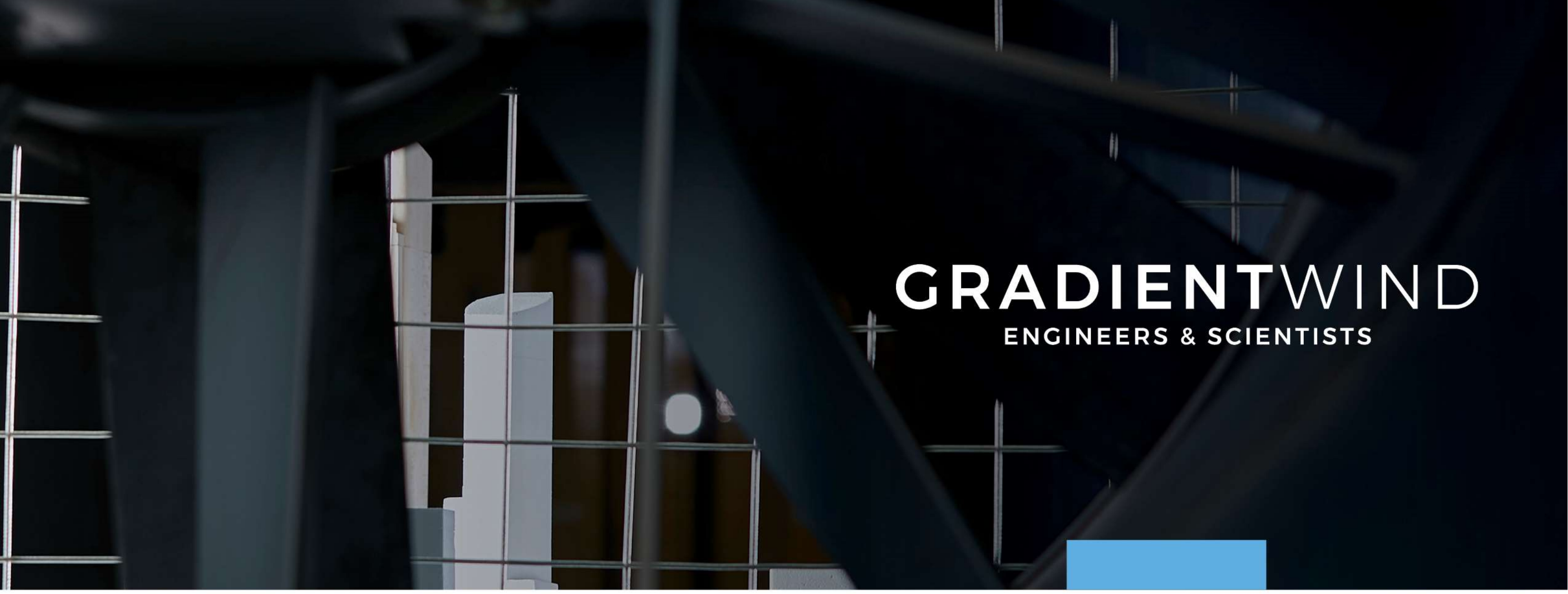
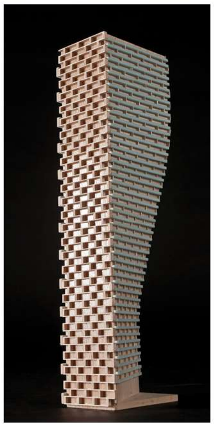


STATIONARY NOISE ASSESSMENT

Long Sault Rail Yards
Long Sault, South Stormont, Ontario

REPORT: 21-361 - Stationary Noise



November 10, 2021

PREPARED FOR
Avenue 31 Capital Inc.
801-250 City Centre
Ottawa, ON | K1R 6K7

PREPARED BY
Tanyon Matheson-Fitchett, B.Eng., Junior Environmental Scientist
Joshua Foster, P.Eng., Principal

EXECUTIVE SUMMARY

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Avenue 31 Capital Inc. to undertake a stationary noise assessment in support of a Site Plan Control application (SPA) for the proposed industrial rail yard development located south of Highway 401 and west of Avonmore Road in Long Sault, South Stormont, Ontario. The proposed development comprises an irregularly shaped parcel of land encompassed by Highway 401 to the north, Avonmore Road to the east, Moulinette Road to the west, and CN rail line (Kingston Subdivision) to the south. A new rail yard is proposed north of the existing tracks, with a gravel parking lot situated north of the rail yard. Main sources of noise include idling locomotives within the yard, and impulsive noise caused by shunting of train cars.

The assessment was performed based on theoretical noise calculation methods conforming to the Ministry of the Environment, Conservation and Parks (MECP) NPC-300[1] guidelines, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Procedure[2], the Canadian Transportation Agency Railway Noise Measurement and Reporting Methodology[3], site plan drawings received from Avenue 31 Capital Inc. in October 2021, correspondence with the local railway authority, Gradient Wind's experience with similar rail yard developments, surrounding street layouts, and recent site imagery.

The results of the current study indicate that stationary noise levels received at nearby noise sensitive dwellings, generated by the proposed rail yard development, are expected to comply with NPC-300 sound level limits at all points of reception. The proposed industrial rail yard development is expected to be compatible with the surrounding noise-sensitive dwellings, provided the assumptions in Section 2.1 are adhered to during design and operation of the rail yard.

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

[2] C. E. Hanson; D. A. Towers; and L. D. Meister, Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.

[3] Railway Noise Measurement and Reporting Methodology, Canadian Transportation Agency, Minister of Public Works and Government Services Canada, August 2011

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1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Avenue 31 Capital Inc. to undertake a stationary noise assessment in support of a Site Plan Control application (SPA) for the Long Sault Rail Yard development located south of Highway 401 and west of Avonmore Road in Long Sault, South Stormont, 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 sources associated with the proposed industrial rail yard development, received at nearby noise-sensitive dwellings. The main sources of noise include idling locomotives within the yard, and impulsive noise caused by shunting of train cars. The assessment was performed based on theoretical noise calculation methods conforming to the Ministry of the Environment, Conservation and Parks (MECP) NPC-300[4] guidelines, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Procedure[5] and the Canadian Transportation Agency Railway Noise Measurement and Reporting Methodology[6], site plan drawings received from Avenue 31 Capital Inc. in October 2021, correspondence with the local railway authority, Gradient Wind's experience with similar rail yard developments, surrounding street layouts, and recent site imagery.

2. TERMS OF REFERENCE

The focus of this stationary noise assessment is the proposed industrial rail yard development located south of Highway 401 and west of Avonmore Road in Long Sault, South Stormont, Ontario. The proposed development comprises an irregularly shaped parcel of land encompassed by Highway 401 to the north, Avonmore Road to the east, Moulinette Road to the west, and the CN rail line (Kingston Subdivision) to the south. A new rail yard is proposed north of the existing tracks, with a gravel parking lot situated north of the rail yard. Access to the parking lot will be provided from Avonmore Road. A shop is proposed to be placed at the east side of the yard.

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

[5] C. E. Hanson; D. A. Towers; and L. D. Meister, Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.

[6] Railway Noise Measurement and Reporting Methodology, Canadian Transportation Agency, Minister of Public Works and Government Services Canada, August 2011

The surroundings of the proposed development are primarily open fields and wooded areas, with the town of Long Sault which borders the St. Lawrence River located to the south of the proposed development. The nearest noise-sensitive dwellings surrounding the site are located on Ouellette Avenue, French Avenue, Mille Roches Road, Barnhart Drive, Barry Street, County Road 36, Jenkins Road, and Avonmore Road, as well as future residential dwellings planned for Jim Brownell Boulevard, the John Chase Subdivision, and the Fenton Farm Subdivision. A 5.5-meter acoustic barrier is positioned at the north end of the future Fenton Farm Subdivision, as recommended by the noise study completed for the proposed subdivision[7]. The nearest existing dwelling to the proposed rail yard is approximately 280 meters to the south. Figure 1 illustrates the site plan and surrounding context.

Sources of steady-state/varying stationary noise include idling trains, while sources of impulsive stationary noise (i.e., bangs) is produced by shunting operations. It is expected that less than 40 train pass-by events occur during the daytime period and less than 20 train pass-by events occur during the nighttime period. Therefore, train pass-by events are excluded from determination of background noise levels, per MECP guidelines. The community type is considered a quiet rural area with low background noise levels. Figure 2 illustrates the location of all noise sources and points of reception (POR) included in this study.

2.1 Assumptions

Gradient Wind assumed the sound power levels produced by idling trains and shunting events based on published research, correspondence with the local railway authority (Appendix A), and previous experience with similar developments. The following assumptions have been made in the analysis:

(i) The subject site is on Heavy Industrial zoned lands permitting Railway Yard development.

(ii) Two (2) locomotives idle in the proposed rail yard on the east side of the yard, towards the shop. This location models a “worst-case scenario” as it is nearest to the closet point of reception. The locomotives idle for the entirety of a given 1-hour period.

(iii) Train shunting produces impulsive which occur more than 9 times in a given 1-hour period during the daytime, evening and nighttime periods.

(iv) During the evening and nighttime periods, rail yard operations are reduced by 50%.

(v) The ground region was modelled as absorptive for soft ground (open fields).

[7] Noise and Vibration Feasibility Study - Fenton Farm Subdivision, Howe Gastmeier Chapnik Ltd., October 2 2020

3. OBJECTIVES

The main goals of this work are to (i) calculate the future noise levels on the surrounding noise-sensitive dwellings produced by stationary noise sources and (ii) ensure that exterior noise levels do not exceed the allowable limits specified by the NPC-300, as outlined in Section 4 of this report.

4. METHODOLOGY

The impact of the external stationary noise sources on the nearby residential areas was determined through a combination of computer modelling, and a procedure selected from the Federal Transit Authority's (FTA) Transit Noise and Vibration Impact Assessment[8] protocol. 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. Twenty-three (23) 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

[8] C. E. Hanson; D. A. Towers; and L. D. Meister, Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006

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”[9].

4.2 Steady-State / Varying Stationary Noise

4.2.1 Criteria for Steady-State / Varying Stationary Noise

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 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”[10]. 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, campgrounds, and noise sensitive buildings such as schools and places of worship. The recommended maximum noise levels for a Class 3 (rural) environment at a POR are outlined in Table 1 below. The noise-sensitive dwellings are located in a quiet rural community having little or no road traffic. Therefore, the acoustical environment is dominated by natural sounds during both the daytime and nighttime periods. There are less than 40 train pass-by event during the daytime period and less than 20 train pass-by events during the nighttime period. Therefore, train pass-by events are excluded from determination of background noise levels, per MECP guidelines. As road traffic is expected to be minimal, background noise is negligible in this assessment. The sound level limit is therefore defined by the exclusionary limits for a Class 3 area, as listed in Table 1.

TABLE 1: EXCLUSIONARY LIMITS FOR CLASS 3 AREA

Time of Day	Outdoor Points of Reception (dBA)	Plane of Window (dBA)
07:00 – 19:00	45	45
19:00 – 23:00	40	40
23:00 – 07:00	N/A	40

[9] NPC – 300, page 16
[10] NPC – 300, page 14

4.2.2 Determination of Steady-State / Varying Noise Source Power Levels

Gradient Wind obtained sound power data through correspondence with the local rail authority. Idling locomotives that will be present in the rail yard are expected to have a sound pressure level of 71 dBA measured at 50 feet. Using the following equation, the sound pressure at 50 feet was converted to an equivalent sound power level for use in the modelling.

$$L_p = L_W - \left|10\log\left(\frac{Q}{4\pi r^2}\right)\right| \qquad \text{(Equation 1)}$$

Where:

L_W = Sound Power Level (dBA)

L_p = Sound Pressure Level (dBA)

Q = Directivity Factor (2 for hemispherical radiation)

r = Distance between Source and Receiver (m)

Calculations yield an equivalent sound power level of 103 dBA for each idling locomotive.

Further justification is presented through an alternative approach. The FTA protocol provides a general assessment and screening procedures for the computation of stationary noise impacts from rail yards. The general assessment has been based on noise source and land-use information previously mentioned.

To determine the sound power level of the rail yard steady-state/varying stationary noise based on the FTA protocol, the assessment begins with determining a reference Sound Exposure Level (SEL) at 50 feet (15 m). A value of 118 dBA is provided for rail yards. Next, the hourly L_{eq} can be calculated based on the average number of trains per hour during the day and night. It is assumed that the rail yard could experiences 2 train activities per hour during the daytime period. These parameters are used to determine the hourly L_{eq} sound pressure level at 15 m as summarized by Equation 2.

$$L_{eq}(h) = SEL_{ref} + \left(10log\left(\frac{N_T}{20}\right)\right) - 35.6 \qquad \text{(Equation 2)}$$

Where:

$L_{eq}(h)$ = Hourly L_{eq} Sound Pressure Level at 15 m (dBA)
SEL_{ref} = Source Reference Level at 15 m (dBA)
N_T = Number of train activities per hour

Equation 2 yielded a sound pressure level of 72.4 dBA. Equation 1 was used to convert the sound pressure level of the rail yard to sound power level. The resultant steady state sound power level of the rail yard was calculated to be 104 dBA (1 hour L_{eq}). The FTA method defines the resultant sound power level as an equivalent source placed at the center of the rail yard.

Based on the two approaches, a sound power level of 103 dBA is used to represent each idling locomotive in the modelling. This will ensure a conservative estimate compared to the FTA method, as the logarithmic addition of two 103 dBA sources equates to a resultant sound power level of 106 dBA.

4.2.3 Steady-State / Varying 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, which has an algorithm for outdoor noise propagation based on ISO standard 9613 Parts 1 and 2. The methodology has been used on numerous assignments and has been accepted by the Ministry of the Environment, Conservation and Parks (MECP) as part of Environmental Compliance Approval applications.

A total of twenty-three (23) receptor locations were chosen at nearby noise-sensitive dwellings to measure the noise impact at points of reception (POR) during the daytime (07:00 - 19:00), evening (19:00 – 23:00), and nighttime period (23:00 – 07:00). POR locations include plane of window (POW) and outdoor points of reception (OPOR) of the adjacent residential properties. Sensor locations are described in Table 2 and illustrated in Figure 2. The locomotives were modeled as point sources with heights of 2.0 metres, located to the east side of the rail yard near the shop. As previously mentioned, this location models a "worse-case scenario" which is nearest to the closest point of reception. Table 3 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. Predictor-Lima modelling data is available upon request.

TABLE 2: RECEPTOR LOCATIONS

Receptor Number	Receptor Location	Height Above Grade (m)
1	POW - Ouellette Avenue	4.5
2	POW - French Avenue	4.5
3a	POW - Mille Roches Road	4.5
3b	OPOR - Mille Roches Road	1.5
4	POW - Barnhart Drive	4.5
5	POW - Barry Street	4.5
6a	POW - County Road 36	4.5
6b	OPOR - County Road 36	1.5
7	POW - County Road 36	4.5
8	POW - County Road 36	4.5
9a	POW - County Road 36	4.5
9b	OPOR - County Road 36	1.5
10	POW - County Road 36	4.5
11	POW - County Road 36	4.5
12	POW - Jenkins Road	4.5
13a	POW - Avonmore Road	4.5
13b	OPOR - Avonmore Road	1.5
14	POW - Avonmore Road	4.5
15	POW - Jim Brownell Boulevard (Future)	4.5
16	POW - John Chase Subdivision (Future)	4.5
17	POW - Fenton Farm Subdivision (Future)	4.5
18	POW - Fenton Farm Subdivision (Future)	4.5
19	POW - Fenton Farm Subdivision (Future)	4.5

TABLE 3: CALCULATION SETTINGS

Parameter	Setting
Meteorological correction method	Single value for C0
Value C0	2.0
Ground attenuation factor for soft ground regions	1
Temperature (K)	283.15
Pressure (kPa)	101.33
Air humidity (%)	70

4.3 Impulsive Stationary Noise

4.3.1 Criteria for Impulsive Stationary Noise

Impulsive noise events are expected to occur during train shunting operations. Impulsive noise, such as bangs and firearm discharges, are expressed in terms of the Logarithmic Mean Impulse Sound Level (L_{LM}). The L_{LM} is the average of the individual sound pressure levels generated by each impulse event. According to the NPC-300, the exclusion limit values for impulsive noise levels for Plane of Window and Outdoor Points of Reception are shown in Table 4 below.

TABLE 4: EXCLUSION LIMIT FOR IMPULSIVE SOUND LEVELS - CLASS 3 AREA

Time of Day	Actual Number of Impulses in Period of One-Hour	Class 3 L_{LM} (dBAI) Limit	
		POW Points of Reception	OPOR Points of Reception
07:00 – 23:00 / 23:00-07:00	9 or more	45/40	45/-
07:00 – 23:00 / 23:00-07:00	7 to 8	50/45	50/-
07:00 – 23:00 / 23:00-07:00	5 to 6	55/50	55/-
07:00 – 23:00 / 23:00-07:00	4	60/55	60/-
07:00 – 23:00 / 23:00-07:00	3	65/60	65/-
07:00 – 23:00 / 23:00-07:00	2	70/65	70/-
07:00 – 23:00 / 23:00-07:00	1	75/70	75/-

4.3.2 Impulsive Stationary Source Noise Predictions

Sound power levels for the impulsive noise due to train shunting operations was based on published research[11] and Gradient Wind's experience with similar developments. The Logarithmic Mean Impulse Sound Level (L_{LM}) of the impulsive noise from train shunting used in the assessment was 111 dBAI. Impulsive noise sources are represented as an area source in the Predictor-Lima model to represent the possibility of shunting operations occurring over the entire length of the rail yard. The logarithmic impulsive noise levels were examined at the various noise-sensitive points of reception in the *Predictor-Lima* model. During the train shunting events, impulses are expected to occur more than 9 times within an hour, requiring the most stringent impulse sound level limits. The impulsive noise sources were modeled as point sources at a height of 1.5 meters above grade.

5. RESULTS AND DISCUSSION

5.1 Steady State / Varying Stationary Noise Results

Noise levels received at the surrounding noise-sensitive dwellings, produced by idling locomotives are presented in Table 5. Noise levels are based on assumptions in Section 2.1. Noise contours at 1.5 metres above grade for all steady-state/varying stationary noise sources can be seen in Figures 3 and 4 for daytime, and evening/nighttime conditions. As Table 5 summarizes, steady-state/varying noise levels meet Class 3 criteria at all receptors.

[11] Railway Noise Measurement and Reporting Methodology, Canadian Transportation Agency, Minister of Public Works and Government Services Canada, August 2011

TABLE 5: NOISE LEVELS FROM STEADY-STATE / VARYING STATIONARY SOURCES

Receptor Number	Receptor Location	Noise Level (dBA)			Sound Level Limits			Meets Class 3 Criteria		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
1	POW - Ouellette Avenue	16	14	14	45	40	40	**YES**	**YES**	**YES**
2	POW - French Avenue	11	5	5	45	40	40	**YES**	**YES**	**YES**
3a	POW - Mille Roches Road	24	21	21	45	40	40	**YES**	**YES**	**YES**
3b	OPOR - Mille Roches Road	26	23	23	45	40	N/A*	**YES**	**YES**	**N/A***
4	POW - Barnhart Drive	27	24	24	45	40	40	**YES**	**YES**	**YES**
5	POW - Barry Street	30	27	27	45	40	40	**YES**	**YES**	**YES**
6a	POW - County Road 36	33	30	30	45	40	40	**YES**	**YES**	**YES**
6b	OPOR - County Road 36	33	30	30	45	40	N/A*	**YES**	**YES**	**N/A***
7	POW - County Road 36	38	35	35	45	40	40	**YES**	**YES**	**YES**
8	POW - County Road 36	38	35	35	45	40	40	**YES**	**YES**	**YES**
9a	POW - County Road 36	41	37	37	45	40	40	**YES**	**YES**	**YES**
9b	OPOR - County Road 36	43	40	40	45	40	N/A*	**YES**	**YES**	**N/A***
10	POW - County Road 36	38	34	34	45	40	40	**YES**	**YES**	**YES**
11	POW - County Road 36	35	31	31	45	40	40	**YES**	**YES**	**YES**
12	POW - Jenkins Road	33	29	29	45	40	40	**YES**	**YES**	**YES**
13a	POW - Avonmore Road	31	27	27	45	40	40	**YES**	**YES**	**YES**
13b	OPOR - Avonmore Road	30	27	27	45	40	N/A*	**YES**	**YES**	**N/A***
14	POW - Avonmore Road	30	26	26	45	40	40	**YES**	**YES**	**YES**
15	POW - Jim Brownell Boulevard (Future)	29	26	26	45	40	40	**YES**	**YES**	**YES**
16	POW - John Chase Subdivision (Future)	28	25	25	45	40	40	**YES**	**YES**	**YES**
17	POW - Fenton Farm Subdivision (Future)	43	40	40	45	40	40	**YES**	**YES**	**YES**
18	POW - Fenton Farm Subdivision (Future)	43	40	40	45	40	40	**YES**	**YES**	**YES**
19	POW - Fenton Farm Subdivision (Future)	43	40	40	45	40	40	**YES**	**YES**	**YES**

*Nighttime noise levels are not considered at OPOR receptors, per NPC-300 guidelines.

5.2 Impulsive Noise Results

The impulse noise levels received at nearby noise-sensitive dwellings, generated from train shunting in the proposed rail yard, are summarized in Table 6. Impulsive noise contours at 1.5 metres above grade can be seen in Figure 5. The results of the analysis indicate that impulsive noise levels are expected to be in compliance with NPC-300 limits at all points of reception.

TABLE 6: NOISE LEVELS FROM IMPULSIVE STATIONARY SOURCES

Receptor Number	Plane of Window Receptor Location	Noise Level (dBAI)		Meets Class 3 Criteria	
		Day	Night	Day (45 dBAI)	Night (40 dBAI)
1	POW - Ouellette Avenue	34	31	**YES**	**YES**
2	POW - French Avenue	39	36	**YES**	**YES**
3a	POW - Mille Roches Road	40	37	**YES**	**YES**
3b	OPOR - Mille Roches Road	40	37	**YES**	**N/A***
4	POW - Barnhart Drive	39	36	**YES**	**YES**
5	POW - Barry Street	40	37	**YES**	**YES**
6a	POW - County Road 36	41	38	**YES**	**YES**
6b	OPOR - County Road 36	40	37	**YES**	**N/A***
7	POW - County Road 36	38	35	**YES**	**YES**
8	POW - County Road 36	39	36	**YES**	**YES**
9a	POW - County Road 36	38	35	**YES**	**YES**
9b	OPOR - County Road 36	40	37	**YES**	**N/A***
10	POW - County Road 36	37	34	**YES**	**YES**
11	POW - County Road 36	35	32	**YES**	**YES**
12	POW - Jenkins Road	33	30	**YES**	**YES**
13a	POW - Avonmore Road	32	29	**YES**	**YES**
13b	OPOR - Avonmore Road	31	28	**YES**	**N/A***
14	POW - Avonmore Road	32	29	**YES**	**YES**
15	POW - Jim Brownell Boulevard (Future)	42	39	**YES**	**YES**
16	POW - John Chase Subdivision (Future)	40	37	**YES**	**YES**
17	POW - Fenton Farm Subdivision (Future)	43	40	**YES**	**YES**
18	POW - Fenton Farm Subdivision (Future)	43	40	**YES**	**YES**
19	POW - Fenton Farm Subdivision (Future)	43	40	**YES**	**YES**

*Nighttime noise levels are not considered at OPOR receptors, as per NPC-300 guidelines

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current study indicate that stationary noise levels received at nearby noise-sensitive dwellings, generated by the proposed rail yard development, are expected to comply with NPC-300 sound level limits at all points of reception. The proposed industrial rail yard development is expected to be compatible with the surrounding noise-sensitive dwellings, provided the assumptions in Section 2.1 are adhered to during design and operation of the rail yard.

This concludes our stationary 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,

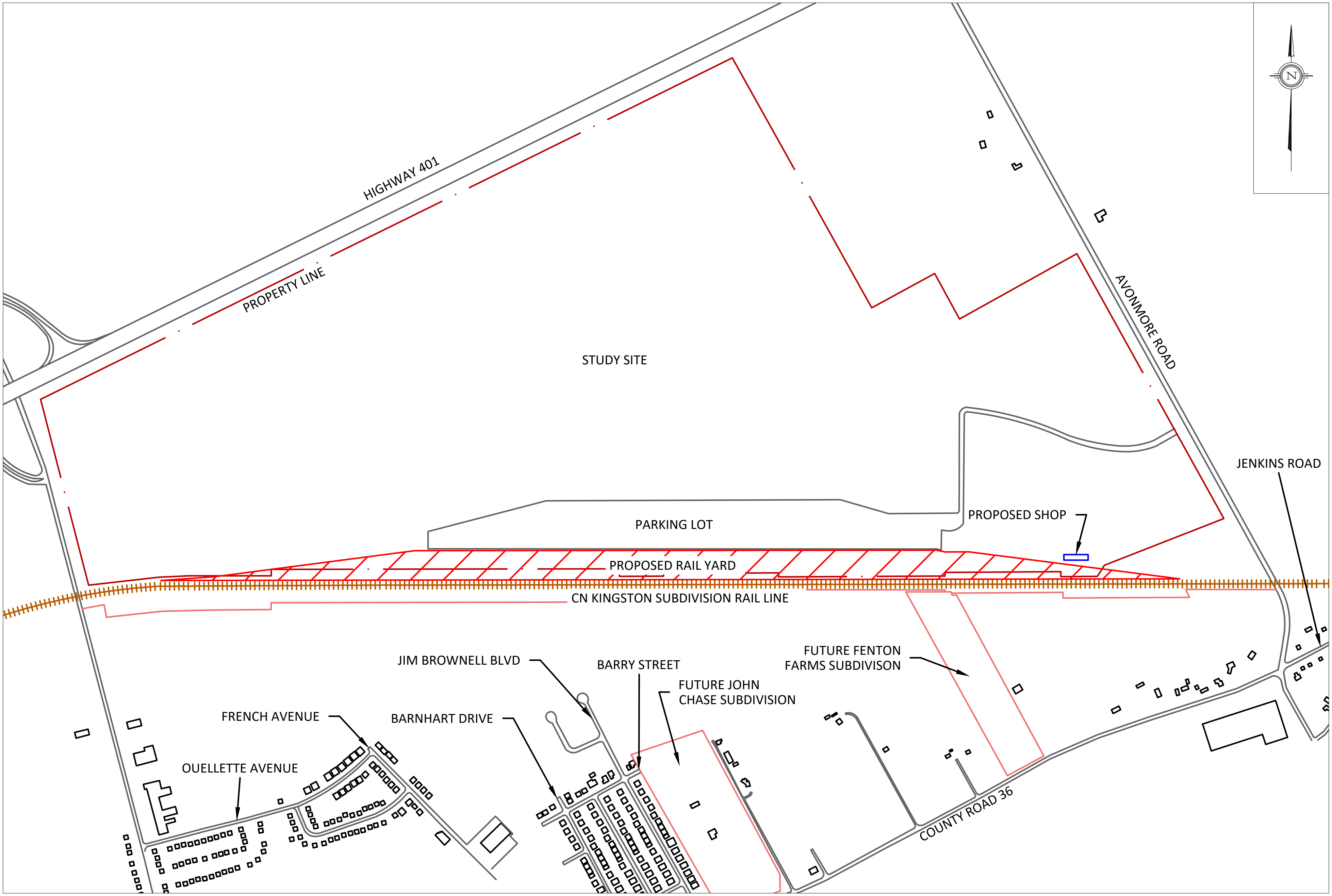
Gradient Wind Engineering Inc.

LICENSED PROFESSIONAL ENGINEER
J. R. FOSTER
100155655
PROVINCE OF ONTARIO

Tanyon Matheson-Fitchett, B.Eng.
Junior Environmental Scientist

Joshua Foster, P.Eng.
Principal

Gradient Wind File #21-361 – Stationary Noise



GRADIENTWIND
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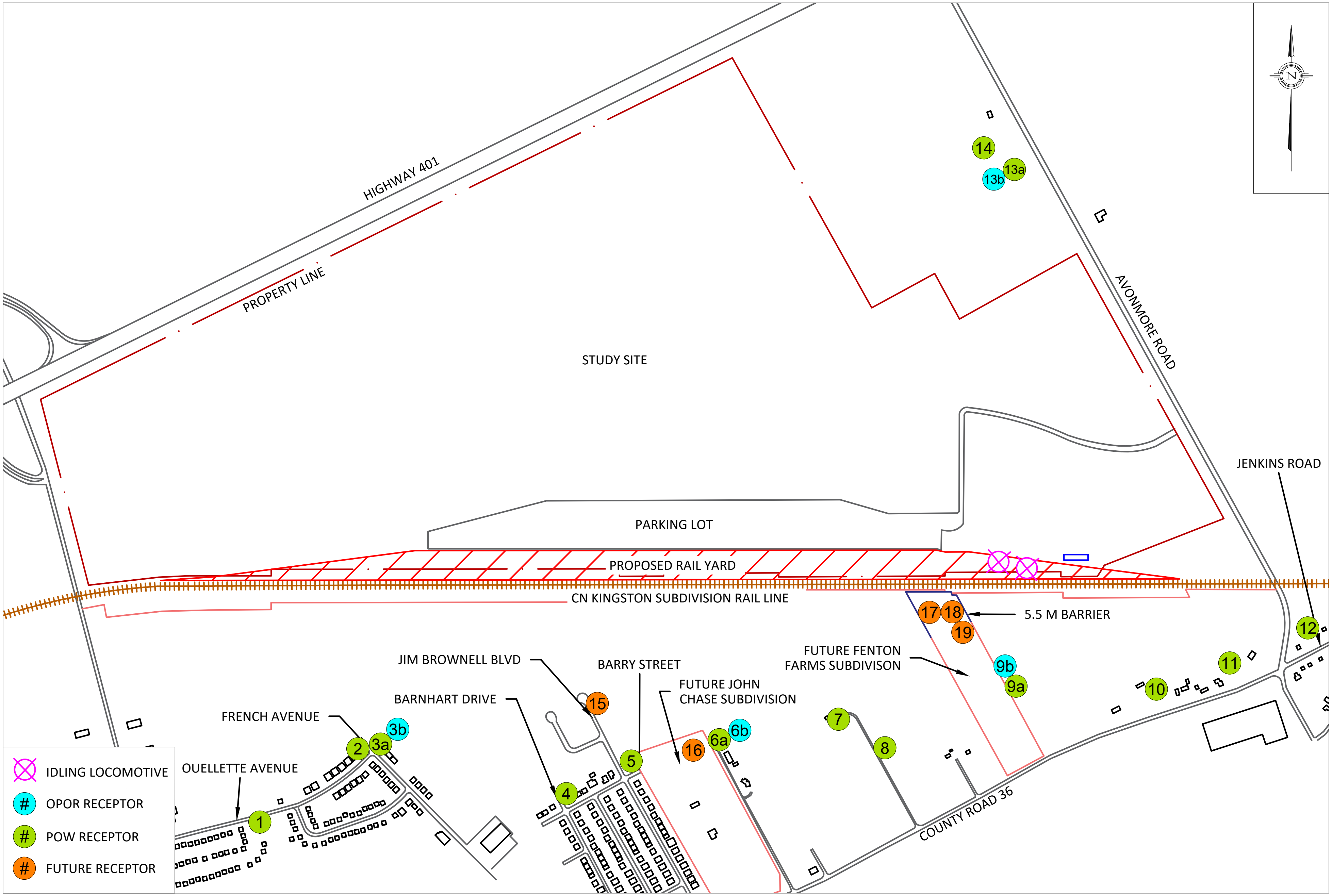
613 836 0934 • GRADIENTWIND.COM

PROJECT	LONG SAULT RAIL YARD, SOUTH STORMONT, ONTARIO STATIONARY NOISE ASSESSMENT		
SCALE	1:14000 (APPROX.)	DRAWING NO.	GW21-361-1
DATE	NOVEMBER 9, 2021	DRAWN BY	T.M.F.

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT



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PROJECT	LONG SAULT RAIL YARD, SOUTH STORMONT, ONTARIO STATIONARY NOISE ASSESSMENT		
SCALE	1:14000 (APPROX.)	DRAWING NO.	GW21-361-2
DATE	NOVEMBER 10, 2021	DRAWN BY	T.M.F.

DESCRIPTION

FIGURE 1:
NOISE SOURCE AND RECEPTOR LOCATIONS

FIGURE 3: DAYTIME STEADY-STATE / VARYING STATIONARY NOISE CONTOURS (1.5 METERS ABOVE GRADE)

	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 4: EVENING AND NIGHTTIME STEADY-STATE / VARYING STATIONARY NOISE CONTOURS (1.5 METERS ABOVE GRADE)

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

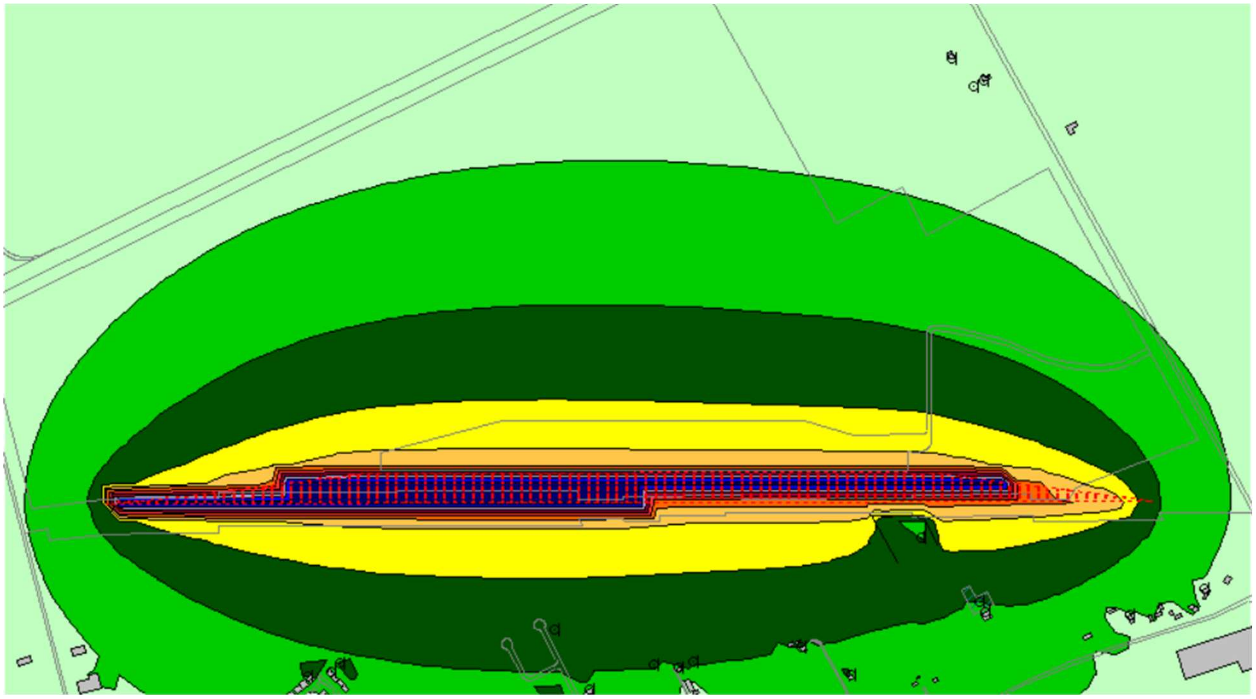
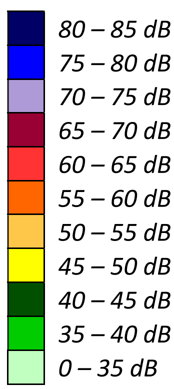
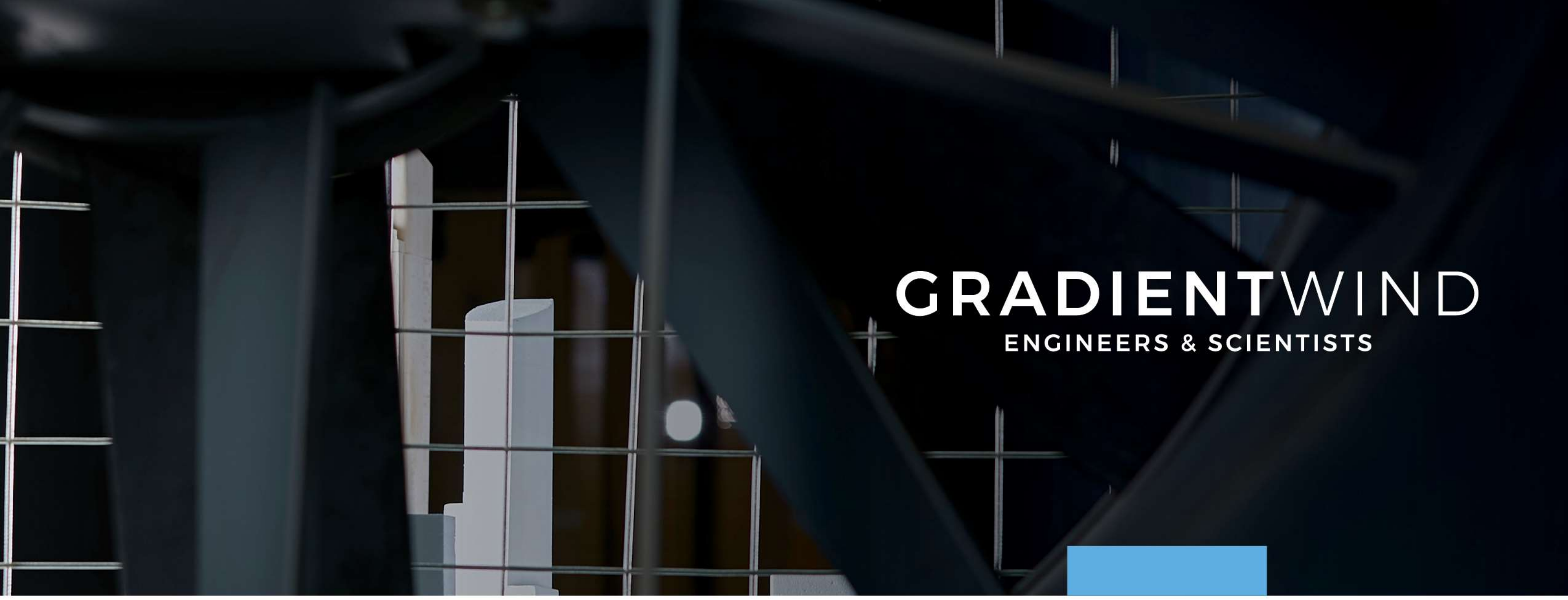
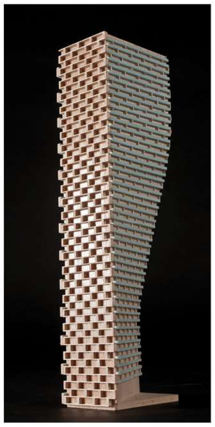
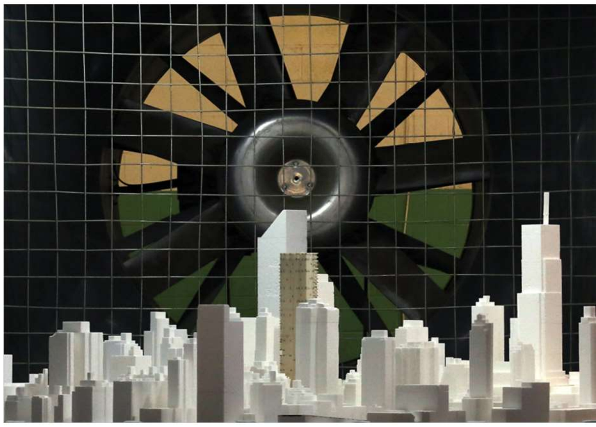


FIGURE 5: IMPULSIVE VARYING STATIONARY NOISE CONTOURS (1.5 METERS ABOVE GRADE)







APPENDIX A

EMAIL CORRESPONDENCE

Hi Jennifer,

We need to consider the plausible worst case scenario, so we should give some thought to future activities.

Will there be shunting of cars occurring in the yard?
How many locomotives would be operating or idling in the yard?

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From: Kyle Jones <Kyle.Jones@crewsrail.com>
Sent: Wednesday, October 13, 2021, 3:22 p.m.
To: Jennifer Murray
Cc: Jesse McPhail
Subject: Re: Industrial Rail Yard - Long Sault, ON

Hi Jennifer,

Yes there will be rail car shunting in the yard.
There will be eventually be 2 locomotives in the yard.
Our locomotives idle at 71 db, taken at 50'

Thanks,

Kyle Jones
Chief Operating Officer
CREWS
Email: kyle.jones@crewsrail.com
Tel: (613) 498-8766
Fax: (613) 713-3350
www.crewsrail.com