Updated Environmental Noise & Vibration Study

1 Rosetta Street, Georgetown, ON

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1.0 Introduction

SLR Consulting (Canada) Ltd. (SLR), was retained by 1 Rosetta Street Inc. to conduct an Environmental Noise and Vibration Study for their proposed residential development, to be located at 1 Rosetta Street in Georgetown, Ontario ("the Project"). This assessment has been completed in support of the zoning by-law amendment (ZBA) application to be filed with Town of Halton Hills.

This report is an Update to the Environmental Noise and Vibration Study completed by SLR Consulting (Canada) Ltd. dated April 25, 2022. This Updated report includes new rail vibration measurements, new Metrolinx rail traffic forecasts, and addresses agency review comments by CN, Metrolinx and the Town of Halton Hills.

1.1 Focus of Report

In keeping with Halton Region, Town of Halton Hills and Ministry of Environment, Conservation and Parks (MECP) requirements, 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.

1.2 Nature of the Surroundings

The Project site is surrounded by existing residential homes in all directions. A moving and storage services facility (A-Plus Canada Inc. Self Storage) is located to the east of the site at 7 River Drive. The GO/CN rail corridor and Georgetown Station including the GO Train Layover Yard is located to the south of the site. A brewery and other single family residential dwellings are located on the south side of the rail corridor.

The rail corridor currently consists of three tracks that are used by CN and GO Metrolinx, plus the Georgetown GO Layover Yard with tracks available where trains may idle.

SLR understands a new Metrolinx Heritage Layover Yard is proposed at a location approximately 4 km east of the development. Based on information provided by Metrolinx, the Heritage Road Layover Yard is expected to replace the existing Georgetown Layover Yard, which is approaching the end of its serviceable life. This construction is tentatively scheduled to begin in spring 2023 and be completed in 2026/2027.

A context plan is included as Figure 1.

1.3 Description of Proposed Development

The subject property is located at 1 Rosetta Street in Georgetown, Ontario. The development lands are currently occupied by a multi-tenant industrial building. It is located directly north of the Canadian National (CN) Halton Subdivision and Metrolinx rail corridor.

The proposed development includes three condominium buildings:

- Building 01: 12-storey residential;
- Building 02: 12-storey residential (attached to Building 01);
- Building 03: 8-storey residential; and,

- 2 levels of underground parking.

Buildings 01 and 02 will be connected via a single corridor and suites on both sides (with exterior green wall) through the centre of the buildings. Figures presented throughout this report for descriptive purposes that show a dotted line approximating the location where Building 01 and Building 02 are separated.

Common outdoor amenity spaces within the development will include elevated rooftop terraces on the second level of Buildings 01 and 02, facing south, and a rooftop outdoor terrace atop Building 03. The terrace on the second level of Buildings 01 and 02 will be surrounded by a 2.95 m high sound barrier wall. The site plan and architectural drawings (including building sections) of the proposed development are provided for reference in Appendix A.

PART 1: IMPACTS OF THE ENVIRONMENT ON THE DEVELOPMENT

In assessing potential impacts of the environment on the proposed development, the focus of this report is to assess the potential for:

- Transportation noise impacts from the GO, Freight and Passenger trains along the railway line south of the site.
- Stationary source noise impacts from the surrounding sources on the development.

2.0 Transportation Noise Assessment

2.1 Transportation Noise Sources

The transportation noise source that has the potential to impact the proposed development includes railway noise (Freight, VIA and GO) along the Halton Subdivision/Metrolinx rail corridor.

Roadway traffic volumes from Rosetta Street, Caroline Street, St. Michaels Street and River Drive around the development are expected to be sufficiently low in volume that noise impacts are insignificant relative to rail impacts; therefore, road traffic noise has not been considered further in the analysis.

Daytime and night-time sound levels due to rail traffic at the proposed development have been predicted, and this information has been used to identify façade, ventilation and warning clause requirements.

2.2 Surface Transportation Noise Criteria

Relevant noise guidelines are outlined in MECP Publication NPC-300. The Federation of Canadian Municipalities/Railway Association of Canada (FCM/RAC) document entitled “Guidelines for New Development in Proximity to Railway Operations” also includes guidelines that generally align with those in NPC-300.

2.2.1 Ministry of Environment Publication NPC-300

Noise-Sensitive Developments

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. Tables 1 to 4 summarize the applicable surface transportation (road/rail) guideline limits.

Location-Specific Criteria

Table 1 summarizes criteria in terms of energy equivalent sound exposure (L_{eq}) levels 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 1: NPC-300 Sound Level Criteria for Road and Rail Noise

Type of Space	Time Period	Energy Equivalent Sound Exposure Level L_{eq} [5] (dBA)		Assessment Location
		Road	Rail [1]	
Outdoor Living Area	Daytime (0700-2300h)	55	55	Outdoors [2]
Living/Dining Room [3]	Daytime (0700-2300h)	45	40	Indoors [4]
	Night-time (2300-0700h)	45	40	Indoors [4]
Sleeping Quarters	Daytime (0700-2300h)	45	40	Indoors [4]
	Night-time (2300-0700h)	40	35	Indoors [4]

Notes:
[1] Whistle noise is excluded for OLA noise assessments and included for Living/Dining Room and Sleeping Quarter assessments, if sounded.
[2] Road and Rail sound levels are to be combined for assessment of OLA impacts.
[3] Residence area Dens, Hospitals, Nursing Homes, Schools, Daycares are also included. During the nighttime period, Schools and Daycares are excluded.
[4] An assessment of indoor noise levels is required only if the criteria in Table 3 are exceeded.
[5] L_{eq} – the energy equivalent sound exposure level, integrated over the time period shown.

Outdoor Living Areas

Table 2 summarizes the noise mitigation requirements for communal outdoor amenity areas ("Outdoor Living Areas" or "OLAs").

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

Table 2: NPC-300 OLA Sound Level Criteria for Road and Rail Noise

Time Period	OLA Energy Equivalent Sound Level L_{eq} (dBA)	Mitigation/Warning Clause Requirements
Daytime (0700-2300h)	≤ 55	• None
	56 to 60 incl.	• Noise barrier OR Warning Clause A

	> 60	• Noise barrier to reduce noise to 55 dBA OR • Noise barrier to reduce noise to 60 dBA and Warning Clause B

Ventilation and Warning Clauses

Table 3 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 1, warning clauses advising future occupants of the potential excesses are also recommended. Warning clauses also apply to OLAs.

Table 3: NPC-300 Ventilation and Warning Clause Requirements/Recommendations

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - L_{eq} (dBA)		Ventilation and Warning Clause Recommendations [2]
		Road	Rail [1]	
Outdoor Living Area	Daytime (0700-2300h)	56 to 60 incl.		Type A Warning Clause
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 sound levels is combined for determining ventilation and warning clause recommendations.

Building Component Requirements

Table 4 provides sound level thresholds which, if exceeded, trigger a requirement for the building shell components (i.e., wall, windows) to be designed accordingly to meet the applicable indoor sound criteria.

Table 4: NPC-300 Building Component Assessment Requirements

Assessment Location	Time Period	Energy Equivalent Sound Exposure 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 to be included in the assessment, if sounded. [2] Building component requirements are assessed separately for Road and Rail, and then combined for a resultant sound isolation parameter.

In addition to the building component criteria outlined in Table 4, NPC-300 also includes a façade construction requirement for rail noise only, outlined in Table 5. The façade construction requirements are necessary only if the proposed development is located in the first row of dwellings adjacent to the rail corridor.

Table 5: NPC-300 Rail Noise Façade Requirements

Assessment Location	Distance to Railway	24-hour Energy Equivalent Sound Exposure Level L_{eq} (24hr) (dBA)[1],[2]	Noise Control Requirements
Plane of Window	Within 100 m	< 60	No additional requirement
		> 60	Brick Veneer or Masonry Equivalent
	Beyond 100 m	< 60	No additional requirement
		> 60	No additional requirement
Notes:	[1] Assessed for proposed developments located within the for row of dwellings adjacent to a rail corridor. [2] Whistle noise is included in the assessment, if sounded.		

2.3 Traffic Data and Future Projections

2.3.1 Rail Traffic Data

GO train volumes were obtained directly from Metrolinx in the form of ultimate forecasted volumes. A copy of the most recent traffic data correspondence is included in Appendix B.

CN rail data for this track segment from year 2020 was grown to the future 2037 year assuming the typical growth rate of 2.5% per annum. CN traffic data are provided in Appendix B for reference.

Table 6 summarizes the railway traffic data used in the analysis.

Table 6: Summary of Rail Traffic Data Used in Transportation Noise Assessment

Railway Source	Train Type	Max. Locomotive per Train	Max. Cars per train	Forecasted Train Volumes		Travel Speed (km/hr)
				Daytime	Night-time	
CN Trains Halton Subdivision	CN Passenger (diesel)[1]	2	10	0	7[3]	80
	CN Freight (diesel)[1]	4	140	10[3]	14[3]	80
Metrolinx GO Trains Halton Subdivision	Metrolinx/GO (diesel)[2]	1	12	56	12	80
	Metrolinx/GO (diesel) [2]	2	12	8	0	80
Notes:	[1] Rail traffic data provided by CN from year 2020 was projected to year 2037 at a 2.5% annual growth rate. [2] Metrolinx data represents forecasted future volumes. [3] Values are rounded up to the nearest whole number.					

2.4 Predicted Sound Levels

Rail traffic sound levels at the proposed development were predicted using the U.S. Department of Transportation Federal Transit Administration ("FTA") and Federal Railway Administration ("FRA") rail noise modelling algorithms included in Cadna/A software. The FTA/FRA algorithms are the replacement models for the former MECP "STEAM" model and are written into the current draft version of MECP Publication NPC-306, which will replace the current NPC-206 guideline on transportation noise prediction. The FTA/FRA algorithms have been used in numerous Environmental Assessments ("EAs") for Metrolinx and CN railway projects, as well as in numerous land use planning projects across the province.

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.Ground absorption was modelled considering a value of G = 0.0 (reflective).

2.4.1 Noise Control Measures Included with Design

The terrace on the second level of Buildings 01 and 02 will be surrounded by a 2.95 m high sound barrier wall, included with the building design. The barrier was included in the analysis of predicted sound levels. The extent of the barrier wall is shown in the results figures and in section drawings provided in Appendix A. The barrier must be constructed of material with a minimum surface density of 20 kg/m^2, and without any cracks or gaps (except for small, localized gaps under the barrier if required for drainage purposes). A range of materials can be used to construct the barrier, including plexiglass, provided the surface density requirements are met.

2.4.2 Façade Sound Levels

Predicted worse-case façade sound levels are presented in Table 7. The transportation façade sound levels are shown in Figure 2 and Figure 3 for daytime and night-time periods, respectively.

The façade railway sound levels are predicted to be above 60 dBA (daytime) and/or 55 dBA (night-time) along portions of facades for Building 02 and Building 03. Therefore, an assessment of building components is required. Refer to Section 2.5.

Table 7: Summary of Predicted Transportation Façade Sound Levels

Assessment Location	Building Façade[1]	Maximum Predicted Rail Traffic Sound Levels	
		L_{eq} Daytime (dBA)	L_{eq} Night-time (dBA)
Building 01	North	68	55
	East	65	68
	South	52	71
	West[2]	---	---
Building 02	North	59	62
	East	54	57
	South[2]	---	---
	West	66	70

Building 03	North	57	60
	East	59	62
	South	58	62
	West	57	60
Notes:	[1] Façade locations are shown in **Figure 2** and **Figure 3**. The sound levels presented are for the worst-case on the entire façade. [2] No south façade (Building 02) or west façade (Building 01) has been considered where Building 01 connects to Building 02.		

2.4.3 Façade Sound Levels – 24-Hour Impacts

An assessment of 24-hour Leq sound levels was completed as the setback distance between the closest façade to the rail track is less than 100 m. The predicted façade sound levels are presented in **Table 8** showing highest levels for each façade, with complete results shown in **Figure 4**.

Table 8: Summary of Predicted 24-Hour Transportation Façade Sound Levels

Assessment Location	Building Façade[1]	Maximum Predicted Rail Traffic Sound Levels
		L_{eq} 24-hour(dBA)
Building 01	North	55
	East	68
	South	71
	West[2]	---
Building 02	North	62
	East	57
	South[2]	---
	West	70
Building 03	North	60
	East	62
	South	62
	West	60
Notes:	[1] Façade locations are shown in **Figure 2** and **Figure 3**. The sound levels presented are for the worst-case on the entire façade. [2] No south façade (Building 02) or west façade (Building 01) has been considered where Building 01 connects to Building 02.	

The proposed development Buildings 01 and 02 are planned to be constructed predominantly with either brick veneer or pre-cast masonry materials, with small portions of window-wall containing spandrel panel.

The non-vision glass spandrel panels will incorporate a metal backer panel, insulation, and two layers of gypsum board on resilient channel. Such a configuration will provide an STC rating in excess of STC 50, and sill result in the guideline limits being met, and an appropriate indoor noise environment. .

2.4.4 Outdoor Living Area Sound Levels

Common outdoor amenity spaces within the development will include an elevated terrace on the second level of Buildings 01 and 02, facing south, and a rooftop outdoor terrace atop Building 03. These are both greater than 4.0 m in depth and therefore have been considered in the assessment.

As the development includes a common amenity space for all occupants, the private terraces are not considered to be the only outdoor amenity space available. Therefore, an assessment of private terraces was excluded based on the definitions outlined in NPC-300.

The predicted OLA transportation sound levels are shown in Figure 5 and summarized in Table 9.

Table 9: Summary of Predicted Transportation Outdoor Sound Levels

Assessment Location	Location	Predicted Rail Traffic Sound Levels L_{eq} Daytime (dBA)[1]
OLA 01	Building 01/02 2nd Floor Elevated Terrace	55
OLA 02	Building 03 Rooftop Elevated Terrace	57

Notes: [1] Predicted sound levels considered the screening from the 2.95 m high crash wall shown in **Figure 5**.

The predicted transportation sound level at OLA 01 is 55 dBA; therefore, additional mitigation is not required to address rail traffic (provided a warning clause is included). For OLA 02, the sound level exceeds 55 dBA but is below 60 dBA; therefore, warning clauses are required. Refer to Section 4.6.

2.5 Noise Control Measures

2.5.1 Façade Assessment

The façade railway sound levels are predicted to be above 60 dBA (daytime) and/or 55 dBA (night-time) along portions of facades for Buildings 01, 02 and 03. Therefore, an assessment of glazing requirements is necessary for meeting the indoor sound level requirements outlined in Table 1.

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

Calculated window STC ratings are the combined acoustical parameter determined from the individual locomotive, and wheel noise impacts. The highest daytime and night-time period impacts along the facade were considered in this assessment, resulting in the highest STC requirements calculated for each façade location.

Detailed floor plans were not available at the time of the assessment. For the analysis, generic bedrooms and living/dining rooms have been considered based on the following assumptions:

- For living/dining rooms, 70% of the exterior wall is vision glass/patio doors;
- For bedrooms, 50% of the exterior wall is vision glass;
- Non-glazing portions of the wall has an assumed minimum rating of STC 50;
- Living rooms were assumed to be 3 m x 6 m in size with intermediate absorption;
- Bedrooms were assumed to be 3 m x 3 m in size and considered very absorptive.

SLR understands that a majority of the exterior wall construction will be a pre-cast masonry material, which is expected to have a rating of STC 54. Some localized façade locations will have window-wall construction, with exterior wall spandrel panel sections to be backed with minimum two layers of gypsum board and resilient channels (expected to meet STC 52). Although some locations on the south/west/east facades of Building 01/02 have an Leq_{24} greater than 60 dBA, it is expected that because these locations are to be protected through implementation of Enclosed Noise Buffers (ENBs, refer to **Section 4** of this report), indoor noise from rail traffic should be sufficiently mitigated with exterior wall construction meeting minimum STC 52.

Worst-case glazing requirements were determined based on an exterior wall construction meeting minimum STC 52.

Facade requirements are provided in **Table 10**, and for corner units, **Table 11**. The presented values are the composite STC ratings taking into consideration railway noise and the assumptions and recommendations listed above.

Table 10: Summary of Façade Requirements for Proposed Development

Assessment Location	Building Façade[1]	Non-Glazing Façade Component[2]	Glazing STC Requirements[3],[4]	
			Bedroom (Sleeping Quarters)	Living/Dining Room
Building 01	North	52	OBC	OBC
	East (non-ENB)	52	34	32
	East (ENB)	52	37	32
	South (ENB)	52	41	35
	West	---	---	---
Building 02	North	52	32	OBC
	East	52	OBC	OBC
	South	---	---	---
	West (non-ENB)	52	37	33
	West (ENB)	52	40	34
Building 03	North	52	OBC	OBC
	East	52	32	OBC
	South	52	31	OBC
	West	52	OBC	OBC

Notes:
[1] Refer to **Figure 3** and **Figure 4** for façade location identification. ENB = facades where ENBs are planned. Non-ENB = facades where there will not be ENBs.
[2] Minimum expected STC rating of the exterior façade.
[3] OBC = windows meeting the minimum non-acoustic requirements of the Ontario Building Code (STC 29).
[4] Portions of Building 01 and 02 will have ENBs. The glazing requirement for ENBs applies to the composite rating across both glazing assemblies (i.e., outer and inner glazing assemblies).

Table 11: Summary of Façade Requirements for Proposed Development – Corner Units

Assessment Location	Building Location[1]	Non-Glazing Façade Component[2]	Glazing STC Requirements[3],[4]	
			Bedroom (Sleeping Quarters)	Living/Dining Room
Building 01	NE Corner (non-ENB)	52	35	30
	SE Corner (ENB)	52	43	37
Building 01/02	SW Corner Transition (ENB)	52	44	38
Building 02	NE Corner	52	33	OBC
	NW Corner	52	38	34
Building 03	NE Corner	52	34	OBC
	SE Corner	52	35	OBC
	SW Corner	52	33	OBC
	NW Corner	52	32	OBC

Notes:
[1] Refer to **Figure 3** and **Figure 4** for façade location identification. ENB = facades where ENBs are planned. Non-ENB = facades where there will not be ENBs.
[2] Minimum expected STC rating of the exterior façade.
[3] OBC = windows meeting the minimum non-acoustic requirements of the Ontario Building Code (STC 29).
[4] Portions of Building 01 and 02 will have ENBs. The glazing requirement for ENBs applies to the composite rating across both glazing assemblies (i.e., outer and inner glazing assemblies).

Where upgraded glazing is required, the combined glazing and frame assembly must be constructed to ensure the overall sound isolation performance of the entire window unit meets the specified STC rating. It is recommended that test data from the window manufacturer be reviewed to confirm the required acoustical performance is achieved.

The building façade requirements should be reviewed by an acoustical consultant when detailed suite layouts and elevations are available.

2.5.2 Ventilation and Warning Clause Recommendations

2.5.2.1 Residential Units

The guidelines that trigger recommendations for warning clauses are summarized in Table 2. Where recommended, the warning clauses should be included in agreements registered on Title for the residential units and included in all agreements of purchase and sale or lease, and all rental agreements. Warning clauses are summarized in Appendix D.

Based on the predicted façade noise levels, central air conditioning and an MECP Type D warning clause, are recommended for all residential units in Building 01, Building 02 and Building 03. It should be noted that due to the recommended Class 4 designation for the development, all units are expected to be provided with central air conditioning regardless of the transportation analysis.

Due to the proximity of the proposed development to the railway lines, CN and Metrolinx Warning Clauses are also required to be included for all units.

Refer to Appendix D for all warning clause details.

2.5.2.2 Outdoor Living Areas

As the predicted outdoor sound level at OLA 01 meets 55 dBA with the crash wall barrier, a Type B warning clause is recommended for all residential units in Buildings 01 and 02.

Furthermore, as the outdoor sound level at OLA 02 is 57 dBA without mitigation, a Type A warning clause is recommended for all residential units in Building 03.

3.0 Transportation Vibration Assessment

There is no specific MECP guideline with respect to railway vibration for land use approvals. Both CN and Metrolinx/GO Transit have published their own criteria, and both require that vibration impact assessments be conducted to ensure that adverse vibration impacts do not occur. The document entitled 'Guidelines for New Development in Proximity to Railway Operations' prepared by the Federation of Canadian Municipalities (FCM) and the Railway Association of Canada (RAC) is also applicable for rail-generated vibration, and therefore used as a reference tool of best practices for rail-adjacent developments. Both CN and Metrolinx/GO endorse the FCM/RAC guidelines.

Both CN and Metrolinx/GO require the following with respect to rail vibration:

- Ground-borne vibration transmission to be evaluated in a report through site testing to determine if dwellings within 75 metres of the railway rights-of-way will be impacted by vibration conditions in excess of 0.14 mm/sec Root Mean Square (RMS) between 4 Hz and 200 Hz.
- The monitoring system should be capable of measuring frequencies between 4 Hz and 200 Hz, ± 3 dB, with an RMS averaging time constant of 1 second.
- If in excess, vibration isolation measures will be required to ensure living areas do not exceed 0.14 mm/s RMS.

3.1 Vibration Sources

The Halton Subdivision is the rail source of vibration located north of the proposed development, immediately adjacent to the Project site. Ground-borne vibration due to rail traffic along this railway is the focus of this assessment.

3.2 Vibration Measurement Program

Measurements of ground-induced vibration due to rail traffic along the Halton Subdivision were made at the Project site. Measurements were conducted on April 12, 2023, and were performed at two locations: one at the existing building footprint (Location L2), and one closer to the rail corridor (Location L1) – to capture variability in ground borne vibration propagation characteristics.

The vibration measurement locations are shown in Figure 6.

Rail traffic was determined to pass by the Project site primarily on Track 4 (GO passenger trains) and Track 5 (CN freight trains). The layover tracks (Tracks 1 through 3 inclusive) are intermittently used as well; the trains do not pass through, and instead come to a stop.

At least five (5) rail pass by events were captured of both GO trains and CN Freight trains along Track 4 and 5, respectively. Setback distances from the measurement locations are shown in Figure 6. Three train movements along layover tracks were also measured.

Vibration velocity amplitudes were collected with Syscom MR3000C units sampling at a rate of 1024 Hz.

3.3 Vibration Measurement Data Processing

Collected vibration data were reviewed and post-processed using MATLAB to compute overall RMS vertical vibration levels.

The measured data were post-processed per the FCM/RAC guideline to compute the 1-second sliding window RMS amplitudes of the vibration velocity in units of mm/s.

Coupling losses/attenuation due to the proposed Building 01/02 structure was applied to the measured vibration levels. Vibration levels are attenuated as they travel from the ground and enter building structures, due to coupling losses between the ground and building foundation. In general, the larger (more massive) the structure, the greater the coupling losses, and correspondingly the lower the vibration levels in the structure. The U.S. Federal Transit Administration ("FTA") Transit Noise and Vibration Impact Assessment Manual, which is a widely used reference in rail vibration analysis, provides a method for assessing the impacts of building structures on interior vibration levels, where impacts (if any) could be experienced. The adjustments are in units of VdB.

In this assessment, the vibration levels were adjusted using the method outlined in the FTA manual to account for what vibration levels would be experienced at the closest residential vibration-sensitive point of reception. For Buildings 01/02 this is expected to be at the 2nd floor, where the nearest residential units will be located. The adjustments applied to the measured vibration levels are summarized as follows:

Foundation Coupling, Large Building on Piles	-10 VdB	FTA Manual Table 6-12
Floor-to-Floor Attenuation, 1st to 2nd Floor	-2 VdB	FTA Manual Table 6-13
Resonance amplification, centre of span	+6 VdB	FTA Manual Table 6-13
TOTAL ADJUSTMENT	-6 VdB	

3.4 Vibration Assessment Results – Existing Rail Traffic

Table 12 summarizes measured and calculated vibration levels due to all rail pass by events.

Raw vibration measurements at Location L2 indicate that for GO Trains and CN Freight Trains passing by the proposed development on Tracks 4 and 5, respectively, RMS vibration levels will be below applicable criteria. With additional attenuation due to foundation coupling and floor-to-floor attenuation considered, RMS vibration levels have been calculated to be well below 0.14 mm/s.

With respect to rail movements along the Layover Yard tracks (Tracks 1 and 3), calculated RMS vibration levels were also determined to be below the 0.14 mm/s criterion.

It should be further noted that due to the presence of the existing building at the Project site, it was not possible to take outdoor measurements at locations representing residential unit setbacks. Actual residential units will be set back further than the Location L2 vibration monitor, and therefore would be expected to experience even lower levels of ground borne vibration due to rail pass by events.

Based on the results of the vibration measurement program, mitigation is not required for the proposed development.

Table 12: Summary of Rail Vibration Levels – Existing Rail Traffic Pass-By Events

Train Pass-By Event	Description	Time	RMS Vibration Level					Assessment of Compliance (Y/N)[2]
			Raw Data		Calculated Data		Criterion	
			Location L1	Location L2	Location L1[1]	Location L2[1]		
1	CN Train Westbound – Track 5	4:28 PM	0.120	0.078	0.060	0.039	0.14	Y
2	GO Train Westbound – Track 4	4:33 PM	0.141	0.076	0.071	0.038		Y
3	GO Train Westbound – Track 4	5:20 PM	0.155	0.092	0.077	0.046		Y
4	GO Train – Layover Track 3	5:33 PM	0.119	0.088	0.060	0.044		Y
5	GO Train Westbound – Track 4	5:41 PM	0.126	0.063	0.063	0.031		Y
6	GO Train – Layover Track 1	6:08 PM	0.314	0.151	0.157	0.076		Y
7	GO Train – Layover Track 1	6:12 PM	0.370	0.183	0.186	0.092		Y
8	GO Train Westbound – Track 4	6:15 PM	0.141	0.069	0.070	0.035		Y
9	CN Train Westbound – Track 5	6:37 PM	0.164	0.087	0.082	0.044		Y
10	GO Train Westbound – Track 4	6:43 PM	0.173	0.083	0.087	0.042		Y
11	GO Train Westbound – Track 4	7:03 PM	0.115	0.060	0.057	0.030		Y
12	CN Train Westbound – Track 5	7:44 PM	0.177	0.097	0.089	0.048		Y
13	CN Train Westbound – Track 5	7:55 PM	0.168	0.096	0.084	0.048		Y

14	GO Train Eastbound – Track 4	9:28 PM	0.120	0.063	0.060	0.032		Y
15	CN Train Westbound – Track 5	9:47 PM	0.144	0.073	0.072	0.036		Y
16	GO Train Westbound – Track 4	10:32 PM	0.127	0.069	0.063	0.035		Y
17	CN Train Westbound – Track 5	10:36 PM	0.138	0.086	0.069	0.043		Y
Notes:	[1] Values have been calculated to account for foundation coupling losses/attenuation, floor-to-floor attenuation, and resonance amplification as outlined in **Section 3.3**. [2] Assessment of compliance refers to comparison of calculated data to 0.14 mm/s criterion.							

3.5 Vibration Considerations – Future Rail Traffic

SLR understands that based on correspondence from Metrolinx, it is possible that Track 2 and Track 3 in the Layover Yard could be converted to pass-through tracks in the future (once the future Heritage Road Layover Yard is constructed). This would introduce rail sources of ground vibration closer to the proposed development than trains measured along Tracks 4 and 5 as part of the Vibration Measurement Program on April 12, 2023.

As pass-through traffic is not currently occurring along the Layover Yard tracks, calculated propagation of ground borne vibration between measurements Locations L1 and L2 was used to estimate future RMS vibration levels should GO Trains and CN Freight Trains travel on Tracks 2 and 3. It was assumed that attenuation of ground borne vibration within the ground would be linear between measurement locations.

The setback distances of Tracks 2 and 3 from the measurement locations were considered as follows:

- Measurement Location L1: Track 2 setback 9.8 m, Track 3 setback 16.0 m
- Measurement Location L2: Track 2 setback 29.3 m, Track 3 setback 35.5 m

Estimated vibration levels at Location L2 (nearest building footprint) for trains travelling along Track 2 and Track 3 are presented in **Table 13**.

Table 13 presents 'raw data' (i.e., raw measurements propagated to new distances assuming rail traffic occurred along Tracks 2 and 3), and 'calculated data' (i.e., further considers attenuation as noted in **Section 3.3**).

Calculated RMS vibration levels at Location L2 are below the 0.14 mm/s criterion for every GO Passenger Train and CN Freight Train based on estimated propagation. Furthermore, current rail movements along Tracks 1 and 3 (previously shown in **Table 12**) yielded calculated RMS vibration levels below 0.14 mm/s.

Based on this analysis, RMS vibration levels above 0.14 mm/s are not anticipated should rail pass-through traffic along Track 2 and Track 3. Vibration mitigation is therefore not anticipated to be required.

Table 13: Summary of Rail Vibration Levels – Future Rail Traffic

Train Pass-By Event	Description	Time	RMS Vibration Level					Assessment of Compliance (Y/N)[2]
			Raw Data		Calculated Data		Criterion	
			Track 2 Location L2	Track 3 Location L2	Track 2 Location L1[1]	Track 3 Location L2[1]		
1	CN Train Westbound	4:28 PM	0.134	0.067	0.120	0.060	0.14	Y
2	GO Train Westbound	4:33 PM	0.128	0.064	0.108	0.054		Y
3	GO Train Westbound	5:20 PM	0.142	0.071	0.122	0.061		Y
4	GO Train Westbound	5:41 PM	0.114	0.057	0.094	0.047		Y
5	GO Train Westbound	6:15 PM	0.127	0.063	0.104	0.052		Y
6	CN Train Westbound	6:37 PM	0.189	0.095	0.165	0.082		Y
7	GO Train Westbound	6:43 PM	0.156	0.078	0.127	0.064		Y
8	GO Train Westbound	7:03 PM	0.104	0.052	0.086	0.043		Y
9	CN Train Westbound	7:44 PM	0.203	0.102	0.177	0.089		Y
10	CN Train Westbound	7:55 PM	0.191	0.096	0.168	0.084		Y
11	GO Train Eastbound	9:28 PM	0.109	0.055	0.091	0.045		Y
12	CN Train Westbound	9:47 PM	0.167	0.084	0.144	0.072		Y
13	GO Train Westbound	10:32 PM	0.115	0.058	0.097	0.049		Y
14	CN Train Westbound	10:36 PM	0.155	0.078	0.138	0.069		Y

Notes: [1] Values have been calculated to account for foundation coupling losses/attenuation, floor-to-floor attenuation, and resonance amplification as outlined in **Section 3.3**.

[2] Assessment of compliance refers to comparison of calculated data to 0.14 mm/s criterion.

4.0 Stationary Source Noise Impacts

A review has been conducted for the potential impacts on the proposed development from nearby stationary noise sources.

SLR staff completed a site visit on October 14th, 2020 to survey the surrounding area for potential stationary noise sources. An aerial imagery review was also conducted of the development lands and surrounding area. Impulsive noise sources were not observed by SLR staff during the site visit.

During the site visit, the Georgetown GO Layover Yard (located at the southside of the development) was identified as stationary source with potential to impact the proposed development. SLR understands the new Metrolinx Heritage Layover Yard is proposed at a location approximately 4 km east of the development. Based on information provided by Metrolinx, the Heritage Road Layover Yard is expected to replace the existing Georgetown Layover Yard, which is approaching the end of its serviceable life. The completion timeframe is understood to be 2026/2027 based on correspondence from Metrolinx. Once the Heritage Road Layover Yard is built and fully operational, the Georgetown GO Layover Yard is not expected to be a significant noise source in proximity to the proposed development.

As the scheduling of constructing the Heritage Road GO Layover Yard is tentative and the Georgetown GO Layover Yard is currently operational, an assessment of its stationary noise impacts was completed due to its proximity to the proposed development.

4.1 Stationary Source Noise Guidelines

4.1.1 MECP Publication NPC-300 – Stationary Sources

The applicable MECP noise guidelines for new sensitive land uses adjacent to existing industrial commercial uses are provided in MECP Publication NPC-300. NPC-300 revokes and replaces the previous noise assessment guideline, Publication LU-131 and Publication NPC-205, which was previously used for assessing noise impacts as part of Certificates of Approval / Environmental Compliance Approvals granted by the MECP for industries.

The new 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 (Leq (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 (LLM) of the impulses in a one-hour period, in dBAI.

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.

Table 12 sets out the exclusion limits from the guideline for continuous noise.

4.1.2 MECP Publication NPC-300 – Layover Yards

Section C4.5.4 of NPC-300 defines the sound level limit for noise from a layover site such as the Georgetown GO Layover Yard, expressed in terms of the One-Hour Equivalent Sound Level (Leq(1-hr), in dBA). The limit is the higher of either 55 dBA or the background sound level, during any hour of the day.

The layover yard criteria are also shown in Table 14 for reference.

Table 14: NPC-300 Exclusion Limits for Non-Impulsive Sounds (L_{eq}(1-hr), dBA)

Time of Day	Class 1 Area		Class 4 Area		Layover Yards
	Plane of Window of Noise Sensitive Space	Outdoor Point of Reception	Plane of Window of Noise Sensitive Space	Outdoor Point of Reception	
Daytime (0700-1900)	50	50	60	55	55
Evening (0700-1900)	50	50	60	55	55
Night-time (0700-1900)	45	n/a	55	n/a	55

4.1.3 Application of the NPC-300 Guidelines

The 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 guidelines only apply to the residential portions of the development, including:

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

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

4.1.4 Proposed Area Classification

Under Ministry of the Environment, Conservation & Parks (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 – Infill areas

In addition, layover yards, as noted previously, are considered separately and are assessed against relaxed guideline limits.

Depending on the receptor area classification, different guideline limits apply. Classes 1, 2 and 3 were included in the predecessor guidelines to NPC-300, namely MECP Publications NPC-205, NPC-232, and LU-131. The Class 4 designation is a new designation, intended to allow for infill and redevelopment, whilst still protecting residences from undue noise.

The area is urban in nature and dominated by man-made sounds, including road traffic noise and an "urban hum", including idling train noise during the overnight period. The acoustic environment is considered to be a Class 1 area. As the project site meets the definition and requirements for a Class 4 area, it would be recommended and appropriate to issue a Class 4 designation for the development lands.

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

> 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);
> - has formal confirmation from the land use planning authority with the Class 4 area classification which is determined during the land use planning process; and

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 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 assume 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."

The Project meets the definitions and requirements for a Class 4 area listed in Publication NPC-300:

- the Project site is close proximity to an area that contains existing and proposed mixed-use developments and is intended for new high-intensity developments.
- the Project site is in proximity to existing lawfully established noise generating sources.
- the Project site does not contain existing noise-sensitive land-uses.
- An appropriate, detailed noise impact assessment will be conducted as part of the zoning by-law amendment application (i.e., this study and report).

It is therefore appropriate for the Town of Halton Hills to declare the development property as a Class 4 area, under their role as the land use planning authority, in the exercise of its responsibility and authority under the Planning Act. For reference, The City of Toronto and other municipalities have issued a Class 4 designation for other similar developments, including but not limited to:

- Judson Street, west of Royal York, in Etobicoke
- Lower Yonge Precinct, in Toronto;
- Highway 7, east of Keele Street, in Vaughan;
- Milton Meadows Precinct, in Milton
- West Harbour District, in Hamilton
- Masonry Court, east of Waterdown Road, in Burlington

It is important to note that the Class 4 designation only applies to the development lands. Existing noise-sensitive receptors in the area will remain as Class 1 areas and subject to the Layover Yard requirements in NPC-300. Therefore, the designation will not allow for industries to increase their noise impacts at existing residences.

The proposed development meets the general requirements of obtaining a Class 4 area designation under NPC-300: that is to say, the development is in an area intended for future residences (new noise sensitive land uses) that are not yet built; and it is in proximity to existing, lawfully established stationary sources.

For this assessment, both the Layover Yard and Class 4 limits have been investigated.

4.2 Stationary Noise Modelling

Idling locomotives operating at the Georgetown GO Layover Yard were assessed in this study based on observed locations of 2 locomotives by SLR staff. The 2 idling locomotives were modelled based on historical sound level data and idling times (15 minutes), in which the layover yard guideline limits are met at existing homes. Both trains were included in the daytime, evening and night-time 1-hour periods based on a predictable worst-case assessment of noise impacts.

Noise impacts from stationary sources were modelled using Cadna/A, a software implementation of the internationally recognized ISO-9613-2 environmental noise propagation algorithms. Cadna/A / ISO-9613 is the preferred noise model 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; and
- 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 (worst-case assessment of noise levels):

- Temperature: 10°C;
- Relative Humidity: 70%;
- Ground Absorption G: G = 0.0 (reflective) as default global parameter;
- Reflection: An order of reflection of 2 was used (accounts for noise reflecting from walls);
- Wall Absorption Coefficients: A CadnaA default coefficient for Structured Facades was applied in the modelling for buildings, and for the 2nd floor amenity terrace barrier, a Smooth Façade was applied; and
- Terrain: Relatively flat near the Project site.

SLR historical sound level data was applied in the stationary noise modelling. A summary of the sound levels used in the analysis and equipment operating conditions is included in Appendix E. All stationary sources modelled are shown in Figure 7.

The "building evaluation" feature of Cadna/A was used to predict sound levels on the residential portions of the towers and podium. This feature allows for noise levels to be predicted across the entire façade of a structure. Outdoor sound levels were assessed at 1.5 m above the terrace level, at usable locations within the terrace.

4.3 Predicted Façade Sound Levels

A summary of the predicted unmitigated sound levels from GO Layover Yard on each façade are shown in Figure 8 and summarized in Table 15.

The predicted façade sound levels along a portion of the Building 02 west façade, the south façade of Building 01, and a portion of the east façade of Building 01 exceed the applicable layover yard guideline limits during all hours. Furthermore, the Class 4 limits are predicted to be exceeded during all hours along the south façade of Building 01, and during night-time hours along a portion of the Building 02 west façade and a portion of the Building 01 east façade. Therefore, an assessment of mitigation measures is required.

Table 15: Summary of Stationary Source Façade Sound Levels – Unmitigated

Building	Facade	Max Predicted Stationary Source Sound Level (dBA) (D/E/N)	Applicable Layover Yard Guideline Limit (dBA)	Meets Layover Guideline Limits? (Y/N)	Applicable Class 4 Guideline Limits (dBA) (D/E/N)	Meets Class 4 Guideline Limits (D/E/N)? (Y/N)
Building 01	North	44 / 44 / 44	55 / 55 / 55	Y / Y / Y	60 / 60 / 55	Y / Y / Y
	East	62 / 62 / 62		N / N / N		N / N / N

	South	66 / 66 / 66		N / N / N		N / N / N
	West[2]	- / - / -		- / - / -		- / - / -
Building 02	North	38 / 38 / 38		Y / Y / Y		Y / Y / Y
	East	35 / 35 / 35		Y / Y / Y		Y / Y / Y
	South[2]	- / - / -		- / - / -		- / - / -
	West	61 / 61 / 61		N / N / N		N / N / N
Building 03	North	30 / 30 / 30		Y / Y / Y		Y / Y / Y
	East	42 / 42 / 42		Y / Y / Y		Y / Y / Y
	South	41 / 41 / 41		Y / Y / Y		Y / Y / Y
	West	32 / 32 / 32		Y / Y / Y		Y / Y / Y

Notes: [1] Façade locations are shown in **Figure 8** and **Figure 9**. The sound levels presented are for the worst-case on the entire façade.
[2] No south façade (Building 02) or west façade (Building 01) has been considered as Building 01 connects to Building 02.

4.4 Predicted Outdoor Sound Levels

The predicted outdoor stationary source noise impacts from the GO Layover Yard are shown in **Figure 8** and summarized in **Table 16**.

Table 16: Summary of Stationary Source Outdoor Sound Levels – Unmitigated[1]

Assessment Location	Location	Predicted Stationary Source Sound Levels L_{eq} Daytime/Evening (dBA)	Applicable Class 4 and Layover Yard Limits (dBA) (D/E)	Meets Applicable Limits (D/E)? (Y/N)
OPOR 01A	Building 01/02 2nd Floor Elevated Terrace	52 / 52	55 / 55	Y / Y
OPOR 01B		56 / 56	55 / 55	N / N
OPOR 01C		53 / 53	55 / 55	Y / Y
OPOR 02	Building 03 Rooftop Elevated Terrace	33 / 33	55 / 55	Y / Y

Notes: [1] Assessed including the screening from the 2.95 m high sound barrier/crash wall shown in development drawings.

The layover criteria of 55 dBA are met at all locations except for the western portion of the Building 01/02 2nd Floor Elevated Terrace, provided the 2.95 m high sound barrier is constructed as previously discussed and required for transportation rail noise (refer to **Section 2.6.2** for details).

For OPOR 01B, additional mitigation is required to achieve an outdoor sound level of 55 dBA. Refer to **Section 4.7**.

4.5 Mitigation Requirements

4.5.1 Preliminary Mitigation Review

As shown above, Layover Yard and Class 4 guideline limit excesses were predicted to range from 1 to 11 dB along the proposed development's Building 01 south and east facades, and a portion of the Building

02 west façade. The following is general discussion of possible mitigation options considered for the development.

4.5.1.1 Source-Based Noise Controls

A discussion of the possible noise controls measures for achieving the required reduction of GO Train locomotives is provided below:

- Installation of an acoustical barrier – Given the height requirements needed to screen elevated receptors (e.g., 12th-floor units) from idling locomotives, the extent and height of such a barrier would be impractical. Preliminary noise modelling was not able achieve the required reduction along all façades of the development with either a traditional barrier or a cantilevered barrier.
- Physical mitigation measures to the locomotive – Installing permanent mitigation on the locomotives themselves would be impractical due to need to treat the entire fleet of GO Trains in service along the rail subdivision.
- Physical mitigation measures for the locomotive in the form of a temporary hood, applied as needed – This option would be considered impractical due to the daily use and movement of the trains. In addition, this would be excessively costly for the required reduction in noise, and administratively difficult given the space constraints of the layover yard and the number of locomotive locations possible on-site.
- Construction of an extension/enclosure over the layover yard – Construction of a canopy/enclosure over the layover yard would likely provide sufficient reductions in noise. However, significant effort and cost would be required to include a structure over the entire layover yard with sufficient density to effectively reduce noise. Additionally, high volume ventilation fans would be required to address diesel fumes within the building during engine warm up, which would also need to be mitigated. This option is considered excessively costly and complex for the required reduction in noise.

4.5.1.2 Development (Receptor-Based) Noise Controls

The following is summary of the possible development noise controls considered to addresses excesses from idling locomotives.

Site Configuration

- Change Building 01/02 from Residential to a Commercial/Office building – The inclusion of a non-noise sensitive building will provide additional screening from the industries to the south. This is not considered a feasible option, as Commercial/Office space would not be attractive from a business/economic perspective for this location in Georgetown.
- Increase set back distances from the layover yard – Given the size of the development site, any increase in distance would reduce the total number of units and the development would not be economically justifiable/feasible.

Blank/Non-Noise-Sensitive Facades

- A blank façade or corridor along the south and east sides of Building 01 and the west side of Building 02 would require a single-loaded design for the building. This would reduce the total number of units and the development would not be economically justifiable/feasible.

Enclosed Noise Buffers

- The NPC-300 guideline allows for the use of additional mitigation in the form of "Enclosed Noise Buffers" (ENBs) on high-rise, multi-unit buildings, in which a Class 4 area designation is required for the development.

ENBs overlap sensitive windows and essentially act as a "secondary skin facade", providing an initial reduction in noise prior to impacting the window on the sensitive space, thus ensuring that the noise guidelines are met at the exterior plane of windows next to noise sensitive spaces. The exterior plane of the window next to the noise sensitive space is defined as a sensitive point of reception (POR) in NPC-300. Figures summarizing the ENB concepts are included for reference in Appendix D.

4.5.1.3 Noise Mitigation Review Summary

Based on a review of the above, physical noise mitigation measures and development noise controls, such as site configuration and blank facades, are generally not considered to be practical, may not be feasible, would be excessively costly to meet the Layover Yard limits at the proposed development, and/or not economically justifiable for the proposed development.

However, the consideration for a Class 4 Area Designation and application of ENBs is a feasible consideration for the development and is discussed further in the following sections.

4.5.2 Class 4 Area Designation

Class 4 area designation is considered appropriate for the proposed development and should be sought from the Town of Halton Hills to allow for the application of ENBs. This is based on:

- the development lands being located in a Class 1 urban area;
- the lands are intended for development of new residential lands; and
- the surrounding stationary sources are lawfully established, where MECP permitting is not required for the layover yard.

As mentioned above, typical mitigation measures for addressing noise from idling locomotives are considered excessively costly, infeasible and/or impractical. The exception is ENBs, in which a Class 4 Area Designation is required for the development lands.

With the approval of a Class 4 designation, the application of receptor-based ENB mitigation would be possible as a noise control option for the development and is therefore recommended.

4.5.3 Application of the Enclosed Noise Buffer (ENB)

With the application of the Class 4 guideline limits, the guideline limits are exceeded along the south and east facades of Building 01, and the west façade of Building 02 (refer to Table 13), and shown in Figure 8. For these facades, application of ENB is recommended.

The following is a summary of the requirements for the application of ENBB as a noise mitigation measures:

1 A "Class 4" area designation must be obtained from the land use planning authority.

2 Noise-sensitive windows of all residential units must be located behind an ENB, as defined under Publication NPC-300 (see Appendix D for concept details). The characteristics of an enclosed noise buffer are listed below:

- Not less than one metre and not more than two metres in depth;
- Fully enclosed with floor to ceiling glazing or a combination of solid parapet plus glazing above
- Glazing can potentially be operable to the maximum permitted by the Ontario Building Code;
- Separated from interior space with a weatherproof boundary of exterior grade wall, exterior grade window, exterior grade door, or any combination, in compliance with exterior envelope requirements of the Ontario Building Code;
- Of sufficient horizontal extent to protect windows of noise sensitive spaces; and
- The architectural design is not amenable to converting the enclosed space to being noise-sensitive.

The ENBs must extend to cover windows and patio doors connected to noise sensitive spaces such as living rooms, kitchens, bedrooms, and dens. Non-noise sensitive spaces such as corridors, bathrooms, or laundry rooms do not need to be enclosed.

3 Noise Warning Clauses – In addition to the NPC-300 Type E warning clause, a warning clause is required for notification the proposed development is located within an MECP NPC-300 Class 4 Area. An MECP NPC-300 Type F warning clause is required for all units within the building. The Type F warning clause is included in Appendix D.

4 Under the Class 4 designation, when receptor-based noise mitigation measures are used, such as enclosed noise buffer balconies, then a legally-binding "Agreement for Noise Mitigation" must be entered into, between the land use planning authority, the developer and the affected industries (e.g., Metrolinx). The purpose of such an agreement is to ensure that any receptor-based noise mitigation measures are implemented and maintained.

With the inclusion of ENBs meeting the requirements noted above, the applicable guideline limits are considered to be met at the proposed development on all facades from Layover Yard idling train noise. The facades recommended for ENBs are shown in Figure 9 and Figure D1, Appendix D.

Figure 9 and Table 17 show the evaluation of stationary source noise impacts indicating compliance with applicable Class 4 limits at all other potentially noise-sensitive locations within the proposed development.

Table 17: Summary of Stationary Source Façade Sound Levels – Mitigated

Building	Facade	Predicted Stationary Source Sound Level (dBA) (D/E/N)	Applicable Layover Yard Guideline Limit (dBA)	Meets Layover Guideline Limits? (Y/N)	Applicable Class 4 Guideline Limits (dBA) (D/E/N)	Meets Class 4 Guideline Limits (D/E/N)? (Y/N)
Building 01	North	44 / 44 / 44	55 / 55 / 55	Y / Y / Y	60 / 60 / 55	Y / Y / Y
	East	51 / 51 / 51		Y / Y / Y		Y / Y / Y
	South	- / - / - [3]		Y / Y / Y		Y / Y / Y
	West[2]	- / - / -		- / - / -		- / - / -
Building 02	North	38 / 38 / 38		Y / Y / Y		Y / Y / Y

	East	35 / 35 / 35		Y / Y / Y		Y / Y / Y
	South[2]	- / - / -		- / - / -		- / - / -
	West	54 / 54 / 54		Y / Y / Y		Y / Y / Y
Building 03	North	30 / 30 / 30		Y / Y / Y		Y / Y / Y
	East	42 / 42 / 42		Y / Y / Y		Y / Y / Y
	South	41 / 41 / 41		Y / Y / Y		Y / Y / Y
	West	32 / 32 / 32		Y / Y / Y		Y / Y / Y

Notes: [1] Façade locations are shown in **Figure 8** and **Figure 9**. The sound levels presented are for the worst-case on the entire façade.
[2] No south façade (Building 02) or west façade (Building 01) has been considered as Building 01 connects to Building 02.
[3] A portion of the east façade and the entire south façade (Building 01) are considered non-noise sensitive with planned application of ENBs. Similarly, a portion of the west façade of Building 02 is considered non-noise sensitive with planned application of ENBs.

4.6 Ventilation and Warning Clause Requirements

As the GO Layover Yard has the potential to be audible at times, a warning clause should be included in the Agreement of Purchase and Sale or Lease and in the relevant Development Agreements and condominium documents. An MECP NPC-300 Type E warning clause is recommended for all suites within the development. Refer to Appendix D for warning clause details.

In addition, central air conditioning and a Type F Warning Clause is recommended as a component of the Class 4 Area designation. See Appendix D.

4.7 Outdoor Mitigation Requirements

To mitigate outdoor sound levels at OPOR 01C (at the west side of the terrace), the barrier height should be increased to 3.95 m along a portion of the terrace as shown in Figure 9. Mitigated sound levels are summarized in Table 18.

Table 18: Summary of Stationary Source Outdoor Sound Levels – Mitigated[1]

Assessment Location	Location	Predicted Stationary Source Sound Levels L_{eq} Daytime/Evening (dBA)	Applicable Class 4 and Layover Yard Limits (dBA) (D/E)	Meets Applicable Limits (D/E)? (Y/N)
OPOR 01A	Building 01/02 2nd Floor Elevated Terrace	52	55 / 55	Y / Y
OPOR 01B		55	55 / 55	Y / Y
OPOR 01C		53	55 / 55	Y / Y
OPOR 02	Building 03 Rooftop Elevated Terrace	33	55 / 55	Y / Y

Notes: [1] Assessed including the screening from the 2.95 m high sound barrier/crash wall shown in development drawings.

PART 2: IMPACTS OF THE DEVELOPMENT ON THE SURROUNDING AREA

5.0 Stationary Source Noise Impacts of the Development on the Surrounding Area

In terms of the noise environment of the area, it is expected that the proposed development will have a negligible effect on the neighbouring properties.

The traffic related to the proposed development will be small relative to the existing traffic volumes within the area and is expected to be negligible with respect to noise impacts.

Other possible development noise sources with possible adverse impacts on the surrounding neighbourhood are mechanical equipment associated with the buildings, such as make up air units, cooling units, and parking garage vents. Noise from mechanical equipment is required to meet MECP Publication NPC 300 requirements at the worst-case off-site noise sensitive receptors.

Off-site impacts are not anticipated given that the systems will be designed to ensure that the applicable noise guidelines are met at on-site receptors.

Regardless, potential impacts will be assessed as part of the final building design to ensure compliance. The criteria can be met at all surrounding and on-site 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) into the design.

PART 3: IMPACTS OF THE DEVELOPMENT ON ITSELF

6.0 Stationary Source Noise Impacts on the Development Itself

The building mechanical systems (e.g., make-up air units, cooling units, and parking garage vents) have not been designed in detail at this stage. Although no adverse impacts are expected, such equipment has the potential to result in noise impacts on the noise sensitive spaces within the development itself.

Therefore, the potential impacts should be assessed as part of the final building design. The criteria are expected to be met at all on-site receptors with the appropriate selection of mechanical equipment, by locating equipment to minimize noise impacts within the development, and by incorporating control measures (e.g., silencers, barriers) into the design.

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

7.0 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 the surrounding area and the development on itself have been considered. Based on the results of the studies, the following conclusions have been reached:

Transportation Noise

- An assessment of transportation noise impacts has been completed.
- Based on transportation façade sound levels upgraded glazing is required within the development, as outlined in outlined in Section 2.5.
- Ventilation requirements include a combination of Mandatory AC and Provision for Future Installation of AC, as outlined in Section 2.6 and Appendix D. Warning Clauses requirements include those for CN and Metrolinx, for all units.
- Warning Clauses should be included in agreements registered on Title for the residential units and included in agreements of purchase and sale/rental agreements, and include a combination of MECP Type C and Type D warning clauses. In addition, the CN and Metrolinx warning clauses are recommended for all units. A summary of the warning clauses recommendations is included in Appendix D.

Transportation Vibration

- Transportation (rail) vibration has been assessed, as outlined in Section 3 of this report.
- Rail vibration levels were measured at the existing site in the approximate area of the building footprint location and at a location closer to the rail right-of-way. The maximum vibration levels were found to meet the CN/GO criteria. No mitigation is required.
- Expected vibration levels from potential future rail traffic along closer tracks is not expected to be of concern, based on assessment of vibration propagation from existing rail traffic.

Stationary Source Noise

- A site visit was completed by SLR personnel to review the surrounding area. Stationary noise with the potential to impact the development includes the Georgetown GO Train Layover Yard to the south.
- It is recommended that the site be designated as Class 4 by the land-use planning authority, due to the predicted impacts of the Georgetown GO Train Layover Yard on the proposed residential development.
- In addition to Class 4 designation, enclosed noise buffers (ENBs) are required along a portion of the south and east facades of Building 01 and west façade of Building 02, where residential units are planned, as outlined in Section 4.5.
- Warning Clauses should be included in agreements registered on Title for the residential units and included in agreements of purchase and sale/rental agreements. MECP Type E and Type F warning clauses are required for all units. A summary of the warning clauses recommendations is included in Appendix D.

- Mandatory AC is required for all units within the development as a component of the Class 4 designation, as summarized in Appendix D.
- The proposed Heritage Road Layover Yard is scheduled for construction with completion expected in 2026/2027. SLR understands the Georgetown Layover Yard is reaching the end of its serviceable life, and it will be replaced with the proposed Heritage Road Layover Yard. Once the Heritage Road Layover Yard is fully operational, the Georgetown GO Layover Yard is not expected to be a stationary source with the potential to impact the Project, and the above noted noise controls (ENBs, Type F warning clause, and mandatory AC) will no longer be required.

Overall Assessment

- Impacts of the environment on the proposed development can be adequately controlled through the feasible mitigation measures, current development design features, ventilation requirements and warning clauses detailed in Part 1 of this report.
- Impacts of the proposed development on the surrounding area are anticipated to be adequately controlled by following the design guidance outlined in Part 2 of this report.
- Impacts of the proposed development on itself are anticipated to be adequately controlled by following the design guidance outlined in Part 3 of this report.
- As the glazing analysis was completed based on generic room and window dimensions, the analysis should be revised once detailed floor and façade plans are available.
- As the mechanical systems for the proposed development have not been designed at the time of this assessment, the acoustical requirements above should be confirmed by a qualified acoustical consultant as part of the final building design.
- As the Heritage Road Layover Yard is currently proposed, a re-assessment of noise control measures (transportation and stationary noise) should be completed once the Heritage Road Layover is confirmed to proceed and the anticipated schedule for completion is available.

Sincerely,

SLR Consulting (Canada) Ltd.

Keni Mallinen, M.A.Sc., P.Eng.
Acoustics Engineer

R.L. Scott Penton, P.Eng.
Principal Acoustics Engineer

Distribution: 1 electronic copy – 1 Rosetta Street Inc.
1 electronic copy – SLR Consulting (Canada) Ltd.

8.0 References

International Organization for Standardization, ISO 9613-2: Acoustics – Attenuation of Sound During Propagation Outdoors Part 2: General Method of Calculation, Geneva, Switzerland, 1996.

National Research Council, Building Practice Note 56: Controlling Sound Transmission into Buildings, Canada 1985.

Ontario Ministry of the Environment, Conservation and Parks, 1989, Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT).

Ontario Ministry of the Environment, Conservation and Parks, Publication NPC-300: Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, 2013.

Ontario Ministry of the Environment, Conservation and Parks, 1996, STAMSON v5.04: Road, Rail and Rapid Transit Noise Prediction.

U.S. Department of Transportation - Federal Transit Administration (FTA), 2006. Transit Noise and Vibration Impact Assessment, FTA-VA-90-1003-06

9.0 Statement of Limitations

This report has been prepared and the work referred to in this report has been undertaken by SLR Consulting (Canada) Ltd. (SLR) for 1 Rosetta Street Inc., hereafter referred to as the "Client." It is intended for the sole and exclusive use of the Client. The report has been prepared in accordance with the Scope of Work and agreement between SLR and the Client. Other than by the Client, the Town of Halton Hills and Halton Region in their role as land use planning approval authorities, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted unless payment for the work has been made in full and express written permission has been obtained from SLR.

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Opinions and recommendations contained in this report are based on conditions that existed at the time the services were performed and are intended only for the client, purposes, locations, time frames and project parameters as outlined in the Scope or Work and agreement between SLR and the Client. The data reported, findings, observations and conclusions expressed are limited by the Scope of Work. SLR is not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. SLR does not warranty the accuracy of information provided by third party sources.

Figures

Updated Environmental Noise & Vibration Study

1 Rosetta Street,
Georgetown, ON

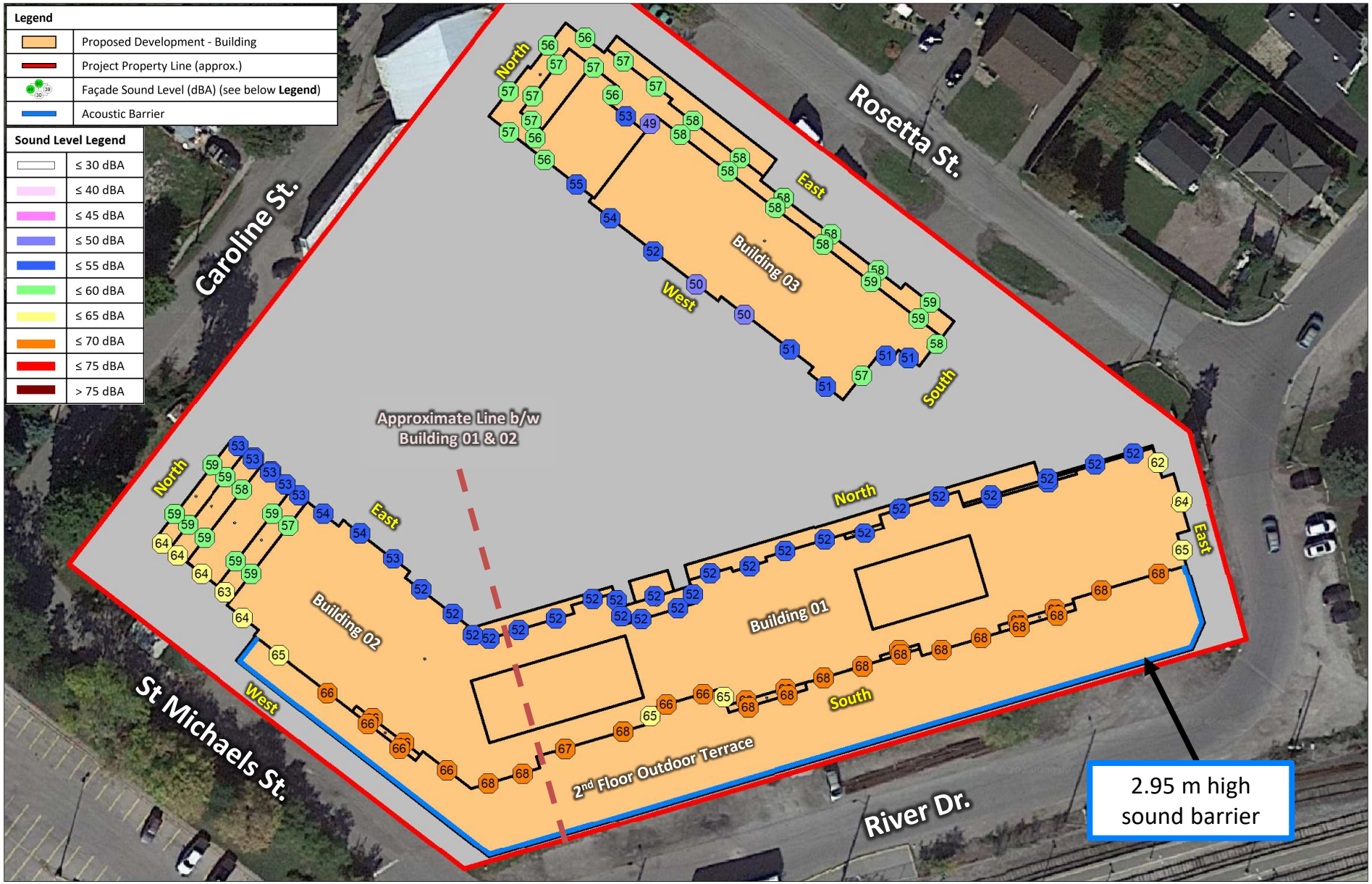
1 Rosetta Street Inc.

SLR Project No. 241.V20210.00001

May 26, 2023

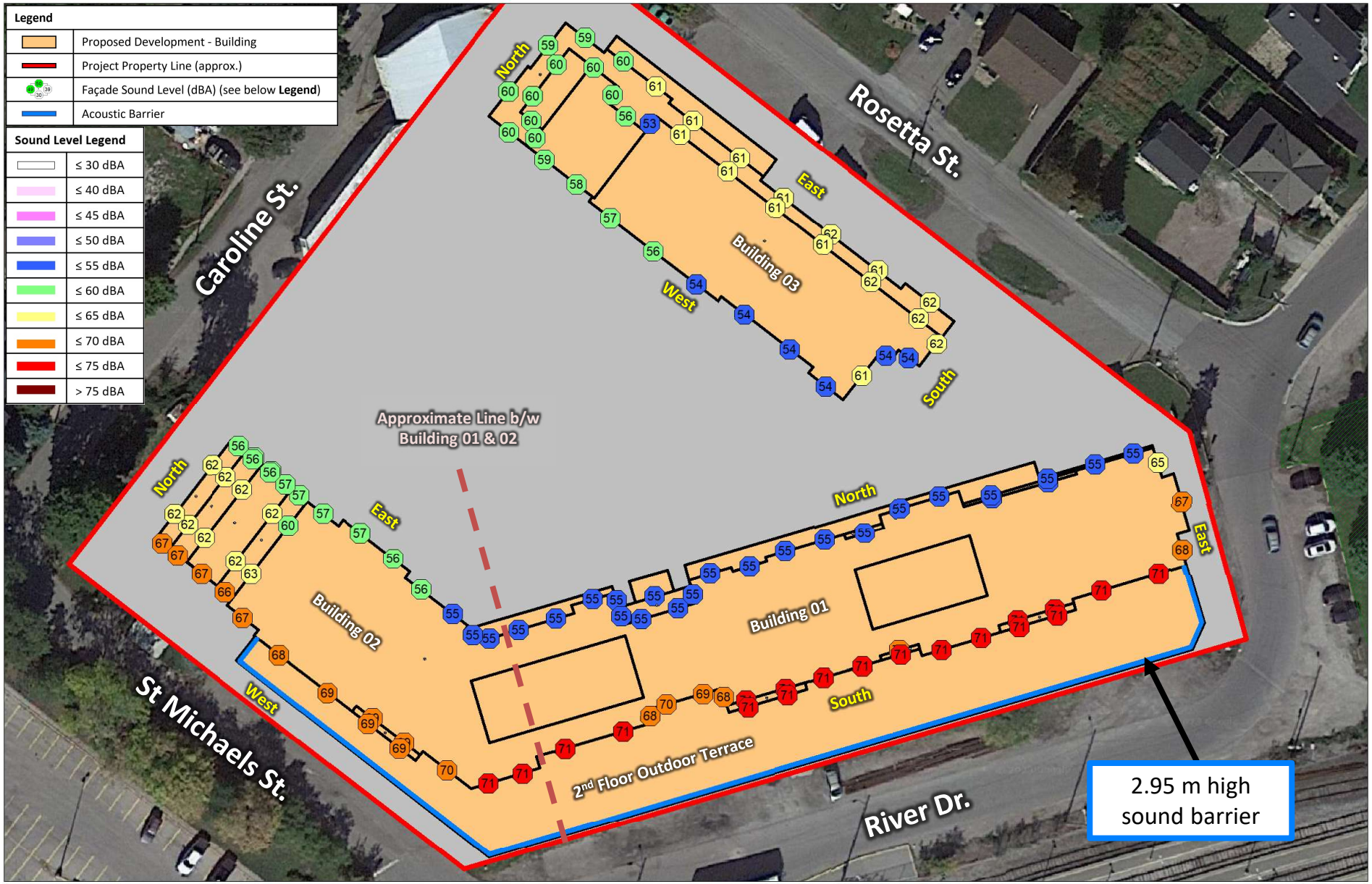
1 ROSETTA STREET INC.	True North	Scale: 1:8000		METRES
1 ROSETTA STREET, GEORGETOWN		Date: May 26, 2023	Rev 1.0	Figure No. 1
CONTEXT PLAN		Project No. 241.V20210.00001		

SLR global environmental solutions



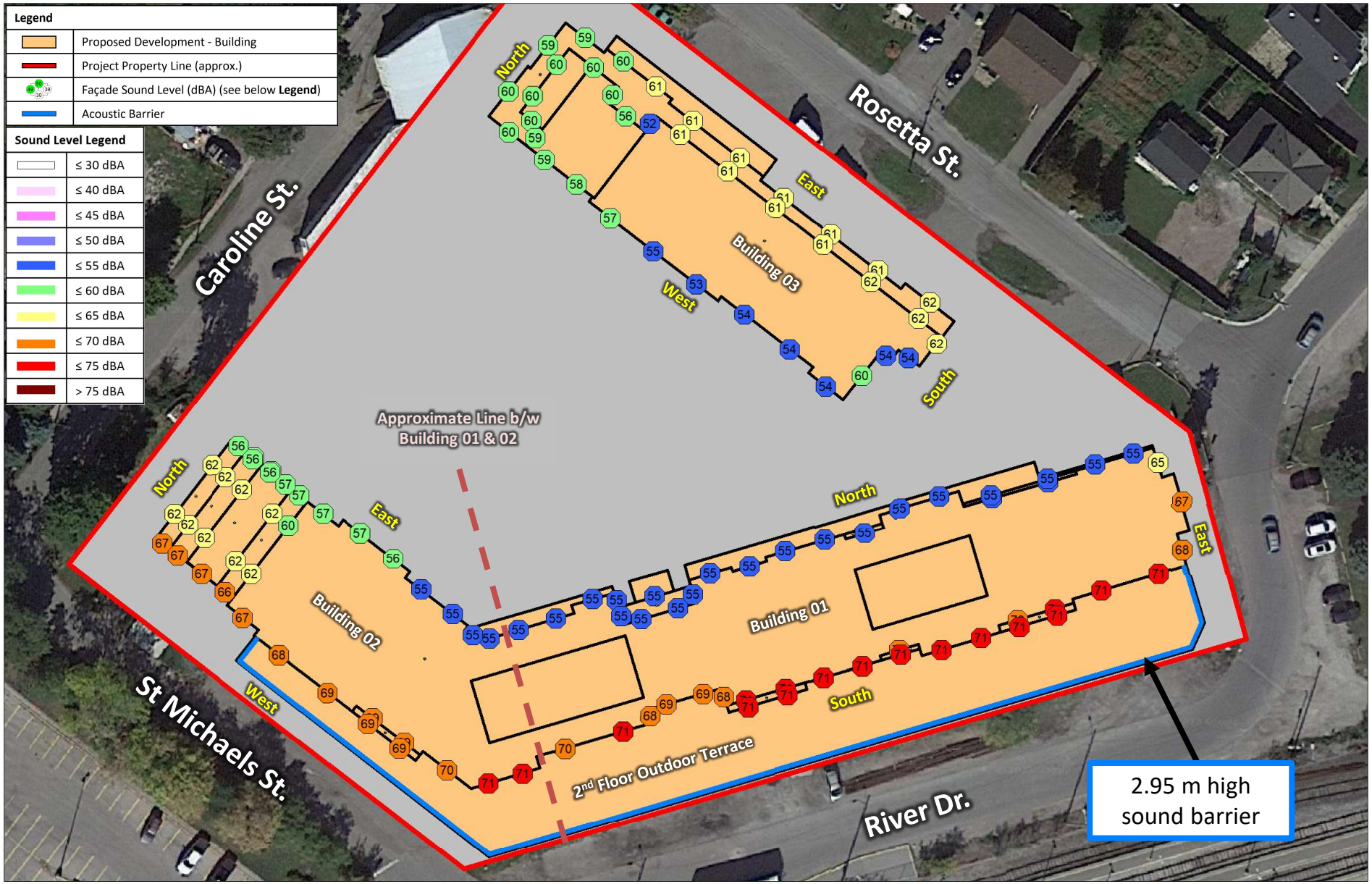
1 ROSETTA STREET INC.	True North	Scale: 1:800	METRES
1 ROSETTA STREET, GEORGETOWN		Date: May 26, 2023 Rev 1.0	Figure No. **2**
PREDICTED FAÇADE SOUND LEVELS – RAIL - DAYTIME		Project No. 241.V20210.00001	

SLR global environmental solutions

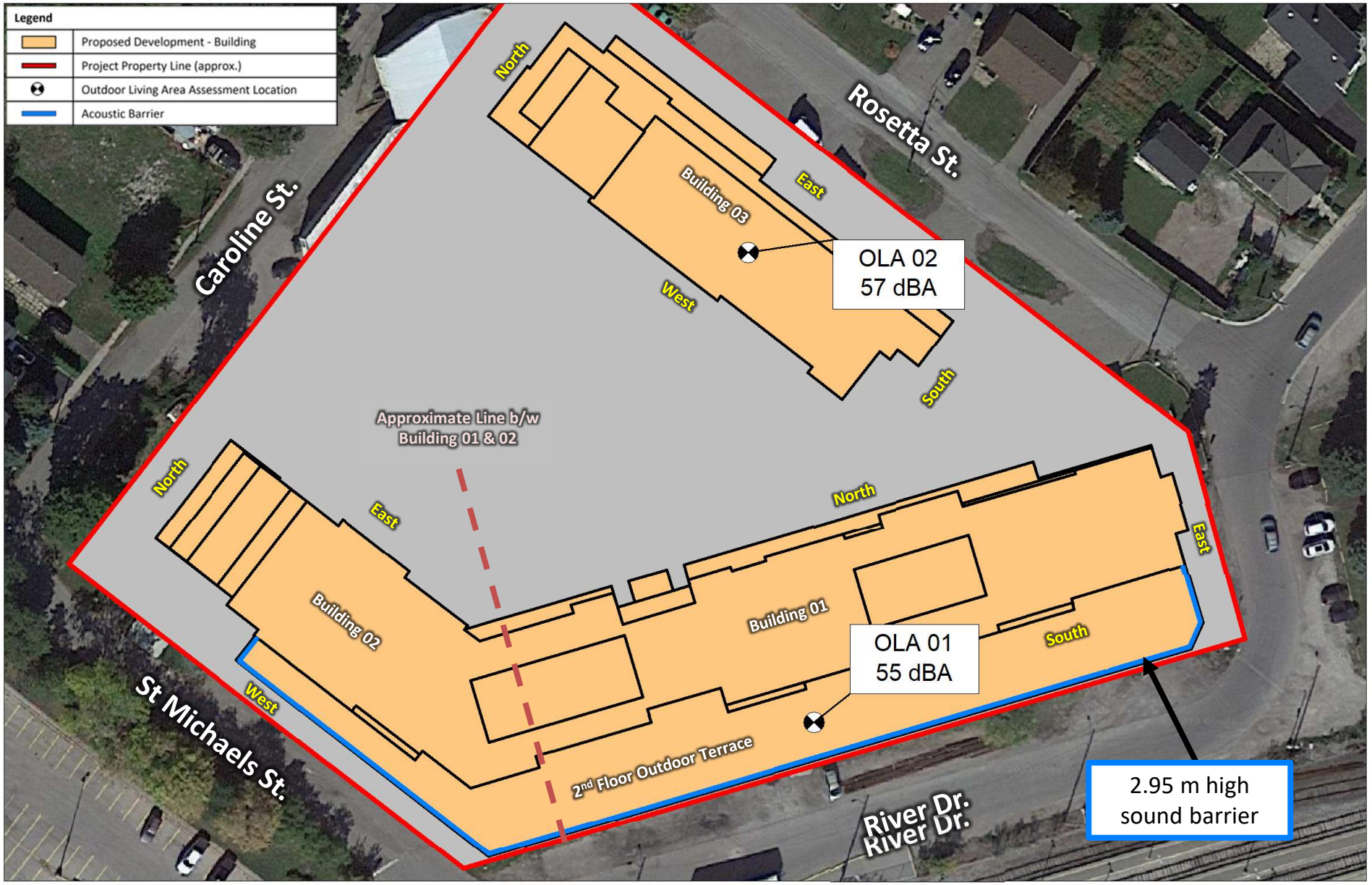


1 ROSETTA STREET INC.	True North	Scale: 1:800		METRES
1 ROSETTA STREET, GEORGETOWN		Date: May 26, 2023	Rev 1.0	Figure No. **3**
PREDICTED FAÇADE SOUND LEVELS – RAIL – NIGHT-TIME		Project No. 241.V20210.00001		

SLR global environmental solutions

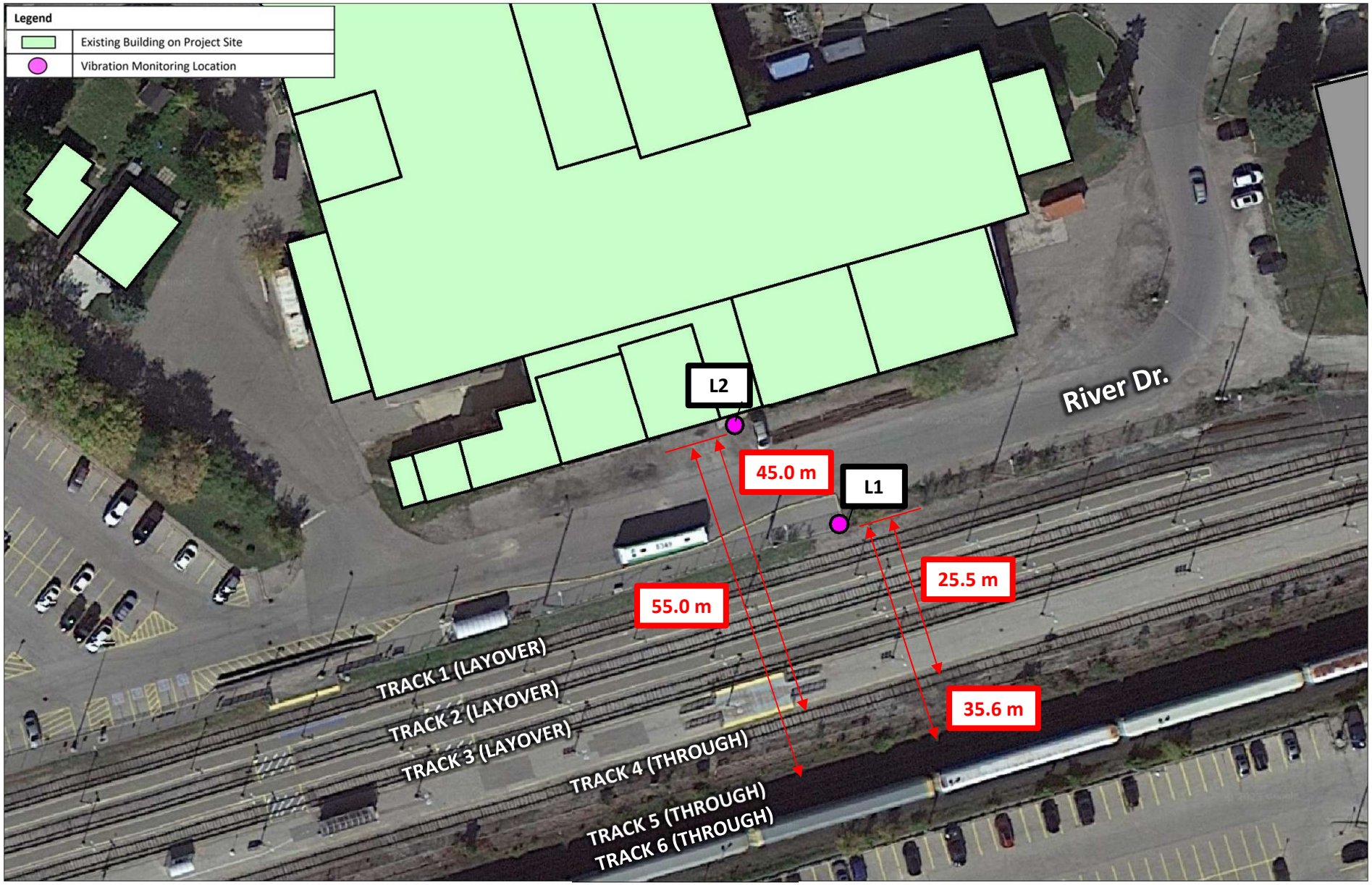


1 ROSETTA STREET INC.	True North	Scale: 1:800	METRES	SLR global environmental solutions
1 ROSETTA STREET, GEORGETOWN		Date: May 26, 2023 Rev 1.0	Figure No. **4**	
PREDICTED FAÇADE SOUND LEVELS – RAIL – 24-HOUR		Project No. 241.V20210.00001		

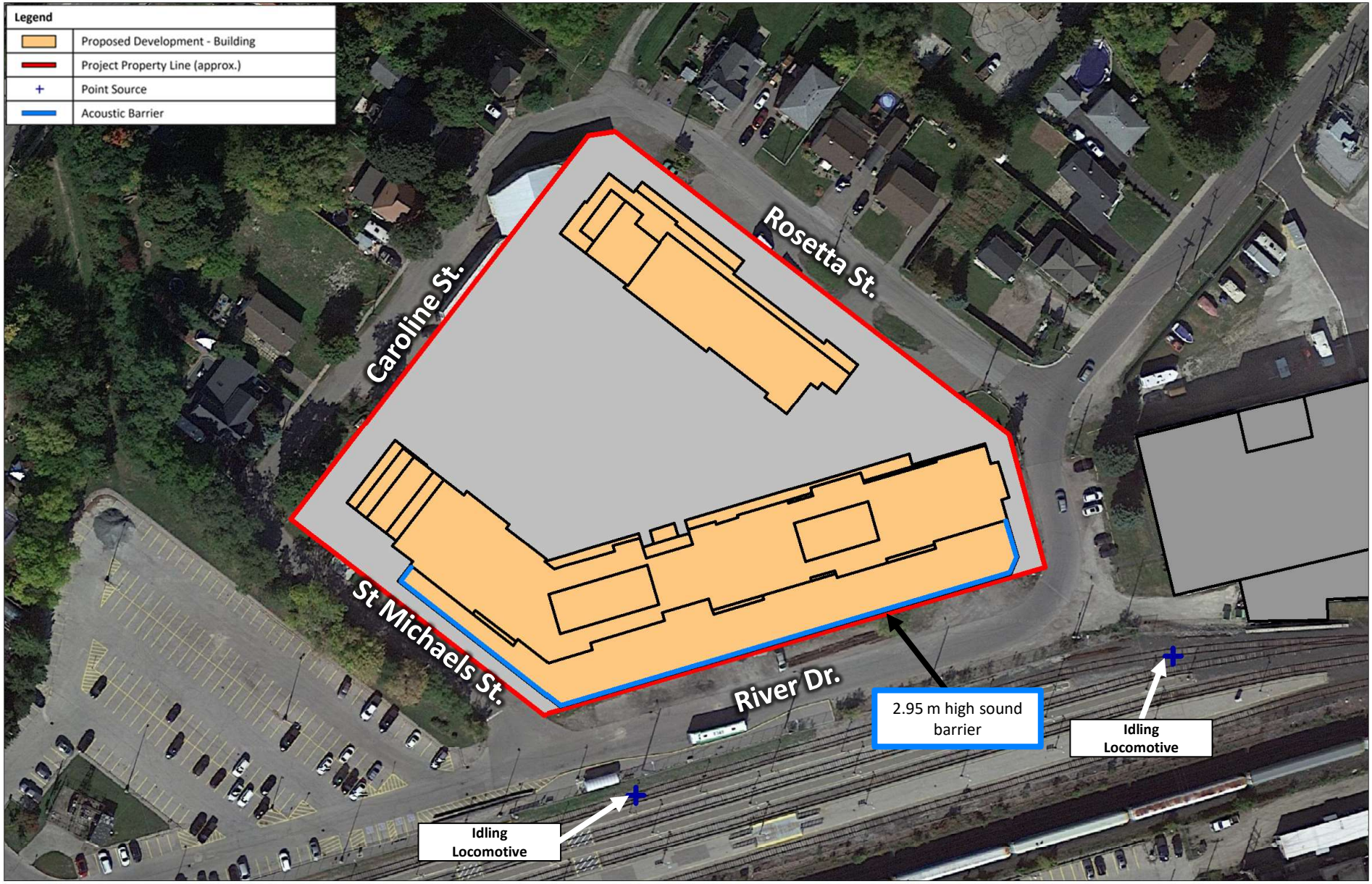


1 ROSETTA STREET INC.	True North	Scale: 1:800		METRES
1 ROSETTA STREET, GEORGETOWN		Date: May 26, 2023	Rev 1.0	Figure No. **5**
PREDICTED OUTDOOR LIVING AREA SOUND LEVELS – RAIL – DAYTIME		Project No. 241.V20210.00001		

SLR global environmental solutions

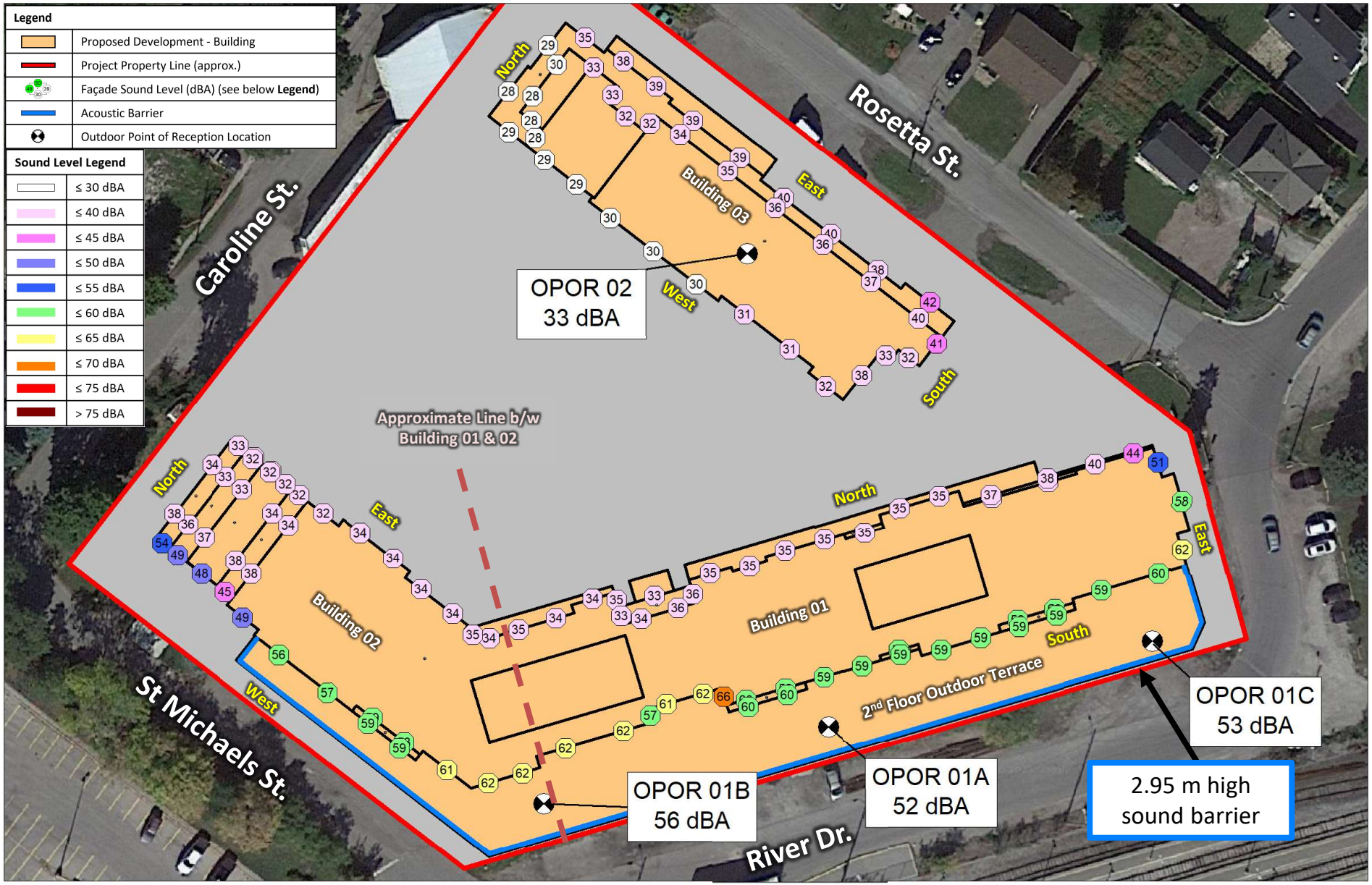


1 ROSETTA STREET INC.	True North	Scale: 1:800	METRES	SLR global environmental solutions
1 ROSETTA STREET, GEORGETOWN		Date: May 26, 2023 Rev 1.0	Figure No. **6**	
VIBRATION MEASUREMENT LOCATIONS AND SETBACK DISTANCES		Project No. 241.V20210.00001		

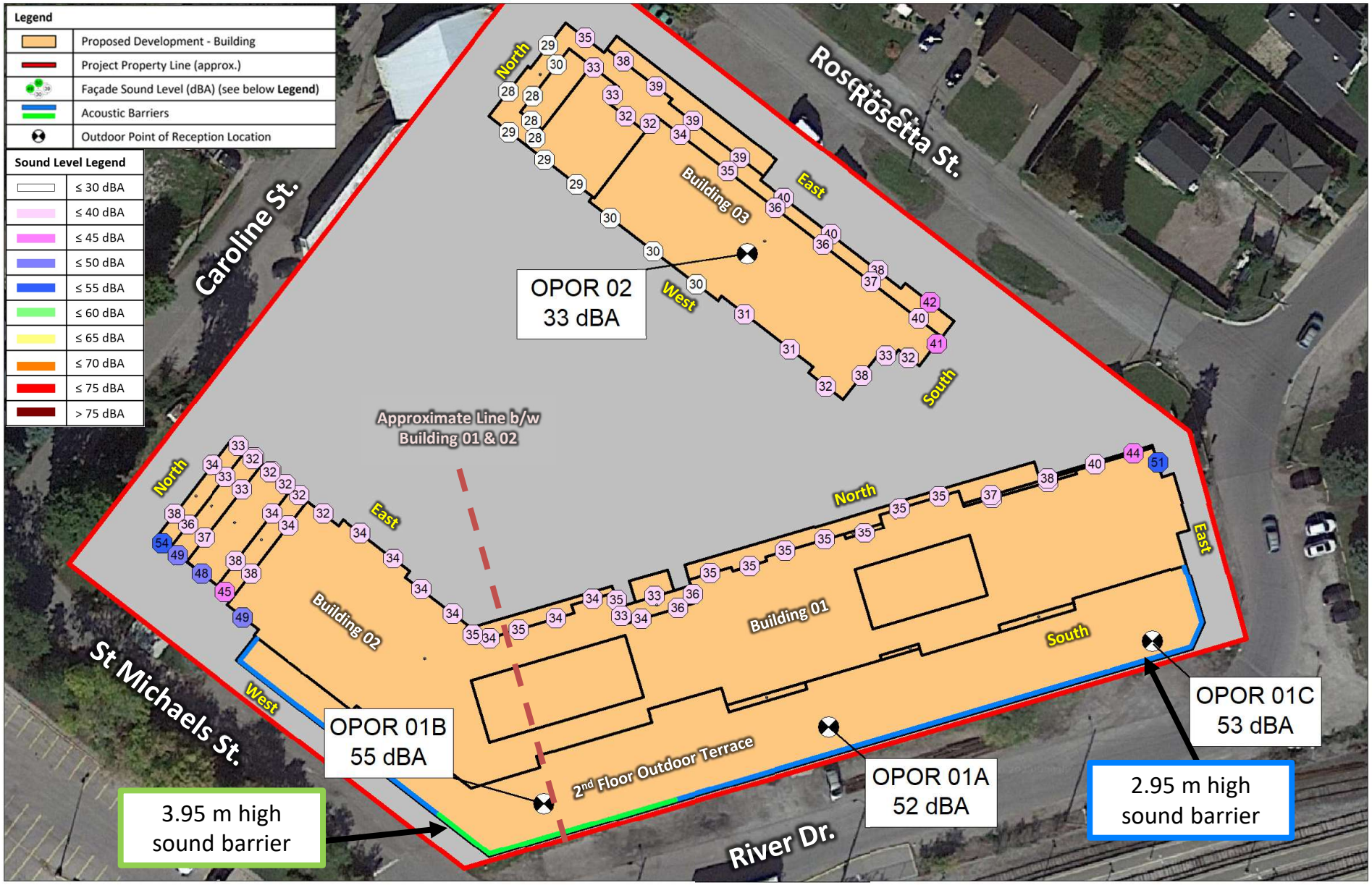


1 ROSETTA STREET INC.	True North	Scale: 1:1250		METRES
1 ROSETTA STREET, GEORGETOWN		Date: May 26, 2023	Rev 1.0	Figure No. **7**
STATIONARY SOURCE LOCATIONS		Project No. 241.V20210.00001		

SLR global environmental solutions



1 ROSETTA STREET INC.	True North	Scale: 1:750	METRES	SLR global environmental solutions
1 ROSETTA STREET, GEORGETOWN		Date: May 26, 2023 Rev 1.0	Figure No. **8**	
PREDICTED STATIONARY SOURCE SOUND LEVELS (1-HR) – DAYTIME/EVENING/NIGHT-TIME - UNMITIGATED		Project No. 241.V20210.00001		



1 ROSETTA STREET INC.	True North	Scale: 1:800	METRES	SLR global environmental solutions
1 ROSETTA STREET, GEORGETOWN		Date: May 26, 2023 Rev 1.0	Figure No. **9**	
PREDICTED STATIONARY SOURCE SOUND LEVELS (1-HR) – DAYTIME/EVENING/NIGHT-TIME - MITIGATED		Project No. 241.V20210.00001		

Appendix A Development Drawings

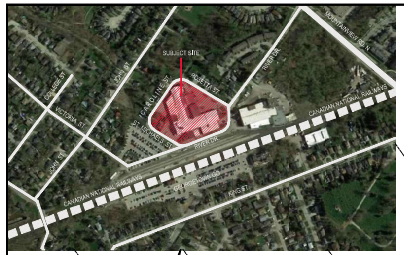
Updated Environmental Noise & Vibration Study

1 Rosetta Street,
Georgetown, ON

1 Rosetta Street Inc.

SLR Project No. 241.V20210.00001

May 26, 2023



KEY PLAN _ NTS

SITE PLAN _ SCALE: 1/400

DEVELOPMENT DETAILS HIGH DENSITY RESIDENTIAL ZONE (HDR) - EXCEPTION			
	Required	Proposed	Amendment Needed
MINIMUM LOT FRONTAGE (Rosetta Street)	11.0 m	121.01	
MIN. FRONT YARD (Rosetta Street)	4.5 m	2.33 m	X
MIN. REAR YARD (St. Michael's Street)	7.5 m	3.56 m	X
MIN. INTERIOR SIDE YARD (River Street)	7.5 m	0.46 m	X
MIN. SETBACK FROM A RAILWAY	30.0 m	30 m Measured from the building face to he centerline of the active lanby lane	X
MAX. BUILDING HEIGHT	25.0 m	Bulling 1 = 39.79M Bulling 2 = 39.79M Bulling 3 = 27.63M	X
MAX. LOT COVERAGE		51.3%	
OUTDOOR AMENITY AREA INCLUDING PRIVATE TERRACES AND BALCONIES		1006.30 sq.m	
MIN. OUTDOOR AMENITY AREA (PARK)		1,759.90 sq.m	
MIN. LANDSCAPE OPENSPACE (%)		32.80 %	
MIN. PARKING SETBACK BETWEEN A BUILDING AND AN AT-GRADE PARKING AREA	1.2 M	11.78 M	
PARKING REQUIREMENTS			
640 APPARTMENT UNITS	1.5 spaces per unit Plus 0.75 spaces per unit for visitor parking 640 x 1.5 = 960 spaces 640 x 0.25 = 160 spaces Total = 1120 spaces	1.0 spaces per unit Plus 0.1 spaces per unit for visitor parking 640 ; 1.0 = 640 spaces 640 ; 0.10 = 64 spaces Total = 704 spaces	X
TOTAL PARKING	1120 spaces	704 spaces	X
BARRIER FREE PARKING	2 parking spaces +2% of required parking spaces	2= (704 x 0.02) = 16.08 or 16 Spaces	
MINIMUM SURFACE PARKING STALL SIZE	2.75 m width 5.5 m length	1.75 m width 1.5 m length	
MINIMUM WIDTH OF DRIVE AISLE ACCESSING SURFACE PARKING SPACES	6.7m	6.7m	
BICYCLE PARKING SPACES		702 Spaces	

ZONING CHART

PROJECT STATISTICS

1 ROSETTA STREET

PRELIMINARY STATS

		m2	ft2	hectare
Gross Site Area		14355.50	154,521.2	1.44
Net Site Area		13,614.40	146,544.0	1.36
Total GFA		18,393.80	520,906.0	
FSI (based on Gross Site Area)	3.19			
Density (units/hectare)	467.89			
Total Units	637			
Lot Coverage	51.3%			
Landscape Area	33.6%	4,560.00	49,208.7	

BUILDING - 01									
Floors	GFA		Units						Total
	m2	ft2	1B	1B+D+1BTH	1B+D+2BTH	2B+2BTH	2B+D+2BTH	3B	
UG2	484.00	5,208.7							
UG1	516.20	5,556.3							
GROUND FLOOR	1,151.20	12,391.4							
2ND FLOOR	1,491.40	16,053.3	4	6	5	2	2	1	20
3RD FLOOR	1,585.50	17,066.2	4	7	5	3	2	1	22
4TH FLOOR	1,634.90	17,597.9	4	8	5	3	2	1	23
5TH FLOOR	1,634.90	17,597.9	4	8	5	3	2	1	23
6TH FLOOR	1,634.90	17,597.9	4	8	5	3	2	1	23
7TH FLOOR	1,634.90	17,597.9	4	8	5	3	2	1	23
8TH FLOOR	1,614.10	17,374.0	4	9	4	3	2	1	23
9TH FLOOR	1,596.00	17,179.2	5	9	3	3	2	1	23
10TH FLOOR	1,596.00	17,179.2	5	9	3	3	2	1	23
11TH FLOOR	1,596.00	17,179.2	5	9	3	3	2	1	23
12TH FLOOR	1,596.00	17,179.2	5	9	3	3	2	1	23
Total	19,766.00	212,759.2	48	90	46	32	22	11	249

BUILDING - 02									
Floors	GFA		Units						Total
	m2	ft2	1B	1B+D+1BTH	1B+D+2BTH	2B+2BTH	2B+D+2BTH	3B	
UG2	331.70	3,570.4							
UG1	372.70	4,011.7							
GROUND FLOOR	1,002.30	10,788.7							
2ND FLOOR	1,491.90	16,058.7	6	7	4	1	2	2	22
3RD FLOOR	1,491.90	16,058.7	6	7	4	1	2	2	22
4TH FLOOR	1,540.00	16,576.4	6	8	4	1	2	2	23
5TH FLOOR	1,540.00	16,576.4	6	8	4	1	2	2	23
6TH FLOOR	1,540.00	16,576.4	6	8	4	1	2	2	23
7TH FLOOR	1,540.00	16,576.4	6	8	4	1	2	2	23
8TH FLOOR	1,438.80	16,010.9	7	9	4	1	2	0	23
9TH FLOOR	1,438.80	15,487.1	4	9	4	2	2	0	21
10TH FLOOR	1,333.50	14,353.7	3	7	4	2	3	0	19
11TH FLOOR	1,333.50	14,353.7	3	7	4	2	3	0	19
12TH FLOOR	1,278.90	13,766.0	4	8	4	1	2	0	19
Total	17,723.50	190,774.0	57	86	44	14	24	11	237

BUILDING - 03									
Floors	GFA		Units						Total
	m2	ft2	1B	1B+D+1BTH	1B+D+2BTH	2B+2BTH	2B+D+2BTH	3B	
UG2	360.20	3,877.2							
UG1	464.90	5,004.1							
GROUND FLOOR	1,336.30	14,383.8	4	3	2	0	1	1	11
2ND FLOOR	1,248.60	13,439.8	5	8	2	2	2	1	20
3RD FLOOR	1,248.60	13,439.8	5	8	2	2	2	1	20
4TH FLOOR	1,304.40	14,040.4	5	8	3	2	2	1	21
5TH FLOOR	1,304.40	14,040.4	5	8	3	2	2	1	21
6TH FLOOR	1,304.40	14,040.4	5	8	3	2	2	1	21
7TH FLOOR	1,304.40	14,040.4	5	8	3	2	2	1	21
8TH FLOOR	1,028.10	11,066.4	3	7	3	2	1	0	16
Total	10,904.30	117,372.8	37	58	21	14	14	7	151

ALL BUILDINGSCOMBINED								
Floors	BUILDING 1		BUILDING 2		BUILDING 3		TOTAL GFA	
	m2	ft2	m2	ft2	m2	ft2	m2	ft;
UG2	484.00	5,208.7	331.70	3,570.4	360.20	3,877.2	1,175.90	12,657.3
UG1	516.20	5,556.3	372.70	4,011.7	464.90	5,004.1	1,353.80	14,572.2
GROUND FLOOR	1,151.20	12,391.4	1,002.30	10,788.7	1,336.30	14,383.8	3,489.80	37,563.9
2ND FLOOR	1,491.40	16,053.3	1,491.90	16,058.7	1,248.60	13,439.8	4,231.90	45,551.7
3RD FLOOR	1,585.50	17,066.2	1,491.90	16,058.7	1,248.60	13,439.8	4,326.00	46,564.6
4TH FLOOR	1,634.90	17,597.9	1,540.00	16,576.4	1,304.40	14,040.4	4,479.30	48,214.7
5TH FLOOR	1,634.90	17,597.9	1,540.00	16,576.4	1,304.40	14,040.4	4,479.30	48,214.7
6TH FLOOR	1,634.90	17,597.9	1,540.00	16,576.4	1,304.40	14,040.4	4,479.30	48,214.7
7TH FLOOR	1,634.90	17,597.9	1,540.00	16,576.4	1,304.40	14,040.4	4,479.30	48,214.7
8TH FLOOR	1,614.10	17,374.0	1,488.30	16,019.9	1,028.10	11,066.4	4,130.50	44,460.3
9TH FLOOR	1,596.00	17,179.2	1,438.80	15,487.1			3,034.80	32,666.3
10TH FLOOR	1,596.00	17,179.2	1,333.50	14,353.7			2,929.50	31,532.8
11TH FLOOR	1,596.00	17,179.2	1,333.50	14,353.7			2,929.50	31,532.8
12TH FLOOR	1,596.00	17,179.2	1,278.90	13,766.0			2,874.90	30,945.1
Total GFA							48,393.80	520,906.0

CAR PARKING REQUIRED

	Units	Ratio	Required
Residential	637	1.1	701
Visitor	637	0.1	64
TOTAL			765

BICYCLE PARKING REQUIRED

	Units	Ratio	Required
Long - term	637	1.0	637
Short - term	637	0.1	64
TOTAL			701

CAR PARKING PROVIDED

	Visitors	Residents
Grade	63	20
UG1	0	328
UG2	0	340
	63	668
TOTAL	731	

BICYCLE PARKING PROVIDED

	Short - term	Long - erm
Grade	64	380
UG1	0	0
UG2	0	338
	64	638
TOTAL	702	

ACCESSIBLE PARKING AS PER AODA

RATIO	REQUIRED PARKING	REQUIRED ACCESSIBLE PARKING	PROVIDED ACCESSIBLE PARKING
2 PARKING SPACES + 2% OF REQUIRED PARKING SPACES	765	18	20
TOTAL			20

PROVIDED AMENITY AREAS

INDOOR AMENITY AREAS								
Program	Building 01		Building 02		Building 03		Total	
	m2	ft2	m2	ft2	m2	ft2	m2	ft;
Lounge	124.80	1343.33	0.00	0.00	55.30	595.24	180.10	1938.58
Party Room	0.00	0.00	235.80	2538.13	147.70	1589.83	383.50	4127.96
Exercise Room	0.00	0.00	183.80	1978.40	107.30	1154.97	291.10	3133.37
Kids' Play Area	0.00	0.00	35.60	383.19	31.50	339.06	67.10	722.26
	124.80	1343.33	455.20	4899.73	341.80	3679.10		
TOTAL INDOOR AMENITY AREA							921.80	9922.16

OUTDOOR AMENITY AREAS								
Program	Building 01		Building 02		Building 03		Total	
	m2	ft2	m2	ft2	m2	ft2	m2	ft;
Rooftop Terrace	717.30	7720.95	228.80	2462.78	765.80	8242.99	1711.90	18425.72
Park							1759.90	18941.39
TOTAL OUTDOOR AMENITY AREA							3471.80	37379.11

FLOOR AREA, GROSS (Town of Halton Hills zoning by-law 2010-0050)

The aggregate of the areas of each floor of a building or structure above or below established grade, measured between the exterior faces of the exterior walls of the building or structure excluding the sum of the areas of each floor used, or designed or intended for use for the parking of motor vehicles, unless the parking of motor vehicles is the principle use of the building or structure.

NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ESLAMI
LICENCE
8525

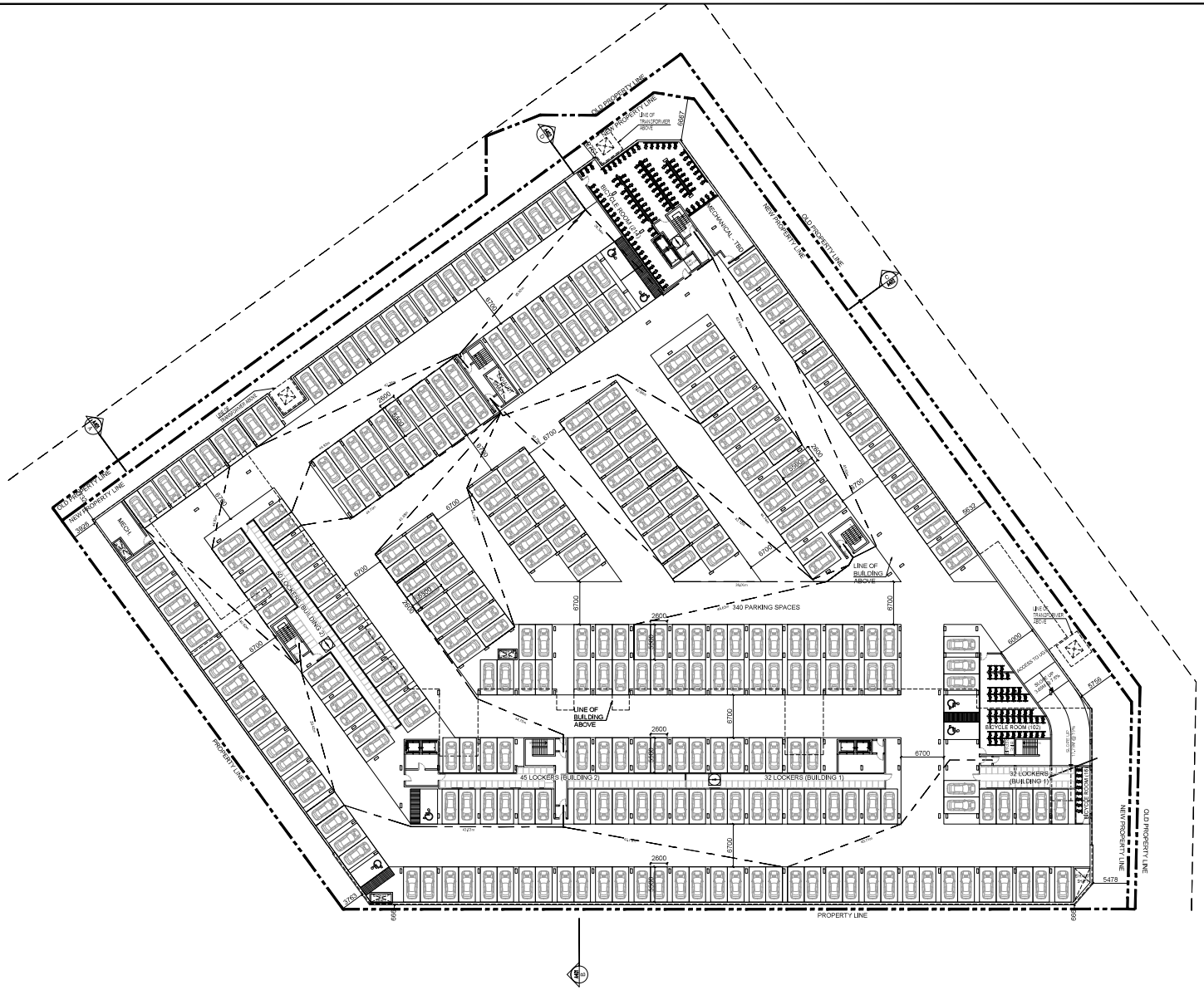
1 ROSETTA STREET
GEORGETOWN, ON

DRAWING TITLE
SITE PLAN & PROJECT STATS

Scale: 1/400
Date: MAY.12, 2023
Project No. 17127

Drawn by: RK
Checked by: RE
Drawing No. A101

ICON ARCHITECTS
813 - 4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-224-4805 F 416-224-5904



NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ISLAM
LICENCE
1505

1 ROSETTA STREET
GEORGETOWN, ON

DRAWING TITLE
UG2 FLOOR PLAN

Scale: 1/300
Date: MAY.12, 2023
Project No. 17127

Drawn by: RK
Checked by: RE
Drawing No. A201

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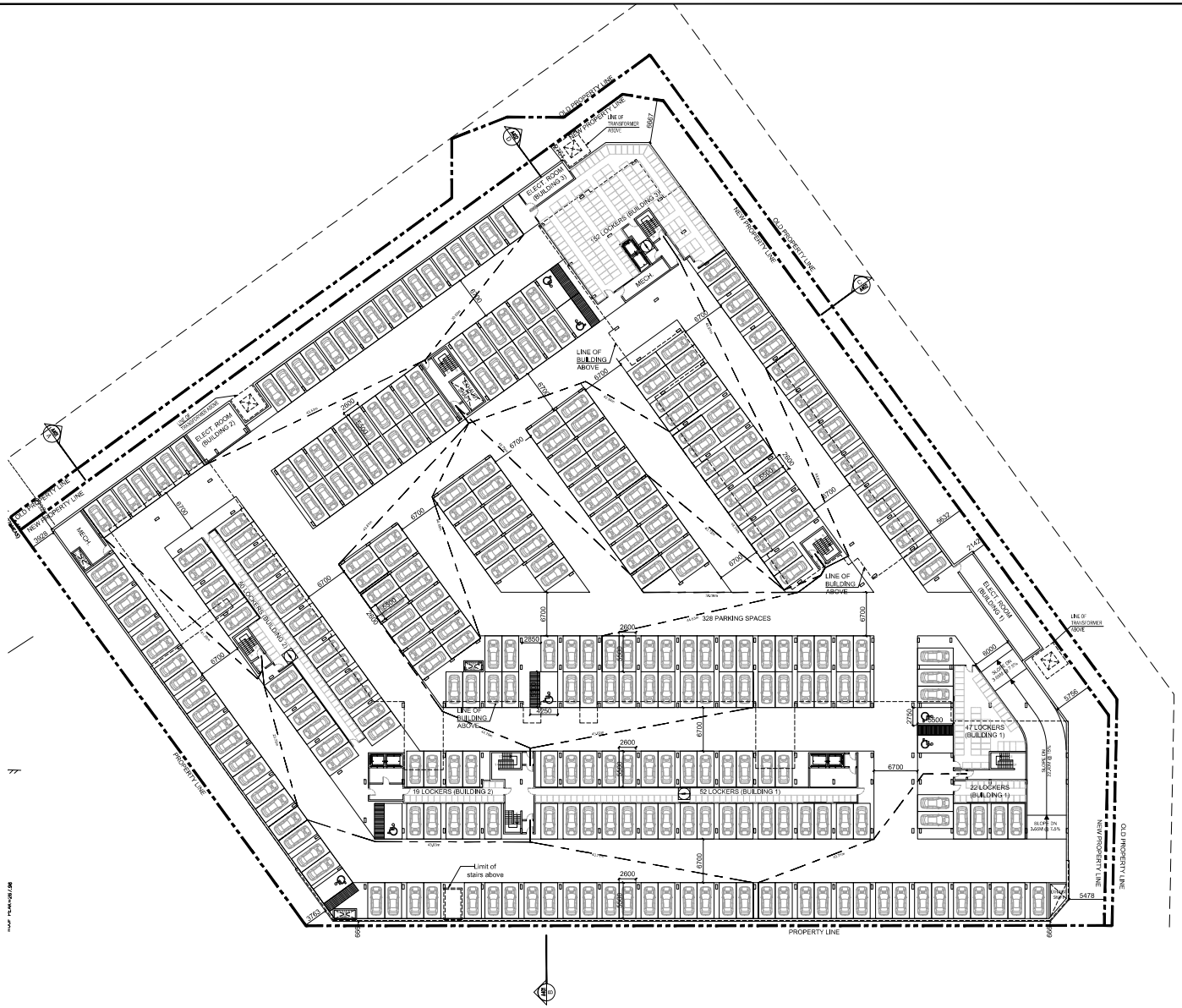
T 416-234-0363 F 416-234-0364

ICON ARCHITECTS



NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ISLAM
LICENCE
8305

1 ROSETTA STREET
GEORGETOWN, ON

DRAWING TITLE
UG1 FLOOR PLAN

Scale: 1/300
Date: MAY.12, 2023
Project No. 17127

Drawn by: RK
Checked by: RE
Drawing No. A202

813 - 4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-224-4805 F 416-224-5904

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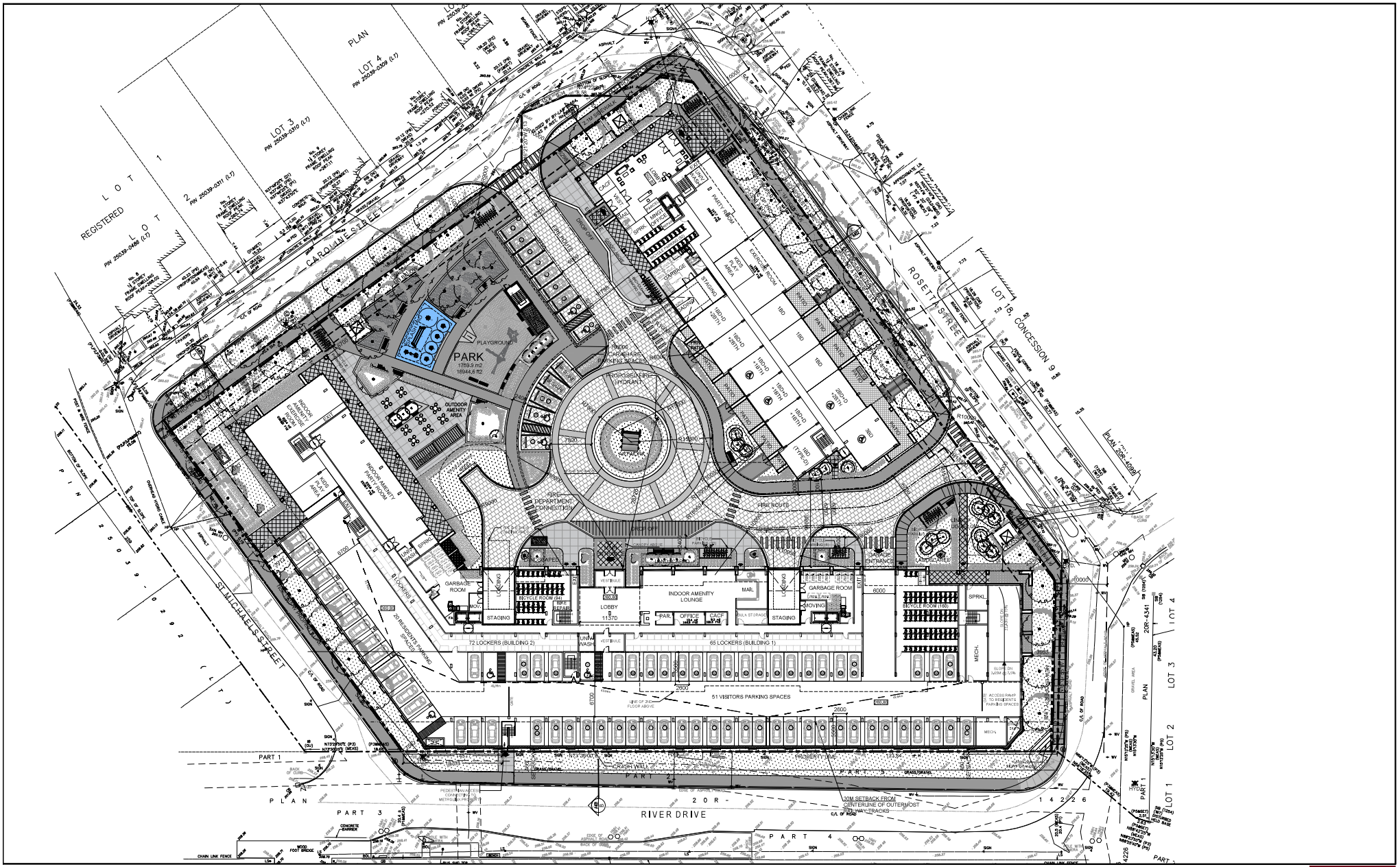


NO.	REVISION	DATE

NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ISLAM
LICENCE
5004

1 ROSETTA STREET
GEORGETOWN, ON

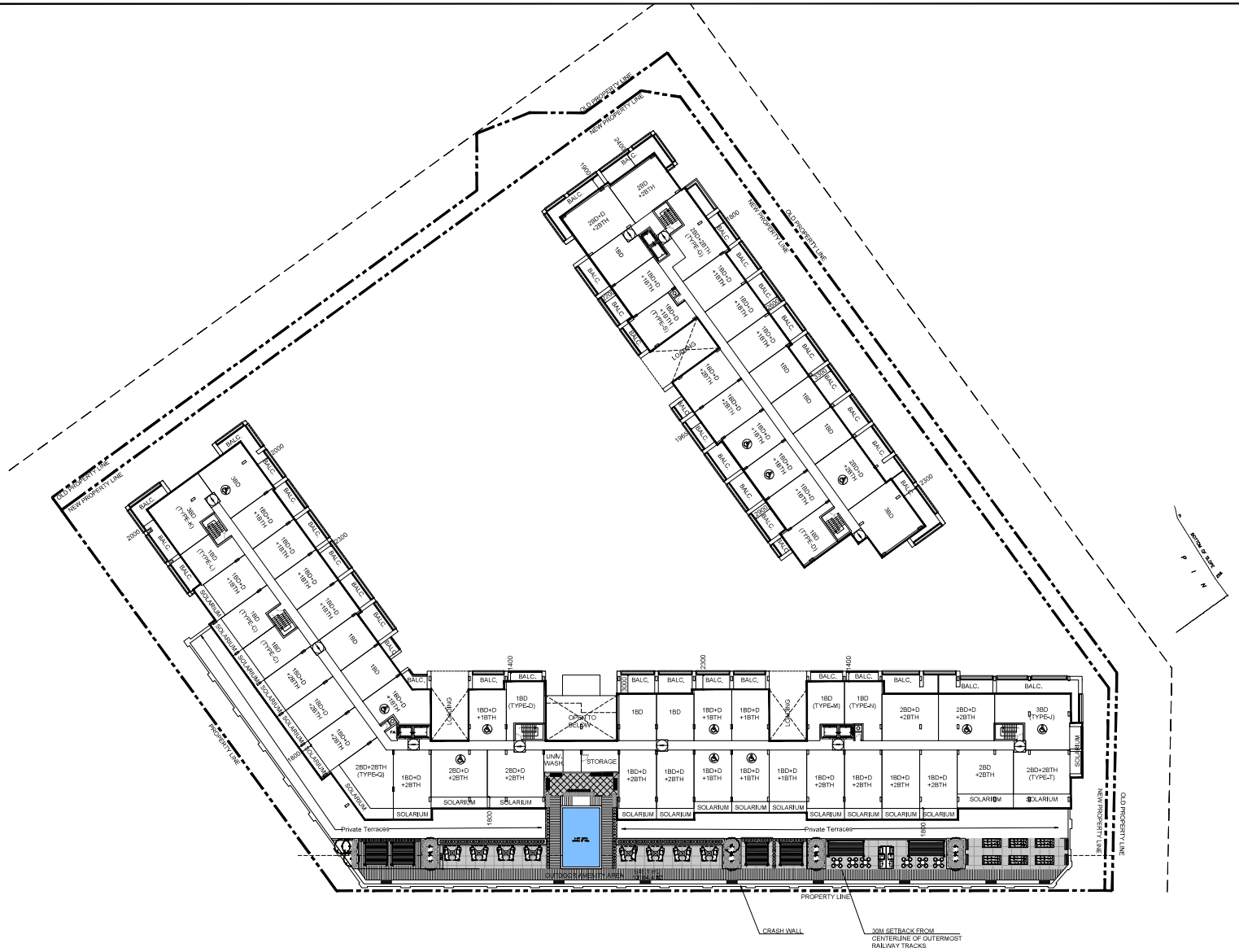
DRAWING TITLE
GROUND FLOOR PLAN

Scale: 1/300
Date: MAY.12, 2023
Project No. 17127

Drawn by: RK
Checked by: RE
Drawing No. A203

813 - 4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-224-4800 F 416-224-4804

ICON ARCHITECTS



NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ISLAM
LICENCE
8324

1 ROSETTA STREET
GEORGETOWN, ON

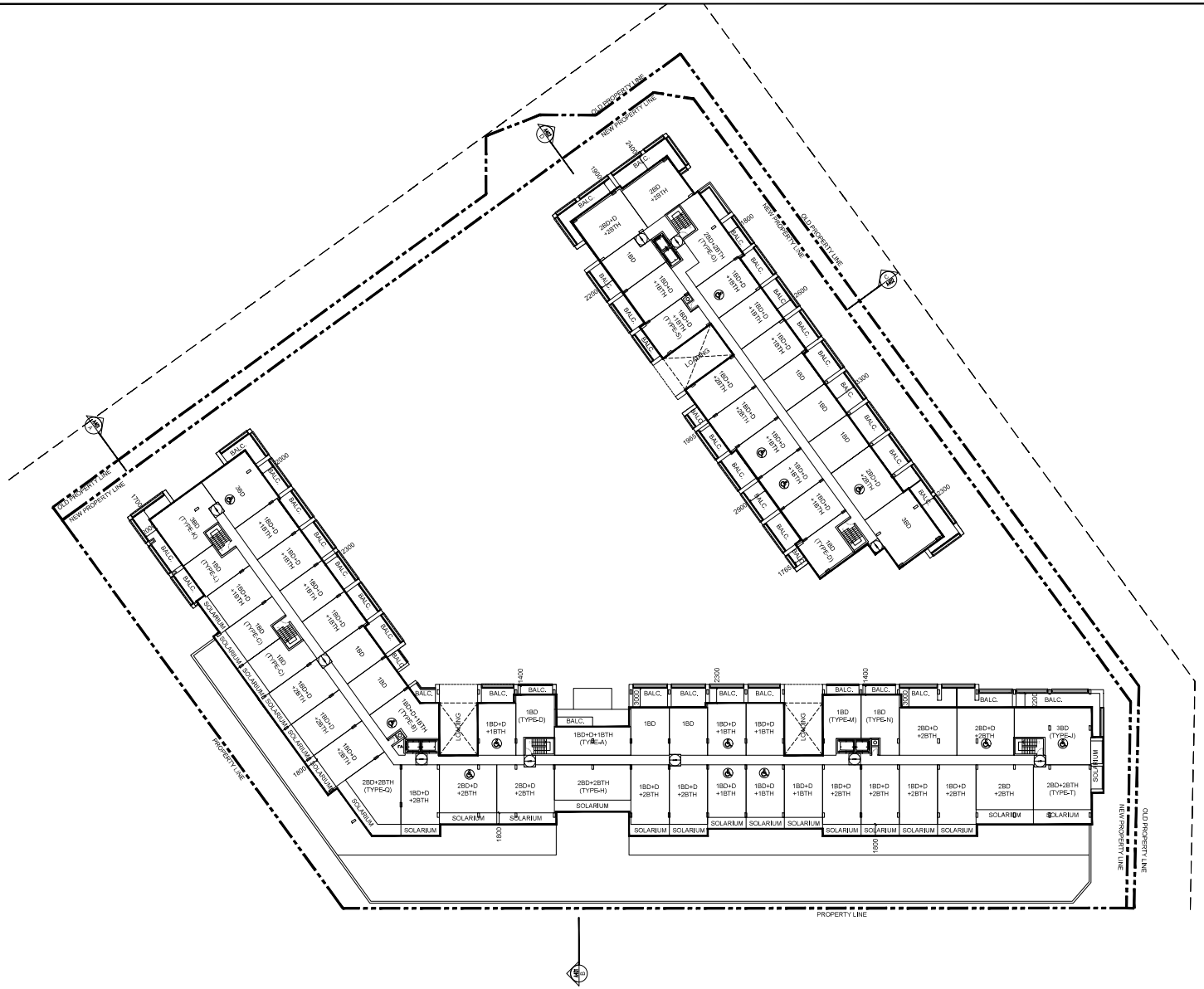
DRAWING TITLE
2ND FLOOR PLAN

Scale: 1/300
Date: MAY.12, 2023
Project No. 17127

Drawn by: RK
Checked by: RE
Drawing No. A204

813 - 4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-224-4804 F 416-224-4805

ICON ARCHITECTS



NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ISLAM
LICENCE
8324

1 ROSETTA STREET
GEORGETOWN, ON

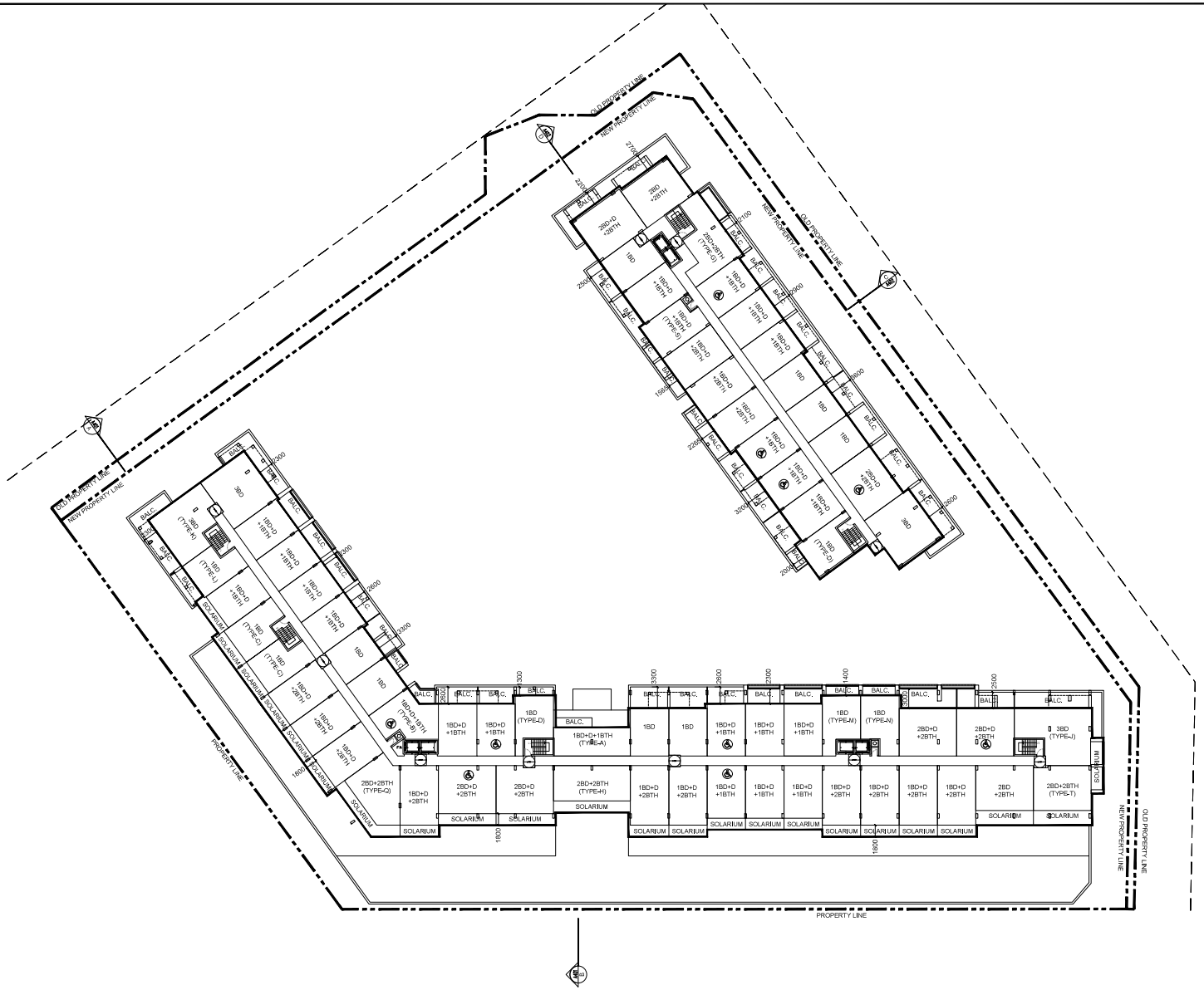
DRAWING TITLE
3RD FLOOR PLAN

Scale: 1/300
Date: MAY.12, 2023
Project No. 17127

Drawn by: RK
Checked by: RE
Drawing No. A205

813 - 4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-224-4804

ICON ARCHITECTS



NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ISLAM
LICENCE
8324

1 ROSETTA STREET
GEORGETOWN, ON

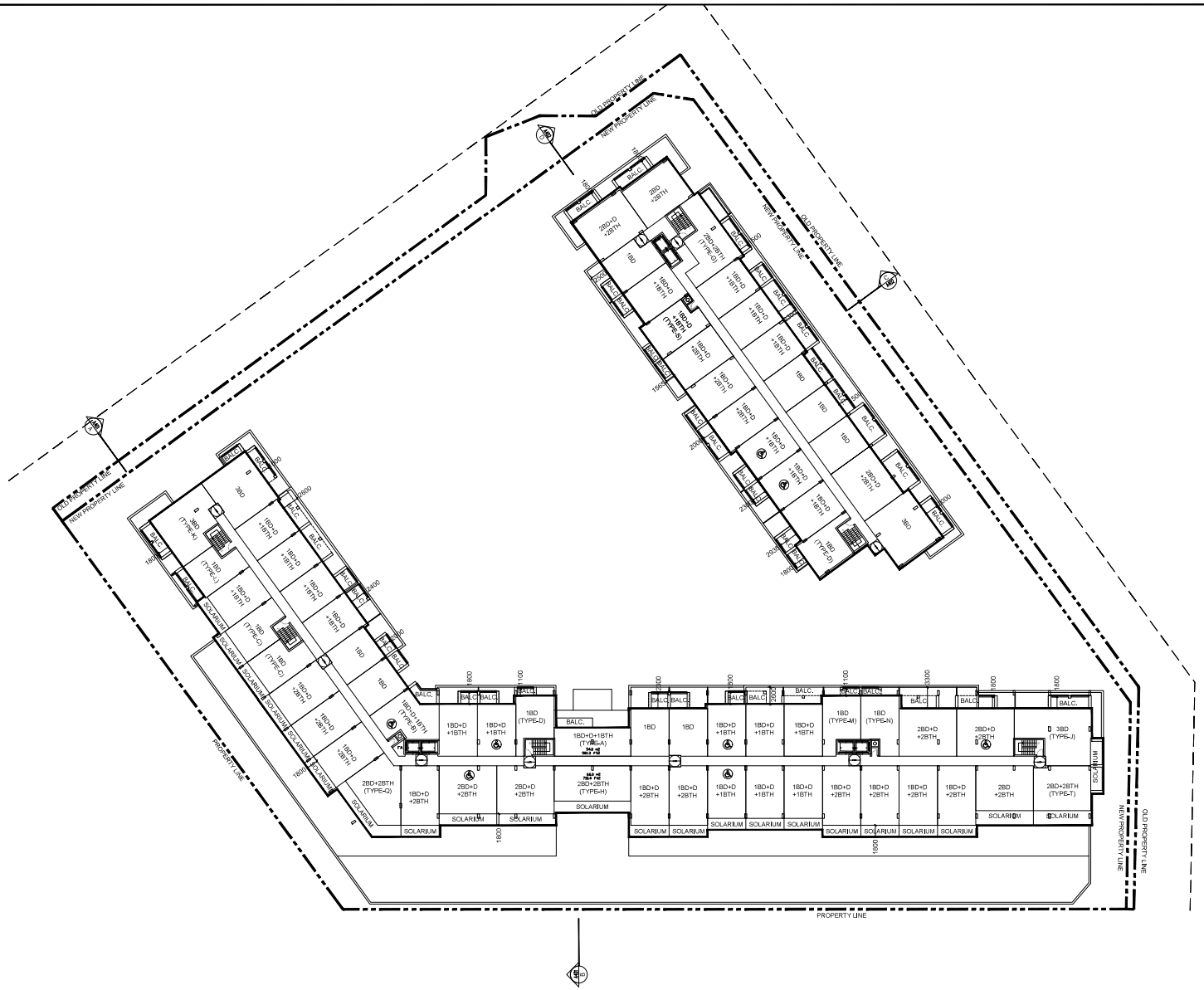
DRAWING TITLE
4TH FLOOR PLAN

Scale: 1/300
Date: MAY.12, 2023
Project No. 17127

Drawn by: RK
Checked by: RE
Drawing No. A206

813 - 4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-224-4804 F 416-224-4805

ICON ARCHITECTS



NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ISLAM
LICENCE
8324

1 ROSETTA STREET
GEORGETOWN, ON

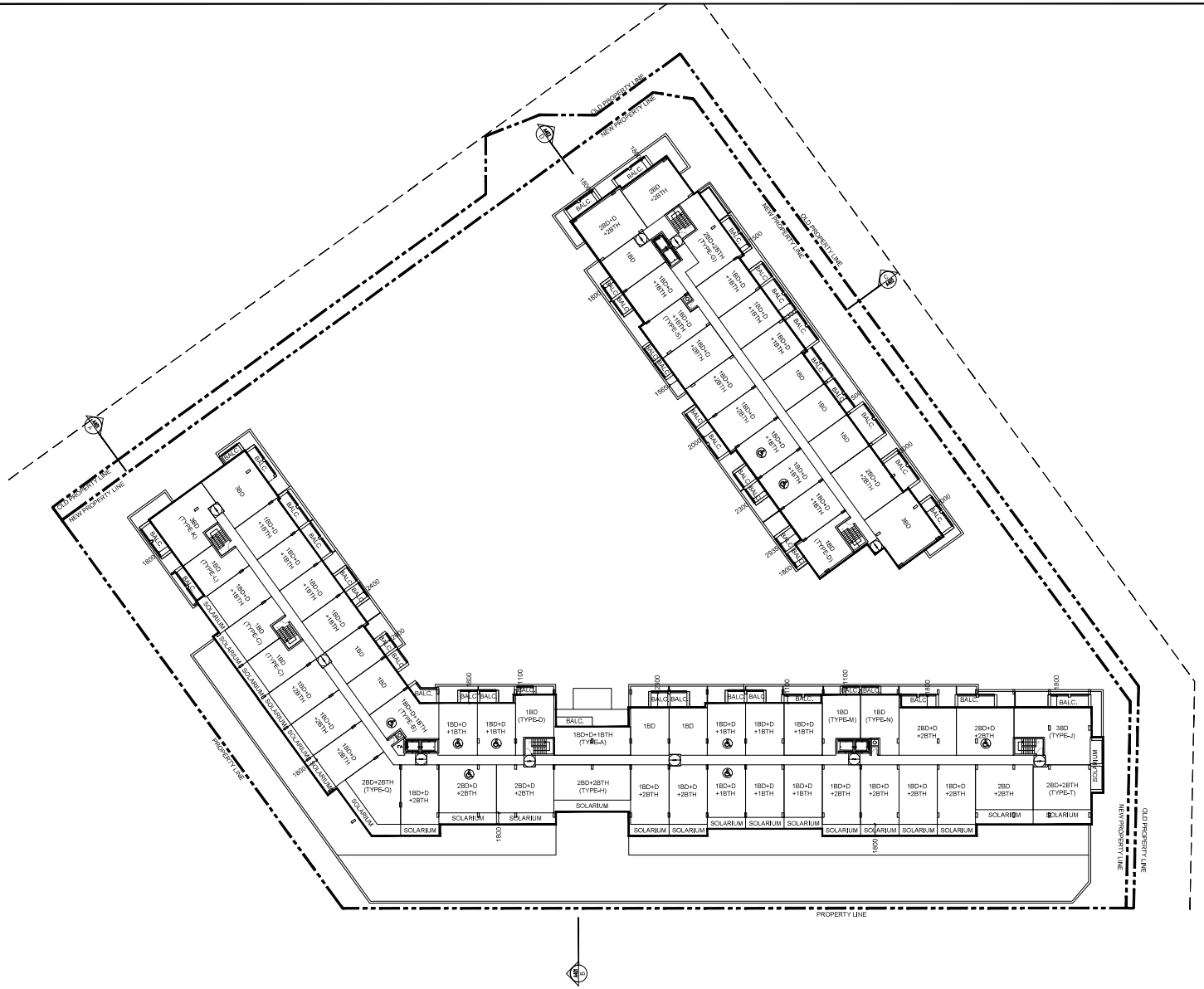
DRAWING TITLE
5TH FLOOR PLAN

Scale: 1/300
Date: MAY.12, 2023
Project No. 17127

Drawn by: RK
Checked by: RE
Drawing No. A207

813 - 4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-224-4804

ICON ARCHITECTS



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NO.	REVISION	YY	MM	DD

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ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ISLAM
LICENCE
8324

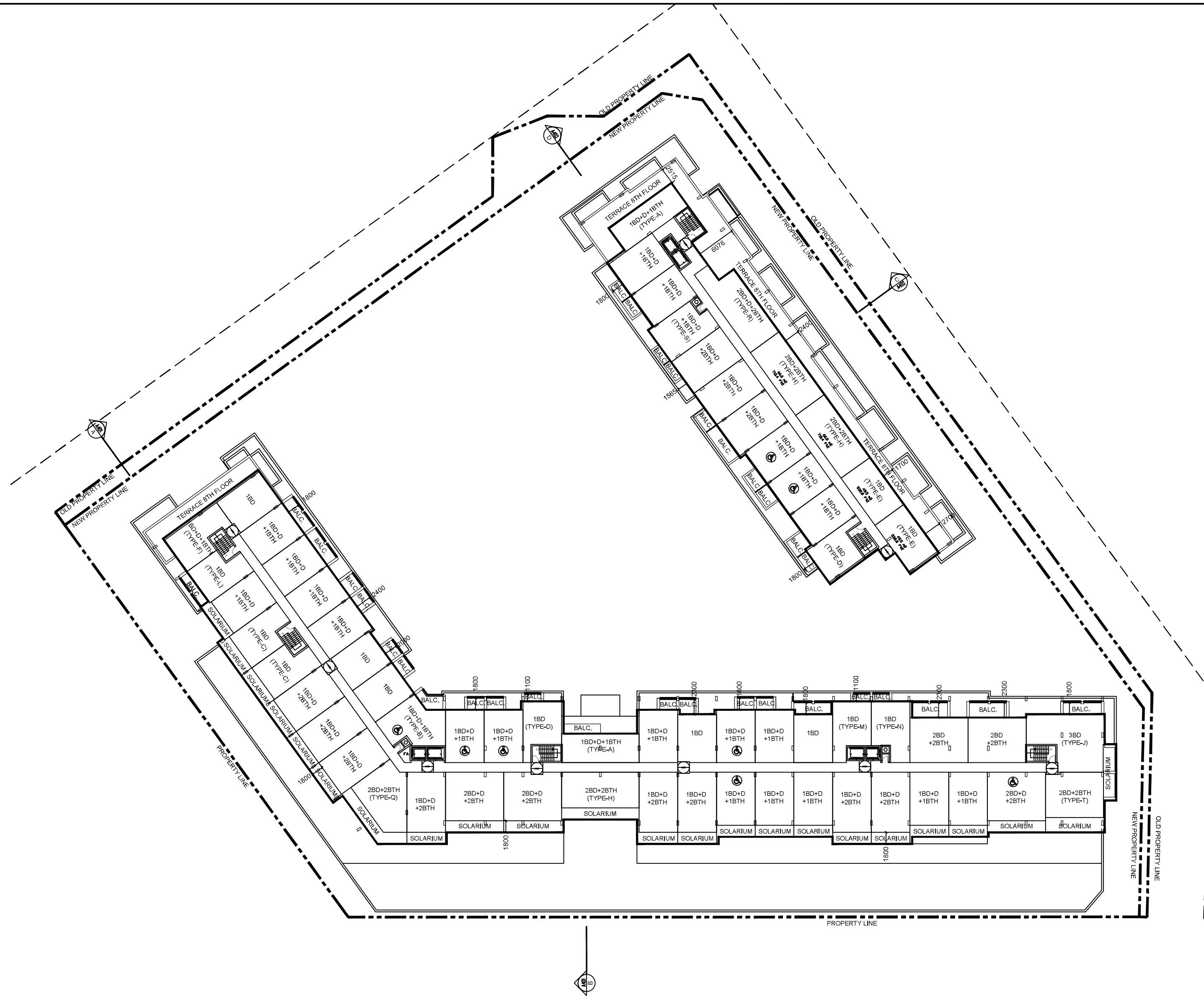
1 ROSETTA STREET
GEORGETOWN, ON

DRAWING TITLE
6TH & 7TH FLOOR PLANS

Scale: 1/300
Date: MAY.12, 2023
Project No. 17127

Drawn by: RK
Checked by: RE
Drawing No. A208

ICON ARCHITECTS
813 - 4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-224-4804 F 416-224-4805



NORTH

CONS. TRUE

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ESLAMI
LICENCE
6225

1 ROSETTA STREET
GEORGETOWN, ON

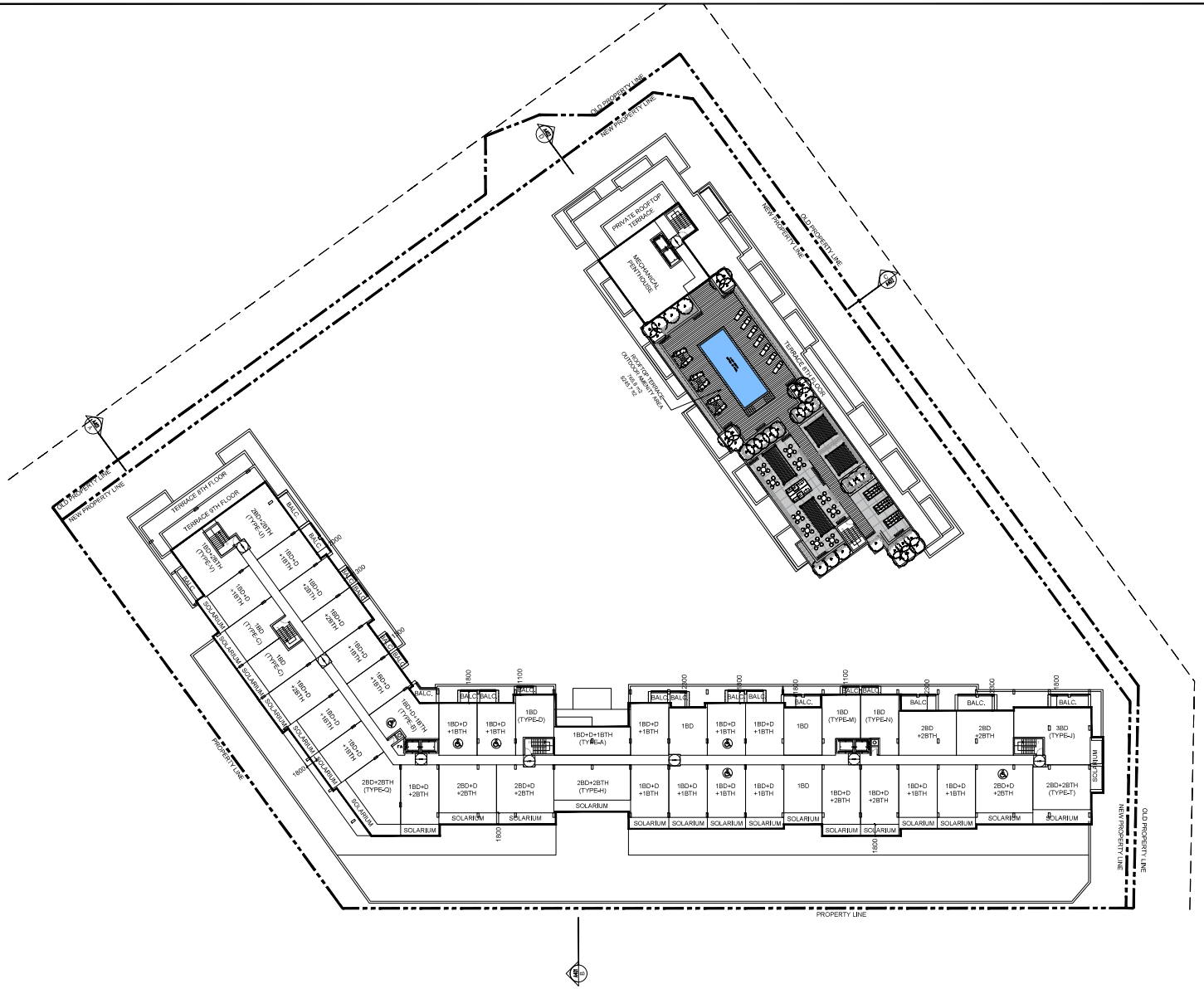
DRAWING TITLE
8TH FLOOR PLAN

Scale: 1/300
Date: MAY.12, 2023
Project No. 17127

Drawn by: RK
Checked by: RE
Drawing No. A209

813 - 4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T:416-224-0505 F:416-224-0504

ICON ARCHITECTS



NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ISLAM
LICENCE
8324

1 ROSETTA STREET
GEORGETOWN, ON

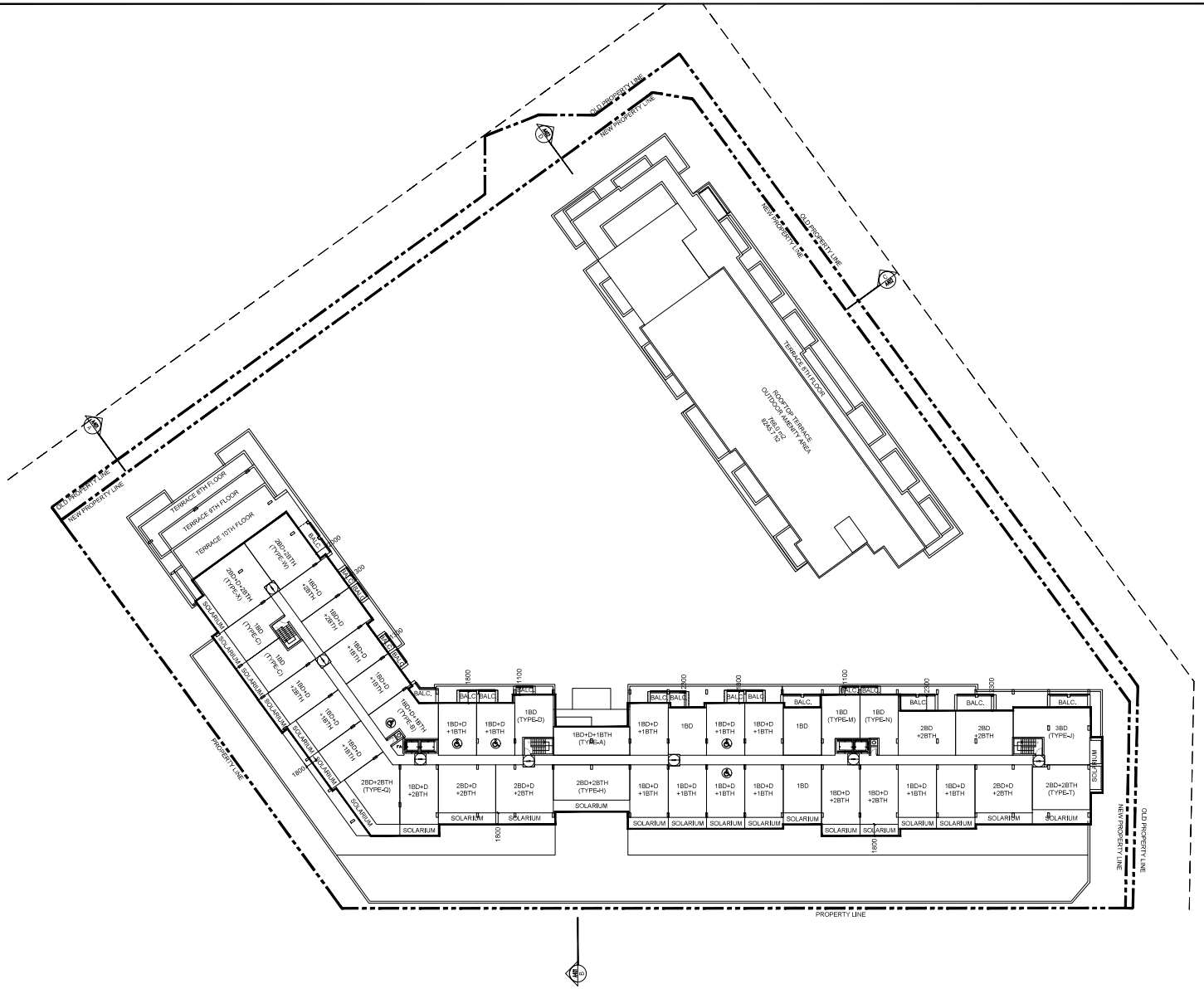
DRAWING TITLE
9TH FLOOR PLAN

Scale: 1/300
Date: MAY.12, 2023
Project No. 17127

Drawn by: RK
Checked by: RE
Drawing No. A210

813 - 4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-224-4804

ICON ARCHITECTS



NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ISLAM
LICENCE
8324

1 ROSETTA STREET
GEORGETOWN, ON

DRAWING TITLE
10TH–11TH TYPICAL FLOOR PLAN

Scale: 1/300
Date: MAY.12, 2023
Project No. 17127

Drawn by: RK
Checked by: RE
Drawing No. A211

813 - 4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-224-4804 F 416-224-4805

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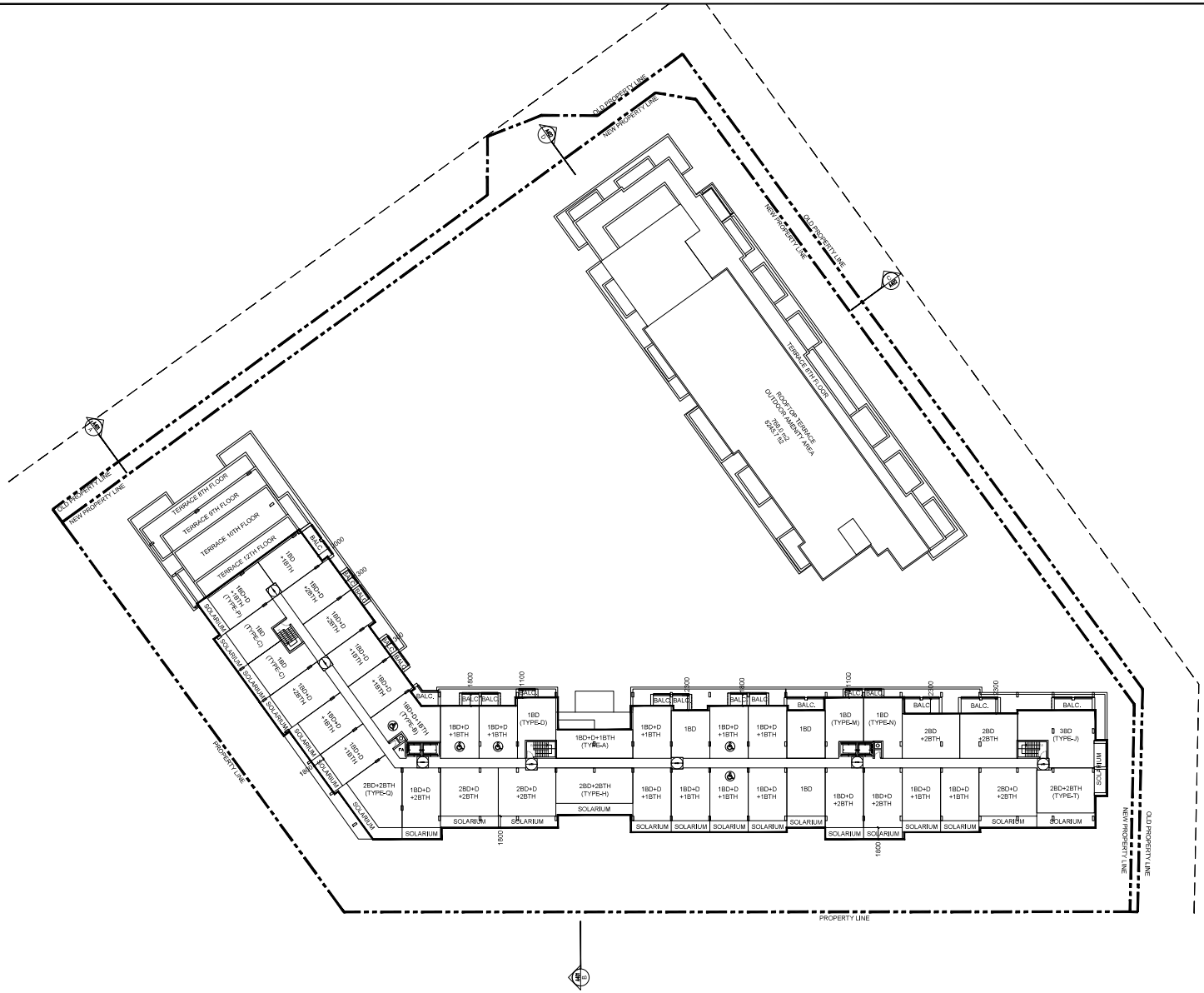


NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ISLAM
LICENCE
8324

1 ROSETTA STREET
GEORGETOWN, ON

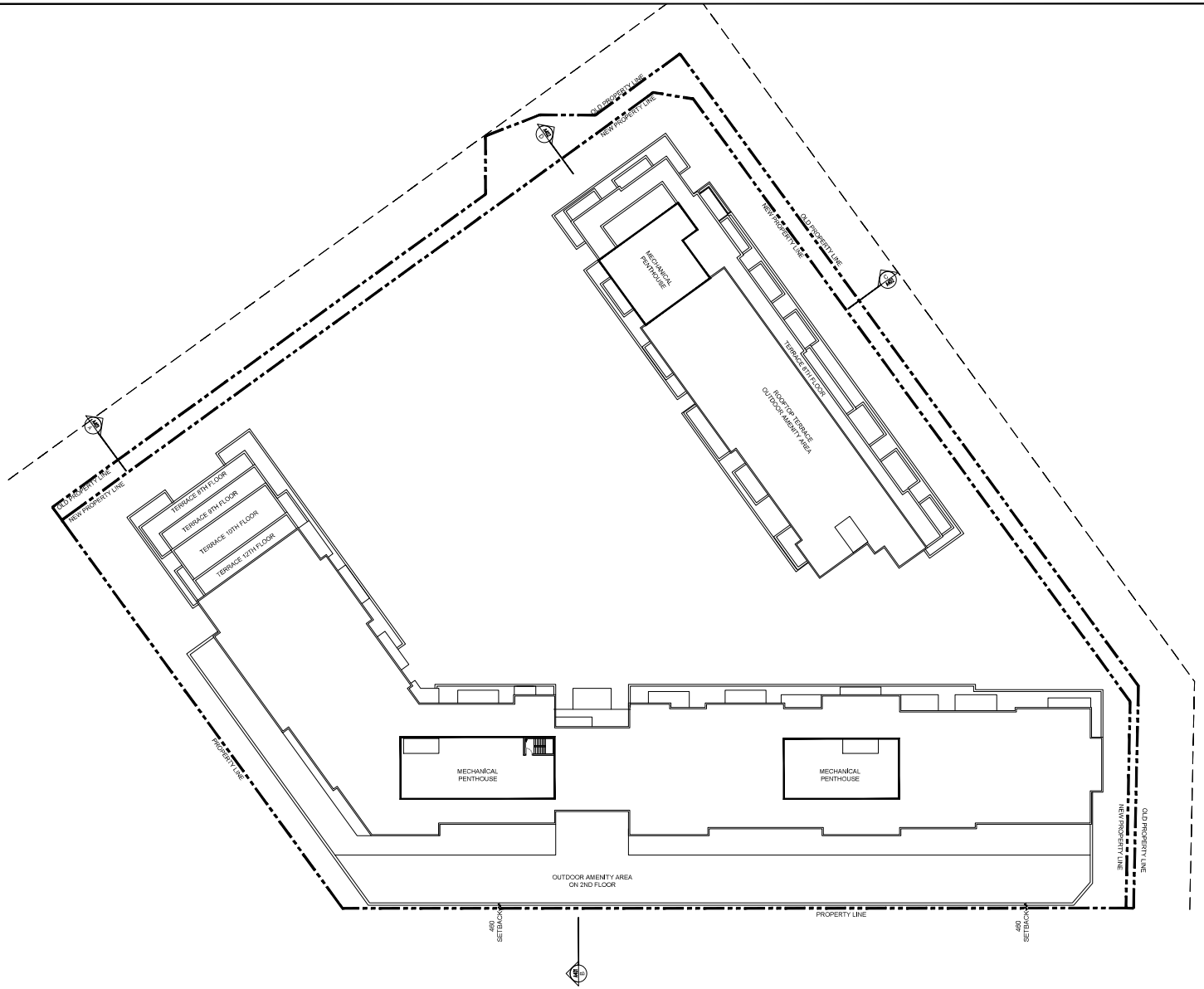
DRAWING TITLE
12TH FLOOR PLAN

Scale: 1/300
Date: MAY.12, 2023
Project No. 17127

Drawn by: RK
Checked by: RE
Drawing No. A212

813 - 4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-224-4804 F 416-224-4805

ICON ARCHITECTS



NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ISLAM
LICENCE
8324

1 ROSETTA STREET
GEORGETOWN, ON

DRAWING TITLE
ROOF FLOOR PLAN

Scale: 1/300
Date: MAY.12, 2023
Project No. 17127

Drawn by: RK
Checked by: RE
Drawing No. A213

813 - 4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-224-4804 F 416-224-4805

ICON ARCHITECTS

BUILDING - 1&2 _ NORTH ELEVATION _ SCALE 1:200

BUILDING - 1&2 _ SOUTH ELEVATION _ SCALE 1:200

NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ISLAM
LICENCE
3525

1 ROSETTA STREET
GEORGETOWN, ON

DRAWING TITLE
ELEVATIONS (BUILDINGS-1&2)

Scale:
1/200
Date:
MAY.12, 2023
Project No.
17127

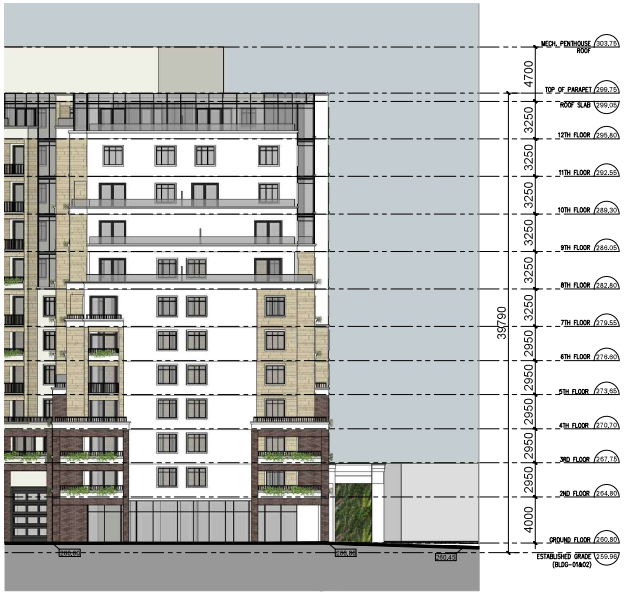
Drawn by:
RK
Checked by:
RE
Drawing No.
A301

813 - 4789 YONGE ST, TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-224-4868 F 416-224-4904

ICON ARCHITECTS

BUILDING - 1 _ EAST ELEVATION _ SCALE 1:200

BUILDING - 2 _ EAST ELEVATION _ SCALE 1:200



BUILDING - 2 _ NORTH ELEVATION _ SCALE 1:200

BUILDING - 2 _ WEST ELEVATION _ SCALE 1:200

NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ISLAM
LICENCE
3529

1 ROSETTA STREET
GEORGETOWN, ON

DRAWING TITLE
ELEVATIONS (BUILDINGS-1&2)

Scale: 1/200
Date: MAY.12, 2023
Project No. 17127
Drawn by: RK
Checked by: RE
Drawing No. A302

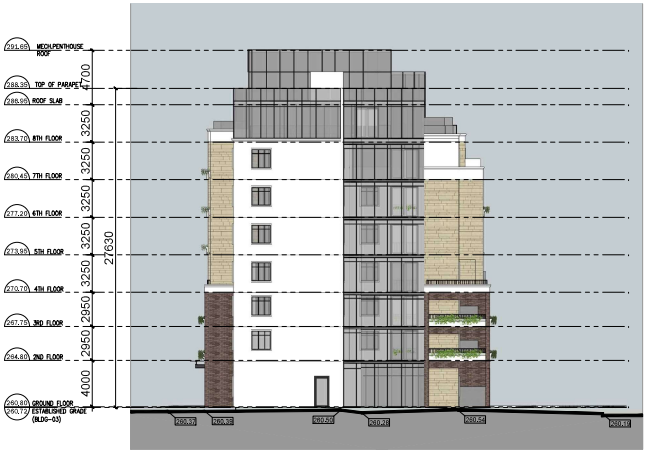
813 - 4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-224-4868 F 416-224-5004

ICON ARCHITECTS

BUILDING - 3 _ EAST ELEVATION _ SCALE 1:200

BUILDING - 3 _ NORTH ELEVATION _ SCALE 1:200

BUILDING - 3 _ WEST ELEVATION _ SCALE 1:200



BUILDING - 3 _ SOUTH ELEVATION _ SCALE 1:200

NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ISLAM
LICENCE
8324

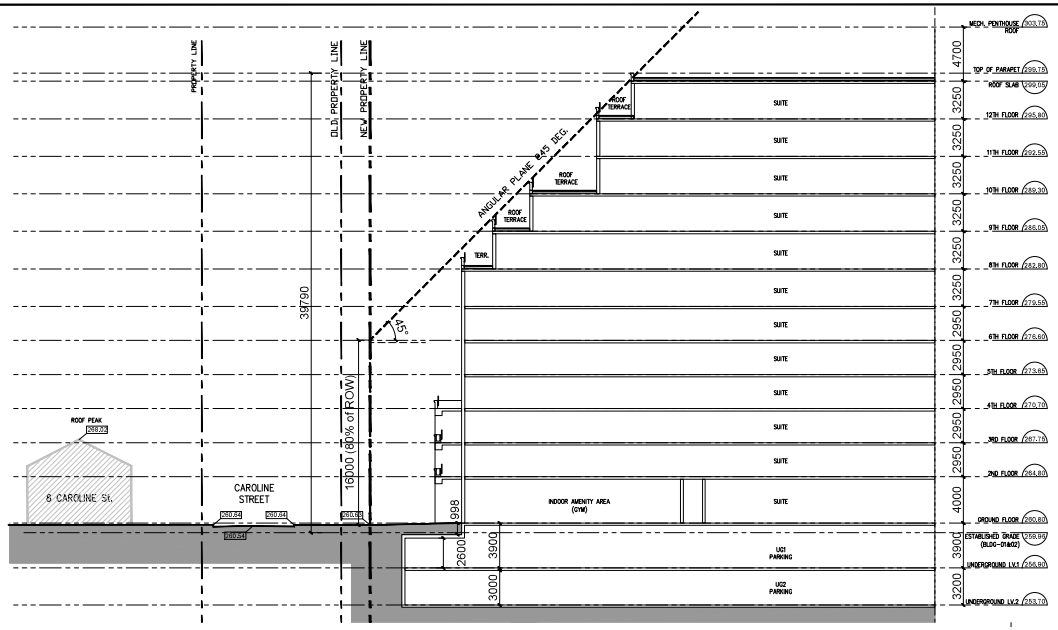
1 ROSETTA STREET
GEORGETOWN, ON

DRAWING TITLE
ELEVATIONS (BUILDING-3)

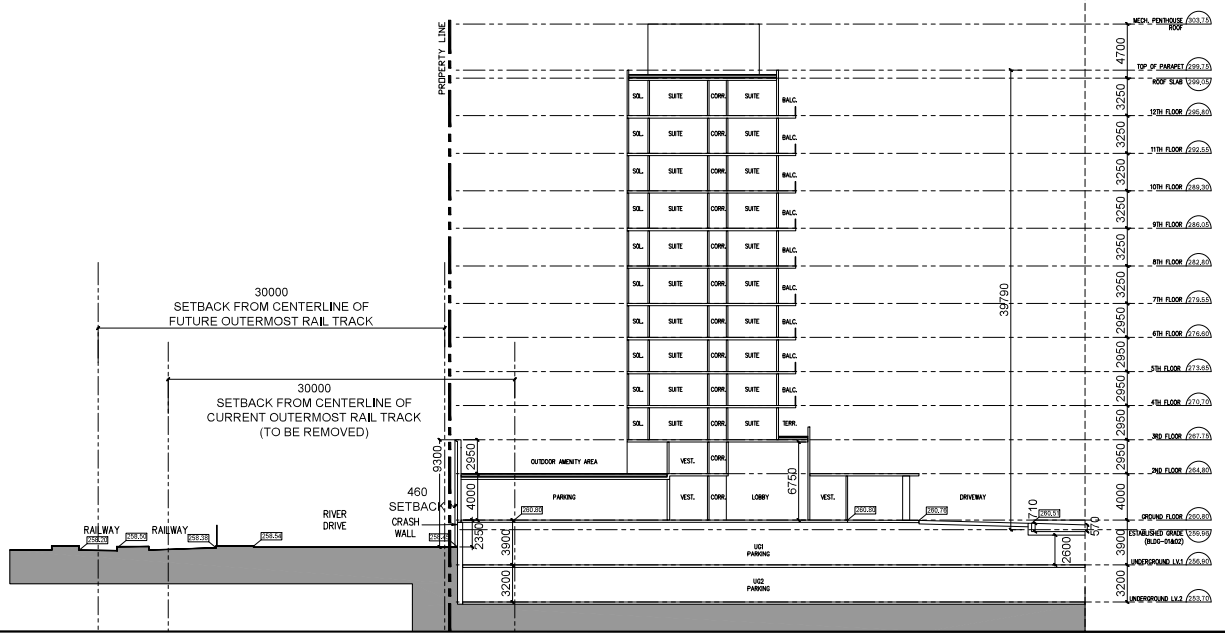
Scale: 1/200
Date: MAY.12, 2023
Project No. 17127

Drawn by: RK
Checked by: RE
Drawing No. A303

ICON ARCHITECTS
813 - 4789 YONGE ST, TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-224-5936 F 416-224-5934



SECTION A _ SCALE 1:200



SECTION B _ SCALE 1:200

NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZI ISLAM
LICENCE
8324

1 ROSETTA STREET
GEORGETOWN, ON

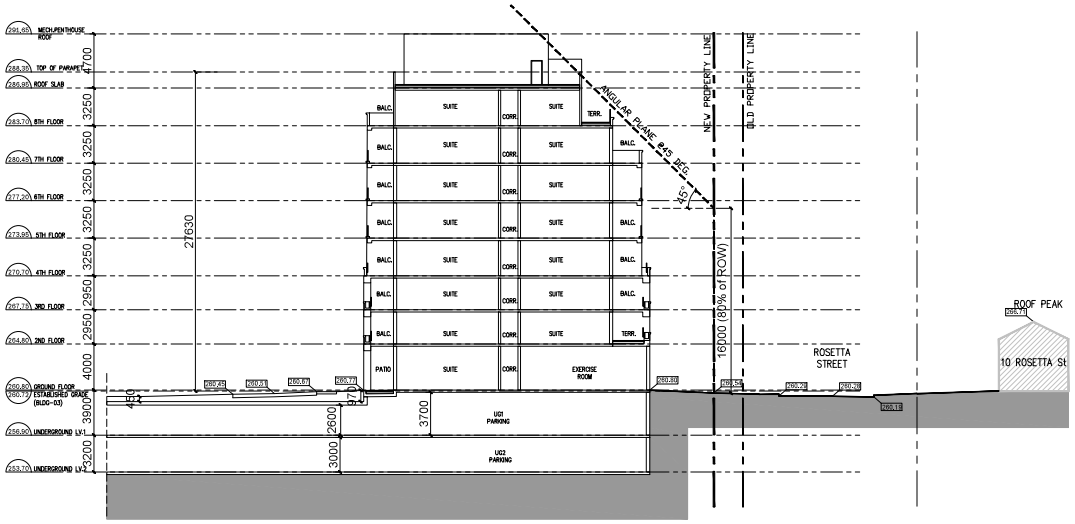
DRAWING TITLE
SECTIONS

Scale: 1/200
Date: MAY.12, 2023
Project No. 17127

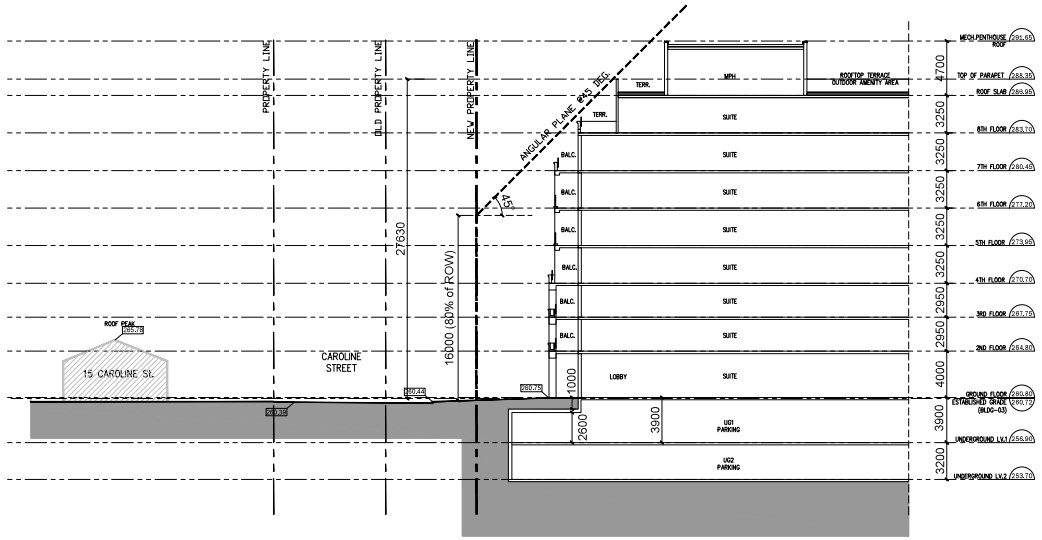
Drawn by: RK
Checked by: RE
Drawing No. A401

813 - 4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-234-0500 F 416-234-0504

ICON ARCHITECTS



SECTION C _ SCALE 1:200



SECTION D _ SCALE 1:200

NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
M. REZA ISLAM
LICENCE
1525

1 ROSETTA STREET
GEORGETOWN, ON

DRAWING TITLE
SECTIONS

Scale: 1/200
Date: MAY.12, 2023
Project No. 17127

Drawn by: RK
Checked by: RE
Drawing No. A402

813 - 4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T 416-224-4868 F 416-224-5004

ICON ARCHITECTS

Appendix B Traffic Data and Calculations

Updated Environmental Noise & Vibration Study

1 Rosetta Street,
Georgetown, ON

1 Rosetta Street Inc.

SLR Project No. 241.V20210.00001

May 26, 2023

System Engineering
Engineering Services

1 Administration Road
Concord, ON, L4K 1B9
T: 905.669.3264
F: 905.760.3406

Train Count Data

TRANSMITTAL

To: *Destinataire :*	SLR 150 Research Lane Suite 105 Limited	*Project :*	HAL – 23.5 Georgetown Go Station, Georgetown ON
Att'n:	Marcus Li	*Routing:*	mli@slrconsulting.com
From: *Expéditeur :*	Michael Vallins	*Date:*	2020/12/18
Cc:	Adjacent Development CN via e-mail		

☐ Urgent ☐ For Your Use ☐ For Review ☐ For Your Information ☐ Confidential

Re: Train Traffic Data – CN Halton Subdivision near Georgetown Go Station in Georgetown, ON

Please find attached the requested Train Traffic Data; this data does not reflect GO Metrolinx Traffic. The application fee in the amount of **$500.00** +HST will be invoiced.

Should you have any questions, please do not hesitate to contact the undersigned at permits.gld@cn.ca

Sincerely,
CN Design & Construction

Michael Vallins P.Eng
Manager, Public Works-Eastern Canada
Permits.gld@cn.ca

Date: 2020/12/18 Project Number: HAL – 23.5 – Georgetown Go station, Georgetown ON

Dear Marcus:

Re: Train Traffic Data – CN Halton Subdivision near 11611 Trafalgar in Georgetown, ON

The following is provided in response to Marcus's 2020/09/08 request for information regarding rail traffic in the vicinity of Georgetown Go station in Georgetown at approximately Mile 23.5 on CN's Halton Subdivision.

Typical daily traffic volumes are recorded below. However, traffic volumes may fluctuate due to overall economic conditions, varying traffic demands, weather conditions, track maintenance programs, statutory holidays and traffic detours that when required may be heavy although temporary. For the purpose of noise and vibration reports, train volumes must be escalated by 2.5% per annum for a 10-year period.

Typical daily traffic volumes at this site location are as follows:

***Maximum train speed is given in Miles per Hour**

	0700-2300			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	6	140	50	4
Way Freight	0	25	50	4
Passenger	0	10	50	2

	2300-0700			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	9	140	50	4
Way Freight	0	25	50	4
Passenger	4	10	50	2

The volumes recorded reflect westbound and eastbound freight and passenger operations on CN's Halton Subdivision.

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. There is no at-grade crossing in the immediate vicinity of the study area. Please note that engine warning whistles may be sounded in cases of emergency, as a safety and or warning precaution at station locations and pedestrian crossings and occasionally for operating requirements.

With respect to equipment restrictions, the gross weight of the heaviest permissible car is 286,000 lbs.

The double mainline track is considered to be continuously welded rail throughout the study area.

The Canadian National Railway continues to be strongly opposed to locating developments near railway facilities and rights-of-way due to potential safety and environmental conflicts. Development adjacent to the Railway Right-of-Way is not appropriate without sound impact mitigation measures to reduce the incompatibility. For confirmation of the applicable rail noise, vibration and safety standards, Adjacent Development, Canadian National Railway Properties at Proximity@cn.ca should be contacted directly.

I trust the above information will satisfy your current request.

Sincerely,

Michael Vallins P.Eng
Manager, Public Works-Eastern Canada
Permits.gld@cn.ca

Marcus Li

From: Rail Data Requests <RailDataRequests@metrolinx.com>
Sent: January 17, 2023 12:59 PM
To: Marcus Li
Subject: RE: Confirm Rail Traffic Data Up-to-Date: 18 Mill St., Georgetown (from May 19, 2021)

Hi Marcus,
Further to your request dated January 16, 2023, the subject lands (18 Mill St., Georgetown) are located within 300 metres of the CN Halton Subdivision (which carries Kitchener GO rail service).

It's anticipated that GO rail service on this Subdivision will be comprised of diesel trains. The GO rail fleet combination on this Subdivision will consist of up to 2 locomotives and 12 passenger cars. The typical GO rail weekday train volume forecast near the subject lands, including both revenue and equipment trips is in the order of 76 trains. The planned detailed trip breakdown is listed below:

	1 Diesel Locomotive	2 Diesel Locomotives		1 Diesel Locomotive	2 Diesel Locomotives
Day (0700-2300)	56	8	Night (2300-0700)	12	0

The current track design speed near the subject lands is 50 mph (80 km/h).

There are no *anti-whistling by-laws* in affect near the subject lands.
Operational information is subject to change and may be influenced by, among other factors, service planning priorities, operational considerations, funding availability and passenger demand.

It should be noted that this information only pertains to Metrolinx rail service. It would be prudent to contact other rail operators in the area directly for rail traffic information pertaining to non-Metrolinx rail service.

I trust this information is useful. Should you have any questions or concerns, please do not hesitate to contact me.

Regards,
Tara Kamal Ahmadi

Tara Kamal Ahmadi
Junior Analyst
Third Party Projects Review, Capital Projects Group
Metrolinx | 20 Bay Street | Suite 600 | Toronto | Ontario | M5J 2W3

METROLINX

From: Marcus Li <mli@slrconsulting.com>
Sent: January 16, 2023 11:28 AM
To: Rail Data Requests <RailDataRequests@metrolinx.com>; Keni Mallinen <kmallinen@slrconsulting.com>
Subject: RE: Confirm Rail Traffic Data Up-to-Date: 18 Mill St., Georgetown (from May 19, 2021)

RAILWAY SOURCES

Description	Name	M.	ID	Lw' Day (dBA)	Lw' Night (dBA)	Train Class	Correct. Track (dB)	Vmax (km(km/h)	Height A (m)	E (m)	A_att	E_Att	Length (m)	Train Type 1 Type	No. Day	No. Night	Speed (km/h)	Throttle (1 to 8)
GO Train - Locomotive	GO		Go_loco	69.0	64.2	(local)	0		0.6		r		2639	FTA_COMM_LOC_DE	72	12	80	8
GO Train - Wheel	GO		Go_wheel	63.2	58.9	(local)	0		0.6		r		2639	FTA_COMM_CAR	768	144	80	0
Freight Train - Locomotive	Freight		freight_loco	72.3	76.8	(local)	0		0.6		r		2639	FRA_CONV_FRE_LOC	40	56	80	8
Freight Train - Wheel	Freight		freight_wheel	65.8	70.2	(local)	0		0.6		r		2639	FTA_COMM_CAR	1400	1960	80	0
Passenger Train - Locomotive	Passenger		pass_loco	-81.0	64.9	(local)	0		0.6		r		2639	FTA_COMM_LOC_DE	0	14	80	8
Passenger Train - Wheel	Passenger		pass_wheel	-81.0	55.8	(local)	0		0.6		r		2639	FTA_COMM_CAR	0	70	80	0
GO Train - 24-hour Locomotive	GO		Go_loco_24Loco	69.6	-81.0	(local)	0		0.6		r		2639	FTA_COMM_LOC_DE	84	0	80	8
GO Train - 24-hour Wheel	GO		Go_wheel_24wheel	63.9	-81.0	(local)	0		0.6		r		2639	FTA_COMM_CAR	912	0	80	0
Freight Train - 24-hour Locomotive	Freight		FR_D_24Loco	76.1	-81.0	(local)	0		0.6		r		2639	FRA_CONV_FRE_LOC	96	0	80	8
Freight Train - 24-hour Wheel	Freight		FR_D_24Wheel	69.6	-81.0	(local)	0		0.6		r		2639	FTA_COMM_CAR	3360	0	80	0
Passenger Train - 24-hour Locomotive	Passenger		P_D_24Loco	61.8	-81.0	(local)	0		0.6		r		2639	FTA_COMM_LOC_DE	14	0	80	8
Passenger Train - 24-hour Wheel	Passenger		P_D_24Wheel	52.8	-81.0	(local)	0		0.6		r		2639	FTA_COMM_CAR	70	0	80	0

Appendix C Detailed Façade Calculations

Updated Environmental Noise & Vibration Study

1 Rosetta Street,
Georgetown, ON

1 Rosetta Street Inc.

SLR Project No. 241.V20210.00001

May 26, 2023

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

Receptor ID	Receptor Description	Sound Levels				Room / Façade Inputs										Source Inputs			Veneer - Component 1							Glazing - Component 2					
		Façade Sound Level:	Free - field Corr:	Req'd Indoor Sound Level:	Req'd Noise Red:	Glazing as % of Wall Area	Exp Wall Ht	Exp Wall Length	Room Depth	Total Floor Area	Veneer Wall Area	Glazing Wall Area	Veneer as % of Floor Area:	Glazing as % of Floor Area:	Room Absorption:	Incident Sound Angle:	Angle Corr Factor:	Spectrum type:	Veneer STC	Component Category:	Room Correction	Frequency Correction	Sound Energy Correction	% Total Transmitted Energy			Component Category:	Room Correction	Frequency Correction	% Total Transmitted Energy	Sound Energy Correction	Req'd Glazing STC
		(dBA)	(dBA)	(dBA)	(dBA)		(m)	(m)	(m)	(m^2)	(m^2)	(m^2)	(%)	(%)		(deg)			(STC)					(%)						(%)		(STC)
DAYTIME																																
B03_SF_LR	Building 03 - South Façade - Living Room	58	3	40	21	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	29	5			C. sealed thin window, or openable thick window	-4	6	95	0	**23**
B03_SF_BR	Building 03 - South Façade - Bedroom	58	3	40	21	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	25	5			C. sealed thin window, or openable thick window	-4	6	95	0	**23**
B03_EF_LR	Building 03 - East Façade - Living Room	58	3	40	21	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	29	5			C. sealed thin window, or openable thick window	-4	6	95	0	**23**
B03_EF_BR	Building 03 - East Façade - Bedroom	58	3	40	21	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	25	5			C. sealed thin window, or openable thick window	-4	6	95	0	**23**
B03_NF_LR	Building 03 - North Façade - Living Room	56	3	40	19	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	31	5			C. sealed thin window, or openable thick window	-4	6	95	0	**21**
B03_NF_BR	Building 03 - North Façade - Bedroom	56	3	40	19	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	27	5			C. sealed thin window, or openable thick window	-4	6	95	0	**21**
B03_WF_LR	Building 03- West Façade - Living Room	56	3	40	19	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	31	5			C. sealed thin window, or openable thick window	-4	6	95	0	**21**
B03_WF_BR	Building 03 - West Façade - Bedroom	56	3	40	19	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	27	5			C. sealed thin window, or openable thick window	-4	6	95	0	**21**
B02_NF_LR	Building 02 - North Façade - Living Room	58	3	40	21	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	29	5			C. sealed thin window, or openable thick window	-4	6	95	0	**23**
B02_NF_BR	Building 02 - North Façade - Bedroom	58	3	40	21	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	25	5			C. sealed thin window, or openable thick window	-4	6	95	0	**23**
B02_WF_LR	Building 02 - West Façade (non-ENB) - Living Room	63	3	40	26	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	24	5			C. sealed thin window, or openable thick window	-4	6	95	0	**28**
B02_WF_BR	Building 02 - West Façade (non-ENB) - Bedroom	63	3	40	26	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	20	5			C. sealed thin window, or openable thick window	-4	6	95	0	**28**
B02_WF2_LR	Building 02- West Façade (ENB) - Living Room	66	3	40	29	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	21	5			C. sealed thin window, or openable thick window	-4	6	95	0	**31**
B02_WF2_BR	Building 02 - West Façade (ENB) - Bedroom	66	3	40	29	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	17	5			C. sealed thin window, or openable thick window	-4	6	95	0	**31**
B02_EF_LR	Building 02 - East Façade - Living Room	53	3	40	16	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	34	5			C. sealed thin window, or openable thick window	-4	6	95	0	**18**
B02_EF_BR	Building 02 - East Façade - Bedroom	53	3	40	16	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	30	5			C. sealed thin window, or openable thick window	-4	6	95	0	**18**
B01_EF_LR	Building 01 - East Façade (non-ENB) - Living Room	61	3	40	24	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	26	5			C. sealed thin window, or openable thick window	-4	6	95	0	**26**
B01_EF_BR	Building 01 - East Façade (non-ENB) - Bedroom	61	3	40	24	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	22	5			C. sealed thin window, or openable thick window	-4	6	95	0	**26**
B01_EF2_LR	Building 01 - East Façade (ENB) - Living Room	64	3	40	27	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	23	5			C. sealed thin window, or openable thick window	-4	6	95	0	**29**
B01_EF2_BR	Building 01 - East Façade (ENB) - Bedroom	64	3	40	27	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	19	5			C. sealed thin window, or openable thick window	-4	6	95	0	**29**
B01_SF_LR	Building 01 - South Façade (ENBs) - Living Room	67	3	40	30	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	20	5			C. sealed thin window, or openable thick window	-4	6	95	0	**32**
B01_SF_BR	Building 01 - South Façade (ENBs) - Bedroom	67	3	40	30	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	16	5			C. sealed thin window, or openable thick window	-4	6	95	0	**32**
B01_NF_LR	Building 01 - North Façade - Living Room	51	3	40	14	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-7	10	35	5			C. sealed thin window, or openable thick window	-4	6	95	0	**16**
B01_NF_BR	Building 01 - North Façade - Bedroom	51	3	40	14	50%	3.0	3.0	3.0	9.0	4.4	4.4	49	49	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	32	5			C. sealed thin window, or openable thick window	-4	6	95	0	**16**
NIGHT-TIME																																
B03_SF_LR	Building 03 - South Façade - Living Room	61	3	40	24	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	26	5			C. sealed thin window, or openable thick window	-4	6	95	0	**26**
B03_SF_BR	Building 03 - South Façade - Bedroom	61	3	35	29	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	17	5			C. sealed thin window, or openable thick window	-4	6	95	0	**31**
B03_EF_LR	Building 03 - East Façade - Living Room	62	3	40	25	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	25	5			C. sealed thin window, or openable thick window	-4	6	95	0	**27**
B03_EF_BR	Building 03 - East Façade - Bedroom	62	3	35	30	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	16	5			C. sealed thin window, or openable thick window	-4	6	95	0	**32**
B03_NF_LR	Building 03 - North Façade - Living Room	59	3	40	22	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	28	5			C. sealed thin window, or openable thick window	-4	6	95	0	**24**
B03_NF_BR	Building 03 - North Façade - Bedroom	59	3	35	27	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	19	5			C. sealed thin window, or openable thick window	-4	6	95	0	**29**
B03_WF_LR	Building 03- West Façade - Living Room	59	3	40	22	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	28	5			C. sealed thin window, or openable thick window	-4	6	95	0	**24**
B03_WF_BR	Building 03 - West Façade - Bedroom	59	3	35	27	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	19	5			C. sealed thin window, or openable thick window	-4	6	95	0	**29**
B02_NF_LR	Building 02 - North Façade - Living Room	62	3	40	25	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	25	5			C. sealed thin window, or openable thick window	-4	6	95	0	**27**
B02_NF_BR	Building 02 - North Façade - Bedroom	62	3	35	30	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	16	5			C. sealed thin window, or openable thick window	-4	6	95	0	**32**
B02_WF_LR	Building 02 - West Façade (non-ENB) - Living Room	67	3	40	30	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	20	5			C. sealed thin window, or openable thick window	-4	6	95	0	**32**
B02_WF_BR	Building 02 - West Façade (non-ENB) - Bedroom	67	3	35	35	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	11	8			C. sealed thin window, or openable thick window	-4	6	92	0	**37**
B02_WF2_LR	Building 02- West Façade (ENB) - Living Room	69	3	40	32	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	18	5			C. sealed thin window, or openable thick window	-4	6	95	0	**34**
B02_WF2_BR	Building 02 - West Façade (ENB) - Bedroom	69	3	35	37	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	9	12			C. sealed thin window, or openable thick window	-4	6	88	1	**40**
B02_EF_LR	Building 02 - East Façade - Living Room	57	3	40	20	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	30	5			C. sealed thin window, or openable thick window	-4	6	95	0	**22**
B02_EF_BR	Building 02 - East Façade - Bedroom	57	3	35	25	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	21	5			C. sealed thin window, or openable thick window	-4	6	95	0	**27**
B01_EF_LR	Building 01 - East Façade (non-ENB) - Living Room	64	3	40	27	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	23	5			C. sealed thin window, or openable thick window	-4	6	95	0	**29**
B01_EF_BR	Building 01 - East Façade (non-ENB) - Bedroom	64	3	35	32	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	14	5			C. sealed thin window, or openable thick window	-4	6	95	0	**34**
B01_EF2_LR	Building 01 - East Façade (ENB) - Living Room	67	3	40	30	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	20	5			C. sealed thin window, or openable thick window	-4	6	95	0	**32**
B01_EF2_BR	Building 01 - East Façade (ENB) - Bedroom	67	3	35	35	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	11	8			C. sealed thin window, or openable thick window	-4	6	92	0	**37**
B01_SF_LR	Building 01 - South Façade (ENBs) - Living Room	70	3	40	33	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	10	17	5			C. sealed thin window, or openable thick window	-4	6	95	0	**35**
B01_SF_BR	Building 01 - South Façade (ENBs) - Bedroom	70	3	35	38	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	8	16			C. sealed thin window, or openable thick window	-4	6	84	1	**41**
B01_NF_LR	Building 01 - North Façade - Living Room	55	3	40	18	70%	3.0	3.0	6.0	18.0	2.7	6.3	15	35	Intermediate	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-7	10	31	5			C. sealed thin window, or openable thick window	-4	6	95	0	**20**
B01_NF_BR	Building 01 - North Façade - Bedroom	55	3	35	23	50%	3.0	3.0	3.0	9.0	4.4	4.4	49	49	Very Absorptive	0 - 90	0	F. diesel railway locomotive	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	10	23	5			C. sealed thin window, or openable thick window	-4	6	95	0	**25**

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

Receptor ID	Receptor Description	Sound Levels				Room / Façade Inputs										Source Inputs			Veneer - Component 1							Glazing - Component 2					
		Façade Sound Level:	Free - field Corr:	Req'd Indoor Sound Level:	Req'd Noise Red:	Glazing as % of Wall Area	Exp Wall Ht	Exp Wall Length	Room Depth	Total Floor Area	Veneer Wall Area	Glazing Wall Area	Veneer as % of Floor Area:	Glazing as % of Floor Area:	Room Absorption:	Incident Sound Angle:	Angle Corr Factor:	Spectrum type:	Veneer STC	Component Category:	Room Correction	Frequency Correction	Sound Energy Correction	% Total Transmitted Energy		Component Category:	Room Correction	Frequency Correction	% Total Transmitted Energy	Sound Energy Correction	Req'd Glazing STC
		(dBA)	(dBA)	(dBA)	(dBA)		(m)	(m)	(m)	(m^2)	(m^2)	(m^2)	(%)	(%)		(deg)			(STC)					(%)					(%)		(STC)
DAYTIME																															
B03_SF_LR	Building 03 - South Façade - Living Room	50	3	40	13	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	45	5		C. sealed thin window, or openable thick window	-4	1	95	0	**10**
B03_SF_BR	Building 03 - South Façade - Bedroom	50	3	40	13	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	41	5		C. sealed thin window, or openable thick window	-4	1	95	0	**10**
B03_EF_LR	Building 03 - East Façade - Living Room	51	3	40	14	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	44	5		C. sealed thin window, or openable thick window	-4	1	95	0	**11**
B03_EF_BR	Building 03 - East Façade - Bedroom	51	3	40	14	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	40	5		C. sealed thin window, or openable thick window	-4	1	95	0	**11**
B03_NF_LR	Building 03 - North Façade - Living Room	50	3	40	13	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	45	5		C. sealed thin window, or openable thick window	-4	1	95	0	**10**
B03_NF_BR	Building 03 - North Façade - Bedroom	50	3	40	13	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	41	5		C. sealed thin window, or openable thick window	-4	1	95	0	**10**
B03_WF_LR	Building 03- West Façade - Living Room	49	3	40	12	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	46	5		C. sealed thin window, or openable thick window	-4	1	95	0	**9**
B03_WF_BR	Building 03 - West Façade - Bedroom	49	3	40	12	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	42	5		C. sealed thin window, or openable thick window	-4	1	95	0	**9**
B02_NF_LR	Building 02 - North Façade - Living Room	52	3	40	15	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	43	5		C. sealed thin window, or openable thick window	-4	1	95	0	**12**
B02_NF_BR	Building 02 - North Façade - Bedroom	52	3	40	15	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	39	5		C. sealed thin window, or openable thick window	-4	1	95	0	**12**
B02_WF_LR	Building 02 - West Façade (non-ENB) - Living Room	57	3	40	20	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	38	5		C. sealed thin window, or openable thick window	-4	1	95	0	**17**
B02_WF_BR	Building 02 - West Façade (non-ENB) - Bedroom	57	3	40	20	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	34	5		C. sealed thin window, or openable thick window	-4	1	95	0	**17**
B02_WF2_LR	Building 02- West Façade (ENB) - Living Room	59	3	40	22	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	36	5		C. sealed thin window, or openable thick window	-4	1	95	0	**19**
B02_WF2_BR	Building 02 - West Façade (ENB) - Bedroom	59	3	40	22	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	32	5		C. sealed thin window, or openable thick window	-4	1	95	0	**19**
B02_EF_LR	Building 02 - East Façade - Living Room	46	3	40	9	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	49	5		C. sealed thin window, or openable thick window	-4	1	95	0	**6**
B02_EF_BR	Building 02 - East Façade - Bedroom	46	3	40	9	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	45	5		C. sealed thin window, or openable thick window	-4	1	95	0	**6**
B01_EF_LR	Building 01 - East Façade (non-ENB) - Living Room	54	3	40	17	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	41	5		C. sealed thin window, or openable thick window	-4	1	95	0	**14**
B01_EF_BR	Building 01 - East Façade (non-ENB) - Bedroom	54	3	40	17	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	37	5		C. sealed thin window, or openable thick window	-4	1	95	0	**14**
B01_EF2_LR	Building 01 - East Façade (ENB) - Living Room	57	3	40	20	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	38	5		C. sealed thin window, or openable thick window	-4	1	95	0	**17**
B01_EF2_BR	Building 01 - East Façade (ENB) - Bedroom	57	3	40	20	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	34	5		C. sealed thin window, or openable thick window	-4	1	95	0	**17**
B01_SF_LR	Building 01 - South Façade (ENBs) - Living Room	61	3	40	24	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	34	5		C. sealed thin window, or openable thick window	-4	1	95	0	**21**
B01_SF_BR	Building 01 - South Façade (ENBs) - Bedroom	61	3	40	24	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	30	5		C. sealed thin window, or openable thick window	-4	1	95	0	**21**
B01_NF_LR	Building 01 - North Façade - Living Room	45	3	40	8	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	50	5		C. sealed thin window, or openable thick window	-4	1	95	0	**5**
B01_NF_BR	Building 01 - North Façade - Bedroom	45	3	40	8	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	46	5		C. sealed thin window, or openable thick window	-4	1	95	0	**5**
NIGHT-TIME																															
B03_SF_LR	Building 03 - South Façade - Living Room	53	3	40	16	70%	2.8	3.0	3.0	9.0	2.5	5.8	28	64	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-5	2	39	5		C. sealed thin window, or openable thick window	-1	1	95	0	**16**
B03_SF_BR	Building 03 - South Façade - Bedroom	53	3	35	21	50%	2.8	3.0	6.0	18.0	4.1	4.1	23	23	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-7	2	36	5		C. sealed thin window, or openable thick window	-7	1	95	0	**15**
B03_EF_LR	Building 03 - East Façade - Living Room	54	3	40	17	70%	2.8	3.0	3.0	9.0	2.5	5.8	28	64	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-5	2	38	5		C. sealed thin window, or openable thick window	-1	1	95	0	**17**
B03_EF_BR	Building 03 - East Façade - Bedroom	54	3	35	22	50%	2.8	3.0	6.0	18.0	4.1	4.1	23	23	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-7	2	35	5		C. sealed thin window, or openable thick window	-7	1	95	0	**16**
B03_NF_LR	Building 03 - North Façade - Living Room	53	3	40	16	70%	2.8	3.0	3.0	9.0	2.5	5.8	28	64	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-5	2	39	5		C. sealed thin window, or openable thick window	-1	1	95	0	**16**
B03_NF_BR	Building 03 - North Façade - Bedroom	53	3	35	21	50%	2.8	3.0	6.0	18.0	4.1	4.1	23	23	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-7	2	36	5		C. sealed thin window, or openable thick window	-7	1	95	0	**15**
B03_WF_LR	Building 03- West Façade - Living Room	52	3	40	15	70%	2.8	3.0	3.0	9.0	2.5	5.8	28	64	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-5	2	40	5		C. sealed thin window, or openable thick window	-1	1	95	0	**15**
B03_WF_BR	Building 03 - West Façade - Bedroom	52	3	35	20	50%	2.8	3.0	6.0	18.0	4.1	4.1	23	23	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-7	2	37	5		C. sealed thin window, or openable thick window	-7	1	95	0	**14**
B02_NF_LR	Building 02 - North Façade - Living Room	55	3	40	18	70%	2.8	3.0	3.0	9.0	2.5	5.8	28	64	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-5	2	37	5		C. sealed thin window, or openable thick window	-1	1	95	0	**18**
B02_NF_BR	Building 02 - North Façade - Bedroom	55	3	35	23	50%	2.8	3.0	6.0	18.0	4.1	4.1	23	23	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-7	2	34	5		C. sealed thin window, or openable thick window	-7	1	95	0	**17**
B02_WF_LR	Building 02 - West Façade (non-ENB) - Living Room	60	3	40	23	70%	2.8	3.0	3.0	9.0	2.5	5.8	28	64	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-5	2	32	5		C. sealed thin window, or openable thick window	-1	1	95	0	**23**
B02_WF_BR	Building 02 - West Façade (non-ENB) - Bedroom	60	3	35	28	50%	2.8	3.0	6.0	18.0	4.1	4.1	23	23	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-7	2	29	5		C. sealed thin window, or openable thick window	-7	1	95	0	**22**
B02_WF2_LR	Building 02- West Façade (ENB) - Living Room	62	3	40	25	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	33	5		C. sealed thin window, or openable thick window	-4	1	95	0	**22**
B02_WF2_BR	Building 02 - West Façade (ENB) - Bedroom	62	3	35	30	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	24	5		C. sealed thin window, or openable thick window	-4	1	95	0	**27**
B02_EF_LR	Building 02 - East Façade - Living Room	49	3	40	12	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	46	5		C. sealed thin window, or openable thick window	-4	1	95	0	**9**
B02_EF_BR	Building 02 - East Façade - Bedroom	49	3	35	17	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	37	5		C. sealed thin window, or openable thick window	-4	1	95	0	**14**
B01_EF_LR	Building 01 - East Façade (non-ENB) - Living Room	57	3	40	20	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	38	5		C. sealed thin window, or openable thick window	-4	1	95	0	**17**
B01_EF_BR	Building 01 - East Façade (non-ENB) - Bedroom	57	3	35	25	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	29	5		C. sealed thin window, or openable thick window	-4	1	95	0	**22**
B01_EF2_LR	Building 01 - East Façade (ENB) - Living Room	60	3	40	23	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	35	5		C. sealed thin window, or openable thick window	-4	1	95	0	**20**
B01_EF2_BR	Building 01 - East Façade (ENB) - Bedroom	60	3	35	28	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	26	5		C. sealed thin window, or openable thick window	-4	1	95	0	**25**
B01_SF_LR	Building 01 - South Façade (ENBs) - Living Room	64	3	40	27	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	31	5		C. sealed thin window, or openable thick window	-4	1	95	0	**24**
B01_SF_BR	Building 01 - South Façade (ENBs) - Bedroom	64	3	35	32	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	22	5		C. sealed thin window, or openable thick window	-4	1	95	0	**29**
B01_NF_LR	Building 01 - North Façade - Living Room	48	3	40	11	70%	2.8	3.0	6.0	18.0	2.5	5.8	14	32	Intermediate	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-8	2	47	5		C. sealed thin window, or openable thick window	-4	1	95	0	**8**
B01_NF_BR	Building 01 - North Façade - Bedroom	48	3	35	16	50%	2.8	3.0	3.0	9.0	4.1	4.1	46	46	Very Absorptive	0 - 90	0	B. avg aircraft, railway wheel noise	52	D. sealed thick window, or exterior wall, or roof/ceiling	-4	2	38	5		C. sealed thin window, or openable thick window	-4	1	95	0	**13**

Appendix D Mitigation, Ventilation, Warning Clause and Barrier Summary

Updated Environmental Noise & Vibration Study

1 Rosetta Street,
Georgetown, ON

1 Rosetta Street Inc.

SLR Project No. 241.V20210.00001

May 26, 2023

Mitigation, Ventilation, Warning Clause and Barrier Summary

The following Warning Clauses are recommended for inclusion in agreements registered on Title for the residential units, and included in all agreements of purchase and sale or lease, and all rental agreements.

A summary of the Warning Clause and Ventilation Requirements is included in Table D1.

MECP Type A: "Purchasers/tenants are advised that sound levels due to increasing road traffic and rail traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."

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

MECP Type C: "This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."

MECP Type D: "Purchasers are advised that the dwelling unit has been or will be fitted with a central air conditioning system which will enable occupants to keep windows closed if road and or rail traffic noise interferes with the indoor activities."

MECP Type E: "Purchasers/tenants are advised that due to the proximity of the adjacent industry (Layover Yard), noise from the facility may at times be audible."

MECP Type F: "Purchasers/tenants are advised that sound levels due to the adjacent industry are required 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. This dwelling unit has been supplied with a ventilation/air conditioning system which will allow windows and exterior doors to remain closed."

Metrolinx: "Metrolinx and its assigns and successors in interest operate commuter transit service within 300 metres from the land which is the subject hereof. In addition to the current use of these lands, there may be alterations to or expansions of the rail and other facilities on such lands in the future including the possibility that Metrolinx or any railway entering into an agreement with Metrolinx or any railway assigns or successors as aforesaid may expand their operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwellings. Metrolinx will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under these lands."

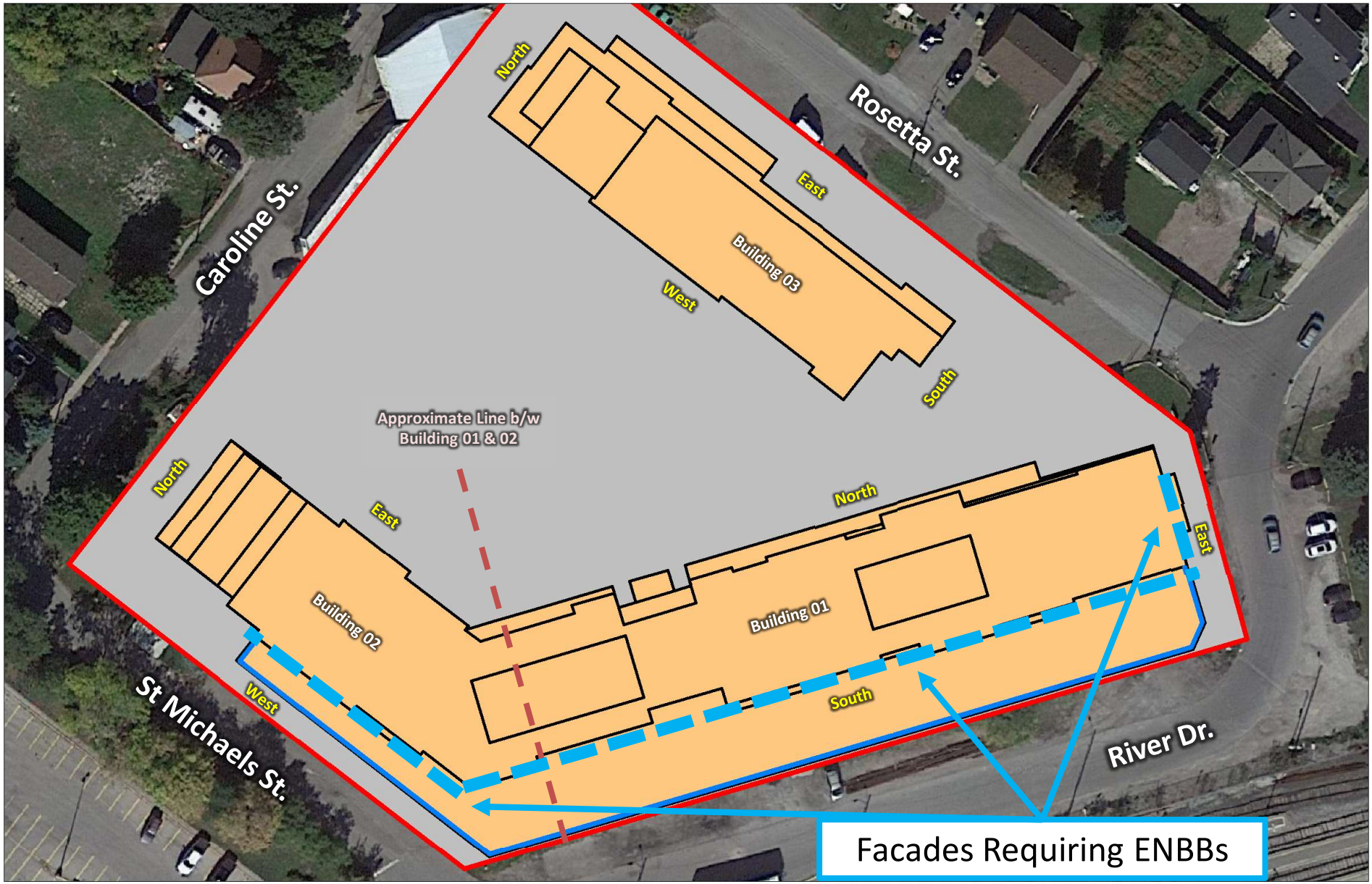
CN: "Purchasers are advised that Canadian National Railway Company or its assigns or successors in interest has or have a right-of-way within 300 metres from the land the subject thereof. There may be alterations to or expansions of the rail facilities on such right-of-way in the future, including the possibility that the railway or its assigns or successors as aforesaid may expand its operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). CNR will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid right-of-way."

Table D1: Summary of Ventilation and Warning Clause Requirements

Residential Units	Facade Requirements[1]		Ventilation	Warning Clauses
	Wall	Glazing		
Building 01 – residential units along south and east facades with ENBs	STC 50	Up to STC 44	Mandatory AC	Type B, Type D, Type E, Type F, Metrolinx, CN
Building 01 – all other residential units without ENBs	STC 50	Up to STC 35	Mandatory AC	Type B, Type D, Type E, Metrolinx, CN
Building 02 – residential units along portion of west façade with ENBs	STC 50	Up to STC 44	Mandatory AC	Type B, Type D, Type E, Type F, Metrolinx, CN
Building 02 – all other residential units without ENBs	STC 50	Up to STC 39	Mandatory AC	Type B, Type D, Type E, Metrolinx, CN
Building 03 – all residential units	STC 50	Up to STC 35	Mandatory AC	Type A, Type D, Type E, Metrolinx, CN
Building 01 and 02 – 2nd Floor Outdoor Amenity Terrace[2]	2.95 m high at west, central and east portion, 3.95 m high at central-west portion			
Building 03 – Rooftop Outdoor Amenity Terrace	None Required			

Notes: [1] Worst-Case façade requirements are presented. For detailed façade requirements, refer to report **Section 2.5**.

[2] Refer to **Figure 9** for location and extent of required barrier.

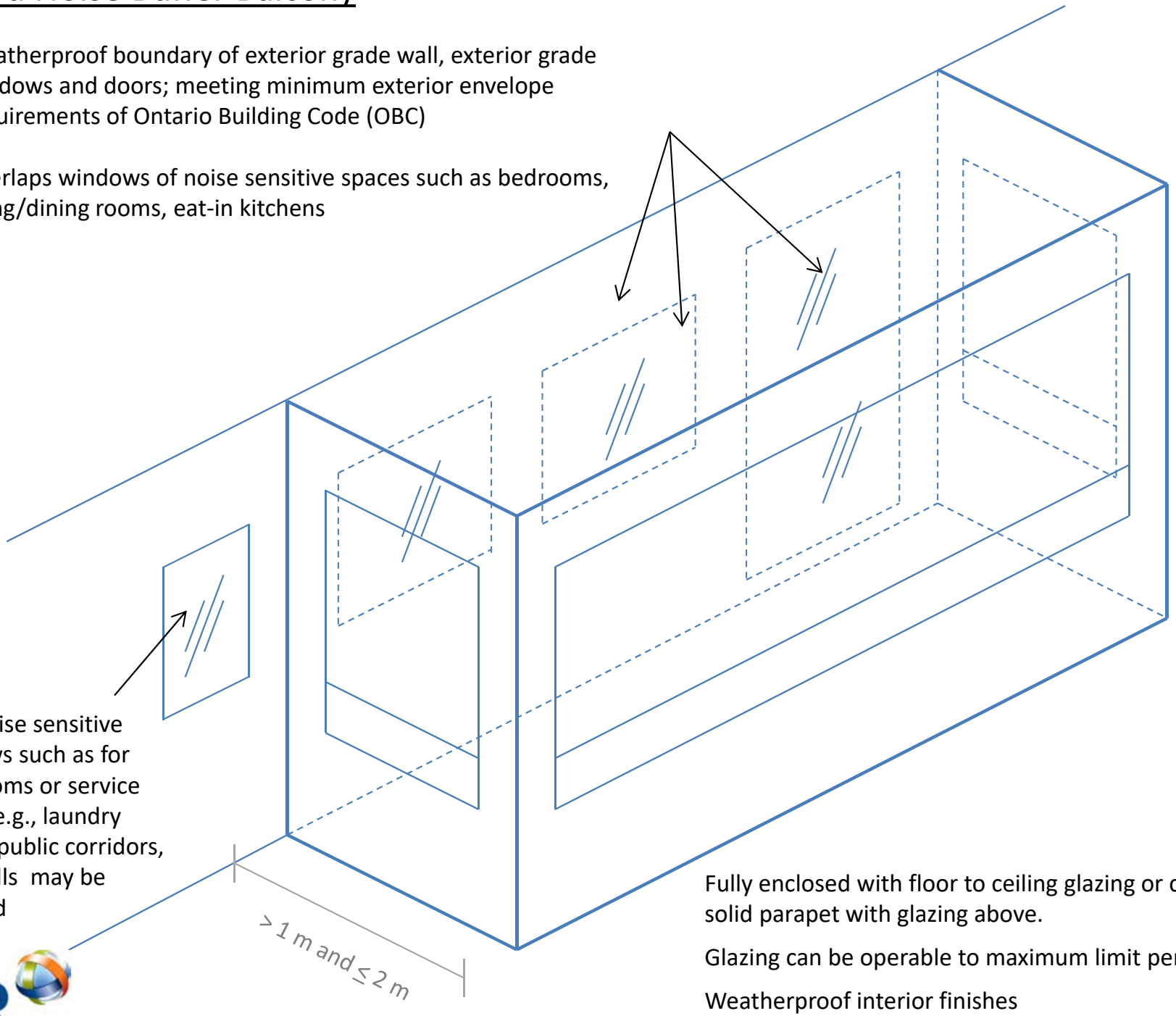


1 ROSETTA STREET INC.	True North	Scale: 1:800	METRES	SLR global environmental solutions
1 ROSETTA STREET, GEORGETOWN		Date: May 26, 2023 Rev 1.0	Figure No. **D1**	
FACADES REQUIRING ENCLOSED NOISE BUFFERS		Project No. 241.V20210.00001		

Enclosed Noise Buffer Balcony

Weatherproof boundary of exterior grade wall, exterior grade windows and doors; meeting minimum exterior envelope requirements of Ontario Building Code (OBC)

Overlaps windows of noise sensitive spaces such as bedrooms, living/dining rooms, eat-in kitchens



Non-noise sensitive windows such as for bathrooms or service Areas (e.g., laundry room), public corridors, stairwells may be exposed

Fully enclosed with floor to ceiling glazing or combination of solid parapet with glazing above.

Glazing can be operable to maximum limit permitted by OBC.

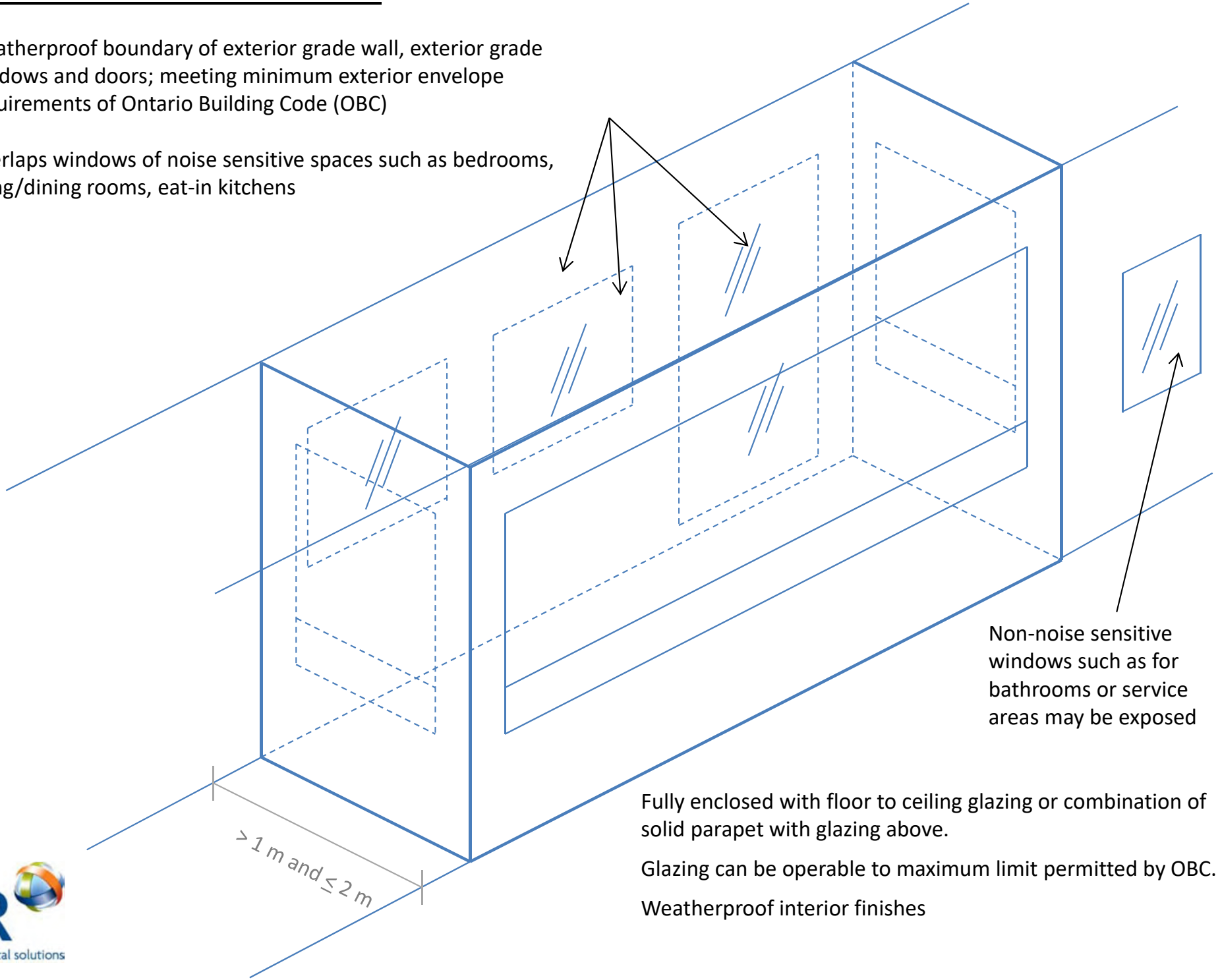
Weatherproof interior finishes

SLR
global environmental solutions

Enclosed Noise Buffer within Suite

Weatherproof boundary of exterior grade wall, exterior grade windows and doors; meeting minimum exterior envelope requirements of Ontario Building Code (OBC)

Overlaps windows of noise sensitive spaces such as bedrooms, living/dining rooms, eat-in kitchens



Non-noise sensitive windows such as for bathrooms or service areas may be exposed

Fully enclosed with floor to ceiling glazing or combination of solid parapet with glazing above.

Glazing can be operable to maximum limit permitted by OBC.

Weatherproof interior finishes

SLR
global environmental solutions

Appendix E Stationary Source Modelling Data

Updated Environmental Noise & Vibration Study

1 Rosetta Street,
Georgetown, ON

1 Rosetta Street Inc.

SLR Project No. 241.V20210.00001

May 26, 2023

Modelling Information Summary

Source Description	Maximum Sound Power Levels (1/1 Octave Band Levels)									Modelled Sound Power Level (dBA)	Notes
	32	63	125	250	500	1000	2000	4000	8000		
Loblaws											
Idling Train	117	127	114	110	103	98	97	95	90	108	- Based on historical SLR data. - Train Idling 15 during daytime and 15 min during nighttime