

# GRADIENTWIND

ENGINEERS & SCIENTISTS

## TRANSPORTATION NOISE FEASIBILITY ASSESSMENT

466 Tremblay Road and  
1440 St. Laurent Boulevard  
Ottawa, Ontario

Report: 26-111 – Transportation Noise Feasibility



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PREPARED FOR

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## EXECUTIVE SUMMARY

This report describes a transportation noise feasibility assessment undertaken to support an Official Plan Amendment (OPA) and Zoning By-Law Amendment (ZBA) applications for the proposed development located at 466 Tremblay Road and 1440 St. Laurent Boulevard in Ottawa, Ontario. The proposed development is located on a rectangular parcel of land and comprises two 'L'-shaped residential buildings each rising nine-storeys, with Building A to the north and Building B to the south. The dominant sources of roadway traffic noise impacting the development is Tremblay Road and Highway 417, located to the north of the subject site. The major source of LRT noise includes the Confederation Line 1 to the northeast. The VIA Rail Alexandria subdivision to the south is a source of railway noise. As the railway tracks are located further than 75 metres from the subject site, vibration impacts are not expected to be a concern. 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); (iii) future vehicular traffic volumes based on the City of Ottawa's Official Plan roadway classifications; (iv) railway data obtained from VIA Rail's daily train schedule, which was projected for future growth; and (v) architectural drawings provided by Project1 Studio Incorporated in June 2026.

The results of the current analysis indicate that noise levels will range between 52 and 76 dBA during the daytime period (07:00-23:00) and between 46 and 69 dBA during the nighttime period (23:00-07:00). The highest noise level (i.e. 76 dBA) occurs along the development's north façade of Building A which is nearest and most exposed to Highway 417 and Tremblay Road.

The noise levels predicted due to roadway and railway traffic exceed the criteria listed in Section 4.2 for building components. As such, upgraded building components, including STC rated glazing elements and exterior walls, will be required. Additional details are provided in Section 5.2 and Figure 3. Results of the calculations also indicate that the development will require air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. In addition to ventilation requirements, a Type D Warning Clause will also be required to be placed on all Lease, Purchase and Sale Agreements, as summarized in Section 6 of this report.



Noise levels at the rooftop outdoor amenities are expected to exceed 60 dBA during the daytime period without a noise barrier. If these areas are to be used as an outdoor living area, noise control measures are required to reduce noise levels as close as possible to 55 dBA where technically and administratively feasible and must not exceed 60 dBA. Further analysis investigated the noise mitigating impact of adding noise barriers to the rooftop outdoor amenities and is summarized in Section 5.3.

Noise levels fall at 60 dBA with a 2.5-metre-tall (above the walking surface) noise barrier enclosing the Building A outdoor amenity as shown in Figure 4. Furthermore, a 2.1 metre-tall (above the walking surface) noise barrier enclosing the Building B outdoor amenity as shown in Figure 4 will also reduce noise levels to 60 dBA. In addition to the noise barriers, a Type B Warning Clause will be required on all Lease, Purchase, and Sale Agreements as summarized in Section 6. The solid noise walls must be constructed from materials having a minimum surface density of 20 kg/m<sup>2</sup> (STC rating of 30) and contain no gaps.

As the subject site is within 300 metres of the Alexandria subdivision railway, a VIA Rail Warning Clause is required on all Lease, Purchase, and Sale Agreements, as summarized in Section 6.

Furthermore, as the development is near the LRT Line 1, the Rail Construction Program Office recommends that a warning clause be included in all Lease, Purchase, and Sale Agreements as summarized in Section 6.

A review of satellite imagery confirmed there are no significant sources of stationary noise surrounding the site. Surrounding buildings consist of single-family homes. The dominant source of noise impacting the development is from transportation noise sources.

The development's own mechanical equipment has the potential to generate noise off-site at surrounding noise sensitive (residential) developments and on the development itself. Any potential impacts can be minimized by judicious selection of mechanical equipment and its location. These systems will be designed to comply with the ENCG sound level limits. A review by a qualified acoustic consultant is recommended once the mechanical design of the building has developed.

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## **1. INTRODUCTION**

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Rohit Homes to undertake a transportation noise feasibility assessment to support Official Plan Amendment (OPA) and Zoning By-Law Amendment (ZBA) applications for a proposed development located at 466 Tremblay Road and 1440 St. Laurent Boulevard in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to the assessment of exterior and interior noise levels generated by local roadway, LRT, and railway traffic.

This assessment is based on theoretical noise calculation methods conforming to the Ministry of the Environment, Conservation and Parks (MECP) NPC-300<sup>1</sup> and City of Ottawa Environmental Noise Control Guidelines (ENCG)<sup>2</sup>. Noise calculations were based on architectural drawings provided by Project1 Studio Incorporated, received in June 2026, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications and railway data obtained from VIA Rail's daily train schedule which was projected for future growth.

## **2. TERMS OF REFERENCE**

The subject site is located at 466 Tremblay Road and 1440 St. Laurent Boulevard in Ottawa, Ontario. The site is bordered by Tremblay Road to the north, low-rise residential homes to the west, vacant land to the east, and the Via Rail Alexandria subdivision to the south.

The proposed development is located on a rectangular parcel of land and comprises two 'L'-shaped residential buildings each rising nine-storeys, with Building A to the north and Building B to the south. Each building features floorplate setbacks along the west elevation at levels six and eight, to form a rectangular shape. Rooftop outdoor amenities are features on both buildings. Additionally, the proposed development includes one level of underground parking. Residential units are located at all levels for both buildings. Although the development features private balconies, these are not considered noise sensitive as they are less than 4 metres in depth. The dominant sources of roadway traffic noise impacting the

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<sup>1</sup> Ontario Ministry of the Environment and Climate Change – Environmental Noise Guidelines, Publication NPC-300, Queens Printer for Ontario, Toronto, 2013

<sup>2</sup> City of Ottawa, Environmental Noise Control Guidelines, January 2016

development is Tremblay Road and Highway 417, located to the north of the subject site. The major source of LRT noise includes the Confederation Line 1 to the northeast. The VIA Rail Alexandria subdivision to the south is a source of railway noise. As the railway tracks are located further than 75 metres from the subject site, vibration impacts are not expected to be a concern. Figure 1 illustrates a site plan with surrounding context.

### **3. OBJECTIVES**

The principal objectives of this study are to (i) calculate the future noise levels on the study building produced by local roadway traffic, and (ii) ensure that interior and exterior noise levels do not exceed the allowable limits specified by the City of Ottawa's Environmental Noise Control Guidelines as outlined in Section 4.2 of this report.

### **4. METHODOLOGY**

#### **4.1 Background**

Noise can be defined as any obtrusive sound. It is created at a source, transmitted through a medium, such as air, and intercepted by a receiver. Noise may be characterized in terms of the power of the source or the sound pressure at a specific distance. While the power of a source is characteristic of that particular source, the sound pressure depends on the location of the receiver and the path that the noise takes to reach the receiver. Measurement of noise is based on the decibel unit, dBA, which is a logarithmic ratio referenced to a standard noise level ( $2 \times 10^{-5}$  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 and Railway Traffic Noise

For surface 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 and railways, 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) specify that the recommended indoor noise limit range due to roadway noise (that is relevant to this study) is 45 and 40 dBA for living rooms and sleeping quarters respectively, as listed in Table 1. Indoor noise level limits due to railway noise are 5 dBA lower.

**TABLE 1: INDOOR SOUND LEVEL CRITERIA<sup>3</sup>**

| Type of Space                                                                                                                                                                                                     | Time Period   | $L_{eq}$ (dBA) |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------|------|
|                                                                                                                                                                                                                   |               | Road           | Rail |
| General offices, reception areas, retail stores, etc.                                                                                                                                                             | 07:00 – 23:00 | 50             | 45   |
| Living/dining/den areas of <b>residences</b> , 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             | 40   |
| Sleeping quarters of hotels/motels                                                                                                                                                                                | 23:00 – 07:00 | 45             | 40   |
| Sleeping quarters of <b>residences</b> , hospitals, nursing/retirement homes, etc.                                                                                                                                | 23:00 – 07:00 | 40             | 35   |

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<sup>4</sup>. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor

<sup>3</sup> Adapted from ENCG 2016 – Tables 2.2b and 2.2c

<sup>4</sup> Burberry, P.B. (2014). Mitchell's Environment and Services. Routledge, Page 125



environment<sup>5</sup>. 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. Additionally, where sound levels due to roadway noise exceed 65 dBA during the daytime or 60 dBA during the nighttime, building components will require higher levels of sound attenuation<sup>6</sup>. For railway noise, where sound levels exceed 60 dBA during the daytime and 55 dBA during the nighttime, building components with higher levels of sound attenuation will also be required.

For designated Outdoor Living Areas (OLAs), the sound level limit is 55 dBA during the daytime period. An excess above the limit is acceptable only in cases where the required noise control measures are not feasible for technical, economic or administrative reasons. Furthermore, noise levels must not exceed 60 dBA.

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<sup>5</sup> MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8

<sup>6</sup> MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3



## 4.2.2 Roadway and Railway 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<sup>7</sup> 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. LRT traffic data for the Confederation Line 1 was obtained from the City of Ottawa. Table 2A (below) summarizes the AADT values used for each roadway and LRT included in this assessment. VIA Rail traffic data was obtained from the daily schedules and projected ten years into the future using an assumed growth rate of 2.5%. Table 2B (below) summarizes the data used for each railway included in this assessment.

**TABLE 2A: ROADWAY AND LRT TRAFFIC DATA**

| Segment                          | Roadway Traffic Classification | Speed Limit (km/h) | Traffic Volumes |
|----------------------------------|--------------------------------|--------------------|-----------------|
| Tremblay Road                    | Two-Lane Major Collector       | 50                 | <b>12,000</b>   |
| Highway 417 Eastbound            | 5-Lane Highway                 | 100                | <b>91,665</b>   |
| Highway 417 Westbound            | 5-Lane Highway                 | 100                | <b>91,655</b>   |
| Highway 417 Onramp               | 1-Lane Highway                 | 100                | <b>18,333</b>   |
| Highway 417 Offramp              | 2-Lane Highway                 | 100                | <b>36,666</b>   |
| O-Train Confederation Line 1 LRT | Passenger LRT*                 | 70                 | <b>540/60**</b> |

\*The LRT was modelled in STAMSON as a 4-car SRT using the RT/Custom feature

\*\*Day/night split

**TABLE 2B: RAILWAY TRAFFIC DATA**

| Segment  | Roadway Class  | Operating Speed (km/h) | AADT Day/Night Split |
|----------|----------------|------------------------|----------------------|
| VIA Rail | Passenger Rail | 160***                 | 12/2                 |

\*\*\*Maximum operating speed of passenger trains along this corridor is 160 km/h. However, due to STAMSON limitations, a speed of 150 km/h was used in the sample calculations

<sup>7</sup> City of Ottawa Transportation Master Plan, November 2013



### 4.2.3 Theoretical Roadway and Railway Traffic Noise Predictions

The impact of transportation noise sources on the development was determined by computer modelling. Transportation noise source modelling is based on the software program *CadnaA*, which utilizes the United States Federal Highway Administration's Traffic Noise Model (TNM) to represent the roadway line sources and the FTA/FRA model to represent railway sources. The TNM analysis model has been recognized by the Ministry of Transportation Ontario (MTO) as the recommended noise model for transportation projects (ref. Environmental Guide for Noise, 2022, by the Ministry of Transportation (MTO)<sup>8</sup>). The Ministry of Environment, Conservation and Parks has also adopted the TMN model as per their "Draft Guideline Noise Pollution Control Publications 306 (NPC-306)"<sup>9</sup>.

A set of comparative calculations were also performed for comparisons using STAMSON. The *CadnaA* computer program can represent three-dimensional surfaces and the one order of reflection of sound waves over a suitable spectrum for human hearing. The STAMSON model, however, is an older software and requires each receptor to be calculated separately. STAMSON also does not accurately account for building reflections, multiple screening elements, and curved road geometry. The result of the comparative calculations can be seen in Section 5, Table 4.

Transportation noise calculations were performed by treating each roadway and railway 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 Tables 2A and 2B, theoretical noise predictions were based on the following parameters:

- Truck traffic on all roadways was taken to comprise 5% heavy trucks and 7% medium trucks, as per ENCG requirements for noise level predictions.
- The day/night split for all roads were taken to be 92%/8%, respectively.
- Ground surfaces for receptors were taken to be absorptive where grass and soil is present, and absorptive where paved (hard) ground is located.
- The LRT Line was modelled 5-metres below local grade.

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<sup>8</sup> Ministry of Transportation, Environmental Guide for Noise, 2022. Retrieved from [Environmental Guide for Noise 2022](#)

<sup>9</sup> Ministry of Environment, Conservation and Parks, Ontario, "Methods to determine Sound Levels Due to Road and Rail Traffic", Draft February 12, 2020



- The 4-metre-tall berm between Tremblay Road and Highway 417 has been included in the noise model.
- The VIA rail trains were modelled comprising one diesel locomotive and four passenger cars.
- Noise receptors were strategically placed at 16 locations around the study area (see Figure 2).

### 4.3 Indoor Noise Calculations

The difference between outdoor and indoor noise levels is the noise attenuation provided by the building envelope. According to common industry practice, complete walls and individual wall elements are rated according to the Sound Transmission Class (STC). The STC ratings of common residential walls built in conformance with the Ontario Building Code (2024) typically exceed STC 35, depending on exterior cladding, thickness and interior finish details. For example, brick veneer walls can achieve STC 50 or more. Standard commercially sided exterior metal stud walls have around STC 45. Standard good quality double-glazed non-operable windows can have STC ratings ranging from 25 to 40, depending on the window manufacturer, pane thickness and inter-pane spacing. As previously mentioned, the windows are the known weak point in a partition.

As per Section 4.2, when daytime and nighttime noise levels from road and rail sources at the plane of the window exceed the criteria, calculations must be performed to evaluate the sound transmission quality of the building components to ensure acceptable indoor noise levels. The calculation procedure<sup>10</sup> considers:

- Window type and total area as a percentage of total room floor area
- Exterior wall type and total area as a percentage of the total room floor area
- Acoustic absorption characteristics of the room
- Outdoor noise source type and approach geometry
- Indoor sound level criteria, which varies according to the intended use of a space

Based on published research<sup>11</sup>, exterior walls possess specific sound attenuation characteristics that are used as a basis for calculating the required STC ratings of windows in the same partition. Due to the limited

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<sup>10</sup> Building Practice Note: Controlling Sound Transmission into Buildings by J.D. Quirt, National Research Council of Canada, September 1985

<sup>11</sup> CMHC, Road & Rail Noise: Effects on Housing



information available at the time of the study, which was prepared for OPA and ZBA applications, detailed floor layouts and building elevations have not been finalized; therefore, detailed STC calculations could not be performed at this time. As a guideline, the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels + safety factor).

## **5. RESULTS**

### **5.1 Roadway and Railway Traffic Noise Levels**

The results of the roadway traffic noise calculations are summarized in Table 3 below. The results of the current analysis indicate that noise levels will range between 52 and 76 dBA during the daytime period (07:00-23:00) and between 46 and 69 dBA during the nighttime period (23:00-07:00). The highest noise level (i.e. 76 dBA) occurs along the development's north façade of Building A which is nearest and most exposed to Highway 417 and Tremblay Road.

The noise levels predicted due to roadway and railway traffic exceed the criteria listed in Section 4.2 for building components. As such, upgraded building components, including STC rated glazing elements and exterior walls, will be required. Additional details are provided in Section 5.2 and Figure 3. Results of the calculations also indicate that the development will require air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. In addition to ventilation requirements, a Type D Warning Clause will also be required to be placed on all Lease, Purchase and Sale Agreements, as summarized in Section 6 of this report.

Noise levels at the rooftop outdoor amenities are expected to exceed 60 dBA during the daytime period without a noise barrier. If these areas are to be used as an outdoor living area, noise control measures are required to reduce noise levels as close as possible to 55 dBA where technically and administratively feasible and must not exceed 60 dBA. Further analysis investigated the noise mitigating impact of adding noise barriers to the rooftop outdoor amenities and is summarized in Section 5.3.



**TABLE 3: EXTERIOR NOISE LEVELS DUE TO TRANSPORTATION SOURCES**

| Receptor Number / Type | Height Above Grade / Roof (m) | Receptor Location       | Roadway and LRT Noise Level (dBA) |       | Railway Noise Level (dBA) |       | Total Noise Level (dBA) |       |
|------------------------|-------------------------------|-------------------------|-----------------------------------|-------|---------------------------|-------|-------------------------|-------|
|                        |                               |                         | Day                               | Night | Day                       | Night | Day                     | Night |
| BUILDING A             |                               |                         |                                   |       |                           |       |                         |       |
| R1 / POW               | 13.5                          | Level 5 – West Façade   | 74                                | 66    | 48                        | 43    | 74                      | 66    |
| R2 / POW               | 25.5                          | Level 9 – West Façade   | 74                                | 66    | 49                        | 44    | 74                      | 66    |
| R3 / POW               | 25.5                          | Level 9 – North Façade  | 76                                | 69    | 38                        | 32    | 76                      | 69    |
| R4 / POW               | 25.5                          | Level 9 – East Façade   | 73                                | 66    | 49                        | 44    | 73                      | 66    |
| R5 / POW               | 25.5                          | Level 9 – West Façade   | 68                                | 61    | 51                        | 46    | 68                      | 61    |
| R6 / POW               | 25.5                          | Level 9 – South Façade  | 47                                | 39    | 51                        | 45    | 52                      | 46    |
| R7 / POW               | 25.5                          | Level 9 – East Façade   | 69                                | 61    | 52                        | 46    | 69                      | 61    |
| R8 / OLA               | 1.5                           | Rooftop Outdoor Amenity | 71                                | N/A*  | 50                        | N/A*  | 71                      | N/A*  |
| BUILDING B             |                               |                         |                                   |       |                           |       |                         |       |
| R9 / POW               | 13.5                          | Level 5 – West Façade   | 63                                | 55    | 55                        | 50    | 64                      | 56    |
| R10 / POW              | 25.5                          | Level 9 – West Façade   | 65                                | 58    | 57                        | 52    | 67                      | 59    |
| R11 / POW              | 25.5                          | Level 9 – South Façade  | 46                                | 38    | 59                        | 54    | 60                      | 54    |
| R12 / POW              | 25.5                          | Level 9 – East Façade   | 66                                | 59    | 55                        | 50    | 66                      | 59    |
| R13 / POW              | 25.5                          | Level 9 – West Façade   | 68                                | 60    | 52                        | 47    | 68                      | 60    |
| R14 / POW              | 25.5                          | Level 9 – North Façade  | 69                                | 61    | 40                        | 35    | 69                      | 61    |
| R15 / POW              | 25.5                          | Level 9 – East Façade   | 69                                | 61    | 52                        | 46    | 69                      | 61    |
| R16 / OLA              | 1.5                           | Rooftop Outdoor Amenity | 68                                | N/A*  | 53                        | N/A*  | 68                      | N/A*  |

\*Noise levels during the nighttime are not considered for OLAs



Table 4 below provides a comparison between CadnaA and STAMSON. Noise levels calculated in STAMSON were found to have a good correlation with CadnaA, and variability between the two programs was within an acceptable level of  $\pm 0-1$  dBA.

**TABLE 4: RESULT CORRELATION WITH STAMSON**

| Receptor Number | Receptor Location                   | Receptor Height (m) | CADNAA Noise Level (dBA) |       | STAMSON 5.04 Noise Level (dBA) |       |
|-----------------|-------------------------------------|---------------------|--------------------------|-------|--------------------------------|-------|
|                 |                                     |                     | Day                      | Night | Day                            | Night |
| R2              | Building A – Level 9 – West Façade  | 25.5                | 74                       | 66    | 75                             | 67    |
| R11             | Building B – Level 9 – South Façade | 25.5                | 60                       | 54    | 59                             | 55    |

## 5.2 Noise Control Measures

The noise levels predicted due to roadway traffic exceed the criteria listed in Section 4.2 for building components. As discussed in Section 4.3, the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels + safety factor). Figure 3 outlines the required bedroom and living room window STC's for all facades of the development. The STC requirements are summarized below for various units within the development:

- **Bedroom Windows**
  - (i) Bedroom windows on Building A facing north, west, and east will require a minimum STC of 34.
  - (ii) Bedroom windows on Building B facing north, west, and east will require a minimum STC of 30.
  - (iii) All other bedroom windows are to satisfy Ontario Building Code (OBC 2024) requirements.
- **Living Room Windows**
  - (i) Living room windows Building A facing north, west, and east will require a minimum STC of 34.
  - (ii) Bedroom windows on Building B facing north, west, and east will require a minimum STC of 30.
  - (iii) All other living room windows are to satisfy Ontario Building Code (OBC 2024) requirements.



■ **Exterior Walls**

- (i) Exterior wall components on the north, east, and west façades of Building A and Building B will require a minimum STC of 45, which will be achieved with brick cladding or an acoustical equivalent according to NRC test data<sup>12</sup>.

The STC requirements apply to windows, doors, spandrel panels and curtainwall elements. Exterior wall components on these façades are recommended to have a minimum STC of 45, where a stud wall system is used. A review of window supplier literature indicates that the specified STC ratings can be achieved by a variety of window systems having a combination of glass thickness and inter-pane spacing. We have specified an example window configuration, however several manufacturers and various combinations of window components, such as those proposed, will offer the necessary sound attenuation rating. It is the responsibility of the manufacturer to ensure that the specified window achieves the required STC. This can only be assured by using window configurations that have been certified by laboratory testing. The requirements for STC ratings assume that the remaining components of the building are constructed and installed according to the minimum standards of the Ontario Building Code. The specified STC requirements also apply to swinging and/or sliding patio doors.

Results of the calculations also indicate that the development will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. In addition to ventilation requirements, Warning Clauses will also be required on all Lease, Purchase and Sale Agreements, as summarized in Section 6.

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<sup>12</sup> J.S. Bradley and J.A. Birta. Laboratory Measurements of the Sound Insulation of Building Façade Elements, National Research Council October 2000.



### 5.3 Noise Barrier Calculation

Noise levels at the rooftop outdoor amenities are expected to exceed 60 dBA during the daytime period without a noise barrier. If these areas are to be used as an outdoor living area, noise control measures are required to reduce noise levels as close as possible to 55 dBA where technically and administratively feasible and must not exceed 60 dBA. Further analysis investigated the noise mitigating impact of adding noise barriers to the rooftop outdoor amenities and is summarized in Table 5.

Noise levels fall at 60 dBA with a 2.5-metre-tall (above the walking surface) noise barrier enclosing the Building A outdoor amenity as shown in Figure 4. Furthermore, a 2.1 metre-tall (above the walking surface) noise barrier enclosing the Building B outdoor amenity as shown in Figure 4 will also reduce noise levels to 60 dBA. In addition to the noise barriers, a Type B Warning Clause will be required on all Lease, Purchase, and Sale Agreements as summarized in Section 6.

**TABLE 5: RESULTS OF NOISE BARRIER INVESTIGATION**

| Receptor Number | Receptor Height Above Roof (m) | Receptor Location                    | Daytime $L_{eq}$ Noise Levels (dBA) |                    |                    |                    |                    |
|-----------------|--------------------------------|--------------------------------------|-------------------------------------|--------------------|--------------------|--------------------|--------------------|
|                 |                                |                                      | No Barrier                          | With 1.1 m Barrier | With 2.1 m Barrier | With 2.5 m Barrier | With 3.0 m Barrier |
| R8              | 1.5                            | Building A – Rooftop Outdoor Amenity | 71                                  | 65                 | 62                 | <b>60</b>          | 59                 |
| R16             | 1.5                            | Building B – Rooftop Outdoor Amenity | 68                                  | 64                 | <b>60</b>          | 59                 | 58                 |



## 6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 52 and 76 dBA during the daytime period (07:00-23:00) and between 46 and 69 dBA during the nighttime period (23:00-07:00). The highest noise level (i.e. 76 dBA) occurs along the development's north façade of Building A which is nearest and most exposed to Highway 417 and Tremblay Road.

The noise levels predicted due to roadway and railway traffic exceed the criteria listed in Section 4.2 for building components. As such, upgraded building components, including STC rated glazing elements and exterior walls, will be required. Additional details are provided in Section 5.2 and Figure 3. Results of the calculations also indicate that the development will require air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. In addition to ventilation requirements, a Type D Warning Clause will also be required to be placed on all Lease, Purchase and Sale Agreements, as summarized below.

### **Type D:**

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

Noise levels at the rooftop outdoor amenities are expected to exceed 60 dBA during the daytime period without a noise barrier. If these areas are to be used as an outdoor living area, noise control measures are required to reduce noise levels as close as possible to 55 dBA where technically and administratively feasible and must not exceed 60 dBA. Further analysis investigated the noise mitigating impact of adding noise barriers to the rooftop outdoor amenities and is summarized in Section 5.3.

Noise levels fall at 60 dBA with a 2.5-metre-tall (above the walking surface) noise barrier enclosing the Building A outdoor amenity as shown in Figure 4. Furthermore, a 2.1 metre-tall (above the walking surface) noise barrier enclosing the Building B outdoor amenity as shown in Figure 4 will also reduce noise levels to 60 dBA. In addition to the noise barriers, a Type B Warning Clause will be required on all Lease, Purchase, and Sale Agreements as summarized below.



**Type B:**

*"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road and rail traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."*

The solid noise walls must be constructed from materials having a minimum surface density of 20 kg/m<sup>2</sup> (STC rating of 30) and contain no gaps. Design of the guardrail will conform to the requirements outlined in Part 5 of the ENCG. The following information will be required by the City for review prior to installation of the barrier:

1. Shop drawings, signed and sealed by a qualified Professional Engineer licenced by the Professional Engineers of Ontario, showing the details of the acoustic barrier systems components, including material specifications.
2. Structural drawing(s), signed by a qualified Professional Engineer licenced by the Professional Engineers of Ontario, showing foundation details, and specifying design criteria, climatic design loads, as well as applicable geotechnical data used in the design.
3. Layout plan, and wall elevations, showing proposed colours and patterns.

As the subject site is within 300 metres of the Alexandria subdivision railway, a VIA Rail Warning Clause is required on all Lease, Purchase, and Sale agreements, as summarized below.

**VIA Rail Warning Clause:**

"Warning: VIA Rail Canada Inc. or its assigns or successors in interest has or have a rights-of-way within 300 metres from the land the subject hereof. There may be alterations to or expansions of the railway facilities on such rights-of-way in the future including the possibility that the railway or its assigns or successors as aforesaid may expand its operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). VIA will not be responsible for any complaints or



claims arising from the use of such facilities and/or operations on, over or under the aforesaid rights-of-way.”

As the development is near the LRT Line 1, the Rail Construction Program Office recommends that the warning clause identified below be included in all Lease, Purchase, and Sale Agreements.

*"The Owner hereby acknowledges and agrees:*

- i) The proximity of the proposed development of the lands described in Schedule "A" hereto (the "Lands") to the City's existing and future transit operations, may result in noise, vibration, electromagnetic interferences, stray current transmissions, smoke and particulate matter (collectively referred to as "Interferences") to the development;*
- ii) It has been advised by the City to apply reasonable attenuation measures with respect to the level of the Interferences on and within the Lands and the proposed development; and*
- iii) The Owner acknowledges and agrees all agreements of purchase and sale and lease agreements, and all information on all plans and documents used for marketing purposes, for the whole or any part of the subject lands, shall contain the following clauses which shall also be incorporated in all transfer/deeds and leases from the Owner so that the clauses shall be covenants running with the lands for the benefit of the owner of the adjacent road:*

*'The Transferee/Lessee for himself, his heirs, executors, administrators, successors and assigns acknowledges being advised that a public transit light-rail rapid transit system (LRT) is proposed to be located in proximity to the subject lands, and the construction, operation and maintenance of the LRT may result in environmental impacts including, but not limited to noise, vibration, electromagnetic interferences, stray current transmissions, smoke and particulate matter (collectively referred to as the Interferences) to the subject lands. The Transferee/Lessee acknowledges and agrees that despite the inclusion of noise control features within the subject lands,*



*Interferences may continue to be of concern, occasionally interfering with some activities of the occupants on the subject lands.*

*The Transferee covenants with the Transferor and the Lessee covenants with the Lessor that the above clauses verbatim shall be included in all subsequent lease agreements, agreements of purchase and sale and deeds conveying the lands described herein, which covenants shall run with the lands and are for the benefit of the owner of the adjacent road.”*

A review of satellite imagery confirmed there are no significant sources of stationary noise surrounding the site. Surrounding buildings consist of single-family homes. The dominant source of noise impacting the development is from transportation noise sources. Additionally, as the railway tracks are located further than 75 metres from the subject site, vibration impacts are not expected to be a concern.

The development’s own mechanical equipment has the potential to generate noise off-site at surrounding noise sensitive (residential) developments and on the development itself. Any potential impacts can be minimized by judicious selection of mechanical equipment and its location. These systems will be designed to comply with the ENCG sound level limits. A review by a qualified acoustic consultant is recommended once the mechanical design of the building has developed.



This concludes our transportation noise feasibility 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.***

*Doryan S2.*

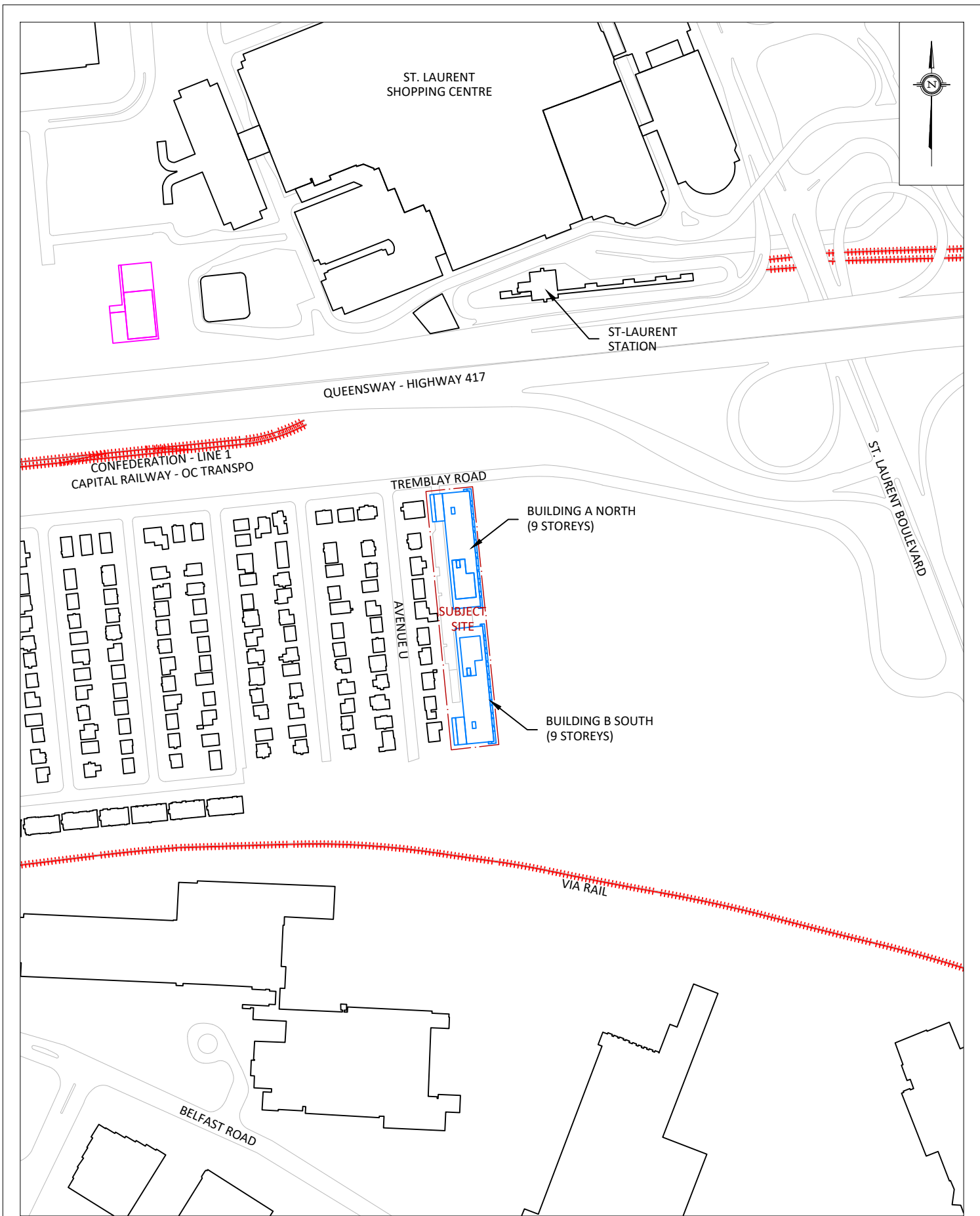
Doryan Saavedra, B.Eng.  
Junior Acoustic Scientist

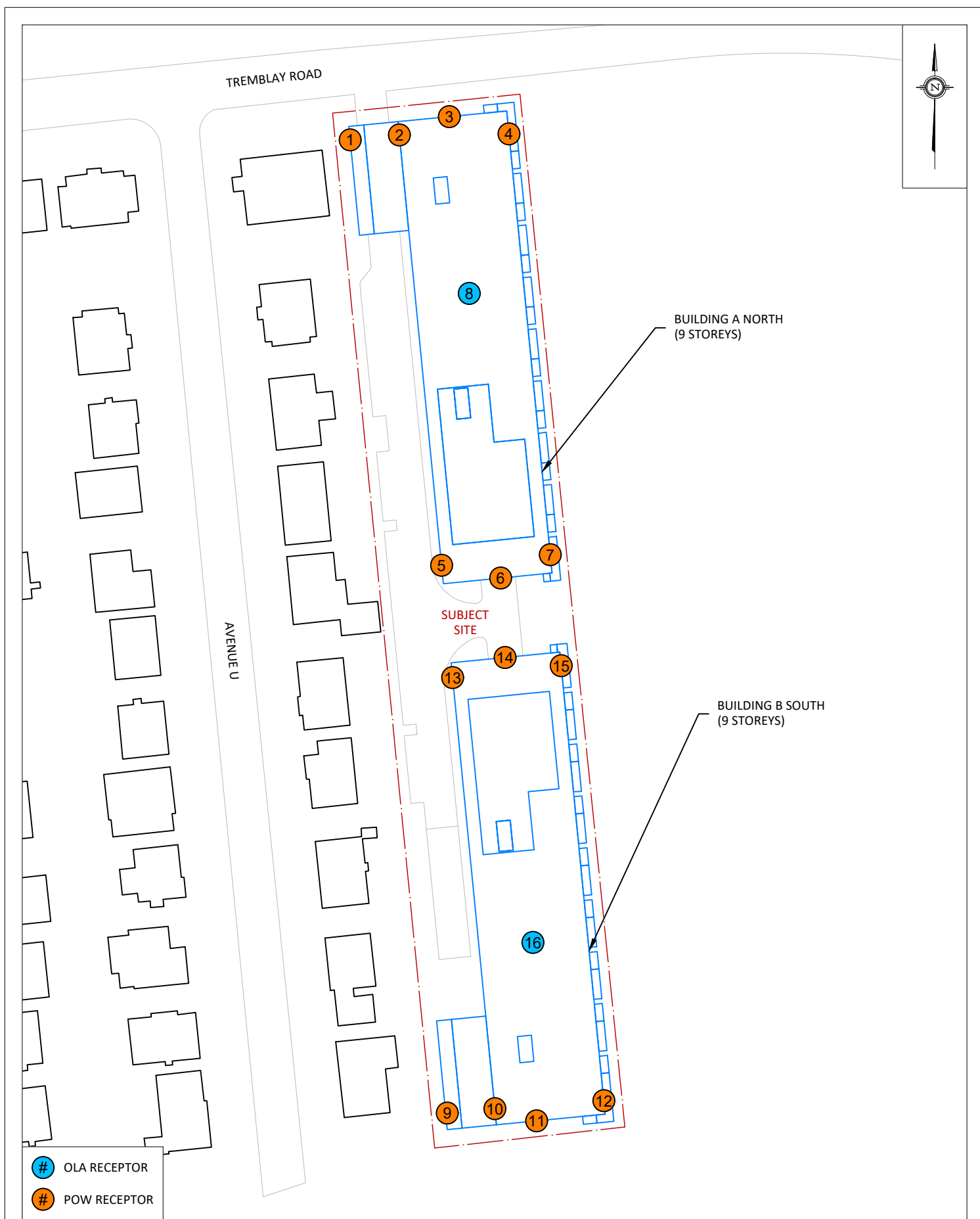


Joshua Foster, P.Eng.  
Lead Engineer

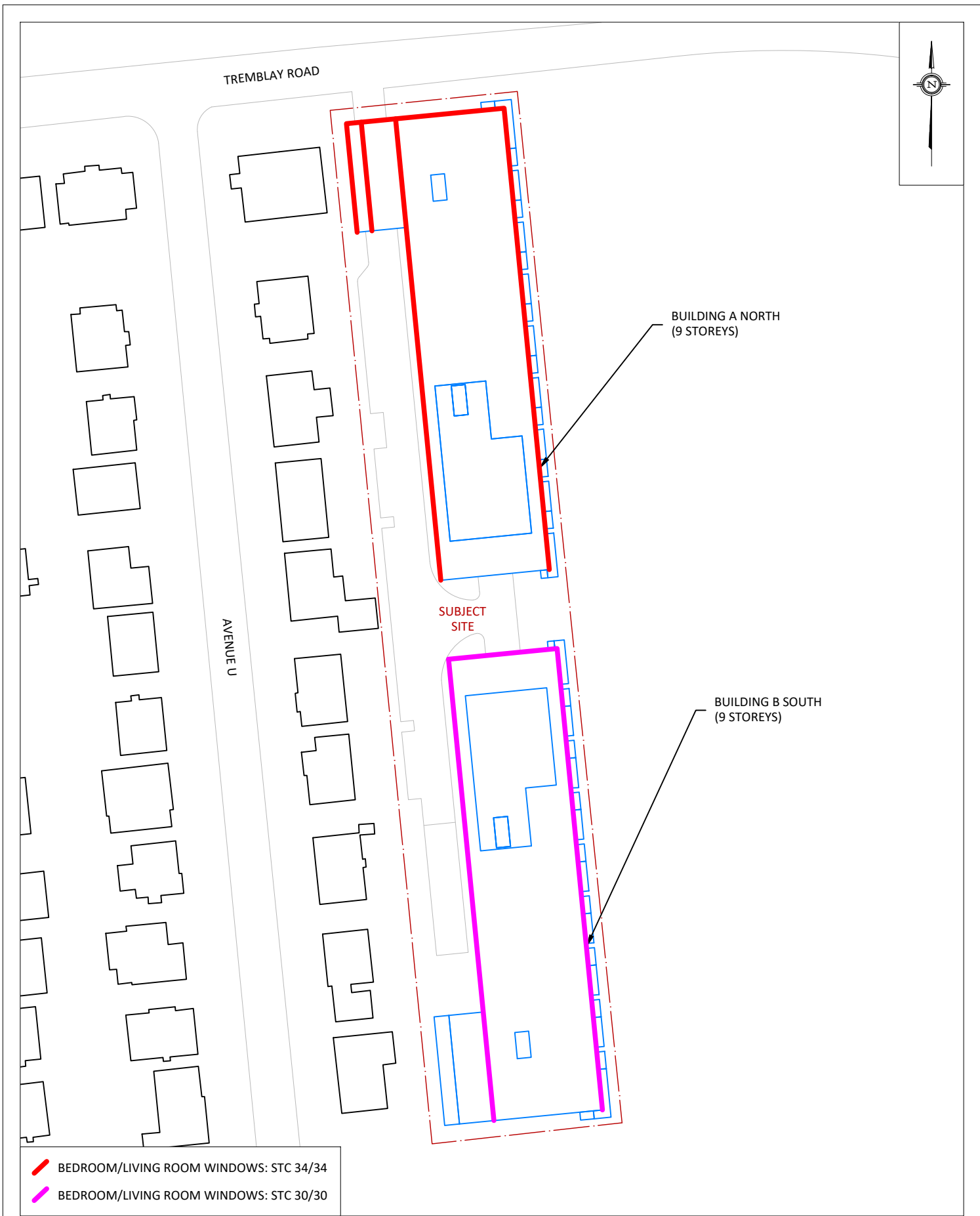
*Gradient Wind File #26-111 – Transportation Noise Feasibility*

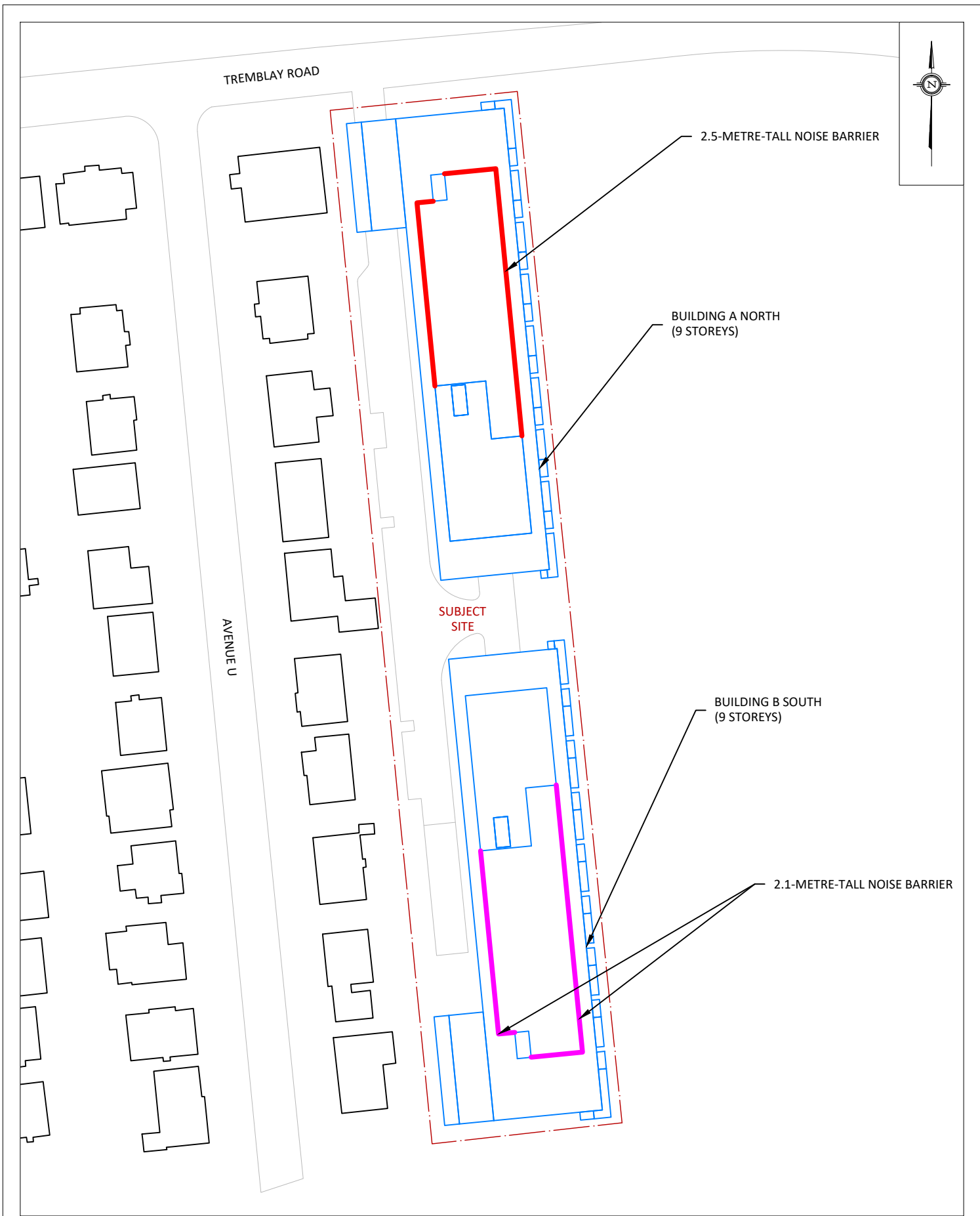






|                                                                                                                                            |                                                                                                           |                          |                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------|
| <div>GRADIENTWIND</div> <div>ENGINEERS &amp; SCIENTISTS</div> <div>127 WALGREEN ROAD, OTTAWA, ON<br/>613 836 0934 • GRADIENTWIND.COM</div> | PROJECT 466 TREMLAY ROAD AND 1440 ST. LAURENT BOULEVARD, OTTAWA<br>TRANSPORTATION NOISE FEASIBILITY STUDY |                          | DESCRIPTION<br><br>FIGURE 2:<br>RECEPTOR LOCATIONS |
|                                                                                                                                            | SCALE 1:1000 (APPROX.)                                                                                    | DRAWING NO. 26-466-ANV-2 |                                                    |
|                                                                                                                                            | DATE AUGUST 4, 2026                                                                                       | DRAWN BY N.M.P.          |                                                    |
|                                                                                                                                            |                                                                                                           |                          |                                                    |





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## APPENDIX A

### STAMSON 5.04 – SAMPLE CALCULATIONS

# GRADIENTWIND

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STAMSON 5.0                      NORMAL REPORT                      Date: 22-07-2026 16:08:07  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2.te                      Time Period: Day/Night 16/8 hours  
Description: POW - Building A - Level 9 - West Facade

Road data, segment # 1: HWY 417 East (day/night)

-----  
Car traffic volume : 74212/6453 veh/TimePeriod \*  
Medium truck volume : 5903/513 veh/TimePeriod \*  
Heavy truck volume : 4217/367 veh/TimePeriod \*  
Posted speed limit : 100 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): 91665  
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: HWY 417 East (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 : 90.00 / 90.00 m  
Receiver height : 25.50 / 25.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



Road data, segment # 2: HWY 417 West (day/night)

-----  
Car traffic volume : 74212/6453 veh/TimePeriod \*  
Medium truck volume : 5903/513 veh/TimePeriod \*  
Heavy truck volume : 4217/367 veh/TimePeriod \*  
Posted speed limit : 100 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): 91665  
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: HWY 417 West (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 : 114.00 / 114.00 m  
Receiver height : 25.50 / 25.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



Road data, segment # 3: Tremblay Rd (day/night)

-----  
Car traffic volume : 9715/845 veh/TimePeriod \*  
Medium truck volume : 773/67 veh/TimePeriod \*  
Heavy truck volume : 552/48 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): 12000  
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 # 3: Tremblay Rd (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 : 15.00 / 15.00 m  
Receiver height : 25.50 / 25.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



Results segment # 1: HWY 417 East (day)

-----

Source height = 1.50 m

ROAD (0.00 + 71.57 + 0.00) = 71.57 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 82.37  | 0.00  | -7.78 | -3.01 | 0.00  | 0.00  | 0.00  | 71.57  |

Segment Leq : 71.57 dBA

Results segment # 2: HWY 417 West (day)

-----

Source height = 1.50 m

ROAD (0.00 + 70.55 + 0.00) = 70.55 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 82.37  | 0.00  | -8.81 | -3.01 | 0.00  | 0.00  | 0.00  | 70.55  |

Segment Leq : 70.55 dBA

Results segment # 3: Tremblay Rd (day)

-----

Source height = 1.50 m

ROAD (0.00 + 64.50 + 0.00) = 64.50 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 67.51  | 0.00  | 0.00  | -3.01 | 0.00  | 0.00  | 0.00  | 64.50  |

Segment Leq : 64.50 dBA

Total Leq All Segments: 74.55 dBA



Results segment # 1: HWY 417 East (night)

Source height = 1.50 m

ROAD (0.00 + 63.98 + 0.00) = 63.98 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 74.77  | 0.00  | -7.78 | -3.01 | 0.00  | 0.00  | 0.00  | 63.98  |

Segment Leq : 63.98 dBA

Results segment # 2: HWY 417 West (night)

Source height = 1.50 m

ROAD (0.00 + 62.95 + 0.00) = 62.95 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 74.77  | 0.00  | -8.81 | -3.01 | 0.00  | 0.00  | 0.00  | 62.95  |

Segment Leq : 62.95 dBA

Results segment # 3: Tremblay Rd (night)

Source height = 1.50 m

ROAD (0.00 + 56.90 + 0.00) = 56.90 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 0      | 0.00  | 59.91  | 0.00  | 0.00  | -3.01 | 0.00  | 0.00  | 0.00  | 56.90  |

Segment Leq : 56.90 dBA

Total Leq All Segments: 66.96 dBA



RT/Custom data, segment # 1: LRT (day/night)

-----  
1 - 4-car SRT:

Traffic volume : 540/60 veh/TimePeriod  
Speed : 70 km/h

Data for Segment # 1: LRT (day/night)

-----  
Angle1 Angle2 : -90.00 deg -57.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 58.00 / 58.00 m  
Receiver height : 25.50 / 25.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -57.00 deg  
Barrier height : 0.00 m  
Barrier receiver distance : 0.01 / 0.01 m  
Source elevation : 0.00 m  
Receiver elevation : 5.00 m  
Barrier elevation : 5.00 m  
Reference angle : 0.00



Results segment # 1: LRT (day)

Source height = 0.50 m

Barrier height for grazing incidence

| Source<br>Height (m) | Receiver<br>Height (m) | Barrier<br>Height (m) | Elevation of<br>Barrier Top (m) |
|----------------------|------------------------|-----------------------|---------------------------------|
| 0.50                 | 25.50                  | 25.49                 | 30.49                           |

RT/Custom (0.00 + 50.20 + 0.00) = 50.20 dBA

| Angle1 | Angle2 | Alpha | RefLeq | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|--------|
| -90    | -57    | 0.00  | 63.44  | -5.87 | -7.37 | 0.00  | 0.00  | -0.01 | 50.18* |
| -90    | -57    | 0.00  | 63.44  | -5.87 | -7.37 | 0.00  | 0.00  | 0.00  | 50.20  |

\* Bright Zone !

Segment Leq : 50.20 dBA

Total Leq All Segments: 50.20 dBA

Results segment # 1: LRT (night)

Source height = 0.50 m

Barrier height for grazing incidence

| Source<br>Height (m) | Receiver<br>Height (m) | Barrier<br>Height (m) | Elevation of<br>Barrier Top (m) |
|----------------------|------------------------|-----------------------|---------------------------------|
| 0.50                 | 25.50                  | 25.49                 | 30.49                           |

RT/Custom (0.00 + 43.66 + 0.00) = 43.66 dBA

| Angle1 | Angle2 | Alpha | RefLeq | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|--------|
| -90    | -57    | 0.00  | 56.91  | -5.87 | -7.37 | 0.00  | 0.00  | -0.01 | 43.65* |
| -90    | -57    | 0.00  | 56.91  | -5.87 | -7.37 | 0.00  | 0.00  | 0.00  | 43.66  |

\* Bright Zone !

Segment Leq : 43.66 dBA

Total Leq All Segments: 43.66 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 74.57  
(NIGHT): 66.98



# GRADIENTWIND

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STAMSON 5.0                      NORMAL REPORT                      Date: 17-07-2026 15:05:03  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r11.te                      Time Period: Day/Night 16/8 hours  
Description: POW - Building B - Level 9 - South Facade

Rail data, segment # 1: VIA (day/night)

```
-----  
Train          ! Trains      ! Speed !# loc !# Cars! Eng  !Cont  
Type           !           ! (km/h) !/Train!/Train! type !weld  
-----+-----+-----+-----+-----+-----  
1. VIA         ! 12.0/2.0  ! 150.0 ! 1.0 ! 4.0 !Diesel! No
```

Data for Segment # 1: VIA (day/night)

```
-----  
Angle1  Angle2      : -90.00 deg  77.00 deg  
Wood depth      :      0      (No woods.)  
No of house rows :      0 / 0  
Surface         :      1      (Absorptive ground surface)  
Receiver source distance : 92.00 / 92.00 m  
Receiver height  : 25.50 / 25.50 m  
Topography      :      1      (Flat/gentle slope; no barrier)  
No Whistle  
Reference angle  :      0.00
```



Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 58.53 + 0.00) = 58.53 dBA

| Angle1 | Angle2 | Alpha | RefLeq | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|--------|
| -90    | 77     | 0.00  | 66.73  | -7.88 | -0.33 | 0.00  | 0.00  | 0.00  | 58.53  |

WHEEL (0.00 + 51.60 + 0.00) = 51.60 dBA

| Angle1 | Angle2 | Alpha | RefLeq | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|--------|
| -90    | 77     | 0.00  | 59.81  | -7.88 | -0.33 | 0.00  | 0.00  | 0.00  | 51.60  |

Segment Leq : 59.33 dBA

Total Leq All Segments: 59.33 dBA

Results segment # 1: VIA (night)

LOCOMOTIVE (0.00 + 53.76 + 0.00) = 53.76 dBA

| Angle1 | Angle2 | Alpha | RefLeq | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|--------|
| -90    | 77     | 0.00  | 61.96  | -7.88 | -0.33 | 0.00  | 0.00  | 0.00  | 53.76  |

WHEEL (0.00 + 46.83 + 0.00) = 46.83 dBA

| Angle1 | Angle2 | Alpha | RefLeq | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|--------|
| -90    | 77     | 0.00  | 55.04  | -7.88 | -0.33 | 0.00  | 0.00  | 0.00  | 46.83  |

Segment Leq : 54.56 dBA

Total Leq All Segments: 54.56 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.33  
(NIGHT): 54.56



