leq : 47.75 dBA

Total Leq All Segments: 47.75 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 55.35
                         (NIGHT): 47.75
```

```
STAMSON 5.0        NORMAL REPORT        Date: 15-05-2020 15:13:36
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Perth (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: Perth (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  :  28.00 / 28.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 62.92 + 0.00) = 62.92 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
----------------------------------------------------------------------------
   -90     90   0.57  68.48   0.00  -4.26  -1.30   0.00   0.00   0.00  62.92
----------------------------------------------------------------------------

Segment Leq : 62.92 dBA

Total Leq All Segments: 62.92 dBA


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

Source height = 1.50 m

ROAD (0.00 + 55.32 + 0.00) = 55.32 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
----------------------------------------------------------------------------
   -90     90   0.57  60.88   0.00  -4.26  -1.30   0.00   0.00   0.00  55.32
----------------------------------------------------------------------------

Segment Leq : 55.32 dBA

Total Leq All Segments: 55.32 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 62.92
                         (NIGHT): 55.32
```