



Environmental Noise and Vibration Assessment, Blocks 1 and 2 – Site Plan Approval Application

25 Pickering Place Development, Ottawa, ON

Colonnade BridgePort

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Acronyms and Abbreviations

| | |
|--------------|---|
| AADT | Average Annual Daily Traffic |
| ACC | Air Cooled Condenser/ Chiller |
| ANSI | American National Standards Institute |
| BPN | National Research Council Building Practice Note |
| C of A | Certificate of Approval |
| CC | Cooling Capacity |
| CT | Cooling Tower |
| dBA | Decibels (A-weighted) |
| dBAI | Decibels (A-weighted), Impulsive |
| dBL | Decibels (Linear), unweighted |
| Developer | Colonnade BridgePort |
| EASR | Environmental Activity and Sector Registry |
| ECA | Environmental Compliance Approval |
| ENCG | City of Ottawa Environmental Noise Control Guidelines |
| EPA | Ontario Environmental Protection Act |
| FCM | Federation of Canadian Municipalities |
| FTA | U.S. Federal Transit Administration |
| FRA | U.S. Federal Railroad Administration |
| HVAC | Heating Ventilation and Air Conditioning |
| ISO | International Organization for Standardization |
| Leq | Energy Equivalent Sound Level |
| LLM | Logarithmic Mean Impulse Sound Level |
| MECP | Ministry of the Environment, Conservation and Parks |
| MMAH | Ontario Ministry of Municipal Affairs and Housing |
| MTO | Ontario Ministry of Transportation |
| NPC-300 | MECP Publication NPC-300 |
| NRCC | National Research Council Canada |
| OBC | Ontario Building Code |
| OP | City of Ottawa Official Plan |
| ORNAMENT | Ontario Road Noise Analysis Method for Environment and Transportation |
| PPS | Provincial Planning Statement |
| PIPSC | Professional Institute of the Public Service of Canada |
| Project site | 25 Pickering Place in the City of Ottawa |
| PMTSA | Protected Major Transit Station Area |
| PWL | Sound Power Level |
| QA/QC | Quality Assurance/Quality Control |
| RAC | Railway Association of Canada |
| RMS | Root Mean Square Vibration Level |
| SADT | Summer Average Daily Traffic |
| SLM | Sound Level Meter |
| SPA | Site Plan Approval |
| SPL | Sound Pressure Level |
| STC | Sound Transmission Class |
| VIA | VIA Rail Canada Inc. |
| ZBA | Zoning By-law Amendment |



1.0 Introduction

SLR Consulting (Canada) Ltd. (“SLR”) has been retained by Colonnade BridgePort (“the Developer”) to complete an environmental noise assessment for Blocks 1 and 2 of its proposed development (the “Project”), located on the lands comprised of 25 Pickering Place in the City of Ottawa (the “Project site”).

This work has been completed in support of the Site Plan Approval (SPA) application for Lots A and B, and includes an assessment of transportation noise and vibration and “stationary” noise and vibration which may affect the development, including noise from the VIA Rail Canada Inc. (“VIA”) Ottawa Station.

A separate report has been prepared examining “stationary source” noise impacts from operations of the VIA Ottawa Station on the overall development plan, in support of the Draft Plan of Subdivision approval for the overall development (including Blocks 1 through 7):

- SLR Report, “Stationary Source Noise Assessment, VIA Rail Ottawa Station, Plan of Subdivision, 25 Pickering Place Development, Ottawa, ON, OLT Case No. OLT-24-000482”, dated April 28, 2025 (“the Draft Plan Report”).

This study represents a “Phase 2 Noise Control Detailed Study” for Lots A and B of the Project, as defined in the City of Ottawa’s Environmental Noise Control Guidelines.

1.1 Focus of Report

In keeping with general acoustical engineering practices, this report examines the potential for:

- Impacts of the environment on the proposed development;
- Impacts of the proposed development on the environment; and
- Impacts of the proposed development on itself.

Mechanical systems associated with the development (e.g., cooling and ventilation equipment) have not been sufficiently designed at this stage and would be assessed at a future date. A general discussion has been included in this report to address the impacts of the proposed development on the environment and on itself.

1.2 Description of Proposed Development

A context plan is shown in **Figures 1a** and **1b**. The overall Project site is bounded by Tremblay Road to the north, Pickering Place to the west, Avenue L to the east (with Belfast Road beyond), and by the VIA Ottawa Station lands and railway corridor to the south.

As shown in **Figure 2a** (Draft Plan of Subdivision) and **Figure 2b** (Master Plan), seven Blocks are to be established through the approval of the Plan of Subdivision which are planned to be developed as follows:

- Block 1 – 28-storey residential tower on a 4-storey mixed use podium;
- Block 2 – 14-storey residential tower on a 4-storey mixed use podium;
- Block 3 – 20-storey residential tower on a 4-storey mixed use podium;
- Block 4 – 20-storey residential tower on a 4-storey mixed use podium;
- Block 5 – 30-storey residential tower on a 4-storey mixed use podium;



- Block 6 – Parkland Dedication; and
- Block 7 – 16-storey residential tower on a 4-storey mixed use podium.

Block 1 and Block 2 for Phase 1 of the development, and are the subject of an SPA application, and is the focus of this report. **Figure 3** provides excerpts of the Site Plan drawing for Block 1 and Block 2. Excerpts from the drawings are provided in **Appendix A**.

1.3 Nature of the Surroundings

A context plan is shown in Figures 1a and 1b. Excerpts from Official Plan and Zoning maps are provided in Figures 4a and 4b. The Project site is surrounded by the railway Station site, as well as commercial, office, industrial and telecom and low-rise residential uses.

In the Official Plan, the Project site and surrounding area are located in a “Hub/ “Evolving Neighbourhood” designated area (per Schedule B-2) and are part of a Protected Major Transit Station Area (“PMTSA”) in Schedule C1.

The Project site is zoned as Transit Oriented Development (“TD”) Zone TD3 [2836] S468. The majority of the immediate surrounding area along Pickering Place, Avenue K and Avenue L are also TD1, TD2 and TD3 zones.

Immediately to the south and west of the development is the VIA Rail Ottawa Station. Further to the west is the OC Transpo Tremblay Station.

At the northwest corner of the site (250 Tremblay Road) is a 6-storey office building housing the Professional Institute of the Public Service of Canada (“PIPSC”), a public services labour union.

At the south end of Avenue L, at the eastern edge of the Project site, there are four General Industrial Zone (“IG”) properties zoned as IG3 [263].

Further to the south and forming the southern edge of the VIA Ottawa Station is the VIA Rail Alexandria Subdivision railway corridor. West of the VIA Station is the Beachburg Subdivision railway corridor.

South of the railway corridors are TD, IG and MC zoned lands used for office buildings, commercial uses, and telecommunication uses.

PART 1: IMPACTS OF THE ENVIRONMENT ON THE DEVELOPMENT

In evaluating potential impacts of the environment on the proposed development, the focus of this report is assessment of potential impacts from:

- Stationary source noise (also called “stationary noise”) from the VIA Ottawa Station and from surrounding industries/facilities¹.
- Transportation source noise (“transportation noise”) from surrounding roadways and the

¹ “Stationary source noise” addresses noise from all sources within a facility, and includes noise from truly stationary items of equipment such as fans and mechanical equipment, but also noise from transient sources operating within the facility boundary, such as moving or idling trucks.



VIA railway corridors; and

- Transportation source vibration from railway operations.

The proposed development is located more than 8 km from the Ottawa International Airport, and located outside of the constraint area identified in Official Plan Schedule C14 - Land Use Constraints Due to Aircraft Noise. As a result, an assessment of aircraft noise is not required.

2.0 Stationary Source Noise Assessment

2.1 Stationary Source Noise Guideline Regime

2.1.1 Provincial Policy Statement (2024)

The Provincial Policy Statement (“PPS”) PPS “provides policy direction on matters of provincial interest related to land use planning and development. As a key part of Ontario’s policy-led planning system, the Provincial Policy Statement sets the policy foundation for regulating the development and use of land province-wide, helping achieve the provincial goal of meeting the needs of a fast-growing province while enhancing the quality of life for all Ontarians.”

The PPS is a generic document, providing a consolidated statement of the government’s policies on land use planning and is issued under section 3 of the Planning Act. Municipalities are the primary implementers of the PPS through policies in their local official plans, zoning by-laws and other planning related decisions. The current PPS came into effect in October of 2024.

From the perspective of noise and vibration, Sections 3.4 and 3.5 of the PPS are relevant to this project:

“3.4 Airports, Rail and Marine Facilities

1. Planning for land uses in the vicinity of *airports, rail facilities* and marine facilities shall be undertaken so that:
 - a) their long-term operation and economic role is protected; and
 - b) airports, rail facilities and marine facilities, and sensitive land uses are appropriately designed, buffered and/or separated from each other, in accordance with policy 3.5. ...

3.5 Land Use Compatibility

1. *Major facilities* and *sensitive land uses* shall be planned and developed to avoid, or if avoidance is not possible, minimize and mitigate any potential *adverse effects* from odour, noise and other contaminants, minimize risk to public health and safety, and to ensure the long-term operational and economic viability of *major facilities in accordance with provincial guidelines, standards and procedures* [emphasis added].
2. Where avoidance is not possible in accordance with policy 3.5.1, planning authorities shall protect the long-term viability of existing or planned industrial, manufacturing or other *major facilities* that are vulnerable to encroachment by ensuring that the planning and development of proposed adjacent *sensitive land uses* is only permitted if potential adverse affects to the proposed *sensitive land use* are minimized and mitigated, and potential impacts to industrial, manufacturing



or other *major facilities* are **minimized and mitigated in accordance with provincial guidelines, standards and procedures** [emphasis added].”

In the PPS, *rail facilities* are *major facilities*, and include rail corridors, rail sidings, train stations, inter-modal facilities, rail yards and associated uses, including designated lands for future rail facilities. The Project is a sensitive use as defined in the PPS.

An *adverse effect* is defined in the PPS identically to the *Environmental Protection Act*, as one or more of:

- a) impairment of the quality of the natural environment for any use that can be made of it;
- b) injury or damage to property or plant or animal life;
- c) harm or material discomfort to any person;
- d) an adverse effect on the health of any person;
- e) impairment of the safety of any person;
- f) rendering any property or plant or animal life unfit for human use;
- g) loss of enjoyment of normal use of property; and
- h) interference with normal conduct of business.

The goals of the PPS are implemented through Municipal and Provincial “guidelines, standards and procedures”, as discussed below. Provided the Municipal and Provincial policies, guidelines, standards and procedures are met, the requirements of the PPS will be met.

2.1.2 City Ottawa Official Plan

The City of Ottawa Official Plan (“OP”) includes a number of policies related to land use compatibility between rail and major facilities and sensitive land uses, which would apply in this case.

Within Section 10, Protection of Health and Safety, Section 10.2.1 addresses environmental noise and vibration:

“10.2.1 Environmental noise control

- 1) All development shall comply with the City’s Environmental Noise Control Guidelines which are based on the applicable Provincial noise guidelines [currently NPC-300, MOEE 2013].
- 2) All noise studies prepared in support of development shall be consistent with the City’s Environmental Noise Control Guidelines and shall include noise mitigation and a warning clause where necessary, as a condition of approval.”

The requirements of the provincial Ministry of the Environment, Conservation & Parks Publication NPC-300 and the requirements of the City’s Environmental Noise Control Guidelines (“the ENCG guidelines”) are discussed in detail below.

The section also addresses “Class 4 Areas” for stationary noise. A Class 4 Area is a land classification which can be granted by the Municipality or Ontario Land Tribunal (OLT) which allows for the use of higher noise guideline limits and receptor-based noise mitigation measures. The section states:

“Class 4 stationary noise areas

- 4) Approved Class 4 stationary noise areas shall be identified within the Environmental Noise Control Guideline, consistent with provincial guidelines.



- 5) Where new development is proposed within the Urban area or a Village in proximity to an existing stationary noise source, Council, at its discretion, may amend the Environmental Noise Control Guidelines to identify additional Class 4 stationary noise areas.
- 6) The identification of Class 4 stationary noise areas may not be applied retroactively to existing development.
- 7) If the stationary noise source(s) for which a Class 4 stationary noise area has been identified ceases, the identification will be deemed to no longer apply.”

Class 4 designations and their requirements are discussed in detail in subsequent sections of this report.

Vibration is also addressed in Section 10.2.1:

“Vibration

- 15) The City may require a vibration study for development within 75 metres of a railway right of way or an existing or proposed light rail transit corridor and shall require vibration mitigation and a warning clause where necessary as a condition of approval.”

The Property is within 75 m of the rail line, and the VIA Ottawa Station property which includes the rail corridors is adjacent to Property. Therefore, a rail vibration assessment has been conducted, as documented in subsequent sections of this report.

2.1.3 City of Ottawa Environmental Noise Control Guidelines

The 2016 ENCG guidelines provide guidance and assessment requirements for surface transportation source noise, aircraft/airport noise, and stationary source noise. The requirements for transportation noise are discussed in subsequent sections of this report.

For stationary noise, The ENCG guidelines adopt MECP “D-Series” of land use compatibility guidelines, and MECP Publication NPC-300 guidelines. The “Area of Influence” under Guideline D-6 is used to determine which facilities require an assessment. Publication NPC-300 provides noise guideline limits.

Table 3.0 of the ENCG guidelines provide a discussion of the Class 4 Area designation and notes that “Class 4 is considered to be an extraordinary circumstance that, while proposed by an applicant, can only be classified through a City or Ontario Municipal Board approval of a Planning Act application and accompanying noise study.” This noise and vibration study is intended to meet this requirements.

The ENCG requires that excesses of the noise guidelines first be addressed at the source, through noise mitigation measures, or through separation distance. Where both source measures and distance separation are not feasible the following table provides a list of preferred noise mitigation measures for new development in proximity to stationary sources of noise.



Table 1: Noise Control Measures for New Development in Proximity to Stationary Noise Sources (ENCG Table 3.3a)

| Primary Mitigation Measure In Order of Preference | Secondary Mitigation Measures | |
|---|--|--|
| | Landscape Plantings and/or Non-Acoustic Fence to Obscure Noise Source | Warning Clauses |
| 1. Insertion of noise insensitive land uses between the source and sensitive receptor | | |
| 2. Blank walls of new development facing the source | Required | Warning clause to include additional reference to specific noise mitigation measures in the development, what the stationary source is and that there is a need to maintain mitigation in the development. Class 4 development is to include description of Class 4 receptor-based measures (e.g. closed windows) |
| 3. Orientation of buildings to provide quiet zones in rear yards, interior spaces (room and corridor arrangement) and amenity areas. | | |
| 4. Construction techniques, Enhanced construction quality (e.g. brick veneers, multipane windows) | | |
| 5. Earth berms (sound barriers) | | |
| 6. Class 4 Only - Enhanced Construction techniques and materials, air conditioning and ventilation, high STC materials and/or only a shared outdoor amenity area (indoor isolation) | | |
| 7. Class 4 Only – considered to have no formal outdoor amenity areas, closed windows (indoor isolation) | | |
| 8. Acoustic barriers (noise walls) – the measure must be used in concert with measures listed above as well as additional prescribed measures and is only applicable to the outdoor amenity area. | | |

2.1.4 Ministry of the Environment, Conservation & Parks D-Series of Guidelines

The D-series of guidelines were developed by the Ministry of the Environment, Conservation & Parks (“MECP”) in 1995 as a means to assess recommended separation distances and other control measures for land use planning proposals in an effort to prevent or minimize ‘adverse effects’ from the encroachment of incompatible land uses where a facility either exists or is proposed.

Guideline D-1 and its appendices is the “framework” guideline which sets out concepts, definitions, procedures and specific applications for assessing land use compatibility. The object of the guideline is to “minimize or prevent, through the use of buffers, the exposure of any person, property, plant or animal life to adverse effects associated with the operation of specified facilities.” Buffers can include separation distance but can also include at-source or at-receptor mitigation measures. Mitigation must reduce levels to that of a “trivial impact”.

Additional D-Series guidelines are set out in Guideline D-1-2 and address sources including sewage treatment (Guideline D-2), gas and oil pipelines (Guideline D3), landfills (Guideline D-4), water services (Guideline D-5) and industries (Guideline D-6).

For this project, the applicable guideline is Guideline D-6 - *Compatibility between Industrial Facilities and Sensitive Land Uses*. The guideline specifically addresses issues of air quality,



odour, dust, noise, and litter. Guideline D-6 does not apply to roadways and railways, but does apply to ancillary rail facilities such as the VIA Ottawa Station, as well as to larger scale rail yards.

To minimize the potential to cause an adverse effect, areas of influence and recommended minimum setback distances are included within the guidelines. The areas of influence and recommended separation distances from the guidelines are provided in **Table 2** below.

Industrial categorization criteria are supplied in Guideline D-6-2, and are shown in **Table 3**.

Table 2: Guideline D-6 - Potential Influence Areas and Recommended Minimum Setback Distances for Industrial Land Uses

| Industry Classification | Area of Influence | Recommended Minimum Setback Distance |
|------------------------------|-------------------|--------------------------------------|
| Class I – Light Industrial | 70 m | 20 m |
| Class II – Medium Industrial | 300 m | 70 m |
| Class III – Heavy Industrial | 1000 m | 300 m |

Table 3: Guideline D-6 - Industrial Categorization Criteria

| Category | Outputs | Scale | Process | Operations / Intensity | Possible Examples |
|-----------------------------|---|---|---|---|---|
| Class I Light Industry | <ul style="list-style-type: none"> Noise: Sound not audible off-property Dust: Infrequent and not intense Odour: Infrequent and not intense Vibration: No ground-borne vibration on plant property | <ul style="list-style-type: none"> No outside storage Small-scale plant or scale is irrelevant in relation to all other criteria for this Class | <ul style="list-style-type: none"> Self-contained plant or building which produces/ stores a packaged product Low probability of fugitive emissions | <ul style="list-style-type: none"> Daytime operations only Infrequent movement of products and/ or heavy trucks | <ul style="list-style-type: none"> Electronics manufacturing and repair Furniture repair and refinishing Beverage bottling Auto parts supply Packaging and crafting services Distribution of dairy products Laundry and linen supply |
| Class II Medium Industry | <ul style="list-style-type: none"> Noise: Sound occasionally heard off-property Dust: Frequent and occasionally intense Odour: Frequent and occasionally intense Vibration: Possible ground-borne vibration, but cannot be perceived off-property | <ul style="list-style-type: none"> Outside storage permitted Medium level of production allowed | <ul style="list-style-type: none"> Open process Periodic outputs of minor annoyance Low probability of fugitive emissions | <ul style="list-style-type: none"> Shift operations permitted Frequent movements of products and/ or heavy trucks with the majority of movements during daytime hours | <ul style="list-style-type: none"> Magazine printing Paint spray booths Metal command Electrical production Manufacturing of dairy products Dry cleaning services Feed packing plants |



| Category | Outputs | Scale | Process | Operations / Intensity | Possible Examples |
|--------------------------|---|---|--|---|--|
| Class III Heavy Industry | <ul style="list-style-type: none"> Noise: Sound frequently audible off property Dust: Persistent and/ or intense Odour: Persistent and/ or intense Vibration: Ground-borne vibration can frequently be perceived off-property | <ul style="list-style-type: none"> Outside storage of raw and finished products Large production levels | <ul style="list-style-type: none"> Open process Frequent outputs of major annoyances High probability of fugitive emissions | <ul style="list-style-type: none"> Continuous movement of products and employees Daily shift operations permitted | <ul style="list-style-type: none"> Paint and varnish manufacturing Organic chemical manufacturing Breweries Solvent recovery plants Soaps and detergent manufacturing Metal refining and manufacturing |

2.1.4.1 Requirements for Assessments

Guideline D-6 requires that studies be conducted to assess impacts where sensitive land uses are proposed within the potential area of influence of an industrial facility. This report is intended to fulfill this requirement.

The D-series guidelines reference previous versions of the air quality regulation (Regulation 346) and noise guidelines (Publications NPC-205 and LU-131). However, the D-Series of guidelines are still in force, still represent current MECP policy and are specifically referenced in numerous other current MECP policies. In applying the D-series guidelines, the current policies, regulations, standards, and guidelines have been used (e.g., noise guideline Publication NPC-300, Air Quality Regulation 419/05).

2.1.4.2 Recommended Minimum Separation Distances

Guideline D-6 also *recommends* that no sensitive land use be placed within the Recommended Minimum Separation Distance. However, it should be noted that this is a recommendation only. Section 4.10 of the Guideline allows for development within the minimum recommended separation distance, in cases of redevelopment, infilling, and transitions to mixed use, provided that the appropriate studies are conducted and that the relevant air quality and noise guidelines are met.

2.1.4.3 Nearby Industries and Major Facilities

A site visit to the Project site and surrounding area was completed by SLR personnel on January 13 and 14, and February 12, 2025. The focus of the site visit was to identify nearby facilities with the potential for stationary source noise impacts at the proposed development. Aerial photographs and Google “Streetview” imagery were also reviewed.

Industrial uses within 1 km of the Project site were identified and categorized based on the criteria provided in **Table 3**.

The Guideline D-6 setback distances from the Project site are shown in **Figures 5a and 5b**. There are no Class III Heavy industries located within 1,000 m of the Project site. There are several Class I Light and Class II Medium industries within 300 m of the site, which are identified in **Table 4** below:



Table 4: Local Industries Within 300 m of Project Site

| Address | Name | Operating Hours | Description | MECP ECA/ EASR (Date) [1] | Guideline D-6 Class | | | Actual Separation Dist (m) [4] |
|------------------|--|-------------------|--------------------------------------|---------------------------|---------------------|---------|---------|--------------------------------|
| | | | | | Class | Aol [1] | RMS [2] | |
| 1321 Avenue L | Commence Fence | 7am to 5pm | Fencing Contractor | - | I | 70 | 20 | 15 |
| 1325 Avenue L | Vacant | - | - | - | I | 70 | 20 | 15 |
| 1333 Avenue L | Valvoline Mobile Mechanic | 7am to 6pm | Automotive repair | - | I | 70 | 20 | 15 |
| 1346 Avenue L | Avenue Tire Depot | 7am to 6pm | Automotive repair | - | I | 70 | 20 | 0 |
| 805 Belfast Rd | OC Transpo Belfast Yard | 24 hrs | LRT Maintenance and Storage Facility | 6392-BA9RCP (2019) | I | 70 | 20 | 195 |
| 330 Coventry Rd | Canadian Tire | 8am to 8pm | Retail Commercial | - | n/a | n/a | n/a | 155 |
| 380 Coventry Rd | Best Buy | 8am to 8pm | Retail Commercial | - | n/a | n/a | n/a | 155 |
| 400 Coventry Rd | Vacant | - | Proposed Residential Development | - | n/a | n/a | n/a | 160 |
| 440 Coventry Rd | Government of Canada | 24 hrs | RCMP Office and Distribution Centre | - | n/a | n/a | n/a | 235 |
| 405 Terminal Ave | Employment And Social Development Canada | 7am to 8pm | Office | - | n/a | n/a | n/a | 180 |
| 433 Terminal Ave | Vacant (former VIA Rail) | - | - | - | I | 70 | 20 | 175 |
| 475 Terminal Ave | Parking Indigo Ottawa | 24 hrs | Parking Lot | - | n/a | n/a | n/a | 130 |
| 495 Terminal Ave | Vacant (proposed office building) | - | - | - | I | 70 | 20 | 120 |
| 495 Terminal Ave | Zayo Telecommunications | 24 hrs | Telecommunications | - | I | 70 | 20 | 165 |
| 525 Terminal Ave | Level Three Communications | 24 hrs | Telecommunications | - | I | 70 | 20 | 165 |
| 535 Terminal Ave | OLRT Storage Yard | 24 hrs | Storage yard | - | I | 70 | 20 | 115 |
| 500 Terminal Ave | SmartCentre Shopping Mall | 9:30am to 9pm | Various Retail and Restaurant | - | n/a | n/a | n/a | 240 |
| 550 Terminal Ave | SmartCentre Shopping Mall | 9:30am to 9pm | Various Retail and Restaurant | - | n/a | n/a | n/a | 260 |
| 170 Tremblay Rd | OC Transpo Tremblay Station | 5am to 1am | Light Rail Transit Station | - | I | 70 | 20 | 170 |
| 200 Tremblay Rd | VIA Ottawa Station | 3:45am to 12:30am | Inter-City Passenger Train Station | - | II | 300 | 70 | 0 |
| 250 Tremblay Rd | Professional Institute of the Public Service of Canada (PIPSC) | 8am to 5pm | Office | 4969-6ZYPSH (2007) | n/a | n/a | n/a | 0 |



| Address | Name | Operating Hours | Description | MECP ECA/ EASR (Date) [1] | Guideline D-6 Class | | | Actual Separation Dist (m) [4] |
|--|------|-----------------|-------------|---------------------------------|---------------------|---------|---------|--------------------------------------|
| | | | | | Class | Aol [1] | RMS [2] | |
| Notes: | | | | | | | | |
| [1] Environmental Compliance Approval and/or Environmental Activity and Sector Registration for active industries. Note that some addresses have ECAs or EASRs for industries which are no longer in operation at that location. | | | | | | | | |
| [2] Area of Influence per Guideline D-6. | | | | | | | | |
| [3] Recommended Minimum Separation Distance per Guideline D-6. | | | | | | | | |
| [4] Measured property line to property line. | | | | | | | | |

Environmental Compliance Approvals (“ECAs”) and Environmental Activity and Sector Registrations (“EASRs”) identified in Table 4 are provided in **Appendix B**.

Based on the identified “Areas of Influence” only five industrial uses require additional noise assessment, namely:

- Industries along Avenue L including:
 - Commence Fence 1321 Avenue L
 - Vacant Lot 1325 Avenue L
 - Valvoline Mobile Mechanic Ottawa 1333 Avenue L
 - Avenue Tire Depot 1346 Avenue L
- VIA Ottawa Station 200 Tremblay Road

During site visits to the area, sounds from the OC Transpo Belfast Yard were inaudible at the Development. The facility includes noise mitigation measures to ensure that the applicable noise guideline limits are met at the closer existing residences along Avenues O and P, which are within 35 m of the facility. Further assessment of noise from the OC Transpo Belfast Yard facility is not required.

Guideline D-6 also *recommends* that no sensitive land use be placed within the Recommended Minimum Separation Distance. However, it should be noted that this is a recommendation only. Section 4.10 of the Guideline allows for development within the minimum recommended separation distance, in cases of redevelopment, infilling, and transitions to mixed use, provided that the appropriate studies are conducted and that the relevant air quality and noise guidelines are met.

As an ancillary rail facility, the VIA Ottawa Station has been classified as a Class II Medium use, with a Recommended Minimum Separation Distance of 70 m, and an Area of Influence of 300 m. As the Project site is within the Area of Influence of the station, an assessment of potential noise impacts from the Station is required. See **Figure 5**. Rail Freight Yards, such as the CN MacMillan Yard, are typically classified under Guideline D-6 as Class III Heavy industries. However, the nature of freight yard operations is significantly different from a Railway Station such as the VIA Ottawa Station, as Railway Stations do not require constant movements of heavy freight trains or produce brake squeal from retarders and impulsive-type noise from the coupling and uncoupling of cars. None of these types of sources are present at VIA Ottawa Station.

The Project site shares a property boundary with a large parcel of land which includes the Station, so measured property line to property line, the separation distance between the two sites is 0 m. However, on-site buffers can be accounted for under Sections 4.4.3 and 4.4.4 of Guideline D-6. On-site roads and the Station’s east parking lot are located closest to the Project site. The property line of Block 1, which is the closest point on the property, is located 60 m from the Station building, and 72 m from the closest track. As will be seen in subsequent sections of the report, the dominant noise sources are idling locomotives on the tracks, all of which are more than 70 m away from the development property.



As noted above, the recommended minimum separation distance is a recommendation only, and development within the recommended minimum is allowed provided that a detailed assessment shows that the applicable guidelines are met.

2.1.5 Ministry of Environment, Conservation & Parks Publication NPC-300

The applicable MECP noise guidelines for new sensitive land uses near to existing industrial or commercial uses are provided in MECP Publication NPC-300, published in October 2013. These guidelines replaced the Publication LU-131 guidelines referenced in Guideline D-6. The guideline sets out noise limits for two main types of noise sources:

- Non-impulsive, “continuous” noise sources such as ventilation fans, mechanical equipment, and vehicles while moving within the property boundary of an industry. Continuous noise is measured using 1-hour average sound exposures (L_{eq} (1-hr) values), in dBA; and
- Impulsive noise, which is a “banging” type noise characterized by rapid rise time and decay. Impulsive noise is measured using a logarithmic mean (average) level (L_{LM}) of the impulses in a one-hour period, in dBA.

Furthermore, the guideline requires an assessment at, and provides separate guideline limits for:

- Outdoor points of reception (e.g., back yards, communal outdoor amenity areas); and
- Façade points of reception such as the plane of windows on the outdoor façade which connect onto noise sensitive spaces, such as living rooms, dens, eat-in kitchens, dining rooms and bedrooms.

The applicable noise limits at a point of reception are the higher of:

- The existing ambient sound level due to road traffic, or
- The exclusion limits set out in the guideline.

The following tables set out the exclusion limits from the guideline.

Table 5: NPC-300 Exclusion Limits for Non-Impulsive Sounds (L_{eq} (1-hr), dBA)

| Time of Day | Class 1 Area | | Class 4 Area | |
|---------------|---|-----------------------------|--|-----------------------------|
| | Plane of Windows of Noise Sensitive Spaces | Outdoor Points of Reception | Plane of Windows of Noise Sensitive Spaces | Outdoor Points of Reception |
| 7 am to 7 pm | 50 | 50 | 60 | 55 |
| 7 pm to 11 pm | 50 | 50 | 60 | 55 |
| 11 pm to 7 am | 45 | n/a | 55 | n/a |
| Notes: | | | | |
| n/a | Not Applicable. Outdoor points of reception are not considered to be noise sensitive during the overnight period. | | | |
| - | Area classifications are: Class 1 – Urban; Class 4 - Urban Redevelopment | | | |



Table 6: NPC-300 Exclusion Limits for Impulsive Sounds (L_{LM} , dBAI)

| Time of Day | No. of Impulses in a 1-hour Period | Class 1 Area | | Class 4 Area | |
|---------------|------------------------------------|--|-----------------------------|--|-----------------------------|
| | | Plane of Windows of Noise Sensitive Spaces | Outdoor Points of Reception | Plane of Windows of Noise Sensitive Spaces | Outdoor Points of Reception |
| 7 am to 11 pm | 9 or more | 50 | 50 | 60 | 55 |
| | 7 to 8 | 55 | 55 | 65 | 60 |
| | 5 to 6 | 60 | 60 | 70 | 65 |
| | 4 | 65 | 65 | 75 | 70 |
| | 3 | 70 | 70 | 80 | 75 |
| | 2 | 75 | 75 | 85 | 80 |
| | 1 | 80 | 80 | 90 | 85 |
| 11 pm to 7 am | 9 or more | 45 | n/a | 55 | n/a |
| | 7 to 8 | 50 | n/a | 60 | n/a |
| | 5 to 6 | 55 | n/a | 65 | n/a |
| | 4 | 60 | n/a | 70 | n/a |
| | 3 | 65 | n/a | 75 | n/a |
| | 2 | 70 | n/a | 80 | n/a |
| | 1 | 75 | n/a | 85 | n/a |

Notes:

- n/a Not Applicable. Outdoor points of reception are not considered to be noise sensitive during the overnight period.
- Area classifications are: Class 1 – Urban; Class 4 - Urban Redevelopment

The applicable guideline limits for infrequent events such as emergency generator set testing are +5 dB higher than the values above, and are evaluated separately from other stationary noise sources.

No significant impulsive noise sources have been identified in the area. Impulsive noise impacts are not assessed further in this report.

2.1.5.1 Application of the NPC-300 Guidelines

The stationary noise guidelines apply only to residential land uses and to noise-sensitive commercial and institutional uses, as defined in NPC-300 (e.g., schools, daycares, hotels). For the Project, the stationary noise guidelines only apply to the residential portions of the proposed development, including:

- Individual residences;
- Communal indoor amenity areas; and
- Communal outdoor amenity areas.

All of the above have been considered as noise-sensitive points of reception in the analysis.

2.1.5.2 Proposed Area Classification

Under MECP Publication NPC-300 noise guidelines, noise sensitive receptors are defined using area classifications. The receptor areas are classified as either:

- Class 1 – Urban areas
- Class 2 – Suburban / semi-rural areas
- Class 3 – Rural areas



- Class 4 – Redevelopment areas

Depending on the receptor area classification, different guideline limits apply. The Class 4 designation is intended to allow for infill and redevelopment, whilst still protecting residences from undue noise.

Based on the nature of the area, the Class 1 area urban sound level limits currently apply. The area is urban in nature and dominated by man-made sounds, including road traffic noise and an “urban hum”, 24-hours per day. However, the Project site meets the definition (subject to formal confirmation from the land use planning authority) and requirements for a Class 4 area and it is recommended and appropriate to issue a Class 4 designation for the Project site.

In NPC-300, a Class 4 area is defined as:

“Class 4 area”

means an area or specific site that would otherwise be defined as Class 1 or 2 and which:

- is an area intended for development with new noise sensitive land use(s) that are not yet built;
- is in proximity to existing, lawfully established stationary source(s); and
- has formal confirmation from the land use planning authority with the Class 4 area classification which is determined during the land use planning process.

Additionally, areas with existing noise sensitive land use(s) cannot be classified as Class 4 areas.”

Section C4.4.2 of Publication NPC-300 further discusses the use of Class 4 areas:

“Class 4 area classification is based on the principle of formal confirmation of the classification by the land use planning authority. Such confirmation would be issued at the discretion of the land use planning authority and under the procedures developed by the land use planning authority, in the exercise of its responsibility and authority under the Planning Act.

The following considerations apply to new noise sensitive land uses proposed in a Class 4 area:

- an appropriate noise impact assessment should be conducted for the land use planning authority as early as possible in the land use planning process that verifies that the applicable sound level limits will be met;
- noise control measures may be required to ensure the stationary source complies with the applicable sound level limits at the new noise sensitive land use;
- noise control measures may include receptor based noise control measures and/or source based noise control measures;
- source based noise control measures may require an MECP approval;
- receptor based noise control measures may require agreements for noise mitigation, as described in Part A of this guideline;
- prospective purchasers should be informed that this dwelling is located in a Class 4 area through appropriate means and informed of the agreements for noise mitigation. Registration on title of the agreements for noise mitigation is recommended. Additionally, registration on title of an appropriate warning clause to notify purchasers that the applicable Class 4 area sound level limits for this dwelling are protective of indoor areas and are based on the assumption of closed



windows, such as warning clause F in Section C8.3 is also recommended; and

- any final agreements for noise mitigation as described in Part A of this guideline and all other relevant documentation are to be submitted to the MECP by the stationary source owner(s) when applying for an MECP approval. These agreements will be assessed during the review of the application for MECP approvals.”

Subject to formal confirmation from the land use planning authority, the Project site meets the definition and requirements for a Class 4 area listed in Publication NPC-300, and in the Ottawa ENCG guidelines. It is therefore appropriate for the City to designate the Project site as a Class 4 area.

It is important to note that the recommended Class 4 designation would only apply to the Project site. Existing noise-sensitive receptors in the area will remain as Class 1 areas. Therefore, the designation will not allow for industries to increase their noise impacts at existing residences.

Class 4 area designations have been used for other projects affected by rail yard noise, including but not limited to:

- | | |
|---|---|
| • Tesmar Holdings, Vaughan (PL140839, PL070347) | CN MacMillan Yard |
| • Rutherford Land Development Corp., Vaughan | CN MacMillan Yard |
| • Courtland Road East & Block Line Road, Kitchener (PL190267) | CN Huron Yard |
| • Mimico-Judson Secondary Plan, Toronto (PL160692) | Metrolinx Willowbrook Yard |
| • 101 Masonry Court Development, Burlington | CN Aldershot Yard and Metrolinx Station |
| • 1120 Cooke Blvd Development, Burlington | CN Aldershot Yard and Metrolinx Station |
| • Market-Grey Development, Brantford, ON (OLT-21-0041400) | CN Brantford Yard |

Per Appendix A of the ENCG, there are two developments which have been designated as Class 4 areas:

- 933 Gladstone and 1030 Somerset (By-law No. 2022-355); and.
- 951 Gladstone and 145 Loretta Avenue North (By-law No. 2022-391).

These two developments straddle the O-Train Corso Italia LRT Station.

2.1.6 Stationary Noise Guidelines Adopted in this Assessment

In accordance with Provincial policies and the City of Ottawa OP and ENCG Guidelines, the applicable noise guidelines for this assessment are MECP Publication NPC-300.

The Class 4 area noise guideline limits have been adopted in this study. This allows for the use of higher guideline limits and for the use of receptor-based mitigation measures which are not allowed under a Class 1 designation.

2.2 Stationary Noise Modelling Methods

2.2.1 Ambient Sound Levels and Guideline Limits

Under MECP Publication NPC-300 noise guidelines, the applicable noise limits are the higher of the guideline minimums, or the background ambient sound level due to urban hum, road traffic noise and, in some cases, rail traffic noise.

In this area, road and rail traffic volumes are sufficiently low that the guideline minimums apply along the south façade of buildings. For simplicity, the guideline minimums have been used in



the assessment.

2.2.2 Modelling Techniques

Worst-case scenario noise levels from the surrounding industrial operations were modelled using Cadna/A, a computerized version of the internationally recognized ISO 9613-2 (1996) noise propagation algorithms. This is the preferred noise modelling methodology of the MECP. The ISO 9613 equations account for:

- Source to receiver geometry
- Distance attenuation
- Atmospheric absorption
- Reflections off of the ground and ground absorption
- Reflections off of vertical walls
- Screening effects of buildings, terrain, and purpose-built noise barriers (noise walls, berms, etc.).

The following additional parameters were used in the modelling, which are consistent with providing a conservative assessment (worst-case assessment of noise levels):

- Temperature: 10°C
- Relative Humidity: 70%
- Ground Absorption G: G=0.0 (reflective) as default global parameter, accounting for pavement, with specific large areas of grass, trees, and gravel (rail ballast) modelled as G=1.0 (absorptive).
- Reflection: An order of reflection of 2 was used (accounts for noise reflecting from walls)
- Wall Absorption Coefficients: Set to 0.37 (37% of energy is absorbed, 63% reflected)
- Terrain: detailed terrain contours included in the noise modelling.
- For noise barrier calculations:
 - “No subtraction of negative ground attenuation”
 - “No negative path length difference”

Sound levels are modelled on the facades of buildings, using the “Building Evaluation” feature of the Cadna noise model. Sound levels at communal outdoor amenity areas were modelled as an array of points of reception distributed over the space.

2.2.3 VIA Ottawa Station Noise Sources

Significant sources of stationary noise at the VIA Ottawa Station include:

- Noise from testing of an emergency generator set;
- Noise from normal terminal operations, including;
 - Noise from building mechanical equipment (fans, condensers and HVAC units).
 - Noise from OC Transpo buses; and
 - Noise from idling locomotives while in the station.

The assumptions on VIA Ottawa Station noise source emission rates, utilization and locations used on this assessment are the same as those in the assessment reviewed by VIA as part of the Draft Plan of Subdivision application.



2.2.3.1 Station Emergency Generator, Building Mechanical Equipment and Buses

Information on the emergency generator and building mechanical equipment designations, make and model, and duty cycles were provided by VIA Rail. The data used in the analysis is provided in **Appendix C** and is summarized in the following table:

Table 7: VIA Ottawa Station Emergency Generator, Building Mechanical Equipment and Buses Sound Power Levels

| Noise Source | | Overall | Duty Cycle (Min/hr) | | | Notes |
|--|------|---------|---------------------|---------|-------|--|
| Name | ID | dBA | Day | Evening | Night | |
| Emergency Generator | GEN1 | 100.2 | 0 | 0 | 60 | Cummins 600DFGB Quiet Site II, adjusted to meet 75 dBA at 7 m |
| AC (LG LSU243HLV3) | AC_A | 78.8 | 60 | 60 | 30 | Manufacturer's Data Not Available. Modelled as Typical 1 Ton CC Units |
| AC (AAON) | AC_B | 78.8 | 60 | 60 | 30 | |
| Condensing Unit (REFPlus OVZ-304-1H1-8T) | CU1 | 96.3 | 60 | 60 | 30 | Manufacturer's Data Not Available. Modelled as Typical 6 Fan ACC Units |
| Condensing Unit (REFPlus OVZ-304-1H1-8T) | CU2 | 96.3 | 60 | 60 | 30 | |
| Condensing Unit (AAON CFA-025-C-A-4-DC00K) | CU3 | 94.3 | 60 | 60 | 30 | Manufacturer's Data Not Available. Modelled as Typical 4 Fan ACC Unit |
| Exhaust Fan (Greenheck GB-420-30-X) | EF1 | 81.4 | 60 | 60 | 60 | Manufacturer's Data Not Available. Modelled as Typical Large Mushroom Exhaust Fans |
| Exhaust Fan (Greenheck GB-420-30-X) | EF2 | 81.4 | 60 | 60 | 60 | |
| Exhaust Fan | EF3 | 81.4 | 60 | 60 | 60 | |
| Exhaust Fan | EF4 | 81.4 | 60 | 60 | 60 | |
| Exhaust Fan | EF5 | 81.4 | 60 | 60 | 60 | |
| Exhaust Fan | EF6 | 81.4 | 60 | 60 | 60 | |
| Exhaust Stack | ES1 | 78.6 | 60 | 60 | 60 | Manufacturer's Data Not Available. Modelled as Typical Small Mushroom Exhaust Fans |
| Exhaust Stack | ES2 | 78.6 | 60 | 60 | 60 | |
| Exhaust Stack | ES3 | 78.6 | 60 | 60 | 60 | |
| Rooftop Unit (Lennox GCS24-953-208-1J) | RTU1 | 86.0 | 60 | 60 | 30 | Manufacturer's Overall = 86 dBA, Spectrum Shaped Based on Typical 5 Ton CC HVAC unit |
| Rooftop Unit (Lennox KGB036S4BM3J) | RTU2 | 74.0 | 60 | 60 | 30 | Manufacturer's Overall = 74 dBA, Spectrum Shaped Based on Typical 5 Ton CC HVAC unit |
| Rooftop Unit (Lennox GCS16-413-100-9J) | RTU3 | 78.0 | 60 | 60 | 30 | Manufacturer's Overall = 78 dBA, Spectrum Shaped Based on Typical 5 Ton CC HVAC unit |
| Rooftop Unit (Lennox KGA060S4BM4J) | RTU4 | 86.7 | 60 | 60 | 30 | Manufacturer's Data Used |
| Rooftop Unit (Lennox KGA060S4BMAJ) | RTU5 | 86.7 | 60 | 60 | 30 | Manufacturer's Data Used |
| Rooftop Unit | RTU6 | 87.0 | 60 | 60 | 30 | Modelled as Typical 5 Ton CC HVAC Unit |
| Rooftop Unit (Lennox LGH060H4EH4J) | RTU7 | 80.1 | 60 | 60 | 30 | Manufacturer's Data Used |



| Noise Source | | Overall | Duty Cycle (Min/hr) | | | Notes |
|--|------|---------|---------------------------|---------|-------|---|
| Name | ID | dBA | Day | Evening | Night | |
| Idling Bus 1 | Bus1 | 94.2 | 20 | 20 | 20 | SLR Measurements at TTC McNicoll Garage |
| Idling Bus 2 | Bus2 | 94.2 | 20 | 20 | 0 | |
| Idling Bus 3 | Bus3 | 94.2 | 20 | 20 | 0 | |
| Buses Accelerating (Line Sources) | - | 101.6 | 3 Day; 3 Evening; 1 Night | | | |
| Buses Entering/ Leaving Station (2 Line Sources) | - | 101.2 | 3 Day; 3 Evening; 1 Night | | | |

Modelled noise source locations are shown on **Figure 6a**.

2.2.3.2 Idling Locomotives Within the Station

There are currently three locomotive types which are used at the station:

- General Electric Electro-Motive Division (“EMD”) Model F40PH locomotives;
- EMD Model P42DC locomotives; and
- Siemens “Charger” locomotives.

The P42DC locomotives were acquired in 2001. The F40PH locomotives were added to VIA’s fleet of locomotives between 1987 and 1989, and were last updated in 2007.

In 2018, Siemens Canada was awarded a contract to build the 32 trainsets that will replace the *entire* existing fleet used in the Quebec-Windsor Corridor, which represents 96% of VIA’s ridership.² Since 2022, 50% of the replacement fleet has been delivered.³ By the summer of 2025, the entire Québec City-Windsor corridor will be served by Siemens trains.⁴

Under the normal design, building permit approval, and construction process and timelines, the earliest that the proposed development would be occupied by residents would be sometime in Fall of 2027, well past 2025 when the entire locomotive fleet on the Québec City-Windsor corridor will be replaced. Given the above, the planned and predictable worst-case scenario is to assume the use of all Siemens Charger locomotives in noise modelling.

Sound Emission Levels

SLR and WSP Canada Ltd. (the acoustical consultant for VIA) both conducted noise measurements of idling Siemens Charger locomotives at Ottawa Station, and SLR conducted additional measurements at Union Station and Guelph Station. The measurements include noise from operating Head End Power (HEP) units. The average sound levels of the 9 individual trains measured are provided in **Table 9**, and has been used in the analysis.

² <https://corpo.viarail.ca/en/projects-infrastructure/train-fleet/corridor-fleet>

³ <https://www.railwayage.com/passenger/intercity/new-via-rail-siemens-fleet-50-complete/>

⁴ Ibid.



Table 8: Siemens Charger Locomotive Sound Power Level

| 1/1-Octave Band Sound Power Level (PWL, in dB) | | | | | | | | | | Overall PWL | |
|--|------|-----|-----|-----|-----|------|------|------|------|-------------|-----|
| 16 | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBL | dBA |
| 103 | 107 | 109 | 104 | 104 | 102 | 99 | 93 | 89 | 81 | 114 | 104 |

Locomotive Locations

Trains use the station as a “layover facility”, where trains will park overnight prior to departure the next day. During the winter, a locomotive can idle in the station for approximately 1 hour prior to departure of the train, to allow for the engine to warm up and for station staff to confirm the engine is in proper operating condition.

On the east side of the station, closest to the proposed development, there are six rail lines, located in increasing distance from the Project site:

- Stub East North;
- Stub East South;
- Track 1;
- Track 2;
- Track 3; and
- Track 4.

Trains are not parked on Track 1, to allow it to be used as a “through-line” passing through the station.

The two Stub lines terminate at the station building. These lines are shorter than the new Siemens trains, and therefore are only infrequently used for Siemens train sets. Tracks 2, 3 and 4 include “wayside power” or “shore power” hookups for the Siemens trains. Thus, the Siemens trains are preferentially parked on these lines.

Number of Siemens Locomotives Idling

Based on information obtained during the site visits and a review of 1 month of long-term “trail-cam” photos and videos taken from the development site from December 14 to February 21, 2024:

- During the night-time period a maximum of 1 train leaves the station in any given hour; and
- During the daytime period a maximum of 3 trains leave the station in any given hour.

Modelled locomotive locations are shown on **Figure 6b**.

2.2.4 Other Commercial/ Industrial Noise Sources

Other noise sources located on commercial, industrial or office buildings within 300 m of the Project site were identified and modelled. The following noise sources have been included in the assessment:



Table 9: Other Modelled Commercial/ Industrial Noise Sources

| Name | Address | Modelled Noise Sources |
|--|--------------------------------------|---|
| Avenue Tire Depot | 1346 Avenue L | <ul style="list-style-type: none"> • Typical Auto Repair Shop Noise (Air Tools) through 3 Bay Doors • Typical Auto Repair Shop Noise (Air Tools) at Outdoor Area |
| Valvoline Mobile Mechanic Ottawa | 1333 Avenue L | <ul style="list-style-type: none"> • Typical Auto Repair Shop Noise (Air Tools) through 4 Bay Doors |
| Employment And Social Development Canada | 405 Terminal Ave | <ul style="list-style-type: none"> • 2 Cooling Towers • 4 Mechanical Penthouse louvres |
| Zayo Telecommunications | 495 Terminal Ave | <ul style="list-style-type: none"> • 2 10-ton CC HVAC and 1 30-ton CC HVAC units • 1 3-fan ACC • 1 Emergency Generator |
| Level Three Communications | 525 Terminal Ave | <ul style="list-style-type: none"> • 1 10-fan ACC • 1 Emergency Generator |
| SmartCentre Shopping Mall Ottawa Trainyards Mall | 500 Terminal Ave 550 Terminal Ave | <ul style="list-style-type: none"> • 12 5-ton CC HVAC units • 9 10-ton CC HVAC units • 24 20-ton CC HVAC units • 1 Large Mushroom-type Exhaust Fan • 1 Small Mushroom-type Exhaust Fan • 1 Make-Up Air Unit |
| Canadian Tire | 330 Coventry Rd | <ul style="list-style-type: none"> • 2 5-ton CC HVAC units • 1 10-ton CC HVAC units • 8 20-ton CC HVAC units |
| Best Buy | 380 Coventry Rd | <ul style="list-style-type: none"> • 3 1-ton CC HVAC units • 3 5-ton CC HVAC units • 4 10-ton CC HVAC units |
| Government of Canada (RCMP Offices) | 440 Coventry Rd | <ul style="list-style-type: none"> • 3 5-ton CC HVAC units • 13 10-ton CC HVAC units • 2 20-ton CC HVAC units • 1 3-fan ACC • 4 Small Mushroom-type Exhaust fan • 1 Mechanical Penthouse louvre |
| Professional Institute of the Public Service of Canada (PIPSC) | 250 Tremblay Rd | <ul style="list-style-type: none"> • 1 Cooling Tower • 1 10-fan ACC • 4 Mechanical Penthouse louvres • 1 Emergency Generator |

Modelled source locations are shown in **Figure 6c**. Noise modelling data is provided in **Appendix C**.



2.3 Stationary Noise Modelling Results – VIA Ottawa Terminal

2.3.1 Emergency Generator Testing.

Predicted façade sound levels from emergency generator testing are shown in **Figure 7a** and are summarized in the tables below. Generator set testing at the VIA Ottawa Station occurs during the night-time period. The applicable guideline limits at facades are therefore 50 dBA for Class 1 areas, and 60 dBA for Class 4 areas. There are no guideline limits for outdoor points of reception during the night-time period.

Table 10: Predicted Stationary Source Façade Sound Levels from VIA Ottawa Terminal – Emergency Generator Set Testing – Block 1 and Block 2

| Receptor | | | | Maximum Predicted Sound Level (L_{eq} (1-hr), dBA) | | Meets Guideline? | |
|--|-----------------|-------------|--------|--|-------|------------------|---------|
| Building | Floor | Use | Façade | Day/ Even | Night | Class 1 | Class 4 |
| Block 1 | Flr 1 | Amenity | N | n/a | 27 | Yes | Yes |
| | | | S | n/a | 51 | No | Yes |
| | | | E | n/a | 44 | Yes | Yes |
| | Flr 2 to 4 | Residential | N | n/a | 29 | Yes | Yes |
| | | | S | n/a | 53 | No | Yes |
| | | | E | n/a | 44 | Yes | Yes |
| | | | W | n/a | 54 | No | Yes |
| | Flr 5 to 28 | Residential | N | n/a | 38 | Yes | Yes |
| | | | S | n/a | 54 | No | Yes |
| | | | E | n/a | 45 | Yes | Yes |
| | | | W | n/a | 54 | No | Yes |
| | Penthouse | Amenity | N | n/a | 31 | Yes | Yes |
| | | | S | n/a | 49 | Yes | Yes |
| | | | W | n/a | 49 | Yes | Yes |
| | Outdoor Amenity | Tower Roof | - | n/a | n/a | Yes | Yes |
| Block 2 | Flr 1 | Amenity | N | n/a | 25 | Yes | Yes |
| | | | E | n/a | 23 | Yes | Yes |
| | | Residential | S | n/a | 47 | Yes | Yes |
| | Flr 2 to 4 | Residential | N | n/a | 27 | Yes | Yes |
| | | | S | n/a | 48 | Yes | Yes |
| | | | E | n/a | 33 | Yes | Yes |
| | | | W | n/a | 48 | Yes | Yes |
| | Flr 5 to 14 | Residential | N | n/a | 27 | Yes | Yes |
| | | | S | n/a | 48 | Yes | Yes |
| | | | E | n/a | 26 | Yes | Yes |
| | | | W | n/a | 48 | Yes | Yes |
| | Penthouse | Amenity | N | n/a | 22 | Yes | Yes |
| | | | S | n/a | 46 | Yes | Yes |
| | | | E | n/a | 27 | Yes | Yes |
| | Outdoor Amenity | Tower Roof | - | n/a | n/a | Yes | Yes |
| Notes: - includes noise walls required to address transportation noise. - n/a = not applicable. | | | | | | | |

The Class 4 area noise guideline limits are met at all locations.



The Class 1 area noise guideline limits are exceeded at some locations on the south and west facades of the Block 1 building, by up to 4 dB.

2.3.2 Normal Operations, No Locomotives Idling

Predicted façade sound levels from normal facility operations with no locomotives present are shown in **Figure 7b** and are summarized in the tables below:

Table 11: Predicted Stationary Source Façade Sound Levels from VIA Ottawa Terminal – Normal Operations, No Locomotives Idling – Block 1 and Block 2

| Receptor | | | | Maximum Predicted Sound Level (L _{eq} (1-hr), dBA) | | Meets Guideline? | |
|----------|-----------------|-------------|--------|---|-------|------------------|---------|
| Building | Floor | Use | Façade | Day/ Even | Night | Class 1 | Class 4 |
| Block 1 | Flr 1 | Amenity | N | 37 | 33 | Yes | Yes |
| | | | S | 48 | 45 | Yes | Yes |
| | | | E | 39 | 36 | Yes | Yes |
| | Flr 2 to 4 | Residential | N | 42 | 39 | Yes | Yes |
| | | | S | 52 | 49 | No | Yes |
| | | | E | 40 | 37 | Yes | Yes |
| | | | W | 53 | 50 | No | Yes |
| | Flr 5 to 28 | Residential | N | 42 | 39 | Yes | Yes |
| | | | S | 51 | 49 | No | Yes |
| | | | E | 42 | 40 | Yes | Yes |
| | | | W | 52 | 49 | No | Yes |
| | Penthouse | Amenity | N | 40 | 38 | Yes | Yes |
| | | | S | 49 | 47 | No | Yes |
| | | | W | 50 | 47 | No | Yes |
| | Outdoor Amenity | Tower Roof | - | 30 | n/a | Yes | Yes |
| Block 2 | Flr 1 | Amenity | N | 40 | 37 | Yes | Yes |
| | | | E | 25 | 22 | Yes | Yes |
| | | Residential | S | 45 | 42 | Yes | Yes |
| | Flr 2 to 4 | Residential | N | 41 | 38 | Yes | Yes |
| | | | S | 46 | 43 | Yes | Yes |
| | | | E | 28 | 25 | Yes | Yes |
| | | | W | 46 | 44 | Yes | Yes |
| | Flr 5 to 14 | Residential | N | 41 | 38 | Yes | Yes |
| | | | S | 46 | 43 | Yes | Yes |
| | | | E | 30 | 27 | Yes | Yes |
| | | | W | 46 | 44 | Yes | Yes |
| | Penthouse | Amenity | N | 33 | 29 | Yes | Yes |
| | | | S | 45 | 42 | Yes | Yes |
| | | | E | 29 | 26 | Yes | Yes |
| | Outdoor Amenity | Tower Roof | - | 40 | n/a | Yes | Yes |

Notes:
- includes noise walls required to address transportation noise.
- n/a = not applicable.

The Class 4 area noise guideline limits are met at all locations.

The Class 1 area noise guideline limits are exceeded at some locations on the south and west facades of the Block 1 buildings, by up to 5 dB.



2.3.3 Normal Operations With Idling Locomotives

Predicted façade sound levels from normal VIA Station operations with locomotives idling at the east end of the station are shown in **Figure 7c** and are summarized in the tables below:

Table 12: Predicted Stationary Source Façade Sound Levels from VIA Ottawa Terminal – Locomotive Idling – Block 1 and Block 2

| Receptor | | | | Maximum Predicted Sound Level ($L_{eq}(1\text{-hr})$, dBA) | | Meets Guideline? | |
|----------|-----------------|-------------|--------|---|-------|------------------|---------|
| Building | Floor | Use | Façade | Day/ Even | Night | Class 1 | Class 4 |
| Block 1 | Flr 1 | Amenity | N | 60 | 55 | No | Yes |
| | | | S | 59 | 55 | No | Yes |
| | | | E | 59 | 55 | No | Yes |
| | Flr 2 to 4 | Residential | N | 59 | 55 | No | Yes |
| | | | S | 58 | 54 | No | Yes |
| | | | E | 58 | 54 | No | Yes |
| | | | W | 58 | 54 | No | Yes |
| | Flr 5 to 28 | Residential | N | 59 | 54 | No | Yes |
| | | | S | 59 | 54 | No | Yes |
| | | | E | 57 | 53 | No | Yes |
| | | | W | 57 | 52 | No | Yes |
| | Penthouse | Amenity | N | 55 | 52 | No | Yes |
| | | | S | 55 | 52 | No | Yes |
| | | | W | 57 | 52 | No | Yes |
| | Outdoor Amenity | Tower Roof | - | 36 | n/a | Yes | Yes |
| Block 2 | Flr 1 | Amenity | N | 55 | 51 | No | Yes |
| | | | E | 55 | 51 | No | Yes |
| | | Residential | S | 55 | 51 | No | Yes |
| | Flr 2 to 4 | Residential | N | 55 | 51 | No | Yes |
| | | | S | 53 | 50 | No | Yes |
| | | | E | 54 | 50 | No | Yes |
| | | | W | 52 | 49 | No | Yes |
| | Flr 5 to 14 | Residential | N | 55 | 49 | No | Yes |
| | | | S | 53 | 49 | No | Yes |
| | | | E | 52 | 48 | No | Yes |
| | | | W | 52 | 48 | No | Yes |
| | Penthouse | Amenity | N | 52 | 47 | No | Yes |
| | | | S | 53 | 47 | No | Yes |
| | | | E | 53 | 47 | No | Yes |
| | Outdoor Amenity | Tower Roof | - | 48 | n/a | Yes | Yes |

Notes:
- includes noise walls required to address transportation noise.
- n/a = not applicable.

The Class 4 area noise guideline limits are met at all locations.

The Class 1 area noise guideline limits are exceeded at some locations on the south and west facades of the Block 1 and Block 2 buildings, by up to 10 dB.



2.4 Stationary Noise Modelling Results – Other Commercial/Industrial Noise Sources

2.4.1 Normal Operations

Predicted façade sound levels from other off-site commercial and industrial operations are shown in **Figure 8a** and are summarized in the tables below:

Table 13: Predicted Stationary Source Façade Sound Levels from Other Commercial/Industrial Sources – Normal Operations – Block 1 and Block 2

| Receptor | | | | Maximum Predicted Sound Level (L_{eq} (1-hr), dBA) | | Meets Guideline? | |
|----------|-----------------|-------------|--------|--|-------|------------------|---------|
| Building | Floor | Use | Façade | Day/ Even | Night | Class 1 | Class 4 |
| Block 1 | Flr 1 | Amenity | N | 48 | 43 | Yes | Yes |
| | | | S | 49 | 47 | No | Yes |
| | | | E | 49 | 46 | No | Yes |
| | Flr 2 to 4 | Residential | N | 50 | 46 | No | Yes |
| | | | S | 50 | 47 | No | Yes |
| | | | E | 50 | 48 | No | Yes |
| | | | W | 43 | 40 | Yes | Yes |
| | Flr 5 to 28 | Residential | N | 55 | 50 | No | Yes |
| | | | S | 51 | 48 | No | Yes |
| | | | E | 52 | 49 | No | Yes |
| | | | W | 49 | 45 | Yes | Yes |
| | Penthouse | Amenity | N | 42 | 38 | Yes | Yes |
| | | | S | 50 | 47 | No | Yes |
| | | | W | 48 | 44 | Yes | Yes |
| | Outdoor Amenity | Tower Roof | - | 44 | n/a | Yes | Yes |
| Block 2 | Flr 1 | Amenity | N | 53 | 41 | No | Yes |
| | | | E | 56 | 46 | No | Yes |
| | | Residential | S | 49 | 46 | No | Yes |
| | Flr 2 to 4 | Residential | N | 53 | 44 | No | Yes |
| | | | S | 51 | 48 | No | Yes |
| | | | E | 56 | 48 | No | Yes |
| | | | W | 48 | 45 | Yes | Yes |
| | Flr 5 to 14 | Residential | N | 54 | 48 | No | Yes |
| | | | S | 52 | 49 | No | Yes |
| | | | E | 56 | 49 | No | Yes |
| | | | W | 52 | 48 | No | Yes |
| | Penthouse | Amenity | N | 54 | 47 | No | Yes |
| | | | S | 51 | 48 | No | Yes |
| | | | E | 55 | 49 | No | Yes |
| | Outdoor Amenity | Tower Roof | - | 46 | n/a | Yes | Yes |

Notes:
- includes noise walls required to address transportation noise.
- n/a = not applicable.

The Class 4 area noise guideline limits are met at all locations.

The Class 1 area noise guideline limits are exceeded at some locations by up to 6 dB.



2.4.2 Generator Set Testing

Predicted façade sound levels from off-site generator set testing are shown in **Figure 8b** and are summarized in the tables below:

Table 14: Predicted Stationary Source Façade Sound Levels from Other Commercial/Industrial Sources – Generator Set Testing – Block 1 and Block 2

| Receptor | | | | Maximum Predicted Sound Level (L_{eq} (1-hr), dBA) | | Meets Guideline? | |
|----------|-----------------|-------------|--------|--|-------|------------------|---------|
| Building | Floor | Use | Façade | Day/ Even | Night | Class 1 | Class 4 |
| Block 1 | Flr 1 | Amenity | N | 38 | n/a | Yes | Yes |
| | | | S | 48 | n/a | Yes | Yes |
| | | | E | 47 | n/a | Yes | Yes |
| | Flr 2 to 4 | Residential | N | 37 | n/a | Yes | Yes |
| | | | S | 46 | n/a | Yes | Yes |
| | | | E | 46 | n/a | Yes | Yes |
| | | | W | 34 | n/a | Yes | Yes |
| | Flr 5 to 28 | Residential | N | 38 | n/a | Yes | Yes |
| | | | S | 47 | n/a | Yes | Yes |
| | | | E | 48 | n/a | Yes | Yes |
| | | | W | 34 | n/a | Yes | Yes |
| | Penthouse | Amenity | N | 27 | n/a | Yes | Yes |
| | | | S | 46 | n/a | Yes | Yes |
| | | | W | 35 | n/a | Yes | Yes |
| | Outdoor Amenity | Tower Roof | - | 33 | n/a | Yes | Yes |
| Block 2 | Flr 1 | Amenity | N | 33 | n/a | Yes | Yes |
| | | | E | 40 | n/a | Yes | Yes |
| | | Residential | S | 43 | n/a | Yes | Yes |
| | Flr 2 to 4 | Residential | N | 33 | n/a | Yes | Yes |
| | | | S | 46 | n/a | Yes | Yes |
| | | | E | 43 | n/a | Yes | Yes |
| | | | W | 41 | n/a | Yes | Yes |
| | Flr 5 to 14 | Residential | N | 34 | n/a | Yes | Yes |
| | | | S | 48 | n/a | Yes | Yes |
| | | | E | 47 | n/a | Yes | Yes |
| | | | W | 42 | n/a | Yes | Yes |
| | Penthouse | Amenity | N | 35 | n/a | Yes | Yes |
| | | | S | 48 | n/a | Yes | Yes |
| | | | E | 47 | n/a | Yes | Yes |
| | Outdoor Amenity | Tower Roof | - | 38 | n/a | Yes | Yes |

Notes:
- includes noise walls required to address transportation noise.
- n/a = not applicable.

The Class 1 Area and Class 4 area noise guideline limits are met at all locations.

2.5 Stationary Noise Mitigation Requirements

2.5.1 Mitigation Measures to Meet Class 1 Area Noise Guideline Limits

As sound levels from VIA Ottawa Terminal operations and other commercial/industrial sources exceed the Class 1 Area guideline limits, an analysis of noise mitigation is required.



Based on the nature of the proposed development, and the nature of VIA's operations, at-source mitigation measures are unlikely to be feasible or cost-effective. Based on the settlement discussions, VIA cannot accept restrictions on timing, duration, location, or intensity of operations within their property. Noise barriers within the yard could interfere with rail operations, and noise barriers at the perimeter of the VIA property will not be effective given the height of the proposed development.

As at-source noise mitigation measures are not technically or economically feasible, at-receptor mitigation measures have been investigated. A limited number of receptor-based noise mitigation measures are allowed under a Class 1 Area designation.

Noise Barriers

As discussed above, for high-rise developments, noise barriers will not effectively shield all facades of the building.

Site Configuration

Changes to the site configuration are not feasible in this case, without significantly altering the massing and reducing the density of the overall development.

Blank Facades/ Single Loaded Corridor Designs

Single-loaded corridor buildings incorporating blank facades (with no windows connected to noise sensitive spaces) are significantly more expensive to construct, and unlikely to meet design and density objectives for the Site particularly given that the Site is located within a Protected Major Transit Station Area and is zoned for Transit Oriented Development.

Based on the above, noise mitigation measures to meet the Class 1 Area noise guideline limits are not technically, economically, and administratively infeasible. As a result, it is recommended that a Class 4 Area designation be applied to the Subject Lands. Mitigation measures to meet the Class 4 Area noise guideline limits are discussed below.

2.5.2 Mitigation Measures to Meet Class 4 Area Noise Guideline Limits

The Class 4 Area limits are met at the facades of the development buildings, and no at-source mitigation measures are required. However, the following receptor-based mitigation measures should be included in the design and construction of the development.

2.5.2.1 Air Conditioning and Warning Clauses

Under the Publication NPC-300 noise guidelines, air conditioning by itself is not considered to be a noise control measure for stationary noise. Regardless, mandatory air conditioning is a requirement of the Class 4 Area designation, along with a "Type F" noise warning clause, to notify occupants that there may be times when outdoor noise levels will require windows to remain closed.

2.5.2.2 Noise Walls

As outlined in **Section 3.5.2** below, while noise walls are not required to address stationary source noise, they are required to address transportation noise at the communal outdoor amenity areas. The required noise walls are shown in **Figure 9a** of this report, and include:

- 2.0 m high noise walls are required along the outside edges of the rooftop outdoor amenity areas of the Block 1 and Block 2 buildings.



Noise walls should be constructed to be free of gaps and cracks, and have a minimum face density (mass per unit of area) of 20 kg/m². There are a number of commercial products which meet these requirements, including noise walls made out of glass, plexiglass, metal, polymers, and wood. Any required drainage gaps at the base of the noise wall should be small (less than 25 mm high) and localized (in specific locations and not running the full length of the wall).

2.5.2.3 Wall and Window Upgrades

Under NPC-300 noise guidelines, receptor-based noise mitigation measures, including wall and window upgrades are not required to address stationary source noise, as the Class 4 Area noise guideline limits are met. Regardless, given the potential for low frequency noise arising from railway operations, certain wall and window upgrades are expected to improve the indoor noise levels experienced by future residents and are therefore recommended for implementation. The recommended upgrades are illustrated in **Figure 9b** and are also described below:

Block 1 Building

For facades on the west and south side of the building facing the VIA Station:

- Exterior windows and patio doors for living rooms, kitchens and dens shall have a minimum Sound Transmission Class (STC) rating of STC 37.
- For the podium, exterior windows for bedrooms shall have a minimum rating of STC 39.
- For the tower, exterior windows for bedrooms shall have a minimum rating of STC 37.
- The interior portion of the exterior walls shall be constructed using Genie Clips, resilient channels and 2 layers of 16 mm (5/8") Type X gypsum wall board (STC 60).
- Where upgrades are required, the exterior window area to bedroom or living room floor area shall not exceed 80%.

Block 2 Building

For facades on the west and south side of the building facing the VIA Station:

- Exterior windows and patio doors for living rooms, kitchens, dens shall have a minimum STC rating of STC 37.
- Exterior windows for bedrooms shall have a minimum STC rating of STC 37.
- The interior portion of the exterior walls shall be constructed using resilient channels and 2 layers of 13 mm (1/2") Type X gypsum wall board (STC 50).
- Where upgrades are required, the exterior window area to bedroom or living room floor area shall not exceed 80%.

All other walls, windows and patio doors should meet minimum Ontario Building Code (OBC) thermal and structural requirements and will have minimum ratings of STC 40 for walls and STC 29 for windows and patio doors.

3.0 Transportation Noise Impacts

3.1 Transportation Noise Sources

The transportation sources with the potential to affect the proposed development are:

- Rail traffic noise from the VIA rail corridors and through the station;
- Rail traffic noise from the O-Train Line 1 LRT traffic;



- Road traffic noise from Highway 417, Tremblay Road, Belfast Road and Terminal Avenue.

Transportation noise levels from these sources have been predicted, and this information has been used to identify façade, ventilation, and warning clause recommendations/requirements for the proposed development.

3.2 Surface Transportation Noise Criteria

3.2.1 City of Ottawa Environmental Noise Control Guidelines

For transportation source noise, The ENCG guidelines adopt the MECP Publication NPC-300 guidelines.

The following tables list the primary mitigation methods and additional secondary measures for surface transportation outdoor and indoor noise mitigation to be submitted to the City for approval. The list is in order from the most preferred (distance) to least preferred (acoustic barriers).

Table 15: Outdoor Living Space Noise Control Measures for Surface Transportation Noise (ENCG Table 2.3a)

| Primary Mitigation Measure In Order of Preference | Secondary Mitigation Measures | |
|--|--|---|
| | Landscape Plantings and/or Non-Acoustic Fence to Obscure Noise Source | Warning Clauses |
| 1. Distance setback with soft ground; | Recommended | |
| 2. Insertion of noise insensitive land uses between the source and sensitive receptor | | |
| 3. Orientation of buildings to provide sheltered zones in rear yards. | Required | Warning clauses necessary and to include: <ul style="list-style-type: none"> • reference to specific noise mitigation measures in the development, • whether noise is expected to increase in the future and • that there is a need to maintain mitigation. |
| 4. Shared outdoor amenity areas. | | |
| 5. Earth berms (sound barriers) | | |
| 6. Acoustic Barriers | | |



Table 16: Indoor Noise Control Measures for Surface Transportation Noise (ENCG Table 2.3b)

| Primary Mitigation Measure In Order of Preference | Secondary Mitigation Measures | |
|--|--|---|
| | Landscape Plantings and/or Non-Acoustic Fence to Obscure Noise Source | Warning Clauses |
| 1. Distance setback with soft ground; 2. Insertion of noise insensitive land uses between the source and sensitive receptor | Recommended | |
| 3. Orientation of buildings to provide sheltered zones or modified interior spaces (room and corridor arrangement) and amenity areas. 4. Enhanced construction techniques and construction quality (e.g. brick veneers, multi- pane windows). 5. Earth berms (sound barriers) 6. Indoor isolation - air conditioning and ventilation, enhanced dampening materials (indoor isolation) | Required | Warning clauses necessary and to include: <ul style="list-style-type: none"> • reference to specific noise mitigation measures in the development, • whether noise is expected to increase in the future and • that there is a need to maintain mitigation. |

In assessing impacts from road traffic, the ENCG requires that specific traffic and road parameters be used in the assessment, as outlined in Appendix B of the ENCG.

The guidelines also require the use of ORNAMENT (Ontario Road Noise Analysis Method for Environment and Transportation), STEAM (Sound from Trains Environment Analysis Method), and the computerized version STAMSON (as updated from time to time) as “the required prediction methods”. These are the prediction methods developed by the MECP.

3.2.2 Ministry of Environment Publication NPC-300

MECP Publication NPC-300 provides sound level criteria for noise-sensitive developments. The applicable portions of NPC-300 are Part C – Land Use Planning and the associated definitions outlined in Part A – Background. The following tables summarize the applicable surface transportation (road and rail) criteria.

3.2.2.1 Location-Specific Indoor Noise Criteria

Table 18 summarizes indoor criteria in terms of energy equivalent sound levels (L_{eq}) for specific noise-sensitive locations. Both outdoor and indoor locations are identified, with the focus of outdoor areas being amenity spaces. Indoor criteria vary with sensitivity of the space. As a result, Sleeping Quarters have more stringent criteria than Living/Dining room spaces.



Table 17: NPC-300 Sound Level Criteria for Road and Rail Noise

| Type of Space | Time Period | Energy Equivalent Sound Level L_{eq} (dBA) ^[1] | | Assessment Location |
|-----------------------------------|-------------------------|---|---------------------|---------------------|
| | | Road | Rail ^[2] | |
| Living/Dining Room ^[3] | Daytime (0700-2300h) | 45 | 40 | Indoors |
| | Night-time (2300-0700h) | 45 | 40 | Indoors |
| Sleeping Quarters | Daytime (0700-2300h) | 45 | 40 | Indoors |
| | Night-time (2300-0700h) | 40 | 35 | Indoors |

Notes:
 [1] Road and Rail noise impacts are to be combined for assessment of impacts.
 [2] Whistle/warning bell noise is included for indoor assessments.

3.2.2.2 Outdoor Amenity Areas

Table 19 summarizes the noise mitigation requirements for communal outdoor amenity areas.

For the assessment of outdoor sound levels, total surface transportation noise is determined by combining road and rail traffic sound levels. Per the guideline, whistle noise from trains is not included in the determination of outdoor sound levels.

Table 18: NPC-300 Outdoor Amenity Area Sound Level Criteria for Road and Rail Noise

| Time Period | Energy Equivalent Sound Level L_{eq} (dBA) ^{[1][2]} | Mitigation Requirements/Warning Clause Recommendations |
|----------------------|--|---|
| Daytime (0700-2300h) | ≤ 55 | • None |
| | 56 to 60 inc. | • Noise barrier OR Type A Warning Clause |
| | > 60 | • Noise barrier to reduce noise to 55 dBA OR • Noise barrier to reduce noise to 60 dBA and Type B Warning Clause |

Notes:
 [1] Road and Rail noise impacts are to be combined for assessment of impacts.
 [2] Whistle/warning bell noise is excluded for outdoor amenity area noise assessments

3.2.2.3 Ventilation and Warning Clauses

Table 20 summarizes recommendations for ventilation where windows would potentially have to remain closed as a means of noise control. Despite implementation of ventilation measures where recommended, if sound levels exceed the guideline limits in **Table 15**, warning clauses advising future occupants of the potential excesses are also recommended.



Table 19: NPC-300 Ventilation and Warning Clause Recommendations

| Assessment Location | Time Period | Energy Equivalent Sound Level – L _{eq} (dBA) | | Ventilation and Warning Clause Recommendations ^[2] |
|---------------------|-------------------------|---|---------------------|--|
| | | Road | Rail ^[1] | |
| Plane of Window | Daytime (0700-2300h) | ≤ 55 | | None |
| | | 56 to 65 incl. | | Forced Air Heating with provision to add air conditioning +Type C Warning Clause |
| | | > 65 | | Central Air Conditioning +Type D Warning Clause |
| | Night-time (2300-0700h) | 51 to 60 incl. | | Forced Air Heating with provision to add air conditioning +Type C Warning Clause |
| | | > 60 | | Central Air Conditioning +Type D Warning Clause |

Notes:

[1] Whistle noise is excluded from assessment.

[2] Road and Rail noise is combined for determining Ventilation and Warning Clause requirements.

Building Component Requirements

Table 21 provides sound level thresholds which, if exceeded, trigger a requirement for the building shell components (i.e., exterior walls, windows) to be designed accordingly to meet the applicable indoor sound criteria.

Table 20: NPC-300 Building Component Assessment Requirements

| Assessment Location | Time Period | Energy Equivalent Sound Level – L _{eq} (dBA) | | Component Requirements |
|--|-------------------------|---|---------------------|---|
| | | Road | Rail ^[1] | |
| Plane of Window | Daytime (0700-2300h) | > 65 | > 60 | Designed/ Selected to Meet Indoor Requirements ^[2] |
| | Night-time (2300-0700h) | > 60 | > 55 | |
| Notes: [1] Whistle noise is included in assessment. [2] Building component requirements are assessed separately for Road and Rail, and then combined for a resultant sound isolation parameter. | | | | |

In addition, the exterior walls of the first row of dwellings next to railway tracks are to be acoustically equivalent to brick veneer or masonry construction, from the foundation to the rafters when the rail traffic L_{eq} (24-hour), estimated at a location of a nighttime receptor, is greater than 60 dBA, and when the first row of dwellings is within 100 m of the tracks.

3.2.3 Transportation Noise Guidelines Adopted in This Assessment

In accordance with Provincial policies and the City ENCG the applicable noise guidelines for this assessment are MECP Publication NPC-300.



3.3 Traffic Data and Future Projections

3.3.1 Road Traffic Data

The road traffic data used in the assessment is summarized in the following table:

Table 21: Summary of Year 2040 Road Traffic Data Used in Transportation Analysis

| Name | Lanes | Speed | Day/ Night Split | Year 2040 Traffic Volumes | | | | | Notes |
|--|-------|-------|------------------------|---------------------------|--------|-----------------------|--------|-------|-------|
| | | | | Time | Total | Truck Percentages (%) | | | |
| | | | | | | Total Comm. | Medium | Heavy | |
| Highway 417 E/B | 4 | 100 | 88% | Day | 79,183 | 4.4% | 1.1% | 3.3% | 1 |
| | | | 12% | Night | 10,729 | 4.2% | 1.0% | 3.1% | 1 |
| Highway 417 W/B | 4 | 100 | 87% | Day | 72,415 | 5.2% | 1.3% | 3.9% | 1 |
| | | | 13% | Night | 10,551 | 8.3% | 2.1% | 6.2% | 1 |
| Tremblay Road W of Belfast E/B | 2 | 50 | 92%/8% | Total | 17,500 | 12.0% | 7.0% | 5.0% | 2 |
| Tremblay Road W of Belfast W/B | 2 | 50 | 92%/8% | Total | 17,500 | 12.0% | 7.0% | 5.0% | 2 |
| Tremblay Road E of Belfast | 2 | 50 | 92%/8% | Total | 15,000 | 12.0% | 7.0% | 5.0% | 3 |
| Belfast Road | 2 | 50 | 92%/8% | Total | 15,000 | 12.0% | 7.0% | 5.0% | 3 |
| Terminal Ave | 2 | 50 | 92%/8% | Total | 15,000 | 12.0% | 7.0% | 5.0% | 3 |
| Notes: | | | | | | | | | |
| [1] Forecast to 2040 based on actual traffic volumes. | | | | | | | | | |
| [2] From Ottawa Environmental Noise Control Guide Table B2 - 4-Lane Urban Arterial - Divided | | | | | | | | | |
| [3] From Ottawa Environmental Noise Control Guide Table B2 - 2-Lane Urban Arterial | | | | | | | | | |

For Tremblay Road, Belfast Road, and Terminal Avenue, the road traffic volumes from Appendix B of the ENCG were used.

For Highway 417, traffic data was obtained from the MTO's "iCorridor" website for eastbound and westbound directions, and forecast out to a design year of 2040, as this results in higher Annual Average Daily Traffic ("AADT") volumes and higher night-time heavy truck percentages than the ENCG values, resulting in a more conservative assessment. Data and calculations are provided in **Appendix D**.

3.3.2 Rail Traffic Data

Current rail traffic volumes were obtained based on VIA's published train schedules. This data was forecast to a design year of 2040 assuming a conservative 2.5% per annum growth rate. Copies of all data and calculations are shown in **Appendix D**.

While the maximum posted speeds on the Alexandria and Beachburg railway subdivisions are 120 km/h, actual local speeds are much less, due to speed restrictions from bridges, the tight turn at the west end of the station, and nearby at-grade road/rail crossings. Data on allowed speeds in the area were obtained from the January 2005 version of the Canadian National Railways ("CN") Champlain Division "Time Table 80" document, and from conversations with VIA/WSP. Copies of all data are provided in **Appendix D**. The allowed train speeds are shown in **Figure 10**.



Whistle and bell noise was not observed during site visits and were not included in the noise modelling.

Rail traffic data used in the assessment are provided in **Appendix D** and are summarized in the following table.

Table 22: Summary of Year 2040 Rail Traffic Data Used in Transportation Analysis

| Type | Time Period | | Consist | | Speed |
|---|-------------|-------|---------|------|--|
| | Day | Night | Locos | Cars | |
| VIA Beachburg (W of Station) East Bound | 23 | 2 | 1 | 5 | <ul style="list-style-type: none"> • 72 km/h S of Terminal Ave • 48 km/h W of Riverside Dr • 20 km/h Within Station |
| VIA Beachburg (W of Station) West Bound | 23 | 8 | 1 | 5 | <ul style="list-style-type: none"> • 20 km/h Within Station • 48 km/h W of Riverside Dr • 72 km/h S of Terminal Ave |
| VIA Alexandria (E of Station) East Bound | 17 | 2 | 1 | 5 | <ul style="list-style-type: none"> • 20 km/h Within Station • 48 km/h E of Belfast Rd • 120 km/h E of Avenue R |
| VIA Alexandria (E of Station) West Bound | 8 | 0 | 1 | 5 | <ul style="list-style-type: none"> • 120 km/h E of Avenue R • 48 km/h E of Belfast Rd • 20 km/h Within Station |
| O-Train Total | 137 | 32 | n/a | n/a | <ul style="list-style-type: none"> • 80 East of Belfast Rd • 40 West of Belfast Rd |
| Notes: - Projected values assumes growth rate of 2.5% per year, to year 2040, rounded to nearest full train | | | | | |

3.4 Predicted Sound Levels

Future road traffic noise levels at the proposed development were predicted using Cadna/A, a commercially available noise propagation modelling software package.

Global ground absorption was conservatively considered to be reflective ($G = 0.0$), with specific large areas of grass, trees, and gravel (rail ballast) modelled as $G=1.0$ (absorptive). An order of reflection of 0 was used, consistent with the requirements of MECP Publication NPC-300.

Sound levels were predicted along the facades of the proposed development using the “building evaluation” feature of Cadna/A. This feature allows for noise levels to be predicted across the entire façade of a structure. Outdoor Amenity Area sound levels were assessed at the centre of the ground level and terrace spaces and at a height of 1.5 m.

Roadways

Roadways were modelled as line sources of sound, with sound emission rates calculated using the ORNAMENT algorithms, the road traffic noise model of the MECP. These predictions were validated and are equivalent to those made using the MECP’s ORNAMENT or STAMSON v5.04 road traffic noise models.

Road grades in the area for the modelled roads are flat (<2%) so no adjustments for grade changes are required.

Railways

Rail traffic noise levels were modelled using the U.S. Federal Transit Administration / Federal Railway Administration noise models, built into the Cadna/A noise modelling package. While the



ENCG requires the use the STEAM algorithms, subsequent to the publication of the ENCG, the MECP has indicated its intent to update their preferred transportation noise models. A draft version of Publication NPC-306 which recommends the use of U.S. Federal Transit Administration (“FTA”) and Federal Railway Administration (“FRA”) models for rail traffic noise has been published.

In this assessment, the FTA/FRA algorithms have been used for rail traffic noise predictions. These models are more accurate, and are commonly used by CN, CP, and Metrolinx in evaluating predicted impacts from their own expansion projects and are accepted by the MECP. Critically, the FTA/FRA models also allow for the use of throttle settings to account for increased noise levels for trains accelerating from a stop.

VIA trains were modelled as “Commercial Diesel Locomotives” and Commercial Passenger Cars”. Locomotives leaving the station were modelled at maximum throttle setting 8, locomotives entering the station were modelled at throttle setting 1. O-Train vehicles were modelled as “Rail Transit and Streetcar” (“RT”) units. “RT” units are electric, and throttle settings do not alter the noise levels.

The VIA rail lines are continuously welded rail. However, the lines through the immediate vicinity of the station have been modelled as jointed track to account for the switches and frogs in this area.

3.4.1 Façade Sound Levels

Predicted unmitigated and mitigated worst-case façade sound levels due to road and rail traffic are presented in **Figures 11a and 11b** and are summarized in the following tables.

The predicted results presented for Blocks 1 and 2 do not include the future buildings on Blocks 3 through 7 which are not part of the current SPA application. This provides worst-case predictions for road and rail traffic noise. The predictions for the Future lots include the screening effects of the Block 1 and Block 2 buildings.



Table 23: Summary of Predicted Worst-Case Façade Transportation Sound Levels – Block 1 and Block 2

| Receptor | | | | Maximum Predicted Sound Level (dBA) | | | | | | | | |
|----------|-----------------|-------------|--------|-------------------------------------|-------|------------|-------|------------|-------|----------|-------|----------|
| | | | | Road | | Locomotive | | Rail Wheel | | Combined | | Rail 24h |
| Bldg | Floor | Use | Façade | Day | Night | Day | Night | Day | Night | Day | Night | |
| Block 1 | Flr 1 | Amenity | N | 64 | 59 | 46 | 40 | 33 | 29 | 64 | 59 | 44 |
| | | | S | 53 | 46 | 58 | 52 | 38 | 32 | 59 | 53 | 56 |
| | | | E | 62 | 58 | 55 | 49 | 36 | 30 | 63 | 58 | 53 |
| | Flr 2 to 4 | Residential | N | 66 | 62 | 45 | 40 | 38 | 34 | 66 | 62 | 44 |
| | | | S | 55 | 49 | 59 | 54 | 40 | 34 | 61 | 55 | 58 |
| | | | E | 63 | 58 | 56 | 50 | 37 | 32 | 64 | 59 | 54 |
| | Flr 5 to 28 | Residential | W | 65 | 61 | 56 | 52 | 39 | 35 | 65 | 61 | 55 |
| | | | N | 68 | 63 | 44 | 39 | 43 | 39 | 68 | 63 | 43 |
| | | | S | 56 | 50 | 59 | 54 | 41 | 35 | 61 | 55 | 58 |
| | Penthouse | Amenity | E | 65 | 61 | 57 | 51 | 43 | 38 | 66 | 61 | 55 |
| | | | W | 65 | 61 | 56 | 51 | 42 | 38 | 66 | 61 | 55 |
| | | | N | 67 | 63 | 43 | 38 | 42 | 39 | 67 | 63 | 42 |
| | Outdoor Amenity | Tower Roof | S | 56 | 50 | 58 | 53 | 41 | 35 | 60 | 55 | 57 |
| | | | W | 65 | 61 | 56 | 51 | 42 | 38 | 66 | 61 | 55 |
| Block 2 | Flr 1 | Amenity | N | 63 | 58 | 46 | 40 | 32 | 28 | 63 | 58 | 45 |
| | | | E | 60 | 54 | 51 | 45 | 34 | 29 | 60 | 55 | 50 |
| | | Residential | S | 52 | 45 | 57 | 51 | 38 | 32 | 58 | 52 | 56 |
| | Flr 2 to 4 | Residential | N | 66 | 62 | 45 | 40 | 36 | 33 | 66 | 62 | 44 |
| | | | S | 55 | 48 | 59 | 54 | 39 | 34 | 60 | 55 | 58 |
| | | | E | 64 | 59 | 54 | 48 | 36 | 31 | 64 | 59 | 53 |
| | Flr 5 to 14 | Residential | W | 63 | 58 | 56 | 51 | 38 | 33 | 64 | 59 | 55 |
| | | | N | 68 | 63 | 44 | 39 | 42 | 39 | 68 | 63 | 43 |
| | | | S | 56 | 49 | 60 | 54 | 41 | 35 | 61 | 55 | 58 |
| | Penthouse | Amenity | E | 65 | 61 | 56 | 50 | 42 | 38 | 66 | 61 | 55 |
| | | | W | 64 | 60 | 57 | 52 | 40 | 35 | 64 | 60 | 56 |
| | | | N | 68 | 63 | 43 | 38 | 42 | 39 | 68 | 63 | 42 |
| | Outdoor Amenity | Tower Roof | S | 56 | 50 | 59 | 53 | 41 | 35 | 61 | 55 | 58 |
| | | | E | 66 | 61 | 56 | 50 | 43 | 38 | 66 | 61 | 55 |
| | | | - | 63 | n/a | 55 | n/a | 38 | n/a | 64 | n/a | n/a |

Notes:

- The predicted results presented for Lot do not include the future buildings on Lots C through F which are not part of the SPA application. This provides worst-case predictions for road and rail traffic noise.

3.5 Transportation Noise Control Measures

3.5.1 Façade Assessment

Maximum predicted sound levels (total of road and rail) are:

- For Block 1 and Block 2: L_{eq} (Day) of 68 dBA, and L_{eq} (Night) of 63 dBA.

Based on the levels, an assessment of façade construction is required to ensure the indoor noise levels are met. The sound levels are dominated by road traffic noise from Highway 417, and not from rail traffic noise along the VIA and O-Train corridors. For rail traffic noise only, the maximum predicted values are:



- For Block 1 and Block 2: L_{eq} (Day) of 60 dBA, L_{eq} (Night) of 55 dBA, and L_{eq} (24h) of 59 dBA.

Under NPC-300 requirements, the exterior walls of the first row of dwellings next to railway tracks require upgrades only when the rail traffic L_{eq} (24-hour) is greater than 60 dBA. That is not the case here. Therefore, brick veneer or masonry equivalent construction is not required for buildings on Lots A, B, or C.

Indoor sound levels and required façade Sound Transmission Classes (STCs) were estimated using the procedures outlined in National Research Council Building Practice Note BPN-56.

The size of the windows were determined from the elevation drawings. As a percentage of total wall area (not floor area), the following values were used:

- | | |
|---|-------------|
| • Residential Living Rooms (including Patio Door) | 70% glazing |
| • Residential Bedrooms | 50% glazing |
| • Floor 1 Indoor Amenity Areas | 90% glazing |
| • Penthouse Indoor Amenity Areas | 90% glazing |
| • All Rooms are intermediate absorption | |

The assessment results are shown in **Appendix D**. The results show that wall and window upgrades are not required to address transportation noise, and walls, windows and patio doors meeting the minimum thermal and structural requirements of the OBC will be acoustically acceptable.

Regardless, the wall and window constructions outlined in **Section 2.5.2** will be used for the development.

3.5.2 Communal Outdoor Amenity Areas

As discussed in Section 2.5.22, mitigation measures in the form of noise walls are required to address both stationary and transportation noise at the communal outdoor amenity areas. The required noise walls are shown in **Figure 9a** of this report, and include:

- 2.0 m high noise walls are required along the outside edges of the rooftop outdoor amenity areas of the Block 1 and Block 2 buildings.

Noise walls should be constructed to be free of gaps and cracks, and have a minimum face density (mass per unit of area) of 20 kg/m². There are a number of commercial products which meet these requirements, including noise walls made out of glass, plexiglass, metal, polymers, and wood. Any required drainage gaps at the base of the noise wall should be small (less than 25 mm high) and localized (in specific locations and not running the full length of the wall).

Predicted sound levels with the noise walls in place are shown in the following table:



Table 24: Summary of Predicted Mitigated Sound Levels at Communal Outdoor Amenity Areas - Block 1 and Block 2

| Receptor | | | Maximum Predicted Sound Level (dBA) | |
|--|-----------------|------------|-------------------------------------|--|
| Bldg | Floor | Façade | | |
| Block 1 | Outdoor Amenity | Tower Roof | 57 | <ul style="list-style-type: none"> 2.0 m high noise walls along the outside edges of the rooftop outdoor amenity area |
| Block 2 | Outdoor Amenity | Tower Roof | 57 to 58 | <ul style="list-style-type: none"> 2.0 m high noise walls along the outside edges of the rooftop outdoor amenity area |
| Notes: <ul style="list-style-type: none"> The predicted results presented for Lot do not include the future buildings on Lots C through F which are not part of the SPA application. This provides worst-case predictions for road and rail traffic noise. | | | | |

The amenity area sound levels are dominated by road traffic noise from Highway 417. As the other portions of the development are constructed, the sound levels at the amenity areas will be further decreased.

3.5.3 Ventilation Recommendations

Based on exterior sound levels, and on the use of a Class 4 Area designation, mandatory air conditioning is required for all residential units, as well as a Type D noise warning clause.

Warning clause recommendations are summarized in **Section 4**.

4.0 Summary of Warning Clauses

Warning Clauses should be included in agreements or documents registered on title for the residential units and included in all agreements of purchase and sale or lease, and all rental agreements. The following warning clauses are required by MECP Publication NPC-300, the ENG C, and the settlement between VIA and the Developer.

VIA Rail and MECP Type F Warning Clause (All Units)

“VIA Rail Canada Inc. and its assigns and successors in interest, currently operates a passenger railway station on lands located within 300 metres of the Subject Lands. There may be alterations to or expansions of the railway station in the future, including the possibility that VIA Rail Canada Inc. may expand or alter its operations, which expansion or alteration 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 Rail Canada Inc. and its successors will not be responsible for any complaints or claims arising from use of such facilities and/or operations on the aforesaid lands.”

“Purchasers/tenants are advised that the Subject Lands, and the residential developments which are to be constructed thereon, have been designated Class 4 as defined by the Ministry of the Environment, Conservation and Parks guidelines as the sound levels at the proposed development exceed the Class 1 sound level limits. The developer/builder is required to provide mitigation measures to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. The Class 4 designation permits this dwelling unit to be supplied with a central air conditioning system which will allow windows and exterior doors to remain closed.”



MECP Type B Warning Clause (All Units)

“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, rail and light rail traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the City and the Ministry of the Environment.

To help address the need for sound attenuation this development includes acoustic barriers for outdoor amenity areas.

To ensure that provincial sound level limits are not exceeded it is important to maintain these sound attenuation features. The acoustic barrier shall be maintained and kept in good repair by the property owner. Any maintenance, repair or replacement is the responsibility of the owner and shall be with the same material or to the same standards, having the same function of the original.”

MECP Type D Warning Clause (All Units)

“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 City and the Ministry of the Environment.”

5.0 Transportation Vibration

There are no significant sources of industrial, “stationary” vibration in the vicinity of the proposed development. However, the development lies within 75 m of the VIA rail tracks, and a vibration assessment of transportation sources is required.

5.1 Guidelines

The Rail Association of Canada and Federation of Canadian Municipalities “Proximity Guidelines”, as well as individual policies from rail lines provide guideline limits for vibration. International Standard ISO 2631-2: 2003 (1989) also provides supplementation criteria for commercial and office space and for industrial buildings. The adopted guideline limits are presented in the following table.

Table 25: Transportation Vibration Guideline Limits

| Train Type | Receptor Type | Limit (mm/s RMS) | Source |
|---|---------------------|------------------|----------------------------------|
| Heavy Rail (Freight and Commuter) | Residential | 0.14 | RAC/FCM, CN, CP, Metrolinx, MECP |
| | Commercial / Office | 0.40 | ISO 2631-2: 2003 (1989) |
| | Industrial | 0.80 | ISO 2631-2: 2003 (1989) |
| Notes: | | | |
| - Limits are overall vibration levels in the vertical direction, measured in root-mean square (“RMS”) values (1-second averaging time), in the frequency range from 4 Hz to 200 Hz. | | | |



5.2 Measurements

Vibration measurements were conducted by Englobe Corp. (“Englobe”) on December 14 and 15, 2024. The vibration measurement locations was chosen to be representative of the location of the closest building foundations. The measurement location is shown in **Figure 12**.

Vibration measurements were conducted using an Instantel “Minimate” vibration monitoring system, which records vibration levels using an external tri-axial geophone. The maximum RMS vibration levels were obtained by post-processing.

5.3 Assessment Results

A total of 23 train events were recorded by the system. Measured vibration levels are shown in the following table:

Table 26: Measured Vibration Levels

| Measurement Date | Measurement Time | Measured Level (mm/s, R.M.S.) | Meets 0.14 mm/s Guideline? |
|--|------------------|-------------------------------|----------------------------|
| Dec 14 /24 | 5:00:37 | 0.13 | Yes |
| | 7:01:05 | 0.06 | Yes |
| | 8:00:36 | 0.12 | Yes |
| | 10:00:36 | 0.04 | Yes |
| | 11:00:36 | 0.12 | Yes |
| | 13:00:36 | 0.11 | Yes |
| | 14:00:36 | 0.13 | Yes |
| | 16:00:36 | 0.12 | Yes |
| | 18:00:36 | 0.11 | Yes |
| | 19:00:36 | 0.12 | Yes |
| | 21:00:36 | 0.13 | Yes |
| Dec 15 /24 | 3:00:36 | 0.04 | Yes |
| | 7:00:37 | 0.06 | Yes |
| | 9:00:36 | 0.10 | Yes |
| | 10:00:36 | 0.04 | Yes |
| | 11:00:37 | 0.04 | Yes |
| | 13:00:36 | 0.14 | Yes |
| | 14:00:36 | 0.06 | Yes |
| | 16:00:36 | 0.05 | Yes |
| | 18:00:36 | 0.06 | Yes |
| | 19:00:36 | 0.12 | Yes |
| | 20:00:36 | 0.08 | Yes |
| | 23:00:36 | 0.12 | Yes |
| Notes: - Measured Levels shown are overall vibration levels in the vertical direction, measured in root-mean square (“RMS”) values (1-second averaging time), in the frequency range from 4 Hz to 200 Hz | | | |

5.4 Summary Of Vibration Conclusions And Recommendations

The potential for vibration impacts on and the proposed development have been assessed. Based on the results of our studies:

- Adverse vibration impacts from commercial or industrial facilities are not anticipated at the Project. The requirements of MECP Guideline D-6 are met.



- Adverse vibration impacts from transportation sources are not anticipated.

Receptor-based physical mitigation measures not required.

PART 2: IMPACTS OF THE DEVELOPMENT ON ITSELF

6.0 Stationary Source Noise from the Development on Itself

At the time of this assessment, mechanical systems for the proposed development have not been sufficiently designed to complete a detailed assessment of stationary source noise from the development on itself.

For common mechanical systems that will be implemented as part of the proposed development, sound levels from all noise-generating equipment should comply with the guideline limits in MECP Publication NPC-300. The potential noise from mechanical equipment in the proposed development (such as from make-up air units, cooling towers, parking garage exhaust fans, emergency generators, etc.) should be assessed as part of the final building design. The applicable criteria can be met at all on-site receptors through appropriate selection of mechanical equipment, by locating equipment with sufficient setback from noise sensitive locations, and by incorporating control measures (e.g., silencers) into the design. This can be confirmed either later in the site plan approval process, or at the building permit approval stages.

It is recommended that the mechanical systems be reviewed by an acoustical consultant prior to final equipment selection.

If individual air conditioning systems are to be implemented for individual residential units within the proposed development, the sound levels from each unit should meet the requirements of MECP Publication NPC-216.

PART 3: IMPACTS OF THE DEVELOPMENT ON THE SURROUNDING AREA

7.0 Stationary Source Noise from the Development on the Surroundings

With respect to the acoustic environment of the area, it is expected that the proposed development will have a negligible effect on neighbouring noise-sensitive properties.

Traffic related to the proposed development will be small relative to the existing traffic volumes within the area and is not of concern with respect to potential transportation noise.

Other sources associated within the proposed development with the potential to generate noise are mechanical equipment (e.g., air conditioning units, make up air units, cooling units, and parking garage exhaust fans). Sound levels due to operation of these sources should meet MECP Publication NPC-300 noise guidelines at all off-site noise sensitive receptors.

Off-site sound levels are not expected to be of concern are not anticipated because systems will be designed to ensure that the applicable noise guidelines are met at on-site receptors.

Regardless, off-site sound levels from mechanical equipment should be assessed as part of the



final building designs. The applicable criteria can be met at all surrounding receptors though the use of routine mitigation measures, including the appropriate selection of mechanical equipment, by locating equipment with sufficient setback from noise sensitive locations, and by incorporating control measures (e.g., silencers, barriers) into the designs.

It is recommended that the mechanical systems be reviewed by an acoustical consultant prior to final selection of equipment.

If individual air conditioning systems are to be implemented for individual residential units within the proposed development, the sound levels from each unit should meet the requirements of MECP Publication NPC-216.

8.0 Conclusions and Recommendations

The potential for noise impacts on and from the proposed development have been assessed. Impacts of the environment on the development, the development on itself, and the development on the surrounding area have been considered. Based on the results of this assessment, the following conclusions have been reached:

- An assessment of stationary source noise, transportation source noise, and transportation vibration have been completed.
- The following noise mitigation measures are recommended/ required as outlined in **Section 2.4.2** of this report:
 - A Class 4 Area designation under MECP Publication NPC-300;
 - Mandatory air conditioning for all residential units;
 - Noise barriers for the rooftop outdoor amenity terraces, as indicated in **Figure 9a**; and
 - Wall and window upgrades on some facades indicated in **Figure 9b**.
- With these measures in place, the Class 4 Area guideline limits will be met, and impacts from noise are not anticipated.
- Adverse vibration impacts are not anticipated, and vibration mitigation is not required.
- Warning clauses are required should be included in agreements registered on title for the residential units and included in agreements of purchase and sale/rental agreements. Recommended warning clauses are provided in **Section 4**.
- It is recommended that the mechanical systems be reviewed by an acoustical consultant prior to final selection of equipment. These systems should be designed and selected to meet MECP Publication NPC-216 and Publication NPC-300 limits at all on-site and off-site noise-sensitive receptors.
- Noise from the environment on the proposed development can be adequately controlled with the inclusion of the recommended mitigation measures, ventilation requirements, and warning clause recommendations as detailed in **Part 1** of this report.
- Noise from the proposed development on itself is not expected to be of concern and can be adequately controlled by following the design guidance outlined in **Part 2** of this report.



- Noise from the proposed development on the surroundings is expected to meet the applicable guideline limits and can be adequately controlled by following the design guidance outlined in **Part 3** of this report.
- As the mechanical systems for the proposed development have not been designed in detail, the acoustical design should be reviewed by an acoustical consultant during site plan approval process, and as part of the final building design.

Regards,

SLR Consulting (Canada) Ltd.



R. L. Scott Penton, P.Eng.
Principal, Acoustics Engineer
spenton@slrconsulting.com

A handwritten signature in black ink, appearing to read "Jason Dorssers".

Jason Dorssers, P.Eng.
Acoustics Engineer
jdorssers@slrconsulting.com

Distribution: 1 electronic copy – Colonnade BridgePort.
 1 electronic copy – SLR Consulting (Canada) Ltd.



9.0 References

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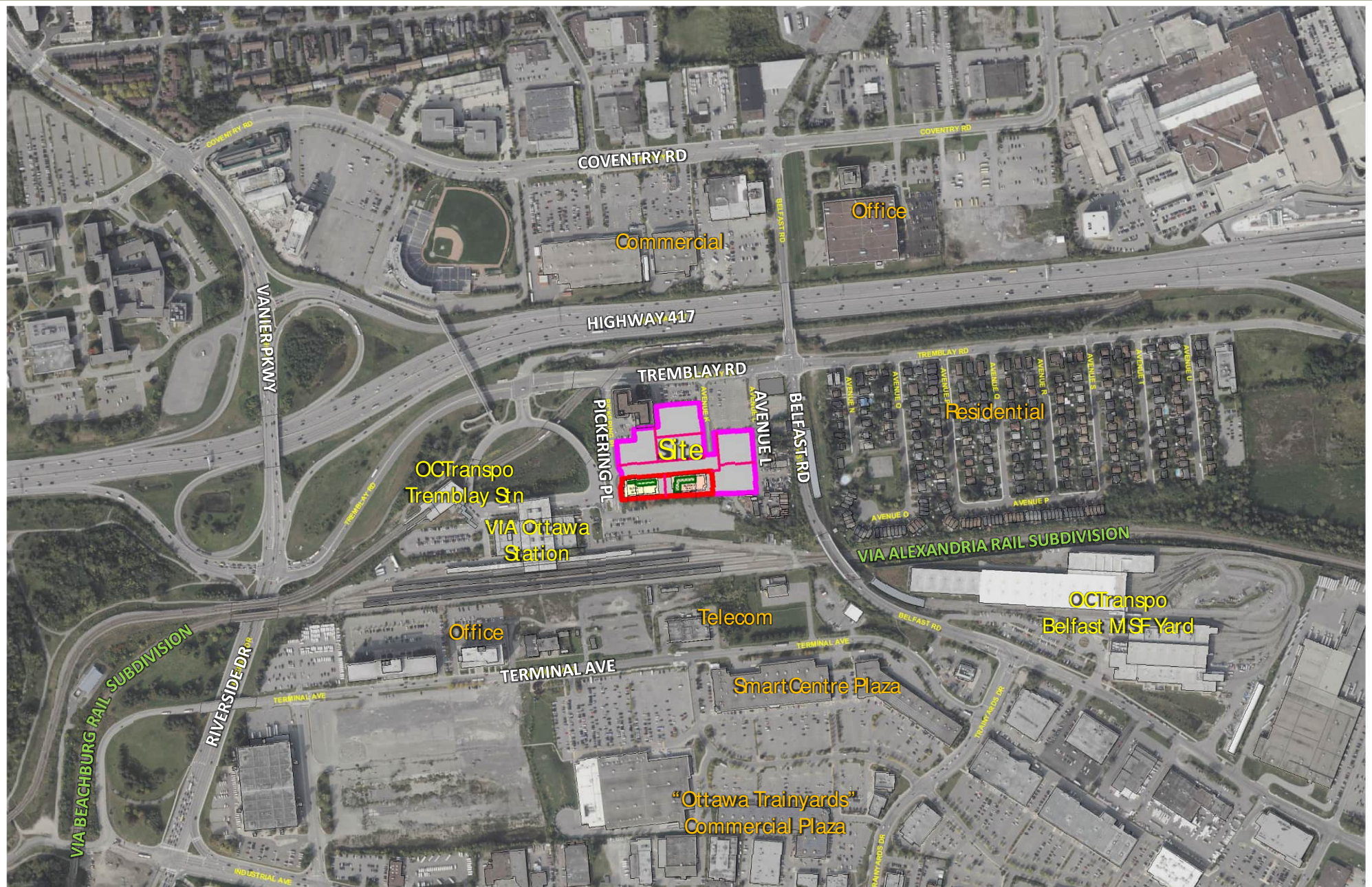
Figures

Environmental Noise and Vibration Assessment, Blocks 1 and 2 – Site Plan Approval Application

25 Pickering Place Development, Ottawa, ON

Colonnade BridgePort

SLR Project No.: 241.03870.00001

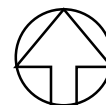


COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA – BLOCKS 1 AND 2 SITE PLAN APPROVAL

SITE AND SURROUNDING AREA

True North



Scale: 1:7,500

METRES

Date: July 2025 Rev 0.0

Figure No.

Project: 241.03970.00001

1a





COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA – BLOCKS 1 AND 2 SITE PLAN APPROVAL

SITE AND SURROUNDING AREA (ZOOM)

True North



Scale:

1:4,000

METRES

Date:

July 2025

Rev 0.0

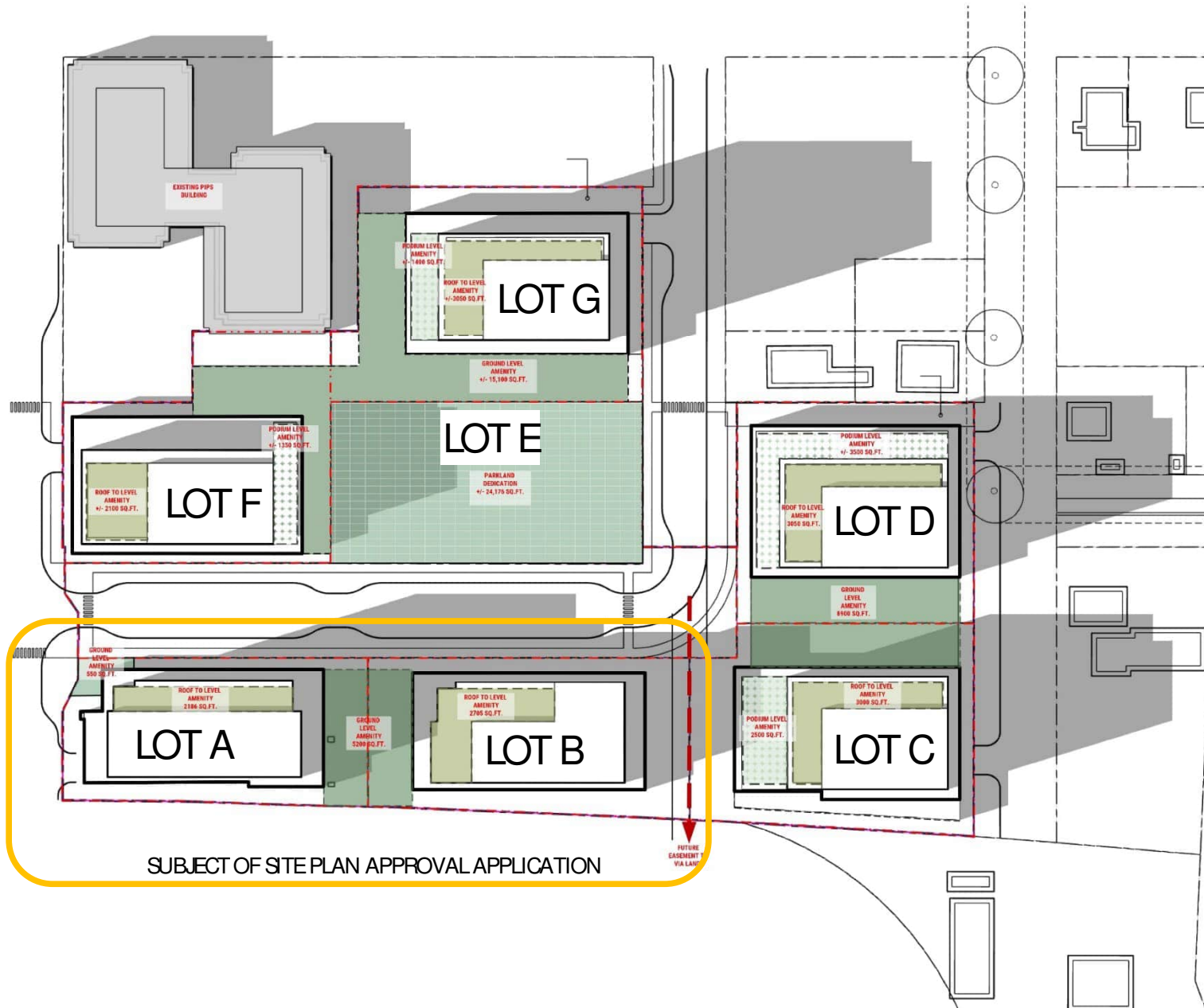
Figure No.

1b

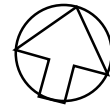
Project:

241.03970.00001





True North



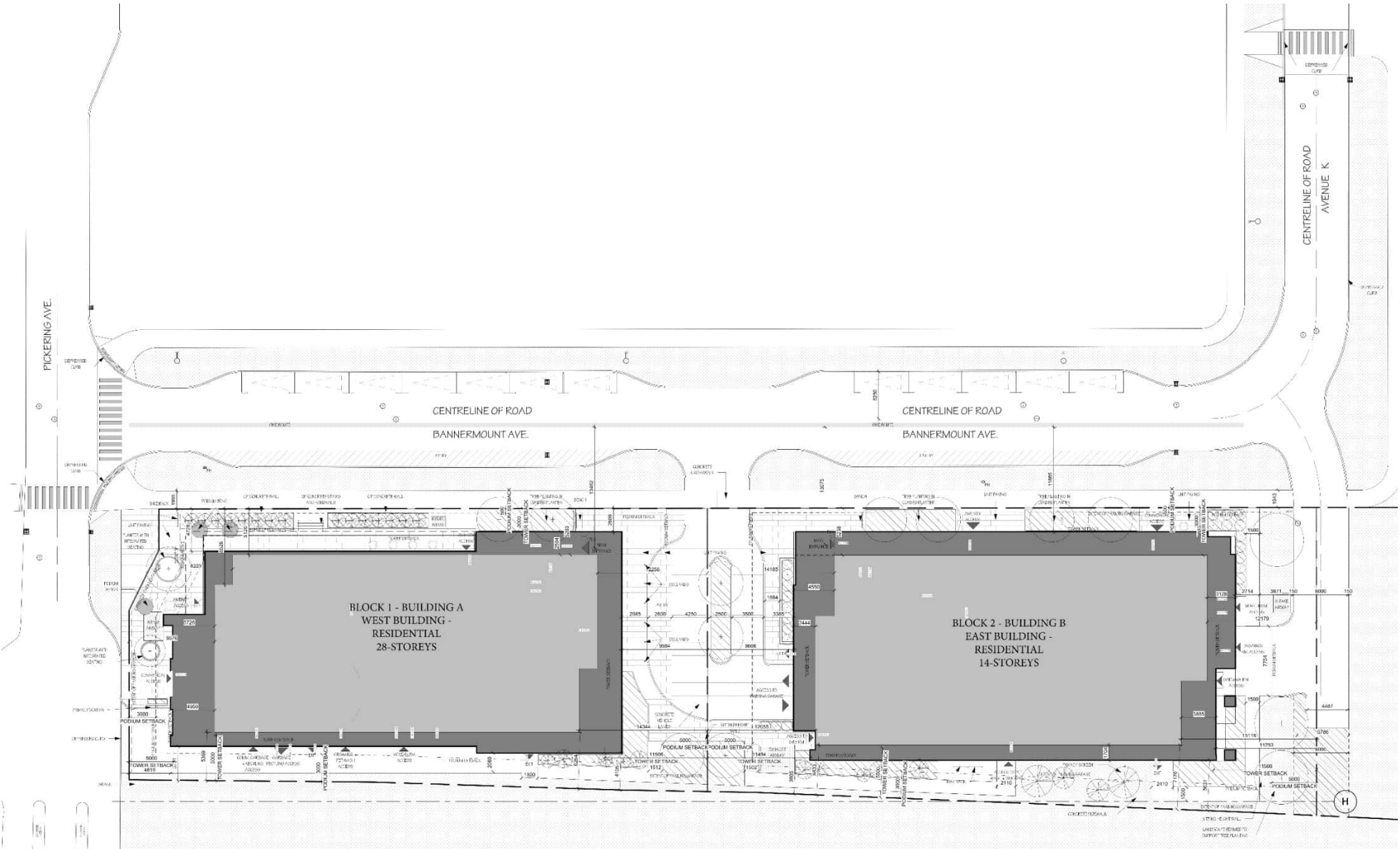
COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA –
BLOCKS 1 AND 2 SITE PLAN
APPROVAL

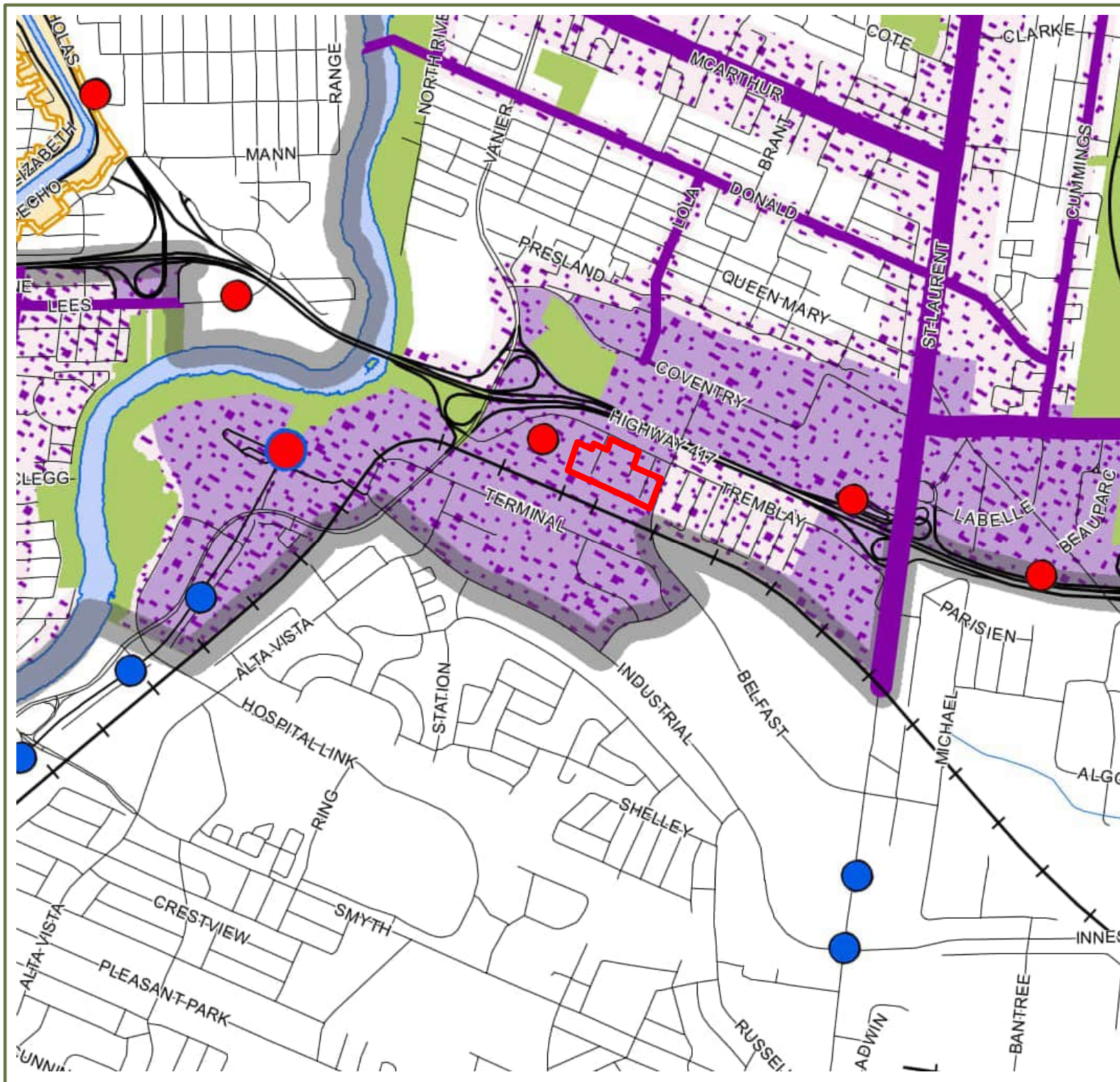
EXCERPTS FROM
DEVELOPMENT MASTER PLAN

| | | |
|----------|-----------------|--------------|
| Scale: | N.T.S. | METRES |
| Date: | July 2025 | Rev 0 |
| Project: | 241.03970.00001 | Figure No. 2 |





| | | | | | | |
|--|--|-----------------------------------|--------------------------|---------|------------------------|-------------|
| COLONNADE BRIDGEPORT | | <div>True North</div> <div></div> | Scale: N.T.S. | | METRES | <div></div> |
| 25 PICKERING PLACE, OTTAWA – BLOCKS 1 AND 2 SITE PLAN APPROVAL | | | Date: July 2025 | Rev 0.0 | Figure No. 3 | |
| EXCERPTS FROM SITE PLAN FOR LOTS A AND B | | | Project: 241.03970.00001 | | | |



From:
https://documents.ottawa.ca/sites/default/files/schedule_b2_op_bil.pdf/

DESIGNATIONS / DESIGNATIONS

- Hub / Carrefour
- Corridor - Mainstreet / Couloir - Rue principale
- Corridor - Minor / Couloir - Rue principale mineure
- Mixed Industrial / Industrie Mixte
- Greenspace / Espace vert

OVERLAYS / AFFECTATION SUPPLÉMENTAIRE

- Evolving Neighbourhood / Quartier en évolution

TRANSIT

- O-Train Station / Station de l'O-Train
- Transfer Station / Station de correspondance
- Transitway Station / Station du Transitway

True North



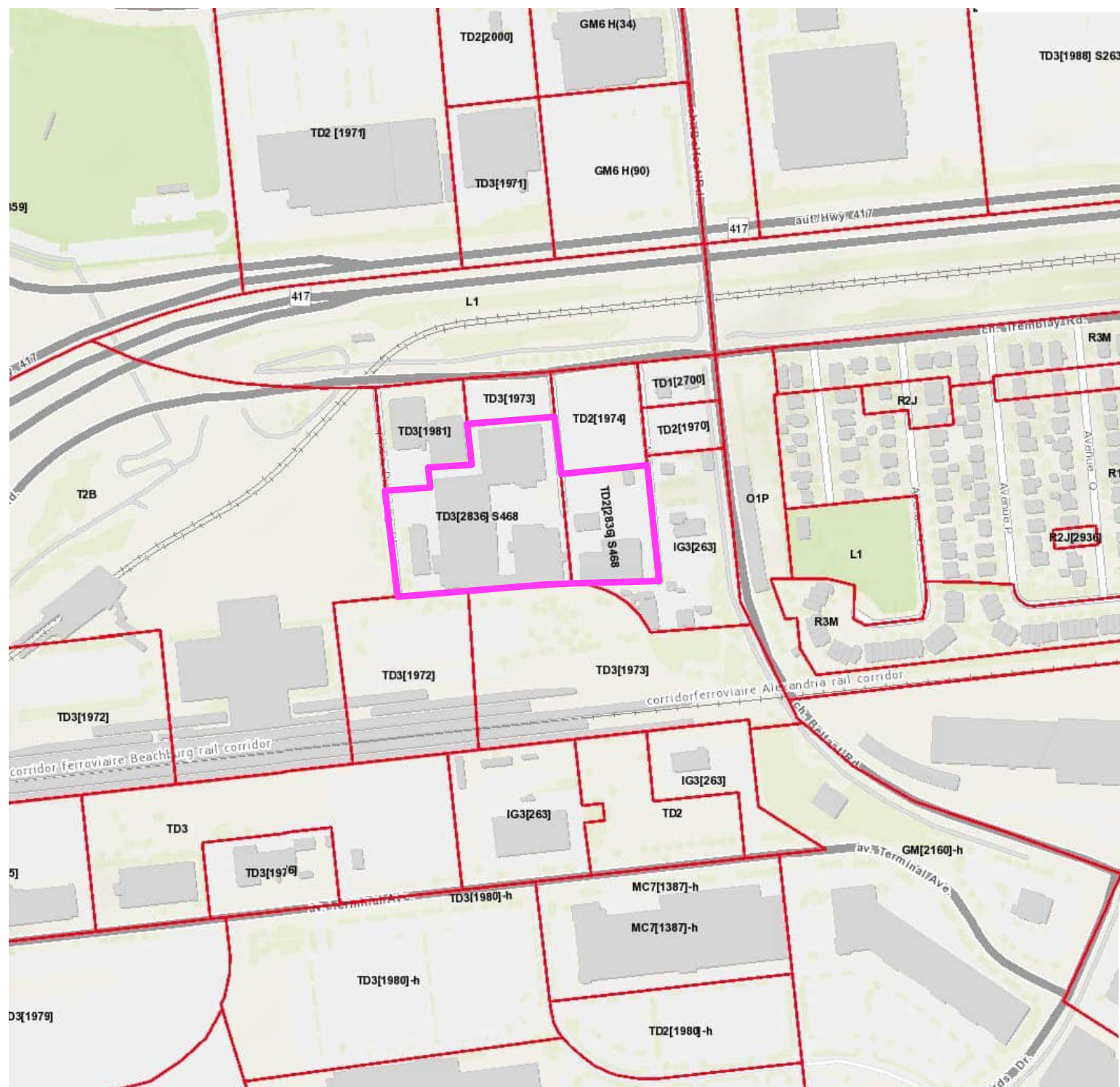
COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA –
BLOCKS 1 AND 2 SITE PLAN
APPROVAL

EXCERPTS FROM OFFICIAL PLAN
MAP SCHEDULE B2 – INNER
URBAN TRANSECT

| | | |
|----------|-----------------|----------------------|
| Scale: | N.T.S. | METRES |
| Date: | July 2025 | Rev 0 |
| Project: | 241.03970.00001 | Figure No. 4a |





From <https://maps.ottawa.ca/geoottawa/>



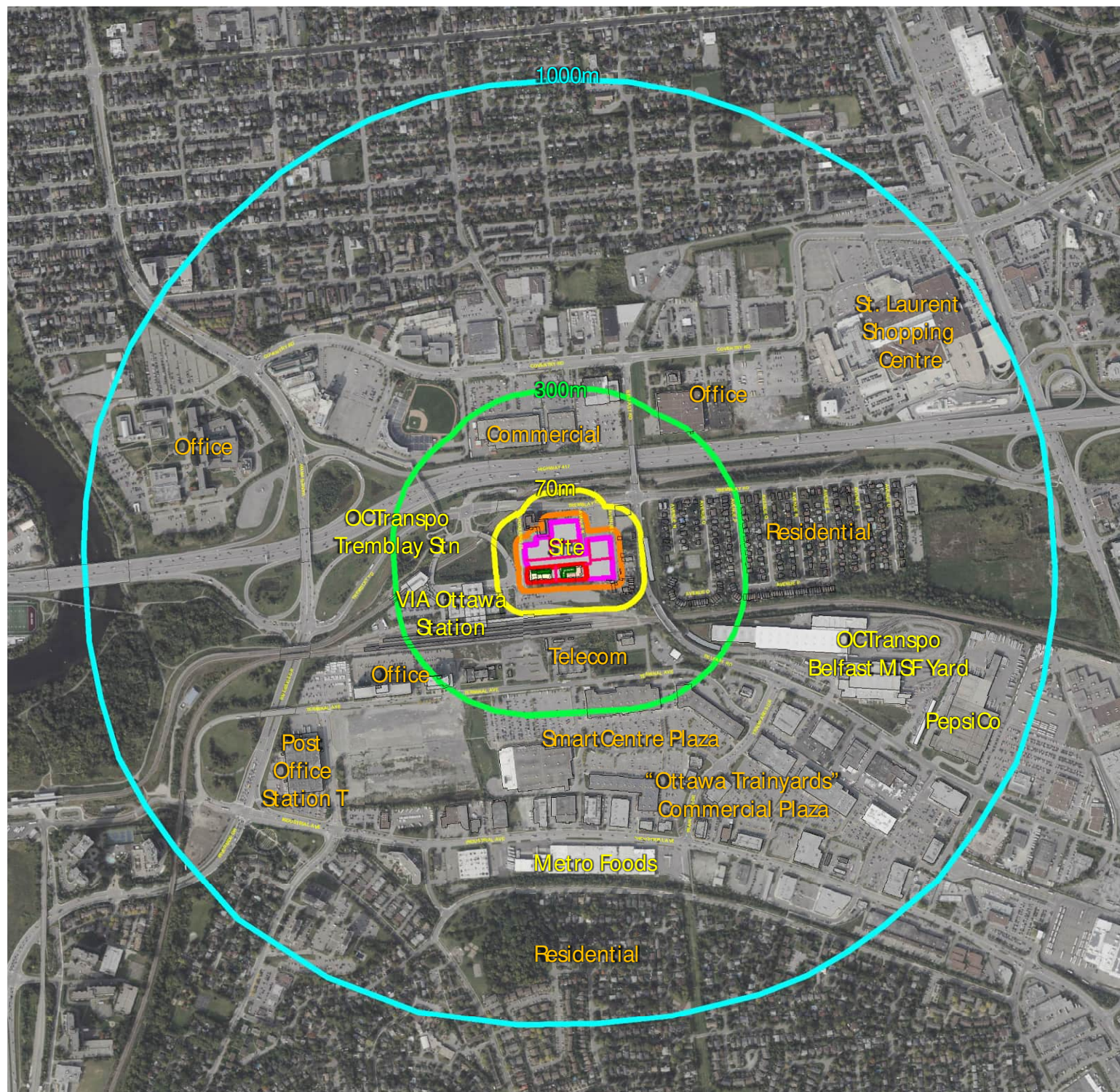
COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA –
BLOCKS 1 AND 2 SITE PLAN
APPROVAL

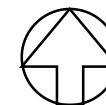
ZONING MAP

| | | | |
|----------|-----------------|-------|-------------------------|
| Scale: | N.T.S. | | METRES |
| Date: | July 2025 | Rev 0 | Figure No. 4b |
| Project: | 241.03970.00001 | | |





True North



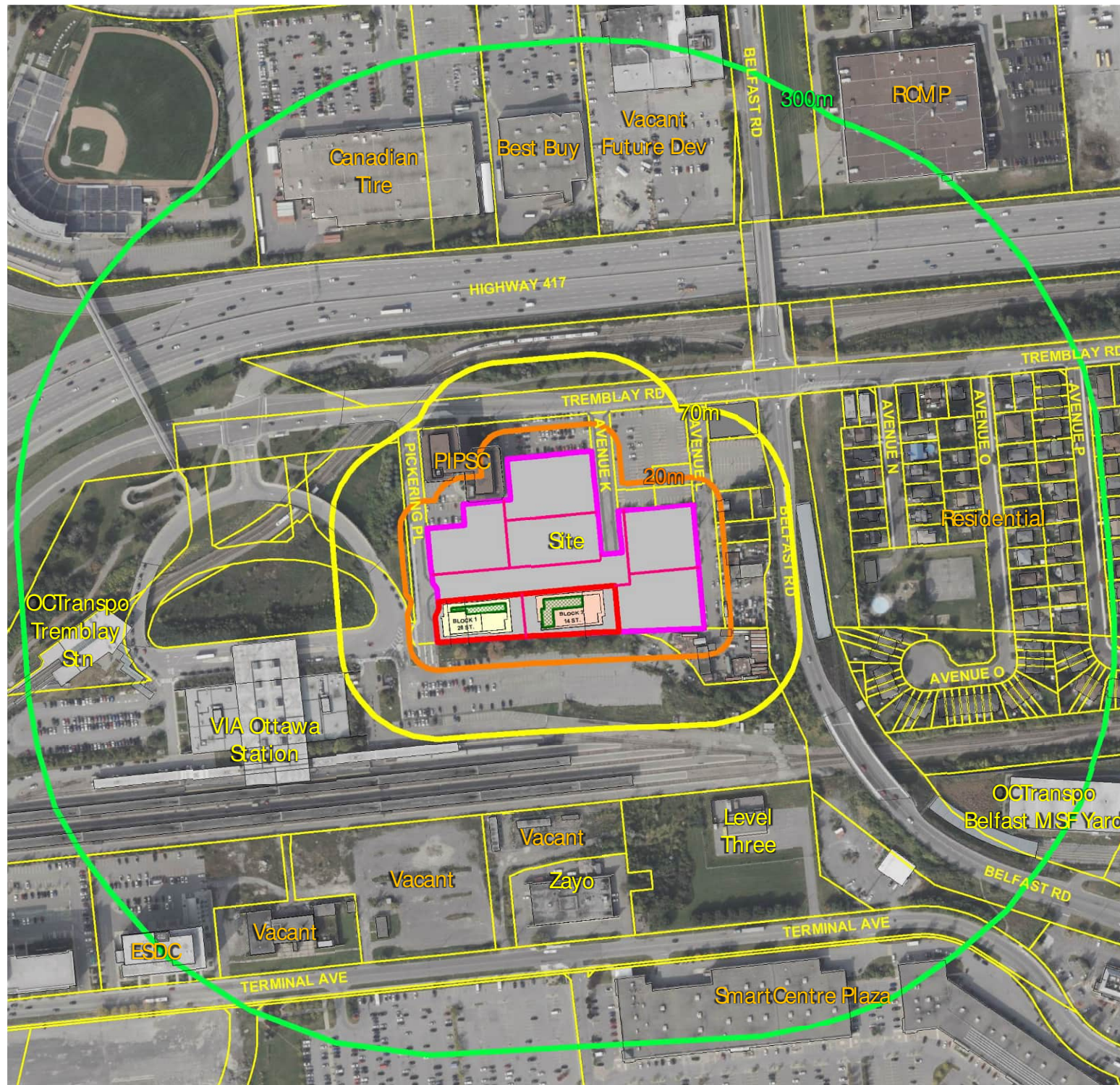
COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA –
BLOCKS 1 AND 2 SITE PLAN
APPROVAL

MECP GUIDELINE D-6
SEPARATION DISTANCES TO
1000 M

| | | |
|----------|-----------------|-------------------------|
| Scale: | 1: 12,500 | METRES |
| Date: | July 2025 | Rev 0.0 |
| Project: | 241.03970.00001 | Figure No. 5a |





True North



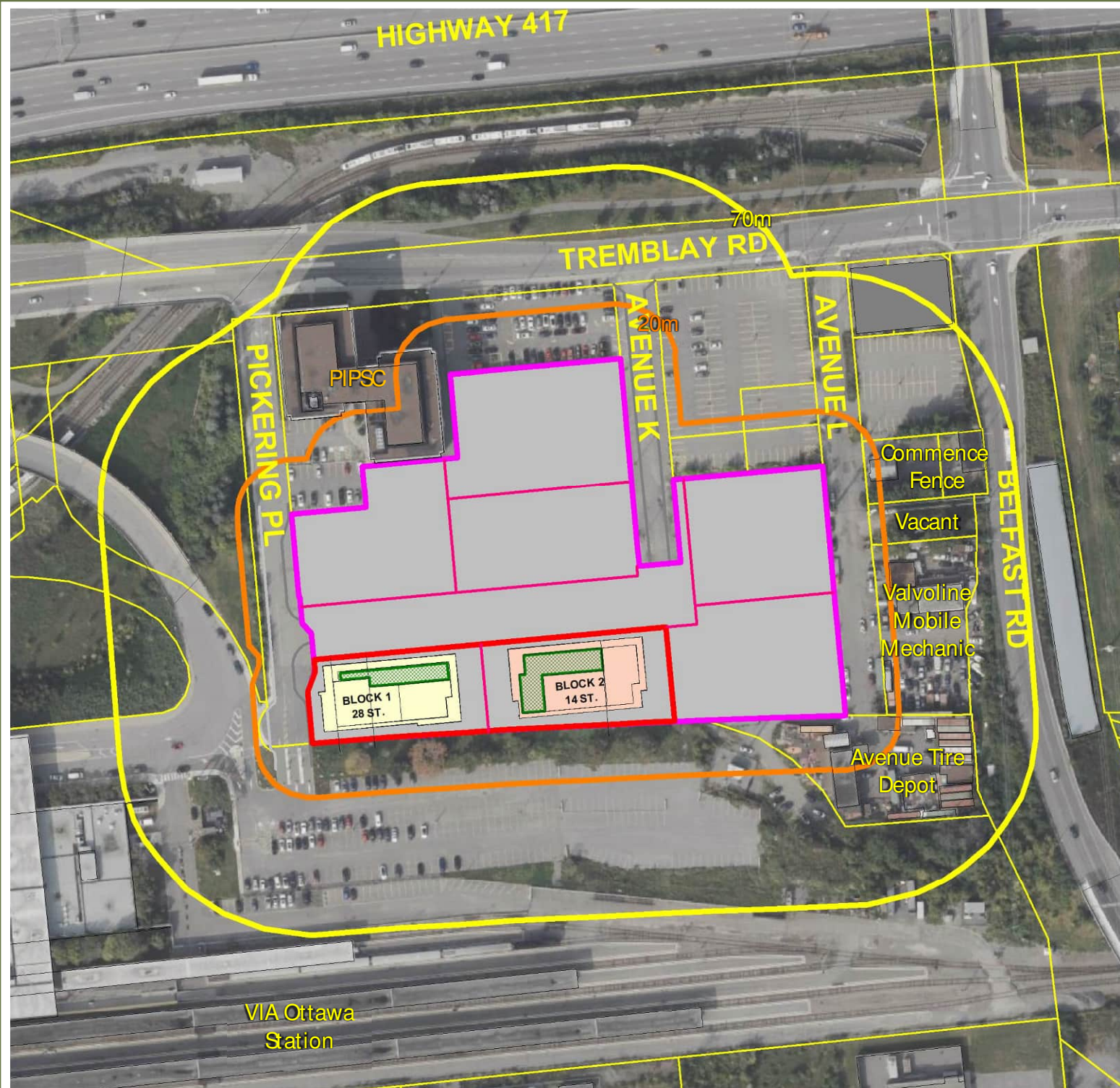
COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA –
BLOCKS 1 AND 2 SITE PLAN
APPROVAL

MECP GUIDELINE D-6
SEPARATION DISTANCES TO
300 M

| | | |
|----------|-----------------|-------------------------|
| Scale: | 1: 4,000 | METRES |
| Date: | July 2025 | Rev 0.0 |
| Project: | 241.03970.00001 | Figure No. 5b |





True North



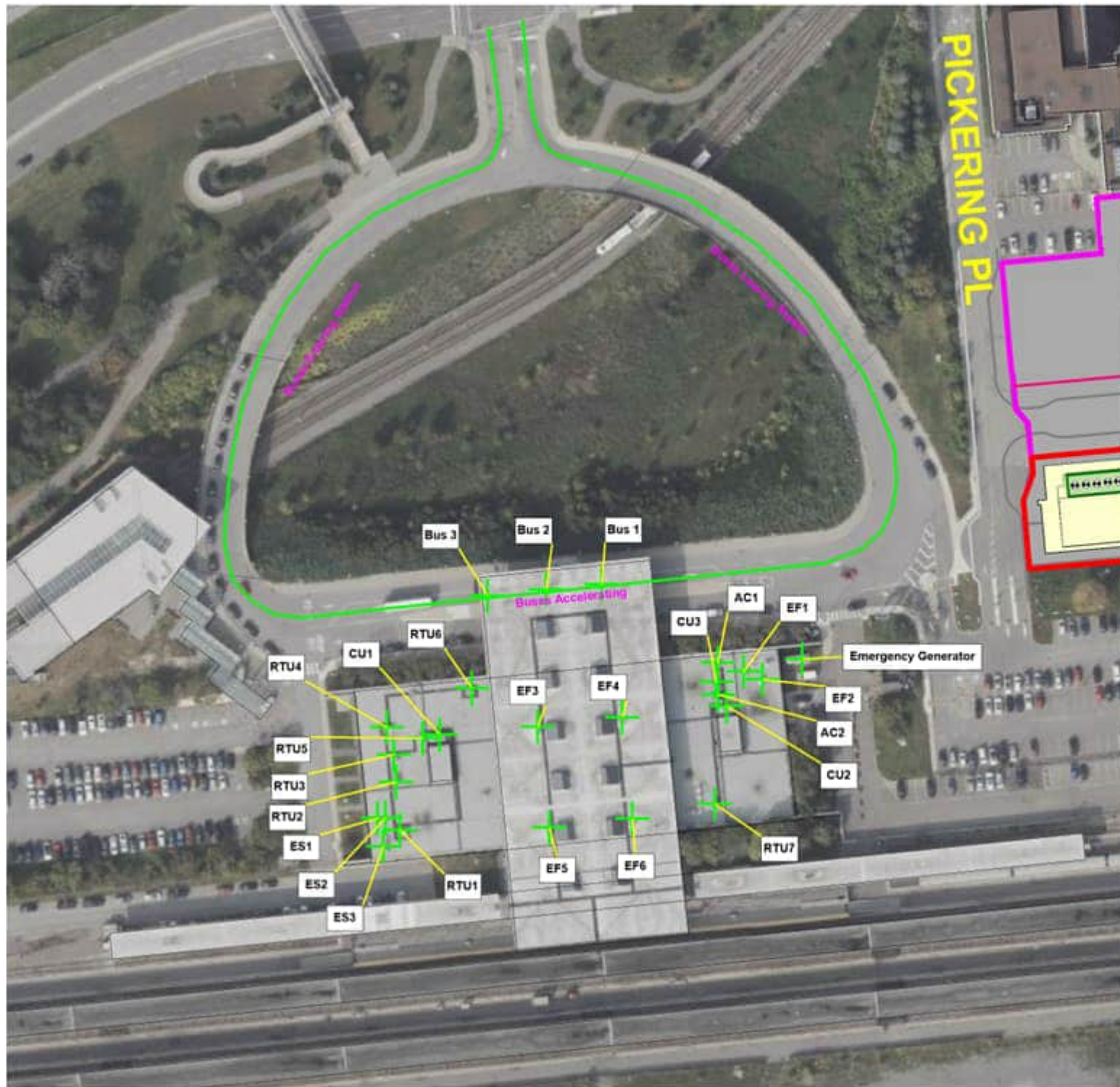
COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA –
BLOCKS 1 AND 2 SITE PLAN
APPROVAL

MECP GUIDELINE D-6
SEPARATION DISTANCES TO
70 M

| | | |
|----------|-----------------|-------------------------|
| Scale: | 1: 2,000 | METRES |
| Date: | July 2025 | Rev 0.0 |
| Project: | 241.03970.00001 | Figure No. 5c |





True North



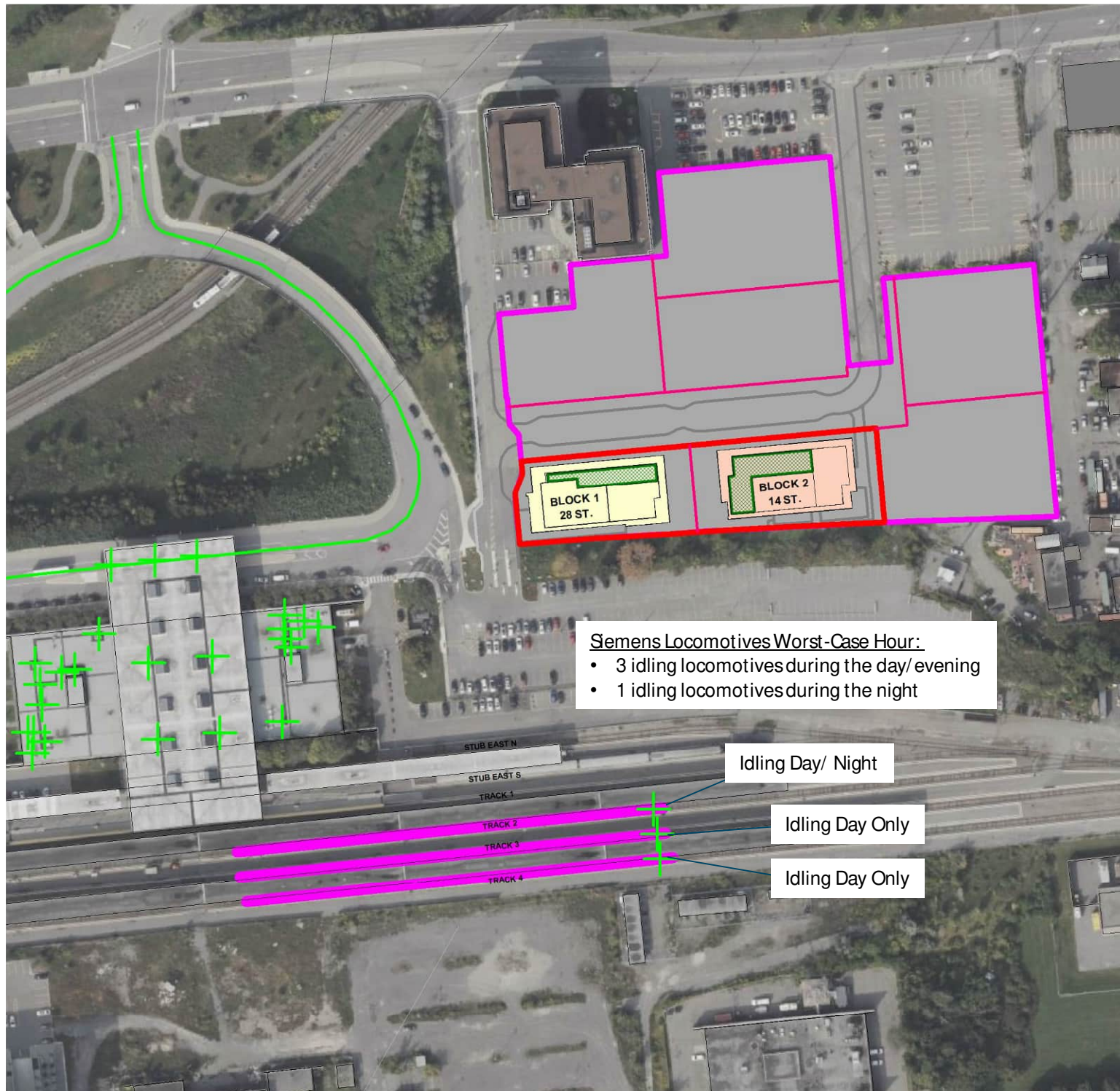
COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA –
BLOCKS 1 AND 2 SITE PLAN
APPROVAL

VIA OTTAWA STATION
STATIONARY NOISE SOURCE
LOCATIONS –
NON-LOCOMOTIVE SOURCES

| | | |
|----------|-----------------|-------------------------|
| Scale: | 1: 1,500 | METRES |
| Date: | July 2025 | Rev 0.0 |
| Project: | 241.03970.00001 | Figure No. 6a |





True North



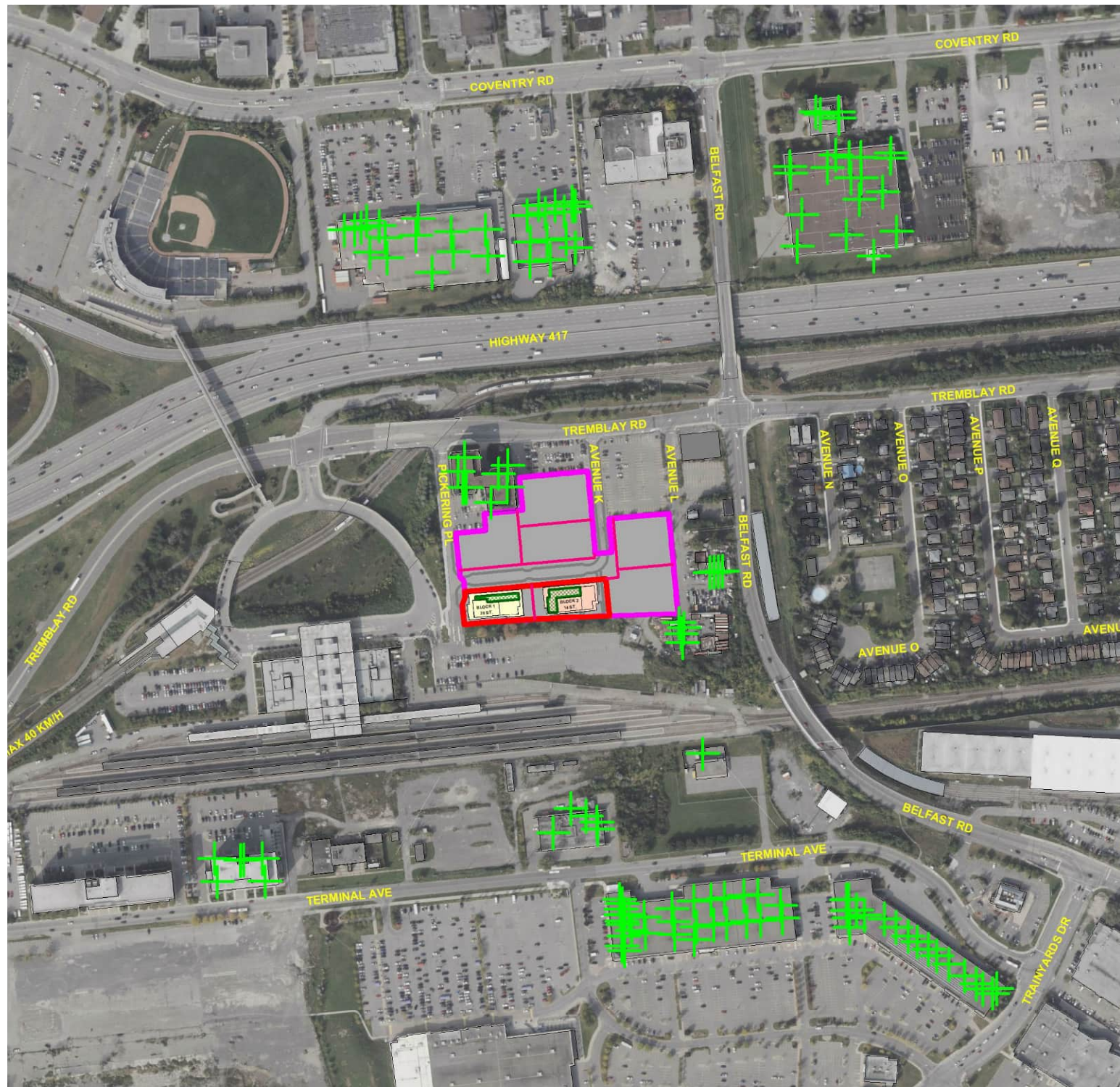
COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA –
BLOCKS 1 AND 2 SITE PLAN
APPROVAL

VIA OTTAWA STATION
STATIONARY NOISE SOURCE
LOCATIONS –
LOCOMOTIVE SOURCES

| | | |
|----------|-----------------|-------------------------|
| Scale: | 1: 2,000 | METRES |
| Date: | July 2025 | Rev 0.0 |
| Project: | 241.03970.00001 | Figure No. 6b |





True North



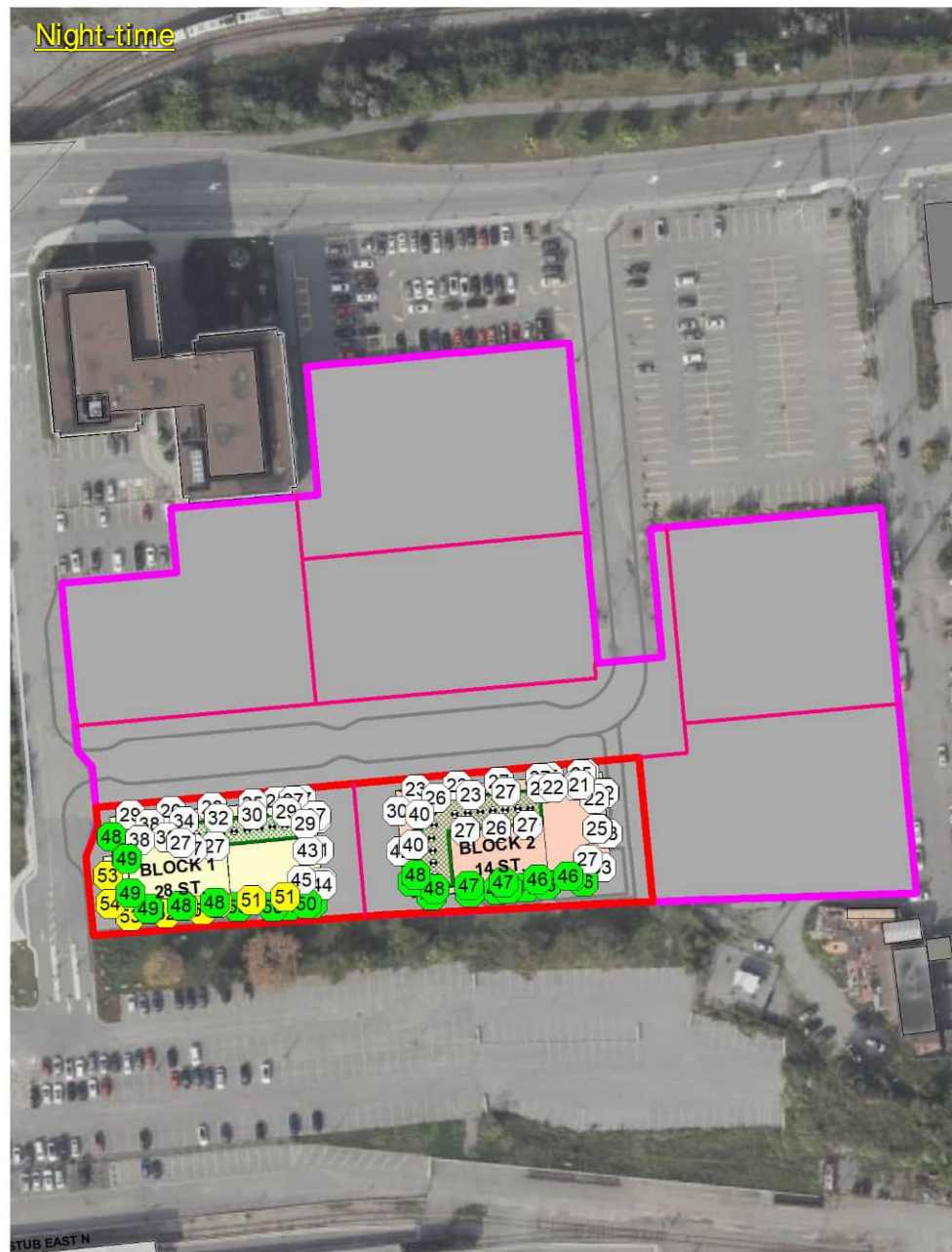
COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA –
BLOCKS 1 AND 2 SITE PLAN
APPROVAL

OTHER COMMERCIAL/
INDUSTRIAL STATIONARY
NOISE SOURCE LOCATIONS

| | | |
|----------|-----------------|-------------------------|
| Scale: | 1: 5000 | METRES |
| Date: | July 2025 | Rev 0.0 |
| Project: | 241.03970.00001 | Figure No. 6c |





COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA – BLOCKS 1 AND 2 SITE PLAN APPROVAL

VIA OTTAWA STATION STATIONARY NOISE SOURCE SOUND LEVELS –
GENERATOR SET TESTING

True North



Scale:

1: 1,750

METRES

Date:

July 2025

Rev 0.0

Figure No.

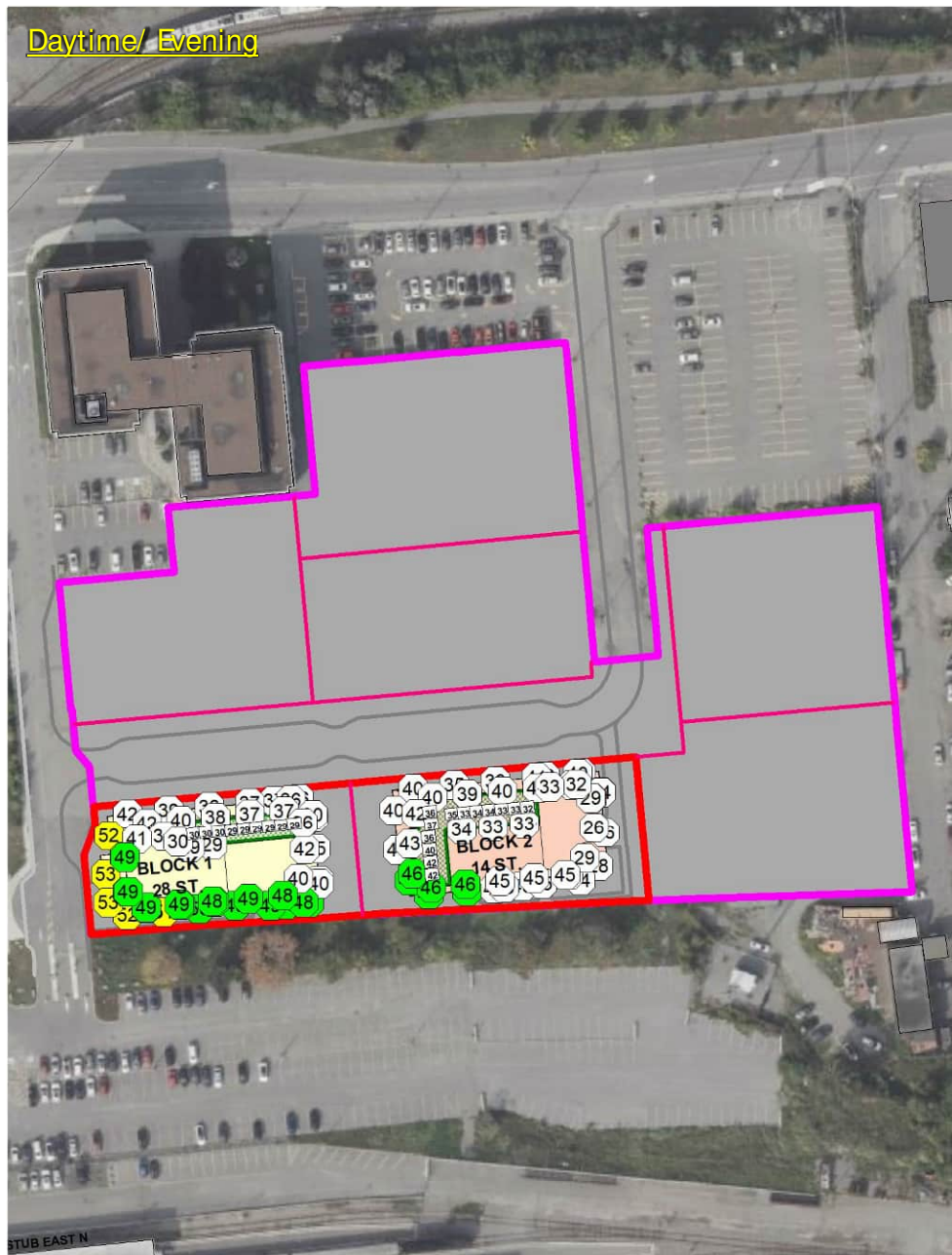
7a

Project:

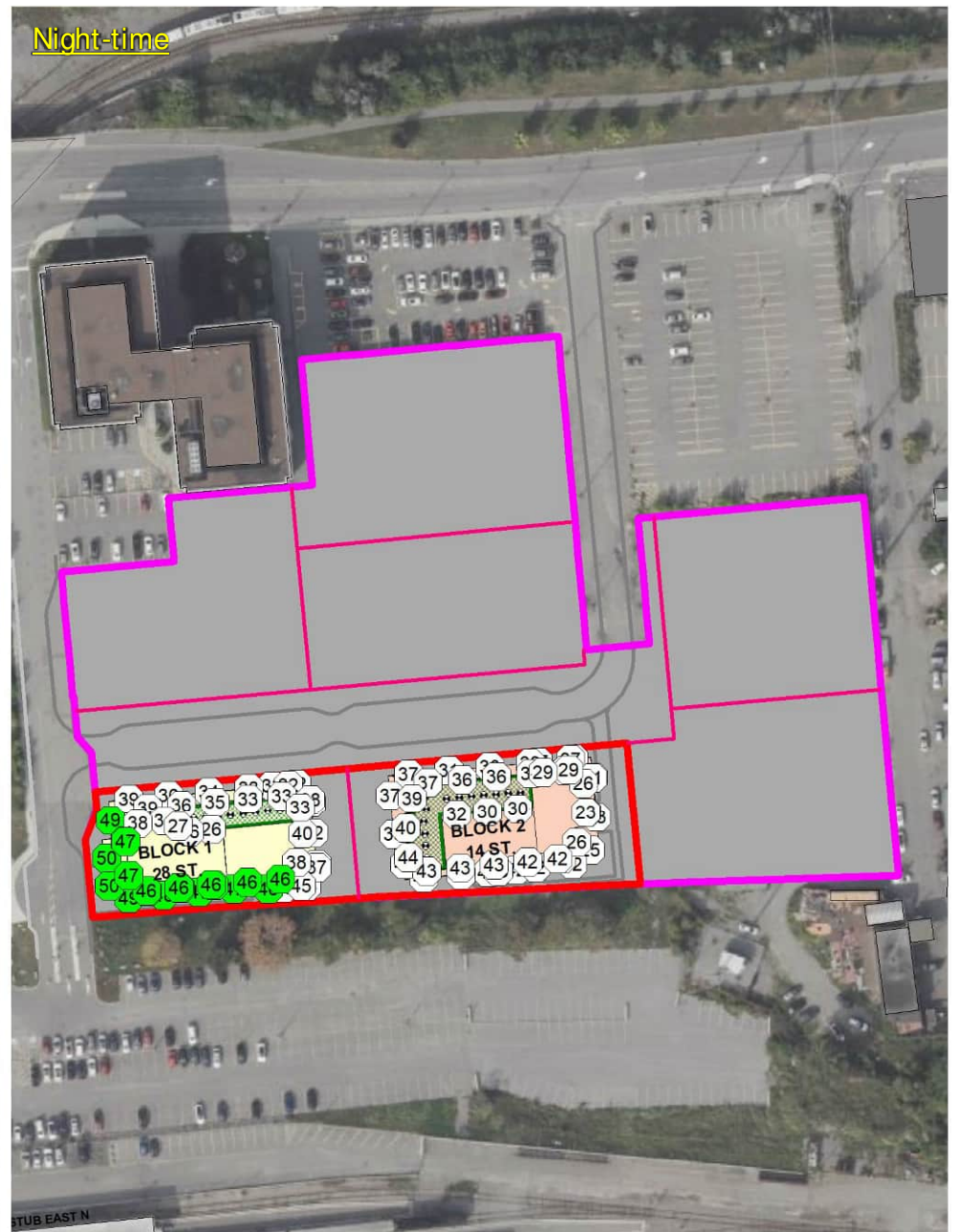
241.03970.00001



Daytime/ Evening



Night-time

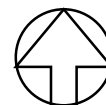


COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA – BLOCKS 1 AND 2 SITE PLAN APPROVAL

VIA OTTAWA STATION STATIONARY NOISE SOURCE SOUND LEVELS –
NORMAL OPERATIONS, NO LOCOMOTIVES IDLING

True North



Scale: 1: 1,750

METRES

Date: July 2025 Rev 0.0

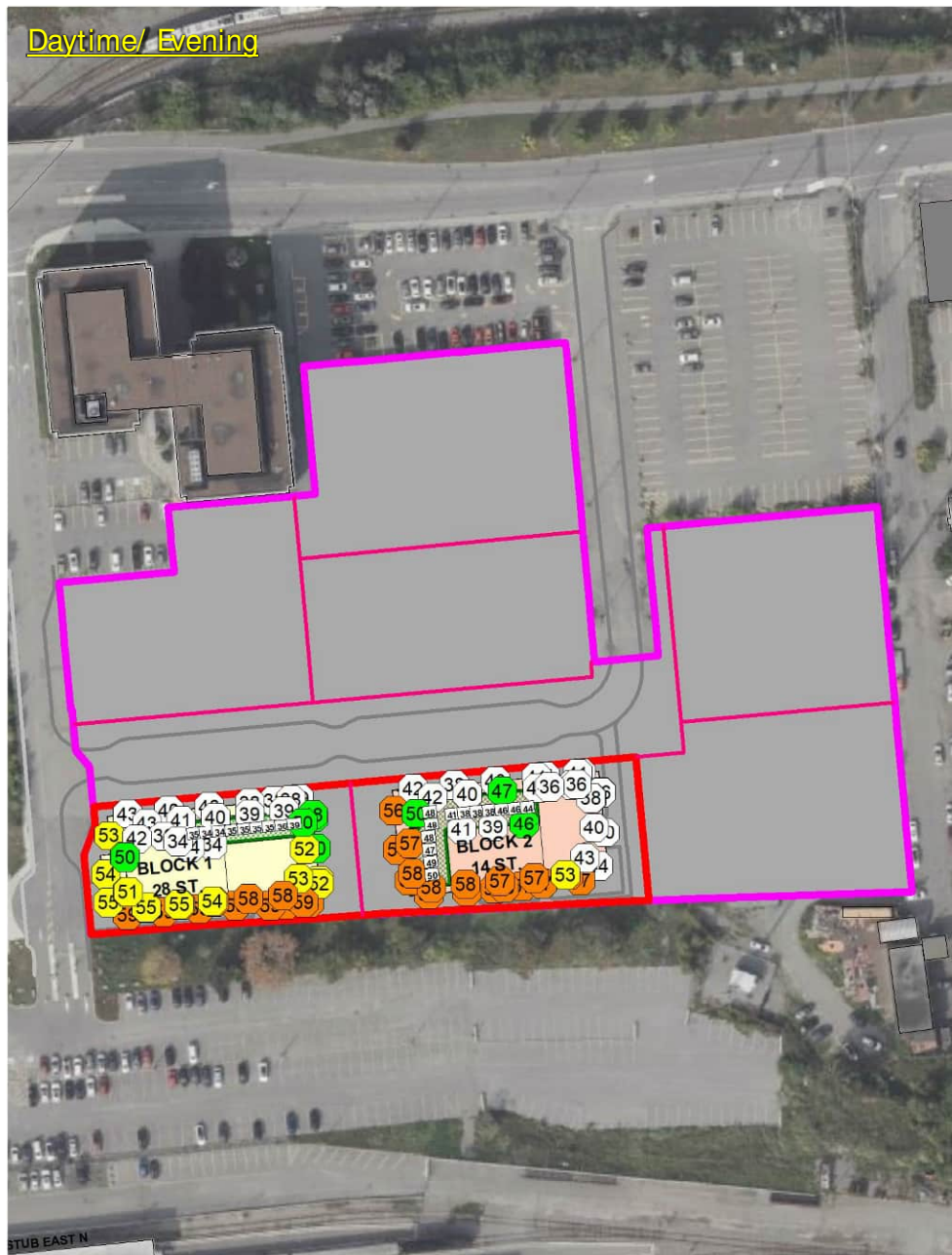
Project: 241.03970.00001

Figure No.

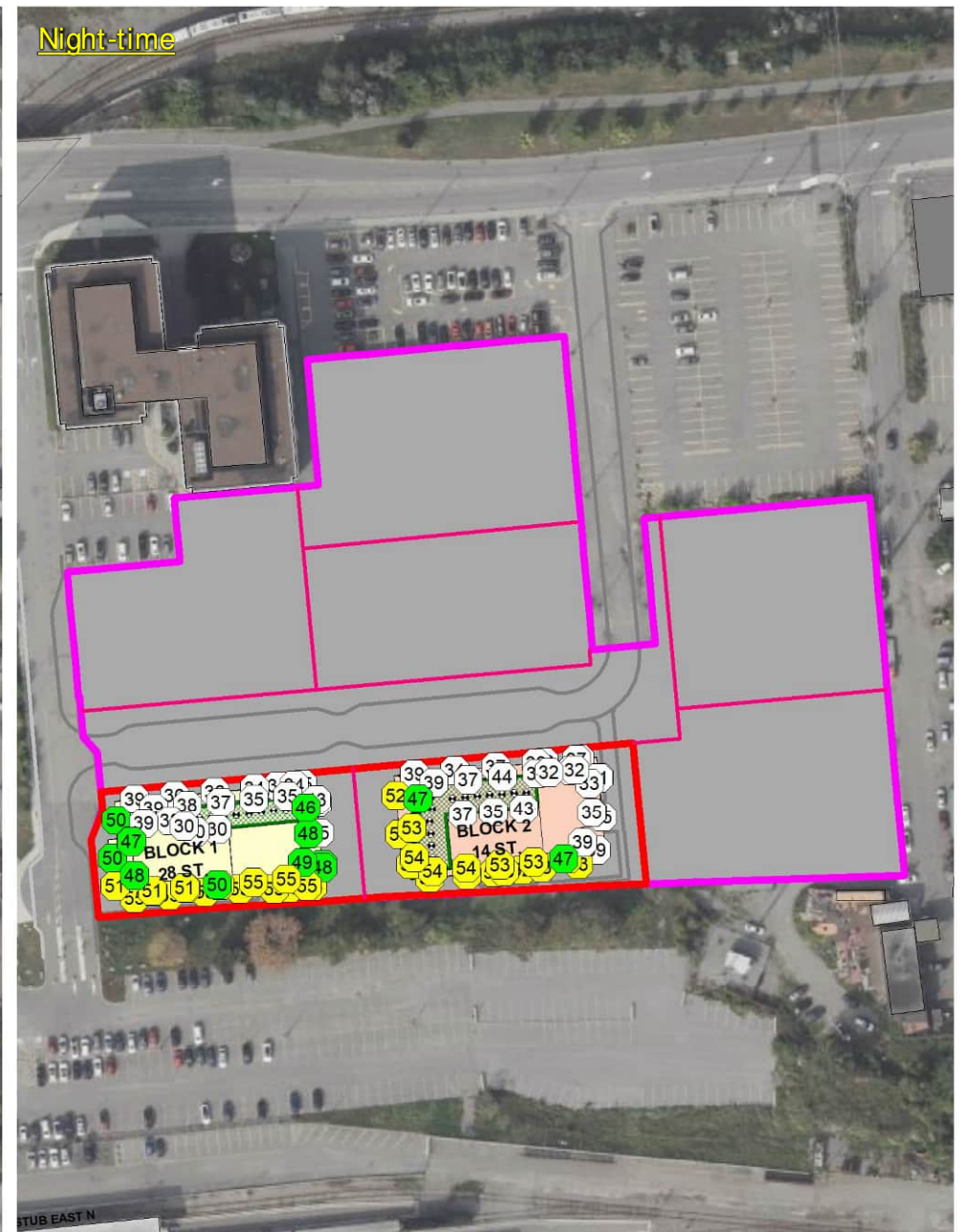
7b



Daytime/ Evening



Night-time



COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA – BLOCKS 1 AND 2 SITE PLAN APPROVAL

VIA OTTAWA STATION STATIONARY NOISE SOURCE SOUND LEVELS –
NORMAL OPERATIONS, WITH IDLING LOCOMOTIVES

True North



Scale:

1: 1,750

METRES

Date:

July 2025

Rev 0.0

Figure No.

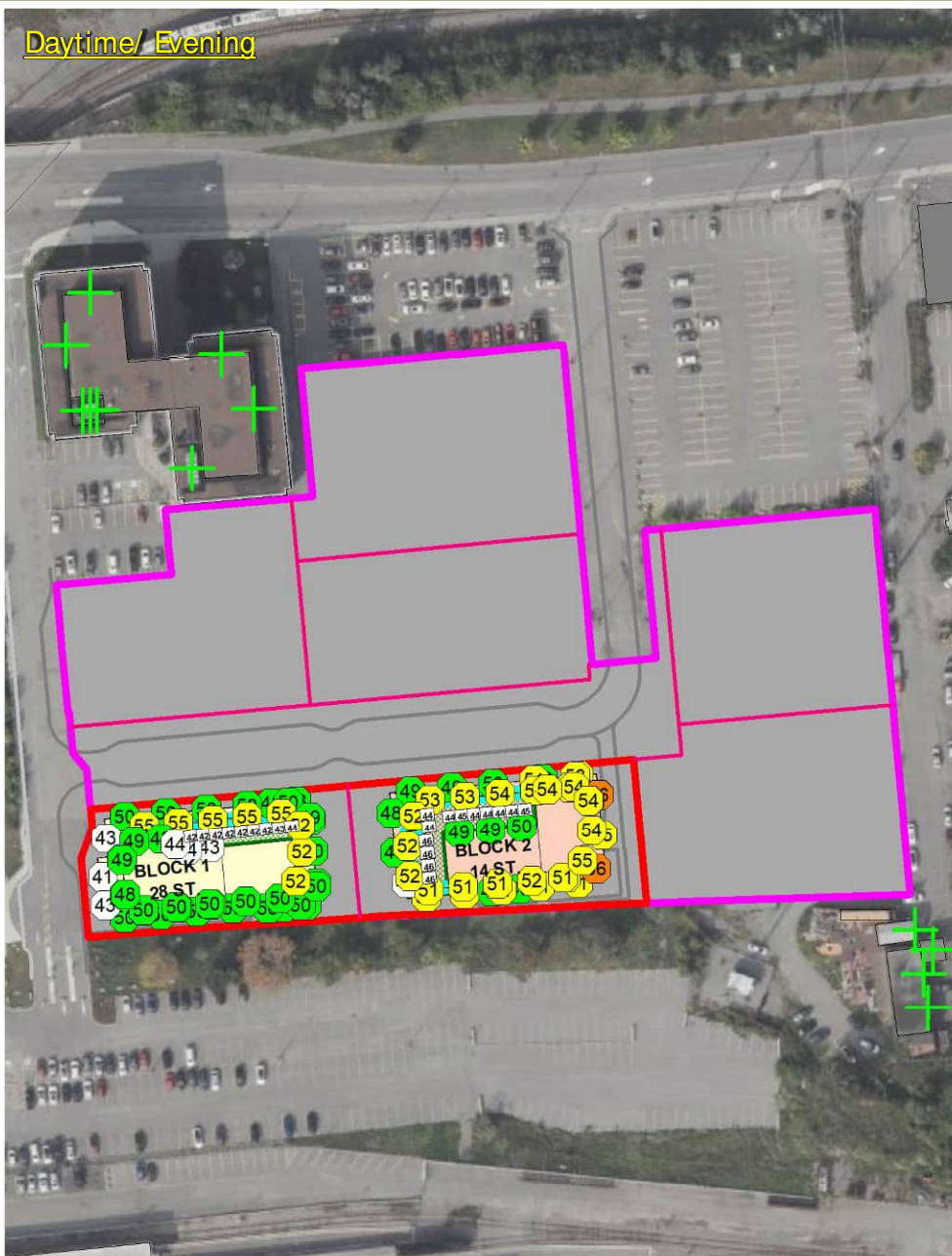
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Project:

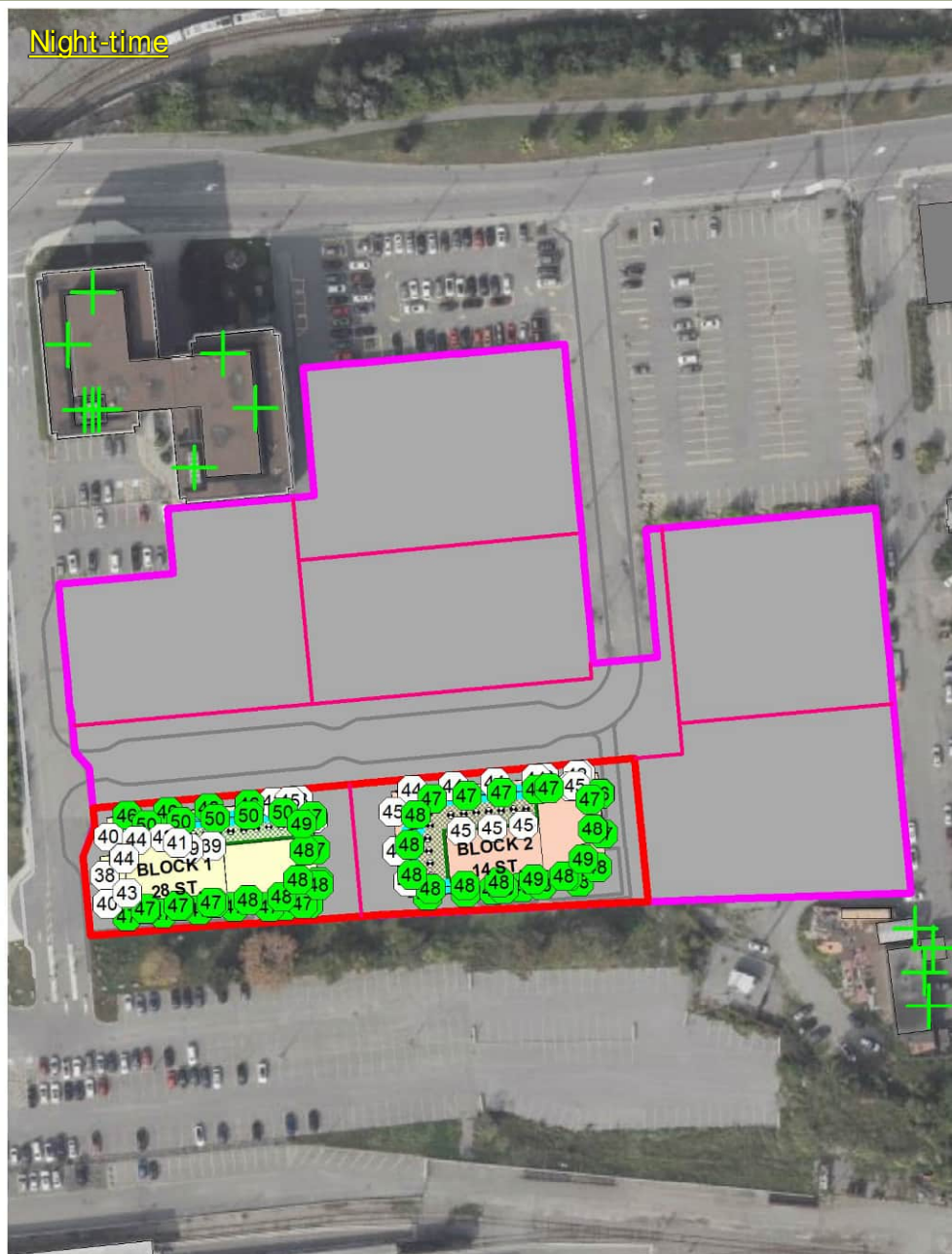
241.03970.00001



Daytime/ Evening



Night-time



COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA – BLOCKS 1 AND 2 SITE PLAN APPROVAL

OTHER STATIONARY NOISE SOURCE SOUND LEVELS – NORMAL OPERATIONS

True North



Scale:

1: 1,750

METRES

Date:

July 2025

Rev 0.0

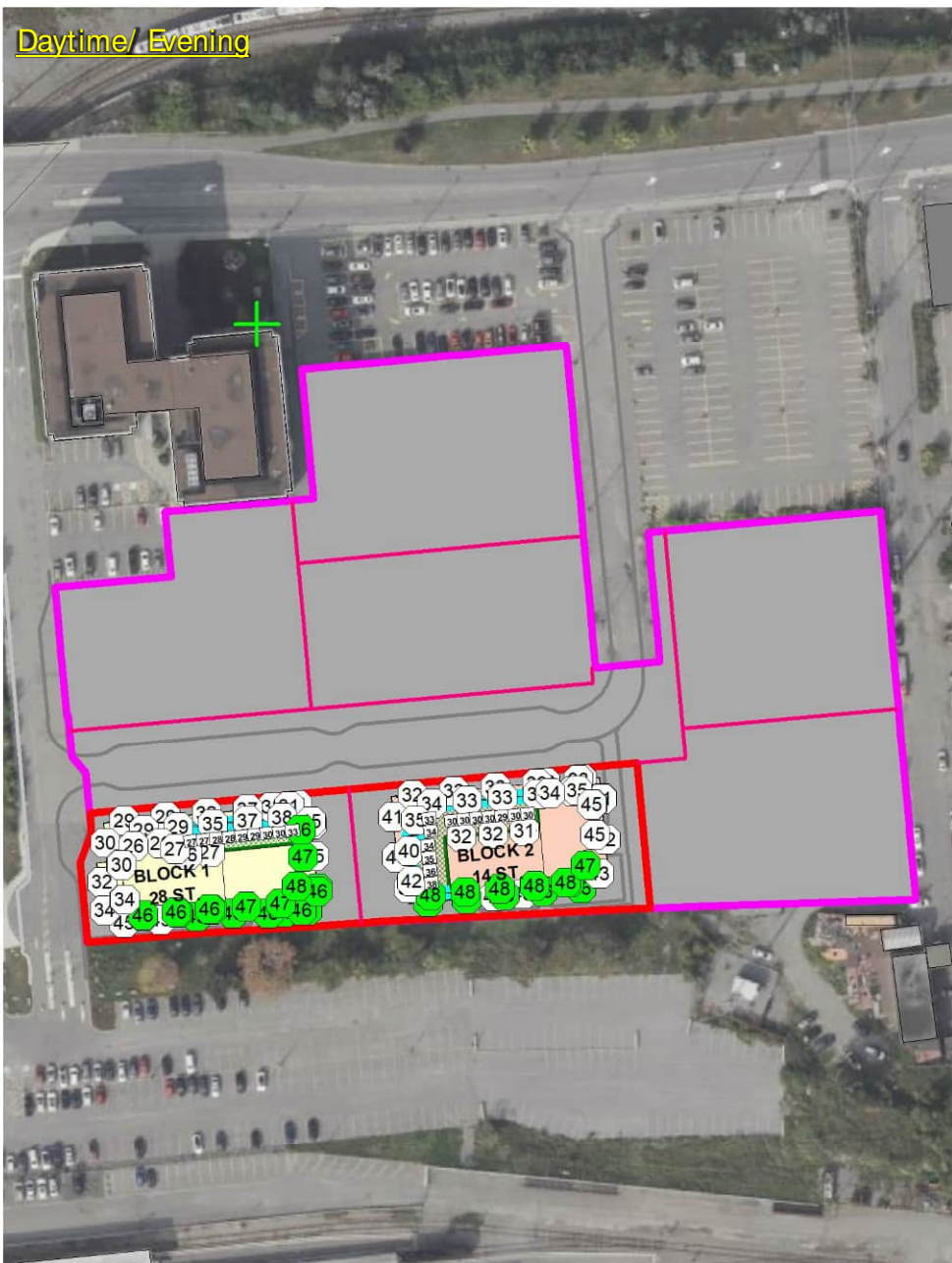
Figure No.

8a

Project:

241.03970.00001





COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA – BLOCKS 1 AND 2 SITE PLAN APPROVAL

OTHER STATIONARY NOISE SOURCE SOUND LEVELS – GENERATOR SET TESTING

True North



Scale: 1:1,750

METRES

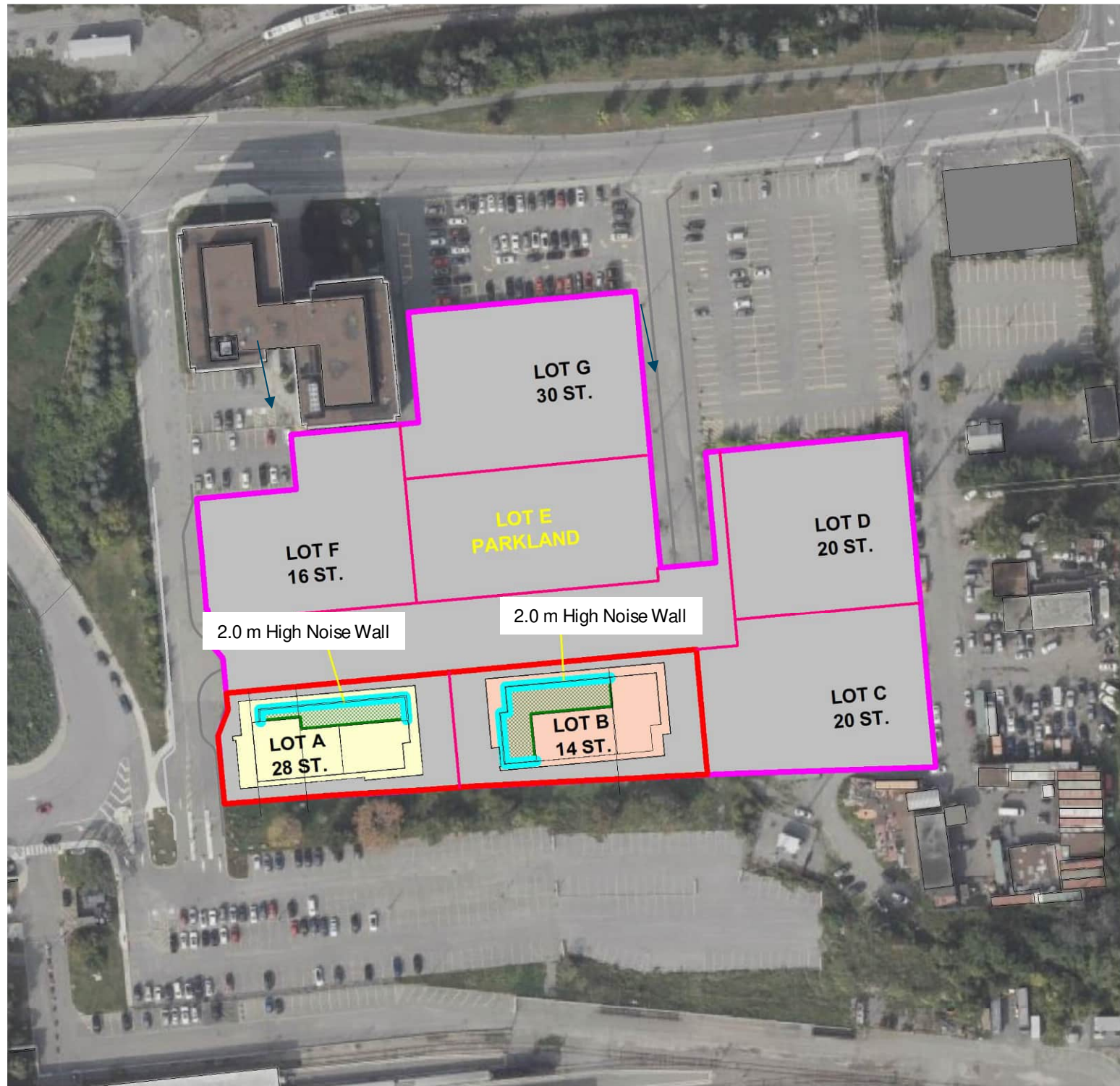
Date: July 2025 Rev 0.0

Project: 241.03970.00001

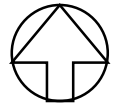
Figure No.

8b





True North



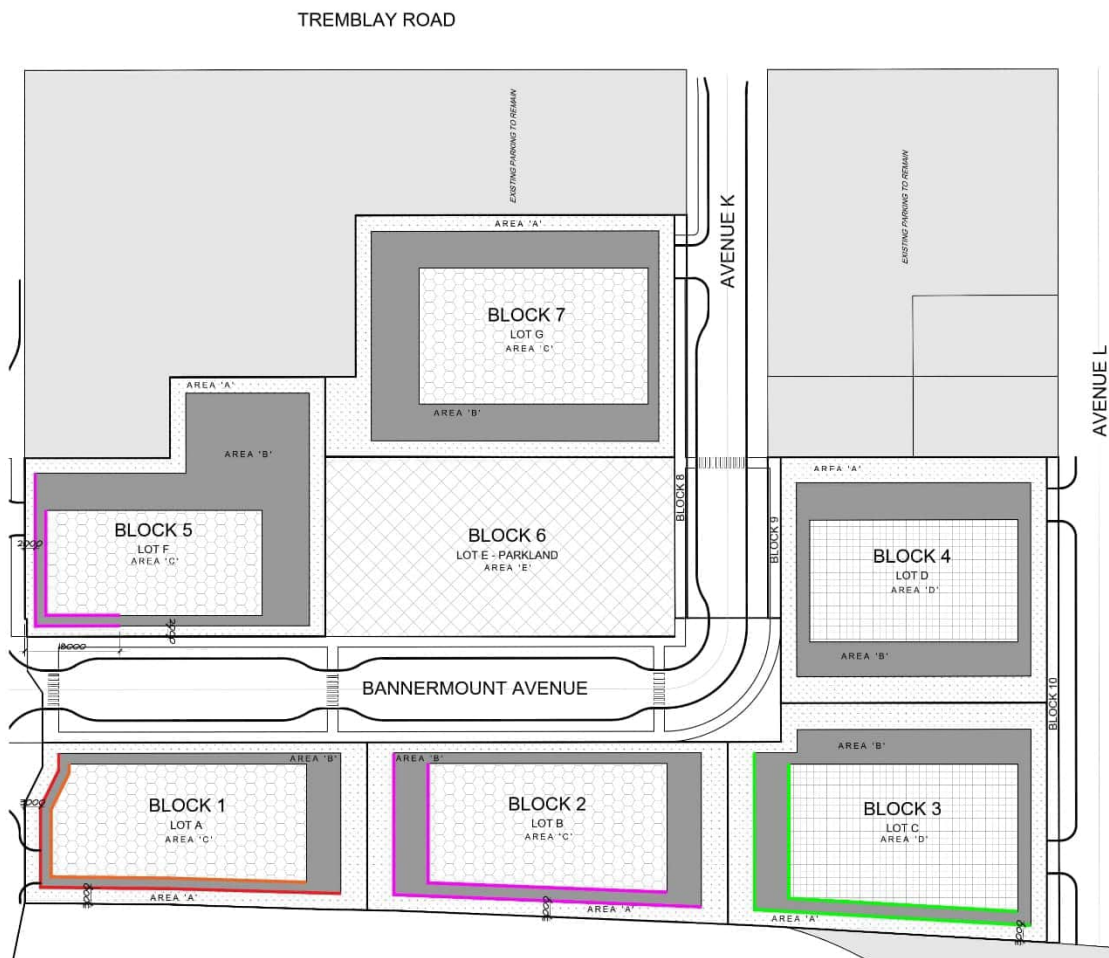
COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA –
BLOCKS 1 AND 2 SITE PLAN
APPROVAL

NOISE MITIGATION MEASURES
– NOISE WALLS

| | | |
|----------|-----------------|-------------------------|
| Scale: | 1: 1,500 | METRES |
| Date: | July 2025 | Rev 0.0 |
| Project: | 241.03970.00001 | Figure No. 9a |





Required Wall and Window Construction Upgrades

| | | |
|----------|--------------|------------------------------|
| Block 1 | Living Room: | Type 2 Wall, STC 37 Windows/ |
| | Podium: | Patio Doors |
| Block 1 | Bedroom: | Type 2 Wall, STC 39 Windows |
| | Tower: | |
| Block 2: | Living Room: | Type 2 Wall, STC 37 Windows/ |
| | Patio Doors: | |
| Block 2: | Bedroom: | Type 2 Wall, STC 37 Windows |
| | | |
| Block 2: | Living Room: | Type 1 Wall, STC 37 Windows/ |
| | Patio Doors: | |
| Block 2: | Bedroom: | Type 1 Wall, STC 37 Windows |
| | | |
| Block 3 | Living Room: | OBC Wall, STC 37 Windows/ |
| | Patio Doors: | |
| Block 3 | Bedroom: | OBC Wall, STC 37 Windows |
| | | |
| Block 5: | Living Room: | Type 1 Wall, STC 37 Windows/ |
| | Patio Doors: | |
| Block 5: | Bedroom: | Type 1 Wall, STC 37 Windows |
| | | |

Notes:

- Where upgrades are required, the exterior window area to bedroom or living room floor area shall not exceed 80%.
- “OBC” indicates wall and window construction meeting Ontario Building Code minimum requirements. In this case, an OBC compliant wall construction has a minimum STC rating of STC 40, and an OBC compliant window/patio door has a minimum rating of STC 28.
- “Type 1 Wall” includes resilient channels and 2 layers of 1/2" gypsum wall board on the inside face of exterior walls (STC 50).
- “Type 2 Wall” includes Genie Clips, resilient channels and 2 layers of 5/8" Type X gypsum wall board on the inside face of exterior walls (STC 60).
- For Block 5, only the indicated portions of the south and west facades require upgrades.

COLONNADE BRIDGEPORT

25 25 PICKERING PLACE, OTTAWA – BLOCKS 1 AND 2 SITE PLAN APPROVAL

NOISE MITIGATION MEASURES – WALL AND WINDOW UPGRADES

True North



Scale:

N.T.S

METRES

Date:

July 2025

Rev 0.0

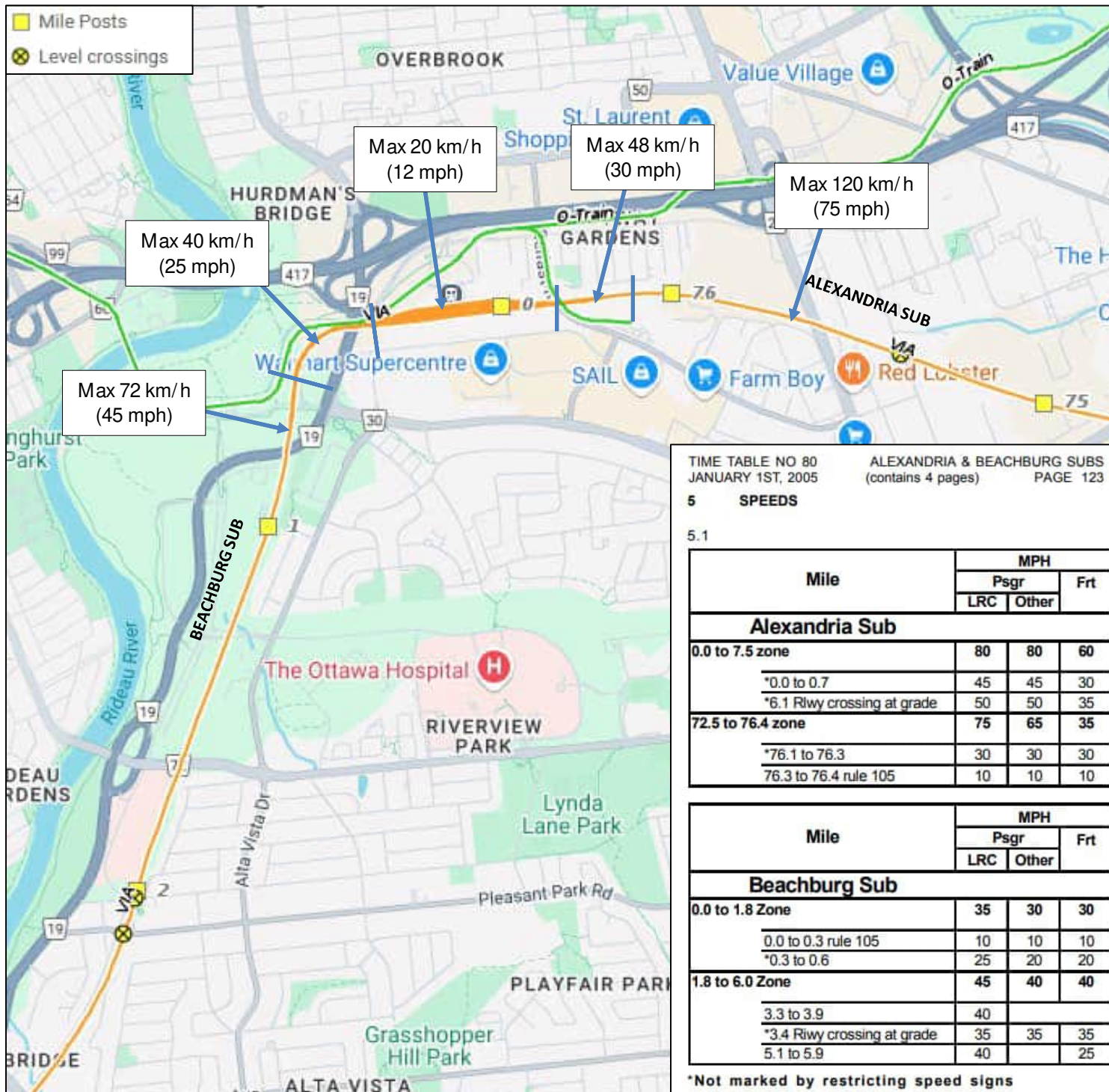
Figure No.

9b

Project:

241.03970.00001





TIME TABLE NO 80
JANUARY 1ST, 2005
ALEXANDRIA & BEACHBURG SUBS
(contains 4 pages) PAGE 123

5 SPEEDS

5.1

| Mile | MPH | | Frt |
|-----------------------------|-----|-------|-----|
| | Psg | | |
| | LRC | Other | |
| Alexandria Sub | | | |
| 0.0 to 7.5 zone | 80 | 80 | 60 |
| *0.0 to 0.7 | 45 | 45 | 30 |
| *6.1 Rlwy crossing at grade | 50 | 50 | 35 |
| 72.5 to 76.4 zone | 75 | 65 | 35 |
| *76.1 to 76.3 | 30 | 30 | 30 |
| 76.3 to 76.4 rule 105 | 10 | 10 | 10 |

| Mile | MPH | | Frt |
|-----------------------------|-----|-------|-----|
| | Psg | | |
| | LRC | Other | |
| Beachburg Sub | | | |
| 0.0 to 1.8 Zone | 35 | 30 | 30 |
| 0.0 to 0.3 rule 105 | 10 | 10 | 10 |
| *0.3 to 0.6 | 25 | 20 | 20 |
| 1.8 to 6.0 Zone | 45 | 40 | 40 |
| 3.3 to 3.9 | 40 | | |
| *3.4 Rlwy crossing at grade | 35 | 35 | 35 |
| 5.1 to 5.9 | 40 | | 25 |

*Not marked by restricting speed signs

True North



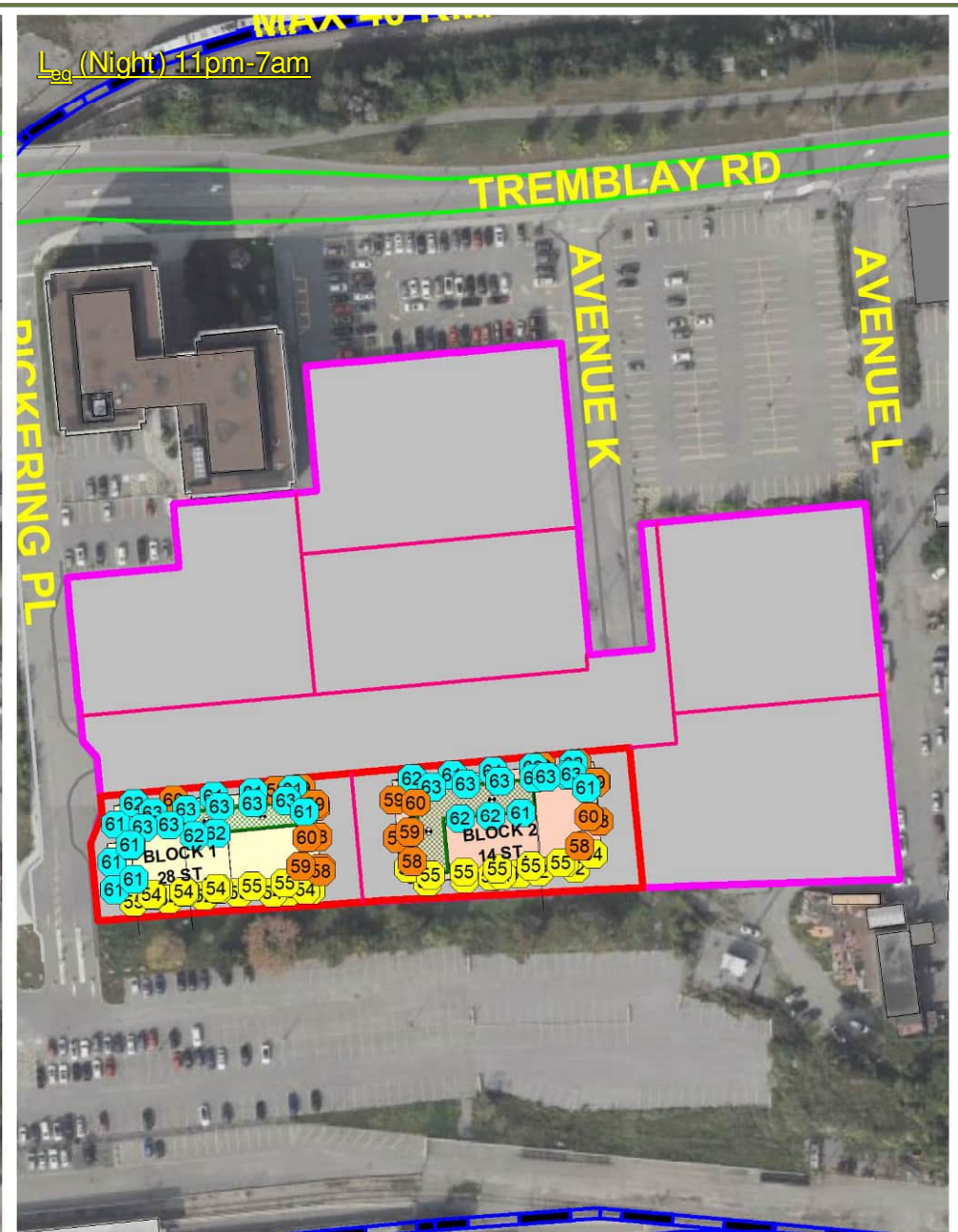
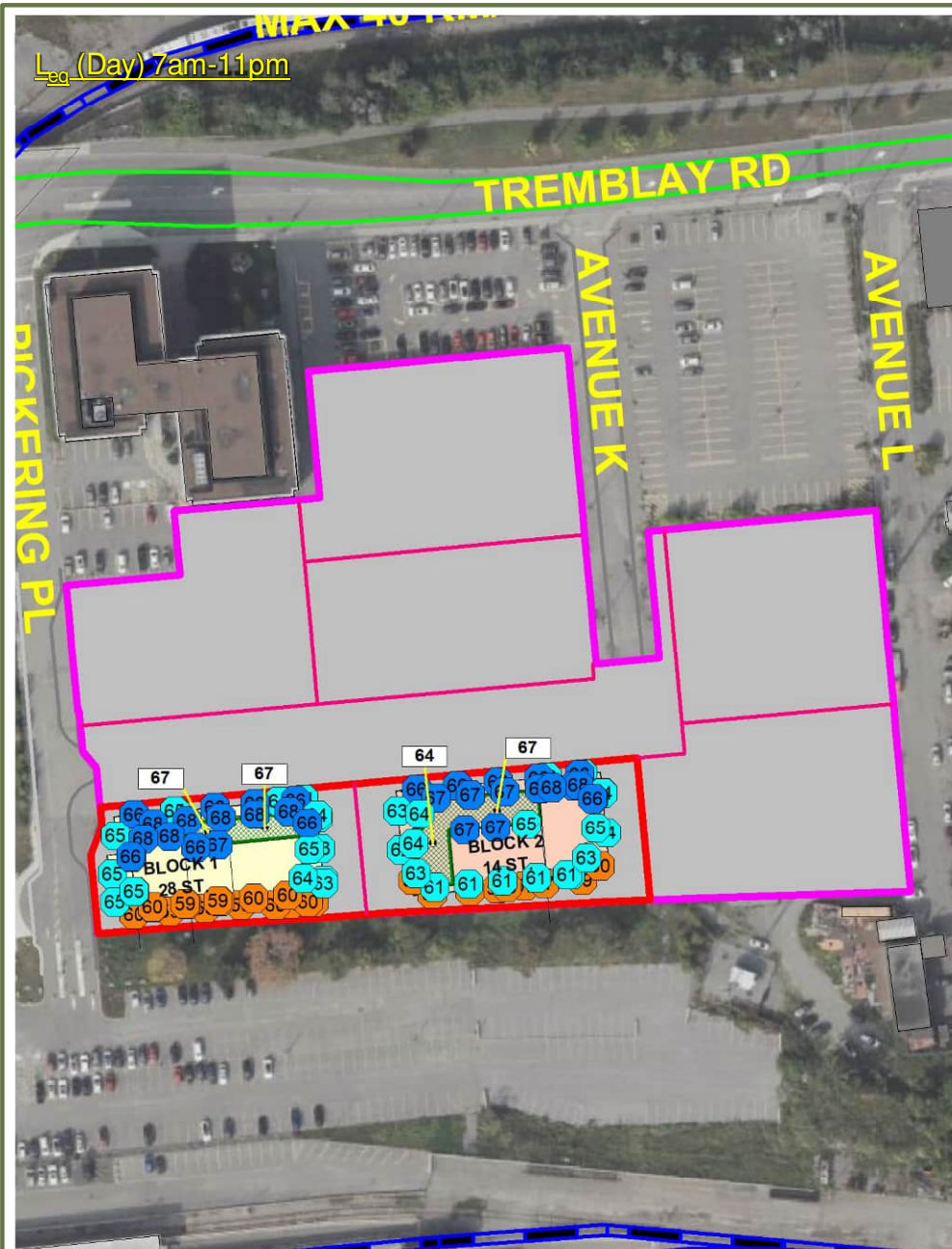
COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA –
BLOCKS 1 AND 2 SITE PLAN
APPROVAL

MAXIMUM ALLOWED TRAIN
SPEEDS IN THE AREA OF THE
VIA OTTAWA STATION

| | | |
|----------|-----------------|-------------------------|
| Scale: | n/a | METRES |
| Date: | July 2025 | Rev 0.0 |
| Project: | 241.03970.00001 | Figure No. 10 |





COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA – BLOCKS 1 AND 2 SITE PLAN APPROVAL

PREDICTED TRANSPORTATION SOUND LEVELS - UNMITIGATED

True North



Scale:

N.T.S.

METRES

Date:

July 2025

Rev 0.0

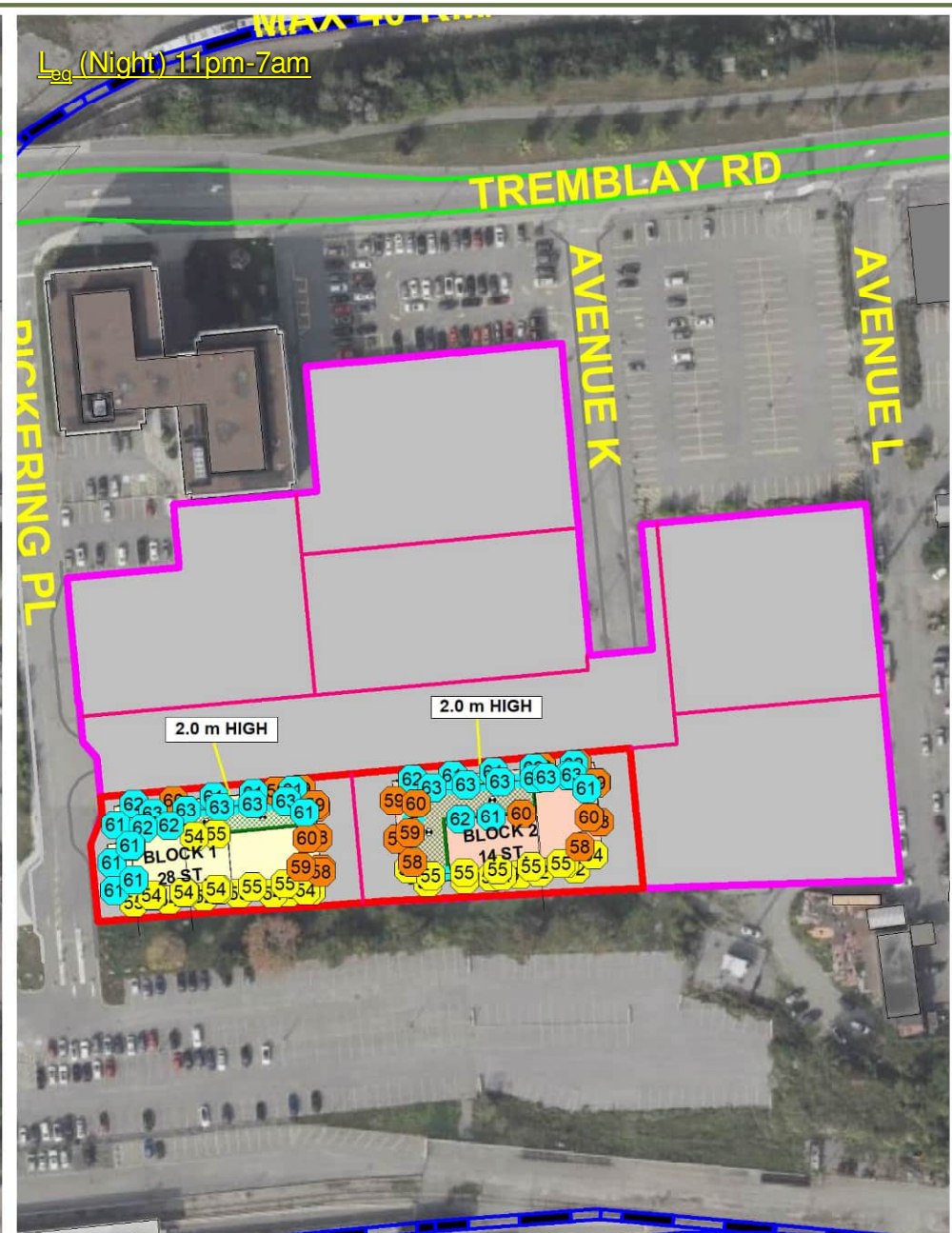
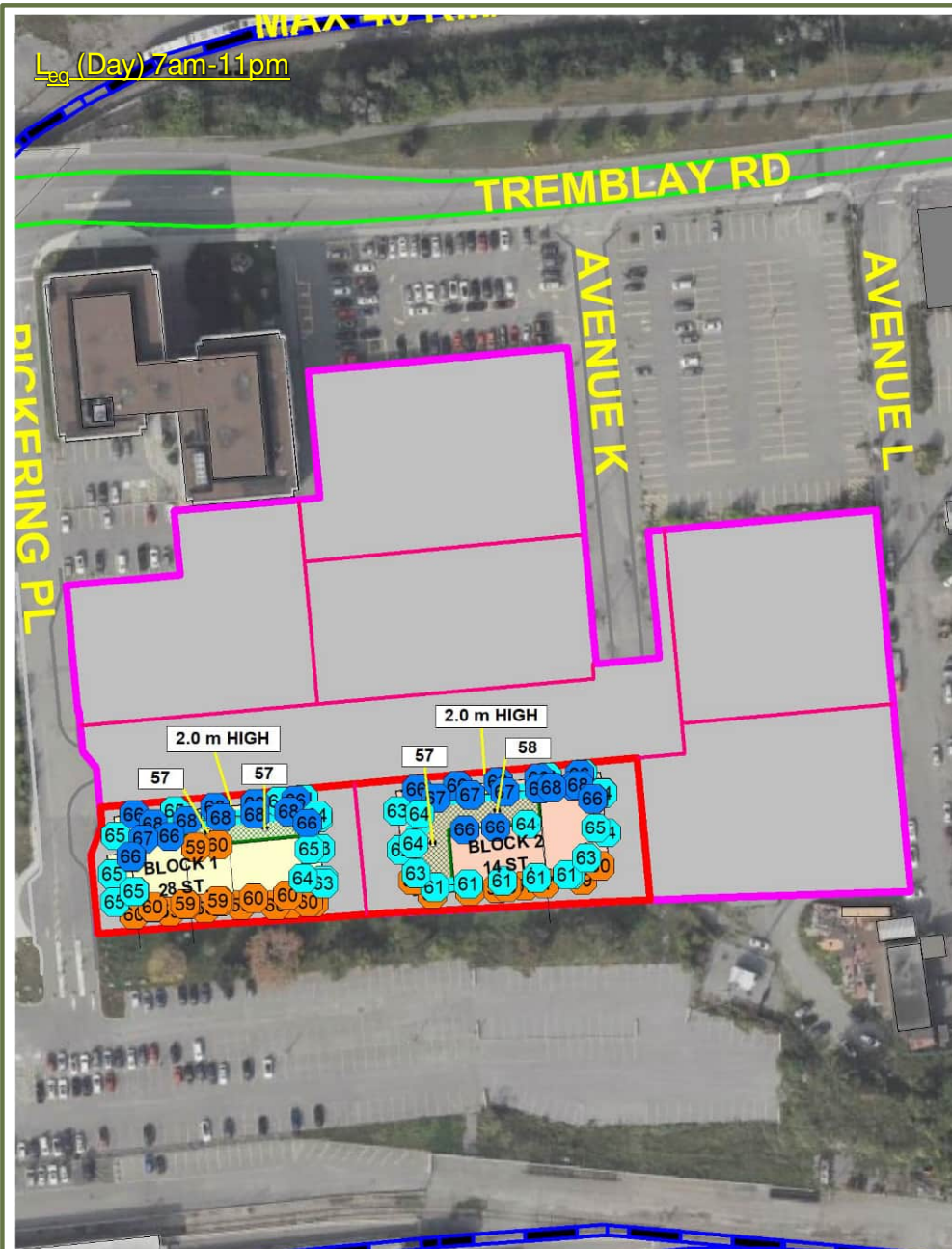
Figure No.

11a

Project:

241.03970.00001



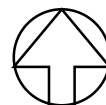


COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA – BLOCKS 1 AND 2 SITE PLAN APPROVAL

PREDICTED TRANSPORTATION SOUND LEVELS - MITIGATED

True North



Scale:

N.T.S.

METRES

Date:

July 2025

Rev 0.0

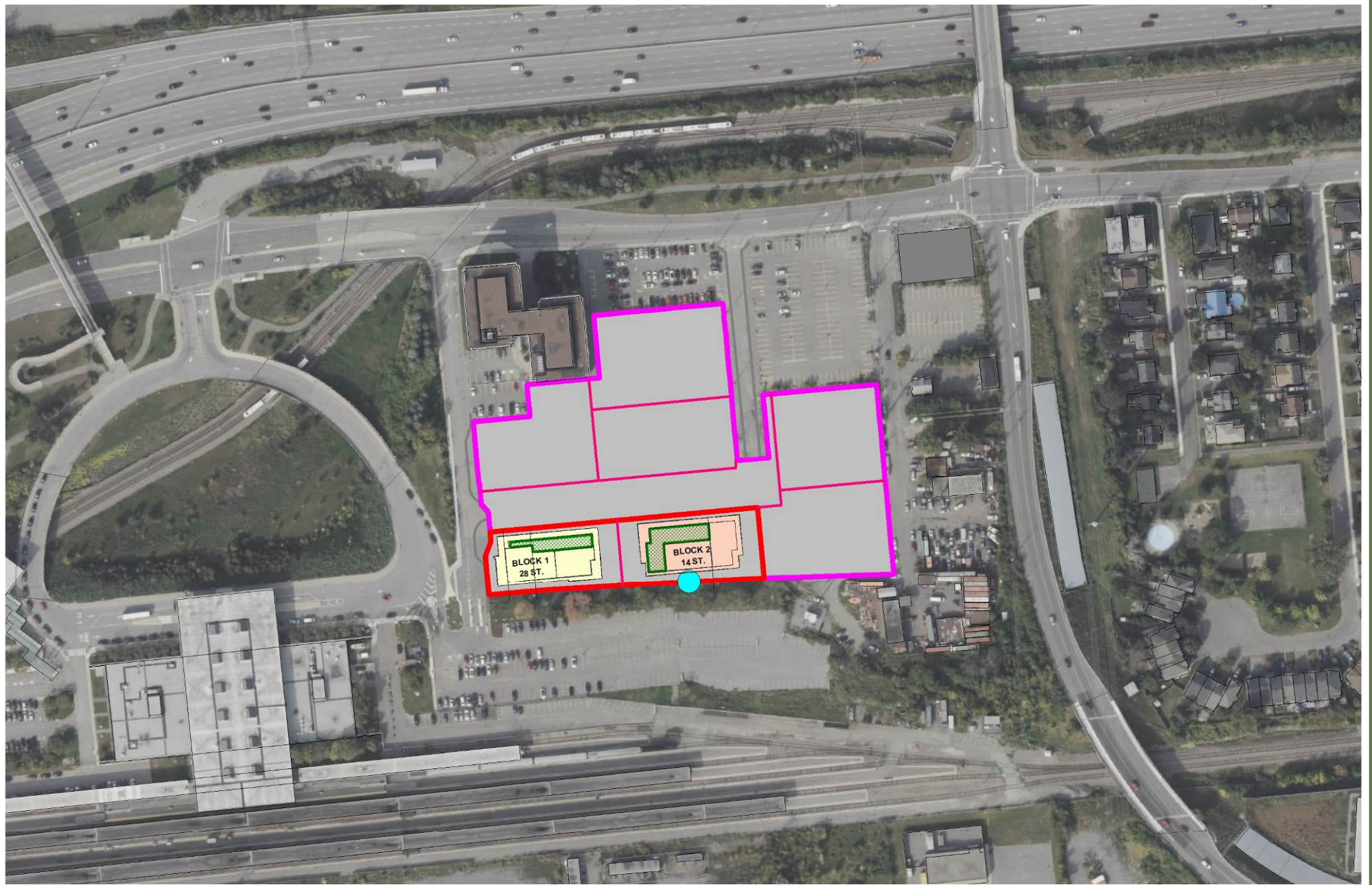
Figure No.

11b

Project:

241.03970.00001





COLONNADE BRIDGEPORT

25 PICKERING PLACE, OTTAWA – BLOCKS 1 AND 2 SITE PLAN APPROVAL

VIBRATION MEASUREMENT LOCATION

True North



Scale: 1:2,500

METRES

Date: July 2025 Rev 0.0

Project: 241.03970.00001

Figure No.

12





Appendix A Excerpts From Development Drawings

Environmental Noise and Vibration Assessment, Blocks 1 and 2 – Site Plan Approval Application

25 Pickering Place Development, Ottawa, ON

Colonnade BridgePort

SLR Project No.: 241.03870.00001



NOT FOR CONSTRUCTION

| | | |
|-----|--------|----------------------|
| B | 250417 | REISSUED FOR SPC |
| A | 240910 | ISSUED FOR SITE PLAN |
| REV | DATE | REVISION |

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT.

ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS.

DO NOT SCALE DRAWINGS.

THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED.

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63 Pamela Street
Ottawa, Ontario
Canada K1S 3K7
T: 613-238-7200
F: 613-235-2005
E: mail@hobinarc.com
hobinarc.com

HOBIN
ARCHITECTURE

PROJECT
22 PICKERING

Lot A (WEST) - 7000 Bannermount Ave, Ottawa, ON
Lot B (EAST) - 720 Bannermount Ave, Ottawa, ON

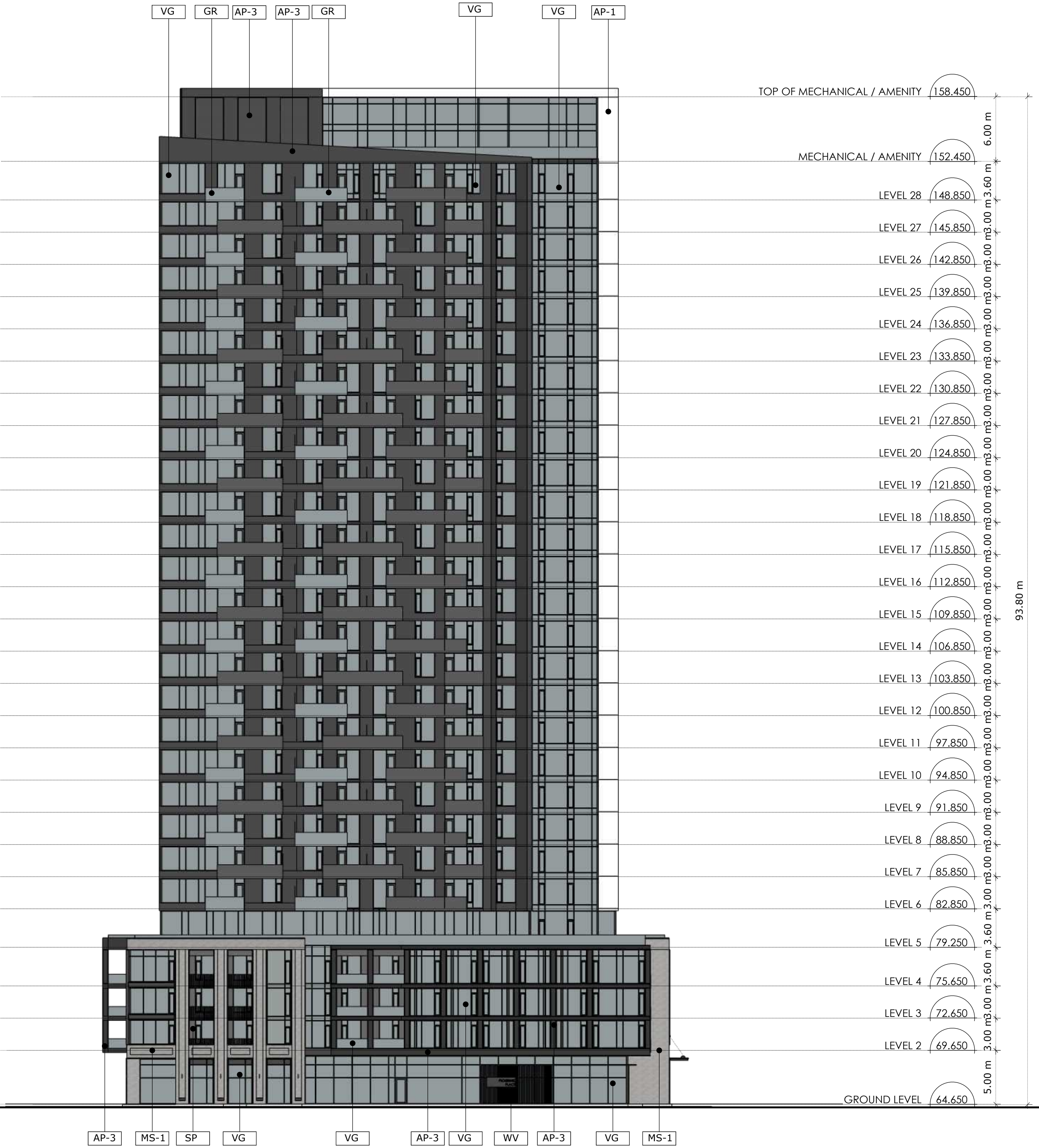
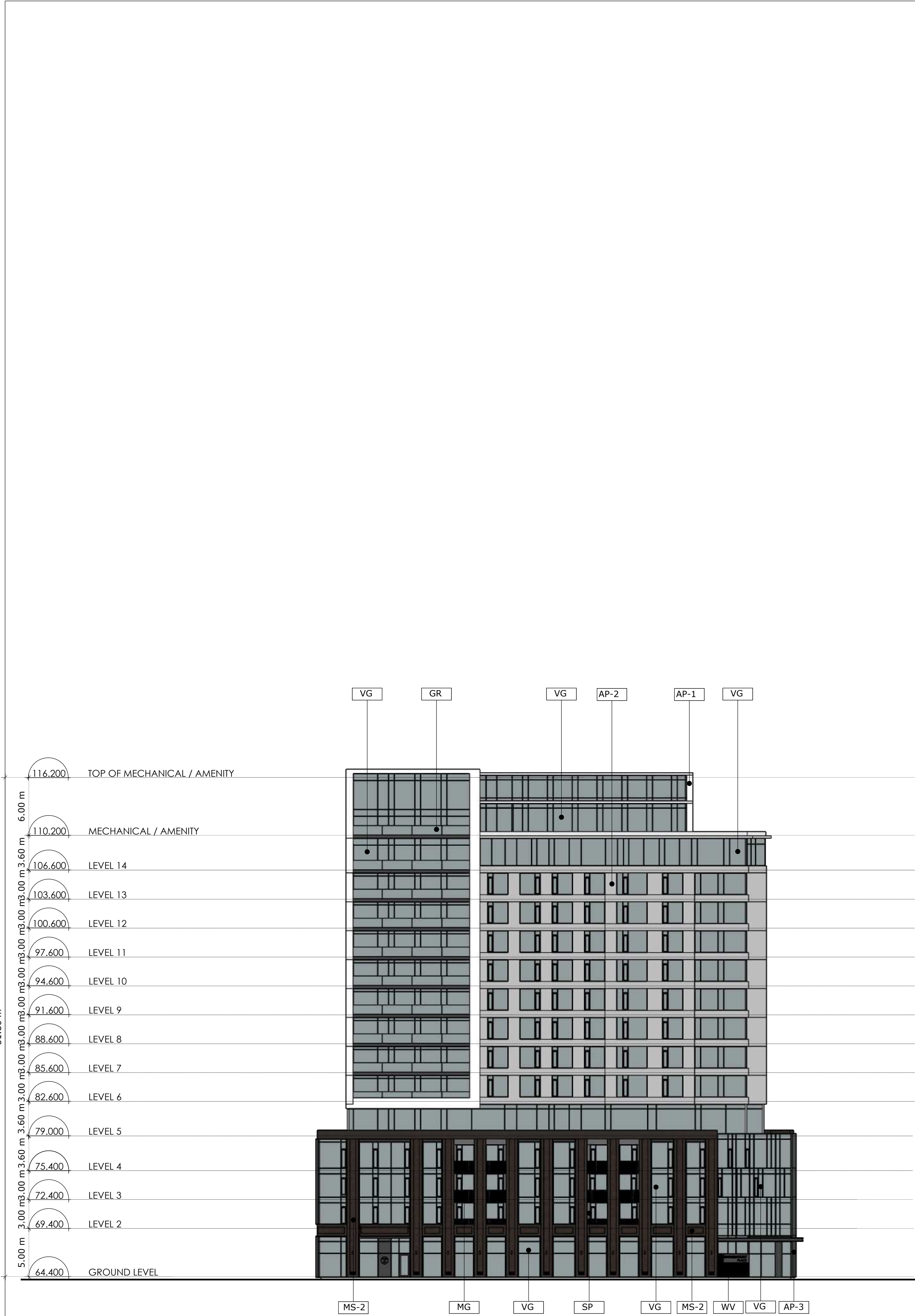
DRAWING TITLE
SITE PLAN

| | | |
|--------|--------|--------------|
| DRAWN | DATE | SCALE |
| Author | 240228 | As indicated |

| |
|-------------|
| PROJECT |
| 2222 |
| DRAWING NO. |

A1.01
SPA
REVISION NO. B

A1.01 SFA-RS- SITE PLAN #15865



| | | |
|--|--|--|
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|-----|----------|----------------------|
| 1 | 24-05-10 | ISSUED FOR SITE PLAN |
| no. | date | revision |

It is the responsibility of the appropriate contractor to check and verify all dimensions on site and report all errors and/or omissions to the architect.

All contractors must comply with all pertinent codes and by-laws.

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This drawing may not be used for construction until signed.

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| | |
|---------|------------------|
| LEGEND: | |
| AP-1 | ALUMINUM PANEL 1 |
| AP-2 | ALUMINUM PANEL 2 |
| AP-3 | ALUMINUM PANEL 3 |
| MS | METAL GUARD |
| MS-1 | MASONRY 1 |
| MS-2 | MASONRY 2 |
| GR | GLASS RAILING |
| SP | SPANDREL PANEL |
| VG | VISION GLASS |
| WV | WOOD VENEER |

Hobin Architecture Incorporated
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Ottawa, Ontario
Canada K1S 5K6
T: 613-238-7200
F: 613-235-2005
E: mail@hobinarc.com
hobinarc.com

HOBIN
ARCHITECTURE

PROJECT/LOCATION:
22 PICKERING PLACE
OTTAWA, ON

DRAWING TITLE:
BUILDINGS 1 + 2 - NORTH ELEVATION

DRAWN BY: DATE: SCALE:
PB 240214 1:250

PROJECT:
2222
DRAWING NO.:
A3-00

REVISION NO.:



1 SOUTH ELEVATIONS
A3.01 Scale: 1: 250

| | | |
|--|--|--|
| | | |
| | | |
| | | |
| | | |

| | | |
|-----|----------|----------------------|
| 1 | 24-05-10 | ISSUED FOR SITE PLAN |
| no. | date | revision |

It is the responsibility of the appropriate contractor to check and verify all dimensions on site and report all errors and/or omissions to the architect.

All contractors must comply with all pertinent codes and by-laws.

Do not scale drawings.

This drawing may not be used for construction until signed.

Copyright reserved.

| LEGEND: | |
|---------|------------------|
| AP-1 | ALUMINUM PANEL 1 |
| AP-2 | ALUMINUM PANEL 2 |
| AP-3 | ALUMINUM PANEL 3 |
| MS | METAL GUARD |
| MS-1 | MASONRY 1 |
| MS-2 | MASONRY 2 |
| GR | GLASS RAILING |
| SP | SPANDREL PANEL |
| VG | VISION GLASS |
| WV | WOOD VENER |

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hobinarc.com



HOBIN
ARCHITECTURE

PROJECT/LOCATION:
22 PICKERING PLACE
OTTAWA, ON

DRAWING TITLE:
BUILDINGS 1 + 2 - SOUTH ELEVATION

DRAWN BY: DATE: SCALE:
PB 240214 1:250

PROJECT:
2222

DRAWING NO.:
A3-01

REVISION NO.:





Appendix B Environmental Permits for Surrounding Industries

Environmental Noise and Vibration Assessment, Blocks 1 and 2 – Site Plan Approval Application

25 Pickering Place Development, Ottawa, ON

Colonnade BridgePort

SLR Project No.: 241.03870.00001



INDUSTRIES AND COMMERCIAL USES WITHIN 300 m OF MASTER PLAN

| Address | | Name | Operating Hours | Description | MECP ECA/ EASR (Date) | Guideline D-6 Class | | | Actual Separation Dist (m) | Within Setback? | | Notes | |
|---------|---------------|--|-------------------|---------------------------|-----------------------------|---------------------|-----|-----|----------------------------------|-----------------|-----|-------|------------|
| | | | | | | Class | AoI | RMS | | AoI | RMS | | |
| 1321 | Avenue L | Commence Fence | 7am to 5pm | Fencing Contractor | - | I | 70 | 20 | 15 | Yes | Yes | 85 | m to Lot B |
| 1325 | Avenue L | Vacant | - | - | - | I | 70 | 20 | 15 | Yes | Yes | 81 | m to Lot B |
| 1333 | Avenue L | Valvoline Mobile Mechanic Ottawa | 7am to 6pm | Automotive repair | - | I | 70 | 20 | 15 | Yes | Yes | 77 | m to Lot B |
| 1346 | Avenue L | Avenue Tire Depot | 7am to 6pm | Automotive repair | - | I | 70 | 20 | 0 | Yes | Yes | 40 | m to Lot B |
| 805 | Belfast Rd | OC Transpo Belfast Yard | 24 hrs | LRT Maintenance and | 6392-BA9RCP (2019) | II | 300 | 70 | 195 | Yes | No | 250 | m to Lot B |
| 330 | Coventry Road | Canadian Tire | 8am to 8pm | Retail Commercial | - | n/a | n/a | n/a | 155 | n/a | n/a | 255 | m to Lot A |
| 380 | Coventry Road | Best Buy | 8am to 8pm | Retail Commercial | - | n/a | n/a | n/a | 155 | n/a | n/a | 255 | m to Lot B |
| 400 | Coventry Road | Vacant (Proposed Residential Development) | - | - | - | n/a | n/a | n/a | 160 | n/a | n/a | 255 | m to Lot B |
| 440 | Coventry Road | Government of Canada | 24 hrs | RCMP Office and Distri | - | n/a | n/a | n/a | 235 | n/a | n/a | 315 | m to Lot B |
| 405 | Terminal Ave | Employment And Social Development Canada | 7am to 8pm | Office | - | n/a | n/a | n/a | 180 | n/a | n/a | 180 | m to Lot A |
| 433 | Terminal Ave | Vacant (former Via Rail) | - | - | - | I | 70 | 20 | 175 | No | No | 175 | m to Lot B |
| 475 | Terminal Ave | Parking Indigo Ottawa | 24 hrs | Parking Lot | - | n/a | n/a | n/a | 130 | n/a | n/a | 130 | m to Lot A |
| 495 | Terminal Ave | Vacant (proposed office building) | - | - | - | I | 70 | 20 | 120 | No | No | 120 | m to Lot A |
| 495 | Terminal Ave | Zayo Telecommunications | 24 hrs | Telecommunications | - | I | 70 | 20 | 165 | No | No | 165 | m to Lot A |
| 525 | Terminal Ave | Level Three Communications | 24 hrs | Telecommunications | - | I | 70 | 20 | 165 | No | No | 165 | m to Lot A |
| 535 | Terminal Ave | OLRT Storage Yard | 24 hrs | Storage yard | - | I | 70 | 20 | 115 | No | No | 120 | m to Lot B |
| 500 | Terminal Ave | SmartCentre Shopping Mall | 9:30am to 9pm | Various Retail and Res | - | n/a | n/a | n/a | 240 | n/a | n/a | 240 | m to Lot A |
| 550 | Terminal Ave | SmartCentre Shopping Mall | 9:30am to 9pm | Various Retail and Res | - | n/a | n/a | n/a | 260 | n/a | n/a | 290 | m to Lot A |
| 170 | Tremblay Road | OC Transpo Tremblay Station | 5am to 1am | Light Rail Transit Static | - | I | 70 | 20 | 170 | No | No | 190 | m to Lot B |
| 200 | Tremblay Road | VIA Ottawa Station | 3:45am to 12:30am | Inter-City Passenger Tr | - | II | 300 | 70 | 0 | Yes | Yes | 0 | m to Lot B |
| 250 | Tremblay Road | Professional Institute of the Public Service of Canada (PIPSC) | 8am to 5pm | Office | 4969-6ZYPSH (2007) | n/a | n/a | n/a | 0 | n/a | n/a | 70 | m to Lot A |

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 6392-BA9RCP

Issue Date: May 30, 2019

SNC-Lavalin Constructors (Pacific) Inc., Dragados Canada, Inc. and EllisDon Corporation
1600 Carling Ave, No. 300
Ottawa, Ontario
K1Z 1G3

Site Location: OLRT Constructors Maintenance and Storage Facility
805 Belfast Road
Ottawa City,
K1G 0Z4

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act , R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

Description Section

A light rail transit system maintenance and storage facility, consisting of the following processes and support units:

- LRT vehicle assembly and finishing;
- Train Sanding Inspection and Washing;
- Vehicle Cleaning and Inspection Tracks;
- Heavy Maintenance Tracks;
- Wheel Truing Lathe;
- Maintenance of Way;

including the *Equipment* and any other ancillary and support processes and activities, operating at a *Facility Production Limit* of up to **72 light rail train and support vehicles** , discharging to the air as described in the *Original ESDM Report*.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "**ACB list**" means the document entitled "Air Contaminants Benchmarks (ACB) List: Standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants", as amended from time to time

and published by the *Ministry* and available on a Government website;

2. "*Acceptable Point of Impingement Concentration*" means a concentration accepted by the *Ministry* as not likely to cause an adverse effect for a *Compound of Concern* that,
 - a. is not identified in the *ACB list*, or
 - b. is identified in the *ACB list* as belonging to the category "Benchmark 2" and has a concentration at a *Point of Impingement* that exceeds the concentration set out for the contaminant in that document.With respect to the *Original ESDM Report*, the *Acceptable Point of Impingement Concentration* for a *Compound of Concern* mentioned above is the concentration set out in the *Original ESDM Report*;
3. "*Acoustic Assessment Report*" means the report, prepared in accordance with *Publication NPC-233* and Appendix A of the *Basic Comprehensive User Guide*, by Martin Meunier, P.Eng. and Chris Bestfather, P.Eng. / SNC-Lavalin Inc. and dated October 29, 2018 submitted in support of the application, that documents all sources of noise emissions and *Noise Control Measures* present at the *Facility*, as updated in accordance with Condition 5 of this *Approval*;
4. "*Acoustic Assessment Summary Table*" means a table prepared in accordance with the *Basic Comprehensive User Guide* summarising the results of the *Acoustic Assessment Report*, as updated in accordance with Condition 5 of this *Approval*;
5. "*Acoustic Audit*" means an investigative procedure consisting of measurements and/or acoustic modelling of all sources of noise emissions due to the operation of the *Facility*, assessed to determine compliance with the Performance Limits for the *Facility* regarding noise emissions, completed in accordance with the procedures set in *Publication NPC-103* and reported in accordance with *Publication NPC-233*;
6. "*Acoustic Audit Report*" means a report presenting the results of an *Acoustic Audit*, prepared in accordance with *Publication NPC-233*;
7. "*Acoustical Consultant*" means a person currently active in the field of environmental acoustics and noise/vibration control, who is familiar with *Ministry* noise guidelines and procedures and has a combination of formal university education, training and experience necessary to assess noise emissions from a *Facility*;
8. "*Approval*" means this entire Environmental Compliance Approval and any *Schedules* to it;
9. "*Basic Comprehensive User Guide*" means the *Ministry* document titled "Basic Comprehensive Certificates of Approval (Air) User Guide" dated March 2011, as amended;

10. "*Company*" means SNC-Lavalin Constructors (Pacific) Inc., Dragados Canada, Inc., and EllisDon Corporation, that is responsible for the construction or operation of the *Facility* and includes any successors and assigns in accordance with section 19 of the *EPA*;
11. "*Compound of Concern*" means a contaminant described in paragraph 4 subsection 26 (1) of *O. Reg. 419/05*, namely, a contaminant that is discharged from the *Facility* in an amount that is not negligible;
12. "*Description Section*" means the section on page one of this *Approval* describing the *Company's* operations and the *Equipment* located at the *Facility* and specifying the *Facility Production Limit* for the *Facility*;
13. "*Director*" means a person appointed for the purpose of section 20.3 of the *EPA* by the *Minister* pursuant to section 5 of the *EPA*;
14. "*District Manager*" means the District Manager of the appropriate local district office of the *Ministry*, where the *Facility* is geographically located;
15. "*Emission Summary Table*" means a table described in paragraph 14 of subsection 26 (1) of *O. Reg. 419/05*;
16. "*Environmental Assessment Act*" means the Environmental Assessment Act, R.S.O. 1990, c.E.18, as amended;
17. "*EPA*" means the Environmental Protection Act, R.S.O. 1990, c.E.19, as amended;
18. "*Equipment*" means equipment or processes described in the *ESDM Report*, this *Approval* and in the *Schedules* referred to herein and any other equipment or processes;
19. "*Equipment with Specific Operational Limits*" means any *Equipment* related to the thermal oxidation of waste or waste derived fuels, fume incinerators or any other *Equipment* that is specifically referenced in any published *Ministry* document that outlines specific operational guidance that must be considered by the *Director* in issuing an *Approval*;
20. "*ESDM Report*" means the most current Emission Summary and Dispersion Modelling Report that describes the *Facility*. The *ESDM Report* is based on the *Original ESDM Report* and is updated after the issuance of this *Approval* in accordance with section 26 of *O. Reg. 419/05* and the *Procedure Document*;
21. "*Facility*" means the entire operation located on the property where the *Equipment* is located;
22. "*Facility Production Limit*" means the production limit placed by the *Director* on the main product(s) or raw materials used by the *Facility*;
23. "*Independent Acoustical Consultant*" means an *Acoustical Consultant* who is not

representing the *Company* and was not involved in preparing the *Acoustic Assessment Report* or the design/implementation of *Noise Control Measures* for the *Facility* and/or *Equipment*. The *Independent Acoustical Consultant* shall not be retained by the *Acoustical Consultant* involved in the noise impact assessment or the design/implementation of *Noise Control Measures* for the *Facility* and/or *Equipment*;

24. "*Log*" means a document that contains a record of each change that is required to be made to the *ESDM Report* and *Acoustic Assessment Report*, including the date on which the change occurred. For example, a record would have to be made of a more accurate emission rate for a source of contaminant, more accurate meteorological data, a more accurate value of a parameter that is related to a source of contaminant, a change to a *Point of Impingement* and all changes to information associated with a *Modification* to the *Facility* that satisfies Condition 2;
25. "*Minister*" means the Minister of the Environment, Conservation and Parks or such other member of the Executive Council as may be assigned the administration of the *EPA* under the Executive Council Act;
26. "*Ministry*" means the ministry of the *Minister*;
27. "*Modification*" means any construction, alteration, extension or replacement of any plant, structure, equipment, apparatus, mechanism or thing, or alteration of a process or rate of production at the *Facility* that may discharge or alter the rate or manner of discharge of a *Compound of Concern* to the air or discharge or alter noise or vibration emissions from the *Facility*;
28. "*Noise Control Measures*" means measures to reduce the noise emissions from the *Facility* and/or *Equipment* including, but not limited to, silencers, acoustic louvres, enclosures, absorptive treatment, plenums and barriers. It also means the noise control measures outlined in the *Acoustic Assessment Report*;
29. "*O. Reg. 419/05*" means Ontario Regulation 419/05, Air Pollution – Local Air Quality, as amended;
30. "*Original ESDM Report*" means the Emission Summary and Dispersion Modelling Report which was prepared in accordance with section 26 of *O. Reg. 419/05* and the *Procedure Document* by SNC-Lavalin Inc., Environment & Geoscience and dated November 16, 2018 submitted in support of the application, and includes any changes to the report made up to the date of issuance of this *Approval*;
31. "*Point of Impingement*" has the same meaning as in section 2 of *O. Reg. 419/05*;
32. "*Point of Reception*" means Point of Reception as defined by *Publication NPC-300*;
33. "*Procedure Document*" means *Ministry* guidance document titled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated

February 2017, as amended;

34. "*Processes with Significant Environmental Aspects*" means the *Equipment* which, during regular operation, would discharge one or more contaminants into the air in an amount which is not considered as negligible in accordance with section 26 (1) 4 of O. Reg. 419/05 and the *Procedure Document*;
35. "*Publication NPC-103*" means the *Ministry* Publication NPC-103 of the Model Municipal Noise Control By-Law, Final Report, August 1978, published by the *Ministry* as amended;
36. "*Publication NPC-207*" means the *Ministry* draft technical publication "Impulse Vibration in Residential Buildings", November 1983, supplementing the Model Municipal Noise Control By-Law, Final Report, published by the *Ministry*, August 1978, as amended;
37. "*Publication NPC-233*" means the *Ministry* Publication NPC-233, "Information to be Submitted for Approval of Stationary Sources of Sound", October, 1995, as amended;
38. "*Publication NPC-300*" means the *Ministry* Publication NPC-300, "Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300", August 2013, as amended;
39. "*Schedules*" means the following schedules attached to this *Approval* and forming part of this *Approval* namely:
 - Schedule A - Supporting Documentation
40. "*Toxicologist*" means a qualified professional currently active in the field of risk assessment and toxicology that has a combination of formal university education, training and experience necessary to assess contaminants; and
41. "*Written Summary Form*" means the electronic questionnaire form, available on the *Ministry* website, and supporting documentation, that documents the activities undertaken at the *Facility* in the previous calendar year.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL

1. Except as otherwise provided by this *Approval*, the *Facility* shall be designed, developed, built, operated and maintained in accordance with the terms and

conditions of this *Approval* and in accordance with the following *Schedules* attached hereto:

- Schedule A - Supporting Documentation

2. LIMITED OPERATIONAL FLEXIBILITY

1. Pursuant to section 20.6 (1) of the *EPA* and subject to Conditions 2.2 and 2.3 of this *Approval*, future construction, alterations, extensions or replacements are approved in this *Approval* if the future construction, alterations, extensions or replacements are *Modifications* to the *Facility* that:
 - a. are within the scope of the operations of the *Facility* as described in the *Description Section* of this *Approval*;
 - b. do not result in an increase of the *Facility Production Limit* above the level specified in the *Description Section* of this *Approval*; and
 - c. result in compliance with the performance limits as specified in Condition 4.
2. Condition 2.1 does not apply to,
 - a. the addition of any new *Equipment with Specific Operational Limits* or to the *Modification* of any existing *Equipment with Specific Operational Limits* at the *Facility*; or
 - b. *Modifications* to the *Facility* that would be subject to the *Environmental Assessment Act*.
3. Condition 2.1 of this *Approval* shall expire ten (10) years from the date of this *Approval*, unless this *Approval* is revoked prior to the expiry date. The *Company* may apply for renewal of Condition 2.1 of this *Approval* by including an *ESDM Report* and an *Acoustic Assessment Report* that describes the *Facility* as of the date of the renewal application.

3. REQUIREMENT TO REQUEST AN ACCEPTABLE POINT OF IMPINGEMENT CONCENTRATION

1. Prior to making a *Modification* to the *Facility* that satisfies Condition 2.1.a. and 2.1.b., the *Company* shall prepare a proposed update to the *ESDM Report* to reflect the proposed *Modification*.
2. The *Company* shall request approval of an *Acceptable Point of Impingement Concentration* for a *Compound of Concern* if the *Compound of Concern* is not identified in the *ACB list* as belonging to the category "Benchmark 1" and a proposed update to an *ESDM Report* indicates that one of the following changes with respect to the concentration of the *Compound of Concern* may occur:

- a. The *Compound of Concern* was not a *Compound of Concern* in the previous version of the *ESDM Report* and
 - i. the concentration of the *Compound of Concern* exceeds the concentration set out for the contaminant in the *ACB list*; or
 - ii. the *Compound of Concern* is not identified in the *ACB list*; or
- b. The concentration of the *Compound of Concern* in the updated *ESDM Report* exceeds the higher of,
 - i. the most recent *Acceptable Point of Impingement Concentration*, and
 - ii. the concentration set out for the contaminant in the *ACB list*, if the contaminant is identified in that document.
3. The request required by Condition 3.2 shall propose a concentration for the *Compound of Concern* and shall contain an assessment, performed by a *Toxicologist*, of the likelihood of the proposed concentration causing an adverse effect at *Points of Impingement*.
4. If the request required by Condition 3.2 is a result of a proposed *Modification* described in Condition 3.1, the *Company* shall submit the request, in writing, to the *Director* at least 30 days prior to commencing to make the *Modification*. The *Director* shall provide written confirmation of receipt of this request to the *Company*.
5. If a request is required to be made under Condition 3.2 in respect of a proposed *Modification* described in Condition 3.1, the *Company* shall not make the *Modification* mentioned in Condition 3.1 unless the request is approved in writing by the *Director*.
6. If the *Director* notifies the *Company* in writing that the *Director* does not approve the request, the *Company* shall,
 - a. revise and resubmit the request; or
 - b. notify the *Director* that it will not be making the *Modification*.
7. The re-submission mentioned in Condition 3.6 shall be deemed a new submission under Condition 3.2.
8. If the *Director* approves the request, the *Company* shall update the *ESDM Report* to reflect the *Modification*.
9. Condition 3 does not apply if Condition 2.1 has expired.

4. PERFORMANCE LIMITS

1. Subject to Condition 4.2, the *Company* shall not discharge or cause or permit

the discharge of a *Compound of Concern* into the air if,

- a. the *Compound of Concern* is identified in the *ACB list* as belonging to the category "Benchmark 1" and the discharge results in the concentration at a *Point of Impingement* exceeding the Benchmark 1 concentration; or
 - b. the *Compound of Concern* is not identified in the *ACB list* as belonging to the category "Benchmark 1" and the discharge results in the concentration at a *Point of Impingement* exceeding the higher of,
 - i. if an *Acceptable Point of Impingement Concentration* exists, the most recent *Acceptable Point of Impingement Concentration*, and
 - ii. the concentration set out for the contaminant in the *ACB list*, if the contaminant is identified in that document.
2. Condition 4.1 does not apply if the benchmark set out in the *ACB list* has a 10-minute averaging period and no ambient monitor indicates an exceedance at a *Point of Impingement* where human activities regularly occur at a time when those activities regularly occur.
3. The *Company* shall:
- a. implement, prior to the commencement of operation of the *Facility*, the *Noise Control Measures* as outlined in the *Acoustic Assessment Report*;
 - b. ensure, subsequent to the implementation of the *Noise Control Measures* that the noise emissions from the *Facility* comply with the limits set in *Ministry Publication NPC-300*; and
 - c. ensure that the *Noise Control Measures* are properly maintained and continue to provide the acoustical performance outlined in the *Acoustic Assessment Report*.
4. The *Company* shall, at all times, ensure that the vibration emissions from the *Facility* comply with the limits set out in *Ministry Publication NPC-207*.
5. The *Company* shall operate any *Equipment with Specific Operational Limits* approved by this *Approval* in accordance with the *Original ESDM Report*.

5. DOCUMENTATION REQUIREMENTS

1. The *Company* shall maintain an up-to-date *Log*.
2. No later than March 31 of each year, the *Company* shall update the *Acoustic Assessment Report* and shall update the *ESDM Report* in accordance with section 26 of *O. Reg. 419/05* so that the information in the reports is accurate as of December 31 in the previous year.
3. The *Company* shall make the *Emission Summary Table* (see section 27 of *O.*

Reg. 419/05) and *Acoustic Assessment Summary Table* available for examination by any person, without charge, by posting it on the Internet or by making it available during regular business hours at the *Facility*.

4. The *Company* shall, within three (3) months after the expiry of Condition 2.1 of this *Approval*, update the *ESDM Report* and the *Acoustic Assessment Report* such that the information in the reports is accurate as of the date that Condition 2.1 of this *Approval* expired.
5. Conditions 5.1 and 5.2 do not apply if Condition 2.1 has expired.

6. REPORTING REQUIREMENTS

1. Subject to Condition 6.2, the *Company* shall provide the *Director* no later than June 30 of each year, a *Written Summary Form* to be submitted through the *Ministry's* website that shall include the following:
 - a. a declaration of whether the *Facility* was in compliance with section 9 of the *EPA, O. Reg. 419/05* and the conditions of this *Approval*;
 - b. a summary of each *Modification* satisfying Condition 2.1.a. and 2.1.b. that took place in the previous calendar year that resulted in a change in the previously calculated concentration at a *Point of Impingement* for any *Compound of Concern* or resulted in a change in the sound levels reported in the *Acoustic Assessment Summary Table* at any *Point of Reception*.
2. Condition 6.1 does not apply if Condition 2.1 has expired.

7. OPERATION AND MAINTENANCE

1. The *Company* shall prepare and implement, not later than three (3) months from the date of this *Approval*, operating procedures and maintenance programs for all *Processes with Significant Environmental Aspects*, which shall specify as a minimum:
 - a. frequency of inspections and scheduled preventative maintenance;
 - b. procedures to prevent upset conditions;
 - c. procedures to minimize all fugitive emissions;
 - d. procedures to prevent and/or minimize odorous emissions;
 - e. procedures to prevent and/or minimize noise emissions; and
 - f. procedures for record keeping activities relating to the operation and maintenance programs.
2. The *Company* shall ensure that all *Processes with Significant Environmental Aspects* are operated and maintained in accordance with this *Approval*, the operating procedures and maintenance programs.

8. COMPLAINTS RECORDING AND REPORTING

1. If at any time, the *Company* receives an environmental complaint from the public regarding the operation of the *Equipment* approved by this *Approval*, the *Company* shall take the following steps:
 - a. Record and number each complaint, either electronically or in a log book. The record shall include the following information: the time and date of the complaint and incident to which the complaint relates, the nature of the complaint, wind direction at the time and date of the incident to which the complaint relates and, if known, the address of the complainant.
 - b. Notify the *District Manager* of the complaint within two (2) business days after the complaint is received, or in a manner acceptable to the *District Manager*.
 - c. Initiate appropriate steps to determine all possible causes of the complaint, and take the necessary actions to appropriately deal with the cause of the subject matter of the complaint.
 - d. Complete and retain on-site a report written within one (1) week of the complaint date. The report shall list the actions taken to appropriately deal with the cause of the complaint and set out steps to be taken to avoid the recurrence of similar incidents.

9. RECORD KEEPING REQUIREMENTS

1. Any information requested by any employee in or agent of the *Ministry* concerning the *Facility* and its operation under this *Approval*, including, but not limited to, any records required to be kept by this *Approval*, shall be provided to the employee in or agent of the *Ministry*, upon request, in a timely manner.
2. Unless otherwise specified in this *Approval*, the *Company* shall retain, for a minimum of five (5) years from the date of their creation all reports, records and information described in this *Approval*, including,
 - a. a copy of the *Original ESDM Report* and each updated version;
 - b. a copy of each version of the *Acoustic Assessment Report*;
 - c. supporting information used in the emission rate calculations performed in the *ESDM Reports* and *Acoustic Assessment Reports*;
 - d. the records in the *Log*;
 - e. copies of each *Written Summary Form* provided to the *Ministry* under Condition 6.1 of this *Approval*;
 - f. records of maintenance, repair and inspection of *Equipment* related to

- all *Processes with Significant Environmental Aspects*; and
- g. all records related to environmental complaints made by the public as required by Condition 8 of this *Approval*.

10. REVOCATION OF PREVIOUS APPROVALS

1. This *Approval* replaces and revokes all Certificates of Approval (Air) issued under section 9 *EPA* and Environmental Compliance Approvals issued under Part II.1 *EPA* to the *Facility* in regards to the activities mentioned in subsection 9(1) of the *EPA* and dated prior to the date of this *Approval*.

11. ACOUSTIC AUDIT

1. The *Company* shall carry out *Acoustic Audit* measurements on the actual noise emissions due to the operation of the *Facility*. The *Company*:
 - a. shall carry out *Acoustic Audit* measurements in accordance with the procedures in *Publication NPC-103*;
 - b. shall submit an *Acoustic Audit Report* on the results of the *Acoustic Audit*, prepared by an *Independent Acoustical Consultant*, in accordance with the requirements of *Publication NPC-233*, to the *District Manager* and the *Director*, not later than twelve (12) months after the commencement of operation of the *Facility*. The *Acoustic Audit Report* shall include projections of the *Facility's* noise emissions at the mature state (year 2031).
2. The *Director*:
 - a. may not accept the results of the *Acoustic Audit* if the requirements of *Publication NPC-233* were not followed;
 - b. may require the *Company* to repeat the *Acoustic Audit* if the results of the *Acoustic Audit* are found unacceptable to the *Director*.

SCHEDULE A

Supporting Documentation

1. Environmental Compliance Approval Application, dated November 16, 2018, signed by Cory Van Hoof and submitted by the *Company*;
2. Emission Summary and Dispersion Modelling Report, prepared by SNC-Lavalin Inc., Environment and Geoscience and dated November 16, 2018;
3. *Acoustic Assessment Report*, prepared by by Martin Meunier, P.Eng. and Chris Bestfather, P.Eng. / SNC-Lavalin Inc. and dated October 29, 2018;

4. The letter prepared by Nicolas Garcia, P.Eng. and Chris Bestfather, P.Eng. / SNC-Lavalin Inc. and dated March 29, 2019;
5. The letter prepared by Martin Meunier, P.Eng. and Chris Bestfather, P.Eng. / SNC-Lavalin Inc. and dated May 3, 2019.

The reasons for the imposition of these terms and conditions are as follows:

1. GENERAL

Condition No. 1 is included to require the *Approval* holder to build, operate and maintain the *Facility* in accordance with the Supporting Documentation in Schedule A considered by the *Director* in issuing this *Approval*.

2. LIMITED OPERATIONAL FLEXIBILITY, REQUIREMENT TO REQUEST AN ACCEPTABLE POINT OF IMPINGEMENT CONCENTRATION AND PERFORMANCE LIMITS

Conditions No. 2, 3 and 4 are included to limit and define the *Modifications* permitted by this *Approval*, and to set out the circumstances in which the *Company* shall request approval of an *Acceptable Point of Impingement Concentration* prior to making *Modifications*. The holder of the *Approval* is approved for operational flexibility for the *Facility* that is consistent with the description of the operations included with the application up to the *Facility Production Limit*. In return for the operational flexibility, the *Approval* places performance based limits that cannot be exceeded under the terms of this *Approval*. *Approval* holders will still have to obtain other relevant approvals required to operate the *Facility*, including requirements under other environmental legislation such as the *Environmental Assessment Act*.

3. DOCUMENTATION REQUIREMENTS

Condition No. 5 is included to require the *Company* to maintain ongoing documentation that demonstrates compliance with the performance limits as specified in Condition 4 of this *Approval* and allows the *Ministry* to monitor ongoing compliance with these performance limits. The *Company* is required to have an up to date *ESDM Report* and *Acoustic Assessment Report* that describe the *Facility* at all times and make the *Emission Summary Table* and *Acoustic Assessment Summary Table* from these reports available to the public on an ongoing basis in order to maintain public communication with regard to the emissions from the *Facility*.

4. REPORTING REQUIREMENTS

Condition No. 6 is included to require the *Company* to provide a yearly *Written Summary Form* to the *Ministry*, to assist the *Ministry* with the review of the site's compliance with the *EPA*, the regulations and this *Approval*.

5. OPERATION AND MAINTENANCE

Condition No. 7 is included to require the *Company* to properly operate and maintain the *Processes with Significant Environmental Aspects* to minimize the impact to the environment from these processes.

6. COMPLAINTS RECORDING AND REPORTING PROCEDURE

Condition No. 8 is included to require the *Company* to respond to any environmental complaints regarding the operation of the *Equipment*, according to a procedure that includes methods for preventing recurrence of similar incidents and a requirement to prepare and retain a written report.

7. RECORD KEEPING REQUIREMENTS

Condition No. 9 is included to require the *Company* to retain all documentation related to this *Approval* and provide access to employees in or agents of the *Ministry*, upon request, so that the *Ministry* can determine if a more detailed review of compliance with the performance limits as specified in Condition 4 of this *Approval* is necessary.

8. REVOCATION OF PREVIOUS APPROVALS

Condition No. 10 is included to identify that this *Approval* replaces all Section 9 Certificate(s) of Approval and Part II.1 Approvals in regards to the activities mentioned in subsection 9(1) of the *EPA* and dated prior to the date of this *Approval*.

9. ACOUSTIC AUDIT

Condition No. 11 is included to require the *Company* to gather accurate information and submit an *Acoustic Audit Report* in accordance with procedures set in the *Ministry's* noise guidelines, so that the environmental impact and subsequent compliance with this *Approval* can be verified.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 1372-9ZSHKR issued on September 3, 2015

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

- a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
- b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in

an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part
II.1 of the Environmental Protection Act
Ministry of the Environment, Conservation and
Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 30th day of May,
2019

Jeffrey McKerrall, P.Eng.
Director
appointed for the purposes of Part
II.1 of the *Environmental Protection
Act*

AB/
c: District Manager, MECP Ottawa
Chris Bestfather, SNC Lavalin Inc.



Ministry
of the
Environment

Ministère
de
l'Environnement

CERTIFICATE OF APPROVAL
AIR
NUMBER 4969-6ZYPSH
Issue Date: April 14, 2007

The Professional Institute Building Trust Fund
53 Augusta Dr
Ottawa, Ontario
K2E 8C3

Site Location: 250 Tremblay Road
Ottawa City, Ontario

You have applied in accordance with Section 9 of the Environmental Protection Act for approval of:

- two (2) natural gas fired boilers and one (1) natural gas fired hot water tank, having a maximum combined thermal input of 7.6 Gigajoules per hour;
- one (1) standby diesel generator set, having a rating of 200 kilowatts, to provide power for the building during emergency situations; and
- one (1) cooling tower;

all in accordance with the Application for Approval (Air & Noise) dated September 29, 2006 and signed by Linda Clement, (Section Head, Policy and Administration), The Professional Institute Building Trust Fund, and all supporting information associated with the application provided by Jeff Gleeson of Water and Earth Science Associates Ltd.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

- (1) "Act" means the *Environmental Protection Act*;
- (2) "Certificate" means this Certificate of Approval issued in accordance with Section 9 of the Act;
- (3) "Equipment" means the diesel generator set, combustion equipment and cooling tower described in the Owner's application, this Certificate and in the supporting documentation submitted with the application, to the extent approved by this Certificate;
- (4) "Generator Set" means the diesel generator set described in the Owner's application, this Certificate and in the supporting documentation submitted with the application, to the extent approved by this Certificate;
- (5) "Manual" means a document or a set of documents that provide written instructions to staff of the Owner;
- (6) "Ministry" means the Ontario Ministry of the Environment;
- (7) "Owner" means The Professional Institute Building Trust Fund, and includes its successors and assignees; and
- (8) "Publication NPC-205" means Ministry Publication NPC-205, Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban), October, 1995;

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

GENERAL

1. Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the Equipment in accordance with the description given in this Certificate, application for approval of the Equipment and the submitted supporting documents and plans and specifications as listed in this Certificate.
2. Where there is a conflict between a provision of any submitted document referred to in this Certificate and the Conditions of this Certificate, the Conditions in this Certificate shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.

PERFORMANCE

3. The Owner shall ensure that the noise emissions from the cooling tower comply with the limits set out in Publication NPC-205.

OPERATION AND MAINTENANCE

4. The Owner shall ensure that the Equipment is properly operated and maintained at all times. The Owner shall:
 - (1) prepare, not later than three (3) months after the date of this Certificate or the date of commissioning of the Equipment, and update, as necessary, a Manual outlining the operating procedures and a maintenance program for the Equipment, including:
 - (a) routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the Equipment suppliers;
 - (b) emergency procedures;
 - (c) procedures for any record keeping activities relating to operation and maintenance of the Equipment;
 - (d) all appropriate measures to minimize noise and odorous emissions from all potential sources;
 - (2) implement the recommendations of the Manual; and
 - (3) retain, for a minimum of two (2) years from the date of their creation, all records on the maintenance, repair and inspection of the Equipment, and make these records available for review by staff of the Ministry upon request.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition Nos. 1 and 2 are imposed to ensure that the Equipment is built and operated in the manner in which it was described for review and upon which approval was granted. These conditions are also included to emphasize the precedence of Conditions in the Certificate and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.
2. Condition No. 3 is included to provide the minimum performance requirement considered necessary to prevent an adverse effect resulting from the operation of the cooling tower.
3. Condition No. 4 is included to emphasize that the Equipment must be maintained and operated according to a procedure that will result in compliance with the Act, the regulations and this Certificate. In addition the Owner is required to keep records and provide information to staff of the Ministry so that compliance with the Act, the regulations and this Certificate can be verified.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written Notice served upon me, the Environmental Review Tribunal and in accordance with Section 47 of the Environmental Bill of Rights, S.O. 1993, Chapter 28, the Environmental Commissioner, within 15 days after receipt of

this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 Yonge St., Suite 1700
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Environmental Commissioner
1075 Bay Street, 6th Floor
Suite 605
Toronto, Ontario
M5S 2B1

AND

The Director
Section 9, *Environmental Protection Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

This instrument is subject to Section 38 of the Environmental Bill of Rights, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek leave to appeal within 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry at www.ene.gov.on.ca, you can determine when the leave to appeal period ends.

The above noted works are approved under Section 9 of the Environmental Protection Act.

DATED AT TORONTO this 14th day of April, 2007

Sarah Paul, P.Eng.
Director
Section 9, *Environmental Protection Act*

TT/
c: District Manager, MOE Ottawa District Office
Jeff Gleeson, WESA



Appendix C Stationary Noise Source Modelling Data

Environmental Noise and Vibration Assessment, Blocks 1 and 2 – Site Plan Approval Application

25 Pickering Place Development, Ottawa, ON

Colonnade BridgePort

SLR Project No.: 241.03870.00001

Appendix C-1 Sound Power Level Library



SOUND POWER LEVEL LIBRARY

| Name | ID | Overall A | Type | 1/3 Oktave Spectrum (dB) | | | | | | | | | | | Source | |
|--|------------------|--------------|--------|--------------------------|------|------|------|------|------|------|------|------|------|-------|--------|--|
| | | | | Weight. | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | A | lin | |
| HVAC Unit (1 ton, res) | HVAC_1ton | 78.5 | Lw | | 73 | 76 | 77 | 77 | 76 | 74 | 70 | 66 | 60 | 78.5 | 83.8 | SLR - H&K calc, adj against Man Data Avg |
| HVAC Unit (5 ton) | HVAC_5ton | 82.5 | Lw | | 77 | 80 | 81 | 81 | 80 | 78 | 74 | 70 | 64 | 82.5 | 87.8 | SLR - H&K calc, adj against Man Data Avg |
| HVAC Unit (10 ton) | HVAC_10ton | 85.5 | Lw | | 80 | 83 | 84 | 84 | 83 | 81 | 77 | 73 | 67 | 85.5 | 90.8 | SLR - H&K calc, adj against Man Data Avg |
| HVAC Unit (20 ton) | HVAC_20ton | 94.5 | Lw | | 89 | 92 | 93 | 93 | 92 | 90 | 86 | 82 | 76 | 94.5 | 99.8 | SLR - H&K calc, adj against Man Data Avg |
| HVAC Unit (30 ton) | HVAC_30ton | 97.8 | Lw | | | 90 | 93 | 94 | 94 | 93 | 91 | 87 | 83 | 97.8 | 100.8 | SLR - H&K calc, adj against Man Data Avg |
| Lennox KGA060S4BMAJ | Lennox_KGA060 | 86.7 | Lw | | | | 76 | 79 | 84 | 83 | 79 | 73 | 66 | 86.7 | 88.3 | Man. Data |
| Lennox LGH060H4EH4J | Lennox_LGH060 | 80.1 | Lw | | | | 67 | 72 | 77 | 76 | 73 | 68 | 61 | 80.1 | 81.4 | Man. Data |
| Generic 3500 cfm MUA - Inlet | GEN_MUA_Inlet | 74.9 | Lw | | | 78 | 79 | 73 | 75 | 69 | 63 | 56 | 45 | 74.9 | 83.1 | Man. Data Daiken Skyline |
| Generic Mechanical Intake/ Exhaust Plenum | GEN_Mech_Int_Ex | 81.6 | Lw | | | 82 | 81 | 81 | 81 | 76 | 71 | 66 | 58 | 81.6 | 87.7 | Man. Data Daiken Skyline |
| Air Cooled Condenser - 3 fan | ACC_3f | 93.3 | Lw | | | 95 | 101 | 95 | 91 | 87 | 82 | 76 | 67 | 93.3 | 103.2 | SLP, based on Bronte Green Meas |
| Air Cooled Condenser - 4 fan | ACC_4f | 94.3 | Lw | | | 96 | 102 | 96 | 92 | 88 | 83 | 77 | 68 | 94.3 | 104.2 | SLP, based on Bronte Green Meas |
| Air Cooled Condenser - 6 fan | ACC_6f | 96.3 | Lw | | | 98 | 104 | 98 | 94 | 90 | 85 | 79 | 70 | 96.3 | 106.2 | SLP, based on Bronte Green Meas |
| Air Cooled Condenser - 10 fan | ACC_10f | 98.3 | Lw | | | 100 | 106 | 100 | 96 | 92 | 87 | 81 | 72 | 98.3 | 108.2 | SLP, based on Bronte Green Meas |
| Generic Exhaust Fan- Medium | Gen_ExFan_M | 90 | Lw | | | 99 | 99 | 92 | 88 | 82 | 78 | 72 | 66 | 90 | 102.6 | SLR Database |
| Upblast Mushroom Fan - Small | MushroomEx_Small | 78.6 | Lw | | | | 80 | 75.8 | 79.4 | 71 | 67 | 64.4 | 59.3 | 78.6 | 83.9 | SLR Database |
| Upblast Mushroom Fan - Large | MushroomEx_Large | 81.4 | Lw | | | | 87.5 | 83.3 | 80.7 | 74.2 | 68.1 | 64.4 | 59.5 | 81.4 | 89.7 | SLR Database |
| 15 HP Cooling Tower (single cell) | CT15 | 99.2 | Lw | | 100 | 103 | 103 | 100 | 97 | 93 | 90 | 87 | 79 | 99.2 | 108.4 | SLR Database |
| Genset, w/ Acoustical Enclosure, 75 dBA at 7 m | Genset_Enclosed | 100.2 | Lw | | | 107 | 104 | 99 | 93 | 93 | 93 | 93 | 88 | 100.2 | 109.6 | Cummins 600DFGB Quiet Ste II |
| Automotive Shop Bay Door (Incl, penalties) | Auto_Door | 98.3 | Lw | | | 85.2 | 89.7 | 83.1 | 86.6 | 85.7 | 92.9 | 92.4 | 92.2 | 98.3 | 98.8 | SLR Database - Bronte Green |
| Bus Idling | Bus_Idling | 94.2 | Lw (c) | | 91.1 | 96.3 | 91.3 | 91.3 | 91 | 89.7 | 87.2 | 81.5 | 76.5 | 94.2 | 100.4 | SLR - TTC McNicoll Garage Meas |
| Bus Accelerating From Stop | Bus_Accel | 101.5 | Lw | | | 115 | 112 | 102 | 96 | 94 | 92 | 87 | 79 | 101.5 | 117 | SLR - TTC McNicoll |
| Bus Passby Low Speed | Bus_Travelling | 101.2 | Lw | | | 118 | 109 | 99 | 96 | 96 | 92 | 87 | 80 | 101.2 | 118.6 | SLR - TTC McNicoll |
| Idling VIA Loco - Siemens | VIA_Siemens_Avg | 103.7 | Lw | | 107 | 109 | 104 | 104 | 102 | 99 | 93 | 89 | 81 | 103.7 | 113.1 | Arithmetic Average of SLR and WSP |

Appendix C-2 VIA Ottawa Station Stationary Sources



VIA OTTAWA STATION POINT SOURCES

| Name | ID | Result: PwL | | | Lw / Li | Value | Correction | | | Sound Reduction | Attenuation | Operating Time | | | K0 | Freq. | Direct. | Height | Coordinates | | |
|--------------------------------|-----------------|-------------|---------|-------|---------|------------------|------------|-------|---------|-----------------|-------------|----------------|-------|---------|-------|-------|---------|--------|-------------|------------|-------|
| | | Day | Evening | Night | | | norm. | Day | Evening | Night | | Area | Day | Special | Night | | | | X | Y | Z |
| | | (dBA) | (dBA) | (dBA) | Type | | dB(A) | dB(A) | dB(A) | dB(A) | | (m²) | (min) | (min) | (min) | (dB) | (Hz) | (m) | (m) | (m) | (m) |
| Emergency Generator | GEN_VIATerminal | 100.2 | 100.2 | 100.2 | Lw | Genset_Enclosed | | 0 | 0 | 0 | | | 0 | 0 | 60 | 0 | (none) | 2.5 r | 449069.75 | 5029446.65 | 67.5 |
| AC1 (LG LSJ243HLV3) | SS_VIATerminal | 78.5 | 78.5 | 78.5 | Lw | HVAC_1ton | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 1.5 g | 449046.66 | 5029445.68 | 71.94 |
| AC2 (AAON) | SS_VIATerminal | 78.5 | 78.5 | 78.5 | Lw | HVAC_1ton | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 1.5 g | 449046.78 | 5029436.88 | 71.94 |
| RTU1 (Lennox GCS24-953-208-1J) | SS_VIATerminal | 86 | 86 | 86 | Lw | HVAC_5ton | 86 | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 1.5 g | 448959.63 | 5029399.79 | 71.94 |
| RTU2 (Lennox KGB036S4BM3J) | SS_VIATerminal | 74 | 74 | 74 | Lw | HVAC_5ton | 74 | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 1.5 g | 448958.68 | 5029413.07 | 71.94 |
| RTU3 (Lennox GCS16-413-100-9J) | SS_VIATerminal | 78 | 78 | 78 | Lw | HVAC_5ton | 78 | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 1.5 g | 448957.98 | 5029420.47 | 71.94 |
| RTU4 (Lennox KGA060S4BMAJ) | SS_VIATerminal | 86.7 | 86.7 | 86.7 | Lw | Lennox_KGA060 | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 1.5 g | 448956.02 | 5029428 | 71.94 |
| RTU5 (Lennox KGA060S4BMAJ) | SS_VIATerminal | 86.7 | 86.7 | 86.7 | Lw | Lennox_KGA060 | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 1.5 g | 448965.83 | 5029424.9 | 71.94 |
| RTU6 | SS_VIATerminal | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 1.5 g | 448979.32 | 5029438.62 | 71.94 |
| RTU7 (Lennox LGH060H4EH4J) | SS_VIATerminal | 80.1 | 80.1 | 80.1 | Lw | Lennox_LGH060 | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 1.5 g | 449045.86 | 5029407.05 | 71.94 |
| CU1 (REFPlus OVZ-304-1H1-8T) | SS_VIATerminal | 96.3 | 96.3 | 96.3 | Lw | ACC_6f | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 1.5 g | 448970.53 | 5029425.9 | 71.94 |
| CU2 (REFPlus OVZ-304-1H1-8T) | SS_VIATerminal | 96.3 | 96.3 | 96.3 | Lw | ACC_6f | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 1.5 g | 449048.99 | 5029433.87 | 71.94 |
| CU3 (AAON CFA-025-C-A-4-DC00K) | SS_VIATerminal | 94.3 | 94.3 | 94.3 | Lw | ACC_4f | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 1.5 g | 449046.28 | 5029440.4 | 71.94 |
| EF1 | SS_VIATerminal | 81.4 | 81.4 | 81.4 | Lw | MushroomEx_Large | | 0 | 0 | 0 | | | 60 | 60 | 60 | 0 | (none) | 0.5 g | 449053.77 | 5029443.22 | 70.94 |
| EF2 | SS_VIATerminal | 81.4 | 81.4 | 81.4 | Lw | MushroomEx_Large | | 0 | 0 | 0 | | | 60 | 60 | 60 | 0 | (none) | 0.5 g | 449058.89 | 5029441.07 | 70.94 |
| EF3 | SS_VIATerminal | 81.4 | 81.4 | 81.4 | Lw | MushroomEx_Large | | 0 | 0 | 0 | | | 60 | 60 | 60 | 0 | (none) | 74.5 a | 448997.31 | 5029428.13 | 74.5 |
| EF4 | SS_VIATerminal | 81.4 | 81.4 | 81.4 | Lw | MushroomEx_Large | | 0 | 0 | 0 | | | 60 | 60 | 60 | 0 | (none) | 74.5 a | 449020.44 | 5029430.64 | 74.5 |
| EF5 | SS_VIATerminal | 81.4 | 81.4 | 81.4 | Lw | MushroomEx_Large | | 0 | 0 | 0 | | | 60 | 60 | 60 | 0 | (none) | 74.5 a | 449000.58 | 5029400.6 | 74.5 |
| EF6 | SS_VIATerminal | 81.4 | 81.4 | 81.4 | Lw | MushroomEx_Large | | 0 | 0 | 0 | | | 60 | 60 | 60 | 0 | (none) | 74.5 a | 449023.21 | 5029402.98 | 74.5 |
| ES1 | SS_VIATerminal | 78.6 | 78.6 | 78.6 | Lw | MushroomEx_Small | | 0 | 0 | 0 | | | 60 | 60 | 60 | 0 | (none) | 1.5 g | 448953.53 | 5029403.11 | 71.94 |
| ES2 | SS_VIATerminal | 78.6 | 78.6 | 78.6 | Lw | MushroomEx_Small | | 0 | 0 | 0 | | | 60 | 60 | 60 | 0 | (none) | 1.5 g | 448955.67 | 5029403.19 | 71.94 |
| ES3 | SS_VIATerminal | 78.6 | 78.6 | 78.6 | Lw | MushroomEx_Small | | 0 | 0 | 0 | | | 60 | 60 | 60 | 0 | (none) | 1.5 g | 448955.03 | 5029395.35 | 71.94 |
| Idling Bus 1 | SS_VIATerminal | 94.2 | 94.2 | 94.2 | Lw | Bus_Idling | | 0 | 0 | 0 | | | 20 | 20 | 20 | 0 | (none) | 3.5 r | 449014.82 | 5029467.11 | 68.5 |
| Idling Bus 2 | SS_VIATerminal | 94.2 | 94.2 | 94.2 | Lw | Bus_Idling | | 0 | 0 | 0 | | | 20 | 20 | 0 | 0 | (none) | 3.5 r | 448999.7 | 5029465.66 | 68.5 |
| Idling Bus 3 | SS_VIATerminal | 94.2 | 94.2 | 94.2 | Lw | Bus_Idling | | 0 | 0 | 0 | | | 20 | 20 | 0 | 0 | (none) | 3.5 r | 448983.65 | 5029463.96 | 68.5 |
| VIA Locos - Sc1 | SS_VIA_Sc1 | 103.7 | 103.7 | 103.7 | Lw | VIA_Siemens_Avg | | 0 | 0 | 0 | | | 60 | 60 | 60 | 0 | (none) | 3.5 r | 449180.61 | 5029375.18 | 68.5 |
| VIA Locos - Sc1 | SS_VIA_Sc1 | 103.7 | 103.7 | 103.7 | Lw | VIA_Siemens_Avg | | 0 | 0 | 0 | | | 60 | 60 | 0 | 0 | (none) | 3.5 r | 449182.93 | 5029357.26 | 68.5 |
| VIA Locos - Sc1 | SS_VIA_Sc1 | 103.7 | 103.7 | 103.7 | Lw | VIA_Siemens_Avg | | 0 | 0 | 0 | | | 60 | 60 | 0 | 0 | (none) | 3.5 r | 449181.94 | 5029366.21 | 68.5 |

VIA OTTAWA STATION LINE SOURCES

| Name | ID | Result. PWL | | | Result. PWL' | | | Lw / Li | | Correction | | | Sound Reduction | | Attenuation | Operating Time | | | K0 | Freq. | Direct. | Moving Pt. Src | | | ht | | |
|--------------------------------------|----------------|--------------|------------------|----------------|--------------|------------------|----------------|---------|----------------|----------------|--------------|------------------|-----------------|---|-------------|----------------|--------------|------------------|----|-------|---------|----------------|---------------|---------|----|-------|-----------------|
| | | Day (dBA) | Evening (dBA) | Night (dBA) | Day (dBA) | Evening (dBA) | Night (dBA) | Type | Value | norm. dB(A) | Day dB(A) | Evening dB(A) | Night dB(A) | R | | Area (m²) | Day (min) | Special (min) | | | | Night (min) | Number Day | Evening | | Night | Speed (km/h) |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Buses to VIA Terminal | SS_VIATerminal | 85.3 | 85.3 | 80.5 | 61.2 | 61.2 | 56.4 | PWL-Pt | Bus_Travelling | 0 | 0 | 0 | | | | 0 | | (none) | 3 | 3 | 1 | 30 | | | | | |
| Buses to VIA Terminal - Accelerating | SS_VIATerminal | 84.5 | 84.5 | 79.8 | 66.2 | 66.2 | 61.5 | PWL-Pt | Bus_Accel | 0 | 0 | 0 | | | | 0 | | (none) | 3 | 3 | 1 | 10 1.5 | | | | | |
| Buses to VIA Terminal | SS_VIATerminal | 85 | 85 | 80.2 | 61.2 | 61.2 | 56.4 | PWL-Pt | Bus_Travelling | 0 | 0 | 0 | | | | 0 | | (none) | 3 | 3 | 1 | 30 | | | | | |

Appendix C-3 Other Off-Site Commercial/ Industrial Stationary Sources



OTHER OFF-SITE COMMERCIAL/ INDUSTRIAL SOURCES

| Name | ID | Result: FWL | | | Lw / Li Type Value | Correction | | | | Sound Reduction R | Attenuation Area (m²) | Operating Time | | | K0 (dB) | Freq. (Hz) | Direct. | Height (m) | Coordinates | | |
|---------------------|----------------|--------------|------------------|----------------|-----------------------|------------------|--------------|------------------|----------------|----------------------|-----------------------------|----------------|------------------|----------------|------------|-----------------|---------|---------------|-------------|------------|----------|
| | | Day (dBA) | Evening (dBA) | Night (dBA) | | norm. dB(A) | Day dB(A) | Evening dB(A) | Night dB(A) | | | Day (min) | Special (min) | Night (min) | | | | | X (m) | Y (m) | Z (m) |
| Genset | GEN_LevelThree | 100.2 | 100.2 | 100.2 | Lw | Genset_Enclosed | 0 | 0 | 0 | | | 60 | 0 | 0 | 0 | (none) | | 2.5 g | 449344.25 | 5029352.91 | 67.5 |
| Genset | GEN_PIPSC | 100.2 | 100.2 | 100.2 | Lw | Genset_Enclosed | 0 | 0 | 0 | | | 60 | 0 | 0 | 0 | (none) | | 2.5 g | 449171.98 | 5029617.21 | 65.5 |
| Emergency Generator | GEN_Zayo | 100.2 | 100.2 | 100.2 | Lw | Genset_Enclosed | 0 | 0 | 0 | | | 60 | 0 | 0 | 0 | (none) | | 3 r | 449229.6 | 5029303.3 | 68 |
| Bay Door | SS_AvenueTire | 98.3 | 98.3 | 98.3 | Lw | Auto_Door | 0 | 0 | 0 | | | 60 | 0 | 0 | 0 | Opening (ÖAL28) | | 3 r | 449330.31 | 5029462.66 | 68 |
| Bay Door | SS_AvenueTire | 98.3 | 98.3 | 98.3 | Lw | Auto_Door | 0 | 0 | 0 | | | 60 | 0 | 0 | 0 | Opening (ÖAL28) | | 3 r | 449331.35 | 5029454.64 | 68 |
| Bay Door | SS_AvenueTire | 98.3 | 98.3 | 98.3 | Lw | Auto_Door | 0 | 0 | 0 | | | 60 | 0 | 0 | 0 | Opening (ÖAL28) | | 3 r | 449328.2 | 5029473.04 | 68 |
| Outdoor Work | SS_AvenueTire | 98.3 | 98.3 | 98.3 | Lw | Auto_Door | 0 | 0 | 0 | | | 60 | 0 | 0 | 0 | (none) | | 3 r | 449332.51 | 5029468.34 | 68 |
| HVAC | SS_BestBuy | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449189.62 | 5029845.05 | 69.18 |
| HVAC | SS_BestBuy | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449206.21 | 5029847.08 | 69.18 |
| HVAC | SS_BestBuy | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449223.55 | 5029848.47 | 69.18 |
| HVAC | SS_BestBuy | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449225.34 | 5029823.56 | 69.18 |
| HVAC | SS_BestBuy | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449208 | 5029821.96 | 69.18 |
| HVAC | SS_BestBuy | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449192.65 | 5029820.37 | 69.18 |
| HVAC | SS_BestBuy | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449210.79 | 5029804.22 | 69.18 |
| HVAC | SS_BestBuy | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449215.18 | 5029853.86 | 69.18 |
| HVAC | SS_BestBuy | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449192.05 | 5029802.83 | 69.18 |
| HVAC | SS_BestBuy | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449233.52 | 5029815.18 | 69.18 |
| HVAC | SS_BestBuy | 78.8 | 78.8 | 78.8 | Lw | HVAC_1ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449230.72 | 5029857.24 | 69.18 |
| HVAC | SS_BestBuy | 78.8 | 78.8 | 78.8 | Lw | HVAC_1ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449231.32 | 5029853.26 | 69.18 |
| HVAC | SS_BestBuy | 78.8 | 78.8 | 78.8 | Lw | HVAC_1ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449233.52 | 5029853.46 | 69.18 |
| Exhaust | SS_BestBuy | 78.6 | 78.6 | 78.6 | Lw | MushroomEx_Small | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449200.23 | 5029854.25 | 69.18 |
| HVAC | SS_CdnTire | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449060.11 | 5029824.18 | 68.97 |
| HVAC | SS_CdnTire | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449061.87 | 5029805.85 | 68.97 |
| HVAC | SS_CdnTire | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449087.99 | 5029826.44 | 68.97 |
| HVAC | SS_CdnTire | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449120.14 | 5029829.83 | 68.97 |
| HVAC | SS_CdnTire | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449122.15 | 5029811.37 | 68.97 |
| HVAC | SS_CdnTire | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449103.06 | 5029792.91 | 68.97 |
| HVAC | SS_CdnTire | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449151.55 | 5029831.69 | 68.97 |
| HVAC | SS_CdnTire | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449153.61 | 5029807.64 | 68.97 |
| HVAC | SS_CdnTire | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449037.95 | 5029833.75 | 68.97 |
| HVAC | SS_CdnTire | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449054.57 | 5029835.17 | 68.97 |
| HVAC | SS_CdnTire | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449090.01 | 5029841.82 | 68.97 |
| Exhaust | SS_CdnTire | 81.4 | 81.4 | 81.4 | Lw | MushroomEx_Large | 0 | 0 | 0 | | | 60 | 60 | 0 | 0 | (none) | | 0.5 g | 449022.83 | 5029831.27 | 67.47 |
| Exhaust | SS_CdnTire | 81.4 | 81.4 | 81.4 | Lw | MushroomEx_Large | 0 | 0 | 0 | | | 60 | 60 | 0 | 0 | (none) | | 0.5 g | 449032.25 | 5029831.9 | 67.47 |
| Exhaust | SS_CdnTire | 81.4 | 81.4 | 81.4 | Lw | MushroomEx_Large | 0 | 0 | 0 | | | 60 | 60 | 0 | 0 | (none) | | 0.5 g | 449046.32 | 5029810.93 | 67.47 |
| Exhaust | SS_CdnTire | 78.6 | 78.6 | 78.6 | Lw | MushroomEx_Small | 0 | 0 | 0 | | | 60 | 60 | 0 | 0 | (none) | | 0.5 g | 449043.3 | 5029839.69 | 67.47 |
| CT | SS_ESDC | 99.2 | 99.2 | 99.2 | Lw | CT15 | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 3.5 g | 448927.98 | 5029256.69 | 108.5 |
| CT | SS_ESDC | 99.2 | 99.2 | 99.2 | Lw | CT15 | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 3.5 g | 448930.91 | 5029257.08 | 108.5 |
| HVACMech Room Vent | SS_ESDC | 81.6 | 81.6 | 81.6 | Lw | GEN_Mech_Int_Ex | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | Opening (ÖAL28) | | 1.5 g | 448906.81 | 5029236.66 | 106.5 |
| HVACMech Room Vent | SS_ESDC | 81.6 | 81.6 | 81.6 | Lw | GEN_Mech_Int_Ex | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | Opening (ÖAL28) | | 1.5 g | 448950.33 | 5029237.13 | 106.5 |
| HVACMech Room Vent | SS_ESDC | 81.6 | 81.6 | 81.6 | Lw | GEN_Mech_Int_Ex | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | Opening (ÖAL28) | | 1.5 g | 448947.96 | 5029258.06 | 106.5 |
| HVACMech Room Vent | SS_ESDC | 81.6 | 81.6 | 81.6 | Lw | GEN_Mech_Int_Ex | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | Opening (ÖAL28) | | 1.5 g | 448904.39 | 5029258.16 | 106.5 |
| ACC | SS_LevelThree | 98.3 | 98.3 | 98.3 | Lw | ACC_10f | 0 | 0 | 0 | | | 45 | 45 | 45 | 0 | (none) | | 2 g | 449349.52 | 5029353.66 | 67 |
| CT | SS_PIPSC | 96.2 | 96.2 | 86.2 | Lw | CT15 | -3 | -3 | -13 | | | 60 | 60 | 60 | 0 | Opening (ÖAL28) | | 0.1 g | 449132.57 | 5029596.49 | 90.55 |
| Mech Penthouse Vent | SS_PIPSC | 81.6 | 81.6 | 81.6 | Lw | GEN_Mech_Int_Ex | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | Opening (ÖAL28) | | 1.5 g | 449171.26 | 5029596.91 | 85.5 |
| Mech Penthouse Vent | SS_PIPSC | 81.6 | 81.6 | 81.6 | Lw | GEN_Mech_Int_Ex | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | Opening (ÖAL28) | | 1.5 g | 449163.58 | 5029609.75 | 85.5 |
| Mech Penthouse Vent | SS_PIPSC | 81.6 | 81.6 | 81.6 | Lw | GEN_Mech_Int_Ex | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | Opening (ÖAL28) | | 1.5 g | 449126.69 | 5029611.88 | 85.5 |
| Mech Penthouse Vent | SS_PIPSC | 81.6 | 81.6 | 81.6 | Lw | GEN_Mech_Int_Ex | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | Opening (ÖAL28) | | 1.5 g | 449132.53 | 5029624.44 | 85.5 |
| CT | SS_PIPSC | 93.2 | 93.2 | 83.2 | Lw | CT15 | -6 | -6 | -16 | | | 60 | 60 | 60 | 0 | Opening (ÖAL28) | | 3 g | 449134.11 | 5029596.6 | 87 |
| CT | SS_PIPSC | 93.2 | 93.2 | 83.2 | Lw | CT15 | -6 | -6 | -16 | | | 60 | 60 | 60 | 0 | Opening (ÖAL28) | | 3 g | 449130.66 | 5029596.36 | 87 |
| ACC | SS_PIPSC | 98.3 | 98.3 | 98.3 | Lw | ACC_10f | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 1 g | 449156.72 | 5029582.86 | 85 |
| Exhaust | SS_ROMP | 78.6 | 78.6 | 78.6 | Lw | MushroomEx_Small | 0 | 0 | 0 | | | 60 | 60 | 60 | 0 | (none) | | 0.5 g | 449457.13 | 5029936.98 | 86.61 |
| HVAC | SS_ROMP | 97.8 | 97.8 | 97.8 | Lw | HVAC_30ton | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449473.88 | 5029938.87 | 84.11 |

| Name | ID | Result. PWL | | | Lw / Li | | Correction | | | | Sound Reduction | | Attenuation | Operating Time | | | K0 | Freq. | Direct. | Height | Coordinates | | |
|---------------------|----------------|-------------|---------|-------|---------|-----------------|------------|-------|---------|-------|-----------------|------|-------------|----------------|---------|-------|------|-----------------|---------|--------|-------------|------------|-------|
| | | Day | Evening | Night | Type | Value | norm. | Day | Evening | Night | R | Area | | Day | Special | Night | | | | | X | Y | Z |
| | | (dBA) | (dBA) | (dBA) | | | dB(A) | dB(A) | dB(A) | dB(A) | | (m²) | | (min) | (min) | (min) | (dB) | (Hz) | | (m) | (m) | (m) | (m) |
| HVAC | SS_ROMP | 97.8 | 97.8 | 97.8 | Lw | HVAC_30ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449474.28 | 5029933.49 | 84.11 |
| Mech Penthouse Vent | SS_ROMP | 81.6 | 81.6 | 81.6 | Lw | GEN_Mech_Int_Ex | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | Opening (ÖAL28) | | 1.5 g | 449452.78 | 5029938.72 | 83.61 |
| HVAC | SS_ROMP | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449429.42 | 5029889.55 | 84.09 |
| HVAC | SS_ROMP | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449430.24 | 5029883.31 | 84.09 |
| HVAC | SS_ROMP | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449463.63 | 5029888.7 | 84.09 |
| HVAC | SS_ROMP | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449483.46 | 5029897.97 | 84.09 |
| HVAC | SS_ROMP | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449484.96 | 5029879.43 | 84.09 |
| HVAC | SS_ROMP | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449471.1 | 5029899.96 | 84.09 |
| HVAC | SS_ROMP | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449494.03 | 5029897.97 | 84.09 |
| HVAC | SS_ROMP | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449494.33 | 5029879.43 | 84.09 |
| HVAC | SS_ROMP | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449440.1 | 5029845.84 | 84.09 |
| HVAC | SS_ROMP | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449436.22 | 5029816.73 | 84.09 |
| HVAC | SS_ROMP | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449480.87 | 5029826.9 | 84.09 |
| HVAC | SS_ROMP | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449526.82 | 5029829.99 | 84.09 |
| HVAC | SS_ROMP | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449513.76 | 5029866.67 | 84.09 |
| HVAC | SS_ROMP | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449492.93 | 5029859.69 | 84.09 |
| HVAC | SS_ROMP | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449521.54 | 5029901.55 | 84.09 |
| HVAC | SS_ROMP | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449521.14 | 5029896.97 | 84.09 |
| AOC | SS_ROMP | 93.3 | 93.3 | 93.3 | Lw | AOC_3f | | 0 | 0 | 0 | | | | 45 | 45 | 45 | 0 | (none) | | 2 r | 449505.75 | 5029807.49 | 68.63 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449296.27 | 5029204.4 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449297.77 | 5029189.84 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449321.88 | 5029212.19 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449323.14 | 5029200.39 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449324.14 | 5029188.83 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449341.72 | 5029218.72 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449343.98 | 5029195.61 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449357.29 | 5029220.22 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449359.8 | 5029197.12 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449369.35 | 5029221.98 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449371.61 | 5029198.38 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449387.43 | 5029223.74 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449389.69 | 5029200.39 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449399.98 | 5029224.74 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449402.49 | 5029201.39 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449420.58 | 5029214.95 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449422.33 | 5029203.4 | 74 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449490.3 | 5029210.9 | 75.07 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449515.42 | 5029202.93 | 75.07 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449526.38 | 5029194.96 | 75.07 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449545.52 | 5029181.8 | 75.07 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449563.46 | 5029169.25 | 75.07 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449574.25 | 5029161.83 | 75.07 |
| HVAC | SS_SmartCentre | 94.5 | 94.5 | 94.5 | Lw | HVAC_20ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449589 | 5029151.26 | 75.07 |
| HVAC | SS_SmartCentre | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449273.91 | 5029220.45 | 74 |
| HVAC | SS_SmartCentre | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449276.91 | 5029197.76 | 74 |
| HVAC | SS_SmartCentre | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449482.92 | 5029203.62 | 75.07 |
| HVAC | SS_SmartCentre | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449484.03 | 5029195 | 75.07 |
| HVAC | SS_SmartCentre | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449497.55 | 5029206.14 | 75.07 |
| HVAC | SS_SmartCentre | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449537.22 | 5029187 | 75.07 |
| HVAC | SS_SmartCentre | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449555.74 | 5029175.43 | 75.07 |
| HVAC | SS_SmartCentre | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449599.48 | 5029144.02 | 75.07 |
| HVAC | SS_SmartCentre | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449614.23 | 5029135.05 | 75.07 |
| HVAC | SS_SmartCentre | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449275.08 | 5029211.8 | 74 |
| HVAC | SS_SmartCentre | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449282.32 | 5029206.42 | 74 |
| HVAC | SS_SmartCentre | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | | 0 | 0 | 0 | | | | 60 | 60 | 30 | 0 | (none) | | 2 g | 449284.83 | 5029192.11 | 74 |

| Name | ID | Result. PWL | | | Lw / Li | | Correction | | | | Sound Reduction | Attenuation | Operating Time | | | K0 | Freq. | Direct. | Height | Coordinates | | | |
|----------|----------------|-------------|---------|-------|---------|------------------|------------|-------|---------|-------|-----------------|-------------|----------------|-------|---------|-------|--------|---------|-----------|-------------|-------|-----|-----|
| | | Day | Evening | Night | Type | Value | norm. | Day | Evening | Night | R | | Area | Day | Special | Night | (dB) | | | (Hz) | X | Y | Z |
| | | (dBA) | (dBA) | (dBA) | | | dB(A) | dB(A) | dB(A) | | (m²) | | (min) | (min) | (min) | (dB) | (Hz) | | | (m) | (m) | (m) | (m) |
| HVAC | SS_SmartCentre | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 2 g | 449277.54 | 5029187.08 | 74 | | |
| HVAC | SS_SmartCentre | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 2 g | 449276.04 | 5029178.17 | 74 | | |
| HVAC | SS_SmartCentre | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 2 g | 449278.55 | 5029173.9 | 74 | | |
| HVAC | SS_SmartCentre | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 2 g | 449341.94 | 5029183.94 | 74 | | |
| HVAC | SS_SmartCentre | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 2 g | 449480.99 | 5029220.11 | 75.07 | | |
| HVAC | SS_SmartCentre | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 2 g | 449483.13 | 5029220.36 | 75.07 | | |
| HVAC | SS_SmartCentre | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 2 g | 449481.37 | 5029210.31 | 75.07 | | |
| HVAC | SS_SmartCentre | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 2 g | 449618.24 | 5029139.68 | 75.07 | | |
| HVAC | SS_SmartCentre | 82.5 | 82.5 | 82.5 | Lw | HVAC_5ton | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 2 g | 449605.39 | 5029139.38 | 75.07 | | |
| Exhaust | SS_SmartCentre | 81.4 | 81.4 | 81.4 | Lw | MushroomEx_Large | | 0 | 0 | 0 | | | 60 | 60 | 0 | 0 | (none) | 0.5 g | 449278.36 | 5029207.19 | 72.5 | | |
| Exhaust | SS_SmartCentre | 78.6 | 78.6 | 78.6 | Lw | MushroomEx_Small | | 0 | 0 | 0 | | | 60 | 60 | 0 | 0 | (none) | 0.5 g | 449275.83 | 5029200.7 | 72.5 | | |
| MUA | SS_SmartCentre | 74.9 | 74.9 | 74.9 | Lw | GEN_MUA_Inlet | | 0 | 0 | 0 | | | 60 | 60 | 0 | 0 | (none) | 0.5 g | 449274.56 | 5029206.71 | 72.5 | | |
| Exhaust | SS_SmartCentre | 90 | 90 | 90 | Lw | Gen_ExFan_M | | 0 | 0 | 0 | | | 60 | 60 | 0 | 0 | (none) | 0.5 g | 449276.23 | 5029216.92 | 72.5 | | |
| Bay Door | SS_Valvoline | 98.3 | 98.3 | 98.3 | Lw | Auto_Door | | 0 | 0 | 0 | | | 60 | 0 | 0 | 0 | (none) | 3 r | 449356.26 | 5029519.14 | 69 | | |
| Bay Door | SS_Valvoline | 98.3 | 98.3 | 98.3 | Lw | Auto_Door | | 0 | 0 | 0 | | | 60 | 0 | 0 | 0 | (none) | 3 r | 449367.94 | 5029520.04 | 69.52 | | |
| Bay Door | SS_Valvoline | 98.3 | 98.3 | 98.3 | Lw | Auto_Door | | 0 | 0 | 0 | | | 60 | 0 | 0 | 0 | (none) | 3 r | 449360.13 | 5029519.44 | 69.15 | | |
| Bay Door | SS_Valvoline | 98.3 | 98.3 | 98.3 | Lw | Auto_Door | | 0 | 0 | 0 | | | 60 | 0 | 0 | 0 | (none) | 3 r | 449363.98 | 5029519.74 | 69.33 | | |
| HVAC | SS_Zayo | 97.8 | 97.8 | 97.8 | Lw | HVAC_30ton | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 2 g | 449213.47 | 5029281.54 | 72 | | |
| HVAC | SS_Zayo | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 2 g | 449254.15 | 5029285.06 | 72 | | |
| ACC | SS_Zayo | 93.3 | 93.3 | 93.3 | Lw | ACC_3f | | 0 | 0 | 0 | | | 45 | 45 | 45 | 0 | (none) | 2 g | 449253.27 | 5029291.09 | 72 | | |
| HVAC | SS_Zayo | 85.5 | 85.5 | 85.5 | Lw | HVAC_10ton | | 0 | 0 | 0 | | | 60 | 60 | 30 | 0 | (none) | 2 g | 449243.55 | 5029296.92 | 72 | | |



Appendix D Transportation Noise Source Modelling Data and Calculations

Environmental Noise and Vibration Assessment, Blocks 1 and 2 – Site Plan Approval Application

25 Pickering Place Development, Ottawa, ON

Colonnade BridgePort

SLR Project No.: 241.03870.00001

Appendix D-1 VIA Train Schedule Data, Speeds and Forecasts



Train Schedule:

Ottawa - Montréal - Sainte Foy - Québec

- Locations in bold indicate a possible connection.
- No local service between Montréal and Saint-Lambert
- No local service between Québec City, Sainte-Foy and Charny
- For a stop at this station, reservations are required at least 40 minutes before the train departs from its station of origin. Train 22 stops in Saint-Hyacinthe on Saturdays and Sundays only.
- No local service between Montreal and Dorval
- No local service between Dorval and Montreal

| # Train | | 22 | 20 | 622 | 624 | 24 | 26 | 26 | 28 | 38 | 38 | 38 |
|--|-----------|------------------------------|----------------|----------------|-----------------------|------------------------------|------------------------------|------------------------------|------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Business class | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Baggage check-in | | No | No | No | No | No | No | No | No | No | No | No |
| Dates | | All year round | All year round | All year round | All year round | All year round | All year round | All year round | All year round | From 2024-11-04 to 2024-12-23 | From 2024-12-24 to 2025-01-01 | From 2025-01-02 to 2059-12-31 |
| Days | | Day 1 MTWTFSS | - | - | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS |
| Ottawa, ON | Departure | 06:07 Eastern Time | - | - | 07:45 Eastern Time | 10:13 Eastern Time | 14:17 Eastern Time | 14:17 Eastern Time | 16:05 Eastern Time | 17:55 Eastern Time | 17:55 Eastern Time | 17:55 Eastern Time |
| Casselman, ON Reservations are required at least 40 minutes before the train departure from its original station for a stop at Casselman. | Departure | 06:34 | - | - | - | - | - | - | 16:32 | 18:27 | 18:27 | 18:27 |
| Alexandria, ON | Departure | 06:57 | - | - | 08:33 | 11:05 | 15:05 | 15:05 | 16:54 | 18:51 | 18:51 | 18:51 |

| | | | | | | | | | | | | |
|---|-----------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------|-------------------|-------------------|
| Coteau, QC Fridays only | Departure | 07:25 | - | - | - | 11:27 | 15:27 | 15:27 | 17:16 | - | - | - |
| Dorval, QC Shuttle service runs between the station and the airport. Stops to disembark. Conditional stop | Arrival | - | - | - | - | 11:50 | 15:49 | 15:49 | 17:38 | - | - | - |
| | Departure | 07:49 | - | - | 09:18 | 11:54 | 15:53 | 15:53 | 17:42 | 19:35 | 19:35 | 19:35 |
| Days | | - | Day 1 MTWTFSS | Day 1 MTWTFSS | - | - | - | - | - | - | - | - |
| Montréal, QC | Arrival | 08:11 | - | - | 09:39 | 12:15 | 16:15 | 16:15 | 18:04 | 19:57 | 19:57 | 19:57 |
| | Departure | 08:36 | 06:25 Eastern Time | 08:20 Eastern Time | 10:15 | 12:45 | 16:40 | 16:40 | 18:25 | - Eastern Time | - Eastern Time | - Eastern Time |
| Saint-Lambert, QC | Departure | 08:50 | 06:40 | 08:34 | 10:30 | 13:00 | 16:54 | 16:54 | 18:40 | - | - | - |
| Saint-Hyacinthe, QC Saturdays and Sundays only | Departure | 09:17 | 07:08 | 09:02 | 11:07 | 13:27 | 17:21 | 17:21 | 19:08 | - | - | - |
| Drummondville, QC | Departure | 09:46 | 07:45 | 09:31 | 11:36 | 13:56 | 18:07 | 18:07 | 19:54 | - | - | - |
| Charny, QC | Departure | - | - | - | 13:14 | 15:39 | 19:46 | 19:46 | 21:15 | - | - | - |
| Sainte-Foy, QC Shuttle operates between Ste-Foy and Québec city (Gare du Palais) in both directions. Reservations are required. Conditional stop | Arrival | 11:19 | - | 11:11 | 13:20 | - | - | - | - | - | - | - |
| | Departure | 11:22 | 09:27 | 11:14 | 13:23 | 15:47 | 19:54 | 19:54 | 21:23 | - | - | - |
| Québec, QC | Arrival | 11:47 Eastern Time | 09:52 Eastern Time | 11:39 Eastern Time | 13:48 Eastern Time | 16:12 Eastern Time | 20:19 Eastern Time | 20:19 Eastern Time | 21:48 Eastern Time | - | - | - |

Train Schedule:

Québec - Sainte Foy - Montréal - Ottawa

- Locations in bold indicate a possible connection.
- No local service between Ottawa and Fallowfield
- No local service between Québec City, Sainte-Foy and Charny

| | | | | | | | | | | |
|--|----------------------|-------------------------------|-------------------------------|-------------------------------|-----------------------|-----------------------|----------------|-----------------------|-----------------------|-----------------------|
| # Train | | 31 | 31 | 31 | 33 | 35 | 633 | 37 | 39 | 29 |
| Business class | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Baggage check-in | | No | No | No | No | No | No | No | No | No |
| Dates | | From 2024-11-04 to 2024-12-24 | From 2024-12-25 to 2025-01-02 | From 2025-01-03 to 2059-12-31 | All year round | All year round | All year round | All year round | All year round | All year round |
| Days | | - | - | - | Day 1 MTWTFSS | Day 1 MTWTFSS | - | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS |
| Québec, QC No local service between Québec and Sainte-Foy. | Departure | - | - | - | 05:29 Eastern Time | 08:06 Eastern Time | - | 12:32 Eastern Time | 14:57 Eastern Time | 17:41 Eastern Time |
| Sainte-Foy, QC Shuttle operates between Ste-Foy and Québec city (Gare du Palais) in both directions. Reservations are required. | Arrival Departure | - | - | - | 05:54 05:57 | 08:31 08:34 | - | 12:57 13:00 | - 15:24 | - 18:08 |
| Charny, QC | Departure | - | - | - | 06:05 | 08:42 | - | - | - | - |
| Drummondville, QC | Arrival Departure | - | - | - | 07:26 07:30 | 10:14 10:17 | - | - 14:46 | - 17:00 | - 19:44 |

| | | | | | | | | | | |
|---|----------------------|----------------------------|----------------------------|----------------------------|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|----------------------------|
| Saint-Hyacinthe, QC | Departure | - | - | - | 07:58 | 10:46 | - | 15:14 | - | 20:20 |
| Saint-Lambert, QC Conditional stop No local service between Saint-Lambert and Montreal. | Departure | - | - | - | 08:24 | 11:13 | - | 15:41 | 17:58 | 20:47 |
| Days | | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | - | - | Day 1 MTWTFSS | - | - | - |
| Montréal, QC | Arrival Departure | - 06:20 Eastern Time | - 06:20 Eastern Time | - 06:20 Eastern Time | 08:37 09:00 | 11:26 11:54 | - 09:00 Eastern Time | 15:54 16:30 | 18:11 18:50 | 21:00 - Eastern Time |
| Dorval, QC Shuttle service runs between the station and the airport. | Arrival Departure | 06:44 06:47 | 06:44 06:47 | 06:44 06:47 | - 09:26 | 12:18 12:22 | 09:24 09:27 | 16:54 16:59 | 19:14 19:19 | - |
| Coteau, QC | Departure | - | - | - | - | 12:47 | - | 17:24 | 19:45 | - |
| Alexandria, ON | Departure | 07:38 | 07:38 | 07:38 | 10:12 | 13:10 | 10:13 | 17:46 | 20:07 | - |
| Casselman, ON Conditional stop For a stop at this station, reservations are required at least 40 minutes before the train departs from its station of origin. | Departure | 08:00 | 08:00 | 08:00 | 10:34 | 13:33 | 10:35 | - | - | - |
| Ottawa, ON | Arrival | 08:25 Eastern Time | 08:25 Eastern Time | 08:25 Eastern Time | 11:04 Eastern Time | 13:58 Eastern Time | 11:05 Eastern Time | 18:36 Eastern Time | 20:51 Eastern Time | - |
| Fallowfield, ON | - | - | - | - | - | - | - | - | - | - |

Train Schedule:

Ottawa - Kingston - Toronto

- Locations in bold indicate a possible connection.

| # Train | | 41 | 641 | 641 | 641 | 641 | 43 | 643 | 45 | 53 | 47 | 47 | 47 | 645 | 645 | 645 | 645 | 645 | 645 | 645 | 645 |
|------------------|-----------|------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------|--------------------|--------------------|--------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Business class | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Baggage check-in | | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No |
| Dates | | All year round | From 2024-11-04 to 2024-12-24 | From 2024-12-25 to 2024-12-25 | From 2024-12-26 to 2025-01-01 | From 2025-01-02 to 2025-01-31 | All year round | All year round | All year round | All year round | From 2024-11-11 to 2024-12-15 | From 2024-12-20 to 2025-01-05 | From 2025-01-09 to 2025-01-31 | From 2024-11-11 to 2024-12-19 | From 2024-12-20 to 2024-12-20 | From 2024-12-21 to 2024-12-24 | From 2024-12-25 to 2024-12-25 | From 2024-12-26 to 2024-12-26 | From 2024-12-27 to 2024-12-27 | From 2024-12-28 to 2025-01-02 | From 2025-01-03 to 2025-01-03 |
| Days | | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS |
| Ottawa, ON | Departure | 12:21 | 04:13 Eastern Time | 04:13 Eastern Time | 04:13 Eastern Time | 04:13 Eastern Time | 09:35 Eastern Time | 08:29 Eastern Time | 10:24 Eastern Time | 11:43 Eastern Time | 12:23 Eastern Time | 12:23 Eastern Time | 12:23 Eastern Time | 14:29 Eastern Time | 14:29 Eastern Time | 14:29 Eastern Time | 14:29 Eastern Time | 14:29 Eastern Time | 14:29 Eastern Time | 14:29 Eastern Time | 14:29 Eastern Time |
| | Arrival | | | | | | | | | | | | | | | | | | | | |
| Fallowfield, ON | Departure | 14:40 | 04:33 | 04:33 | 04:33 | 04:33 | 09:56 | 08:50 | 10:44 | 12:05 | 12:44 | 12:44 | 12:44 | 14:55 | 14:55 | 14:55 | 14:55 | 14:55 | 14:55 | 14:55 | 14:55 |
| | Arrival | | | | | | | | | | | | | | | | | | | | |
| Smiths Falls, ON | Departure | 15:10 | 05:02 | 05:02 | 05:02 | 05:02 | - | 09:20 | - | - | 13:20 | 13:20 | 13:20 | - | - | - | - | - | - | - | - |
| | Arrival | | - | - | - | - | | 09:17 | | | - | - | - | | | | | | | | |
| Brockville, ON | Departure | 15:43 | 05:34 | 05:34 | 05:34 | 05:34 | - | 09:52 | - | 13:05 | 13:57 | 13:57 | 13:57 | - | - | - | - | - | - | - | - |
| | Arrival | | - | - | - | - | | 09:49 | | 13:01 | 13:54 | 13:54 | 13:54 | | | | | | | | |
| Gananoque, ON | Departure | | - | - | - | - | - | - | - | 13:32 | 14:24 | 14:24 | 14:24 | - | - | - | - | - | - | - | - |
| | Arrival | | | | | | | | | | | | | | | | | | | | |
| Kingston, ON | Departure | 16:29 | 06:19 | 06:19 | 06:19 | 06:19 | 11:35 | 10:36 | 12:31 | 13:58 | 14:49 | 14:49 | 14:49 | 16:38 | 16:38 | 16:38 | 16:38 | 16:38 | 16:38 | 16:38 | 16:38 |
| | Arrival | 16:25 | 06:16 | 06:16 | 06:16 | 06:16 | 11:31 | 10:32 | 12:26 | 13:54 | 14:45 | 14:45 | 14:45 | 16:34 | 16:34 | 16:34 | 16:34 | 16:34 | 16:34 | 16:34 | 16:34 |
| Napanee, ON | Departure | 16:50 | - | - | - | - | - | 10:59 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Arrival | | | | | | | | | | | | | | | | | | | | |
| Belleville, ON | Departure | 17:10 | 06:59 | 06:59 | 06:59 | 06:59 | - | 11:20 | - | 14:39 | 15:30 | 15:30 | 15:30 | 17:18 | 17:18 | 17:18 | 17:18 | 17:18 | 17:18 | 17:18 | 17:18 |
| | Arrival | 17:07 | 06:56 | 06:56 | 06:56 | 06:56 | | 11:17 | | 14:36 | 15:26 | 15:26 | 15:26 | 17:15 | 17:15 | 17:15 | 17:15 | 17:15 | 17:15 | 17:15 | 17:15 |

| | | | | | | | | | | | | | | | | | | | | | |
|--|-----------|------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Trenton Junction, ON | Departure | 21 | - | - | - | - | - | 11:33 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Cobourg, ON | Arrival | 44 | - | - | - | - | - | - | - | 15:12 | - | - | - | - | - | - | - | - | - | - | - |
| | Departure | 47 | 07:33 | 07:33 | 07:33 | 07:33 | - | 11:59 | - | 15:15 | - | - | - | - | - | - | - | - | - | - | - |
| Port Hope, ON | Departure | | 07:43 | 07:43 | 07:43 | 07:43 | - | 12:09 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Oshawa, ON | Arrival | 19 | - | - | - | - | - | 12:35 | - | 15:48 | 16:33 | 16:33 | 16:33 | 18:20 | 18:20 | 18:20 | 18:20 | 18:20 | 18:20 | 18:20 | 18:20 |
| | Departure | 22 | - | - | - | - | - | 12:38 | - | 15:51 | 16:36 | 16:36 | 16:36 | 18:23 | 18:23 | 18:23 | 18:23 | 18:23 | 18:23 | 18:23 | 18:23 |
| Guildwood, ON | Departure | | - | - | - | - | 13:30 | 13:00 | - | 16:15 | 17:00 | 17:00 | 17:00 | - | - | - | - | - | - | - | - |
| Toronto, ON Shuttle service runs between the station and the airport. | Arrival | 02 Turn ne | 08:48 Eastern Time | 08:48 Eastern Time | 08:48 Eastern Time | 08:48 Eastern Time | 13:48 Eastern Time | 13:18 Eastern Time | 14:48 Eastern Time | 16:33 Eastern Time | 17:18 Eastern Time | 17:18 Eastern Time | 17:18 Eastern Time | 19:03 Eastern Time | 19:03 Eastern Time | 19:03 Eastern Time | 19:03 Eastern Time | 19:03 Eastern Time | 19:03 Eastern Time | 19:03 Eastern Time | 19:03 Eastern Time |

Train Schedule:

Toronto - Kingston - Ottawa

- Locations in bold indicate a possible connection.

| # Train | | 50 | 50 | 50 | 52 | 40 | 42 | 44 | 44 | 46 | 54 | 54 | 54 | 48 | 644 | 644 | 646 |
|--|-----------|-------------------------------|-------------------------------|-------------------------------|--------------------|--------------------|--------------------|-------------------------------|-------------------------------|--------------------|-------------------------------|-------------------------------|-------------------------------|--------------------|-------------------------------|-------------------------------|--------------------|
| Business class | | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | No | No |
| Baggage check-in | | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No |
| Dates | | From 2024-11-11 to 2024-12-24 | From 2024-12-25 to 2025-01-01 | From 2025-01-02 to 2059-12-31 | All year round | All year round | All year round | From 2024-11-11 to 2024-12-25 | From 2024-12-27 to 2059-12-31 | All year round | From 2024-11-11 to 2024-12-15 | From 2024-12-21 to 2025-01-04 | From 2025-01-09 to 2059-12-31 | All year round | From 2024-11-11 to 2024-12-24 | From 2024-12-26 to 2059-12-31 | All year round |
| Days | | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS | Day 1 MTWTFSS |
| Toronto, ON Shuttle service runs between the station and the airport. | Departure | 06:32 Eastern Time | 06:32 Eastern Time | 06:32 Eastern Time | 08:32 Eastern Time | 10:32 Eastern Time | 12:17 Eastern Time | 14:17 Eastern Time | 14:17 Eastern Time | 15:32 Eastern Time | 17:32 Eastern Time | 17:32 Eastern Time | 17:32 Eastern Time | 18:32 Eastern Time | 13:17 Eastern Time | 13:17 Eastern Time | 16:32 Eastern Time |
| Guildwood, ON | Departure | 06:52 | 06:52 | 06:52 | 08:52 | 10:52 | 12:37 | - | - | 15:52 | 17:52 | 17:52 | 17:52 | 18:52 | 13:37 | 13:37 | 16:52 |
| Oshawa, ON | Arrival | 07:08 | 07:08 | 07:08 | 09:09 | - | 12:55 | 14:54 | 14:54 | 16:09 | 18:08 | 18:08 | 18:08 | 19:08 | 13:53 | 13:53 | - |
| | Departure | 07:12 | 07:12 | 07:12 | 09:13 | - | 12:58 | 14:57 | 14:57 | 16:12 | 18:11 | 18:11 | 18:11 | 19:11 | 13:56 | 13:56 | 17:11 |
| Port Hope, ON | Departure | - | - | - | - | - | 13:27 | - | - | - | 18:39 | 18:39 | 18:39 | 19:38 | - | - | - |
| Cobourg, ON | Arrival | 07:43 | 07:43 | 07:43 | 09:44 | - | - | - | - | - | - | - | - | - | - | - | - |
| | Departure | 07:46 | 07:46 | 07:46 | 09:47 | - | 13:37 | - | - | 16:45 | 18:48 | 18:48 | 18:48 | 19:47 | 14:30 | 14:30 | - |

| | | | | | | | | | | | | | | | | | |
|----------------------|-----------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Trenton Junction, ON | Departure | - | - | - | - | - | 14:03 | - | - | - | 19:15 | 19:15 | 19:15 | 20:14 | - | - | - |
| Belleville, ON | Arrival | 08:18 | 08:18 | 08:18 | 10:20 | 12:09 | 14:15 | - | - | - | 19:27 | 19:27 | 19:27 | 20:25 | 15:03 | 15:03 | - |
| | Departure | 08:21 | 08:21 | 08:21 | 10:23 | 12:12 | 14:18 | - | - | - | 19:30 | 19:30 | 19:30 | 20:28 | 15:06 | 15:06 | 18:15 |
| Napanee, ON | Departure | - | - | - | - | - | 14:38 | - | - | - | 19:50 | 19:50 | 19:50 | 20:47 | - | - | - |
| Kingston, ON | Arrival | 08:57 | 08:57 | 08:57 | 11:00 | 12:48 | 14:58 | 16:32 | 16:32 | 17:54 | 20:09 | 20:09 | 20:09 | 21:06 | 15:43 | 15:43 | - |
| | Departure | 09:02 | 09:02 | 09:02 | 11:05 | 12:52 | 15:02 | 16:37 | 16:37 | 17:58 | 20:12 | 20:12 | 20:12 | 21:09 | 15:47 | 15:47 | 19:00 |
| Gananoque, ON | Departure | - | - | - | - | - | 15:24 | - | - | - | - | - | - | 21:29 | - | - | - |
| Brockville, ON | Arrival | 09:54 | 09:54 | 09:54 | 11:57 | - | - | - | - | - | - | - | - | - | - | - | - |
| | Departure | 10:00 | 10:00 | 10:00 | 12:00 | - | 15:53 | 17:21 | 17:21 | 18:42 | 20:56 | 20:56 | 20:56 | 21:55 | - | - | - |
| Smiths Falls, ON | Departure | 10:31 | 10:31 | 10:31 | 12:37 | - | 16:28 | 17:52 | 17:52 | - | 21:27 | 21:27 | 21:27 | 22:26 | - | - | - |
| Fallowfield, ON | Arrival | 11:01 | 11:01 | 11:01 | 13:11 | 14:38 | 16:54 | 18:22 | 18:22 | 19:40 | 21:52 | 21:52 | 21:52 | 22:51 | 17:30 | 17:30 | 20:23 |
| | Departure | 11:04 | 11:04 | 11:04 | 13:15 | 14:42 | 16:58 | 18:26 | 18:26 | 19:43 | 21:55 | 21:55 | 21:55 | 22:54 | 17:34 | 17:34 | 20:26 |
| Ottawa, ON | Arrival | 11:21 Eastern Time | 11:21 Eastern Time | 11:21 Eastern Time | 13:32 Eastern Time | 15:02 Eastern Time | 17:16 Eastern Time | 18:43 Eastern Time | 18:43 Eastern Time | 20:00 Eastern Time | 22:13 Eastern Time | 22:13 Eastern Time | 22:13 Eastern Time | 23:11 Eastern Time | 17:53 Eastern Time | 17:53 Eastern Time | 20:46 Eastern Time |

VIA Ottawa Station Operating Hours

| | |
|-----------------------------------|----------------|
| Monday Tuesday Wednesday Thursday | 03h45 to 23h30 |
| Friday and Saturday | 04h45 to 23h30 |
| Sunday | 07h00 to 23h30 |

| | | | | | | | | | |
|---|-----------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | 22 | 624 | 24 | 26 | 26 | 28 | 38 | 38 | 38 |
| Ottawa - Montréal - Sainte Foy - Québec | 6:07 | 7:45 | 10:13 | 14:17 | 14:17 | 16:05 | 17:55 | 17:55 | 17:55 |

| | | | | | | | | |
|---|-----------|-----------|-----------|-----------|-----------|------------|-----------|-----------|
| | 31 | 31 | 31 | 33 | 35 | 633 | 37 | 39 |
| Québec - Sainte Foy - Montréal - Ottawa | 8:25 | 8:25 | 8:25 | 11:04 | 13:58 | 11:05 | 18:36 | 20:51 |

| | | | | | | | | | | | | | | | | | | | |
|-----------------------------|-----------|------------|------------|------------|------------|-----------|------------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|------------|
| | 41 | 641 | 641 | 641 | 641 | 43 | 643 | 45 | 53 | 47 | 47 | 47 | 645 | 645 | 645 | 645 | 645 | 645 | 645 |
| Ottawa - Kingston - Toronto | 5:21 | 4:13 | 4:13 | 4:13 | 4:13 | 9:35 | 8:29 | 10:24 | 11:43 | 12:23 | 12:23 | 12:23 | 14:29 | 14:29 | 14:29 | 14:29 | 14:29 | 14:29 | 14:29 |

| | | | | | | | | | | | | | | | | |
|-----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|
| | 50 | 50 | 50 | 52 | 40 | 42 | 44 | 44 | 46 | 54 | 54 | 54 | 48 | 644 | 644 | 646 |
| Toronto - Kingston - Ottawa | 11:21 | 11:21 | 11:21 | 13:31 | 15:02 | 17:16 | 18:43 | 18:43 | 20:00 | 22:13 | 22:13 | 22:13 | 23:11 | 17:53 | 17:53 | 20:46 |

Current Volumes 2024

| Subdivision | Direction | Day | Night |
|----------------|-----------|-----|-------|
| Alexandria | EB | 11 | 1 |
| (E of Station) | WB | 5 | 0 |
| Beachburg | EB | 15 | 1 |
| (W of Station) | WB | 15 | 5 |
| SUM | | 46 | 7 |

Forecast Volumes 2040 2.50% per annum

| Subdivision | Direction | Day | Night |
|----------------|-----------|------|-------|
| Alexandria | EB | 16.3 | 1.5 |
| (E of Station) | WB | 7.4 | 0.0 |
| Beachburg | EB | 22.3 | 1.5 |
| (W of Station) | WB | 22.3 | 7.4 |
| SUM | | 68.3 | 10.4 |

Forecast Volumes 2040 <<< For Modelling

| | |
|---------|---|
| consist | |
| loco | 1 |
| car | 5 |

| Subdivision | Direction | Locos | | Cars | |
|----------------|-----------|-------|-------|------|-------|
| | | Day | Night | Day | Night |
| Alexandria | EB | 17 | 2 | 85 | 10 |
| (E of Station) | WB | 8 | 0 | 40 | 0 |
| Beachburg | EB | 23 | 2 | 115 | 10 |
| (W of Station) | WB | 23 | 8 | 115 | 40 |
| SUM | | 71 | 12 | 355 | 60 |



**EASTERN REGION
CHAMPLAIN DIVISION**

TIME TABLE

80

**GREATER MONTREAL ZONE
QUEBEC SOUTH/NQISL ZONE
ATLANTIC ZONE**



**EFFECTIVE
SATURDAY JANUARY 1st, 2005**

**REFER TO INSIDE COVER FOR EFFECTIVE
TIME, AND OTHER TIME AND DATE CHANGES
THAT WILL OCCUR**

**K. E. CREEL
SENIOR VICE-PRESIDENT EASTERN REGION**

**J. VENA
VICE-PRESIDENT CHAMPLAIN DIVISION**

5 SPEEDS

5.1

| Mile | MPH | | |
|-----------------------------|------|-------|-----|
| | Psgr | | Frt |
| | LRC | Other | |
| Alexandria Sub | | | |
| 0.0 to 7.5 zone | 80 | 80 | 60 |
| *0.0 to 0.7 | 45 | 45 | 30 |
| *6.1 Rlwy crossing at grade | 50 | 50 | 35 |
| 72.5 to 76.4 zone | 75 | 65 | 35 |
| *76.1 to 76.3 | 30 | 30 | 30 |
| 76.3 to 76.4 rule 105 | 10 | 10 | 10 |

| Mile | MPH | | |
|-----------------------------|------|-------|-----|
| | Psgr | | Frt |
| | LRC | Other | |
| Beachburg Sub | | | |
| 0.0 to 1.8 Zone | 35 | 30 | 30 |
| 0.0 to 0.3 rule 105 | 10 | 10 | 10 |
| *0.3 to 0.6 | 25 | 20 | 20 |
| 1.8 to 6.0 Zone | 45 | 40 | 40 |
| 3.3 to 3.9 | 40 | | |
| *3.4 Riwy crossing at grade | 35 | 35 | 35 |
| 5.1 to 5.9 | 40 | | 25 |

*Not marked by restricting speed signs

5.2 CONDITIONAL SPEEDS

| Mile | MPH |
|--|-----|
| Beachburg Sub | |
| 3.2 on connecting track | 5 |
| *5.78 Heavy Axle Load Trains on bridge ... | 10 |

***Applicable until the last Heavy Axle Load on the train clears the bridge**

6 PUBLIC CROSSINGS AT GRADE

- 6.1 **Mile 0.56 Alexandria sub** (Chemin Rivière Delisle)
Warning devices.

Automatic: When switching in track Q050, eastward movements must stop before fouling the crossing, and be protected by a member of the crew until crossing fully occupied unless crossing protection devices have been operating for at least 20 seconds.

- 6.2 **Mile 75.3 Alexandria sub** (Michael Street crossing)
Westward movements stopped between Innes Rd. overpass, mile 74.6 and Michael St., must not exceed 10 mph until crossing occupied.

7 SPURS AND OTHER TRACKS

- 7.1 **MILE 0.0 TO MILE 7.5 and MILE 72.5 TO MILE 76.3 ALEANDRIA SUB AND BETWEEN MILE 0.0 AND MILE 6.0 BEACHBURG SUB.**

Rule 105 (a) applicable on all spurs and other tracks.

Appendix D-2 O-Train Schedules



Schedules & Maps

The next service change is on Sunday, December 22.

Schedule times are based on typical driving conditions and may vary. Please arrive at your stop a few minutes early to allow for any fluctuations in schedule.

Mon, Dec 9

1 Tunney's Pasture

[a] Route R1 service replaces the O-Train Line 1 when the scheduled train service has been cancelled. A R1 timetable is displayed only for the period during which Line 1 service is not running.

[b] Single-car trains will only use half of the platform. Customers should board in the designated section of the platform and follow signs to the boarding zones.

| BLAIR O-TRAIN WEST / OUEST | CYRVILLE O-TRAIN WEST / OUEST | ST-LAURENT O-TRAIN WEST / OUEST | TREMBLAY O-TRAIN WEST / OUEST | HURDMAN O-TRAIN WEST / OUEST | LEES O-TRAIN WEST / OUEST | UOTTAWA O-TRAIN WEST / OUEST | RIDEAU O-TRAIN WEST / OUEST | PARLIAMENT / PARLEMENT O-TRAIN WEST / OUEST | LYON O-TRAIN WEST / OUEST | PIMISI O-TRAIN WEST / OUEST | BAYVIEW O-TRAIN WEST / OUEST | TUNNEY'S PASTURE O-TRAIN |
|-------------------------------|----------------------------------|------------------------------------|----------------------------------|---------------------------------|------------------------------|---------------------------------|--------------------------------|--|------------------------------|--------------------------------|---------------------------------|--------------------------|
| | | | | | | | 05:00 | 05:02 | 05:04 | 05:06 | 05:08 | 05:10 |
| | | | 05:00 | 05:03 | 05:06 | 05:08 | 05:11 | 05:13 | 05:15 | 05:17 | 05:19 | 05:21 |
| 05:00 | 05:02 | 05:04 | 05:07 | 05:10 | 05:13 | 05:15 | 05:18 | 05:20 | 05:22 | 05:24 | 05:26 | 05:28 |
| 05:09 | 05:11 | 05:13 | 05:16 | 05:19 | 05:22 | 05:24 | 05:27 | 05:29 | 05:31 | 05:33 | 05:35 | 05:37 |
| 05:18 | 05:20 | 05:22 | 05:25 | 05:28 | 05:31 | 05:33 | 05:36 | 05:38 | 05:40 | 05:42 | 05:44 | 05:46 |
| 05:28 | 05:30 | 05:32 | 05:35 | 05:38 | 05:41 | 05:43 | 05:46 | 05:48 | 05:50 | 05:52 | 05:54 | 05:56 |
| 05:37 | 05:39 | 05:41 | 05:44 | 05:47 | 05:50 | 05:52 | 05:55 | 05:57 | 05:59 | 06:01 | 06:03 | 06:05 |
| 05:44 | 05:46 | 05:48 | 05:51 | 05:54 | 05:57 | 05:59 | 06:02 | 06:04 | 06:06 | 06:08 | 06:10 | 06:12 |
| | | | 05:59 | 06:02 | 06:05 | 06:07 | 06:10 | 06:12 | 06:14 | 06:16 | 06:18 | 06:20 |
| 05:56 | 05:58 | 06:00 | 06:03 | 06:06 | 06:09 | 06:11 | 06:14 | 06:16 | 06:18 | 06:20 | 06:22 | 06:24 |
| | | | 06:08 | 06:11 | 06:14 | 06:16 | 06:19 | 06:21 | 06:23 | 06:25 | 06:27 | 06:29 |
| 06:05 | 06:07 | 06:09 | 06:12 | 06:15 | 06:18 | 06:20 | 06:23 | 06:25 | 06:27 | 06:29 | 06:31 | 06:33 |
| | | | 06:18 | 06:21 | 06:24 | 06:26 | 06:29 | 06:31 | 06:33 | 06:35 | 06:37 | 06:39 |
| 06:15 | 06:17 | 06:19 | 06:22 | 06:25 | 06:28 | 06:30 | 06:33 | 06:35 | 06:37 | 06:39 | 06:41 | 06:43 |
| 06:19 | 06:21 | 06:23 | 06:26 | 06:29 | 06:32 | 06:34 | 06:37 | 06:39 | 06:41 | 06:43 | 06:45 | 06:47 |
| 06:25 | 06:27 | 06:29 | 06:32 | 06:35 | 06:38 | 06:40 | 06:43 | 06:45 | 06:47 | 06:49 | 06:51 | 06:53 |
| 06:29 | 06:31 | 06:33 | 06:36 | 06:39 | 06:42 | 06:44 | 06:47 | 06:49 | 06:51 | 06:53 | 06:55 | 06:57 |
| 06:35 | 06:37 | 06:39 | 06:42 | 06:45 | 06:48 | 06:50 | 06:53 | 06:55 | 06:57 | 06:59 | 07:01 | 07:03 |
| 06:39 | 06:41 | 06:43 | 06:46 | 06:49 | 06:52 | 06:54 | 06:57 | 06:59 | 07:01 | 07:03 | 07:05 | 07:07 |
| 06:45 | 06:47 | 06:49 | 06:52 | 06:55 | 06:58 | 07:00 | 07:03 | 07:05 | 07:07 | 07:09 | 07:11 | 07:13 |
| 06:49 | 06:51 | 06:53 | 06:56 | 06:59 | 07:02 | 07:04 | 07:07 | 07:09 | 07:11 | 07:13 | 07:15 | 07:17 |
| 06:55 | 06:57 | 06:59 | 07:02 | 07:05 | 07:08 | 07:10 | 07:13 | 07:15 | 07:17 | 07:19 | 07:21 | 07:23 |
| 07:00 | 07:02 | 07:04 | 07:07 | 07:10 | 07:13 | 07:15 | 07:18 | 07:20 | 07:22 | 07:24 | 07:26 | 07:28 |
| 07:05 | 07:07 | 07:09 | 07:12 | 07:15 | 07:18 | 07:20 | 07:23 | 07:25 | 07:27 | 07:29 | 07:31 | 07:33 |
| 07:10 | 07:12 | 07:14 | 07:17 | 07:20 | 07:23 | 07:25 | 07:28 | 07:30 | 07:32 | 07:34 | 07:36 | 07:38 |
| 07:15 | 07:17 | 07:19 | 07:22 | 07:25 | 07:28 | 07:30 | 07:33 | 07:35 | 07:37 | 07:39 | 07:41 | 07:43 |

| BLAIR O-TRAIN WEST / OUEST | CYRVILLE O-TRAIN WEST / OUEST | ST-LAURENT O-TRAIN WEST / OUEST | TREMBLAY O-TRAIN WEST / OUEST | HURDMAN O-TRAIN WEST / OUEST | LEES O-TRAIN WEST / OUEST | UOTTAWA O-TRAIN WEST / OUEST | RIDEAU O-TRAIN WEST / OUEST | PARLIAMENT / PARLEMENT O-TRAIN WEST / OUEST | LYON O-TRAIN WEST / OUEST | PIMISI O-TRAIN WEST / OUEST | BAYVIEW O-TRAIN WEST / OUEST | TUNNEY'S PASTURE O-TRAIN |
|-------------------------------|----------------------------------|------------------------------------|----------------------------------|---------------------------------|------------------------------|---------------------------------|--------------------------------|---|------------------------------|--------------------------------|---------------------------------|-----------------------------|
| 07:20 | 07:22 | 07:24 | 07:27 | 07:30 | 07:33 | 07:35 | 07:38 | 07:40 | 07:42 | 07:44 | 07:46 | 07:48 |
| 07:25 | 07:27 | 07:29 | 07:32 | 07:35 | 07:38 | 07:40 | 07:43 | 07:45 | 07:47 | 07:49 | 07:51 | 07:53 |
| 07:30 | 07:32 | 07:34 | 07:37 | 07:40 | 07:43 | 07:45 | 07:48 | 07:50 | 07:52 | 07:54 | 07:56 | 07:58 |
| 07:35 | 07:37 | 07:39 | 07:42 | 07:45 | 07:48 | 07:50 | 07:53 | 07:55 | 07:57 | 07:59 | 08:01 | 08:03 |
| 07:40 | 07:42 | 07:44 | 07:47 | 07:50 | 07:53 | 07:55 | 07:58 | 08:00 | 08:02 | 08:04 | 08:06 | 08:08 |
| 07:45 | 07:47 | 07:49 | 07:52 | 07:55 | 07:58 | 08:00 | 08:03 | 08:05 | 08:07 | 08:09 | 08:11 | 08:13 |
| 07:50 | 07:52 | 07:54 | 07:57 | 08:00 | 08:03 | 08:05 | 08:08 | 08:10 | 08:12 | 08:14 | 08:16 | 08:18 |
| 07:55 | 07:57 | 07:59 | 08:02 | 08:05 | 08:08 | 08:10 | 08:13 | 08:15 | 08:17 | 08:19 | 08:21 | 08:23 |
| 08:00 | 08:02 | 08:04 | 08:07 | 08:10 | 08:13 | 08:15 | 08:18 | 08:20 | 08:22 | 08:24 | 08:26 | 08:28 |
| 08:05 | 08:07 | 08:09 | 08:12 | 08:15 | 08:18 | 08:20 | 08:23 | 08:25 | 08:27 | 08:29 | 08:31 | 08:33 |
| 08:10 | 08:12 | 08:14 | 08:17 | 08:20 | 08:23 | 08:25 | 08:28 | 08:30 | 08:32 | 08:34 | 08:36 | 08:38 |
| 08:15 | 08:17 | 08:19 | 08:22 | 08:25 | 08:28 | 08:30 | 08:33 | 08:35 | 08:37 | 08:39 | 08:41 | 08:43 |
| 08:20 | 08:22 | 08:24 | 08:27 | 08:30 | 08:33 | 08:35 | 08:38 | 08:40 | 08:42 | 08:44 | 08:46 | 08:48 |
| 08:25 | 08:27 | 08:29 | 08:32 | 08:35 | 08:38 | 08:40 | 08:43 | 08:45 | 08:47 | 08:49 | 08:51 | 08:53 |
| 08:30 | 08:32 | 08:34 | 08:37 | 08:40 | 08:43 | 08:45 | 08:48 | 08:50 | 08:52 | 08:54 | 08:56 | 08:58 |
| 08:35 | 08:37 | 08:39 | 08:42 | 08:45 | 08:48 | 08:50 | 08:53 | 08:55 | 08:57 | 08:59 | 09:01 | 09:03 |
| 08:40 | 08:42 | 08:44 | 08:47 | 08:50 | 08:53 | 08:55 | 08:58 | 09:00 | 09:02 | 09:04 | 09:06 | 09:08 |
| 08:45 | 08:47 | 08:49 | 08:52 | 08:55 | 08:58 | 09:00 | 09:03 | 09:05 | 09:07 | 09:09 | 09:11 | 09:13 |
| 08:50 | 08:52 | 08:54 | 08:57 | 09:00 | 09:03 | 09:05 | 09:08 | 09:10 | 09:12 | 09:14 | 09:16 | 09:18 |
| 08:56 | 08:58 | 09:00 | 09:03 | 09:06 | 09:09 | 09:11 | 09:14 | 09:16 | 09:18 | 09:20 | 09:22 | 09:24 |
| 09:01 | 09:03 | 09:05 | 09:08 | 09:11 | 09:14 | 09:16 | 09:18 | 09:20 | 09:22 | 09:24 | 09:26 | 09:28 |
| 09:10 | 09:12 | 09:14 | 09:17 | 09:20 | 09:23 | 09:25 | 09:27 | 09:29 | 09:31 | 09:33 | 09:35 | 09:37 |
| 09:20 | 09:22 | 09:24 | 09:27 | 09:30 | 09:33 | 09:35 | 09:37 | 09:39 | 09:41 | 09:43 | 09:45 | 09:47 |
| 09:30 | 09:32 | 09:34 | 09:37 | 09:40 | 09:43 | 09:45 | 09:47 | 09:49 | 09:51 | 09:53 | 09:55 | 09:57 |
| 09:40 | 09:42 | 09:44 | 09:47 | 09:50 | 09:53 | 09:55 | 09:57 | 09:59 | 10:01 | 10:03 | 10:05 | 10:07 |
| 09:50 | 09:52 | 09:54 | 09:57 | 10:00 | 10:03 | 10:05 | 10:07 | 10:09 | 10:11 | 10:13 | 10:15 | 10:17 |
| 09:58 | 10:00 | 10:02 | 10:05 | 10:08 | 10:11 | 10:13 | 10:15 | 10:17 | 10:19 | 10:21 | 10:23 | 10:25 |
| 10:10 | 10:12 | 10:14 | 10:17 | 10:20 | 10:23 | 10:25 | 10:27 | 10:29 | 10:31 | 10:33 | 10:35 | 10:37 |
| 10:20 | 10:22 | 10:24 | 10:27 | 10:30 | 10:33 | 10:35 | 10:37 | 10:39 | 10:41 | 10:43 | 10:45 | 10:47 |
| 10:30 | 10:32 | 10:34 | 10:37 | 10:40 | 10:43 | 10:45 | 10:47 | 10:49 | 10:51 | 10:53 | 10:55 | 10:57 |
| 10:40 | 10:42 | 10:44 | 10:47 | 10:50 | 10:53 | 10:55 | 10:57 | 10:59 | 11:01 | 11:03 | 11:05 | 11:07 |
| 10:50 | 10:52 | 10:54 | 10:57 | 11:00 | 11:03 | 11:05 | 11:07 | 11:09 | 11:11 | 11:13 | 11:15 | 11:17 |
| 11:00 | 11:02 | 11:04 | 11:07 | 11:10 | 11:13 | 11:15 | 11:17 | 11:19 | 11:21 | 11:23 | 11:25 | 11:27 |
| 11:10 | 11:12 | 11:14 | 11:17 | 11:20 | 11:23 | 11:25 | 11:27 | 11:29 | 11:31 | 11:33 | 11:35 | 11:37 |
| 11:20 | 11:22 | 11:24 | 11:27 | 11:30 | 11:33 | 11:35 | 11:37 | 11:39 | 11:41 | 11:43 | 11:45 | 11:47 |
| 11:30 | 11:32 | 11:34 | 11:37 | 11:40 | 11:43 | 11:45 | 11:47 | 11:49 | 11:51 | 11:53 | 11:55 | 11:57 |
| 11:40 | 11:42 | 11:44 | 11:47 | 11:50 | 11:53 | 11:55 | 11:57 | 11:59 | 12:01 | 12:03 | 12:05 | 12:07 |
| 11:50 | 11:52 | 11:54 | 11:57 | 12:00 | 12:03 | 12:05 | 12:07 | 12:09 | 12:11 | 12:13 | 12:15 | 12:17 |
| 12:00 | 12:02 | 12:04 | 12:07 | 12:10 | 12:13 | 12:15 | 12:17 | 12:19 | 12:21 | 12:23 | 12:25 | 12:27 |
| 12:10 | 12:12 | 12:14 | 12:17 | 12:20 | 12:23 | 12:25 | 12:27 | 12:29 | 12:31 | 12:33 | 12:35 | 12:37 |
| 12:20 | 12:22 | 12:24 | 12:27 | 12:30 | 12:33 | 12:35 | 12:37 | 12:39 | 12:41 | 12:43 | 12:45 | 12:47 |
| 12:30 | 12:32 | 12:34 | 12:37 | 12:40 | 12:43 | 12:45 | 12:47 | 12:49 | 12:51 | 12:53 | 12:55 | 12:57 |
| 12:40 | 12:42 | 12:44 | 12:47 | 12:50 | 12:53 | 12:55 | 12:57 | 12:59 | 13:01 | 13:03 | 13:05 | 13:07 |
| 12:50 | 12:52 | 12:54 | 12:57 | 13:00 | 13:03 | 13:05 | 13:07 | 13:09 | 13:11 | 13:13 | 13:15 | 13:17 |
| 13:00 | 13:02 | 13:04 | 13:07 | 13:10 | 13:13 | 13:15 | 13:17 | 13:19 | 13:21 | 13:23 | 13:25 | 13:27 |
| 13:10 | 13:12 | 13:14 | 13:17 | 13:20 | 13:23 | 13:25 | 13:27 | 13:29 | 13:31 | 13:33 | 13:35 | 13:37 |
| 13:20 | 13:22 | 13:24 | 13:27 | 13:30 | 13:33 | 13:35 | 13:37 | 13:39 | 13:41 | 13:43 | 13:45 | 13:47 |
| 13:30 | 13:32 | 13:34 | 13:37 | 13:40 | 13:43 | 13:45 | 13:47 | 13:49 | 13:51 | 13:53 | 13:55 | 13:57 |

| BLAIR O-TRAIN WEST / OUEST | CYRVILLE O-TRAIN WEST / OUEST | ST-LAURENT O-TRAIN WEST / OUEST | TREMBLAY O-TRAIN WEST / OUEST | HURDMAN O-TRAIN WEST / OUEST | LEES O-TRAIN WEST / OUEST | UOTTAWA O-TRAIN WEST / OUEST | RIDEAU O-TRAIN WEST / OUEST | PARLIAMENT / PARLEMENT O-TRAIN WEST / OUEST | LYON O-TRAIN WEST / OUEST | PIMISI O-TRAIN WEST / OUEST | BAYVIEW O-TRAIN WEST / OUEST | TUNNEY'S PASTURE O-TRAIN |
|-------------------------------|----------------------------------|------------------------------------|----------------------------------|---------------------------------|------------------------------|---------------------------------|--------------------------------|---|------------------------------|--------------------------------|---------------------------------|-----------------------------|
| 13:40 | 13:42 | 13:44 | 13:47 | 13:50 | 13:53 | 13:55 | 13:57 | 13:59 | 14:01 | 14:03 | 14:05 | 14:07 |
| 13:50 | 13:52 | 13:54 | 13:57 | 14:00 | 14:03 | 14:05 | 14:07 | 14:09 | 14:11 | 14:13 | 14:15 | 14:17 |
| 14:00 | 14:02 | 14:04 | 14:07 | 14:10 | 14:13 | 14:15 | 14:17 | 14:19 | 14:21 | 14:23 | 14:25 | 14:27 |
| | | | 14:13 | 14:16 | 14:19 | 14:21 | 14:23 | 14:25 | 14:27 | 14:29 | 14:31 | 14:33 |
| 14:10 | 14:12 | 14:14 | 14:17 | 14:20 | 14:23 | 14:25 | 14:27 | 14:29 | 14:31 | 14:33 | 14:35 | 14:37 |
| | | | 14:23 | 14:26 | 14:29 | 14:31 | 14:33 | 14:35 | 14:37 | 14:39 | 14:41 | 14:43 |
| 14:20 | 14:22 | 14:24 | 14:27 | 14:30 | 14:33 | 14:35 | 14:37 | 14:39 | 14:41 | 14:43 | 14:45 | 14:47 |
| | | | 14:32 | 14:35 | 14:38 | 14:40 | 14:43 | 14:45 | 14:47 | 14:49 | 14:51 | 14:53 |
| 14:29 | 14:31 | 14:33 | 14:36 | 14:39 | 14:42 | 14:44 | 14:46 | 14:48 | 14:50 | 14:52 | 14:54 | 14:56 |
| | | | 14:42 | 14:45 | 14:48 | 14:50 | 14:53 | 14:55 | 14:57 | 14:59 | 15:01 | 15:03 |
| 14:40 | 14:42 | 14:44 | 14:47 | 14:50 | 14:53 | 14:55 | 14:58 | 15:00 | 15:02 | 15:04 | 15:06 | 15:08 |
| 14:45 | 14:47 | 14:49 | 14:52 | 14:55 | 14:58 | 15:00 | 15:03 | 15:05 | 15:07 | 15:09 | 15:11 | 15:13 |
| 14:49 | 14:51 | 14:53 | 14:56 | 14:59 | 15:02 | 15:04 | 15:07 | 15:09 | 15:11 | 15:13 | 15:15 | 15:17 |
| 14:55 | 14:57 | 14:59 | 15:02 | 15:05 | 15:08 | 15:10 | 15:13 | 15:15 | 15:17 | 15:19 | 15:21 | 15:23 |
| 14:59 | 15:01 | 15:03 | 15:06 | 15:09 | 15:12 | 15:14 | 15:17 | 15:19 | 15:21 | 15:23 | 15:25 | 15:27 |
| 15:05 | 15:07 | 15:09 | 15:12 | 15:15 | 15:18 | 15:20 | 15:23 | 15:25 | 15:27 | 15:29 | 15:31 | 15:33 |
| 15:10 | 15:12 | 15:14 | 15:17 | 15:20 | 15:23 | 15:25 | 15:28 | 15:30 | 15:32 | 15:34 | 15:36 | 15:38 |
| 15:15 | 15:17 | 15:19 | 15:22 | 15:25 | 15:28 | 15:30 | 15:33 | 15:35 | 15:37 | 15:39 | 15:41 | 15:43 |
| 15:20 | 15:22 | 15:24 | 15:27 | 15:30 | 15:33 | 15:35 | 15:38 | 15:40 | 15:42 | 15:44 | 15:46 | 15:48 |
| 15:25 | 15:27 | 15:29 | 15:32 | 15:35 | 15:38 | 15:40 | 15:43 | 15:45 | 15:47 | 15:49 | 15:51 | 15:53 |
| 15:30 | 15:32 | 15:34 | 15:37 | 15:40 | 15:43 | 15:45 | 15:48 | 15:50 | 15:52 | 15:54 | 15:56 | 15:58 |
| 15:35 | 15:37 | 15:39 | 15:42 | 15:45 | 15:48 | 15:50 | 15:53 | 15:55 | 15:57 | 15:59 | 16:01 | 16:03 |
| 15:40 | 15:42 | 15:44 | 15:47 | 15:50 | 15:53 | 15:55 | 15:58 | 16:00 | 16:02 | 16:04 | 16:06 | 16:08 |
| 15:45 | 15:47 | 15:49 | 15:52 | 15:55 | 15:58 | 16:00 | 16:03 | 16:05 | 16:07 | 16:09 | 16:11 | 16:13 |
| 15:50 | 15:52 | 15:54 | 15:57 | 16:00 | 16:03 | 16:05 | 16:08 | 16:10 | 16:12 | 16:14 | 16:16 | 16:18 |
| 15:55 | 15:57 | 15:59 | 16:02 | 16:05 | 16:08 | 16:10 | 16:13 | 16:15 | 16:17 | 16:19 | 16:21 | 16:23 |
| 16:00 | 16:02 | 16:04 | 16:07 | 16:10 | 16:13 | 16:15 | 16:18 | 16:20 | 16:22 | 16:24 | 16:26 | 16:28 |
| 16:05 | 16:07 | 16:09 | 16:12 | 16:15 | 16:18 | 16:20 | 16:23 | 16:25 | 16:27 | 16:29 | 16:31 | 16:33 |
| 16:10 | 16:12 | 16:14 | 16:17 | 16:20 | 16:23 | 16:25 | 16:28 | 16:30 | 16:32 | 16:34 | 16:36 | 16:38 |
| 16:15 | 16:17 | 16:19 | 16:22 | 16:25 | 16:28 | 16:30 | 16:33 | 16:35 | 16:37 | 16:39 | 16:41 | 16:43 |
| 16:20 | 16:22 | 16:24 | 16:27 | 16:30 | 16:33 | 16:35 | 16:38 | 16:40 | 16:42 | 16:44 | 16:46 | 16:48 |
| 16:25 | 16:27 | 16:29 | 16:32 | 16:35 | 16:38 | 16:40 | 16:43 | 16:45 | 16:47 | 16:49 | 16:51 | 16:53 |
| 16:30 | 16:32 | 16:34 | 16:37 | 16:40 | 16:43 | 16:45 | 16:48 | 16:50 | 16:52 | 16:54 | 16:56 | 16:58 |
| 16:35 | 16:37 | 16:39 | 16:42 | 16:45 | 16:48 | 16:50 | 16:53 | 16:55 | 16:57 | 16:59 | 17:01 | 17:03 |
| 16:40 | 16:42 | 16:44 | 16:47 | 16:50 | 16:53 | 16:55 | 16:58 | 17:00 | 17:02 | 17:04 | 17:06 | 17:08 |
| 16:45 | 16:47 | 16:49 | 16:52 | 16:55 | 16:58 | 17:00 | 17:03 | 17:05 | 17:07 | 17:09 | 17:11 | 17:13 |
| 16:50 | 16:52 | 16:54 | 16:57 | 17:00 | 17:03 | 17:05 | 17:08 | 17:10 | 17:12 | 17:14 | 17:16 | 17:18 |
| 16:55 | 16:57 | 16:59 | 17:02 | 17:05 | 17:08 | 17:10 | 17:13 | 17:15 | 17:17 | 17:19 | 17:21 | 17:23 |
| 17:00 | 17:02 | 17:04 | 17:07 | 17:10 | 17:13 | 17:15 | 17:18 | 17:20 | 17:22 | 17:24 | 17:26 | 17:28 |
| 17:05 | 17:07 | 17:09 | 17:12 | 17:15 | 17:18 | 17:20 | 17:23 | 17:25 | 17:27 | 17:29 | 17:31 | 17:33 |
| 17:10 | 17:12 | 17:14 | 17:17 | 17:20 | 17:23 | 17:25 | 17:28 | 17:30 | 17:32 | 17:34 | 17:36 | 17:38 |
| 17:15 | 17:17 | 17:19 | 17:22 | 17:25 | 17:28 | 17:30 | 17:33 | 17:35 | 17:37 | 17:39 | 17:41 | 17:43 |
| 17:20 | 17:22 | 17:24 | 17:27 | 17:30 | 17:33 | 17:35 | 17:38 | 17:40 | 17:42 | 17:44 | 17:46 | 17:48 |
| 17:25 | 17:27 | 17:29 | 17:32 | 17:35 | 17:38 | 17:40 | 17:43 | 17:45 | 17:47 | 17:49 | 17:51 | 17:53 |
| 17:30 | 17:32 | 17:34 | 17:37 | 17:40 | 17:43 | 17:45 | 17:48 | 17:50 | 17:52 | 17:54 | 17:56 | 17:58 |
| 17:35 | 17:37 | 17:39 | 17:42 | 17:45 | 17:48 | 17:50 | 17:53 | 17:55 | 17:57 | 17:59 | 18:01 | 18:03 |
| 17:40 | 17:42 | 17:44 | 17:47 | 17:50 | 17:53 | 17:55 | 17:58 | 18:00 | 18:02 | 18:04 | 18:06 | 18:08 |
| 17:45 | 17:47 | 17:49 | 17:52 | 17:55 | 17:58 | 18:00 | 18:03 | 18:05 | 18:07 | 18:09 | 18:11 | 18:13 |

| BLAIR O-TRAIN WEST / OUEST | CYRVILLE O-TRAIN WEST / OUEST | ST-LAURENT O-TRAIN WEST / OUEST | TREMBLAY O-TRAIN WEST / OUEST | HURDMAN O-TRAIN WEST / OUEST | LEES O-TRAIN WEST / OUEST | UOTTAWA O-TRAIN WEST / OUEST | RIDEAU O-TRAIN WEST / OUEST | PARLIAMENT / PARLEMENT O-TRAIN WEST / OUEST | LYON O-TRAIN WEST / OUEST | PIMISI O-TRAIN WEST / OUEST | BAYVIEW O-TRAIN WEST / OUEST | TUNNEY'S PASTURE O-TRAIN |
|-------------------------------|-------------------------------------|---------------------------------------|-------------------------------------|------------------------------------|------------------------------|------------------------------------|-----------------------------------|---|------------------------------|-----------------------------------|------------------------------------|--------------------------------|
| 17:50 | 17:52 | 17:54 | 17:57 | 18:00 | 18:03 | 18:05 | 18:08 | 18:10 | 18:12 | 18:14 | 18:16 | 18:18 |
| 17:56 | 17:58 | 18:00 | 18:03 | 18:06 | 18:09 | 18:11 | 18:14 | 18:16 | 18:18 | 18:20 | 18:22 | 18:24 |
| 18:02 | 18:04 | 18:06 | 18:09 | 18:12 | 18:15 | 18:17 | 18:20 | 18:22 | 18:24 | 18:26 | 18:28 | 18:30 |
| 18:10 | 18:12 | 18:14 | 18:17 | 18:20 | 18:23 | 18:25 | 18:28 | 18:30 | 18:32 | 18:34 | 18:36 | 18:38 |
| 18:20 | 18:22 | 18:24 | 18:27 | 18:30 | 18:33 | 18:35 | 18:38 | 18:40 | 18:42 | 18:44 | 18:46 | 18:48 |
| 18:28 | 18:30 | 18:32 | 18:35 | 18:38 | 18:41 | 18:43 | 18:46 | 18:48 | 18:50 | 18:52 | 18:54 | 18:56 |
| 18:37 | 18:39 | 18:41 | 18:44 | 18:47 | 18:50 | 18:52 | 18:55 | 18:57 | 18:59 | 19:01 | 19:03 | 19:05 |
| 18:50 | 18:52 | 18:54 | 18:57 | 19:00 | 19:03 | 19:05 | 19:08 | 19:10 | 19:12 | 19:14 | 19:16 | 19:18 |
| 19:00 | 19:02 | 19:04 | 19:07 | 19:10 | 19:13 | 19:15 | 19:18 | 19:20 | 19:22 | 19:24 | 19:26 | 19:28 |
| 19:10 | 19:12 | 19:14 | 19:17 | 19:20 | 19:23 | 19:25 | 19:28 | 19:30 | 19:32 | 19:34 | 19:36 | 19:38 |
| 19:20 | 19:22 | 19:24 | 19:27 | 19:30 | 19:33 | 19:35 | 19:38 | 19:40 | 19:42 | 19:44 | 19:46 | 19:48 |
| 19:30 | 19:32 | 19:34 | 19:37 | 19:40 | 19:43 | 19:45 | 19:48 | 19:50 | 19:52 | 19:54 | 19:56 | 19:58 |
| 19:40 | 19:42 | 19:44 | 19:47 | 19:50 | 19:53 | 19:55 | 19:58 | 20:00 | 20:02 | 20:04 | 20:06 | 20:08 |
| 19:50 | 19:52 | 19:54 | 19:57 | 20:00 | 20:03 | 20:05 | 20:08 | 20:10 | 20:12 | 20:14 | 20:16 | 20:18 |
| 20:00 | 20:02 | 20:04 | 20:07 | 20:10 | 20:13 | 20:15 | 20:18 | 20:20 | 20:22 | 20:24 | 20:26 | 20:28 |
| 20:10 | 20:12 | 20:14 | 20:17 | 20:20 | 20:23 | 20:25 | 20:28 | 20:30 | 20:32 | 20:34 | 20:36 | 20:38 |
| 20:20 | 20:22 | 20:24 | 20:27 | 20:30 | 20:33 | 20:35 | 20:38 | 20:40 | 20:42 | 20:44 | 20:46 | 20:48 |
| 20:30 | 20:32 | 20:34 | 20:37 | 20:40 | 20:43 | 20:45 | 20:48 | 20:50 | 20:52 | 20:54 | 20:56 | 20:58 |
| 20:40 | 20:42 | 20:44 | 20:47 | 20:50 | 20:53 | 20:55 | 20:58 | 21:00 | 21:02 | 21:04 | 21:06 | 21:08 |
| 20:50 | 20:52 | 20:54 | 20:57 | 21:00 | 21:03 | 21:05 | 21:08 | 21:10 | 21:12 | 21:14 | 21:16 | 21:18 |
| 21:00 | 21:02 | 21:04 | 21:07 | 21:10 | 21:13 | 21:15 | 21:18 | 21:20 | 21:22 | 21:24 | 21:26 | 21:28 |
| 21:10 | 21:12 | 21:14 | 21:17 | 21:20 | 21:23 | 21:25 | 21:28 | 21:30 | 21:32 | 21:34 | 21:36 | 21:38 |
| 21:20 | 21:22 | 21:24 | 21:27 | 21:30 | 21:33 | 21:35 | 21:38 | 21:40 | 21:42 | 21:44 | 21:46 | 21:48 |
| 21:30 | 21:32 | 21:34 | 21:37 | 21:40 | 21:43 | 21:45 | 21:48 | 21:50 | 21:52 | 21:54 | 21:56 | 21:58 |
| 21:39 | 21:41 | 21:43 | 21:46 | 21:49 | 21:52 | 21:54 | 21:57 | 21:59 | 22:01 | 22:03 | 22:05 | 22:07 |
| 21:48 | 21:50 | 21:52 | 21:55 | 21:58 | 22:01 | 22:03 | 22:06 | 22:08 | 22:10 | 22:12 | 22:14 | 22:16 |
| 21:58 | 22:00 | 22:02 | 22:05 | 22:08 | 22:11 | 22:13 | 22:16 | 22:18 | 22:20 | 22:22 | 22:24 | 22:26 |
| 22:06 | 22:08 | 22:10 | 22:13 | 22:16 | 22:19 | 22:21 | 22:24 | 22:26 | 22:28 | 22:30 | 22:32 | 22:34 |
| 22:16 | 22:18 | 22:20 | 22:23 | 22:26 | 22:29 | 22:31 | 22:34 | 22:36 | 22:38 | 22:40 | 22:42 | 22:44 |
| 22:24 | 22:26 | 22:28 | 22:31 | 22:34 | 22:37 | 22:39 | 22:42 | 22:44 | 22:46 | 22:48 | 22:50 | 22:52 |
| 22:35 | 22:37 | 22:39 | 22:42 | 22:45 | 22:48 | 22:50 | 22:53 | 22:55 | 22:57 | 22:59 | 23:01 | 23:03 |
| 22:44 | 22:46 | 22:48 | 22:51 | 22:54 | 22:57 | 22:59 | 23:02 | 23:04 | 23:06 | 23:08 | 23:10 | 23:12 |
| 22:54 | 22:56 | 22:58 | 23:01 | 23:04 | 23:07 | 23:09 | 23:12 | 23:14 | 23:16 | 23:18 | 23:20 | 23:22 |
| 23:05 | 23:07 | 23:09 | 23:12 | 23:15 | 23:18 | 23:20 | 23:23 | 23:25 | 23:27 | 23:29 | 23:31 | 23:33 |
| 23:18 | 23:20 | 23:22 | 23:25 | 23:28 | 23:31 | 23:33 | 23:36 | 23:38 | 23:40 | 23:42 | 23:44 | 23:46 |
| 23:32 | 23:34 | 23:36 | 23:39 | 23:42 | 23:45 | 23:47 | 23:50 | 23:52 | 23:54 | 23:56 | 23:58 | 00:00 |
| 23:49 | 23:51 | 23:53 | 23:56 | 23:59 | 00:02 | 00:04 | 00:07 | 00:09 | 00:11 | 00:13 | 00:15 | 00:17 |
| 00:09 | 00:11 | 00:13 | 00:16 | 00:19 | 00:22 | 00:24 | 00:27 | 00:29 | 00:31 | 00:33 | 00:35 | 00:37 |
| 00:25 | 00:27 | 00:29 | 00:32 | 00:35 | 00:38 | 00:40 | 00:43 | 00:45 | 00:47 | 00:49 | 00:51 | 00:53 |
| 00:40 | 00:42 | 00:44 | 00:47 | 00:50 | 00:53 | 00:55 | 00:58 | 01:00 | 01:02 | 01:04 | 01:06 | 01:08 |
| 01:00 | 01:02 | 01:04 | 01:07 | 01:10 | 01:13 | 01:15 | 01:18 | 01:20 | 01:22 | 01:24 | 01:26 | 01:28 |

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2024

Schedules & Maps

The next service change is on Sunday, December 22.

Schedule times are based on typical driving conditions and may vary. Please arrive at your stop a few minutes early to allow for any fluctuations in schedule.

Mon, Dec 9

1 Blair

[a] Route R1 service replaces the O-Train Line 1 when the scheduled train service has been cancelled. A R1 timetable is displayed only for the period during which Line 1 service is not running.

[b] Single-car trains will only use half of the platform. Customers should board in the designated section of the platform and follow signs to the boarding zones.

| TUNNEY'S PASTURE O-TRAIN EAST / EST | BAYVIEW O-TRAIN EAST / EST | PIMISI O-TRAIN EAST / EST | LYON O- TRAIN EAST / EST | PARLIAMENT / PARLEMENT O-TRAIN EAST / EST | RIDEAU O-TRAIN EAST / EST | UOTTAWA O-TRAIN EAST / EST | LEES O- TRAIN EAST / EST | HURDMAN O-TRAIN EAST / EST | TREMBLAY O-TRAIN EAST / EST | ST- LAURENT O-TRAIN EAST / EST | CYRVILLE O-TRAIN EAST / EST | BLAIR O- TRAIN |
|---|-------------------------------------|------------------------------------|-----------------------------------|---|------------------------------------|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|--|--------------------------------------|-------------------|
| | | | | | | | | | | 05:06 | 05:08 | 05:10 |
| 04:56 | 04:59 | 05:01 | 05:03 | 05:05 | 05:07 | 05:10 | 05:12 | 05:14 | 05:17 | 05:20 | 05:22 | 05:24 |
| 05:04 | 05:07 | 05:09 | 05:11 | 05:13 | 05:15 | 05:18 | 05:20 | 05:22 | 05:25 | 05:28 | 05:30 | 05:32 |
| 05:12 | 05:15 | 05:17 | 05:19 | 05:21 | 05:23 | 05:26 | 05:28 | 05:30 | 05:33 | 05:36 | 05:38 | 05:40 |
| 05:22 | 05:25 | 05:27 | 05:29 | 05:31 | 05:33 | 05:36 | 05:38 | 05:40 | 05:43 | 05:46 | 05:48 | 05:50 |
| 05:32 | 05:35 | 05:37 | 05:39 | 05:41 | 05:43 | 05:46 | 05:48 | 05:50 | 05:53 | 05:56 | 05:58 | 06:00 |
| 05:41 | 05:44 | 05:46 | 05:48 | 05:50 | 05:52 | 05:55 | 05:57 | 05:59 | 06:02 | 06:05 | 06:07 | 06:09 |
| | | | | | | | | | | 06:09 | 06:11 | 06:13 |
| 05:50 | 05:53 | 05:55 | 05:57 | 05:59 | 06:01 | 06:04 | 06:06 | 06:08 | 06:11 | 06:14 | 06:16 | 06:18 |
| | | | | | | | | | | 06:20 | 06:22 | 06:24 |
| 06:00 | 06:03 | 06:05 | 06:07 | 06:09 | 06:11 | 06:14 | 06:16 | 06:18 | 06:21 | 06:24 | 06:26 | 06:28 |
| | | | | | | | | | | 06:29 | 06:31 | 06:33 |
| 06:09 | 06:12 | 06:14 | 06:16 | 06:18 | 06:20 | 06:23 | 06:25 | 06:27 | 06:30 | 06:33 | 06:35 | 06:37 |
| 06:15 | 06:18 | 06:20 | 06:22 | 06:24 | 06:26 | 06:29 | 06:31 | 06:33 | 06:36 | 06:39 | 06:41 | 06:43 |
| 06:22 | 06:25 | 06:27 | 06:29 | 06:31 | 06:33 | 06:36 | 06:38 | 06:40 | 06:43 | 06:46 | 06:48 | 06:50 |
| 06:28 | 06:31 | 06:33 | 06:35 | 06:37 | 06:39 | 06:42 | 06:44 | 06:46 | 06:49 | 06:52 | 06:54 | 06:56 |
| 06:31 | 06:34 | 06:36 | 06:38 | 06:40 | 06:42 | 06:45 | 06:47 | 06:49 | 06:52 | 06:56 | 06:58 | 07:00 |
| 06:36 | 06:39 | 06:41 | 06:43 | 06:45 | 06:47 | 06:50 | 06:52 | 06:54 | 06:57 | 07:01 | 07:03 | 07:05 |
| 06:41 | 06:44 | 06:46 | 06:48 | 06:50 | 06:52 | 06:55 | 06:57 | 06:59 | 07:02 | 07:06 | 07:08 | 07:10 |
| 06:46 | 06:49 | 06:51 | 06:53 | 06:55 | 06:57 | 07:00 | 07:02 | 07:04 | 07:07 | 07:11 | 07:13 | 07:15 |
| 06:51 | 06:54 | 06:56 | 06:58 | 07:00 | 07:02 | 07:05 | 07:07 | 07:09 | 07:12 | 07:16 | 07:18 | 07:20 |
| 06:56 | 06:59 | 07:01 | 07:03 | 07:05 | 07:07 | 07:10 | 07:12 | 07:14 | 07:17 | 07:21 | 07:23 | 07:25 |
| 07:01 | 07:04 | 07:06 | 07:08 | 07:10 | 07:12 | 07:15 | 07:17 | 07:19 | 07:22 | 07:26 | 07:28 | 07:30 |
| 07:06 | 07:09 | 07:11 | 07:13 | 07:15 | 07:17 | 07:20 | 07:22 | 07:24 | 07:27 | 07:31 | 07:33 | 07:35 |
| 07:11 | 07:14 | 07:16 | 07:18 | 07:20 | 07:22 | 07:25 | 07:27 | 07:29 | 07:32 | 07:36 | 07:38 | 07:40 |
| 07:16 | 07:19 | 07:21 | 07:23 | 07:25 | 07:27 | 07:30 | 07:32 | 07:34 | 07:37 | 07:41 | 07:43 | 07:45 |
| 07:21 | 07:24 | 07:26 | 07:28 | 07:30 | 07:32 | 07:35 | 07:37 | 07:39 | 07:42 | 07:46 | 07:48 | 07:50 |

| TUNNEY'S PASTURE O-TRAIN EAST / EST | BAYVIEW O-TRAIN EAST / EST | PIMISI O-TRAIN EAST / EST | LYON O- TRAIN EAST / EST | PARLIAMENT / PARLEMENT O-TRAIN EAST / EST | RIDEAU O-TRAIN EAST / EST | UOTTAWA O-TRAIN EAST / EST | LEES O- TRAIN EAST / EST | HURDMAN O-TRAIN EAST / EST | TREMBLAY O-TRAIN EAST / EST | ST- LAURENT O-TRAIN EAST / EST | CYRVILLE O-TRAIN EAST / EST | BLAIR O- TRAIN |
|---|-------------------------------------|------------------------------------|-----------------------------------|---|------------------------------------|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|--|--------------------------------------|-------------------|
| 07:26 | 07:29 | 07:31 | 07:33 | 07:35 | 07:37 | 07:40 | 07:42 | 07:44 | 07:47 | 07:51 | 07:53 | 07:55 |
| 07:31 | 07:34 | 07:36 | 07:38 | 07:40 | 07:42 | 07:45 | 07:47 | 07:49 | 07:52 | 07:56 | 07:58 | 08:00 |
| 07:36 | 07:39 | 07:41 | 07:43 | 07:45 | 07:47 | 07:50 | 07:52 | 07:54 | 07:57 | 08:01 | 08:03 | 08:05 |
| 07:41 | 07:44 | 07:46 | 07:48 | 07:50 | 07:52 | 07:55 | 07:57 | 07:59 | 08:02 | 08:06 | 08:08 | 08:10 |
| 07:46 | 07:49 | 07:51 | 07:53 | 07:55 | 07:57 | 08:00 | 08:02 | 08:04 | 08:07 | 08:11 | 08:13 | 08:15 |
| 07:51 | 07:54 | 07:56 | 07:58 | 08:00 | 08:02 | 08:05 | 08:07 | 08:09 | 08:12 | 08:16 | 08:18 | 08:20 |
| 07:56 | 07:59 | 08:01 | 08:03 | 08:05 | 08:07 | 08:10 | 08:12 | 08:14 | 08:17 | 08:21 | 08:23 | 08:25 |
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| 08:11 | 08:14 | 08:16 | 08:18 | 08:20 | 08:22 | 08:25 | 08:27 | 08:29 | 08:32 | 08:36 | 08:38 | 08:40 |
| 08:16 | 08:19 | 08:21 | 08:23 | 08:25 | 08:27 | 08:30 | 08:32 | 08:34 | 08:37 | 08:41 | 08:43 | 08:45 |
| 08:21 | 08:24 | 08:26 | 08:28 | 08:30 | 08:32 | 08:35 | 08:37 | 08:39 | 08:42 | 08:46 | 08:48 | 08:50 |
| 08:26 | 08:29 | 08:31 | 08:33 | 08:35 | 08:37 | 08:40 | 08:42 | 08:44 | 08:47 | 08:51 | 08:53 | 08:55 |
| 08:31 | 08:34 | 08:36 | 08:38 | 08:40 | 08:42 | 08:45 | 08:47 | 08:49 | 08:52 | 08:56 | 08:58 | 09:00 |
| 08:36 | 08:39 | 08:41 | 08:43 | 08:45 | 08:47 | 08:50 | 08:52 | 08:54 | 08:57 | 09:01 | 09:03 | 09:05 |
| 08:41 | 08:44 | 08:46 | 08:48 | 08:50 | 08:52 | 08:55 | 08:57 | 08:59 | 09:02 | 09:06 | 09:08 | 09:10 |
| 08:46 | 08:49 | 08:51 | 08:53 | 08:55 | 08:57 | 09:00 | 09:02 | 09:04 | 09:07 | 09:11 | 09:13 | 09:15 |
| 08:51 | 08:54 | 08:56 | 08:58 | 09:00 | 09:02 | 09:05 | 09:07 | 09:09 | 09:12 | 09:16 | 09:18 | 09:20 |
| 08:56 | 08:59 | 09:01 | 09:03 | 09:05 | 09:07 | 09:10 | 09:12 | 09:14 | 09:17 | 09:21 | 09:23 | 09:25 |
| 09:01 | 09:04 | 09:06 | 09:08 | 09:10 | 09:12 | 09:15 | 09:17 | 09:19 | 09:22 | 09:26 | 09:28 | 09:30 |
| 09:06 | 09:09 | 09:11 | 09:13 | 09:15 | 09:17 | 09:20 | 09:22 | 09:24 | 09:27 | 09:31 | 09:33 | 09:35 |
| 09:11 | 09:14 | 09:16 | 09:18 | 09:20 | 09:22 | 09:25 | 09:27 | 09:29 | 09:32 | 09:36 | 09:38 | 09:40 |
| 09:16 | 09:19 | 09:21 | 09:23 | 09:25 | 09:27 | 09:30 | 09:32 | 09:34 | 09:37 | 09:41 | 09:43 | 09:45 |
| 09:22 | 09:25 | 09:27 | 09:29 | 09:31 | 09:33 | 09:36 | 09:38 | 09:40 | 09:43 | 09:47 | 09:49 | 09:51 |
| 09:28 | 09:31 | 09:33 | 09:35 | 09:37 | 09:39 | 09:42 | 09:44 | 09:46 | 09:49 | 09:53 | 09:55 | 09:57 |
| 09:33 | 09:36 | 09:38 | 09:40 | 09:42 | 09:44 | 09:47 | 09:49 | 09:51 | 09:54 | 09:57 | 09:59 | 10:01 |
| 09:43 | 09:46 | 09:48 | 09:50 | 09:52 | 09:54 | 09:57 | 09:59 | 10:01 | 10:04 | 10:07 | 10:09 | 10:11 |
| 09:53 | 09:56 | 09:58 | 10:00 | 10:02 | 10:04 | 10:07 | 10:09 | 10:11 | 10:14 | 10:17 | 10:19 | 10:21 |
| 10:03 | 10:06 | 10:08 | 10:10 | 10:12 | 10:14 | 10:17 | 10:19 | 10:21 | 10:24 | 10:27 | 10:29 | 10:31 |
| 10:13 | 10:16 | 10:18 | 10:20 | 10:22 | 10:24 | 10:27 | 10:29 | 10:31 | 10:34 | 10:37 | 10:39 | 10:41 |
| 10:23 | 10:26 | 10:28 | 10:30 | 10:32 | 10:34 | 10:37 | 10:39 | 10:41 | 10:44 | 10:47 | 10:49 | 10:51 |
| 10:33 | 10:36 | 10:38 | 10:40 | 10:42 | 10:44 | 10:47 | 10:49 | 10:51 | 10:54 | 10:57 | 10:59 | 11:01 |
| 10:43 | 10:46 | 10:48 | 10:50 | 10:52 | 10:54 | 10:57 | 10:59 | 11:01 | 11:04 | 11:07 | 11:09 | 11:11 |
| 10:53 | 10:56 | 10:58 | 11:00 | 11:02 | 11:04 | 11:07 | 11:09 | 11:11 | 11:14 | 11:17 | 11:19 | 11:21 |
| 11:03 | 11:06 | 11:08 | 11:10 | 11:12 | 11:14 | 11:17 | 11:19 | 11:21 | 11:24 | 11:27 | 11:29 | 11:31 |
| 11:13 | 11:16 | 11:18 | 11:20 | 11:22 | 11:24 | 11:27 | 11:29 | 11:31 | 11:34 | 11:37 | 11:39 | 11:41 |
| 11:23 | 11:26 | 11:28 | 11:30 | 11:32 | 11:34 | 11:37 | 11:39 | 11:41 | 11:44 | 11:47 | 11:49 | 11:51 |
| 11:33 | 11:36 | 11:38 | 11:40 | 11:42 | 11:44 | 11:47 | 11:49 | 11:51 | 11:54 | 11:57 | 11:59 | 12:01 |
| 11:43 | 11:46 | 11:48 | 11:50 | 11:52 | 11:54 | 11:57 | 11:59 | 12:01 | 12:04 | 12:07 | 12:09 | 12:11 |
| 11:53 | 11:56 | 11:58 | 12:00 | 12:02 | 12:04 | 12:07 | 12:09 | 12:11 | 12:14 | 12:17 | 12:19 | 12:21 |
| 12:03 | 12:06 | 12:08 | 12:10 | 12:12 | 12:14 | 12:17 | 12:19 | 12:21 | 12:24 | 12:27 | 12:29 | 12:31 |
| 12:13 | 12:16 | 12:18 | 12:20 | 12:22 | 12:24 | 12:27 | 12:29 | 12:31 | 12:34 | 12:37 | 12:39 | 12:41 |
| 12:23 | 12:26 | 12:28 | 12:30 | 12:32 | 12:34 | 12:37 | 12:39 | 12:41 | 12:44 | 12:47 | 12:49 | 12:51 |
| 12:33 | 12:36 | 12:38 | 12:40 | 12:42 | 12:44 | 12:47 | 12:49 | 12:51 | 12:54 | 12:57 | 12:59 | 13:01 |
| 12:43 | 12:46 | 12:48 | 12:50 | 12:52 | 12:54 | 12:57 | 12:59 | 13:01 | 13:04 | 13:07 | 13:09 | 13:11 |
| 12:53 | 12:56 | 12:58 | 13:00 | 13:02 | 13:04 | 13:07 | 13:09 | 13:11 | 13:14 | 13:17 | 13:19 | 13:21 |
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| 13:23 | 13:26 | 13:28 | 13:30 | 13:32 | 13:34 | 13:37 | 13:39 | 13:41 | 13:44 | 13:47 | 13:49 | 13:51 |

| TUNNEY'S PASTURE O-TRAIN EAST / EST | BAYVIEW O-TRAIN EAST / EST | PIMISI O-TRAIN EAST / EST | LYON O- TRAIN EAST / EST | PARLIAMENT / PARLEMENT O-TRAIN EAST / EST | RIDEAU O-TRAIN EAST / EST | UOTTAWA O-TRAIN EAST / EST | LEES O- TRAIN EAST / EST | HURDMAN O-TRAIN EAST / EST | TREMBLAY O-TRAIN EAST / EST | ST- LAURENT O-TRAIN EAST / EST | CYRVILLE O-TRAIN EAST / EST | BLAIR O- TRAIN |
|---|-------------------------------------|------------------------------------|-----------------------------------|---|------------------------------------|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|--|--------------------------------------|-------------------|
| 13:33 | 13:36 | 13:38 | 13:40 | 13:42 | 13:44 | 13:47 | 13:49 | 13:51 | 13:54 | 13:57 | 13:59 | 14:01 |
| 13:43 | 13:46 | 13:48 | 13:50 | 13:52 | 13:54 | 13:57 | 13:59 | 14:01 | 14:04 | 14:07 | 14:09 | 14:11 |
| 13:53 | 13:56 | 13:58 | 14:00 | 14:02 | 14:04 | 14:07 | 14:09 | 14:11 | 14:14 | 14:17 | 14:19 | 14:21 |
| 14:03 | 14:06 | 14:08 | 14:10 | 14:12 | 14:14 | 14:17 | 14:19 | 14:21 | 14:24 | 14:27 | 14:29 | 14:31 |
| 14:13 | 14:16 | 14:18 | 14:20 | 14:22 | 14:24 | 14:27 | 14:29 | 14:31 | 14:34 | 14:37 | 14:39 | 14:41 |
| | | | | | | | | | | 14:41 | 14:43 | 14:45 |
| 14:23 | 14:26 | 14:28 | 14:30 | 14:32 | 14:34 | 14:37 | 14:39 | 14:41 | 14:44 | 14:47 | 14:49 | 14:51 |
| | | | | | | | | | | 14:51 | 14:53 | 14:55 |
| 14:33 | 14:36 | 14:38 | 14:40 | 14:42 | 14:44 | 14:47 | 14:49 | 14:51 | 14:54 | 14:57 | 14:59 | 15:01 |
| 14:37 | 14:40 | 14:42 | 14:44 | 14:46 | 14:48 | 14:51 | 14:53 | 14:55 | 14:58 | 15:01 | 15:03 | 15:05 |
| 14:43 | 14:46 | 14:48 | 14:50 | 14:52 | 14:54 | 14:57 | 14:59 | 15:01 | 15:04 | 15:07 | 15:09 | 15:11 |
| 14:47 | 14:50 | 14:52 | 14:54 | 14:56 | 14:58 | 15:01 | 15:03 | 15:05 | 15:08 | 15:11 | 15:13 | 15:15 |
| 14:53 | 14:56 | 14:58 | 15:00 | 15:02 | 15:04 | 15:07 | 15:09 | 15:11 | 15:14 | 15:17 | 15:19 | 15:21 |
| 14:57 | 15:00 | 15:02 | 15:04 | 15:06 | 15:08 | 15:11 | 15:13 | 15:15 | 15:18 | 15:21 | 15:23 | 15:25 |
| 15:01 | 15:04 | 15:06 | 15:08 | 15:10 | 15:12 | 15:15 | 15:17 | 15:19 | 15:22 | 15:26 | 15:28 | 15:30 |
| 15:07 | 15:10 | 15:12 | 15:14 | 15:16 | 15:18 | 15:21 | 15:23 | 15:25 | 15:28 | 15:32 | 15:34 | 15:36 |
| 15:11 | 15:14 | 15:16 | 15:18 | 15:20 | 15:22 | 15:25 | 15:27 | 15:29 | 15:32 | 15:36 | 15:38 | 15:40 |
| 15:16 | 15:19 | 15:21 | 15:23 | 15:25 | 15:27 | 15:30 | 15:32 | 15:34 | 15:37 | 15:41 | 15:43 | 15:45 |
| 15:21 | 15:24 | 15:26 | 15:28 | 15:30 | 15:32 | 15:35 | 15:37 | 15:39 | 15:42 | 15:46 | 15:48 | 15:50 |
| 15:26 | 15:29 | 15:31 | 15:33 | 15:35 | 15:37 | 15:40 | 15:42 | 15:44 | 15:47 | 15:51 | 15:53 | 15:55 |
| 15:31 | 15:34 | 15:36 | 15:38 | 15:40 | 15:42 | 15:45 | 15:47 | 15:49 | 15:52 | 15:56 | 15:58 | 16:00 |
| 15:36 | 15:39 | 15:41 | 15:43 | 15:45 | 15:47 | 15:50 | 15:52 | 15:54 | 15:57 | 16:01 | 16:03 | 16:05 |
| 15:41 | 15:44 | 15:46 | 15:48 | 15:50 | 15:52 | 15:55 | 15:57 | 15:59 | 16:02 | 16:06 | 16:08 | 16:10 |
| 15:46 | 15:49 | 15:51 | 15:53 | 15:55 | 15:57 | 16:00 | 16:02 | 16:04 | 16:07 | 16:11 | 16:13 | 16:15 |
| 15:51 | 15:54 | 15:56 | 15:58 | 16:00 | 16:02 | 16:05 | 16:07 | 16:09 | 16:12 | 16:16 | 16:18 | 16:20 |
| 15:56 | 15:59 | 16:01 | 16:03 | 16:05 | 16:07 | 16:10 | 16:12 | 16:14 | 16:17 | 16:21 | 16:23 | 16:25 |
| 16:01 | 16:04 | 16:06 | 16:08 | 16:10 | 16:12 | 16:15 | 16:17 | 16:19 | 16:22 | 16:26 | 16:28 | 16:30 |
| 16:06 | 16:09 | 16:11 | 16:13 | 16:15 | 16:17 | 16:20 | 16:22 | 16:24 | 16:27 | 16:31 | 16:33 | 16:35 |
| 16:11 | 16:14 | 16:16 | 16:18 | 16:20 | 16:22 | 16:25 | 16:27 | 16:29 | 16:32 | 16:36 | 16:38 | 16:40 |
| 16:16 | 16:19 | 16:21 | 16:23 | 16:25 | 16:27 | 16:30 | 16:32 | 16:34 | 16:37 | 16:41 | 16:43 | 16:45 |
| 16:21 | 16:24 | 16:26 | 16:28 | 16:30 | 16:32 | 16:35 | 16:37 | 16:39 | 16:42 | 16:46 | 16:48 | 16:50 |
| 16:26 | 16:29 | 16:31 | 16:33 | 16:35 | 16:37 | 16:40 | 16:42 | 16:44 | 16:47 | 16:51 | 16:53 | 16:55 |
| 16:31 | 16:34 | 16:36 | 16:38 | 16:40 | 16:42 | 16:45 | 16:47 | 16:49 | 16:52 | 16:56 | 16:58 | 17:00 |
| 16:36 | 16:39 | 16:41 | 16:43 | 16:45 | 16:47 | 16:50 | 16:52 | 16:54 | 16:57 | 17:01 | 17:03 | 17:05 |
| 16:41 | 16:44 | 16:46 | 16:48 | 16:50 | 16:52 | 16:55 | 16:57 | 16:59 | 17:02 | 17:06 | 17:08 | 17:10 |
| 16:46 | 16:49 | 16:51 | 16:53 | 16:55 | 16:57 | 17:00 | 17:02 | 17:04 | 17:07 | 17:11 | 17:13 | 17:15 |
| 16:51 | 16:54 | 16:56 | 16:58 | 17:00 | 17:02 | 17:05 | 17:07 | 17:09 | 17:12 | 17:16 | 17:18 | 17:20 |
| 16:56 | 16:59 | 17:01 | 17:03 | 17:05 | 17:07 | 17:10 | 17:12 | 17:14 | 17:17 | 17:21 | 17:23 | 17:25 |
| 17:01 | 17:04 | 17:06 | 17:08 | 17:10 | 17:12 | 17:15 | 17:17 | 17:19 | 17:22 | 17:26 | 17:28 | 17:30 |
| 17:06 | 17:09 | 17:11 | 17:13 | 17:15 | 17:17 | 17:20 | 17:22 | 17:24 | 17:27 | 17:31 | 17:33 | 17:35 |
| 17:11 | 17:14 | 17:16 | 17:18 | 17:20 | 17:22 | 17:25 | 17:27 | 17:29 | 17:32 | 17:36 | 17:38 | 17:40 |
| 17:16 | 17:19 | 17:21 | 17:23 | 17:25 | 17:27 | 17:30 | 17:32 | 17:34 | 17:37 | 17:41 | 17:43 | 17:45 |
| 17:21 | 17:24 | 17:26 | 17:28 | 17:30 | 17:32 | 17:35 | 17:37 | 17:39 | 17:42 | 17:46 | 17:48 | 17:50 |
| 17:26 | 17:29 | 17:31 | 17:33 | 17:35 | 17:37 | 17:40 | 17:42 | 17:44 | 17:47 | 17:51 | 17:53 | 17:55 |
| 17:31 | 17:34 | 17:36 | 17:38 | 17:40 | 17:42 | 17:45 | 17:47 | 17:49 | 17:52 | 17:56 | 17:58 | 18:00 |
| 17:36 | 17:39 | 17:41 | 17:43 | 17:45 | 17:47 | 17:50 | 17:52 | 17:54 | 17:57 | 18:01 | 18:03 | 18:05 |
| 17:41 | 17:44 | 17:46 | 17:48 | 17:50 | 17:52 | 17:55 | 17:57 | 17:59 | 18:02 | 18:06 | 18:08 | 18:10 |
| 17:46 | 17:49 | 17:51 | 17:53 | 17:55 | 17:57 | 18:00 | 18:02 | 18:04 | 18:07 | 18:11 | 18:13 | 18:15 |
| 17:51 | 17:54 | 17:56 | 17:58 | 18:00 | 18:02 | 18:05 | 18:07 | 18:09 | 18:12 | 18:16 | 18:18 | 18:20 |

| TUNNEY'S PASTURE O-TRAIN EAST / EST | BAYVIEW O-TRAIN EAST / EST | PIMISI O-TRAIN EAST / EST | LYON O- TRAIN EAST / EST | PARLIAMENT / PARLEMENT O-TRAIN EAST / EST | RIDEAU O-TRAIN EAST / EST | UOTTAWA O-TRAIN EAST / EST | LEES O- TRAIN EAST / EST | HURDMAN O-TRAIN EAST / EST | TREMBLAY O-TRAIN EAST / EST | ST- LAURENT O-TRAIN EAST / EST | CYRVILLE O-TRAIN EAST / EST | BLAIR O- TRAIN |
|---|-------------------------------------|------------------------------------|-----------------------------------|---|------------------------------------|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|--|--------------------------------------|-------------------|
| 17:56 | 17:59 | 18:01 | 18:03 | 18:05 | 18:07 | 18:10 | 18:12 | 18:14 | 18:17 | 18:21 | 18:23 | 18:25 |
| 18:01 | 18:04 | 18:06 | 18:08 | 18:10 | 18:12 | 18:15 | 18:17 | 18:19 | 18:22 | 18:26 | 18:28 | 18:30 |
| 18:06 | 18:09 | 18:11 | 18:13 | 18:15 | 18:17 | 18:20 | 18:22 | 18:24 | 18:27 | 18:31 | 18:33 | 18:35 |
| 18:11 | 18:14 | 18:16 | 18:18 | 18:20 | 18:22 | 18:25 | 18:27 | 18:29 | 18:32 | 18:36 | 18:38 | 18:40 |
| 18:16 | 18:19 | 18:21 | 18:23 | 18:25 | 18:27 | 18:30 | 18:32 | 18:34 | 18:37 | 18:41 | 18:43 | 18:45 |
| 18:22 | 18:25 | 18:27 | 18:29 | 18:31 | 18:33 | 18:36 | 18:38 | 18:40 | 18:43 | 18:47 | 18:49 | 18:51 |
| 18:28 | 18:31 | 18:33 | 18:35 | 18:37 | 18:39 | 18:42 | 18:44 | 18:46 | 18:49 | 18:53 | 18:55 | 18:57 |
| 18:33 | 18:36 | 18:38 | 18:40 | 18:42 | 18:44 | 18:47 | 18:49 | 18:51 | 18:54 | 18:57 | 18:59 | 19:01 |
| 18:43 | 18:46 | 18:48 | 18:50 | 18:52 | 18:54 | 18:57 | 18:59 | 19:01 | 19:04 | 19:07 | 19:09 | 19:11 |
| 18:53 | 18:56 | 18:58 | 19:00 | 19:02 | 19:04 | 19:07 | 19:09 | 19:11 | 19:14 | 19:17 | 19:19 | 19:21 |
| 19:03 | 19:06 | 19:08 | 19:10 | 19:12 | 19:14 | 19:17 | 19:19 | 19:21 | 19:24 | 19:27 | 19:29 | 19:31 |
| 19:13 | 19:16 | 19:18 | 19:20 | 19:22 | 19:24 | 19:27 | 19:29 | 19:31 | 19:34 | 19:37 | 19:39 | 19:41 |
| 19:23 | 19:26 | 19:28 | 19:30 | 19:32 | 19:34 | 19:37 | 19:39 | 19:41 | 19:44 | 19:47 | 19:49 | 19:51 |
| 19:33 | 19:36 | 19:38 | 19:40 | 19:42 | 19:44 | 19:47 | 19:49 | 19:51 | 19:54 | 19:57 | 19:59 | 20:01 |
| 19:43 | 19:46 | 19:48 | 19:50 | 19:52 | 19:54 | 19:57 | 19:59 | 20:01 | 20:04 | 20:07 | 20:09 | 20:11 |
| 19:53 | 19:56 | 19:58 | 20:00 | 20:02 | 20:04 | 20:07 | 20:09 | 20:11 | 20:14 | 20:17 | 20:19 | 20:21 |
| 20:03 | 20:06 | 20:08 | 20:10 | 20:12 | 20:14 | 20:17 | 20:19 | 20:21 | 20:24 | 20:27 | 20:29 | 20:31 |
| 20:13 | 20:16 | 20:18 | 20:20 | 20:22 | 20:24 | 20:27 | 20:29 | 20:31 | 20:34 | 20:37 | 20:39 | 20:41 |
| 20:23 | 20:26 | 20:28 | 20:30 | 20:32 | 20:34 | 20:37 | 20:39 | 20:41 | 20:44 | 20:47 | 20:49 | 20:51 |
| 20:33 | 20:36 | 20:38 | 20:40 | 20:42 | 20:44 | 20:47 | 20:49 | 20:51 | 20:54 | 20:57 | 20:59 | 21:01 |
| 20:43 | 20:46 | 20:48 | 20:50 | 20:52 | 20:54 | 20:57 | 20:59 | 21:01 | 21:04 | 21:07 | 21:09 | 21:11 |
| 20:53 | 20:56 | 20:58 | 21:00 | 21:02 | 21:04 | 21:07 | 21:09 | 21:11 | 21:14 | 21:17 | 21:19 | 21:21 |
| 21:03 | 21:06 | 21:08 | 21:10 | 21:12 | 21:14 | 21:17 | 21:19 | 21:21 | 21:24 | 21:27 | 21:29 | 21:31 |
| 21:13 | 21:16 | 21:18 | 21:20 | 21:22 | 21:24 | 21:27 | 21:29 | 21:31 | 21:34 | 21:37 | 21:39 | 21:41 |
| 21:23 | 21:26 | 21:28 | 21:30 | 21:32 | 21:34 | 21:37 | 21:39 | 21:41 | 21:44 | 21:47 | 21:49 | 21:51 |
| 21:33 | 21:36 | 21:38 | 21:40 | 21:42 | 21:44 | 21:47 | 21:49 | 21:51 | 21:54 | 21:57 | 21:59 | 22:01 |
| 21:43 | 21:46 | 21:48 | 21:50 | 21:52 | 21:54 | 21:57 | 21:59 | 22:01 | 22:04 | 22:07 | 22:09 | 22:11 |
| 21:53 | 21:56 | 21:58 | 22:00 | 22:02 | 22:04 | 22:07 | 22:09 | 22:11 | 22:14 | 22:17 | 22:19 | 22:21 |
| 22:01 | 22:04 | 22:06 | 22:08 | 22:10 | 22:12 | 22:15 | 22:17 | 22:19 | 22:22 | 22:25 | 22:27 | 22:29 |
| 22:11 | 22:14 | 22:16 | 22:18 | 22:20 | 22:22 | 22:25 | 22:27 | 22:29 | 22:32 | 22:35 | 22:37 | 22:39 |
| 22:20 | 22:23 | 22:25 | 22:27 | 22:29 | 22:31 | 22:34 | 22:36 | 22:38 | 22:41 | 22:44 | 22:46 | 22:48 |
| 22:29 | 22:32 | 22:34 | 22:36 | 22:38 | 22:40 | 22:43 | 22:45 | 22:47 | 22:50 | 22:53 | 22:55 | 22:57 |
| 22:39 | 22:42 | 22:44 | 22:46 | 22:48 | 22:50 | 22:53 | 22:55 | 22:57 | 23:00 | 23:03 | 23:05 | 23:07 |
| 22:48 | 22:51 | 22:53 | 22:55 | 22:57 | 22:59 | 23:02 | 23:04 | 23:06 | 23:09 | 23:12 | 23:14 | 23:16 |
| 22:57 | 23:00 | 23:02 | 23:04 | 23:06 | 23:08 | 23:11 | 23:13 | 23:15 | 23:18 | 23:21 | 23:23 | 23:25 |
| 23:07 | 23:10 | 23:12 | 23:14 | 23:16 | 23:18 | 23:21 | 23:23 | 23:25 | 23:28 | 23:31 | 23:33 | 23:35 |
| 23:16 | 23:19 | 23:21 | 23:23 | 23:25 | 23:27 | 23:30 | 23:32 | 23:34 | 23:37 | 23:40 | 23:42 | 23:44 |
| 23:25 | 23:28 | 23:30 | 23:32 | 23:34 | 23:36 | 23:39 | 23:41 | 23:43 | 23:46 | 23:49 | 23:51 | 23:53 |
| 23:37 | 23:40 | 23:42 | 23:44 | 23:46 | 23:48 | 23:51 | 23:53 | 23:55 | 23:58 | 00:01 | 00:03 | 00:05 |
| 23:50 | 23:53 | 23:55 | 23:57 | 23:59 | 00:01 | 00:04 | 00:06 | 00:08 | 00:11 | 00:14 | 00:16 | 00:18 |
| 00:04 | 00:07 | 00:09 | 00:11 | 00:13 | 00:15 | 00:18 | 00:20 | 00:22 | 00:25 | 00:28 | 00:30 | 00:32 |
| 00:22 | 00:25 | 00:27 | 00:29 | 00:31 | 00:33 | 00:36 | 00:38 | 00:40 | 00:43 | 00:46 | 00:48 | 00:50 |
| 00:45 | 00:48 | 00:50 | 00:52 | 00:54 | 00:56 | 00:59 | 01:01 | 01:03 | 01:06 | 01:09 | 01:11 | 01:13 |
| 01:00 | 01:03 | 01:05 | 01:07 | 01:09 | 01:11 | 01:14 | 01:16 | 01:18 | 01:21 | 01:24 | 01:26 | 01:28 |

Appendix D-3 Highway 417 Traffic Data



Highway 417 2024 Hourly Counts

From MTO iCorridor Website

WESTBOUND

| PROJECTION | 2040 DESIGN YEAR | | | |
|------------|-----------------------|-------|-------|----------------|
| | 0.5% PER ANNUM GROWTH | | | |
| | OTHER | TRUCK | TOTAL | PERCENT TRUCKS |
| 24 HOUR | 78344 | 4623 | 82966 | 5.6% |
| DAY | 68667 | 3749 | 72415 | 5.2% |
| NIGHT | 9677 | 874 | 10551 | 8.3% |

EASTBOUND

| PROJECTION | 2040 DESIGN YEAR | | | |
|------------|-----------------------|-------|-------|----------------|
| | 0.5% PER ANNUM GROWTH | | | |
| | OTHER | TRUCK | TOTAL | PERCENT TRUCKS |
| 24 HOUR | 85989 | 3923 | 89912 | 4.4% |
| DAY | 75707 | 3477 | 79183 | 4.4% |
| NIGHT | 10283 | 446 | 10729 | 4.2% |

WESTBOUND

| | OTHER | TRUCK | TOTAL | PERCENT TRUCKS | HRLY DISTN |
|---------|-------|-------|-------|----------------|------------|
| | | | | | |
| 24 HOUR | 72335 | 4268 | 76603 | 5.6% | |
| DAY | 63400 | 3461 | 66861 | 5.2% | |
| NIGHT | 8935 | 807 | 9742 | 8.3% | |

EASTBOUND

| | OTHER | TRUCK | TOTAL | PERCENT TRUCKS | HRLY DISTN |
|---------|-------|-------|-------|----------------|------------|
| | | | | | |
| 24 HOUR | 79394 | 3622 | 83016 | 4.4% | |
| DAY | 69900 | 3210 | 73110 | 4.4% | |
| NIGHT | 9494 | 412 | 9906 | 4.2% | |

| | | | | | | | | | |
|----|------|-----|------|------|----|------|-----|------|------|
| 0 | 727 | 31 | 758 | 1.0% | 0 | 827 | 45 | 872 | 1.1% |
| 1 | 380 | 30 | 410 | 0.5% | 1 | 538 | 39 | 577 | 0.7% |
| 2 | 274 | 31 | 305 | 0.4% | 2 | 433 | 40 | 473 | 0.6% |
| 3 | 206 | 37 | 243 | 0.3% | 3 | 313 | 38 | 351 | 0.4% |
| 4 | 348 | 68 | 416 | 0.5% | 4 | 383 | 37 | 420 | 0.5% |
| 5 | 1500 | 122 | 1622 | 2.1% | 5 | 1400 | 60 | 1460 | 1.8% |
| 6 | 4500 | 455 | 4955 | 6.5% | 6 | 3900 | 108 | 4008 | 4.8% |
| 7 | 4900 | 371 | 5271 | 6.9% | 7 | 4500 | 196 | 4696 | 5.7% |
| 8 | 5400 | 345 | 5745 | 7.5% | 8 | 4400 | 189 | 4589 | 5.5% |
| 9 | 4200 | 268 | 4468 | 5.8% | 9 | 4200 | 188 | 4388 | 5.3% |
| 10 | 4100 | 173 | 4273 | 5.6% | 10 | 4300 | 219 | 4519 | 5.4% |
| 11 | 4300 | 295 | 4595 | 6.0% | 11 | 4500 | 210 | 4710 | 5.7% |
| 12 | 4400 | 227 | 4627 | 6.0% | 12 | 4900 | 210 | 5110 | 6.2% |
| 13 | 4400 | 226 | 4626 | 6.0% | 13 | 5000 | 242 | 5242 | 6.3% |
| 14 | 4500 | 304 | 4804 | 6.3% | 14 | 5400 | 288 | 5688 | 6.9% |
| 15 | 4600 | 373 | 4973 | 6.5% | 15 | 5900 | 474 | 6374 | 7.7% |
| 16 | 4200 | 325 | 4525 | 5.9% | 16 | 5800 | 401 | 6201 | 7.5% |
| 17 | 4100 | 185 | 4285 | 5.6% | 17 | 5200 | 212 | 5412 | 6.5% |
| 18 | 3900 | 93 | 3993 | 5.2% | 18 | 4300 | 122 | 4422 | 5.3% |
| 19 | 3300 | 82 | 3382 | 4.4% | 19 | 3500 | 95 | 3595 | 4.3% |
| 20 | 3000 | 90 | 3090 | 4.0% | 20 | 3200 | 60 | 3260 | 3.9% |
| 21 | 2400 | 63 | 2463 | 3.2% | 21 | 2700 | 49 | 2749 | 3.3% |
| 22 | 1700 | 41 | 1741 | 2.3% | 22 | 2100 | 55 | 2155 | 2.6% |
| 23 | 1000 | 33 | 1033 | 1.3% | 23 | 1700 | 45 | 1745 | 2.1% |

Highway 417 Growth Rate

From MTO iCorridor Website

| YEAR | TOTAL | ANNUAL GROWTH |
|---------|---------|------------------|
| 2000 | 134,000 | - |
| 2001 | 136,300 | 1.7% |
| 2002 | 138,600 | 1.7% |
| 2003 | 142,000 | 2.5% |
| 2004 | 143,100 | 0.8% |
| 2005 | 141,700 | -1.0% |
| 2006 | 145,300 | 2.5% |
| 2007 | 145,100 | -0.1% |
| 2008 | 146,900 | 1.2% |
| 2009 | 139,500 | -5.0% |
| 2010 | 150,300 | 7.7% |
| 2011 | 140,000 | -6.9% |
| 2012 | 142,100 | 1.5% |
| 2013 | 136,000 | -4.3% |
| 2014 | 149,200 | 9.7% |
| 2015 | 150,300 | 0.7% |
| 2016 | 151,500 | 0.8% |
| 2017 | 143,000 | -5.6% |
| 2018 | 144,000 | 0.7% |
| 2019 | 145,000 | 0.7% |
| AVERAGE | | 0.5% |

Appendix D-4 Cadna Modelling Inputs



ORNAMENT - Sound Power Emissions & Source Heights

Ontario Road Noise Analysis Method for Environment and Transportation

| Road Segment ID | AADT | Percent Traffic In Period | Period (h) | Total Traffic Volumes (Period) | Speed (kph) | Auto % | Med % | Hvy % | Auto | Med | Heavy | Road Gradient (%) | Cadna/ A Ground Absorption G | PWL (dBA) | Source Height, s (m) |
|--------------------------------|-------|---------------------------|------------|--------------------------------|-------------|--------|-------|-------|-------|------|-------|-------------------|------------------------------|-----------|----------------------|
| Day | | | | | | | | | | | | | | | |
| Highway 417 EB | 79183 | 100% | 16 | 79183 | 100 | 95.6% | 1.1% | 3.3% | 75699 | 871 | 2613 | 0 | 0.00 | 95.3 | 1.3 |
| Highway 417 WB | 72415 | 100% | 16 | 72415 | 100 | 95.9% | 1.0% | 3.1% | 69446 | 724 | 2245 | 0 | 0.00 | 94.8 | 1.3 |
| Tremblay Road W of Belfast E/B | 17500 | 92% | 16 | 16100 | 50 | 88.0% | 7.0% | 5.0% | 14168 | 1127 | 805 | 0 | 0.00 | 84.2 | 1.5 |
| Tremblay Road W of Belfast W/B | 17500 | 92% | 16 | 16100 | 50 | 88.0% | 7.0% | 5.0% | 14168 | 1127 | 805 | 0 | 0.00 | 84.2 | 1.5 |
| Tremblay Road E of Belfast | 15000 | 92% | 16 | 13800 | 50 | 88.0% | 7.0% | 5.0% | 12144 | 966 | 690 | 0 | 0.00 | 83.5 | 1.5 |
| Belfast Road | 15000 | 92% | 16 | 13800 | 50 | 88.0% | 7.0% | 5.0% | 12144 | 966 | 690 | 0 | 0.00 | 83.5 | 1.5 |
| Terminal Ave | 15000 | 92% | 16 | 13800 | 50 | 88.0% | 7.0% | 5.0% | 12144 | 966 | 690 | 0 | 0.00 | 83.5 | 1.5 |
| Night | | | | | | | | | | | | | | | |
| Highway 417 EB | 10729 | 100% | 8 | 10729 | 100 | 94.8% | 1.3% | 3.9% | 10171 | 139 | 418 | 0 | 0.00 | 90.0 | 1.4 |
| Highway 417 WB | 10551 | 100% | 8 | 10551 | 100 | 91.7% | 2.1% | 6.2% | 9675 | 222 | 654 | 0 | 0.00 | 91.1 | 1.6 |
| Tremblay Road W of Belfast E/B | 17500 | 8% | 8 | 1400 | 50 | 88.0% | 7.0% | 5.0% | 1232 | 98 | 70 | 0 | 0.00 | 76.6 | 1.5 |
| Tremblay Road W of Belfast W/B | 17500 | 8% | 8 | 1400 | 50 | 88.0% | 7.0% | 5.0% | 1232 | 98 | 70 | 0 | 0.00 | 76.6 | 1.5 |
| Tremblay Road E of Belfast | 15000 | 8% | 8 | 1200 | 50 | 88.0% | 7.0% | 5.0% | 1056 | 84 | 60 | 0 | 0.00 | 76.0 | 1.5 |
| Belfast Road | 15000 | 8% | 8 | 1200 | 50 | 88.0% | 7.0% | 5.0% | 1056 | 84 | 60 | 0 | 0.00 | 76.0 | 1.5 |
| Terminal Ave | 15000 | 8% | 8 | 1200 | 50 | 88.0% | 7.0% | 5.0% | 1056 | 84 | 60 | 0 | 0.00 | 76.0 | 1.5 |

ROADWAYS

| Name | M. | ID | Result: PWL | | | Result: PWL' | | | Lw / Li | | Correction | | | Sound Reduction | | Attenuation | Operating Time | | | K0 | Freq. | Direct. | Moving Pt. Src | | | ht |
|--------------------------|----|------|-------------|---------|-------|--------------|---------|-------|---------|---------|------------|-------|---------|-----------------|------|-------------|----------------|--------|---------|----|-------|---------|----------------|--------|-------|----|
| | | | Day | Evening | Night | Day | Evening | Night | Type | Value | norm. | Day | Evening | Night | R | | Area | Day | Special | | | | Night | Number | Speed | |
| | | | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | | | dB(A) | dB(A) | dB(A) | dB(A) | (m²) | | (min) | (min) | (min) | | | | (dB) | (Hz) | Day | |
| Highway 417 EB | ~ | ROAD | 128.3 | 33 | 123 | 95.3 | 0 | 90 | Lw' | roadway | 0 | 95.3 | 0 | 90 | | | 0 | (none) | | | | | | | 1.3 | |
| Highway 417 WB | ~ | ROAD | 127.8 | 33 | 124.1 | 94.8 | 0 | 91.1 | Lw' | roadway | 0 | 94.8 | 0 | 91.1 | | | 0 | (none) | | | | | | | 1.3 | |
| Tremblay W of Belfast WB | ~ | ROAD | 113.5 | 29.3 | 105.9 | 84.2 | 0 | 76.6 | Lw' | roadway | 0 | 84.2 | 0 | 76.6 | | | 0 | (none) | | | | | | | 1.5 | |
| Tremblay W of Belfast EB | ~ | ROAD | 113.5 | 29.3 | 105.9 | 84.2 | 0 | 76.6 | Lw' | roadway | 0 | 84.2 | 0 | 76.6 | | | 0 | (none) | | | | | | | 1.5 | |
| Tremblay E of Belfast | ~ | ROAD | 111.3 | 27.8 | 103.8 | 83.5 | 0 | 76 | Lw' | roadway | 0 | 83.5 | 0 | 76 | | | 0 | (none) | | | | | | | 1.5 | |
| Belfast Rd (2-way) | ~ | ROAD | 112.9 | 29.4 | 105.4 | 83.5 | 0 | 76 | Lw' | roadway | 0 | 83.5 | 0 | 76 | | | 0 | (none) | | | | | | | 1.5 | |
| Terminal Ave (2-way) | ~ | ROAD | 113.8 | 30.3 | 106.3 | 83.5 | 0 | 76 | Lw' | roadway | 0 | 83.5 | 0 | 76 | | | 0 | (none) | | | | | | | 1.5 | |

RAIL LINES

| Subdivision | Source Type | Direction | Name | Sel. | M. | ID | Lw' | | Train Class | Track Type | Penalty dB | Consist | | No. of Units | | Speed km/h | Throttle Notch | Correct. Track (dB) |
|-------------|-------------|-------------------|-----------------|------|-----------|----|--------------|----------------|---------------|------------|---------------|----------------------|-----|--------------|----|---------------|-------------------|---------------------------|
| | | | | | | | Day (dBA) | Night (dBA) | | | | Type 1 Type | Day | Night | | | | |
| *** LRT *** | | | | | | | | 0 | 0 | | | | | | | | | |
| n/a | Wheel | E/B | West of Station | ~ | LRT | | 48 | -81 (local) | | | | 0 FTA18_RT_CAR_25 | 137 | 32 | 40 | 0 | 0 | 0 |
| n/a | Wheel | E/B | East of Station | ~ | LRT | | 48 | -81 (local) | | | | 0 FTA18_RT_CAR_25 | 137 | 32 | 40 | 0 | 0 | 0 |
| n/a | Wheel | E/B | East of Station | ~ | LRT | | 53.9 | -81 (local) | | | | 0 FTA18_RT_CAR_50 | 137 | 32 | 80 | 0 | 0 | 0 |
| n/a | Wheel | W/B | West of Station | ~ | LRT | | 48 | -81 (local) | | | | 0 FTA18_RT_CAR_25 | 137 | 32 | 40 | 0 | 0 | 0 |
| n/a | Wheel | W/B | East of Station | ~ | LRT | | 48 | -81 (local) | | | | 0 FTA18_RT_CAR_25 | 137 | 32 | 40 | 0 | 0 | 0 |
| n/a | Wheel | W/B | East of Station | ~ | LRT | | 53.9 | -81 (local) | | | | 0 FTA18_RT_CAR_50 | 137 | 32 | 80 | 0 | 0 | 0 |
| *** VIA *** | | | | | | | | 0 | 0 | | | | | | | | | |
| Beachburg | Loco | E/B | West of Station | ~ | VIA_Loco | | 56.7 | -81 (local) | | | | 0 FTA18_OCOMM_LOC_DE | 23 | 2 | 72 | 1 | 0 | 0 |
| Beachburg | Loco | E/B | West of Station | ~ | VIA_Loco | | 59.3 | -81 (local) | | | | 0 FTA18_OCOMM_LOC_DE | 23 | 2 | 40 | 1 | 0 | 0 |
| Beachburg | Loco | W/B | West of Station | ~ | VIA_Loco | | 65.3 | -81 (local) | | | | 0 FTA18_OCOMM_LOC_DE | 23 | 8 | 40 | 8 | 0 | 0 |
| Beachburg | Loco | W/B | West of Station | ~ | VIA_Loco | | 62.7 | -81 (local) | | | | 0 FTA18_OCOMM_LOC_DE | 23 | 8 | 72 | 8 | 0 | 0 |
| Beachburg | Wheel | E/B | West of Station | ~ | VIA_Wheel | | 52.2 | -81 (local) | | | | 0 FTA18_OCOMM_CAR | 115 | 10 | 72 | 0 | 0 | 0 |
| Beachburg | Wheel | E/B | West of Station | ~ | VIA_Wheel | | 47.1 | -81 (local) | | | | 0 FTA18_OCOMM_CAR | 115 | 10 | 40 | 0 | 0 | 0 |
| Beachburg | Wheel | W/B | West of Station | ~ | VIA_Wheel | | 47.1 | -81 (local) | | | | 0 FTA18_OCOMM_CAR | 115 | 40 | 40 | 0 | 0 | 0 |
| Beachburg | Wheel | W/B | West of Station | ~ | VIA_Wheel | | 52.2 | -81 (local) | | | | 0 FTA18_OCOMM_CAR | 115 | 40 | 72 | 0 | 0 | 0 |
| Beachburg | Loco | Enter West | In_station | ~ | VIA_Loco | | 55.6 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 5 | 1 | 20 | 1 | 5 | 5 |
| Beachburg | Loco | Enter West | In_station | ~ | VIA_Loco | | 55.6 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 5 | 1 | 20 | 1 | 5 | 5 |
| Beachburg | Loco | Enter West | In_station | ~ | VIA_Loco | | 55.6 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 5 | 0 | 20 | 1 | 5 | 5 |
| Beachburg | Loco | Enter West | In_station | ~ | VIA_Loco | | 54.7 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 4 | 0 | 20 | 1 | 5 | 5 |
| Beachburg | Loco | Enter West | In_station | ~ | VIA_Loco | | 54.7 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 4 | 0 | 20 | 1 | 5 | 5 |
| Beachburg | Loco | Leave West | In_station | ~ | VIA_Loco | | 61.6 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 5 | 2 | 20 | 8 | 5 | 5 |
| Beachburg | Loco | Leave West | In_station | ~ | VIA_Loco | | 61.6 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 5 | 2 | 20 | 8 | 5 | 5 |
| Beachburg | Loco | Leave West | In_station | ~ | VIA_Loco | | 61.6 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 5 | 2 | 20 | 8 | 5 | 5 |
| Beachburg | Loco | Leave West | In_station | ~ | VIA_Loco | | 60.7 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 4 | 1 | 20 | 8 | 5 | 5 |
| Beachburg | Loco | Leave West | In_station | ~ | VIA_Loco | | 60.7 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 4 | 1 | 20 | 8 | 5 | 5 |
| Beachburg | Wheel | Enter/ Leave West | In_station | ~ | VIA_Wheel | | 42.1 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_CAR | 46 | 10 | 20 | 0 | 5 | 5 |
| Beachburg | Wheel | Enter/ Leave West | In_station | ~ | VIA_Wheel | | 42.1 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_CAR | 46 | 10 | 20 | 0 | 5 | 5 |
| Beachburg | Wheel | Enter/ Leave West | In_station | ~ | VIA_Wheel | | 42.1 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_CAR | 46 | 10 | 20 | 0 | 5 | 5 |
| Beachburg | Wheel | Enter/ Leave West | In_station | ~ | VIA_Wheel | | 42.1 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_CAR | 46 | 10 | 20 | 0 | 5 | 5 |
| Beachburg | Wheel | Enter/ Leave West | In_station | ~ | VIA_Wheel | | 42.1 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_CAR | 46 | 10 | 20 | 0 | 5 | 5 |
| Alexandria | Loco | Enter East | In_station | ~ | VIA_Loco | | 51.7 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 2 | 0 | 20 | 1 | 5 | 5 |
| Alexandria | Loco | Enter East | In_station | ~ | VIA_Loco | | 51.7 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 2 | 0 | 20 | 1 | 5 | 5 |
| Alexandria | Loco | Enter East | In_station | ~ | VIA_Loco | | 51.7 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 2 | 0 | 20 | 1 | 5 | 5 |
| Alexandria | Loco | Enter East | In_station | ~ | VIA_Loco | | 48.6 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 1 | 0 | 20 | 1 | 5 | 5 |
| Alexandria | Loco | Enter East | In_station | ~ | VIA_Loco | | 48.6 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 1 | 0 | 20 | 1 | 5 | 5 |
| Alexandria | Loco | Leave East | In_station | ~ | VIA_Loco | | 60.7 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 4 | 1 | 20 | 8 | 5 | 5 |
| Alexandria | Loco | Leave East | In_station | ~ | VIA_Loco | | 60.7 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 4 | 1 | 20 | 8 | 5 | 5 |
| Alexandria | Loco | Leave East | In_station | ~ | VIA_Loco | | 59.4 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 3 | 0 | 20 | 8 | 5 | 5 |
| Alexandria | Loco | Leave East | In_station | ~ | VIA_Loco | | 59.4 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 3 | 0 | 20 | 8 | 5 | 5 |
| Alexandria | Loco | Leave East | In_station | ~ | VIA_Loco | | 59.4 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_LOC_DE | 3 | 0 | 20 | 8 | 5 | 5 |
| Alexandria | Wheel | Enter/ Leave East | In_station | ~ | VIA_Wheel | | 39.5 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_CAR | 25 | 2 | 20 | 0 | 5 | 5 |
| Alexandria | Wheel | Enter/ Leave East | In_station | ~ | VIA_Wheel | | 39.5 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_CAR | 25 | 2 | 20 | 0 | 5 | 5 |
| Alexandria | Wheel | Enter/ Leave East | In_station | ~ | VIA_Wheel | | 39.5 | -81 (local) | jointed track | | | 5 FTA18_OCOMM_CAR | 25 | 2 | 20 | 0 | 5 | 5 |

RAIL LINES

| Subdivision | Source Type | Direction | Name | Sel. | M. | ID | Lw' | | Train Class | Track Type | | Consist | | No. of Units | | Speed km/h | Throttle Notch | Correct. Track (dB) |
|-------------------|-------------|-------------------|-----------------|------|----|-----------|--------------|----------------|-------------|---------------|---------------|----------------------|-----|--------------|-----|---------------|-------------------|---------------------------|
| | | | | | | | Day (dBA) | Night (dBA) | | Type | Penalty dB | Type 1 Type | Day | Night | | | | |
| Alexandria | Wheel | Enter/ Leave East | In_station | ~ | | VIA_Wheel | 39.5 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_CAR | 25 | 2 | 20 | 0 | 5 | |
| Alexandria | Wheel | Enter/ Leave East | In_station | ~ | | VIA_Wheel | 39.5 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_CAR | 25 | 2 | 20 | 0 | 5 | |
| Alexandria | Loco | W/B | East of Station | ~ | | VIA_Loco | 49.9 | -81 (local) | | | | 0 FTA18_OCOMM_LOC_DE | 8 | 0 | 120 | 1 | 0 | |
| Alexandria | Loco | W/B | East of Station | ~ | | VIA_Loco | 53.9 | -81 (local) | | | | 0 FTA18_OCOMM_LOC_DE | 8 | 0 | 48 | 1 | 0 | |
| Alexandria | Loco | E/B | East of Station | ~ | | VIA_Loco | 63.1 | -81 (local) | | | | 0 FTA18_OCOMM_LOC_DE | 17 | 2 | 48 | 8 | 0 | |
| Alexandria | Loco | E/B | East of Station | ~ | | VIA_Loco | 59.2 | -81 (local) | | | | 0 FTA18_OCOMM_LOC_DE | 17 | 2 | 120 | 8 | 0 | |
| Alexandria | Wheel | W/B | East of Station | ~ | | VIA_Wheel | 52.1 | -81 (local) | | | | 0 FTA18_OCOMM_CAR | 40 | 0 | 120 | 0 | 0 | |
| Alexandria | Wheel | W/B | East of Station | ~ | | VIA_Wheel | 44.1 | -81 (local) | | | | 0 FTA18_OCOMM_CAR | 40 | 0 | 48 | 0 | 0 | |
| Alexandria | Wheel | E/B | East of Station | ~ | | VIA_Wheel | 47.4 | -81 (local) | | | | 0 FTA18_OCOMM_CAR | 85 | 10 | 48 | 0 | 0 | |
| Alexandria | Wheel | E/B | East of Station | ~ | | VIA_Wheel | 55.4 | -81 (local) | | | | 0 FTA18_OCOMM_CAR | 85 | 10 | 120 | 0 | 0 | |
| *** VIA 24 hr *** | | | | | | | - | 0 | 0 | | | | | | | | | |
| Beachburg | Loco | E/B | West of Station | | | VIA_24h | 57.1 | -81 (local) | | | | 0 FTA18_OCOMM_LOC_DE | 25 | 0 | 72 | 1 | 0 | |
| Beachburg | Loco | E/B | West of Station | | | VIA_24h | 59.6 | -81 (local) | | | | 0 FTA18_OCOMM_LOC_DE | 25 | 0 | 40 | 1 | 0 | |
| Beachburg | Loco | W/B | West of Station | | | VIA_24h | 66.5 | -81 (local) | | | | 0 FTA18_OCOMM_LOC_DE | 31 | 0 | 40 | 8 | 0 | |
| Beachburg | Loco | W/B | West of Station | | | VIA_24h | 64 | -81 (local) | | | | 0 FTA18_OCOMM_LOC_DE | 31 | 0 | 72 | 8 | 0 | |
| Beachburg | Wheel | E/B | West of Station | | | VIA_24h | 52.6 | -81 (local) | | | | 0 FTA18_OCOMM_CAR | 125 | 0 | 72 | 0 | 0 | |
| Beachburg | Wheel | E/B | West of Station | | | VIA_24h | 47.5 | -81 (local) | | | | 0 FTA18_OCOMM_CAR | 125 | 0 | 40 | 0 | 0 | |
| Beachburg | Wheel | W/B | West of Station | | | VIA_24h | 48.4 | -81 (local) | | | | 0 FTA18_OCOMM_CAR | 155 | 0 | 40 | 0 | 0 | |
| Beachburg | Wheel | W/B | West of Station | | | VIA_24h | 53.5 | -81 (local) | | | | 0 FTA18_OCOMM_CAR | 155 | 0 | 72 | 0 | 0 | |
| Beachburg | Loco | Enter West | In_station | | | VIA_24h | 56.4 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 6 | 0 | 20 | 1 | 5 | |
| Beachburg | Loco | Enter West | In_station | | | VIA_24h | 56.4 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 6 | 0 | 20 | 1 | 5 | |
| Beachburg | Loco | Enter West | In_station | | | VIA_24h | 55.6 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 5 | 0 | 20 | 1 | 5 | |
| Beachburg | Loco | Enter West | In_station | | | VIA_24h | 54.7 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 4 | 0 | 20 | 1 | 5 | |
| Beachburg | Loco | Enter West | In_station | | | VIA_24h | 54.7 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 4 | 0 | 20 | 1 | 5 | |
| Beachburg | Loco | Leave West | In_station | | | VIA_24h | 63.1 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 7 | 0 | 20 | 8 | 5 | |
| Beachburg | Loco | Leave West | In_station | | | VIA_24h | 63.1 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 7 | 0 | 20 | 8 | 5 | |
| Beachburg | Loco | Leave West | In_station | | | VIA_24h | 63.1 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 7 | 0 | 20 | 8 | 5 | |
| Beachburg | Loco | Leave West | In_station | | | VIA_24h | 61.6 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 5 | 0 | 20 | 8 | 5 | |
| Beachburg | Loco | Leave West | In_station | | | VIA_24h | 61.6 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 5 | 0 | 20 | 8 | 5 | |
| Beachburg | Wheel | Enter/ Leave West | In_station | | | VIA_24h | 43 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_CAR | 56 | 0 | 20 | 0 | 5 | |
| Beachburg | Wheel | Enter/ Leave West | In_station | | | VIA_24h | 43 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_CAR | 56 | 0 | 20 | 0 | 5 | |
| Beachburg | Wheel | Enter/ Leave West | In_station | | | VIA_24h | 43 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_CAR | 56 | 0 | 20 | 0 | 5 | |
| Beachburg | Wheel | Enter/ Leave West | In_station | | | VIA_24h | 43 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_CAR | 56 | 0 | 20 | 0 | 5 | |
| Beachburg | Wheel | Enter/ Leave West | In_station | | | VIA_24h | 43 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_CAR | 56 | 0 | 20 | 0 | 5 | |
| Alexandria | Loco | Enter East | In_station | | | VIA_24h | 51.7 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 2 | 0 | 20 | 1 | 5 | |
| Alexandria | Loco | Enter East | In_station | | | VIA_24h | 51.7 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 2 | 0 | 20 | 1 | 5 | |
| Alexandria | Loco | Enter East | In_station | | | VIA_24h | 51.7 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 2 | 0 | 20 | 1 | 5 | |
| Alexandria | Loco | Enter East | In_station | | | VIA_24h | 48.6 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 1 | 0 | 20 | 1 | 5 | |
| Alexandria | Loco | Enter East | In_station | | | VIA_24h | 48.6 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 1 | 0 | 20 | 1 | 5 | |
| Alexandria | Loco | Leave East | In_station | | | VIA_24h | 61.6 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 5 | 0 | 20 | 8 | 5 | |
| Alexandria | Loco | Leave East | In_station | | | VIA_24h | 61.6 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 5 | 0 | 20 | 8 | 5 | |
| Alexandria | Loco | Leave East | In_station | | | VIA_24h | 59.4 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 3 | 0 | 20 | 8 | 5 | |
| Alexandria | Loco | Leave East | In_station | | | VIA_24h | 59.4 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 3 | 0 | 20 | 8 | 5 | |
| Alexandria | Loco | Leave East | In_station | | | VIA_24h | 59.4 | -81 (local) | | jointed track | | 5 FTA18_OCOMM_LOC_DE | 3 | 0 | 20 | 8 | 5 | |

RAIL LINES

| Subdivision | Source Type | Direction | Name | Sel. | M. | ID | Lw' | | Train Class | Track Type | Consist | No. of Units | | Speed | Throttle | Correct. |
|-------------|-------------|-------------------|-----------------|------|----|---------|-------|-------------|-------------|---------------|---------------------|--------------|-------|-------|----------|----------|
| | | | | | | | Day | Night | | | Type 1 | Day | Night | km/h | Notch | Track |
| | | | | | | | (dBA) | (dBA) | | | Type | | | | | (dB) |
| Alexandria | Wheel | Enter/ Leave East | In_station | | | VIA_24h | 39.8 | -81 (local) | | jointed track | 5 FTA18_COMM_CAR | 27 | 0 | 20 | 0 | 5 |
| Alexandria | Wheel | Enter/ Leave East | In_station | | | VIA_24h | 39.8 | -81 (local) | | jointed track | 5 FTA18_COMM_CAR | 27 | 0 | 20 | 0 | 5 |
| Alexandria | Wheel | Enter/ Leave East | In_station | | | VIA_24h | 39.8 | -81 (local) | | jointed track | 5 FTA18_COMM_CAR | 27 | 0 | 20 | 0 | 5 |
| Alexandria | Wheel | Enter/ Leave East | In_station | | | VIA_24h | 39.8 | -81 (local) | | jointed track | 5 FTA18_COMM_CAR | 27 | 0 | 20 | 0 | 5 |
| Alexandria | Wheel | Enter/ Leave East | In_station | | | VIA_24h | 39.8 | -81 (local) | | jointed track | 5 FTA18_COMM_CAR | 27 | 0 | 20 | 0 | 5 |
| Alexandria | Loco | W/B | East of Station | | | VIA_24h | 49.9 | -81 (local) | | | 0 FTA18_COMM_LOC_DE | 8 | 0 | 120 | 1 | 0 |
| Alexandria | Loco | W/B | East of Station | | | VIA_24h | 53.9 | -81 (local) | | | 0 FTA18_COMM_LOC_DE | 8 | 0 | 48 | 1 | 0 |
| Alexandria | Loco | E/B | East of Station | | | VIA_24h | 63.6 | -81 (local) | | | 0 FTA18_COMM_LOC_DE | 19 | 0 | 48 | 8 | 0 |
| Alexandria | Loco | E/B | East of Station | | | VIA_24h | 59.7 | -81 (local) | | | 0 FTA18_COMM_LOC_DE | 19 | 0 | 120 | 8 | 0 |
| Alexandria | Wheel | W/B | East of Station | | | VIA_24h | 52.1 | -81 (local) | | | 0 FTA18_COMM_CAR | 40 | 0 | 120 | 0 | 0 |
| Alexandria | Wheel | W/B | East of Station | | | VIA_24h | 44.1 | -81 (local) | | | 0 FTA18_COMM_CAR | 40 | 0 | 48 | 0 | 0 |
| Alexandria | Wheel | E/B | East of Station | | | VIA_24h | 47.9 | -81 (local) | | | 0 FTA18_COMM_CAR | 95 | 0 | 48 | 0 | 0 |
| Alexandria | Wheel | E/B | East of Station | | | VIA_24h | 55.8 | -81 (local) | | | 0 FTA18_COMM_CAR | 95 | 0 | 120 | 0 | 0 |

Appendix D-5 BPN-56 Façade STC Calculations for Transportation Noise



Summary of Required Composite Window STCs to Address Transportation Noise

| Receptor | | | | Sound Transmission Class (STC) Requirement | | | | | | | | |
|----------|-------------|-------------|--------|--|---|------|-------|-------|-----------------------|------|-------|-------|
| | | | | Non-Glazing Veneer | Glazing (Windows and Patio Doors) | | | | | | | |
| | | | | | Living Rooms, Kitchens & Dens (Daytime) | | | | Bedrooms (Night-time) | | | |
| | | | | | Road | Rail | | Total | Road | Rail | | Total |
| Bldg | Floor | Use | Façade | | | Loco | Wheel | | | Loco | Wheel | |
| Lot A | Flr 1 | Amenity | N | OBC | 26 | 15 | -3 | OBC | - | - | - | - |
| | | | S | 40 | 15 | 27 | 2 | OBC | - | - | - | - |
| | | | E | 40 | 24 | 24 | 0 | OBC | - | - | - | - |
| | Flr 2 to 4 | Residential | N | OBC | 24 | 10 | -2 | OBC | 27 | 12 | 1 | OBC |
| | | | S | 40 | 13 | 24 | -1 | OBC | 14 | 26 | 1 | OBC |
| | | | E | 40 | 21 | 21 | -4 | OBC | 23 | 22 | -1 | OBC |
| | | | W | 40 | 23 | 21 | -1 | OBC | 26 | 24 | 2 | OBC |
| | Flr 5 to 28 | Residential | N | OBC | 26 | 9 | 3 | OBC | 29 | 11 | 6 | OBC |
| | | | S | 40 | 14 | 24 | 1 | OBC | 15 | 26 | 2 | OBC |
| | | | E | 40 | 23 | 22 | 3 | OBC | 26 | 23 | 5 | OBC |
| | | | W | 40 | 23 | 21 | 2 | OBC | 26 | 23 | 5 | OBC |
| | Penthouse | Amenity | N | OBC | 26 | 9 | 3 | OBC | - | - | - | - |
| | | | S | 40 | 15 | 24 | 2 | OBC | - | - | - | - |
| | | | W | 40 | 24 | 22 | 3 | OBC | - | - | - | - |
| Lot B | Flr 1 | Amenity | N | OBC | 25 | 15 | -4 | OBC | - | - | - | - |
| | | | E | 40 | 22 | 20 | -2 | OBC | - | - | - | - |
| | | Residential | S | 40 | 10 | 22 | -2 | OBC | 10 | 23 | -1 | OBC |
| | Flr 2 to 4 | Residential | N | OBC | 24 | 10 | -4 | OBC | 27 | 12 | -1 | OBC |
| | | | S | 40 | 13 | 24 | -1 | OBC | 13 | 26 | 1 | OBC |
| | | | E | 40 | 22 | 19 | -4 | OBC | 24 | 20 | -2 | OBC |
| | | | W | 40 | 21 | 21 | -2 | OBC | 23 | 23 | 0 | OBC |
| | Flr 5 to 14 | Residential | N | OBC | 26 | 9 | 2 | OBC | 29 | 11 | 6 | OBC |
| | | | S | 40 | 14 | 25 | 1 | OBC | 14 | 26 | 2 | OBC |
| | | | E | 40 | 23 | 21 | 2 | OBC | 26 | 22 | 5 | OBC |
| | | | W | 40 | 22 | 22 | 0 | OBC | 25 | 24 | 2 | OBC |
| | Penthouse | Amenity | N | OBC | 27 | 9 | 3 | OBC | - | - | - | - |
| | | | S | 40 | 15 | 25 | 2 | OBC | - | - | - | - |
| | | | E | 40 | 25 | 22 | 4 | OBC | - | - | - | - |

BPN 56 Calculation Procedure - Required Glazing STC Rating (Fixed Veneer)

Project Description, Project #

ROADWAY

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| Lot A | Rr 1 | Amenity | N | 64 | 3 | 45 | 22 | 90% | 5.0 | 6.0 | 6.0 | 36.0 | 3.0 | 27.0 | 8 | 75 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -10 | 7 | 21 | 5 | C. sealed thin window, or operable thick window | 0 | 4 | 95 | 0 | 26 |
| | | | S | 53 | 3 | 45 | 11 | 90% | 5.0 | 6.0 | 6.0 | 36.0 | 3.0 | 27.0 | 8 | 75 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -10 | 7 | 32 | 5 | C. sealed thin window, or operable thick window | 0 | 4 | 95 | 0 | 15 |
| | | | E | 62 | 3 | 45 | 20 | 90% | 5.0 | 6.0 | 6.0 | 36.0 | 3.0 | 27.0 | 8 | 75 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -10 | 7 | 23 | 5 | C. sealed thin window, or operable thick window | 0 | 4 | 95 | 0 | 24 |
| | Rr 2 to 4 | Residential | N | 66 | 3 | 45 | 24 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 16 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 24 |
| | | | S | 55 | 3 | 45 | 13 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 27 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 13 |
| | | | E | 63 | 3 | 45 | 21 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 19 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 21 |
| | | | W | 65 | 3 | 45 | 23 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 17 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 23 |
| | Rr 5 to 28 | Residential | N | 68 | 3 | 45 | 26 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 14 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 26 |
| | | | S | 56 | 3 | 45 | 14 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 26 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 14 |
| | | | E | 65 | 3 | 45 | 23 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 17 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 23 |
| | | | W | 65 | 3 | 45 | 23 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 17 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 23 |
| | Penthouse | Amenity | N | 67 | 3 | 45 | 25 | 90% | 3.0 | 6.0 | 6.0 | 36.0 | 1.8 | 16.2 | 5 | 45 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -12 | 7 | 20 | 5 | C. sealed thin window, or operable thick window | -3 | 4 | 95 | 0 | 26 |
| | | | S | 56 | 3 | 45 | 14 | 90% | 3.0 | 6.0 | 6.0 | 36.0 | 1.8 | 16.2 | 5 | 45 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -12 | 7 | 31 | 5 | C. sealed thin window, or operable thick window | -3 | 4 | 95 | 0 | 15 |
| | | | W | 65 | 3 | 45 | 23 | 90% | 3.0 | 6.0 | 6.0 | 36.0 | 1.8 | 16.2 | 5 | 45 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -12 | 7 | 22 | 5 | C. sealed thin window, or operable thick window | -3 | 4 | 95 | 0 | 24 |
| Lot B | Rr 1 | Amenity | N | 63 | 3 | 45 | 21 | 90% | 5.0 | 6.0 | 6.0 | 36.0 | 3.0 | 27.0 | 8 | 75 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -10 | 7 | 22 | 5 | C. sealed thin window, or operable thick window | 0 | 4 | 95 | 0 | 25 |
| | | | S | 60 | 3 | 45 | 18 | 90% | 5.0 | 6.0 | 6.0 | 36.0 | 3.0 | 27.0 | 8 | 75 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -10 | 7 | 26 | 5 | C. sealed thin window, or operable thick window | 0 | 4 | 95 | 0 | 22 |
| | | | E | 52 | 3 | 45 | 10 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 30 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 10 |
| | Rr 2 to 4 | Residential | N | 66 | 3 | 45 | 24 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 16 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 24 |
| | | | S | 55 | 3 | 45 | 13 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 28 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 13 |
| | | | E | 64 | 3 | 45 | 22 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 18 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 22 |
| | | | W | 63 | 3 | 45 | 21 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 19 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 21 |
| | Rr 5 to 14 | Residential | N | 68 | 3 | 45 | 26 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 15 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 26 |
| | | | S | 56 | 3 | 45 | 14 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 26 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 14 |
| | | | E | 65 | 3 | 45 | 23 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 17 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 23 |
| | | | W | 64 | 3 | 45 | 22 | 70% | 3.0 | 3.0 | 6.0 | 18.0 | 2.7 | 6.3 | 15 | 35 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -7 | 7 | 18 | 5 | C. sealed thin window, or operable thick window | -4 | 4 | 95 | 0 | 22 |
| | Penthouse | Amenity | N | 68 | 3 | 45 | 26 | 90% | 3.0 | 6.0 | 6.0 | 36.0 | 1.8 | 16.2 | 5 | 45 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -12 | 7 | 19 | 5 | C. sealed thin window, or operable thick window | -3 | 4 | 95 | 0 | 27 |
| | | | S | 56 | 3 | 45 | 14 | 90% | 3.0 | 6.0 | 6.0 | 36.0 | 1.8 | 16.2 | 5 | 45 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -12 | 7 | 31 | 5 | C. sealed thin window, or operable thick window | -3 | 4 | 95 | 0 | 15 |
| | | | E | 66 | 3 | 45 | 24 | 90% | 3.0 | 6.0 | 6.0 | 36.0 | 1.8 | 16.2 | 5 | 45 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -12 | 7 | 22 | 5 | C. sealed thin window, or operable thick window | -3 | 4 | 95 | 0 | 25 |
| | | | N | 67 | 3 | 45 | 25 | 90% | 3.0 | 6.0 | 6.0 | 36.0 | 1.8 | 16.2 | 5 | 45 | Intermediate | 0-90 | 0 | D. mixed road traffic, distant aircraft | | 40 | D. sealed thick window, or exterior wall, or roof/ceiling | -12 | 7 | 20 | 5 | C. sealed thin window, or operable thick window | -3 | 4 | 95 | 0 | 26 |

NIGHT-TIME

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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