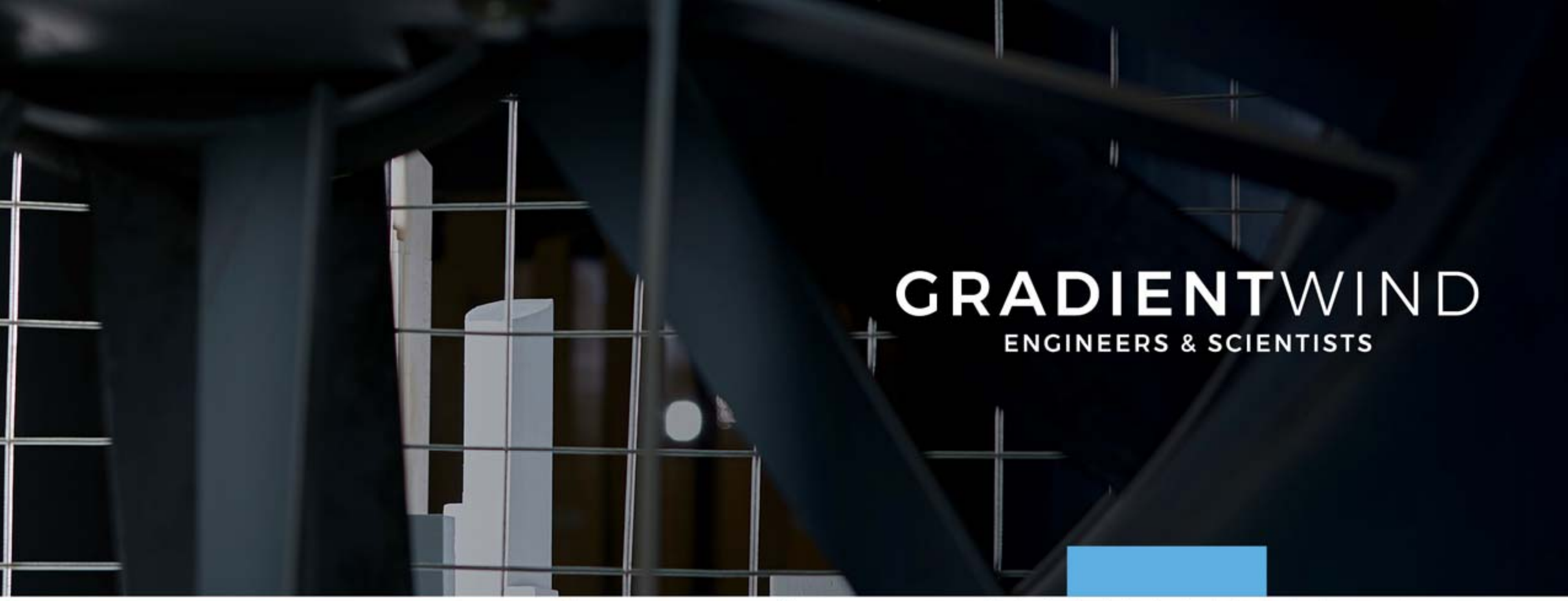
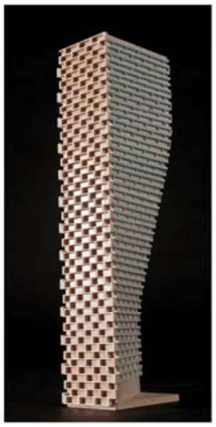


GRADIENTWIND
ENGINEERS & SCIENTISTS

STATIOANRY NOISE FEASIBILITY ASSESSMENT

564 Industrial Avenue
Ottawa, Ontario

REPORT: GWE19-032-Stationary Noise



March 22, 2019

PREPARED FOR
Mike Green
Director of Development
Controlex Corporation
100-223 Colonnade Road South
Nepean, Ontario
K2E 7K3

PREPARED BY
Giuseppe Garro, Junior Environmental Scientist
Joshua Foster, P.Eng., Principal

EXECUTIVE SUMMARY

This report describes a stationary noise feasibility assessment performed for a proposed commercial development located at 564 Industrial Avenue in Ottawa, Ontario. The development comprises a one-storey, irregular planform commercial building. A parking lot is found at the south side of the site, accessed by a laneway along the east perimeter of the site, from Industrial Avenue. The major sources of stationary noise influencing the development include the existing rooftop HVAC equipment from the Metro food distribution facility to the west as well as commercial and retail buildings to the north and east. Other sources of stationary noise include idling refrigerated trucks and trailers as well as truck movements associated with the Metro food distribution centre. Figure 1 illustrates a 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), and; (iii) architectural drawings prepared by McRobie Architects + Interior Designers dated February 11, 2019.

The results of the current study indicate that noise levels at the development due to existing stationary sources are expected to fall below generally acceptable noise levels, based on the ENCG sound level criteria. As indicated in Table 5, background noise levels are more dominant than noise due to the existing stationary sources surrounding the site. With consideration of Gradient Wind's assumptions, the proposed development is expected to be compatible with the existing land uses based on the ENCG criteria for a Class 1 area.

During the time of site plan application, the stationary noise impacts of the building on the surroundings would be considered. Stationary noise sources associated with the development could include rooftop air handling units, cooling towers or dry coolers, and emergency generators. Noise from these sources however can be controlled to acceptable limits established by MECP by judicious selection of the equipment, locating the equipment on high roof away from nearby residential receptors, and where necessary installing silencers or noise screens.

TABLE OF CONTENTS

1. INTRODUCTION 1

2. TERMS OF REFERENCE 1

2.1 Assumptions 2

3. OBJECTIVES 3

4. METHODOLOGY 3

4.1 Perception of Noise 3

4.2 Stationary Noise Criteria 4

4.3 Determination of Noise Source Power Levels 5

4.4 Stationary Source Noise Predictions 5

5. RESULTS AND DISCUSSION 7

6. CONCLUSIONS AND RECOMMENDATIONS 9

FIGURES

APPENDICES

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

Appendix B – Predictor-Lima Input and Output Data and Supporting Information

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Controlex Corporation to undertake a stationary noise feasibility assessment for the proposed development at 564 Industrial Avenue in Ottawa, Ontario. This report summarizes the methodology, results and recommendations related to a stationary noise feasibility assessment.

The assessment was performed based on theoretical noise calculation methods conforming to the City of Ottawa[1] and Ministry of the Environment, Conservation and Parks (MECP) NPC-300[2] guidelines, architectural drawings prepared by McRobie Architects + Interior Designers dated February 11, 2019, mechanical information assumed by Gradient Wind based on experience with similar projects, surrounding street layouts obtained from the City of Ottawa, and recent site imagery.

2. TERMS OF REFERENCE

The focus of this stationary noise feasibility assessment is the proposed commercial development at 564 Industrial Avenue in Ottawa, Ontario. The development as it is currently proposed is not considered to be noise sensitive, but as part of the rezoning application the zoning designation be sought is General Mixed-Use Zone, which has provisions for residential and other noise sensitive land uses. Therefore, this report examined any potential impacts encase the land use of the building changed to a more sensitive land use.

The development is located on an irregular, square parcel of land bounded by Industrial Avenue to the north and Coronation Avenue to the south. The development comprises a one-storey, irregular planform commercial building. A parking lot is found at the south side of the site, accessed by a laneway along the east perimeter of the site, from Industrial Avenue. The development site borders an existing “linear park” area to the south with Coronation Avenue and residential properties beyond, as well as commercial properties, such as the Metro Food Distribution Centre to the west and Turris Communications to the east. Figure 1 illustrates the site plan and surrounding context.

---

[1] City of Ottawa Environmental Noise Control Guidelines, January 2016

[2] Ministry of the Environment, Conservation and Parks (MOECP), Environmental Noise Guideline – Publication NPC-300, August 2013

Stationary sources near the development will be in operation during all hours of the day while certain sources are likely to have reduced operation during the nighttime period between 23:00 and 07:00. The major sources of stationary noise influencing the development include the existing rooftop HVAC equipment from the Metro food distribution facility to the west as well as commercial and retail buildings to the north and east. Other sources of stationary noise include idling trucks and refrigerated trailer air conditioners (reefers) as well as truck movements associated with the Metro food distribution centre. Figure 2 illustrates the location of all noise sources included in this study.

2.1 Assumptions

Stationary sources of noise on the rooftop were identified based on a review of satellite imagery near the development. Gradient Wind has assumed sound data of the rooftop mechanical equipment and truck movement based on experience with similar developments. Truck movement frequency, as well as the location of idling reefer trucks, is based on delivery schedule and operations provided by Metro Corporation. Based on the information gathered, the following assumptions have been included in the analysis:

(i) Six (6) idling reefer trucks were conservatively modelled at the west loading dock of the Metro Food Distribution Facility for one (1) hour during the daytime period (07:00 – 23:00) and nighttime period (23:00-07:00) respectively.

(ii) Four (4) truck movements were conservatively modelled at the east parking lot of the Metro Food Distribution Facility per hour during the daytime period (07:00 – 23:00) and nighttime period (23:00-07:00) respectively.

(iii) The locations, quantity and tonnage of rooftop units has been assumed based on Gradient Wind's experience with similar distribution, commercial and retail buildings (refer to Figure 3 and 4).

(iv) Sound data for reefer units and truck movements are based on Gradient Wind's past experience and measurements. Truck movement frequency is based on delivery schedule and operations provided by Metro Corporation.

(v) The rooftop mechanical units are assumed to operate continuously over a 1-hour period during the daytime and at 50% operation during the nighttime period.

(vi) Screening effects of the parapets have been included in the modelling.

3. OBJECTIVES

The main goals of this work are to (i) calculate the future noise levels on the development due to external stationary noise sources, and (ii) explore potential noise mitigation where required.

4. METHODOLOGY

The impact of the external stationary noise sources onto the development was determined by computer modelling. Stationary noise source modelling is based on the software program *Predictor-Lima* developed from the International Standards Organization (ISO) standard 9613 Parts 1 and 2. This computer program simulates three-dimensional surfaces and first reflections of sound waves over a suitable spectrum for human hearing. This methodology has been used on numerous assignments and has been accepted by the MECP as part of Environmental Compliance Approvals applications. Eleven (11) receptor locations were selected for the study site, as illustrated in Figure 2.

4.1 Perception of Noise

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 source, the sound pressure depends on the location of the receiver and the path that the noise takes to reach the receiver. Its measurement 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 represents the noise perceived by the human ear. With this scale, a doubling of sound power at the source results in a 3 dBA increase in measured noise levels at the receiver and is just perceptible to most people. An increase of 10 dBA is often perceived to be twice as loud.

Stationary sources are defined in NPC-300 as "a source of sound or combination of sources of sound that are included and normally operated within the property lines of a facility and includes the premises of a person as one stationary source, unless the dominant source of sound on those premises is construction"[3].

[3] NPC – 300, page 16

4.2 Stationary Noise Criteria

The equivalent sound energy level, L_{eq}, provides a weighted 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 selected period of time. For stationary sources, the L_{eq} is commonly calculated on an hourly interval, while for roadways, the L_{eq} is calculated on the basis of a 16-hour daytime/8-hour nighttime split.

Noise criteria taken from the NPC-300 apply to outdoor points of reception (POR). A POR is defined under NPC-300 as "any location on a noise sensitive land use where noise from a stationary source is received"[4]. A POR can be located on an existing or zoned for future use premises of permanent or seasonal residences, hotels/motels, nursing/retirement homes, rental residences, hospitals, camp grounds, and noise sensitive buildings such as schools and places of worship. According to the ENCG, the recommended maximum noise level for an urban (Class 1) environment at a POR is either the lowest one-hour background noise level due to other sources, or the exclusionary limits outlined in Table 1, whichever is higher. The study site is considered to be in a Class 1 area because it is located at the intersection of an arterial roadway and local roadway. These conditions indicate that the sound field is dominated by manmade sources.

TABLE 1: EXCLUSIONARY LIMITS FOR CLASS 1 AREA

Time of Day	Outdoor Points of Reception	Plane of Window
07:00 – 19:00	50	50
19:00 – 23:00	50	50
23:00 – 07:00	N/A	45

As the subject site is located adjacent to an arterial roadway, which produce a high level of ambient noise, calculations were performed to determine appropriate background noise levels due to roadway traffic to compare against the noise impacts from the nearby stationary sources. Traffic data was obtained from the City of Ottawa for the intersection of Industrial Avenue and Trainyards Drive; however, data was

[4] NPC – 300, page 14

limited to daytime traffic volumes. Gradient Wind performed calculations using STAMSON software at various receptor locations (see Figure 5). Calculations were based on the lowest hourly traffic data of 1364 vehicles per hour on Industrial Avenue. The mix of truck traffic was assumed to comprise 3% medium trucks and 2% heavy trucks as per the count obtained from the City of Ottawa.

For the source to receiver path, hard/reflective ground was assumed given the majority of the ground surface will be covered by asphalt. Noise levels were assumed to be 10 dBA less during nighttime hours. Details of the calculations are presented in Appendix A.

4.3 Determination of Noise Source Power Levels

Sound power data was assumed based on Gradient Wind's experience with similar types of distribution, retail and commercial buildings, as well as typical pieces equipment associated with said buildings. Table 2 summarizes the sound power of each source used in the analysis.

TABLE 2: EQUIPMENT SOUND POWER LEVELS (dBA)

Source ID	Description	Height Above Grade/Roof (m)	Frequency (Hz)								
			63	125	250	500	1000	2000	4000	8000	Total
S1-S31	5-10 Ton RTU	1.5	56	68	75	79	80	77	77	70	85
S32-S37	Reefer Unit	2.7	-	-	-	-	98	-	-	-	98
S38	Truck Movement	2.7	80	90	97	101	102	97	91	82	106

4.4 Stationary Source Noise Predictions

The impact of surrounding stationary noise sources on 564 Industrial Avenue was determined by computer modelling using the software program *Predictor-Lima*. This program was developed from the International Standards Organization (ISO) standard 9613 Parts 1 and 2 and is capable of representing three-dimensional surfaces and first reflections of sound waves over a suitable spectrum for human hearing.

Eleven individual noise sensor locations were selected in the *Predictor-Lima* model to measure the noise impact at points of reception (POR) during the daytime/evening period (07:00 – 23:00), as well as during the nighttime period (23:00 – 07:00). POR locations include outdoor points of reception (OPOR) and the plane of windows (POW) of the development. Sensor locations are described in Table 3 and illustrated in Figure 2. All mechanical equipment was represented as point sources in the model. Table 4 below contains Predictor-Lima calculation settings. These are typical settings that have been based on ISO 9613 standards and guidance from the MECP.

Ground absorption over the study area was determined based on topographical features (such as water, concrete, grassland, etc.). An absorption value of 0 is representative of hard ground, while a value of 1 represents grass and similar soft surface conditions. Existing and proposed buildings were added to the model to account for screening and reflection effects from building façades. A Predictor-Lima sample output is available in Appendix B.

TABLE 3: RECEPTOR LOCATIONS

Receptor Number	Receptor Location	Height Above Grade (m)
R1	POW – 564 Industrial Avenue – North Façade	1.5
R2	POW – 564 Industrial Avenue – North Façade	1.5
R3	POW – 564 Industrial Avenue – North Façade	1.5
R4	POW – 564 Industrial Avenue – North Façade	1.5
R5	POW – 564 Industrial Avenue – East Façade	1.5
R6	POW – 564 Industrial Avenue – East Façade	1.5
R7	POW – 564 Industrial Avenue – South Façade	1.5
R8	POW – 564 Industrial Avenue – East Façade	1.5
R9	POW – 564 Industrial Avenue – South Façade	1.5

TABLE 3 (CONTINUED): RECEPTOR LOCATIONS

Receptor Number	Receptor Location	Height Above Grade (m)
R10	POW – 564 Industrial Avenue – West Façade	1.5
R11	POW – 564 Industrial Avenue – West Façade	1.5

TABLE 4: CALCULATION SETTINGS

Parameter	Setting
Meteorological correction method	Single value for C0
Value C0	2.0
Default ground attenuation factor	1
Ground attenuation factor for roadways and paved areas	0
Temperature (K)	283.15
Pressure (kPa)	101.33
Air humidity (%)	70

5. RESULTS AND DISCUSSION

Noise levels at the receptors from the surrounding stationary sources fall below the ENCG criteria for stationary noise, as summarized in Table 5 below. The sound levels listed in Table 5 are based on the assumptions outlined in Section 2.1.

TABLE 5: NOISE LEVELS FROM EXISTNG STATIONARY SOURCES

Receptor Number	Plane of Window Receptor Location	Noise Level (dBA)		Sound Level Limits		Meets ENCG Class 4 Criteria	
		Day	Night	Day	Night	Day	Night
R1	POW – 564 Industrial Avenue – North Façade	51	50	63*	53*	Yes	Yes
R2	POW – 564 Industrial Avenue – North Façade	49	48	63*	53*	Yes	Yes
R3	POW – 564 Industrial Avenue – North Façade	46	44	63*	53*	Yes	Yes
R4	POW – 564 Industrial Avenue – North Façade	46	44	63*	53*	Yes	Yes
R5	POW – 564 Industrial Avenue – East Façade	49	46	63*	53*	Yes	Yes
R6	POW – 564 Industrial Avenue – East Façade	49	46	63*	53*	Yes	Yes
R7	POW – 564 Industrial Avenue – South Façade	44	42	63*	53*	Yes	Yes
R8	POW – 564 Industrial Avenue – East Façade	40	38	63*	53*	Yes	Yes
R9	POW – 564 Industrial Avenue – South Façade	48	48	63*	53*	Yes	Yes
R10	POW – 564 Industrial Avenue – West Façade	51	50	63*	53*	Yes	Yes
R11	POW – 564 Industrial Avenue – West Façade	52	51	63*	53*	Yes	Yes

* Based on background noise levels at R11

As Table 5 summarizes, background noise levels are the dominant source of noise and none of the noise levels due to the surrounding existing stationary sources of noise are expected to exceed background noise levels. The main contributor of stationary noise on the development are truck movements to the west of the site. Noise contours at 1.5 m above grade can be seen in Figure 6 and 7 for daytime and nighttime conditions, respectively. With consideration of Gradient Wind's assumptions, the proposed development is expected to be compatible with the existing land uses based on the ENCG criteria for a Class 1 area.

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current study indicate that noise levels at the development due to existing stationary sources are expected to fall below generally acceptable noise levels, based on the ENCG sound level criteria. As indicated in Table 5, background noise levels are more dominant than noise from the existing stationary sources presented in Table 2. With consideration of Gradient Wind's assumptions, the proposed development is expected to be compatible with the existing land uses based on the ENCG criteria for a Class 1 area.

During the time of site plan application, the stationary noise impacts of the building on the surroundings would be considered. Stationary noise sources associated with the development could include rooftop air handling units, cooling towers or dry coolers, and emergency generators. Noise from these sources however can be controlled to acceptable limits established by MECP by judicious selection of the equipment, locating the equipment on high roof away from nearby residential receptors, and where necessary installing silencers or noise screens.

This concludes our 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.

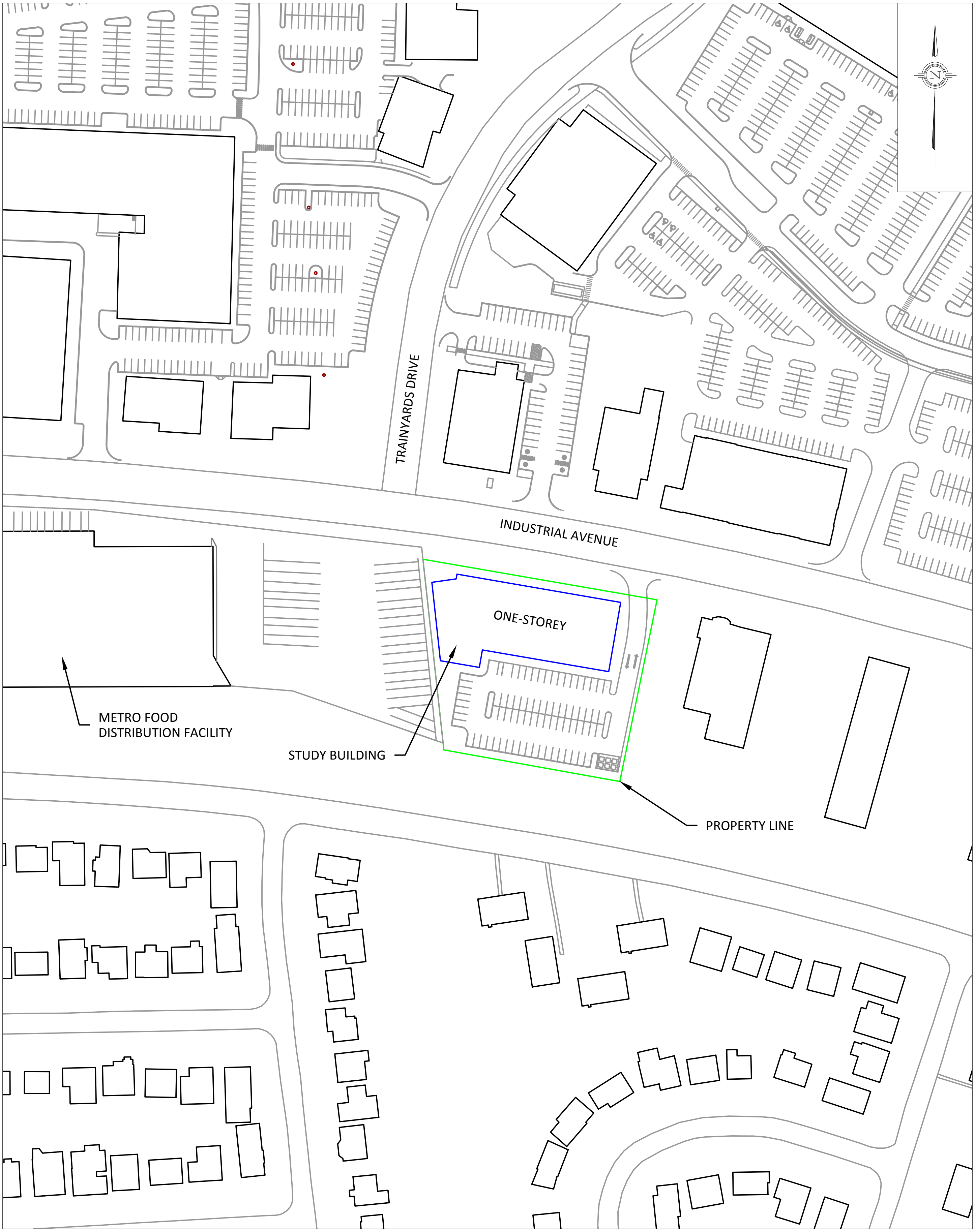
Sincerely,

Gradient Wind Engineering Inc.

Giuseppe Garro, MASc.
Junior Environmental Scientist

Joshua Foster, P.Eng.
Principal

GWE19-032

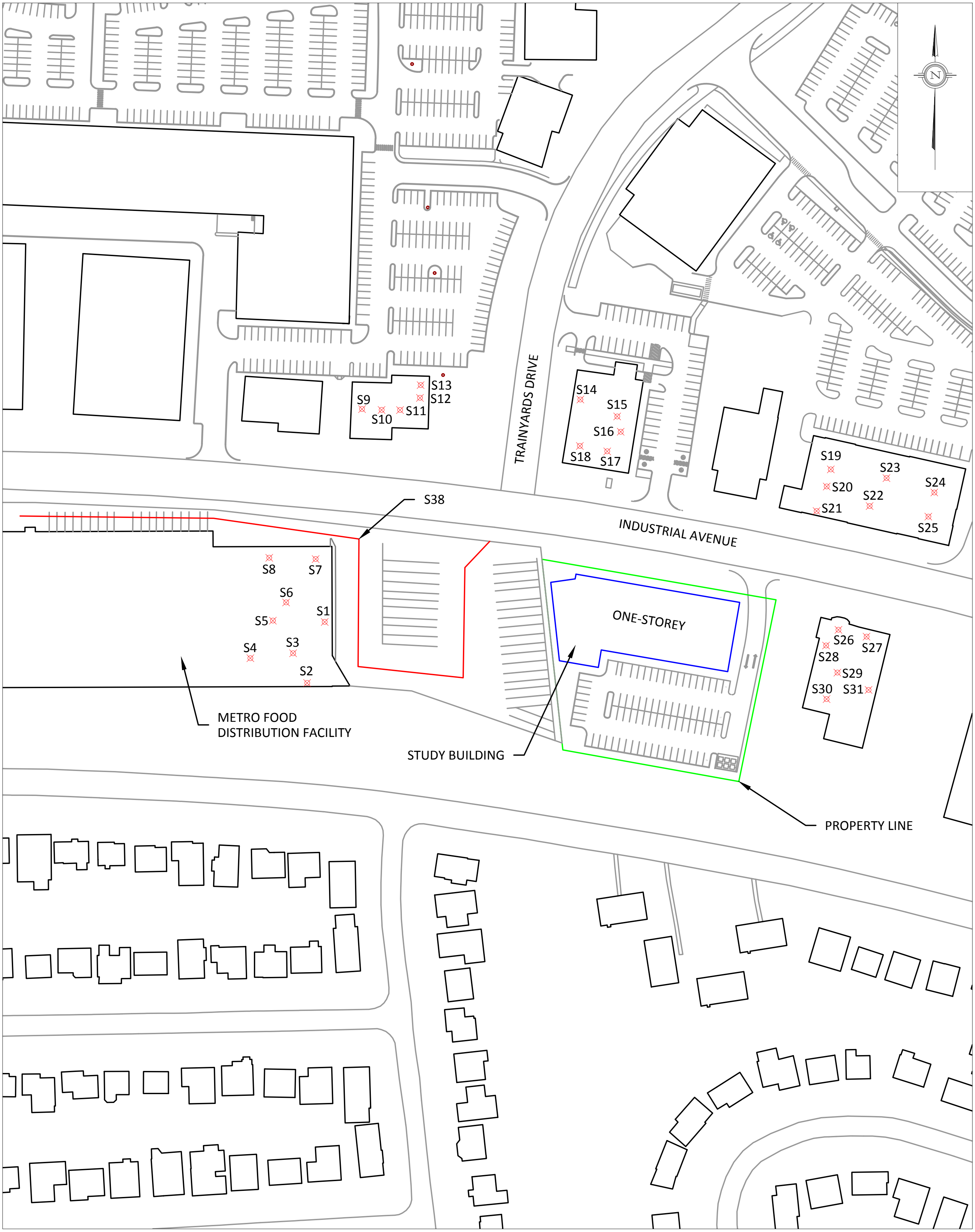


GRADIENTWIND
ENGINEERS & SCIENTISTS
127 WALGREEN ROAD , OTTAWA, ON
613 836 0934 • GRADIENTWIND.COM

PROJECT	564 INDUSTRIAL AVENUE - STATIONARY NOISE FEASIBILITY STUDY
SCALE	1:2000 (APPROX.)
DRAWING NO.	GWE19-032
DATE	MARCH 21, 2019
DRAWN BY	G.G.
DESCRIPTION	FIGURE 1: SITE PLANE AND SURROUNDING CONTEXT

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

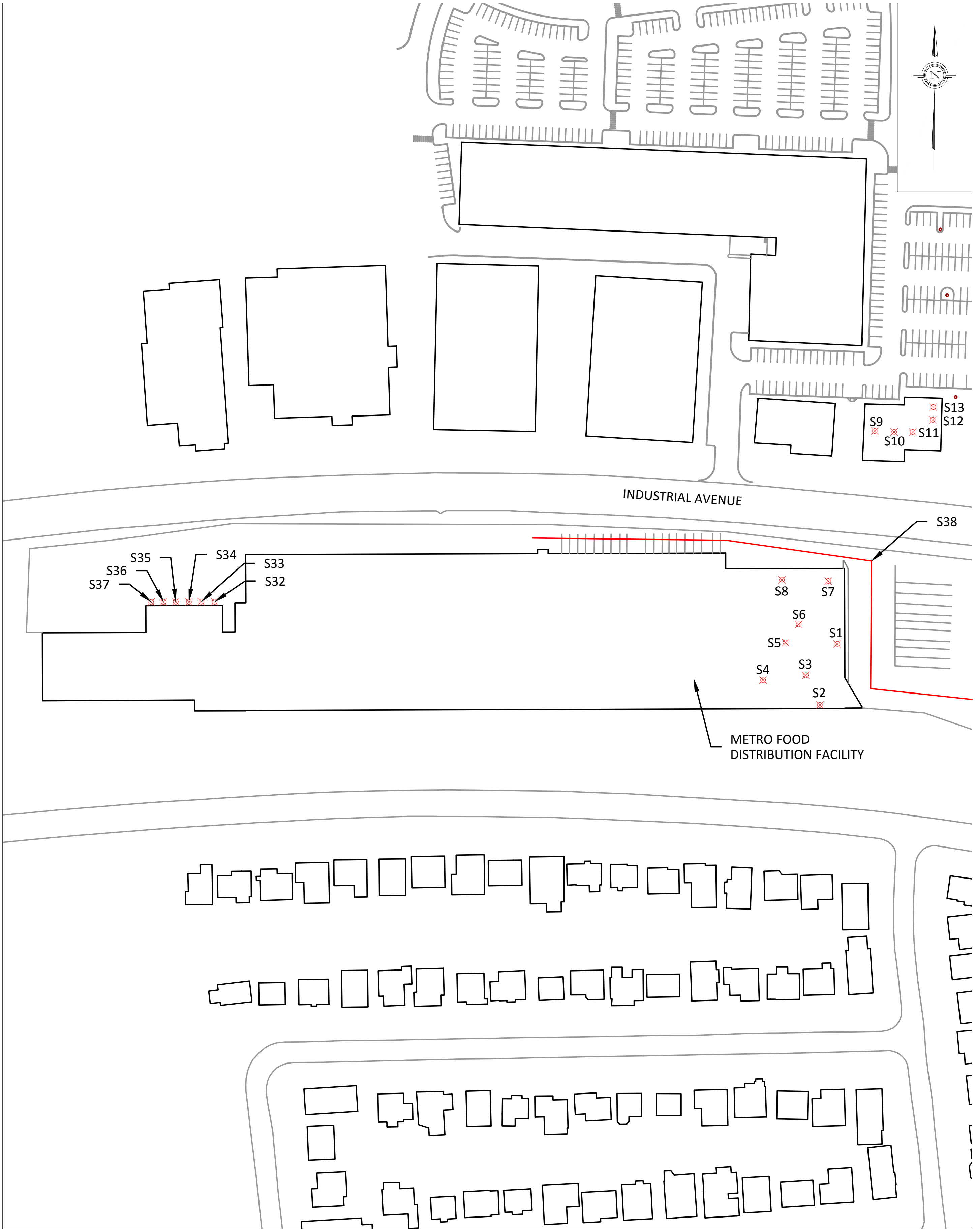
PROJECT	564 INDUSTRIAL AVENUE - STATIONARY NOISE FEASIBILITY STUDY
SCALE	1:500 (APPROX.)
DRAWING NO.	GWE19-032
DATE	MARCH 21, 2019
DRAWN BY	G.G.
DESCRIPTION	FIGURE 2: RECEPTOR LOCATIONS



GRADIENTWIND
ENGINEERS & SCIENTISTS

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

PROJECT 564 INDUSTRIAL AVENUE - STATIONARY NOISE FEASIBILITY STUDY		DESCRIPTION
SCALE 1:2000 (APPROX.)	DRAWING NO. GWE19-032	FIGURE 3: STATIONARY NOISE SOURCE LOCATIONS
DATE MARCH 21, 2019	DRAWN BY G.G.	



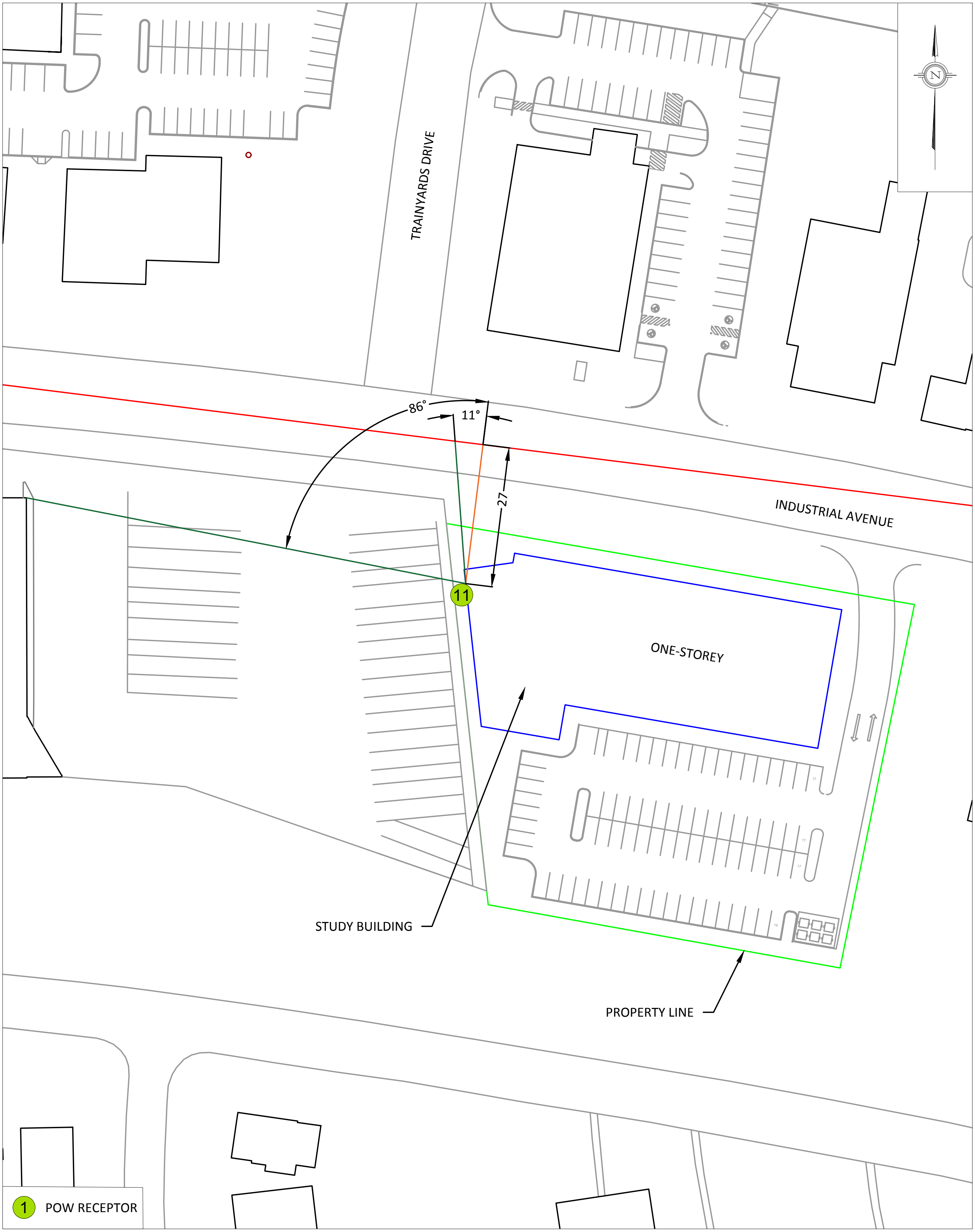
GRADIENTWIND
ENGINEERS & SCIENTISTS

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

PROJECT	564 INDUSTRIAL AVENUE - STATIONARY NOISE FEASIBILITY STUDY		
SCALE	1:2000 (APPROX.)	DRAWING NO.	GWE19-032
DATE	MARCH 21, 2019	DRAWN BY	G.G.

DESCRIPTION

FIGURE 4:
STATIONARY NOISE SOURCE LOCATIONS

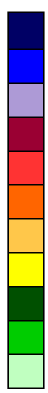


GRADIENTWIND
ENGINEERS & SCIENTISTS

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

PROJECT: 564 INDUSTRIAL AVENUE - STATIONARY NOISE FEASIBILITY STUDY		DESCRIPTION: FIGURE 5: STAMSON BACKGROUND NOISE INPUT PARAMETERS
SCALE: 1:1000 (APPROX.)	DRAWING NO.: GWE19-032	
DATE: MARCH 21, 2019	DRAWN BY: G.G.	

FIGURE 6: GROUND LEVEL NOISE CONTOURS FOR THE SITE (DAYTIME PERIOD)



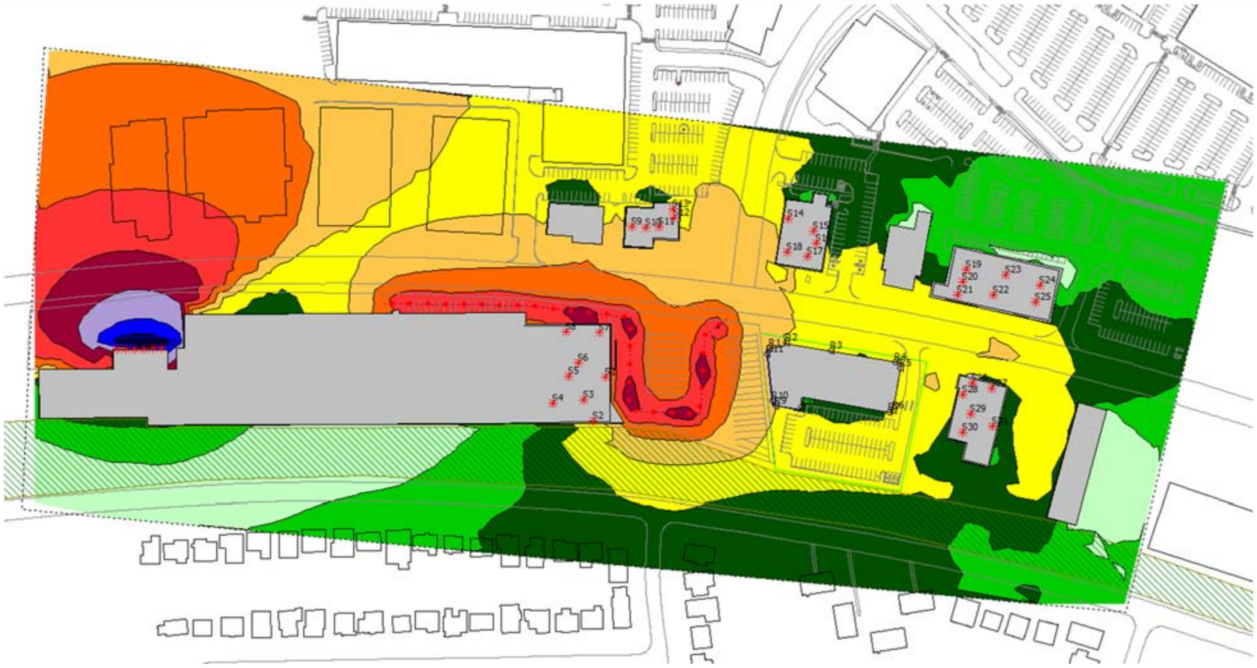


FIGURE 7: GROUND LEVEL NOISE CONTOURS FOR THE SITE (NIGHTTIME PERIOD)

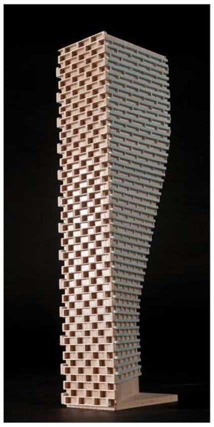
80 – 85 dB
75 – 80 dB
70 – 75 dB
65 – 70 dB
60 – 65 dB
55 – 60 dB
50 – 55 dB
45 – 50 dB
40 – 45 dB
35 – 40 dB
0 – 35 dB

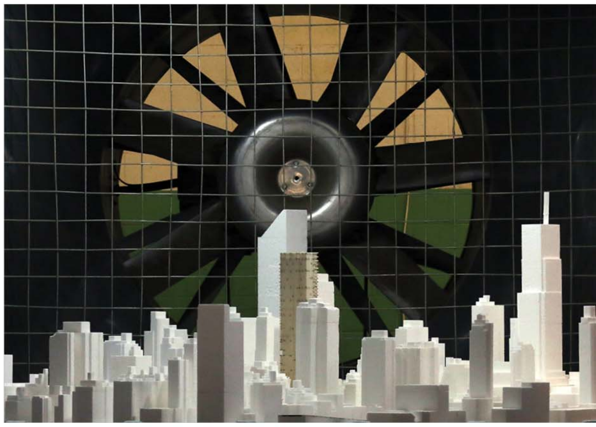
APPENDIX A

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: 21-03-2019 17:30:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: bkgd_r11.te          Time Period: 1 hours
Description:


Road data, segment # 1: Indust Av
---------------------------------
Car traffic volume  :  1295 veh/TimePeriod
Medium truck volume :    41 veh/TimePeriod
Heavy truck volume  :    28 veh/TimePeriod
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Indust Av
-------------------------------
Angle1   Angle2           : -86.00 deg   -11.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  27.00 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: Indust Av
------------------------------

Source height = 1.20 m

ROAD (0.00 + 63.05 + 0.00) = 63.05 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -86    -11   0.00  69.41   0.00  -2.55  -3.80   0.00   0.00   0.00
63.05
--------------------------------------------------------------------------
--

Segment Leq : 63.05 dBA

Total Leq All Segments: 63.05 dBA


TOTAL Leq FROM ALL SOURCES:       63.05
```





APPENDIX B

PREDICTOR - LIMA – INPUT AND OUTPUT DATA

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

Cross section for receiver R11 (Id=-68) and source S1 (Id=91)

ItemType	Id	Distance	X	Y	Hgrnd	Height	GrndFact	Cluster
Receiver	R11	0	371699.3	5030509	0	1.5	0	
Building	Metro	86.84	371613.3	5030497	0	8	0	5
Barrier	0.3	87.429	371612.8	5030497	8	0	0	5
Pointsourc	S1	89.638	371610.6	5030496	8	1.5	0	

L(wr)	--	56	68	75	79	80	77	77	70		
A(ground)	-3	-3	-3	-3	-3	-3	-3	-3	-3		
A(barrier)	0	0	0	0	0	0	0	0	0		
A(veg)	0	0	0	0	0	0	0	0	0		
A(sit)	0	0	0	0	0	0	0	0	0		
A(bld)	0	0	0	0	0	0	0	0	0		
A(air)	0	0.01	0.04	0.09	0.17	0.33	0.87	2.95	10.52		
A(geo)	50.08	50.08	50.08	50.08	50.08	50.08	50.08	50.08	50.08		
C(meteo)	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33		
L(p)	--	7.58	19.56	26.5	30.42	31.26	27.72	25.64	11.07	|	35.97

Cross section for receiver R11 (Id=-68) and source S1 (Id=91)
[Reflection in facade 7 (Id=52)]

ItemType	Id	Distance	X	Y	Hgrnd	Height	GrndFact	Cluster
Receiver	R11	0	371699.3	5030509	0	1.5	0	
Building	LWPOLYLIN	0.183	371699.4	5030509	0	5	0	1
Building	LWPOLYLIN	74.958	371769.7	5030483	0	5	0	1
Building(R)	7	107.489	371800.2	5030472	0	7	0	
Building	LWPOLYLIN	189.892	371718.5	5030483	0	5	0	1
Building	LWPOLYLIN	206.386	371702.1	5030485	0	5	0	1
Building	Metro	295.878	371613.3	5030496	0	8	0	5
Barrier	0.3	296.464	371612.8	5030496	8	0	0	5
Pointsourc	S1	298.671	371610.6	5030496	8	1.5	0	

L(wr)	--	56	68	75	79	80	77	77	70		
A(ground)	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1		
A(barrier)	14.36	16.52	19	20	20	20	20	20	20		
A(veg)	0	0	0	0	0	0	0	0	0		
A(sit)	0	0	0	0	0	0	0	0	0		
A(bld)	0	0	0	0	0	0	0	0	0		
A(air)	0.01	0.04	0.12	0.31	0.58	1.09	2.89	9.79	34.92		
A(geo)	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5		
A(refl)	--	--	--	--	--	-0.97	-0.97	-0.97	-0.97		
C(meteo)	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33		
L(p)	--	--	--	--	--	1.2	-3.59	-10.49	-42.62	|	2.66

Cross section for receiver R11 (Id=-68) and source S1 (Id=91)
[Reflection in facade 6 (Id=53)]

ItemType	Id	Distance	X	Y	Hgrnd	Height	GrndFact	Cluster
Receiver	R11	0	371699.3	5030509	0	1.5	0	
Building	LWPOLYLIN	0.183	371699.4	5030509	0	5	0	1
Building	LWPOLYLIN	75	371769.6	5030483	0	5	0	1
Building	7	107.527	371800.2	5030472	0	7	0	6
Barrier	P5	108.131	371800.7	5030472	7	0.3	0	6
Barrier	P5	133.693	371824.7	5030463	7	0.3	0	6
Building	7	134.267	371825.2	5030463	0	7	0	6
Building(R)	6	172.889	371861.5	5030449	0	5	0	
Building	7	211.308	371823.7	5030456	0	7	0	6
Barrier	P5	211.884	371823.1	5030456	7	0.3	0	6
Barrier	P5	226.146	371809.1	5030459	7	0.3	0	6

Building	7	226.986	371808.3	5030459	0	7	0	6	
Building	Metro	425.338	371613.3	5030496	0	8	0	5	
Barrier	0.3	425.928	371612.8	5030496	8	0	0	5	
Pointsourc	S1	428.158	371610.6	5030496	8	1.5	0		

L(wr)	--	56	68	75	79	80	77	77	70		
A(ground)	-5.37	-5.37	-5.37	-5.37	-5.37	-5.37	-5.37	-5.37	-5.37		
A(barrier)	16.99	20.39	23.48	25	25	25	25	25	25		
A(veg)	0	0	0	0	0	0	0	0	0		
A(sit)	0	0	0	0	0	0	0	0	0		
A(bld)	0	0	0	0	0	0	0	0	0		
A(air)	0.01	0.05	0.18	0.45	0.83	1.57	4.14	14.03	50.05		
A(geo)	63.63	63.63	63.63	63.63	63.63	63.63	63.63	63.63	63.63		
A(refl)	--	--	--	--	--	--	--	-0.97	-0.97		
C(meteo)	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33		

L(p)	--	--	--	--	--	--	--	-22.59	-65.61	|	-22.59

==

Height	Source	Per	LAeq	32	63	125	250	500	1000	2000	4000	8000
1.5	S1	1	35.97	--	7.58	19.56	26.5	30.42	31.27	27.73	25.64	11.07
1.5	S1	2	--	--	--	--	--	--	--	--	--	--
1.5	S1	3	32.96	--	4.57	16.55	23.49	27.41	28.26	24.72	22.63	8.06
1.5	S1	4	--	--	--	--	--	--	--	--	--	--

==

Height	Per	LAeq	32	63	125	250	500	1000	2000	4000	8000
1.5	1	35.97	--	7.58	19.56	26.5	30.42	31.27	27.73	25.64	11.07
1.5	2	--	--	--	--	--	--	--	--	--	--
1.5	3	32.96	--	4.57	16.55	23.49	27.41	28.26	24.72	22.63	8.06
1.5	4	--	--	--	--	--	--	--	--	--	--

0.0000;	220;	0.0000001;	TTimerSet - overhead
0.0008;	110;	0.0000071;	WriteTestString
