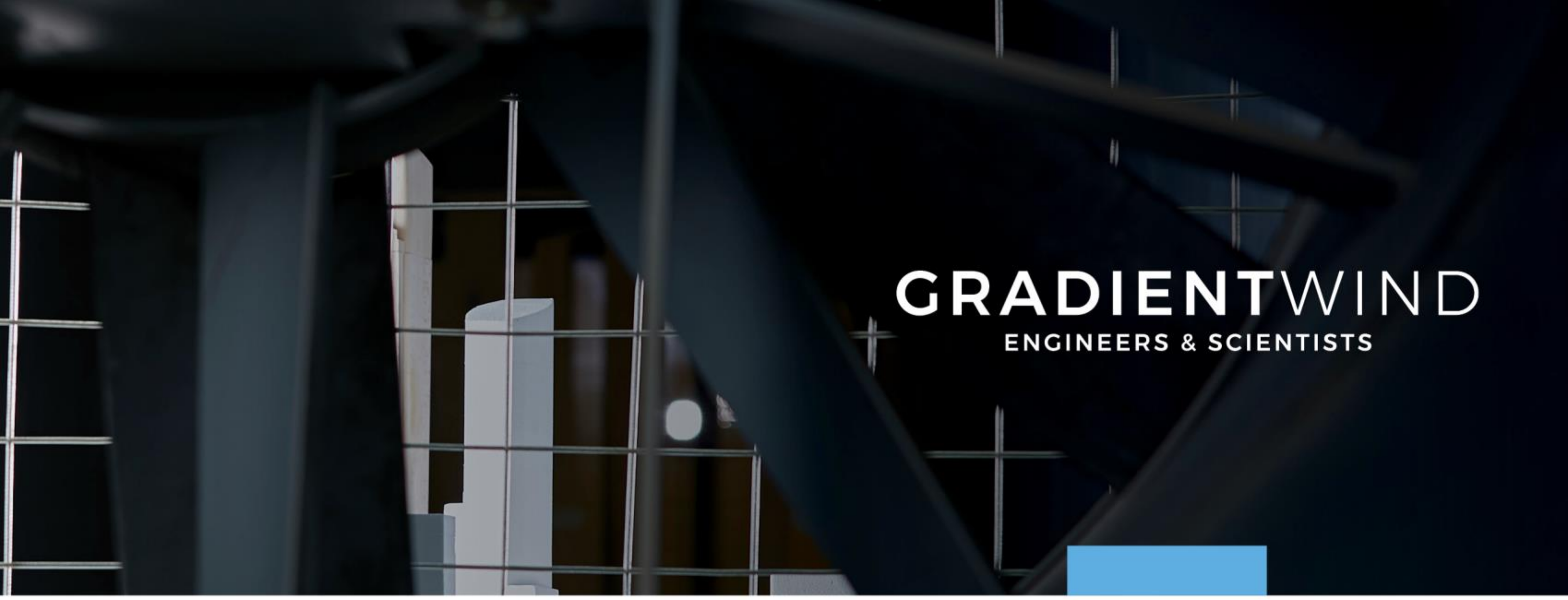
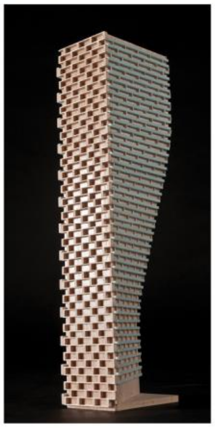


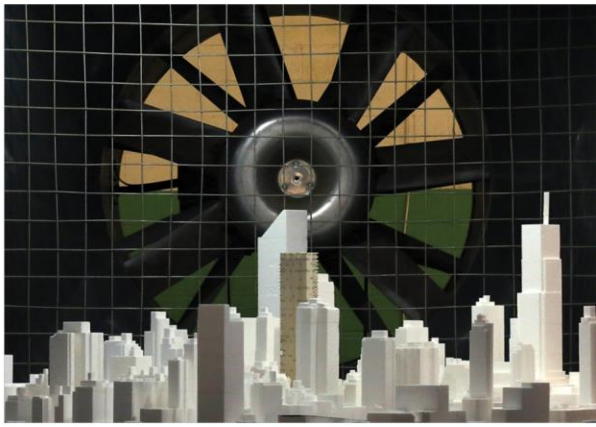
GRADIENTWIND
ENGINEERS & SCIENTISTS

ENVIRONMENTAL NOISE ASSESSMENT

Zibi Block 204A
Ottawa, Ontario

REPORT: GW22-015-Environmental Noise





March 25, 2022

PREPARED FOR
Dream Theia Ontario Block 204A LP
6 Booth Street (Albert Island)
Ottawa, ON K1R 6K8

PREPARED BY
Michael Lafortune, C.E.T., Environmental Scientist
Joshua Foster, P.Eng., Lead Engineer

EXECUTIVE SUMMARY

This report describes an environmental noise assessment performed for the proposed development, known as Zibi Block 204, located on Chaudière Island in Ottawa, Ontario. The development features a 22-storey high-rise condominium with a tower located on a triangular parcel of land. The development includes a residential lobby, loading zone, and several Commercial Retail Units (CRUs). The major source of traffic noise on the development is Booth Street / Rue Eddy (Arterial Road). Other sources noise influencing the development are stationary sources associated with the CHLP generating station. Figure 1 illustrates a complete site plan with surrounding context. From Gradient Wind's previous work on the Zibi lands, noise from the Chaudière Falls is not considered to be a source of stationary noise.

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) architectural drawings prepared by Neuf Architects, and; (iv) mechanical information regarding the generating station on the Chaudière Hydro Limited Partnership (CHLP) lands provided by their consultant HATCH.

The results of the current analysis indicate that roadway traffic noise levels will not exceed 55 dBA at the worst-case location, fallowing below the ENCG noise level criterion. The highest roadway traffic noise levels occur along the east façade of the tower because this maximizes exposure and minimizes setback distance to Booth Street. Because noise levels fall below the ENCG noise level criterion, no noise control measures will be required for the development.

Noise levels from existing stationary sources across the study site were found to be below 50 dBA and within the Class 1 criteria. Impacts from the development on the surroundings can be minimized by judicious placement mechanical equipment such as its placement on a roof or in a mechanical penthouse, or the incorporation of silencers and noise screens as necessary. It is recommended that any large pieces of HVAC equipment be placed in the middle of the roof, avoiding line of site with the surrounding residential buildings.

TABLE OF CONTENTS

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Windmill Dream Ontario 204 LP to undertake an environmental noise assessment for the proposed development, known as Zibi Block 204, located on Chaudière Island in Ottawa, Ontario. This report summarizes the methodology, results and recommendations related to a stationary noise assessment.

The present scope of work involves assessing exterior noise levels generated by local roadway traffic, existing stationary noise sources surrounding the site. 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 Neuf Architects, mechanical information regarding the generating station on the Chaudière Hydro Limited Partnership (CHLP) lands provided by their consultant HATCH, surrounding street layouts obtained from the City of Ottawa, and recent site imagery.

2. TERMS OF REFERENCE

The development features a 22-storey high-rise condominium tower with a triangular massing shape from the ground floor to the 9th Floor, and square massing shape from the 10th Floor to the 22nd Floor. The building features a single-storey podium and terrace amenities atop the podium and at the 10th Floor. The development includes below grade parking, a residential lobby, loading zone, and several Commercial Retail Units (CRUs) on the ground floor, and residential space on the remaining floors. The major source of traffic noise on the development is Booth Street / Rue Eddy (Arterial Road). Other sources noise influencing the development are stationary sources associated with the CHLP generating station. Figure 1 illustrates a complete site plan with surrounding context. From Gradient Wind's previous work on the Zibi lands, noise from the Chaudière Falls is not considered as stationary source of noise.

---

[1] City of Ottawa Environmental Noise Control Guidelines, January 2016
[2] Ministry of the Environment, Conservation and Parks (MECP), Environmental Noise Guideline – Publication NPC-300, August 2013

3. OBJECTIVES

The main goals of this work are to (i) calculate the future noise levels on the study building produced by local transportation and stationary sources, and (ii) ensure that interior noise levels do not exceed the allowable limits specified by the City of Ottawa's Environmental Noise Control Guidelines as outlined in Section 4 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 vehicle traffic, the equivalent sound energy level, L_{eq}, provides a measure of the time varying noise levels, which is well correlated with the annoyance of sound. It is defined as the continuous sound level that 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 50, 45 and 40 dBA for retail, living rooms and sleeping quarters, respectively, as listed in Table 1. However, to account for deficiencies in building construction and control peak noise, these levels should be targeted toward 47, 42 and 37 dBA.

TABLE 1: INDOOR SOUND LEVEL CRITERIA (ROAD)[3]

Type of Space	Time Period	Leq (dBA)
		Road
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[4]. Therefore, where noise levels exceed 55 dBA daytime and 50 dBA nighttime, the ventilation for the building should consider the need for having windows and doors closed, which normally triggers the need for central air conditioning (or similar systems). Where noise levels exceed 65 dBA daytime and 60 dBA nighttime building components will require higher levels of sound attenuation[5].

Noise levels at outdoor living areas should be limited to 55 dBA where technically and administratively feasible. The City of Ottawa preferences for noise control prescribe the following hierarchy:

(i) Increased distance setback with absorptive ground cover (vegetation)
(ii) Relocation of noise sensitive areas away from roadways
(iii) Earth berms
(iv) Acoustic barriers

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

4.2.2 Roadway Traffic Volumes

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

TABLE 2: ROADWAY TRAFFIC DATA

Segment	Roadway Traffic Data	Speed Limit (km/h)	Traffic Volumes
Booth Street	4-UAU	60	**30,000**

4.2.3 Theoretical Roadway Traffic Noise Predictions

Noise predictions were performed with the aid of the MECP computerized noise assessment program, STAMSON 5.04, for road and rail analysis. Appendix A includes the STAMSON 5.04 input and output data.

Roadway noise calculations were performed by treating each road segment as a separate line source of noise, and by using existing building locations as noise barriers. In addition to the traffic volumes summarized in Table 4, 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.
- Ground surfaces were taken to be absorptive and reflective based on specific source-receiver path ground characteristics.
- Site topography was considered as flat or gently sloping.
- Noise receptors were strategically placed at a single worst-case location within study site (see Figure 3). STAMSON input parameters are illustrated in Figure 4.

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

4.3 Stationary Noise

Stationary sources are defined in the ENCG as "all sources of sound and vibration, whether fixed or mobile, that exist or operate on a premises, property or facility, the combined sound and vibration levels of which are emitted beyond the property boundary of the premises, property or facility, unless the source(s) is (are) due to construction" [7].

4.3.1 Criteria for Stationary Noise

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 as previously mentioned in Section 4.2.1. This applies to the plane of window and outdoor amenity spaces serving the development. The surrounding area of the development would be defined as a Class 1 (Urban) environment, as background noise levels are dominated by human activities such as roadway and transit sources. The applicable sound level limit is the higher of either the values in Table 3 or background noise levels due to sources such as transportation. Background noise levels away from Booth Street are dominated by the sound of falling water over the Chaudière falls, as documented in the noise report prepared by Gradient Wind for the Master Plan, and incorporated into Table 3.

TABLE 3: EXCLUSIONARY LIMITS FOR CLASS 1 AREA (DBA)

Time of Day	Class 1		Background Noise Level Due to Chaudière Falls
	Outdoor Points of Reception	Plane of Window	
07:00 – 19:00	50	50	58
19:00 – 23:00	50	50	
23:00 – 07:00	N/A	45	

[7] City of Ottawa Environmental Noise Control Guidelines, page 10

4.3.2 Determination of Noise Source Power Levels

Based on the previous master plan environmental noise assessment prepared by Gradient Wind, dated July 22, 2014, existing sources of stationary noise impacting the Block 204 development are the CHLP generating station. Information on the powerhouse and noise sources was provided to Gradient Wind through CHLP's noise consultant HATCH, without prejudice. The equipment consists of transformers and exhaust fans. For maintenance purposes, a trash rake is infrequently used and was considered to be an insignificant source of noise.

For the powerhouse, the sound data and operating frequency for each unit are based on information provided by HATCH and summarized in Table 4 below and includes equipment such as transformers and ventilation fans. All transformers and ventilation fans were assumed to operate continuously and concurrently during the daytime/evening and nighttime periods. Figure 2 illustrates the location of the mechanical equipment located at the proposed powerhouse.

TABLE 4: STATIONARY SOURCE SOUND POWER DATA

Source	Tag	Frequency Band (Hz)								Total (dBA)
		63	125	250	500	1000	2000	4000	8000	
S1	T1	92	95	93	93	87	82	77	69	93.2
S2	T2									
S3	T3									
S4	T4									
S5	FAN SF-A1	76	74	76	77	71	66	63	58	77.1
S6	FAN EF-A	83	83	77	71	68	65	61	55	74.9
S7	FAN SF-G1	81	81	78	70	70	70	68	66	77.1
S8	FAN SF-01	79	81	81	76	68	68	63	58	77.6
S9	FAN EF-01									
S10	Outfall	52	54	52	54	55	52	47	40	59

4.3.1 Stationary Source Noise Predictions

The impact of stationary noise sources on nearby residential areas 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. The methodology has been used on numerous assignments and has been accepted by the Ministry of the Environment, Conservation and Parks (MOECP) as part of Environmental Compliance Approval applications.

Nine individual noise sensor locations were selected in the *Predictor-Lima* model to measure the noise impact at points of reception (POR) during the daytime (07:00 – 19:00) and nighttime (19:00 – 07:00) periods (see Figure 3). For each tower location, various heights were examined for a total of 17 sensors. POR locations included the Outdoor Living Areas (OLA's) and the Plane of Windows (POW's) of the development. All equipment was represented as point sources in the Predictor model, while the outfall is modeled as an area source. Table 5 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. Further modelling data is available upon request.

TABLE 5: 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

5.1 Roadway Traffic Noise Levels

The results of the roadway noise calculations are summarized in Table 6 below. A complete set of input and output data from all STAMSON 5.04 calculations are available in Appendix A.

TABLE 6: EXTERIOR NOISE LEVELS DUE TO ROADWAY TRAFFIC

Receptor Number	Receptor Height Above Grade/Roof (m)	Receptor Location	STAMSON 5.04 Noise Level (dBA)	
			Day	Night
2	60	Tower East Façade	55	48

The results of the current analysis indicate that roadway traffic noise levels will not exceed 55 dBA at the worst-case location, fallowing below the ENCG noise level criterion. The highest roadway traffic noise levels occur along the east façade of the tower because this maximizes exposure and minimizes setback distance to Booth Street. Because noise levels fall below the ENCG noise level criterion, no noise control measures will be required for the development.

5.2 Stationary Noise Levels

Noise levels from existing stationary sources across the study site were found to be below 50 dBA and withing the Class 1 criteria. The anticipated noise levels across the development are summarized in Table 6 and are based on the assumptions outlined in Section 4.3. Noise contours along the building façades can be seen in Figure 5 for daytime and nighttime conditions. Noise contours surrounding the study building can be seen in Figures 6 for daytime and nighttime conditions.

TABLE 6: NOISE LEVELS FROM STATIONARY SOURCES

Receptor Number	Receptor Height Above Grade/Roof (m)	Receptor Location	Noise Level (dBA)		Exclusionary Limits		Meets ENCG Class 4 Criteria	
			Day	Night	Day	Night	Day	Night
R1_A	20	Tower North Façade	43	43	58*	58*	YES	YES
R1_B	40	Tower North Façade	49	49	58*	58*	YES	YES
R1_C	60	Tower North Façade	49	49	58*	58*	YES	YES
R2_A	20	Tower East Façade	28	28	50	45	YES	YES
R2_B	40	Tower East Façade	30	30	50	45	YES	YES
R2_C	60	Tower East Façade	34	34	50	45	YES	YES
R3_A	20	Tower South Façade	27	27	50	45	YES	YES
R3_B	40	Tower South Façade	26	26	50	45	YES	YES
R3_C	60	Tower South Façade	26	26	50	45	YES	YES
R4_A	20	Tower West Façade	40	40	58*	58*	YES	YES
R4_B	40	Tower West Façade	44	44	58*	58*	YES	YES
R4_C	60	Tower West Façade	49	49	58*	58*	YES	YES
R5_A	4.5	Podium Northwest Facade	40	40	50	45	YES	YES
R6_A	4.5	Podium Northeast Facade	40	40	50	45	YES	YES
R7_A	1.5	Podium Terrace	34	34	50	45	YES	YES
R8_A	1.5	Podium Terrace	40	40	50	45	YES	YES
R9_A	1.5	Podium Terrace	28	28	50	45	YES	YES

* - Criteria dictated by background noise levels due to Chaudière Falls

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that roadway traffic noise levels will not exceed 55 dBA at the worst-case location, fallowing below the ENCG noise level criterion. The highest roadway traffic noise levels occur along the east façade of the tower because this maximizes exposure and minimizes setback distance to Booth Street. Because noise levels fall below the ENCG noise level criterion, no noise control measures will be required for the development.

Noise levels from existing stationary sources across the study site were found to be below 50 dBA and within the Class 1 criteria. Impacts from the development on the surroundings can be minimized by judicious placement mechanical equipment such as its placement on a roof or in a mechanical penthouse, or the incorporation of silencers and noise screens as necessary. It is recommended that any large pieces of HVAC equipment be placed in the middle of the roof, avoiding line of site with the surrounding residential buildings.

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.

Michael Lafortune, C.E.T.
Environmental Scientist

Joshua Foster, P.Eng.
Lead Engineer

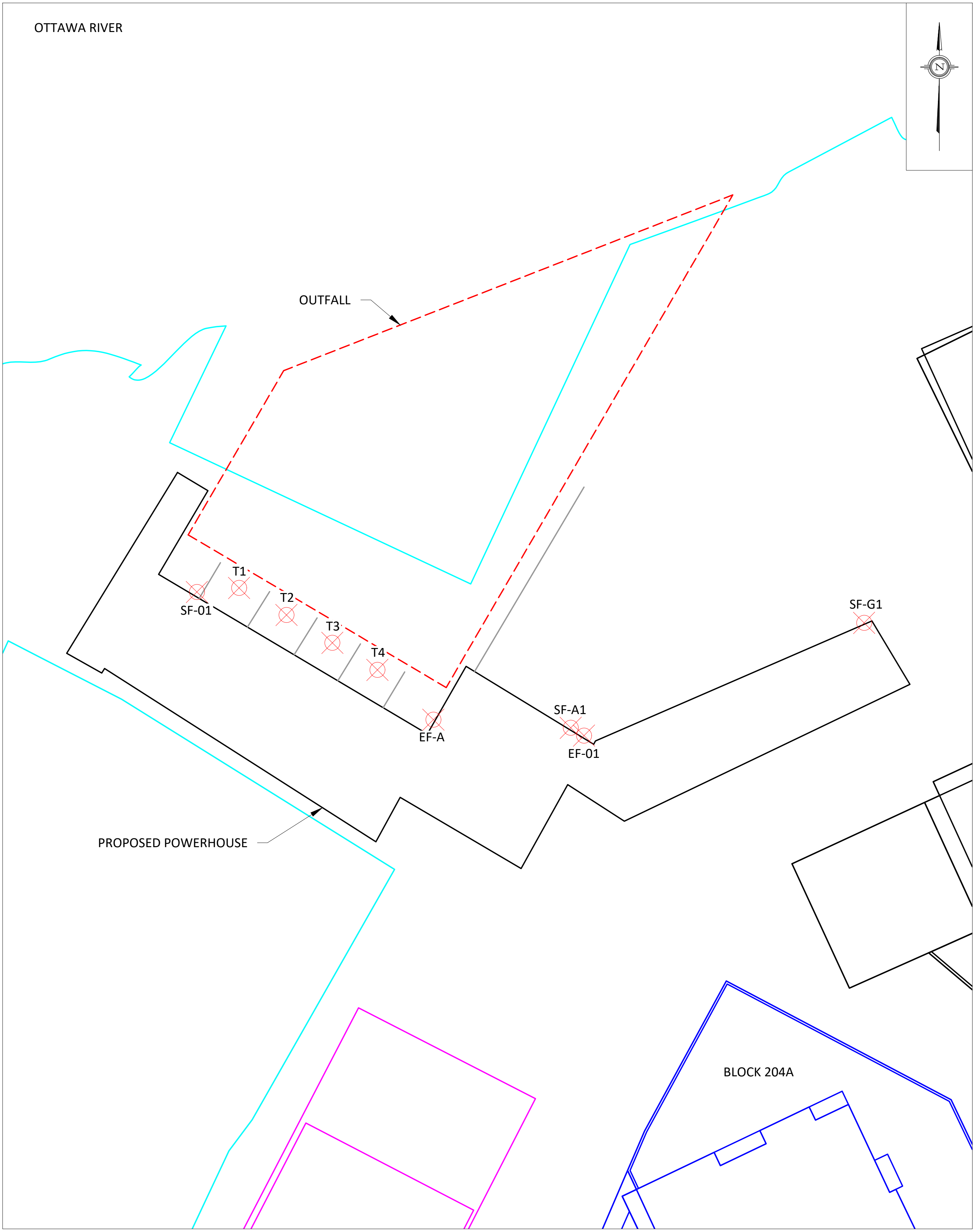
Gradient Wind File #22-015-Environmental Noise

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

PROJECT	ZIBI BLOCK 204A, OTTAWA ENVIRONMENTAL NOISE ASSESSMENT		
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW22-015-1
DATE	MARCH 11, 2022	DRAWN BY	M.L.

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT



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PROJECT	ZIBI BLOCK 204A, OTTAWA ENVIRONMENTAL NOISE ASSESSMENT		
SCALE	1:750 (APPROX.)	DRAWING NO.	GW22-015-2
DATE	MARCH 11, 2022	DRAWN BY	M.L.

DESCRIPTION

FIGURE 2:
SOURCE LOCATIONS

GRADIENTWIND ENGINEERS & SCIENTISTS 127 WALGREEN ROAD , OTTAWA, ON 613 836 0934 • GRADIENTWIND.COM	PROJECT: ZIBI BLOCK 204A, OTTAWA ENVIRONMENTAL NOISE ASSESSMENT		DESCRIPTION: FIGURE 3: RECEPTOR LOCATIONS
	SCALE: 1:500 (APPROX.)	DRAWING NO.: GW22-015-3	
	DATE: MARCH 11, 2022	DRAWN BY: M.L.	

GRADIENTWIND ENGINEERS & SCIENTISTS	PROJECT: ZIBI BLOCK 204A, OTTAWA ENVIRONMENTAL NOISE ASSESSMENT	DESCRIPTION: FIGURE 4: STAMSON INPUT PARAMETERS - RECEPTOR 2
127 WALGREEN ROAD , OTTAWA, ON 613 836 0934 • GRADIENTWIND.COM	SCALE: 1:1000 (APPROX.) / DRAWING NO. GW22-015-4	
	DATE: MARCH 11, 2022 / DRAWN BY: M.L.	

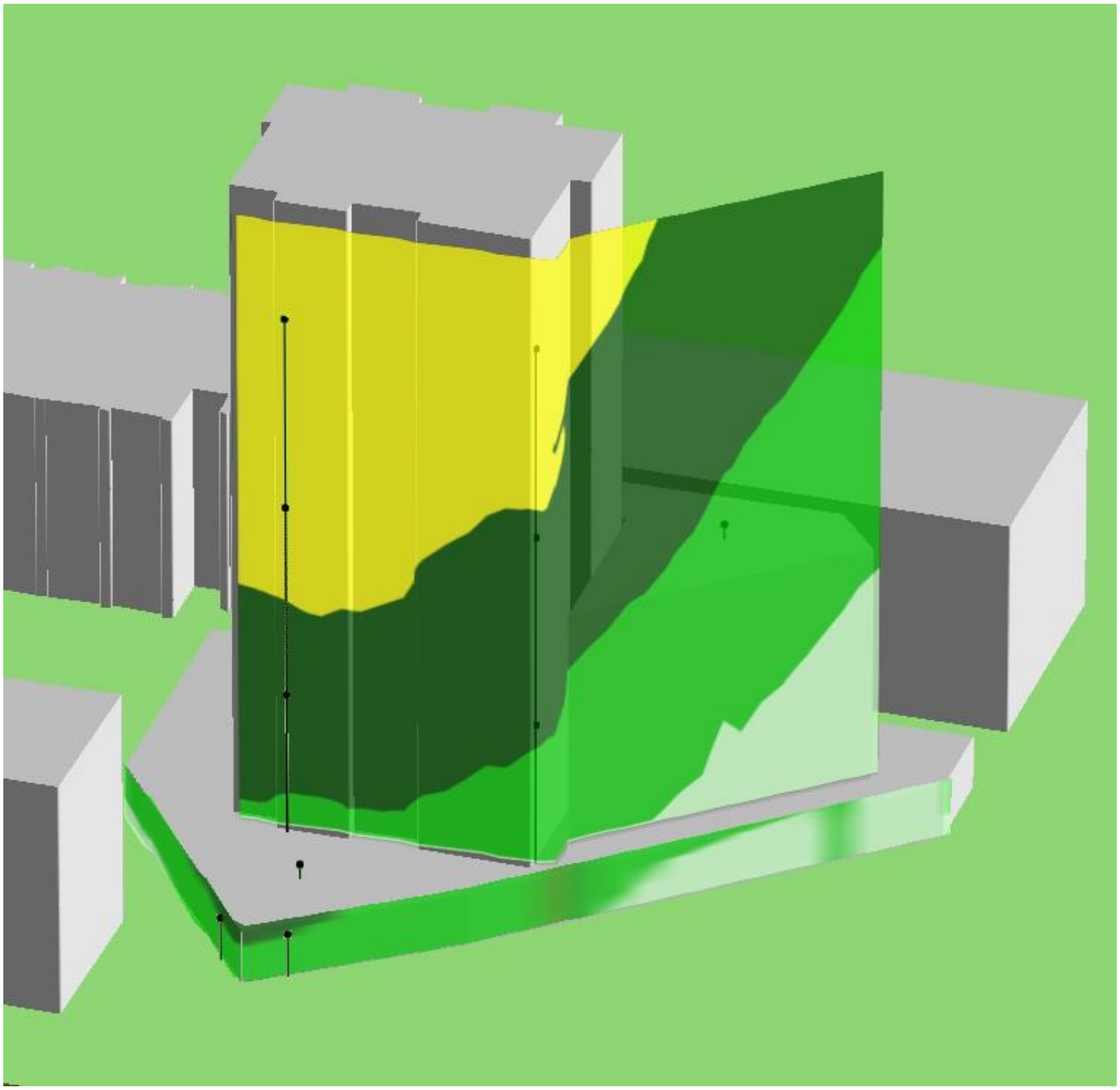
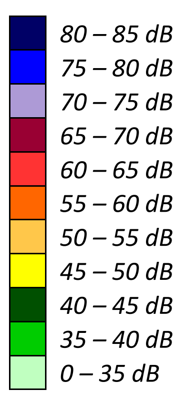


FIGURE 5: DAYTIME/NIGHTTIME STATIONARY NOISE CONTOURS (FACADES)

	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: DAYTIME/NIGHTTIME NOISE STATIONARY CONTOURS (20 M ABOVE GRADE)



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: 10-03-2022 16:02:52
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R2.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: Booth1 (day/night)
------------------------------------------
Car traffic volume  : 24288/2112  veh/TimePeriod  *
Medium truck volume :  1932/168   veh/TimePeriod  *
Heavy truck volume  :  1380/120   veh/TimePeriod  *
Posted speed limit  :    60 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):  30000
    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: Booth1 (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   : 107.00 / 107.00 m
Receiver height            :  60.00 / 60.00  m
Topography                 :      2       (Flat/gentle slope; with barrier)
Barrier angle1             : -90.00 deg   Angle2 : 0.00 deg
Barrier height             :  26.00 m
Barrier receiver distance  :  93.00 / 93.00  m
Source elevation           :   0.00 m
Receiver elevation         :   0.00 m
Barrier elevation          :   0.00 m
Reference angle            :   0.00
```

```
Road data, segment # 2: Booth2 (day/night)
------------------------------------------
Car traffic volume  : 24288/2112  veh/TimePeriod  *
Medium truck volume :  1932/168   veh/TimePeriod  *
Heavy truck volume  :  1380/120   veh/TimePeriod  *
Posted speed limit  :    60 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):  30000
    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: Booth2 (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  : 107.00 / 107.00 m
Receiver height           :  60.00 / 60.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  13.00 deg   Angle2 : 90.00 deg
Barrier height            :  14.00 m
Barrier receiver distance :  92.00 / 92.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Booth1 (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 !       60.00 !        9.15 !         9.15

ROAD (0.00 + 43.50 + 0.00) = 43.50 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -90      0   0.00  73.01   0.00  -8.53  -3.01   0.00   0.00 -17.97
43.50
--------------------------------------------------------------------------
--

Segment Leq : 43.50 dBA
```

```
Results segment # 2: Booth2 (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 !       60.00 !        9.70 !         9.70

ROAD (53.06 + 50.15 + 0.00) = 54.86 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
     0     13   0.00  73.01   0.00  -8.53 -11.41   0.00   0.00   0.00
53.06
--------------------------------------------------------------------------
--
    13     90   0.00  73.01   0.00  -8.53  -3.69   0.00   0.00 -10.63
50.15
--------------------------------------------------------------------------
--

Segment Leq : 54.86 dBA

Total Leq All Segments: 55.17 dBA
```

```
Results segment # 1: Booth1 (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 !       60.00 !        9.15 !         9.15

ROAD (0.00 + 35.90 + 0.00) = 35.90 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
---------------------------------------------------------------------------
--
   -90      0   0.00  65.41   0.00  -8.53  -3.01   0.00   0.00 -17.97
35.90
---------------------------------------------------------------------------
--

Segment Leq : 35.90 dBA
```

```
Results segment # 2: Booth2 (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 !       60.00 !        9.70 !          9.70

ROAD (45.46 + 42.56 + 0.00) = 47.26 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     13   0.00  65.41   0.00  -8.53 -11.41   0.00   0.00   0.00
45.46
-------------------------------------------------------------------------
--
    13     90   0.00  65.41   0.00  -8.53  -3.69   0.00   0.00 -10.63
42.56
-------------------------------------------------------------------------
--

Segment Leq : 47.26 dBA

Total Leq All Segments: 47.57 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 55.17
                         (NIGHT): 47.57
```