Environmental Noise Study
2107 Old Lakeshore Road
Burlington, ON

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NOVUS PROJECT TEAM:

Scientist: Jason Dorssers, B.Eng.
Principal/Specialist: R.L. Scott Penton, P.Eng.



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1.0 Introduction

Novus Environmental Inc. (Novus) now a part of SLR Consulting was retained by Carriage Gate Homes of Burlington, Ontario to conduct an environmental noise assessment in support of a Zoning By-law Amendment (ZBA) application for the redevelopment of 2107 Old Lakeshore Road in Burlington, Ontario.

1.1 Focus of Report

In keeping with the City of Burlington and Ministry of the Environment, Conservation and Parks Publication (MECP) NPC- 300 requirements, this report examines the potential for:

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

1.2 Nature of the Subject Lands

The development is located along Old Lakeshore Road, east of Martha Street in Burlington, Ontario. The site is currently occupied by a Bank of Montreal (BMO), a presentation centre, and Aviva Medical Diagnostics and Specialist Clinic.

The proposed development will consist of a 27-storey residential condominium, with various amenity spaces on the 2nd floor (first floor rooftop) and upper levels of the structure. Underground resident and visitor parking will be included.

The proposed layout of the future development is provided in **Figure 1**. A copy of the site plan is provided in **Appendix A**.

1.3 Nature of the Surroundings

The surrounding area consists of mostly residential zones to the north and east direction with various commercial spaces spread towards the downtown core (north-west). The site is located along Lake Ontario less than 100m north of the water's edge.

Currently, the site is on the corner of Old Lakeshore and Lakeshore Road. Immediately surrounding the site are low/mid-rise residential developments to the west/north-west, a high-rise residential building to the west (Martha's Landing), and commercial lands spread throughout.

PART 1: IMPACTS OF THE ENVIRONMENT ON THE DEVELOPMENT

2.0 Impacts of the Environment on the Development

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

1) Transportation noise impacts from roadways;
2) Stationary noise impacts from surrounding commercial mechanical equipment; and
3) Stationary noise impacts from the proposed development mechanical equipment on noise-sensitive receptors.

2.1 Transportation Noise Impacts

Noise impacts from transportation sources were investigated in detail. Transportation noise sources of interest with the potential to produce noise at the proposed development are Lakeshore Road.

Sound exposure levels at the development due to these sources have been predicted, and this information has been used to identify façade, ventilation, and warning clause requirements.

2.2 Surface Transportation Noise Criteria

2.2.1 Ministry of the Environment Publication NPC-300

Noise Sensitive Developments

Ministry of the Environment, Conservation, and Parks (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** below summarizes the applicable surface transportation (road and rail) criteria 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 the sensitivity of the space. As a result, sleep areas have more stringent criteria than Living / Dining room space.

Table 1: MECP Publication NPC-300 Sound Level Criteria for Road and Rail Noise

Type of Space	Time Period	Equivalent Sound Exposure Level - L_{eq} (dBA)		Assessment Location
		Road	Rail [1]	
Outdoor Living Area (OLA)	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
[2] Road and Rail noise impacts are to be combined for assessment of OLA impacts.
[3] Residence area Dens, Hospitals, Nursing Homes, Schools, Daycares are also included. During the night-time period, Schools and Daycares are excluded.
[4] An assessment of indoor noise levels is required only if the criteria in **Table 4** are exceeded.

Outdoor Amenity Areas

Table 2 summarizes the noise mitigation requirements for communal outdoor amenity areas ("Outdoor Living Areas" or "OLAs"). This would include the common amenity areas on the podium rooftop and twenty-seventh floors of the proposed development.

For the assessment of outdoor sound levels, the surface transportation noise impact is determined by combining road and rail traffic sound levels.

Table 2: MECP Publication NPC-300 Outdoor Living Area Mitigation Requirements

Time Period	Equivalent Sound Level in Outdoor Living Area (dBA)	Ventilation Requirements
Daytime (0700-2300h)	≤ 55	• None
	55 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 potentially would have to remain closed as a means of noise control. Despite the implementation of ventilation measures where recommended, if sound exposure levels exceed the guideline limits in **Table 1**, warning clauses advising future occupants of the potential excesses should be included. Warning clauses also apply to OLAs.

Table 3: MECP Publication NPC-300 Ventilation & Warning Clause Requirements

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - L_{eq} (dBA)		Ventilation and Warning Claus Requirements [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] Rail whistle noise is excluded.
[2] Road and Rail noise is combined for determining Ventilation and Warning Clause requirements.

Building Shell Requirements

Table 4 provides sound level thresholds which if exceeded, require the building shell and components (i.e., wall, windows) to be designed and selected accordingly to ensure that the **Table 3 and 4** indoor sound criteria are met.

Table 4: MECP Publication NPC-300 Building Component Requirements

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - Leq (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] Including whistle noise.
[2] Building component requirements are assessed separately for Road and Railway noise, then combined for an overall acoustic parameter.

2.3 Traffic Data and Future Projections

2.3.1 Roadway Traffic Data

Road traffic data for Lakeshore Road were obtained directly from Paradigm Transportation Solutions Limited. Turning movement counts at the intersection of Lakeshore and Martha were used to calculate AADT (annual average daily traffic). As per the City of Burlington requirements, the traffic data was grown using an annual growth rate of 1.5% applied from 2017 to 2030. Copies of all traffic data used can be found in **Appendix B**. The following **Table 5** summarizes the road traffic volumes used in the analysis.

Table 5: Summary for Road Traffic Data Used in the Transportation Noise Analysis

Roadway Link	2030 Levels (AADT)	# of Lanes	Day/Night Volume Split		Commercial Traffic Breakdown		Vehicle Speed (km/h)
			Day	Night	% Medium Trucks	% Heavy Trucks	
Lakeshore Road (East of Martha)	18906	2	90	10	1.7	0.0	50
Lakeshore Road (West of Martha)	19944	2	90	10	1.5	0.0	50

Notes: [1] From traffic data supplied by Paradigm Transportation Solutions Limited.
[2] A day/night split of 90%/10% was assumed for all roads.

2.4 Projected Sound Levels

Traffic sound levels at the proposed development were predicted using Cadna/A, a commercially available noise propagation modelling software. Roadways were modelled as line sources of sound, with sound emission rates calculated using ORNAMENT algorithms, the road traffic noise model of the MECP. These predictions are equivalent to those made using the MECP's ORNAMENT, RT/Custom or STAMSON v5.04 road traffic noise models.

Sound levels were predicted along the façades 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. Façades considered to be non-noise sensitive were excluded from the analysis.

Ground absorption was assessed as a reflective surface, as the majority of the intervening ground is considered to be paved or concrete.

Figure B1 found in **Appendix B** summarizes a comparison of the Cadna/A implementation and STAMSON modelling at one (1) location on the property, where results are within 0.1 dBA of each other. All required STAMSON modelling output files are attached in **Appendix B**.

2.4.1 Façade Sound Levels

Predicted worst-case façade sound levels are presented in **Table 6**. The transportation façade sound levels of the development, showing the ranges of predicted daytime and night-time sound levels are shown in **Figure 2** and **Figure 3** for the road impacts on all facades of the structure. The first two storeys of the development that consist of the podium are scheduled to be commercial space and are not considered noise-sensitive receptors.

Table 6: Summary of Transportation Façade Sound Levels

Façade	Roadway Sound Levels [1]	
	L_{eq} Day (dBA)	L_{eq} Night (dBA)
North	62	55
East	59	53
South	49	43
West	59	52

Notes: [1] Sound levels shown represent the worst-case impact on all of the structure's façades.

2.4.2 Outdoor Living Areas

Outdoor living areas of the proposed development include two (2) amenity areas located on the roof of the podium and rooftop of the development, as shown in **Figure 4**. The predicted noise impacts from the adjacent roadways are summarized in **Table 7** below.

Table 7: Outdoor Amenity Area Sound Levels

Location [1]	Transportation Noise Level L_{eq} Day (dBA)	Applicable Guideline Limit L_{eq} Day (dBA)	Meets Criteria? (Yes/No)
Podium	53	55	Yes
Rooftop	35	55	Yes

Notes: [1] Outdoor amenity area locations are shown in **Figure 4**.

The projected sound levels of the outdoor sensitive points of reception are predicted to be well below the NPC-300 Guideline Limits for outdoor living areas.

As the development includes common amenity spaces 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.

2.5 Façade Recommendations

2.5.1 Glazing Requirements

The façade sound levels are predicted to be below 65 dBA during the daytime and 60 dBA during the night-time along all building facades with noise sensitive spaces. Therefore, an assessment of indoor noise levels is not required.

2.5.2 Ventilation and Warning Clause Requirements

The requirements regarding warning clauses are summarized in **Appendix C**. Where required, the Warning Clauses should be included in agreements registered on Title and included in all agreements of purchase and sale or lease, and all rental agreements.

Residential Building Units

Central air-conditioning and a **Type D** warning clause is recommended for all units where the daytime and nighttime sound levels from the combination of roadway and railway traffic exceed 65 and 60 dBA L_{eq}, respectively. No units are affected within the development, therefore air-conditioning and a **Type D** warning clause are not required.

Forced air heating with provisions for future installation of central air-conditioning, as well as a **Type C** warning clause are recommended for all units where the daytime and nighttime sound levels from the combination of roadway and railway traffic exceed 55 and 50 dBA L_{eq}, respectively. This affects all units facing the north, east and west facades.

The Warning Clauses should be included in agreements registered on Title, included in all agreements of purchase and sale or lease, and all rental agreements. The recommended Warning Clauses for this development are outlined in **Appendix C**.

2.6 Outdoor Amenity Area Requirements

Given that levels in these areas do not exceed 55 dBA, noise mitigation and noise warning clauses are not required.

3.0 Stationary Source Noise Impacts on the Development

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

Novus completed an aerial review of the development lands and surrounding area. No major industrial facilities were identified within 700m of the development. The site was found to be surrounded by primarily commercial and residential buildings. The high-rise residential tower "Martha's Landing", contains large air-cooled condensers and rooftop air handling units. Therefore, based on MECP NPC-300 guidelines, an assessment of stationary noise is required.

3.1 Applicable Guideline Limits

The applicable MECP noise guidelines for new sensitive land uses adjacent to existing industrial commercial uses are provided in MECP Publication NPC-300. The NPC-300 guideline sets out noise limits for two (2) main types of noise sources:

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

There are no impulsive noise sources in the area; therefore, only non-impulsive, "continuous" noise is considered further. The guidelines require an assessment at, and provides separate guideline limits for:

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

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

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

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

Table 8: Exclusion Limits for Continuous Sounds - Outdoor Points of Reception

Time of Day	Outdoor Points of Reception		Plane of Windows	
	Class 1 Area (L_{eq} (1-hr), dBA)	Class 4 Area (L_{eq} (1-hr), dBA)	Class 1 Area (L_{eq} (1-hr), dBA)	Class 4 Area (L_{eq} (1-hr), dBA)
7am to 7 pm	50	55	50	60
7 pm to 11 pm	50	55	50	60
11 pm to 7 am	n/a	n/a	45	55

Notes: n/a – Not Applicable. Outdoor points of reception are not noise sensitive during the nighttime period.

3.1.1 Area Classification

Based on the nature of the area, the Class 1 area urban sound level limits apply. The area is urban in nature and dominated by man-made sounds, including road traffic noise and an "urban hum", 24-hours per day. However, based on the location of the site, as well as the surrounding uses, the development site would be appropriate for a Class 4 designation.

3.2 Stationary Source Modelling

Noise impacts from stationary noise 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 model accounts for source noise emission levels, distance, screening effects from buildings, noise barriers, ground absorption, reflections from surrounding buildings, atmospheric absorption, and worst-case meteorological conditions.

For this assessment, a ground absorption factor of 0 was applied, as the surrounding area consists primarily of reflective ground surfaces (asphalt and concrete). The "building evaluation" feature of the Cadna/A was used to assess noise impacts on the development. This feature allows for noise levels to be predicted across the entire façade of a structure.

All stationary sources modelled are shown in **Figure 5**. A summary of the sound power levels and assumptions applied are included in **Appendix D**.

3.3 Noise Sources Considered In the Modelling

In accordance with MECP Publication NPC-300, the noise sources included in the modelling are those associated with industrial or commercial uses in the area. Noise from residential air conditioning systems are exempt from the guideline limits.

The sources of interest are HVAC equipment associated with The Carriage House Restaurant (2101 Old Lakeshore) and the Waters Edge Salon and Spa (2097 Old Lakeshore). We note that these properties are part of a recent OPA/ABA application by Core Developments Ltd. and are therefore likely to be eventually removed. Regardless, they have been included in this assessment.

3.4 Stationary Source Impacts

3.4.1 Facade Sound Levels

The predicted noise impacts from the surrounding stationary noise sources are shown in **Figures 6** and **7** for the combined daytime/evening period and night-time period, respectively. The noise impacts from the surroundings were predicted to meet Class 4 criteria during both the daytime/evening and night-time periods.

Provided in **Table 9** below are the summarized impacts on the proposed development facades.

Table 9: Summary of Highest Predicted Stationary Facade Sound Levels

Façade Location	Period	Stationary Impacts (dBA) [1]	Applicable Guideline Limit (dBA) [2]	Meets Criteria (Y/N?)
West	Day/Evening	50	50	Yes
	Night	45	45	Yes

Notes: [1] Sound levels shown are the maximums along the façade and are not necessarily for the same location for the various source types.
[2] Class 4 Area Limits were applied in this assessment.

As shown in the table above, the sound level limits for the surrounding stationary sources are predicted to be at or below the applicable Class 1 criteria at all façade locations of the development. No additional noise mitigation is required.

3.4.2 Predicted OLA Levels

Outdoor living areas (OLAs) of the proposed development include the podium and rooftop common amenity terraces. Tabulated below are the modelled sound levels at both common amenity spaces compared to MECP NPC-300 guideline criteria. Impacts on each OLA from surrounding stationary sources are shown in **Figure 8.**

Table 10: Summary of Stationary OLA Sound Levels

Location	Stationary Impacts (dBA)	Applicable Guideline Limit (dBA)	Meets Criteria? (Yes/No)
Podium	48	50	Yes
Rooftop	15	50	Yes

As shown in the table above, the sound level limits for the surrounding stationary sources are predicted to be below the applicable Class 4 criteria within the podium and rooftop OLA areas. Noise mitigation is not required.

3.5 Ventilation and Warning Clause Requirements

As the surrounding industries have 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. An MECP NPC-300 **Type E** warning clause is recommended for the all suites within the development. See **Appendix C** for warning clause details.

PART 2: IMPACTS OF THE DEVELOPMENT ON THE SURROUNDING AREA

In terms of the noise environment of the area, it is expected that the project will have a negligible effect on the neighbouring properties. The traffic related to the proposed development will be small in relation to the traffic volumes within the area and is not of concern with respect to noise impact.

Other possible development noise sources with potentially adverse impacts on the surrounding neighbourhood are the mechanical roof-top equipment (cooling tower, make up air units and generator). This equipment is required to meet MECP Publication NPC-300 requirements at the worst-case off-site noise sensitive receptors. Given the high ambient sound levels in the area and the requirement for the systems to meet the applicable noise guideline at closer on-site receptors, off-site impacts are not anticipated.

Regardless, potential impacts should be assessed as part of the final building design. The criteria can be met at all surrounding and on-site receptors by the appropriate selection of mechanical equipment, by locating equipment with sufficient setback from noise sensitive locations, and by incorporating control measures (e.g., silencers, barriers) into the design.

It is recommended the mechanical systems be reviewed by an Acoustical Consultant prior to final selection of equipment.

PART 3: IMPACTS OF THE DEVELOPMENT ON ITSELF

The building mechanical systems (e.g. cooling tower, emergency generator, parking garage vents) have not been sufficiently designed at this time for a detailed assessment. Although no adverse impacts are expected, such equipment has the potential to result in noise impacts on the noise sensitive spaces within the development.

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 the mechanical systems be reviewed by an Acoustical Consultant prior to final selection of equipment.

4.0 Conclusions and Recommendations

The potential for noise impacts on the proposed development have been assessed. Impacts of the environment on the proposed have been considered. Based on the results of our studies, the following conclusions have been reached:

4.1 Transportation Noise

- An assessment of transportation noise impacts has been completed for the surrounding roadways. Based on transportation façade sound levels, upgraded glazing is not required to meet the MECP Publication NPC-300 Indoor Sound Level Criteria, as outlined in **Section 2.4.1.**
- Noise impacts in the outdoor amenity spaces of the development meet the applicable guideline limits. No additional noise control measures are required, as outlined in **Section 2.4.2**.
- Forced air heating and the provision for air conditioning and a **Type C** Warning Clause are recommended for all units on the north, west, and east facades, as outlined in **Section 2.5.2**. Warning clauses are included in **Appendix C**.

4.2 Surrounding “Stationary” Noise

- “Stationary” noise impacts from the development on the surrounding area have been accessed and outlined in **Sections 3.0** of this report. The “Class 1” noise guideline limits are met, and stationary noise impacts are not anticipated.

- A **Type E** noise warning clause is recommended, due to the general noise from the surrounding commercial spaces. Warning clauses are included in **Appendix C**.

4.3 Overall Assessment

- Impacts of the environment on the proposed development can be adequately controlled through upgrades to the building construction, detailed in **Sections 2.0** of this report.
- Impacts of the proposed development on the surroundings are expected to meet the applicable guideline limits and can be adequately controlled by following the design guidance outlined **Sections 3.0** of this report.
- 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 an Acoustical Consultant as part of the final building design.

5.0 References

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

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

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

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Figures

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Property Line
Modelled Building
Development

Figure No. **1**

Context Plan

2107 Old Lakeshore Road
Burlington, Ontario

Project North

Scale: 1:4000
Date: 09/27/2019
File No.: 18-0119
Drawn By: JWD

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NOW PART OF SLR



Modelled Building
Development
Modelled Roadway

Figure No. **2**

Façade Sound Levels – Roadway - Daytime

2107 Old Lakeshore Road
Burlington, Ontario

Project North

Scale: 1:700
Date: 09/27/2019
File No.: 18-0119
Drawn By: JWD

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Modelled Building
Development
Modelled Roadway

Figure No. **3**

Façade Sound Levels – Roadway – Night-time

2107 Old Lakeshore Road
Burlington, Ontario

Project North

Scale: 1:700
Date: 09/27/2019
File No.: 18-0119
Drawn By: JWD

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Modelled Building
Development
Modelled Roadway
Outdoor Receiver

Figure No. **4**

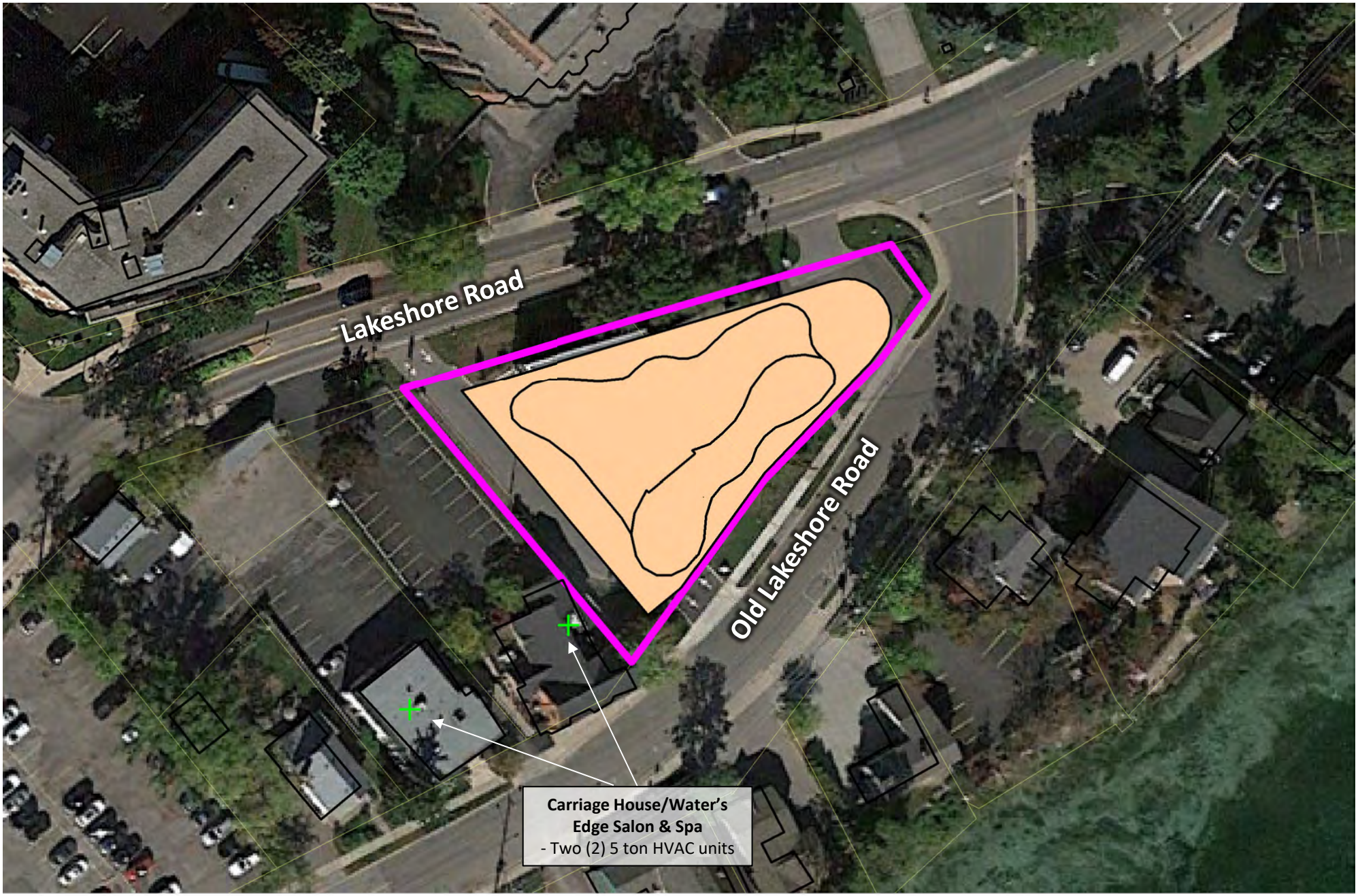
Outdoor Living Area Sound Levels
Roadway – Daytime

2107 Old Lakeshore Road
Burlington, Ontario

Project North

Scale: 1:700
Date: 09/27/2019
File No.: 18-0119
Drawn By: JWD

novus ENVIRONMENTAL
NOW PART OF SLR



Modelled Building
Development
Modelled Stationary Source

Figure No. **5**

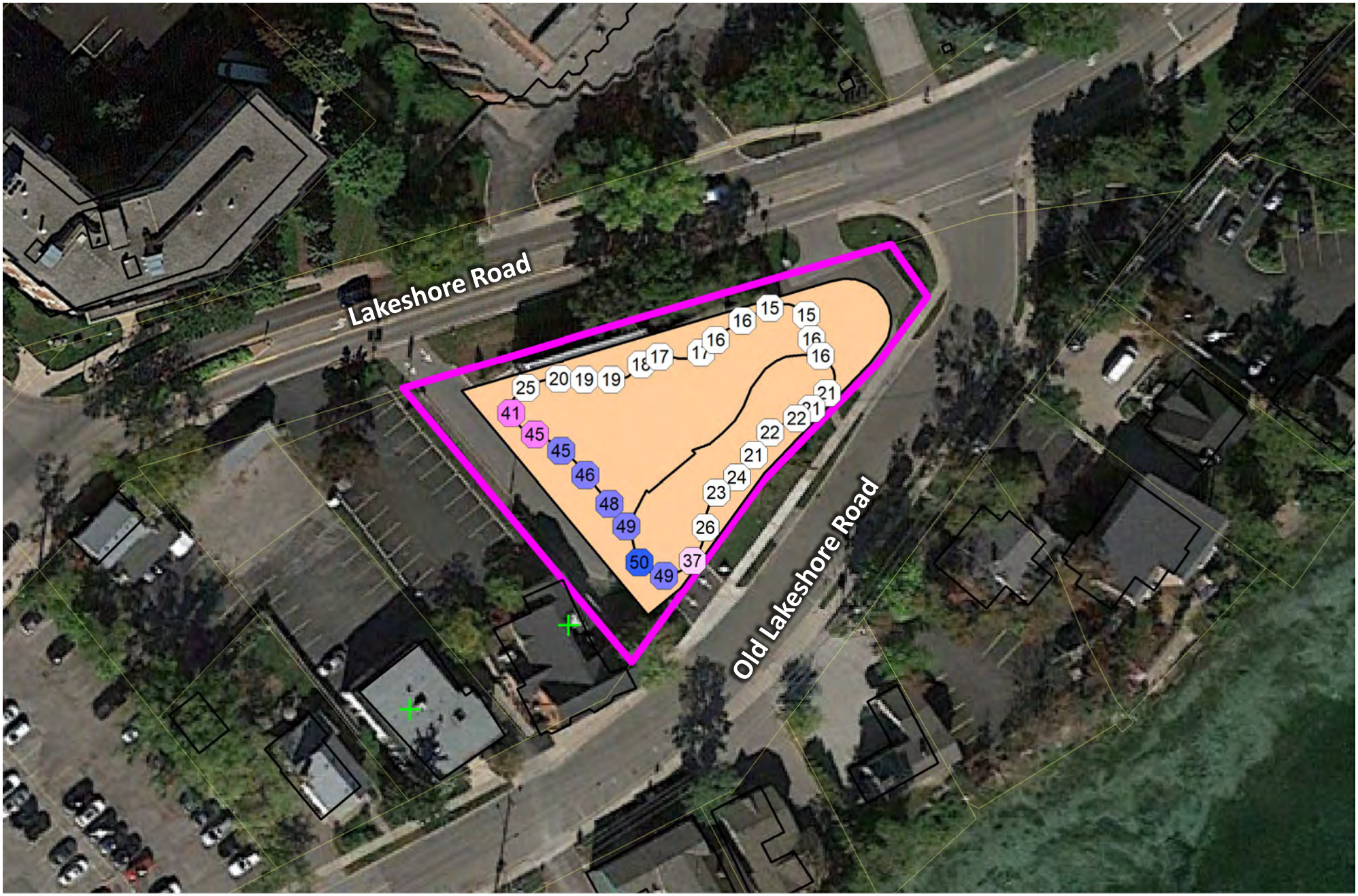
Stationary Sources Modelled

2107 Old Lakeshore Road
Burlington, Ontario

Project North

Scale: 1:700
Date: 09/27/2019
File No.: 18-0119
Drawn By: JWD

novus ENVIRONMENTAL
NOW PART OF SLR



Modelled Building
Development
Modelled Stationary Source

Figure No. **6**

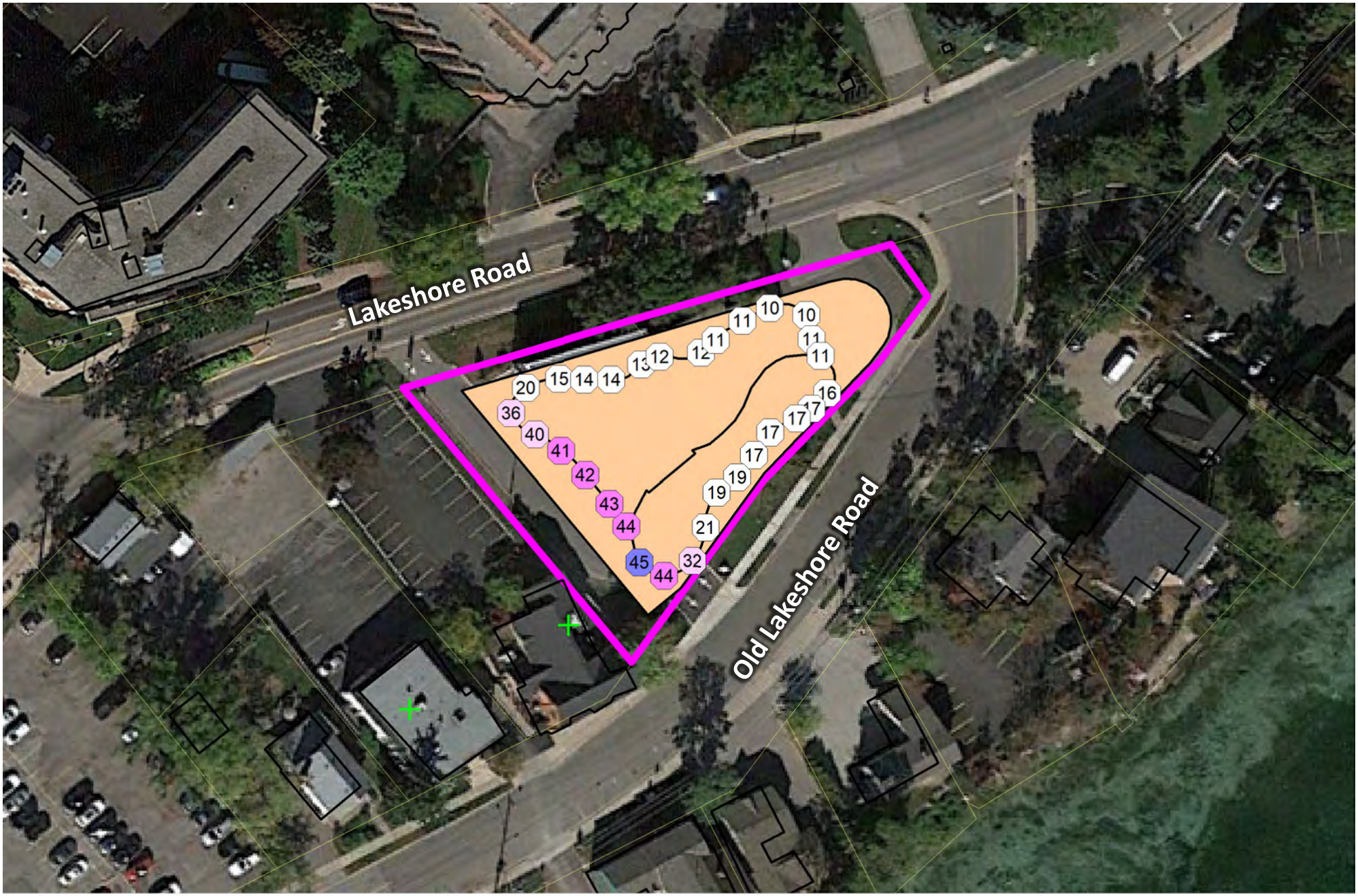
Façade Sound Levels
Surrounding Stationary – Daytime

2107 Old Lakeshore Road
Burlington, Ontario

Project North

Scale: 1:700
Date: 09/27/2019
File No.: 18-0119
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Modelled Building
Development
Modelled Stationary Source

Figure No. **7**

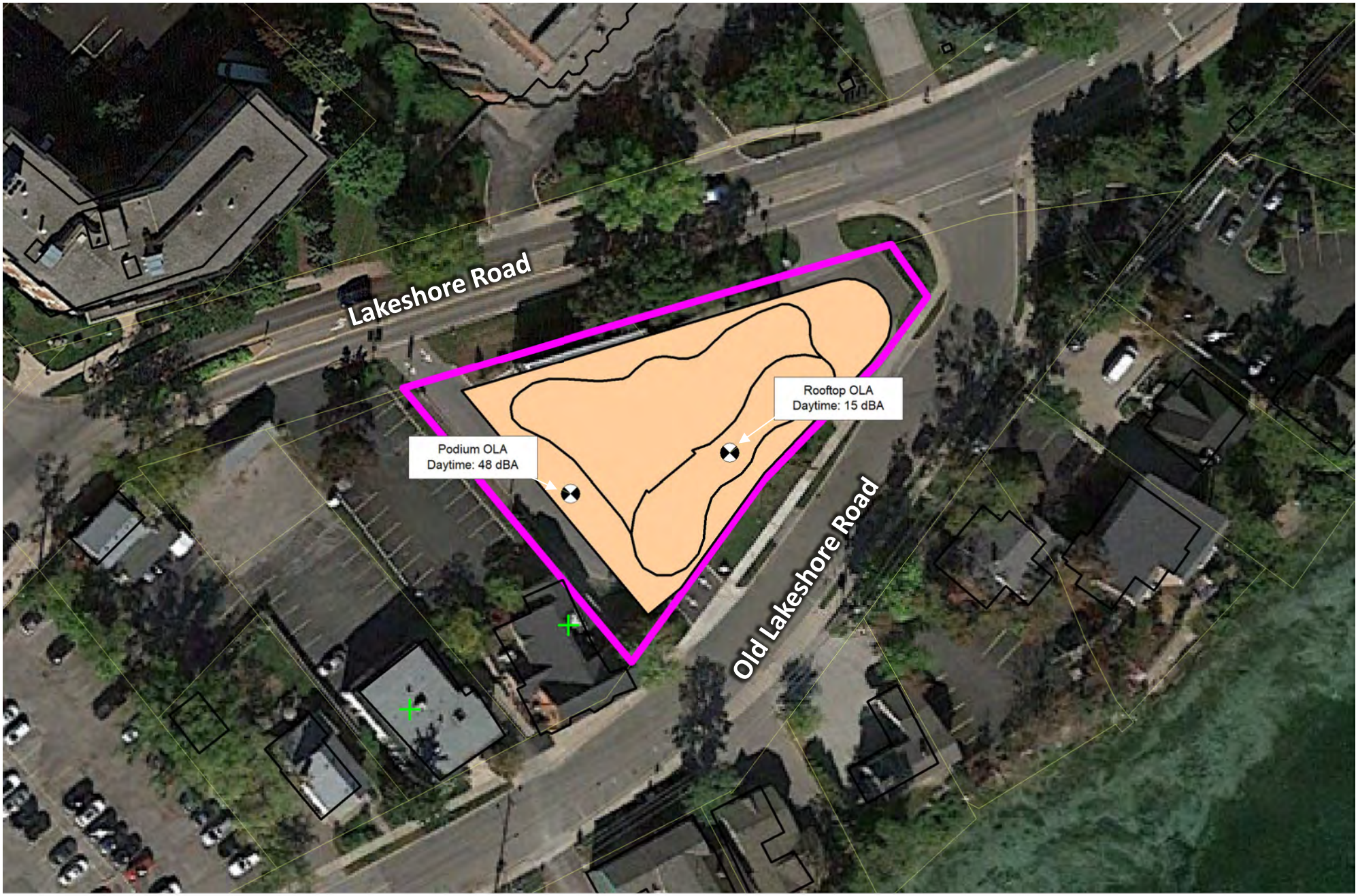
Façade Sound Levels
Surrounding Stationary – Night-time

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Burlington, Ontario

Project North

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NOW PART OF SLR



Property Line
Modelled Building
Development
Modelled Stationary Source
Outdoor Receiver

Figure No. **8**

Outdoor Living Area Sound Levels Surrounding Stationary – Daytime

2107 Old Lakeshore Road
Burlington, Ontario

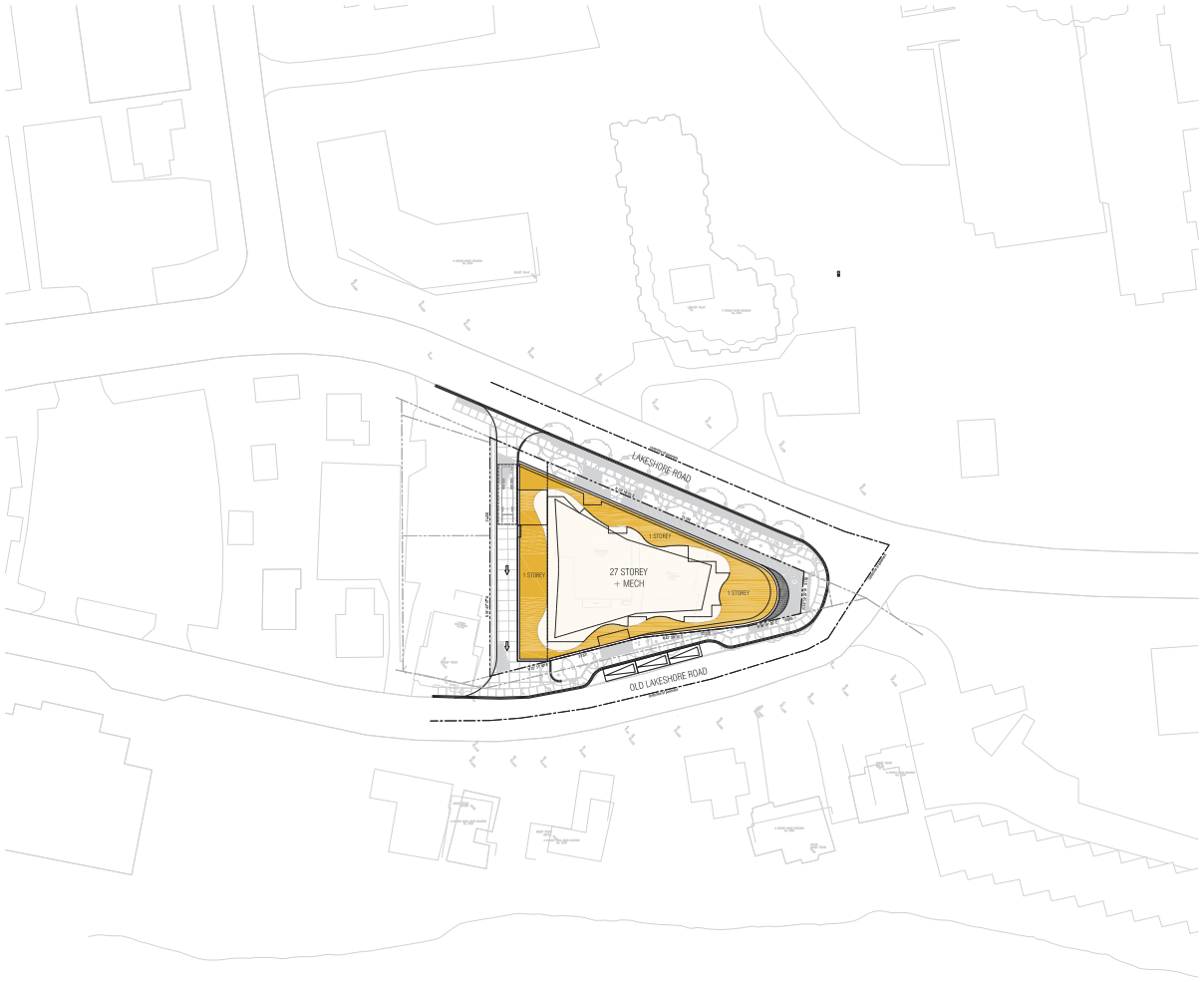
Project North

Scale: 1:700
Date: 09/27/2019
File No.: 18-0119
Drawn By: JWD

novus ENVIRONMENTAL
NOW PART OF SLR

Appendix A

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for 2-sided printing purposes



PROJECT STATISTICS

Nov.14.2019

	Permitted / Required (ZBL-2020)	Proposed	
01. Site Area			
		± 2,229 m2	± 0.20 ha
		± 21,838 ft2	± 0.50 ac
02. Gross Floor Area (G.F.A.)			
Residential			
Ground		± 300 m²	± 3,229 ft2
2nd		± 85 m2	± 701 ft2
3-5,8,11-12,16,18-19,22/23,26-27		± 9,051 m2	± 97,422 ft2
6-7,9-10,13-15,17,20-21,24-25		± 8341 m2	± 89,786 ft2
Mech. Ph.		± 508 m²	± 5,467 ft2
Subtotal		± 18265 m2	± 196,605 ft2
Retail			
Ground		± 584 m²	± 6,282 ft2
Subtotal		± 584 m²	± 6,282 ft2
Total		± 18,849 m2	± 202,886 ft2
03. Gross Building Floor Area (G.B.F.A.)			
Residential			
Ground		± 570 m²	± 6,134 ft2
2nd		± 579 m²	± 6,233 ft2
3-5,8,11-12,16,18-19,22/23,26-27		± 9,576 m2	± 104,151 ft2
6-7,9-10,13-15,17,20-21,24-25		± 8,888 m2	± 95,669 ft2
Mech. Ph.		± 556 m²	± 5,984 ft2
Subtotal		± 20269 m2	± 218,171 ft2
Retail			
Ground		± 598 m²	± 6,440 ft2
Subtotal		± 598 m²	± 6,440 ft2
Total		± 20,867 m2	± 224,611 ft2
04. Floor Area Ratio (F.A.R)	G.B.F.A./Site Area Part 6 - 4.3		
Residential	maximum 4.5	± 10.3	
Total		± 10.3	
05. Setbacks (m)	Part 6 - Digram 6A		
North (Lakeshore Rd.)	minimum 0.5 m below 2 Storey minimum 2.5 m above 2 Storey	2 m below 2 Storey 3 m above 2 Storey	
East (Old Lakeshore Rd.)	minimum 1.0 m below 2 Storey minimum 3.0 m above 2 Storey	5 m below 2 Storey 6 m above 2 Storey	
South (Old Lakeshore Rd.)	minimum 1.0 m below 2 Storey minimum 3.0 m above 2 Storey	3 m below 2 Storey 3.5 m above 2 Storey	
West	minimum 6 m	5 m below 2 Storey 17.5 m above 2 Storey	
06. Building Height	Part 6 - 4.2		
	10 storey 31.5 m	27 storey 102.5m (95.5 m + 7 m mech.) (from established grade to top of roof)	
07. Unit Count			
Ground		± 0	
2nd		± 0	
3rd - 27th		± 150	
Total		± 150	
08. Unit Breakdown			
1 Bedroom		± 0	
1 Bedroom + den		± 25	
2 Bedroom		± 25	
2 Bedroom + den		± 0	
3 Bedroom		± 50	
3 Bedroom + den		± 50	
Total		± 150	
09. Parking	Part 6 - 4.7 (a)		
Residential	1.25 Spaces/Unit = 150 x 1.25 = 188	P1 = ± 25	
		P2 - P4 = ± 108	
		P5 = ± 22	
Total	± 188	± 155	
10. Amenity Space (m2)	Part 6 - 4.1.1		
Indoor	20 m2/Unit = 3,000	± 449	
Outdoor		± 4,128	
Total	3,000	± 4,578	
11. Bicycle Parking	Part 1 - 2.26 (10)		
		Ground = ± 24	
Retail	2 + 1 Spaces/1000 m2 = 2 + (584 x 0.001) = 3	P1 = ± 11	
		P2 - P4 = ± 33	
		P5 = ± 11	
Total		± 79	

GENERAL NOTES

1. For Landscaping, refer to landscape drawings.
2. For proposed grading, refer to landscape drawings.
3. All perimeter existing information indicated taken from survey.
4. All work to be done in conformance with the 2012 Ontario Building Code (O.B.C., as amended).

NOTES

1. This drawing to be read in conjunction with all other drawings comprising the complete set of approved drawings for this development.
2. All roads have been designed to meet the Canadian Highway Bridge Code, CAN/CSA S6 and will be surfaced in order to be accessible under all climate conditions.

SURVEY INFORMATION

TOPOGRAPHIC SURVEY OF
PART OF LOTS 10 AND 12, BLOCK Q
AND ALL OF LOT 11, BLOCK Q
COMPILED PLAN 92
IN THE CITY OF BURLINGTON
REGIONAL MUNICIPALITY OF HALTON

A.T. McLaren Limited
69 John Street South, Suite 230
Hamilton, Ontario L8N 2B9
Tel.(905)527-8559 Fax.(905)527-0032

KEYPLAN



LIST OF DRAWINGS

A101 STATISTICS AND CONTEXT PLAN	1:500
A102 SITE PLAN	1:125
A201 P5 UNDERGROUND PLAN	1:125
A202 TYPICAL UNDERGROUND PLAN	1:125
A203 P2 UNDERGROUND PLAN	1:125
A204 P1 UNDERGROUND PLAN	1:125
A301 GROUND FLOOR PLAN	1:125
A302 2ND FLOOR PLAN	1:125
A303 TYPICAL FLOOR PLAN A	1:125
A304 TYPICAL FLOOR PLAN B	1:125
A305 MECHANICAL FLOOR PLAN	1:125
A401 SOUTH & WEST ELEVATIONS	1:200
A402 NORTH & EAST ELEVATIONS	1:200
A501 SECTIONS	1:200
A502 SECTIONS	1:200

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1320 Sheldon Drive, Cambridge, Ontario, N1R 7H7
Phone 905.765.2601 Fax 905.765.2644 www.g-carchitects.com

PROPOSED MIXED USE DEVELOPMENT

2107-2119 OLD LAKESHORE ROAD

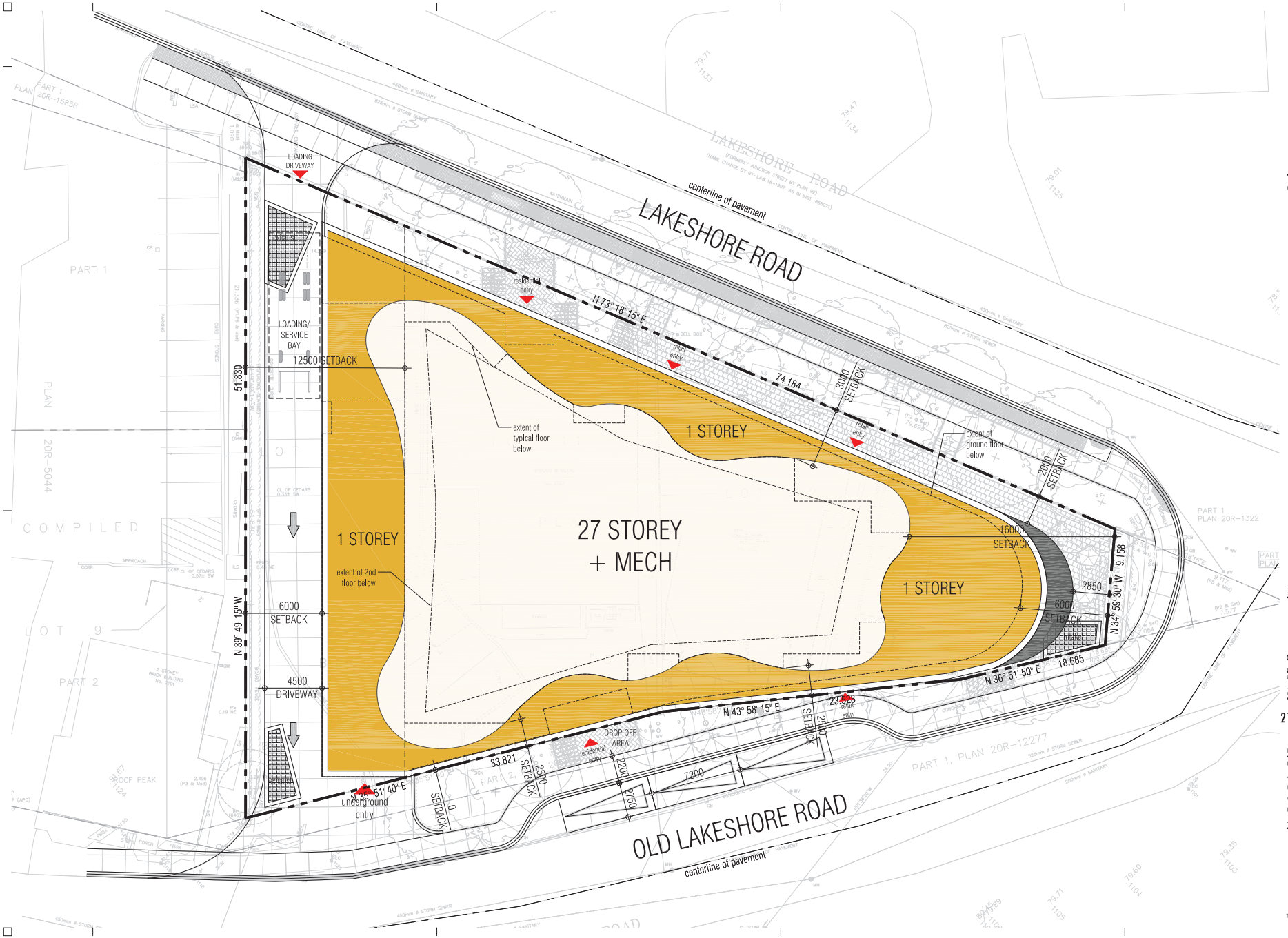
CARRIAGEGATE
BURLINGTON ONTARIO

Project Architect:	E. CORAZZA
Assistant Designer:	M.FAUSTINO
Drawn By:	M.FAUSTINO/W. CHIU
Checked By:	D. BIASE
Plot Date:	Nov. 15, 2019
Job #	1537.17

CONTEXT PLAN & STATISTICS

1:500 A101

TITLEBLOCK SIZE: 610 x 950



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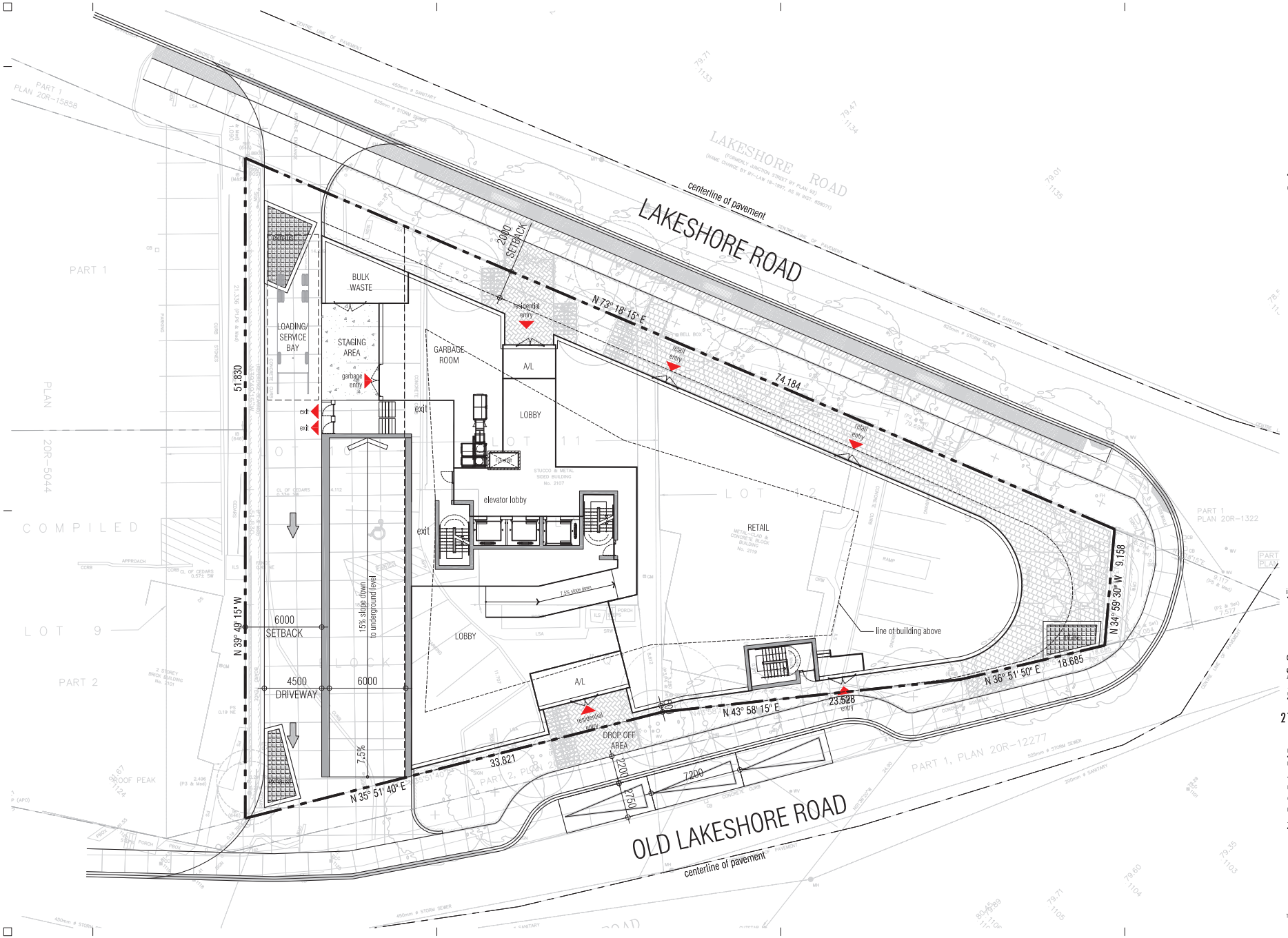
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Assistant Designer:	M.FAUSTINO
Drawn By:	M.FAUSTINO/W. CHIU
Checked By:	D. BIASE
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SITE PLAN

1:125

A103

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CARRIAGEGATE

BURLINGTON ONTARIO

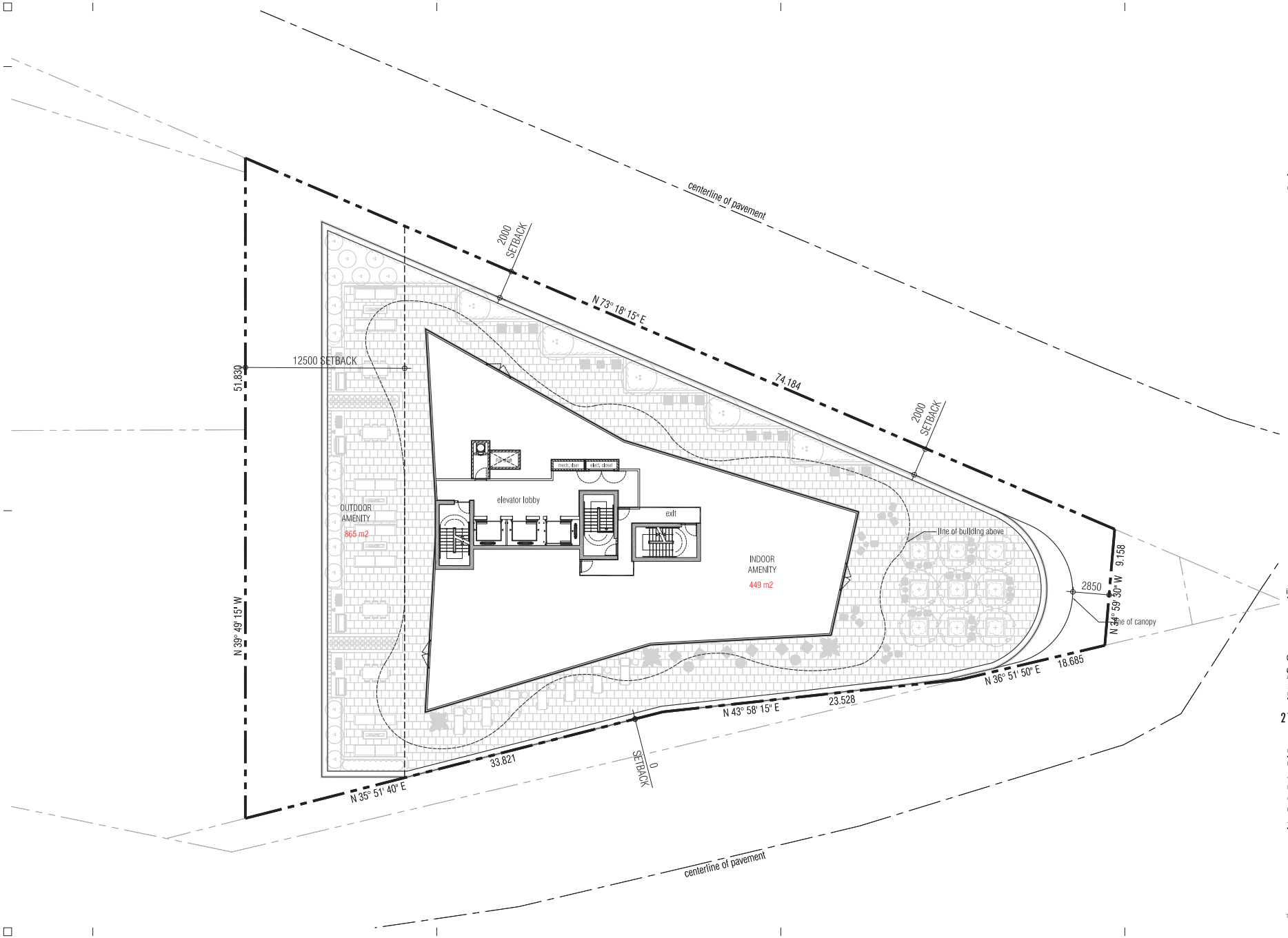
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Assistant Designer:	M.FAUSTINO
Drawn By:	M.FAUSTINO/W. CHIU
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GROUND FLOOR PLAN

1:125

A301

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PROPOSED MIXED USE DEVELOPMENT

2107-2119 OLD LAKESHORE ROAD

CARRIAGEGATE

BURLINGTON ONTARIO

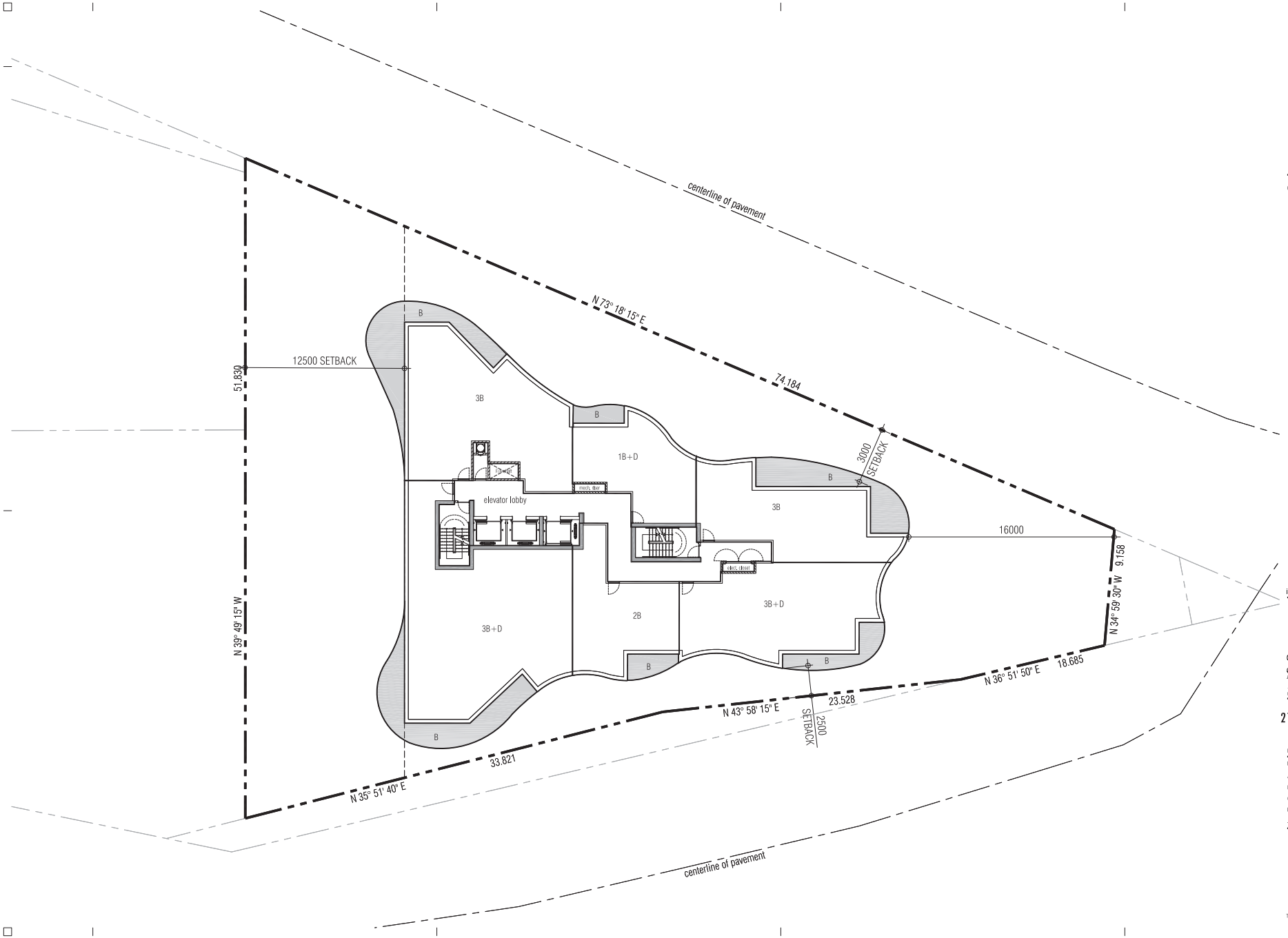
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Assistant Designer:	M.FAUSTINO
Drawn By:	M.FAUSTINO/W. CHIU
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Job #	1537.17

2ND FLOOR PLAN

1:125

A302

TITLEBLOCK SIZE: 610 x 950



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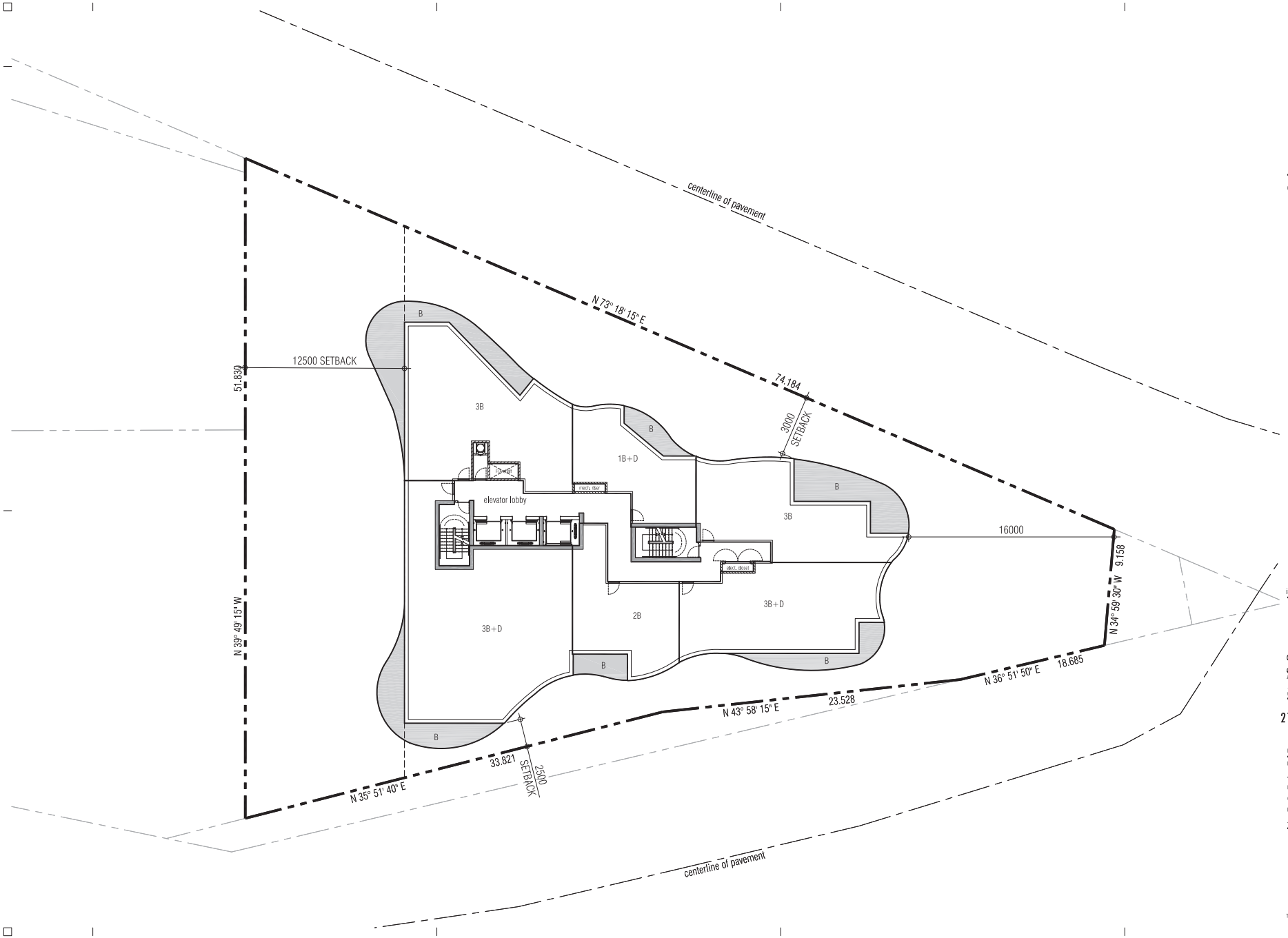
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Assistant Designer:	M.FAUSTINO
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TYPICAL FLOOR PLAN A

1:125

A303

TITLEBLOCK SIZE: 610 x 950



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CARRIAGEGATE

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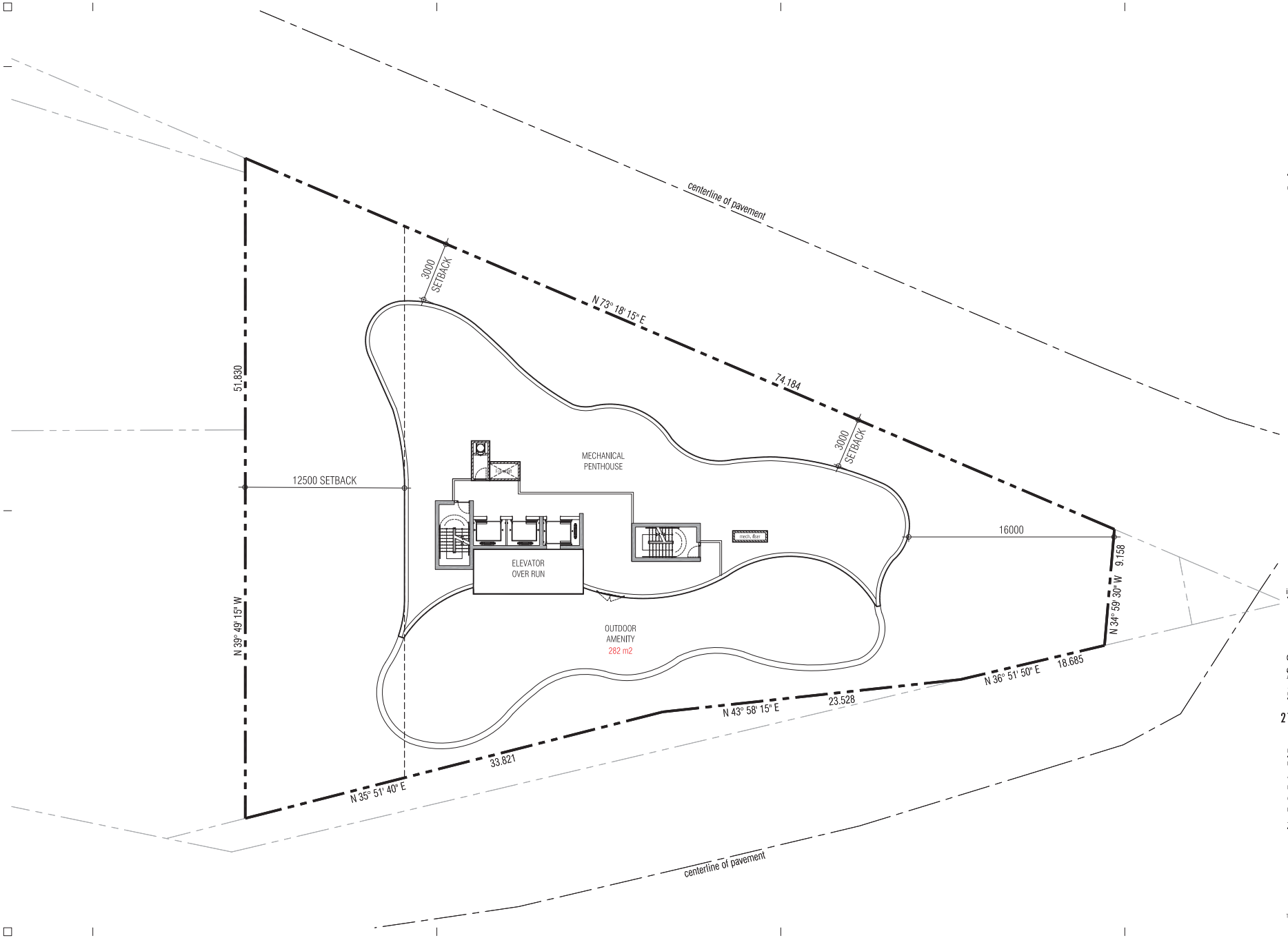
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Drawn By:	M.FAUSTINO/W. CHIU
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Job #	1537.17

TYPICAL FLOOR PLAN B

1:125

A304

TITLEBLOCK SIZE: 610 x 950



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PROPOSED MIXED USE DEVELOPMENT

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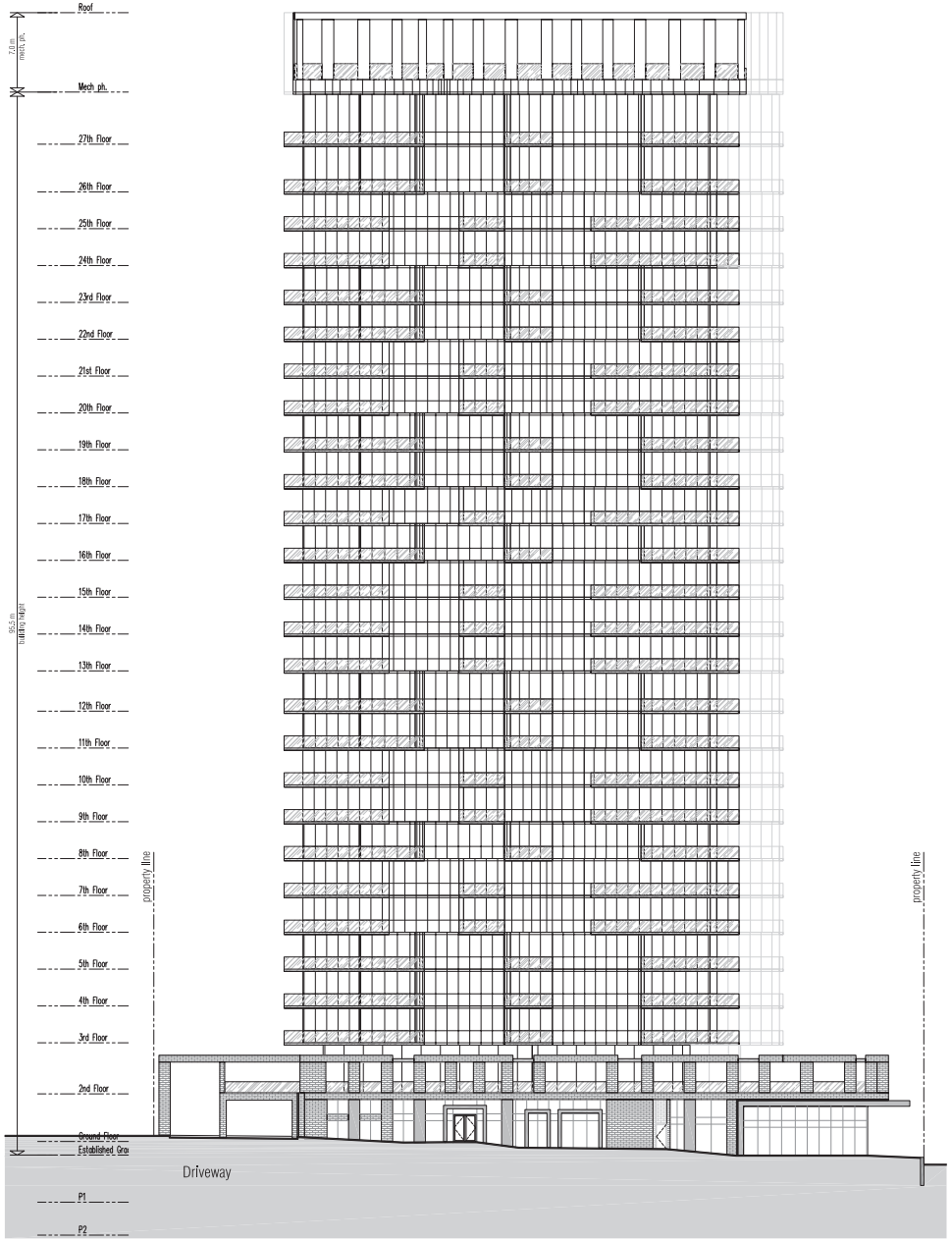
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Plot Date:	Nov. 15, 2019
Job #	1537.17

MECHANICAL FLOOR PLAN

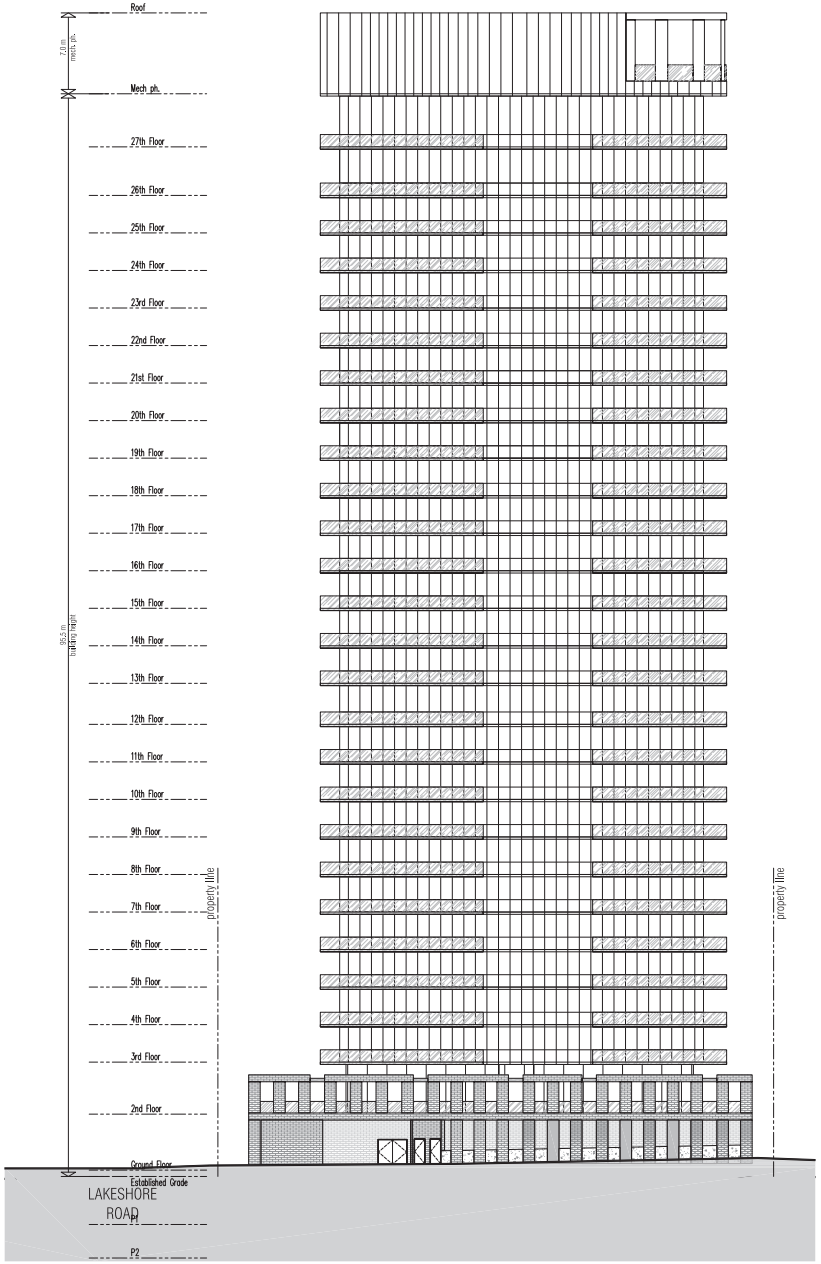
1:125

A305

TITLEBLOCK SIZE: 610 x 950



South Elevation 1 / A401
SCALE – 1:200



West Elevation 1 / A401
SCALE – 1:200

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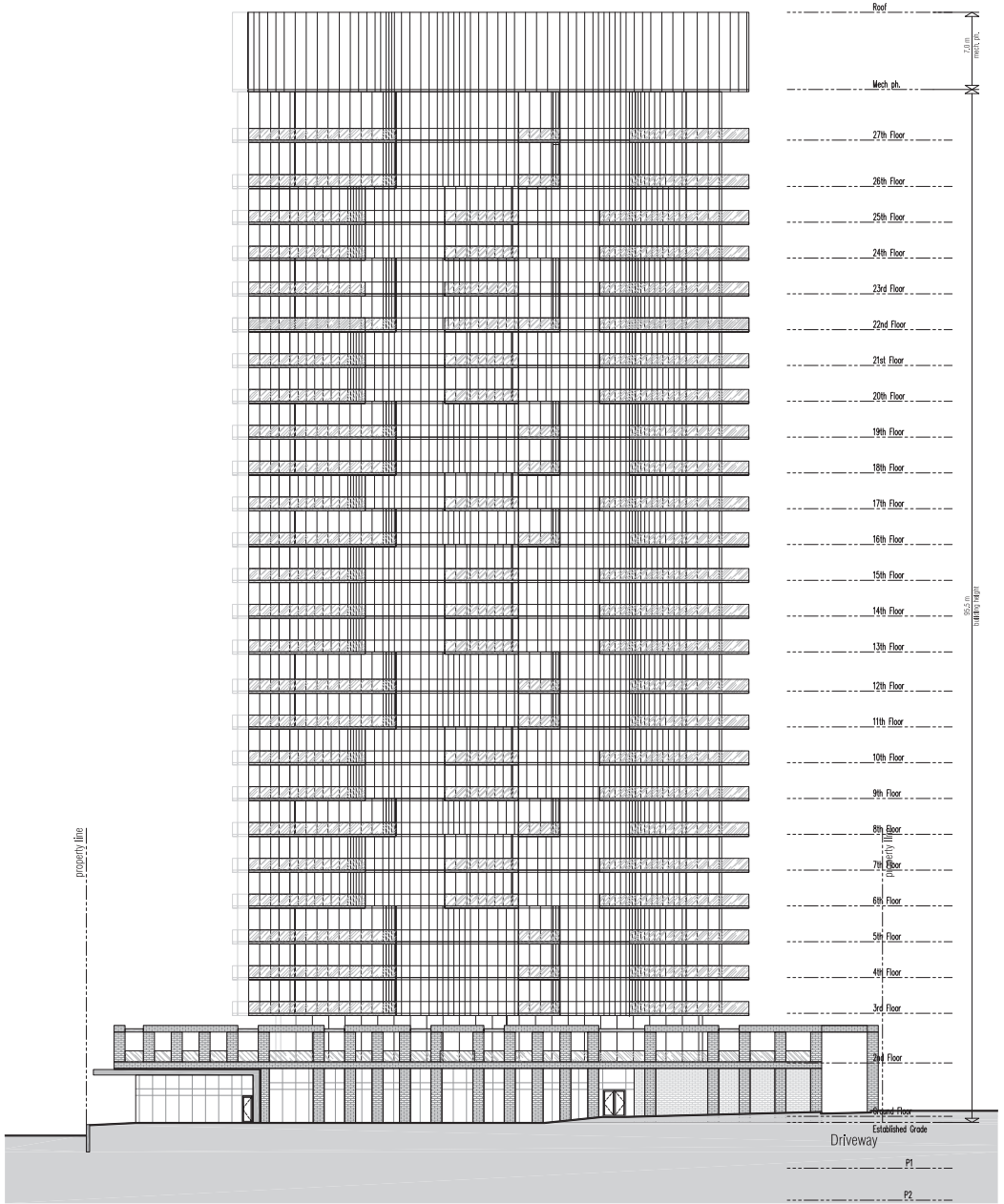
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SOUTH AND WEST ELEVATIONS

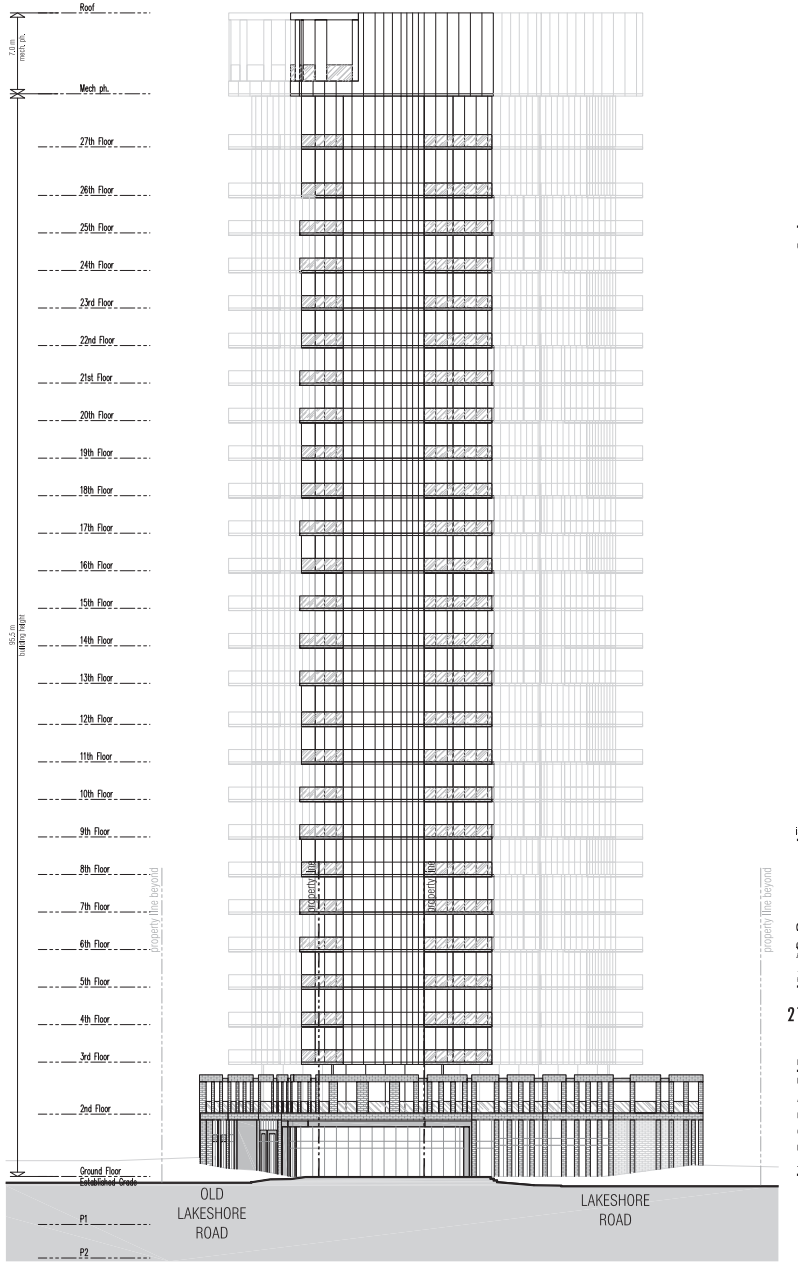
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A401

TITLEBLOCK SIZE: 610 x 950



North Elevation 2 / A402
SCALE – 1:200



East Elevation 2 / A402
SCALE – 1:200

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Suite 100, Mississauga, Ontario, L4W 1C3
Fax 905.795.2644
www.g-c-architects.com

PROPOSED MIXED USE DEVELOPMENT

2107-2119 OLD LAKESHORE ROAD

CARRIAGEGATE

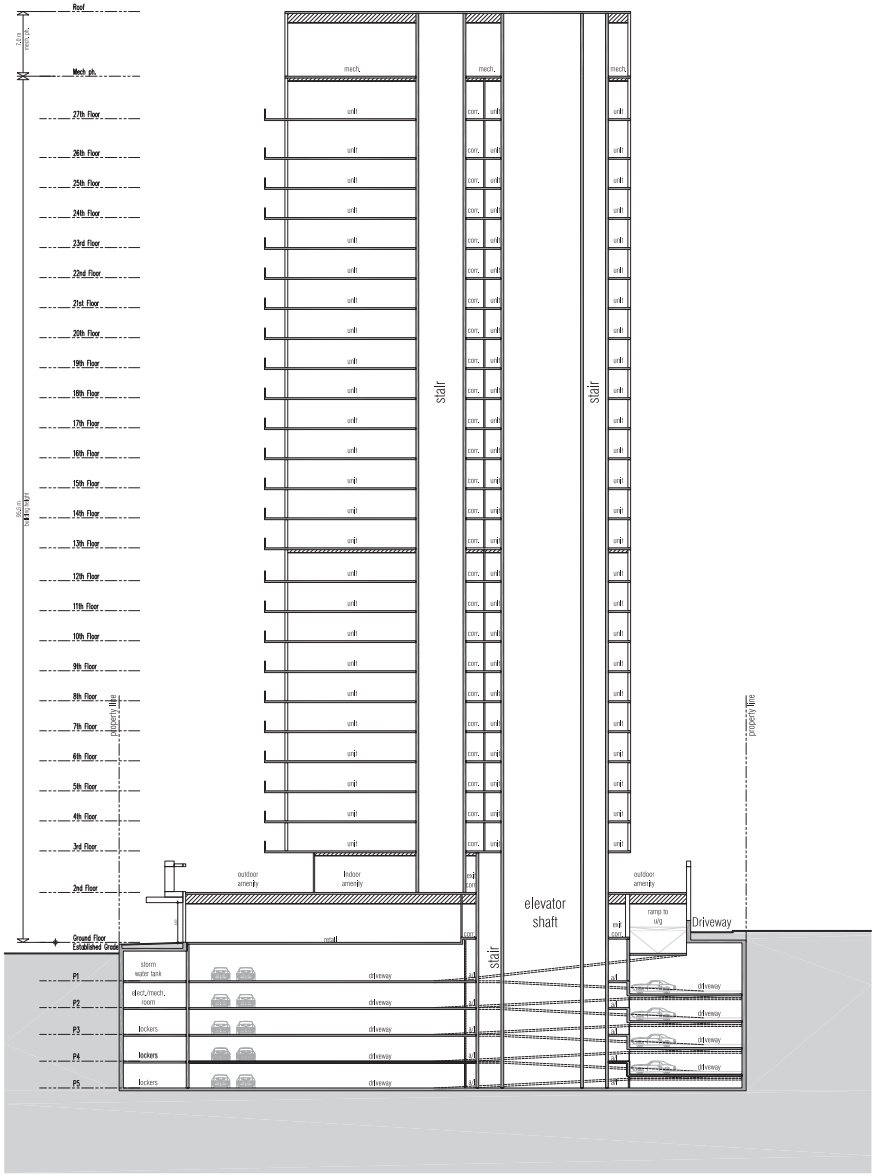
BURLINGTON ONTARIO

Project Architect:	E. CORAZZA
Assistant Designer:	M.FAUSTINO
Drawn By:	M.FAUSTINO/W. CHIU
Checked By:	D. BIASE
Plot Date:	Nov. 15, 2019
Job #	1537.17

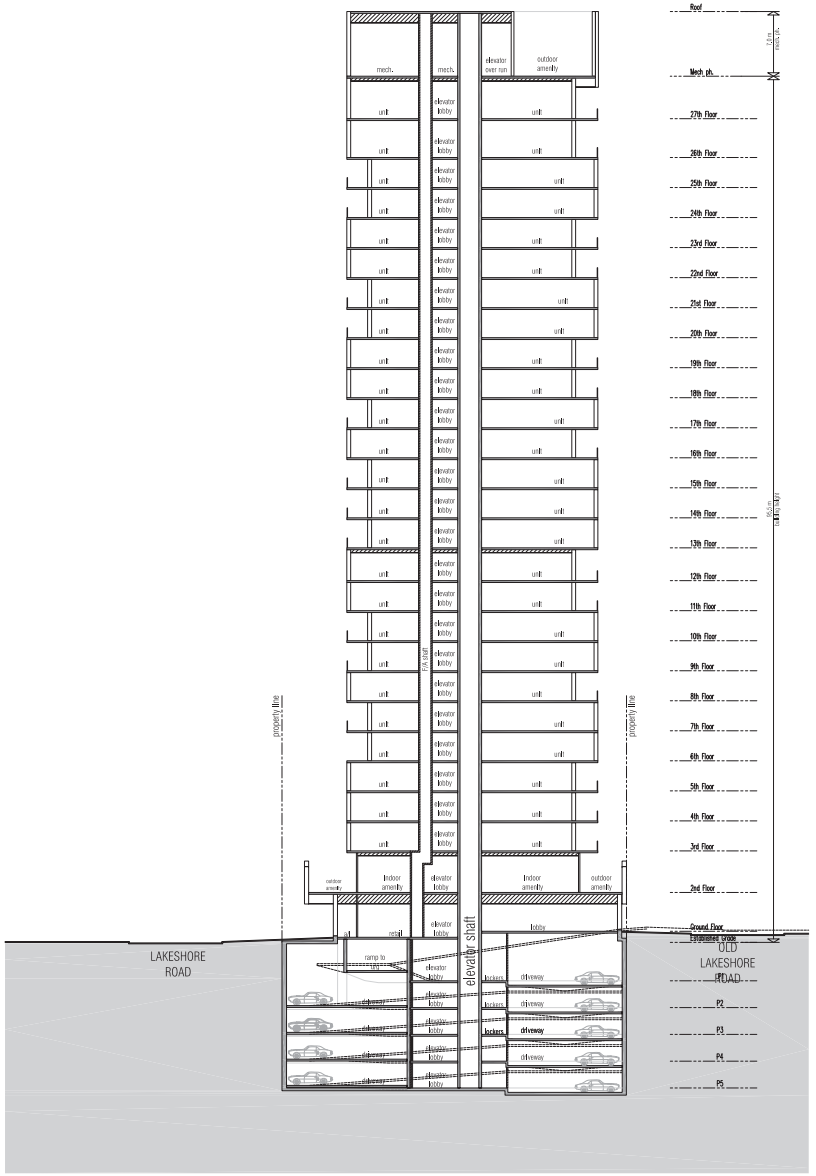
NORTH AND EAST ELEVATIONS

1:200 A402

TITLEBLOCK SIZE: 610 x 950



North – South Section 1 / A501
SCALE - 1:250



East – West Section 2 / A501
SCALE - 1:250

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1. Errors, omissions, inconsistencies due to loss of information in whole or part when information is transferred.
2. Transmission of any virus or damage to the receiving electronic system when information is transferred.

01. NOV.15.2019 ISSUED FOR REZONING APPLICATION

Issued for revisions

GRAZIANI + CORAZZA ARCHITECTS INC.

ONTARIO ASSOCIATION OF ARCHITECTS
ENZO M. CORAZZA
LICENCE 4702

1320 Sheldon Drive, Cambridge, Ontario, N1R 1C3
Phone 905.756.2601 Fax 905.756.2644 www.g-carchitects.com

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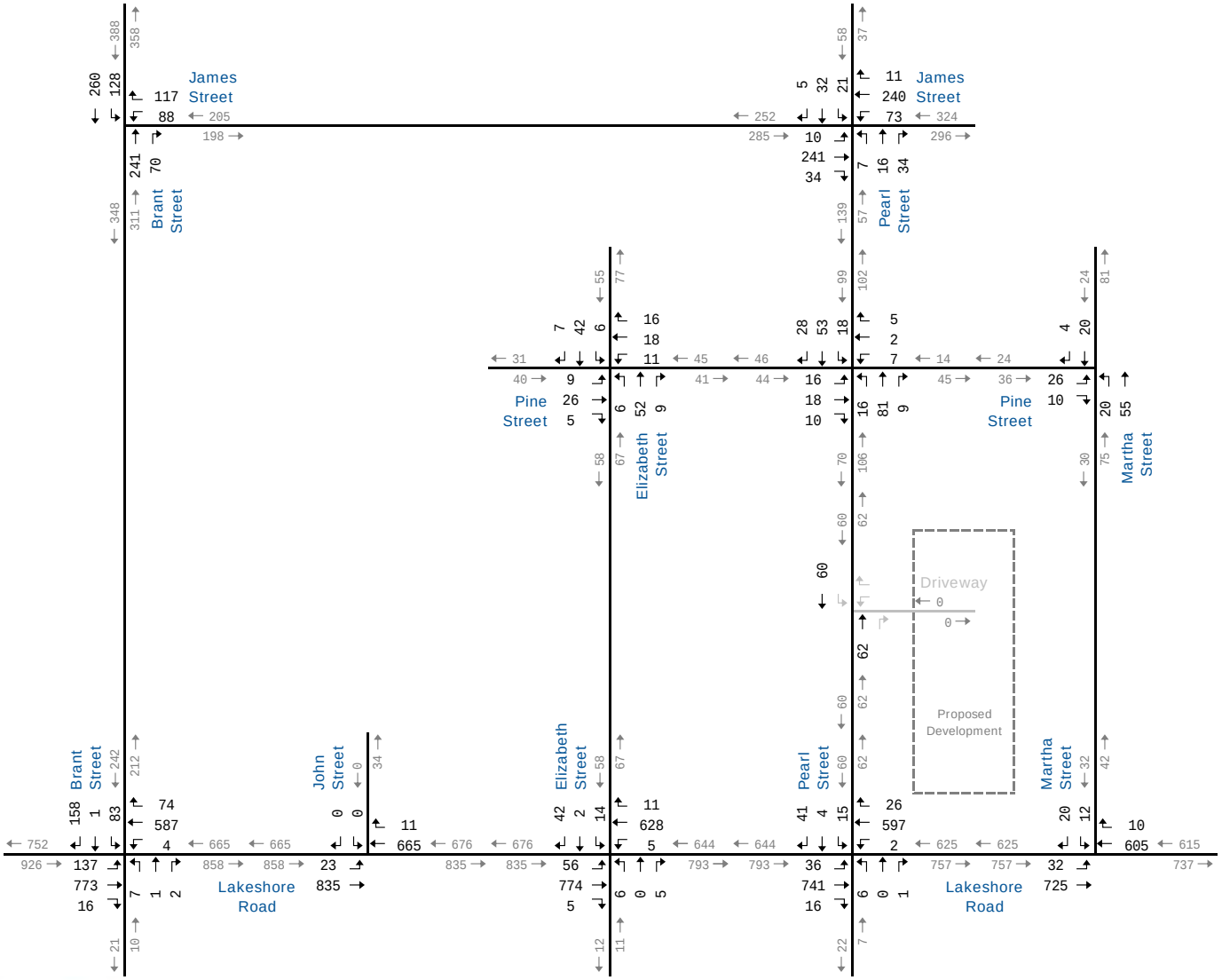
SECTIONS

1:250 A501

TITLEBLOCK SIZE: 610 x 950

Appendix B

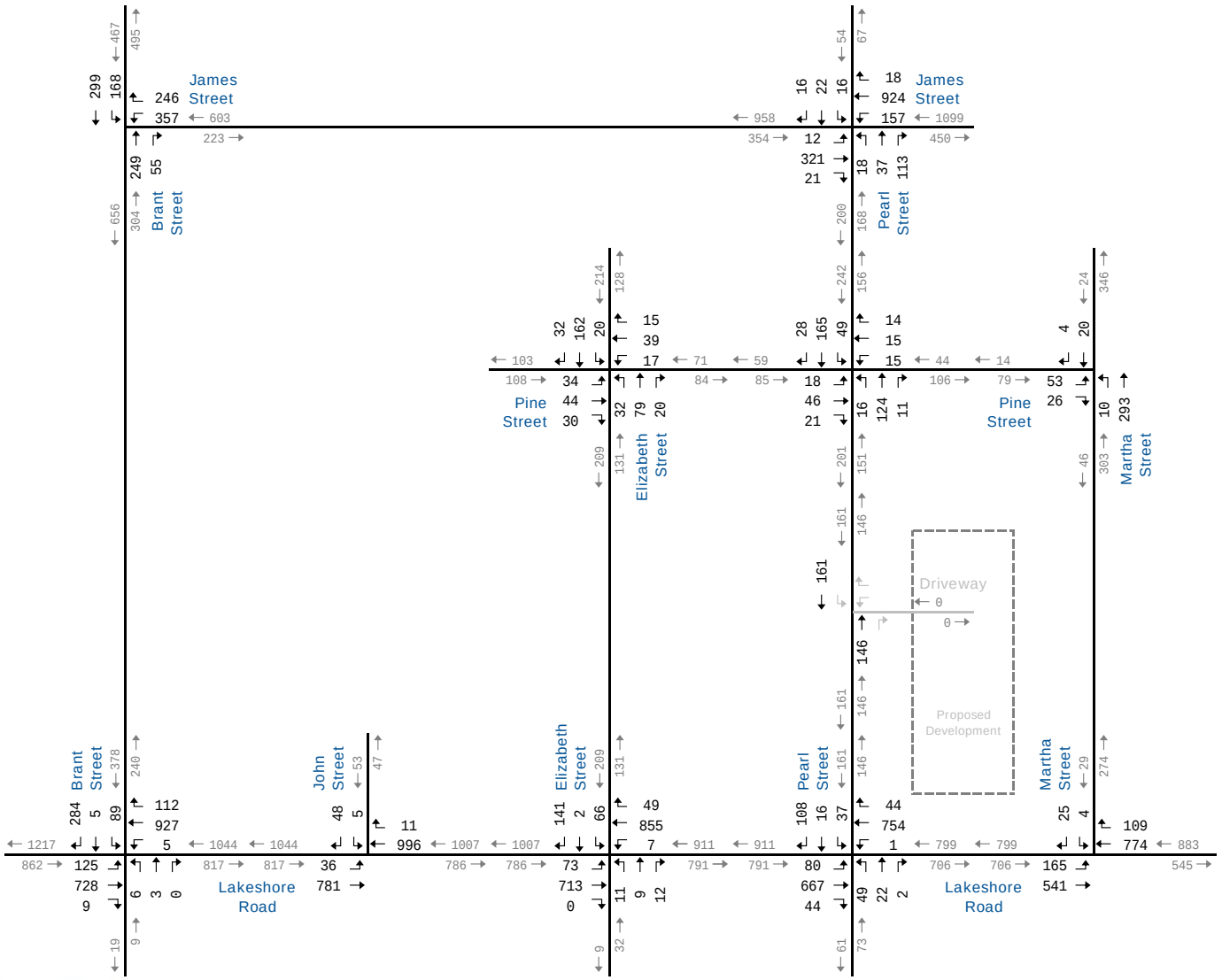
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Adjusted Base Year
AM Peak Hour Traffic Volumes

2069 Lakeshore West
170177

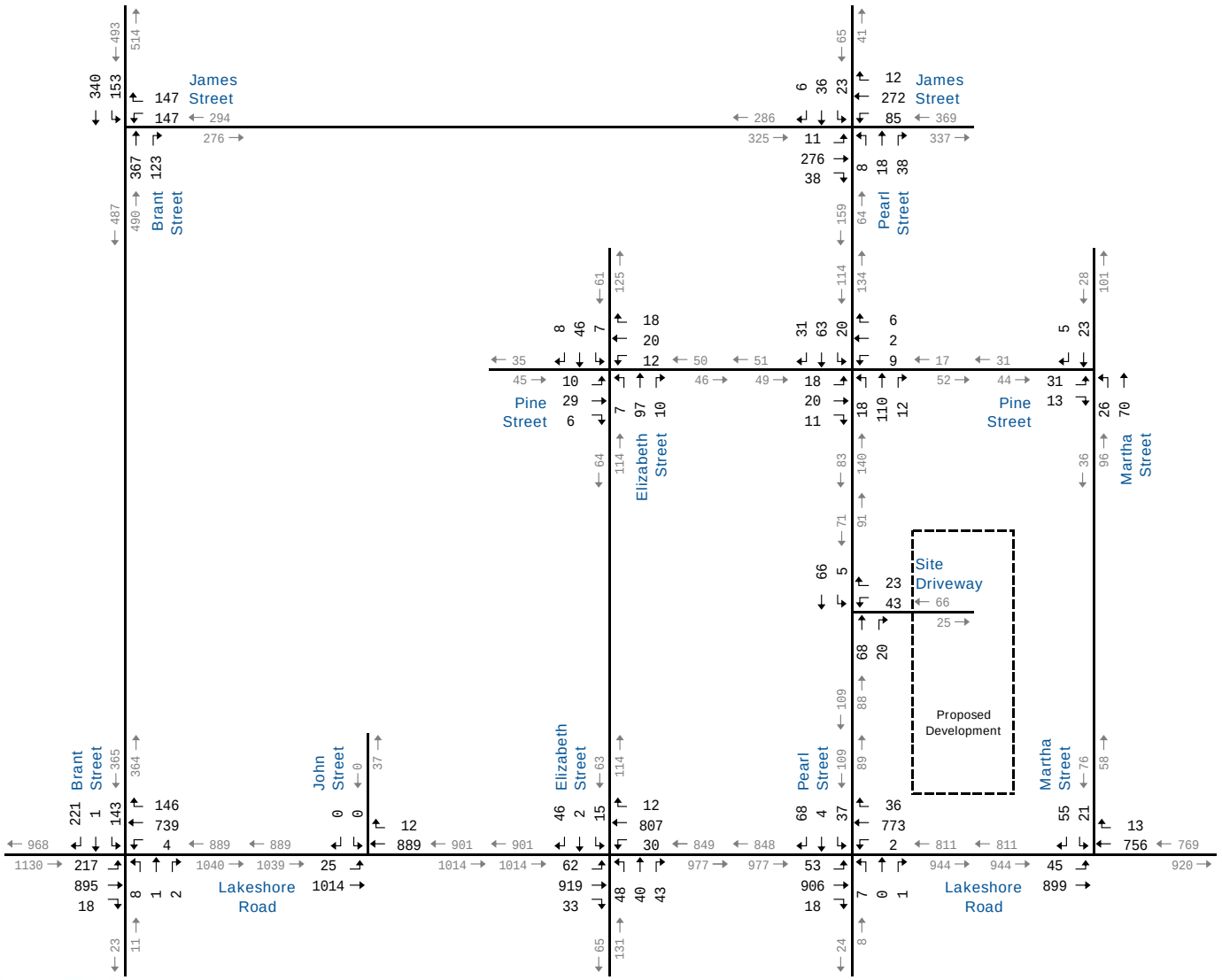
Figure 1A



Adjusted Base Year
PM Peak Hour Traffic Volumes

2069 Lakeshore West
170177

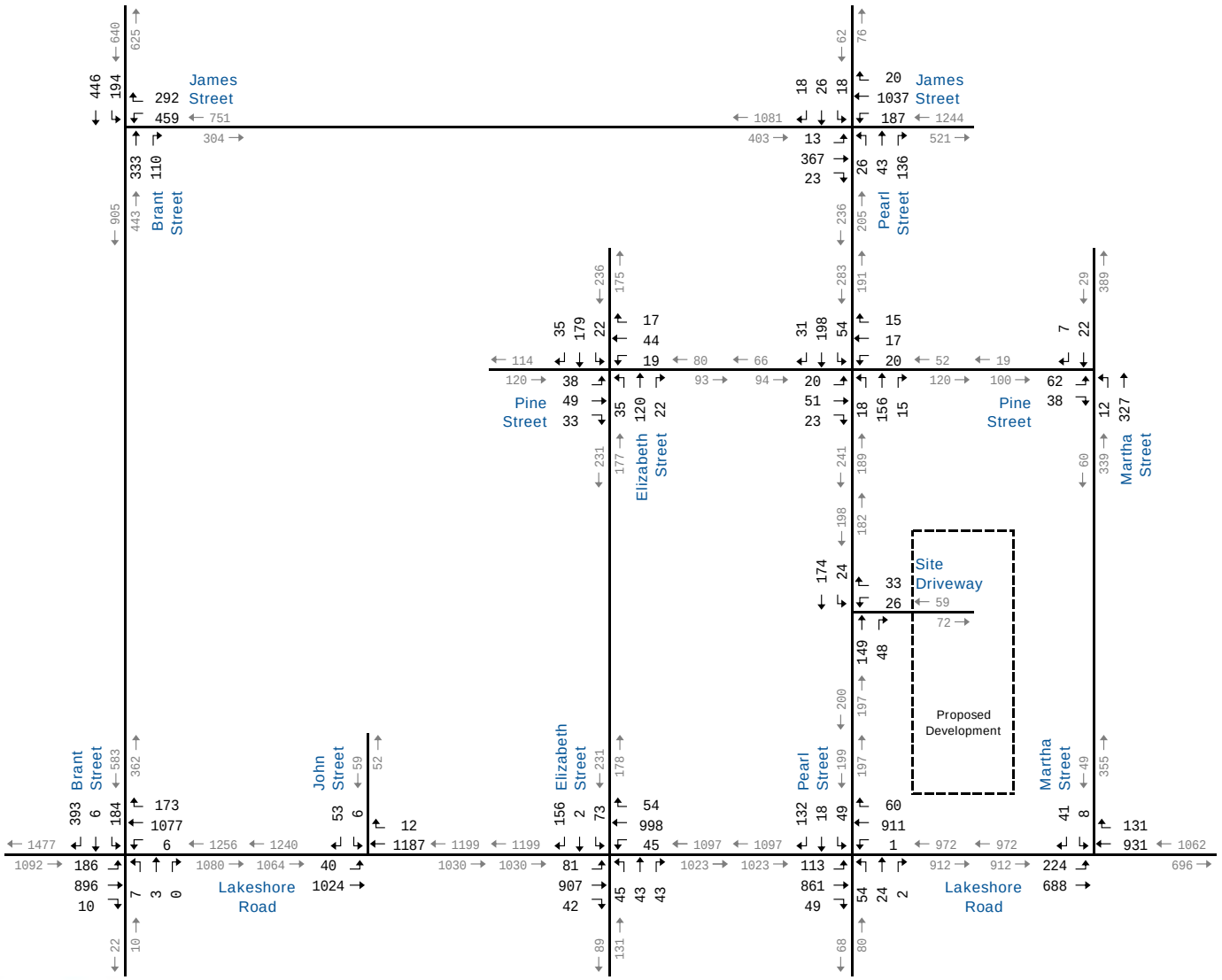
Figure 1B



2027 Total
AM Peak Hour Traffic Volumes

2069 Lakeshore West
170177

Figure 2A



2027 Total
PM Peak Hour Traffic Volumes

2069 Lakeshore West
170177

Figure 2B

O R N A M E N T - Sound Power Emissions & Source Heights

Ontario Road Noise Analysis Method for Environment and Transportation

Road Segment ID	Time Period		Speed (kph)	Period (h)	Total Traffic Volumes	Auto %	Med %	Hvy %	Auto	Med	Heavy	Road Gradient (%)	Cadna/A Ground Absorption G	PWL (dBA)	Source Height, s (m)
Lakeshore West of Martha	Daytime	0700-2300h	50	16	17947	98.3%	1.7%	0.0%	17642	305	0	0	0.00	**78.6**	**0.5**
Lakeshore East of Martha	Daytime	0700-2300h	50	16	17015	98.5%	1.5%	0.0%	16760	255	0	0	0.00	**78.2**	**0.5**
Lakeshore West of Martha	Night-time	2300-0700h	50	8	1994	98.3%	1.7%	0.0%	1960	34	0	0	0.00	**72.0**	**0.5**
Lakeshore East of Martha	Night-time	2300-0700h	50	8	1891	98.5%	1.5%	0.0%	1862	28	0	0	0.00	**71.7**	**0.5**



Modelled Building
Development
Outdoor Receiver

Figure No. **B1**

Stamson Validation

2107 Old Lakeshore Road
Burlington, Ontario

Project North

Scale: 1:700
Date: 09/27/2019
File No.: 18-0119
Drawn By: JWD

novus ENVIRONMENTAL
NOW PART OF SLR

STAMSON 5.0 NORMAL REPORT Date: 24-09-2019 11:40:37
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: Lakeshore Time Period: 16 hours
Description: 1st Floor Receptor Old Lakeshore 2107

Road data, segment # 1: Lakeshore

Car traffic volume : 16760 veh/TimePeriod
Medium truck volume : 255 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Lakeshore

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Lakeshore

Source height = 0.50 m

ROAD (0.00 + 63.18 + 0.00) = 63.18 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.18	0.00	0.00	0.00	0.00	0.00	0.00	63.18

Segment Leq : 63.18 dBA

Total Leq All Segments: 63.18 dBA

TOTAL Leq FROM ALL SOURCES: 63.18

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Appendix C

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Warning Clauses

The following Warning Clauses should be registered on Title and/or included in in all agreements of purchase and sale and/or leases and/or disclosure statements and declarations for the development:

Type C Warning Clause

> "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 low and medium density developments 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."

Type E Warning Clause

> "Purchasers are advised that due to the proximity of the adjacent commercial facilities, sound levels from these facilities may at times be audible."

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Appendix D

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Table D.1: Summary of Noise Source Sound Power Levels

Source Description	63 (dBA)	125 (dBA)	250 (dBA)	500 (dBA)	1000 (dBA)	2000 (dBA)	4000 (dBA)	8000 (dBA)	Total PWL (dBA)	Notes
Carriage House & Water's Edge Salon&Spa										
5 ton HVAC Unit	79	80	80	79	78	73	70	64	82	- based on historical Novus data from similar units - Assumed to operate at 75% duty cicyle during both daytime/evening, and 25% duty cycle at night-time

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