Environmental Noise Feasibility Study
Proposed 1157-1171 North Shore Blvd East Development
Burlington, Ontario

Novus Reference No. 18-0085 Final (v2.2) August 13, 2019

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1.0 INTRODUCTION

Novus Environmental Inc. (Novus) was retained by Amico Properties (Amico) to conduct a noise assessment for the proposed seniors living centre re-development at 1157-1171 North Shore Boulevard East in Burlington, Ontario. This assessment is in support of the Official Plan Amendment and Zoning By-law Amendment (OPA/ZBA) application.

The Region's Noise Abatement Guidelines (NAG) were developed to provide an overview of the approved policy and outlines implementation processes for Existing Residential Development, Regional Capital Road projects and New Developments. The applicable portion of the NAG for this assessment is Section 4.0 – New Development.

In general terms, the NAG requires noise to be addressed from traffic, industry, commercial plazas, and any other noise sources which exceed the Ministry of the Environment, Conversation and Parks (MECP, formerly MOECC) guidelines. These sources are required to be addressed for noise sensitive land uses, such as residential buildings (e.g. single family homes, apartments and condominiums), and institutional buildings (e.g. hospitals, old age homes, etc.). In addition, the City of Burlington has provided guidance for applications which has been included in this report.

1.1 Nature of the Subject Lands

The proposed development is to be located at 1157-1171 NorthShore Boulevard in Burlington, Ontario. The site is at the northeast corner of Northshore Boulevard and the Queen Elizabeth Highway (QEW). The site is currently occupied by a co-operative building, which is intended to be demolished through the development. The site is approximately 4.47 acres in size.

The proposed development would include the demolition of all existing buildings on the site (two four-storey residential buildings and a single-storey garage) and the redevelopment of the site for seniors living. The proposed development will consist of a tall point tower, mid-rise building and podiums levels. The heights of the various built form elements as proposed range between a single and 18 storeys (including penthouse). Copies of the proposed development can be found in **Appendix A**.

The site plan of the proposed development is provided in **Figure 1**.

1.2 Nature of the Surroundings

Immediately surrounding the site is the QEW to the south through west, low-rise residential buildings to the northwest and north, with mid-rise residential buildings to the northeast and east. To the southeast is a low-rise commercial building on the opposite side of North Shore Boulevard. Beyond the immediate surroundings there is low-rise residential buildings to the south through west to north; mid-rise residential buildings to the northeast, along North Shore Boulevard East; and low-rise institutional (Joseph Brant Hospital) and residential buildings (Chartlwell Brant Centre LTC Residence) to the east and southeast. Lake Ontario is 400m to

the east and Hamilton Harbour is 500m southwest. The Skyway Wastewater Treatment Plant is also located to the southeast.

The topography immediately surrounding the proposed development has substantial elevation changes that have been incorporated into the assessment. **Figure 2** shows the site and surrounding area.

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 nearby roadways (predominantly from the QEW).

The area surrounding the proposed development site is mainly residential, however, there are a few commercial/institutional properties along North Shore Boulevard East and industries along the water.

The Chartwell Brant Centre LTC Residence is required by the City of Burlington Noise By-law to meet the MECP NPC noise guideline limits at the adjacent high-rise residential building to the east of the development. This building is the Lakewinds Condo (1201 North Shore Boulevard), located directly opposite the Chartwell Brant Centre LTC Residence. Therefore, the Chartwell Brant Centre LTC Residence noise is not expected to impact the proposed development, and a detailed assessment of impacts is not required.

Both the Joseph Brant Hospital and Burlington Cultural Centre have existing Environmental Compliance Approvals with requirements to meet the MECP noise guidelines. Therefore, the noise guideline limits are expected be met at closer intervening noise sensitive buildings and would not impact the proposed development. A detailed assessment of impacts is not required for these facilities.

The Skyway Wastewater Treatment Plant also has an existing Environmental Compliance Approval, with requirements to meet the MECP NPC noise guideline requirements, and a Noise Abatement Action Plan (NAAP) in place for the facility. Therefore, the Skyway Wastewater Treatment plant is expected to meet the MECP NPC-300 noise guideline limits at all surrounding noise sensitive land uses surrounding this facility. This includes the Chartwell Brant Centre LTC facility, which is located between the proposed development and the Skyway Wastewater Treatment plant. Therefore, noise impacts from the Skyway Wastewater Treatment Plant would not impact the proposed development, and a detailed assessment of impacts is not required.

2.0 Transportation Noise Impacts

2.1 Transportation Noise Sources

Transportation noise sources of interest with the potential to produce noise at the proposed development are the QEW, North Shore Boulevard East and associated ramps. Sound exposure levels at the development have been predicted, and this information has been used to identify façade, ventilation and warning clause requirements.

No impacts are anticipated at the project site from airports or rail traffic due to the large separation distance between the project and any surrounding rail lines or airports. As a result, these two types of transportation sources are not discussed any further in this report.

There are no significant sources of vibration in the area that are anticipated to affect the project. As a result, vibration is not discussed further in this report.

2.2 Surface Transportation Noise Criteria

The NAG requires noise to be addressed from traffic and other sources that exceed the MECP guideline limits. The most applicable MECP guideline for transportation noise levels is Publication NPC-300.

2.2.1 Ministry of the 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. **Table 1 to Table 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 (Leq) 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, 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 outdoor amenity areas ("Outdoor Living Areas" or "OLAs"). Even though elevated amenity spaces are excluded from the Halton Region noise guidelines, the City of Burlington has requested them to be included in the report. As a result, all outdoor amenity spaces that qualify under MECP NPC-300 have been assessed in this report.

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

Time Period	Equivalent Sound Level in Outdoor Living Area (dBA)	Mitigation Requirements and Warning Clauses
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

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

Ventilation and Warning Clauses

Table 3 summarizes requirements for ventilation where windows potentially would have to remain closed as a means of noise control. Despite implementation of ventilation measures where required, if sound exposure levels exceed the guideline limits in **Table 1**, warning clauses advising future occupants of the potential excesses are required.

Warning clauses also apply to the OLA, where an excess of up to 5 dBA over the 55 dBA OLA limit is often acceptable to many, particularly in the context of an urban environment. Warning clauses are discussed further in **Section 2.6**.

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

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - Leq (dBA) Road	Rail [1]	Ventilation and Warning Claus Requirements [2]
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.

In addition to the above requirements, the City of Burlington requires that feasibility of reaching 55 dBA be included in the assessment and does not automatically accept the use of a warning clause.

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. The resultant sound isolation parameter is required to be combined to determine and overall acoustic parameter.

2.3 Traffic Data

Road traffic data and growth rates were obtained through a combination of City of Burlington and MTO information requests. MTO data from 2006 was used to obtain the QEW commercial traffic percentage. Both the 2006 AADT and truck volume data were used in the estimation. MTO data from 2016 was used to grow the AADT to the 2031 future year used in the analysis. Traffic volumes for both North Shore Blvd. E. and the QEW ramps were provided for the 2016 year and grown to the future 2031 year. Based on the Transportation Impact Study conducted by IBI, a growth rate of 1.1% was used for all roadways that were modelled. Copies of all traffic data used and calculations can be found in **Appendix B**. The following table summarizes the road traffic volumes used in the analysis.

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

Roadway Link	2031 Traffic Levels (AADT)	Day/ Night % Split		Commercial Traffic Breakdown		Vehicle Speed (km/h)
		Daytime	Night-time	% Medium Trucks	% Heavy Trucks	
QEW NB	95032	90	10	2.9%	8.8%	100
QEW SB	95032	90	10	2.9%	8.8%	100
North Shore EB to QEW NB Ramp	1093	90	10	1.8%	1.5%	40
North Shore WB to QEW NB Ramp	3681	90	10	1.9%	1.7%	50
QEW NB Offramp to North Shore	9923	90	10	1.4%	1.2%	60
North Shore East of Ramp EB	14371	90	10	1.6%	1.4%	60
North Shore East of Ramp WB	14717	90	10	1.6%	1.4%	60
North Shore West of Ramp EB	7497	90	10	1.9%	1.6%	60
North Shore West of Ramp WB	12991	90	10	1.5%	1.3%	60

2.4 Projected Sound Levels

Future (2031) road 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 were validated and are generally equivalent to those made using the MECP's ORNAMENT or STAMSON v5.04 road traffic noise models.

A validation file (daytime sound levels) is included in **Appendix B**. This file includes 2 locations at the proposed property as follows:

- NR1 is a receptor on the southwest façade of the building, at a height of 2.5 above grade; and
- A 7.5m receptor above grade has been modelled on the southeast façade of the building and labelled NR2.

The validation files do not include the property line berm/barrier/retaining wall, as the effects of this combined with ground topography in Cadna is generally too complex for proper modelling in STAMSON. The general ground level topography has not been included in the STAMSON modelling and is likely the cause for the slightly higher predicted results in STAMSON. Even still, both sets of receptors are within 1 dB between models.

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. Based on drawings, only facades that could contain bedrooms or living areas were considered in the analysis to be noise sensitive. Approximate ground level elevation contours were included in the modelling to include topographical features between the development and transportation sources.

Predicted worst-case façade sound levels are presented in **Table 6**. The predicted sound levels do not significantly change with building elevation. As both the QEW and North Shore Blvd. E. are the dominant sound sources, the largest change in predicted façade levels are due to separation distance and self screening effects. The highest predicted noise levels are on the southwest facades that face the QEW. The façade maps of the development showing predicted roadway impacts are shown in **Figure 3 and Figure 4** for daytime and night-time sound levels, respectively.

Table 6: Summary of Predicted Roadway Noise Impacts – Façades

Building Section	Façade[1]	Roadway Sound Levels	
		L_{eq} Day (dBA)	L_{eq} Night (dBA)
East Tower	Northwest	68	62
	Northeast	61	55

Building Section	Façade[1]	Roadway Sound Levels L_{eq} Day (dBA)	Roadway Sound Levels L_{eq} Night (dBA)
	Southeast	71	64
	Southwest	72	65
Mid-Rise	Northwest	71	64
	Northeast	60	54
	Southeast	71	65
	Southwest	74	67
Podium	Northwest	72	66
	Northeast	58	52
	Southeast	72	65
	Southwest	69	62

Notes: [1] See **Figure 3 and 4** for corresponding façade locations.

Sound levels were predicted at all noise-sensitive façades (residential units) throughout the development. The highest levels on each façade (excluding the northeast façade as it is screened form the QEW) was generally found to be above the 65 dBA daytime and 60 dBA the night-time limits.

2.5 Facade Requirements

Based on the roadway noise levels shown in **Table 6**, façade sound levels were predicted to exceed the above criteria at multiple locations throughout the development. 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 roadway noise impacts. The worst-case daytime and night-time period impacts were considered, with the highest STC requirement calculated for each façade location.

Detailed floor plans were not available at the time of this assessment. For the analysis, generic bedrooms and living rooms have been considered. The following assumptions have been made regarding window glazing as a percentage of wall area for the mid-rise building:

- 70% for living rooms, which have the potential to be located at corners with 2 exposed sides.
- 50% for bedrooms, which will be located mid-span only.
- Non-glazing portions of the wall have an STC rating of 43.

The predicted maximum acoustical glazing requirements are provided in **Table 7** below.

Areas where acoustical requirements are not outlined, typical OBC windows and walls are expected to be sufficient. Any glazing configuration meeting the minimum structural and safety requirements of the Ontario Building Code, which generally produces a minimum STC for glazed elements of STC 29, is sufficient.

Façade Calculations are provided in **Appendix C**.

Table 7: Summary of Façade STC Requirements

Building Section	Façade	STC Glazing Requirements	
		Living Room	Bedroom
East Tower	Northwest	OBC (26)	OBC (28)
	Southeast	OBC (29)	32
	Southwest	30	33
Mid-Rise	Northwest	OBC (29)	32
	Southeast	OBC (29)	32
	Southwest	32	35
Podium	Northwest	30	33
	Southeast	30	33
	Southwest	OBC (27)	OBC (29)

The northeast façade is the only façade that does not need upgraded glazing. All other facades (depending on the usage) would require upgrade glazing to meet the applicable indoor limits.

The combined glazing and frame assembly must be designed to ensure the overall sound isolation performance for the entire window unit meets the sound isolation requirements provided. It is recommended that window manufacturers test data be reviewed to confirm the acoustical performance is met.

As the design progresses, final acoustical requirements should be reviewed as part of the final design at the Building Permit stage.

2.6 Outdoor Living Areas

Outdoor living areas (OLA) of the proposed development, with the potential to be impacted by transportation noise, were assessed at six representative locations. Two of these are located at ground level, one in the north and one in the south courtyards. Although elevated amenity spaces are excluded from the Halton Region noise guidelines, The City of Burlington has requested to include the four representative elevated terrace locations. These being the 3rd floor terrace facing south (between the mid-rise and tower) and the three on the 7th floor (northeast roof, mid-rise and east tower). The OLA assessment locations and the predicted "unmitigated" noise impacts from the roadway are shown in **Figure 5**.

A 1.2m parapet wall has been included around the elevated terraces, the landscaped wall to the northwest (backing onto the townhouse lots) and the acoustic wall running along the western

property line have been included in the "unmitigated" results. The locations of these are included in **Figure 5**.

Table 8: Summary of Predicted Roadway Noise Impacts – OLA

Location	Road Impacts L_{eq} Day (dBA)	Applicable Guideline Limit L_{eq} Day (dBA) [1]	Meets Criteria? (Yes/No)
South Courtyard	64	55/60	No
North Courtyard	59	55/60	No/Yes
3rd Floor Terrace	65	55/60	No
7th Floor Terrace - Northeast	64	55/60	No
7th Floor Terrace – Mid-rise	67	55/60	No
7th Floor Terrace – East Tower	66	55/60	No

Note: [1] XX/YY – City of Burlington guidelines/ MECP NPC-300 Limits with the use of a **Type A** Warning Clause.

The projected sound levels at all outdoor amenity areas are predicted to be above the City of Burlington criteria. The sound level is above the MECP criteria at three of the four locations (North Courtyard meets with the inclusion of **Type A** warning clause).

Table 9 shows the predicted sound level at each of the OLAs with the inclusion of various barrier heights. **Figure 6** shows the locations of the modified barriers.

Table 9: Predicted OLA Sound Level as Height of Noise Wall Increases

Barrier Height (m)	South Courtyard (dBA)	North Courtyard (dBA)	3rd Floor Terrace (dBA)	7th Floor Terrace-Northeast (dBA)	7th Floor Terrace – Mid-rise (dBA)	7th Floor Terrace – East Tower (dBA)
1	64	59	n/a [1]	n/a [1]	n/a [1]	n/a [1]
2	62	59	59	62	64	63
3	59	56	56	60	61	59
3.5	-	-	55	-	59	-
4	56	55	54	57	58	56
5	55	-	-	56	57	54
6	-	-	-	55	56	-
7	-	-	-	-	56	-
8	-	-	-	-	56	-

Notes: "Unmitigated" parapet height is 1.2m.

2.6.1 MECP NPC-300 Criteria

The results presented in **Table 9** show that the following barrier heights are required for compliance with MECP NPC-300 criteria (60 dBA criteria), with the inclusion of **Type B** warning clauses:

- South Courtyard – barrier height of less than 3 m;

- 3rd Floor Terrace – a parapet wall of less than 2 m;
- 7th Floor Terrace - northeast – a parapet wall of approximately 3 m;
- 7th Floor Terrace – mid-rise – a parapet wall of less than 3.5m; and
- 7th Floor Terrace - northeast – a parapet wall of less than 3 m;

2.6.2 City of Burlington Criteria

The results presented in **Table 9** show that the following barrier heights are required for compliance with City of Burlington criteria (55 dBA criteria):

- South Courtyard – barrier height of approximately 5 m;
- North Courtyard – barrier height of approximately 4m ;
- 3rd Floor Terrace – a parapet wall of approximately 3.5 m;
- 7th Floor Terrace- northeast – a parapet wall of approximately 6 m;
- 7th Floor Terrace – mid-rise – a parapet wall of greater than 8 m; and
- 7th Floor Terrace - northeast – a parapet wall of less than 5 m;

The results presented above show that barrier heights are possible in order to reduce the sound level down to the 55 dBA criteria for the City of Burlington. The practicality of installing such barriers (other than for sound reductions purposes) should be further reviewed for feasibility prior to recommendation or installation.

Another practical reduction method is to use localized acoustical screenings at select locations within the outdoor amenity areas. Given the maximum predicted sound levels within the OLA (64 dBA impacts), meeting the guideline requirements is anticipated to be possible.

2.7 Ventilation and Warning Clause Requirements

Based on the predicted sound levels, warning clauses are required to be included in agreements of purchase and sale or lease and rental agreements for the residential dwellings. See **Appendix C** for warning clause details.

2.7.1 Residential Units

The sound levels generated by the surrounding roadways will cause various warning clauses to be required on different units on the proposed development. The applicable portion **of Table 3** has been included below for reference.

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - Leq (dBA) Road	Ventilation and Warning Claus Requirements
Plane of Window	Daytime (0700-2300h)	≤ 55	None
		56 to 65 incl.	Forced Air Heating with provision to add air conditioning +

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - Leq (dBA) Road	Ventilation and Warning Claus Requirements
			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

Forced air heating with the provision to add air conditioning (**Type C** warning clause) is required on the northeast residential rooms of the building. All other residential rooms that face the outdoors will require central air conditioning (**Type D** warning clause).

2.7.2 Outdoor Amenity Area

Based on the MECP NPC-300 document, **Type A and B** warning clauses and acoustical mitigation measure related to the increased sound levels for the outdoor amenity area is required for all suites. See **Appendix C** for all warning clause details

PART 2: IMPACTS OF THE DEVELOPMENT ON ITSELF

3.0 Noise Impacts Proposed Development Stationary Sources

The building mechanical systems have not been designed at this time. Details on size, location or operations have not been provided for sue within this study. In addition, details on the building's shipping and receiving activities were not provided and therefore not assessed.

Although no adverse impacts are expected, such equipment has the potential to result in noise impacts on residential spaces within the development. This equipment is required to meet MOECC Publication NPC-300 requirements at the facades of 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) into the design.

It is recommended the mechanical systems be reviewed by an acoustical professional prior to final design.

PART 3: IMPACTS OF THE DEVELOPMENT ON THE SURROUNDING

4.0 Proposed Development Mechanical Equipment

At the time of this assessment, the proposed development's mechanical systems have not been sufficiently designed. On- and off-site noise impacts from all mechanical equipment should comply with the MECP Publication NPC-300 guideline limits.

Mechanical equipment is to be included with proposed development. Mechanical ventilation, cooling and emergency power systems may be required. Based on our experience, the type and size of the units and their probable locations are not anticipated to result in adverse noise impacts.

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) into the design. This can be confirmed at either the site plan approval or building permit approval stages.

5.0 CONCLUSIONS AND RECOMMENDATIONS

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

5.1 Transportation Noise

- An assessment of transportation noise impacts from roadways has been completed.
- Based on transportation façade sound levels, the northeast façade is the only façade that does not need upgraded glazing. All other facades (depending on the usage) would require upgrade glazing to meet the applicable indoor limits, as listed in **Section 2.5**.
- Glazing requirements above are approximated, based on the generic room, façade and glazing dimensions. Once detailed floor plans and façade plans become available, the glazing requirements should be re-assessed and reviewed by an Acoustical Consultant.
- Forced air heating with the provision to add air conditioning (**Type C** warning clause) is required on the northeast residential rooms of the building. All other residential rooms that face the outdoors will require central air conditioning (**Type D** warning clause), as summarized in **Section 2.7**.
- Various recommendations are suggested depending if MECP NPC-300 or the City of Burlington criteria is used for assessing the predicted sound levels for the Outdoor Amenity Areas. Details on this can be found in **Section 2.6**.

5.2 Noise Impacts From Proposed Development on Itself

- The building mechanical systems have not been designed at this time. The potential impacts should be assessed as details are available or 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) into the design.
- It is recommended the mechanical systems be reviewed by an acoustical professional prior to final design.

5.3 Noise Impacts From Proposed Development on the Surroundings

- The proposed development's mechanical systems have not been sufficiently designed. 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) into the design.

- It is recommended that this be confirmed at either the site plan approval or building permit approval stages.

6.0 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, (NRC, 1985). Building Practice Note: Controlling Sound Transmission into Buildings (BPN-56), ISSN 0701-5216.

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Figures

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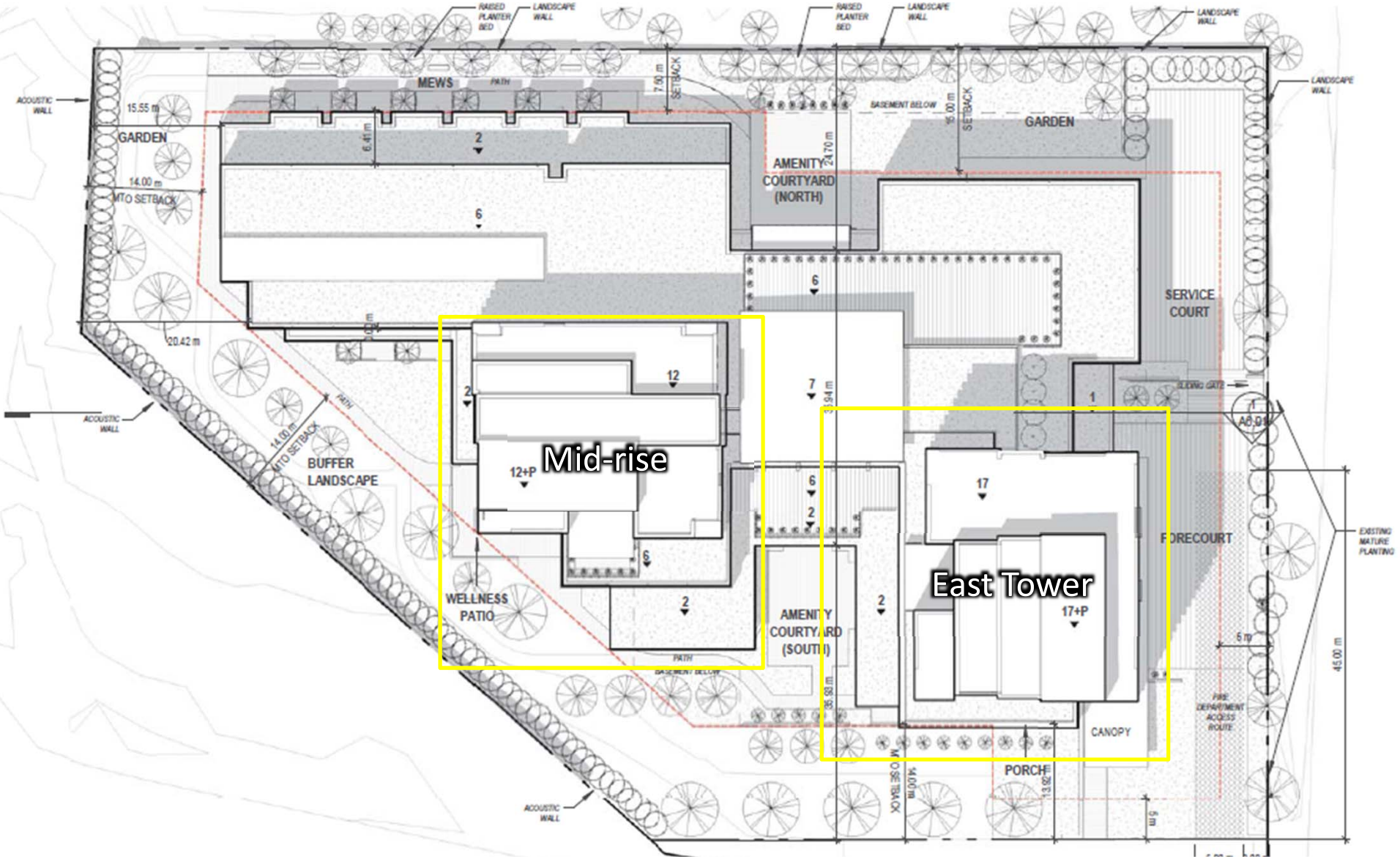

Figure No. **1**

Site Plan

18-0085 – 1157-1171 North Shore Development
Burlington, Ontario

True North

Scale: N/A
Date: 19/08/01
File No.: 18-0085
Drawn By: AKH

novus ENVIRONMENTAL

Figure No. **2**

Site and Surrounding Area

18-0085 – 1157-1171 North Shore Development
Burlington, Ontario

True North

Scale: 1: 6,000
Date: 19/08/01
File No.: 18-0085
Drawn By: AKH

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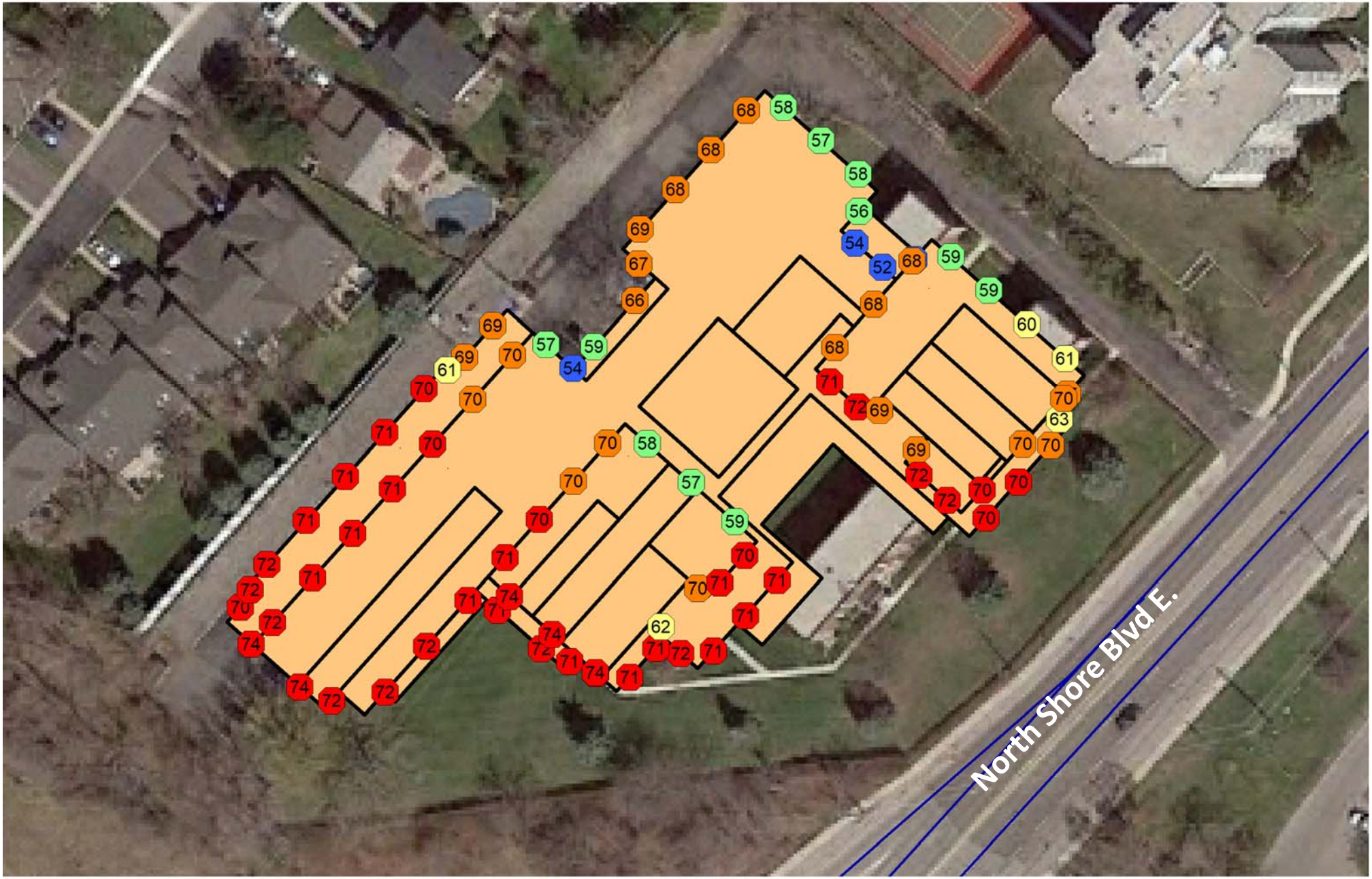

Figure No. **3**

Modelled Development Façade Sound Levels
Roadway, Daytime

18-0085 – 1157-1171 North Shore Development
Burlington, Ontario

True North

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Date:	19/08/01
File No.:	18-0085
Drawn By:	AKH

novus ENVIRONMENTAL

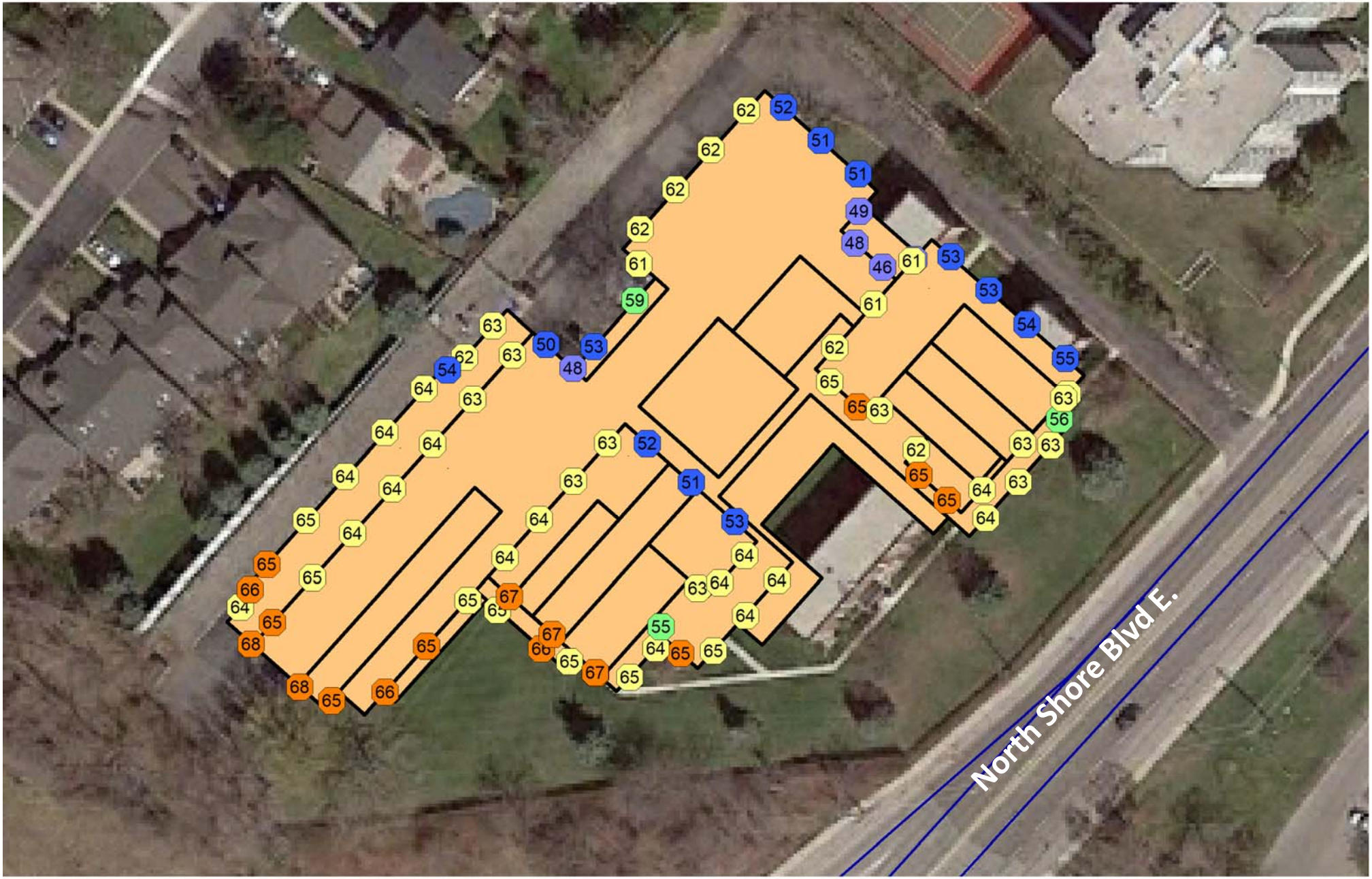

Figure No. **4**

Modelled Development Façade Sound Levels
Roadway, Nighttime

18-0085 – 1157-1171 North Shore Development
Burlington, Ontario

True North

Scale:	1: 750
Date:	19/08/01
File No.:	18-0085
Drawn By:	AKH

novus ENVIRONMENTAL

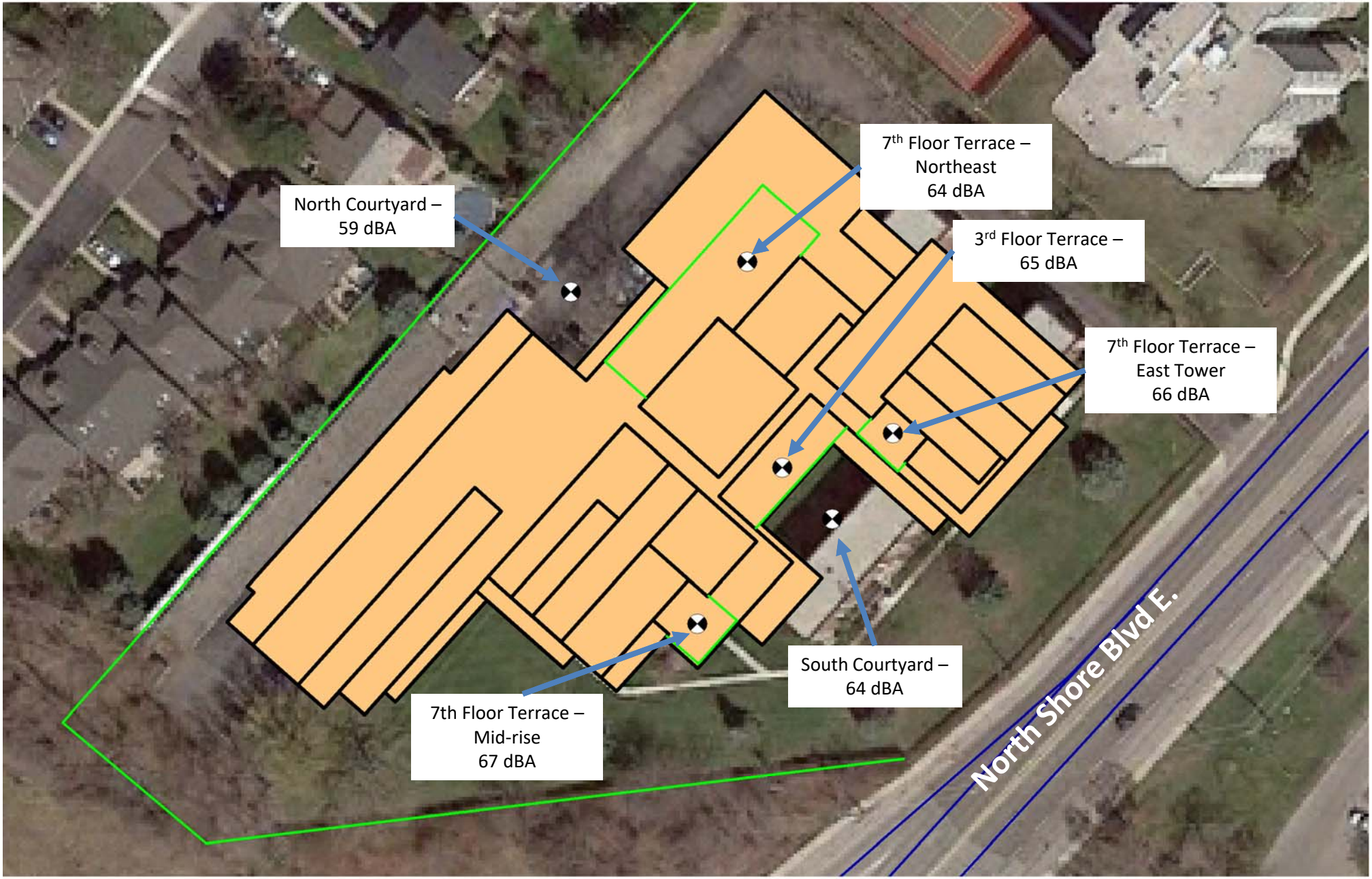

Figure No. **5**

Outdoor Living Area - Road Impacts

18-0085 – 1157-1171 North Shore Development
Burlington, Ontario

True North

Scale:	1: 750
Date:	19/08/01
File No.:	18-0085
Drawn By:	AKH

novus ENVIRONMENTAL

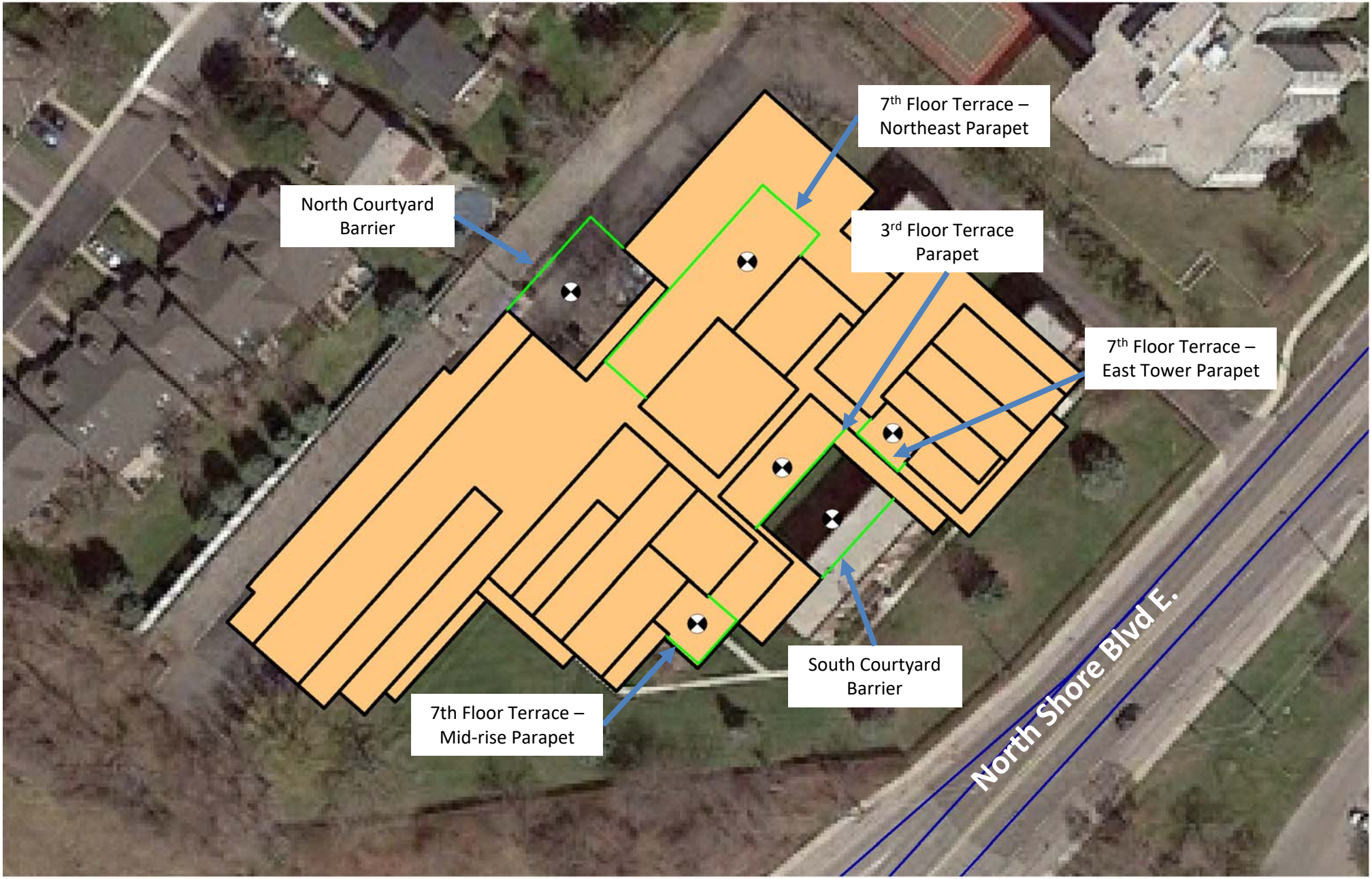

Figure No. **6**

Potential Barrier Locations

18-0085 – 1157-1171 North Shore Development
Burlington, Ontario

True North

Scale: 1: 750
Date: 19/08/01
File No.: 18-0085
Drawn By: AKH

novus ENVIRONMENTAL

Appendix A

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for 2-sided printing purposes

MontgomerySisam

Montgomery Sisam Architects Inc.

197 Spadina Avenue, Toronto, Ontario M5T 2C8 montgomerysisam.com
Tel 416.364.8079 Fax 416.364.7723

Planning :	**Bousfields Inc.**
Traffic :	**IBI Group**
Air / Wind / Noise :	**Novus Environmental Inc.**
Geotechnical Engineer :	**Pinchin Ltd**
Environmental :	**Pinchin Ltd.**
Civil Engineering :	**Odan-Detech Group Inc.**
Landscape Architecture :	**Baker Turner Inc.**

AMICA Mature Lifestyles | AMICO | SPRUCE PARTNERS

AMICA NORTH SHORE

1161 NORTH SHORE BOULEVARD, BURLINGTON

ISSUED FOR REZONING
AUGUST 12th, 2019

MontgomerySisam

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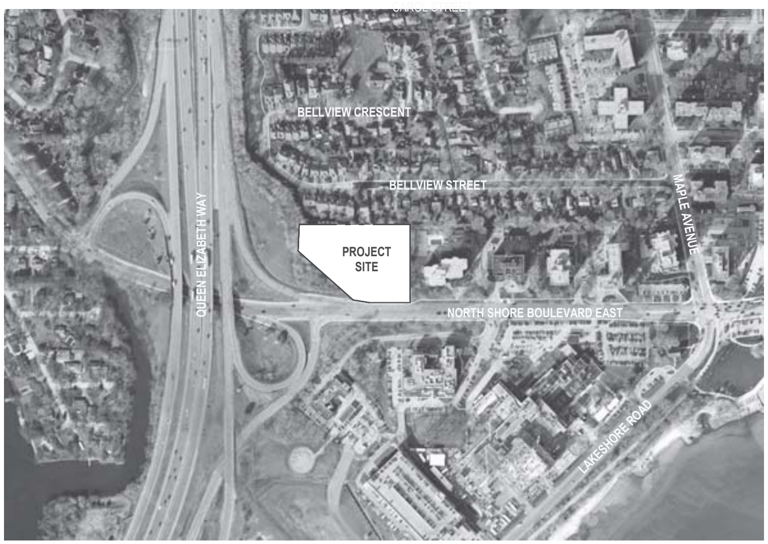
SHEET LIST



1 / A0.01 CONTEXT PLAN
1 : 3000

Development Statistics
19.08.12

Montgomery Sisam Architects

Table A: DEVELOPMENT STATISTICS	Statistic	Figure	Unit	Comments
(A)	Existing Site Area	12,186	sm	3.01 Acres
(B)	**ROW Dedication**	**336**	sm	.08 Acres
(C)	**New Site Area** (A - B)	**11,850**	sm	2.93 Acres
(D)	**GFA**	**42,532**	sm	* See Table D
(E)	**FAR** (D / C)	**3.59**		
(F)	**Unit Count**	**419**	Units	* See Table B
(G)	Resident Population	600	People	
(H)	Staff Population	180	People	* On site at any given time
(I)	**Total Population on Site**	**780**	People	

Table B: UNIT NEIGHBOURHOOD BREAKDOWN	Neighbourhood	Percentage	Unit Count	Comments
(A)	Assisted Living	37%	155	
(B)	Memory Care	13%	55	
(C)	Independent Living	50%	209	
(D)	**Total Units**		**419**	

Table C: UNIT TYPE BREAKDOWN	Neighbourhood	Percentage	Unit Count	Comments
(A)	Assisted Living - Studio	80%	124	
(B)	Assisted Living - 1 Bed	20%	31	
(C)	Memory Care - Studio	80%	44	
(D)	Memory Care - 1 Bed	20%	11	
(E)	Independent Living - Studio	22%	46	
(F)	Independent Living - 1 Bed	36%	75	
(G)	Independent Living - 1 Bed + Den	25%	53	
(H)	Independent Living - 2 Bed	17%	35	
(I)	**Total Units**		**419**	
(J)	Premium Independent Living	31%	65	

Table D: GROSS FLOOR AREA	
	REFER TO A0.11; TABLE A- ZONING GROSS FLOOR AREA (GFA)

Table E: PARKING	Type	Percentage	Count	Comments
(A)	Visitor & Staff Parking	22%	53	
	Accessible Visitor Parking		3	
(B)	Resident Parking	77%	180	
	Accessible Res. Parking		8	
(C)	**Total Parking**		**244**	

Table F: BICYCLE PARKING	Type	Percentage	Count	Comments
(A)	Employment Long Term 2 Long Term Spaces + 1 Space/1,000 sq.m. GFA	50%	45	
(B)	Employment Short Term 2 Short Term Spaces + 1 Space/1,000 sq.m. GFA	50%	45	
(C)	**Total Bicycle Parking**		**90**	

2 / A0.01 STATISTICS
1 : 1

#	date	revision	by
1	18.09.17	ISSUED FOR REZONING	MSA

revisions

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1161 - 1167 North Shore Boulevard
Burlington, ON

GENERAL INFO

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reviewed by: KH
job number: 17099
plot date: 2019/08/09

drawing number:
A0.01

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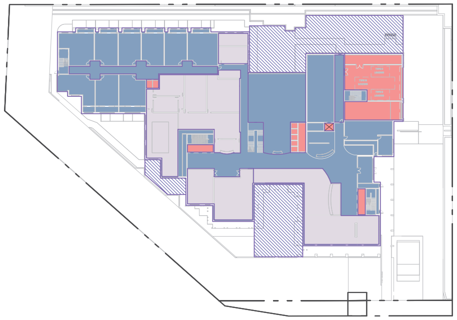

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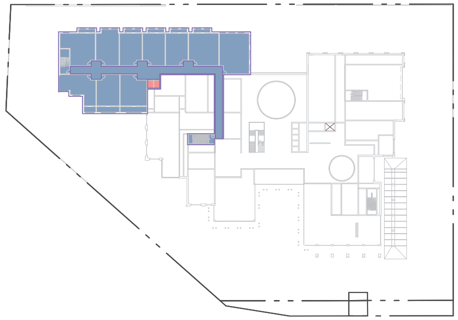

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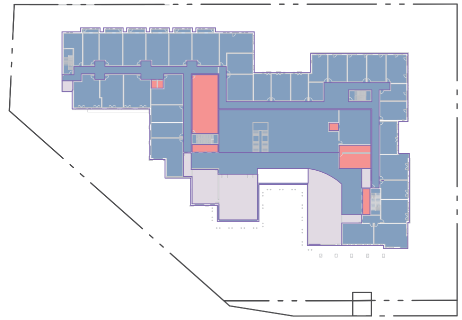

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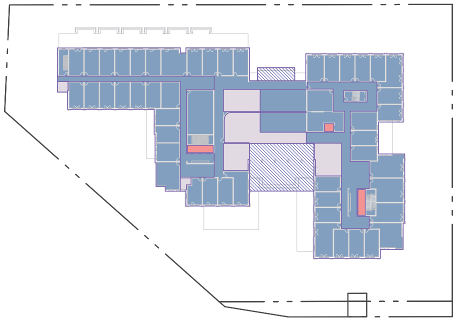

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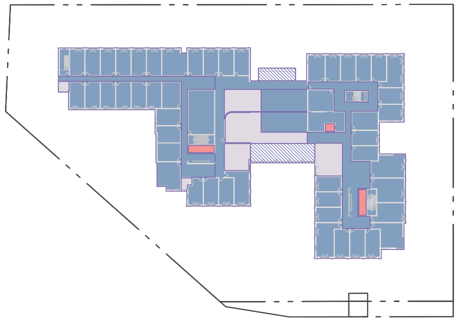

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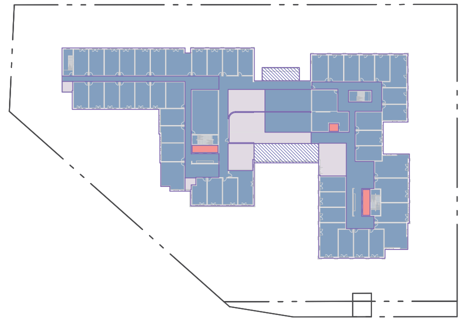

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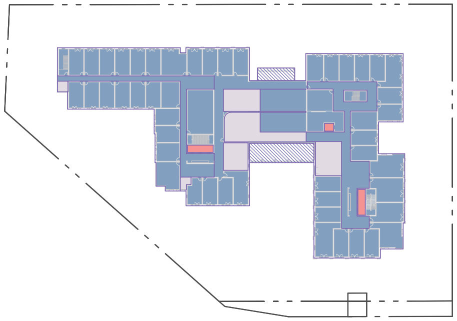

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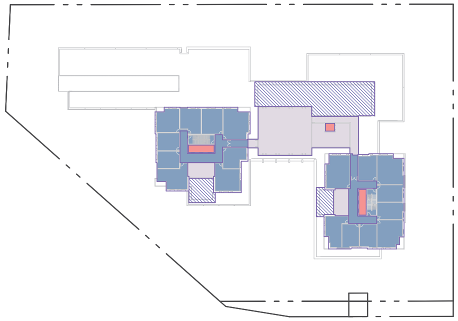

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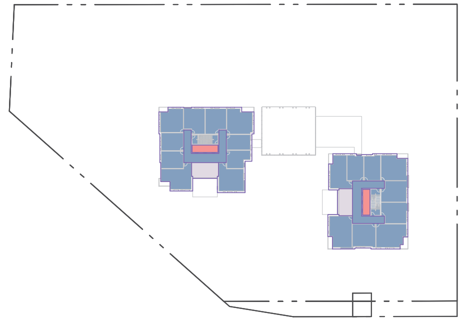

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MontgomerySisam

GFA CALCULATION LEGEND

- AREA INCLUDED IN GFA
- AREA INCLUDED IN GFA - INDOOR AMENITY *
- AREA EXCLUDED FROM GFA AS PER BY-LAW 2020, PART 16- DEFINITIONS OF FLOOR AREA, GROSS **
- OUTDOOR AMENITY

* **INDOOR AMENITY**
DOES NOT INCLUDE CORRIDORS AND DINING ROOM AS PER CITY COMMENTS FROM MARCH 4TH, 2019

** **ZONING BY-LAW 2020, PART 16- DEFINITIONS**

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* Elevators and associated equipment
* Washrooms
* Foyers, lobbies, but not waiting areas/ rooms

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AMICA NORTH SHORE

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Burlington, ON

GFA CALCULATION

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reviewed by: KH
job number: 17099
plot date: 2019/08/09

drawing number:
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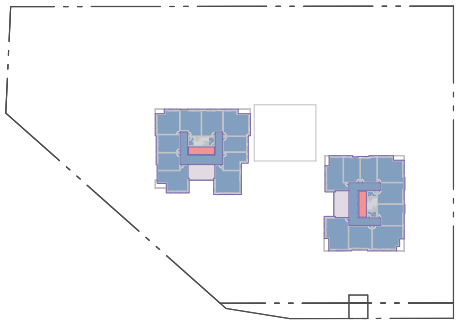

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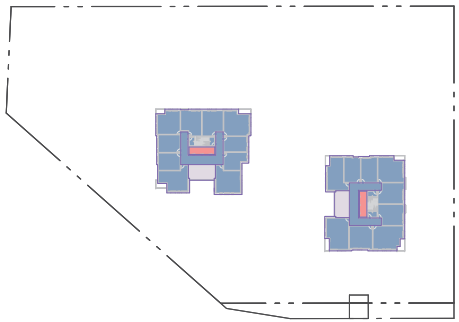

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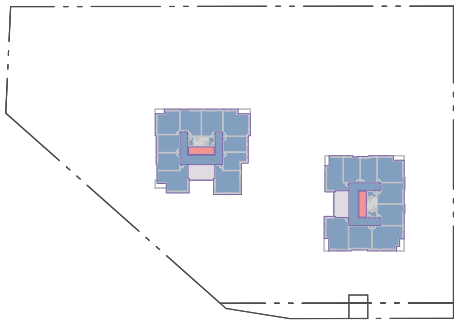

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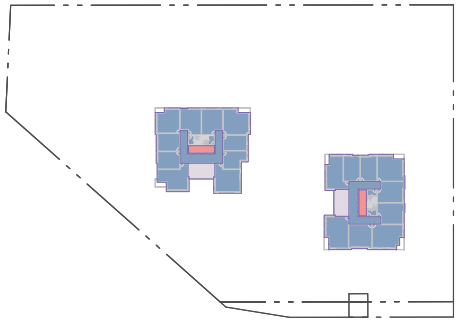

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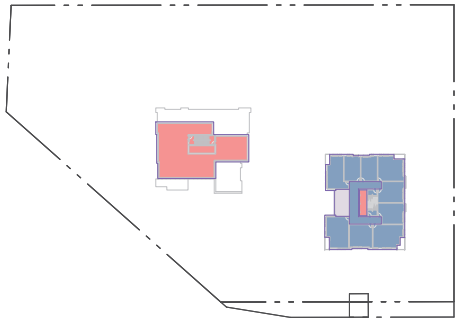

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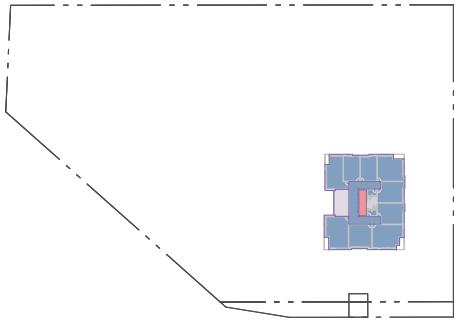

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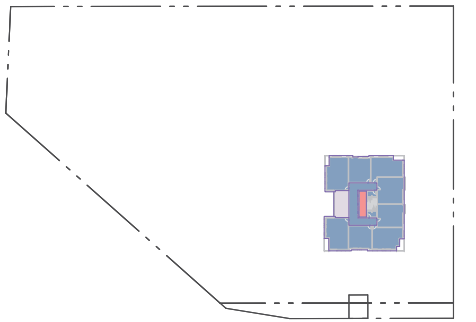

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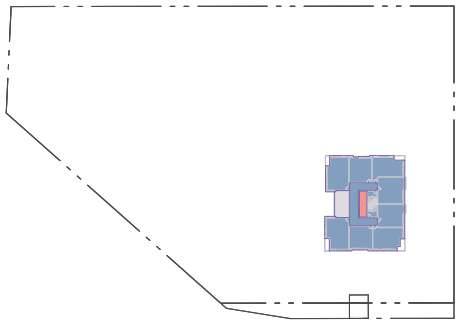

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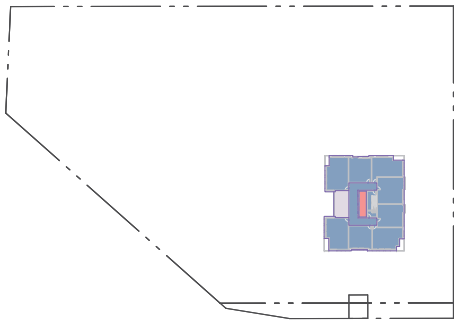

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GFA CALCULATION LEGEND

- AREA INCLUDED IN GFA
- AREA INCLUDED IN GFA - INDOOR AMENITY *
- AREA EXCLUDED FROM GFA AS PER BY-LAW 2020, PART 16- DEFINITIONS OF FLOOR AREA, GROSS **
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DOES NOT INCLUDE CORRIDORS AND DINING ROOM AS PER CITY COMMENTS FROM MARCH 4TH, 2019

** **ZONING BY-LAW 2020, PART 16- DEFINITIONS**

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* Foyers, lobbies, but not waiting areas/ rooms

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AMICA NORTH SHORE

1161 - 1167 North Shore Boulevard
Burlington, ON

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reviewed by:	KH
job number:	17099
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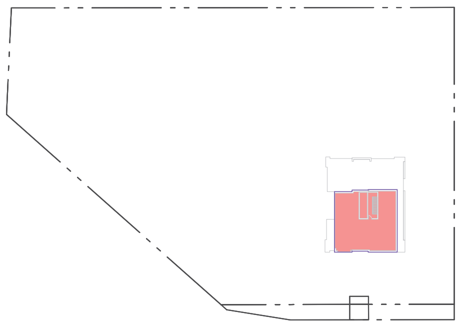

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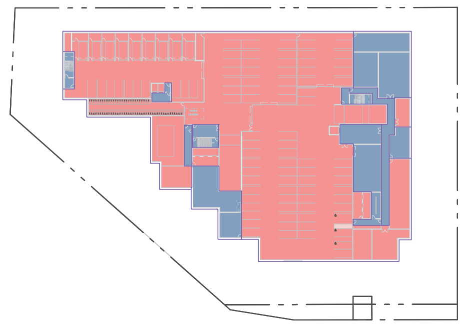

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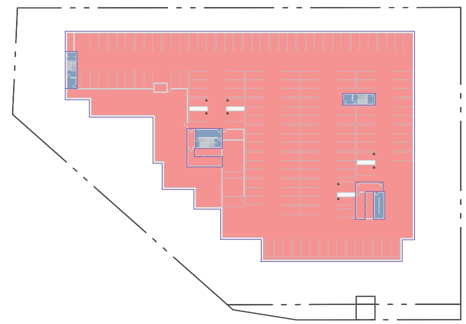

3 A0.12 LEVEL P2
1 : 750

TABLE A

ZONING GROSS FLOOR AREA (GFA)	
Level	Area
LEVEL 17	7,855 SF
	7,855 SF
LEVEL 16	7,855 SF
	7,855 SF
LEVEL 15	7,855 SF
	7,855 SF
LEVEL 14	7,855 SF
	7,855 SF
LEVEL 13	7,855 SF
	7,855 SF
LEVEL 12	15,711 SF
	15,711 SF
LEVEL 11	15,711 SF
	15,711 SF
LEVEL 10	15,711 SF
	15,711 SF
LEVEL 9	15,711 SF
	15,711 SF
LEVEL 8	15,711 SF
	15,711 SF
LEVEL 7	20,441 SF
	20,441 SF
LEVEL 6	46,978 SF
	46,978 SF
LEVEL 5 - AL	46,995 SF
	46,995 SF
LEVEL 4 - AL	47,028 SF
	47,028 SF
LEVEL 3 - MC	47,004 SF
	47,004 SF
LEVEL 2	52,477 SF
	52,477 SF
MEZZANINE	14,437 SF
	14,437 SF
LEVEL 1	48,646 SF
	48,646 SF
LEVEL P1	14,104 SF
	14,104 SF
LEVEL P2	1,874 SF
	1,874 SF
Grand total	457,813 SF

TABLE B

INDOOR AMENITY AREA	
Level	Area
LEVEL 17	457 SF
	457 SF
LEVEL 16	457 SF
	457 SF
LEVEL 15	457 SF
	457 SF
LEVEL 14	457 SF
	457 SF
LEVEL 13	457 SF
	457 SF
LEVEL 12	932 SF
	932 SF
LEVEL 11	932 SF
	932 SF
LEVEL 10	932 SF
	932 SF
LEVEL 9	932 SF
	932 SF
LEVEL 8	932 SF
	932 SF
LEVEL 7	5,664 SF
	5,664 SF
LEVEL 6	4,688 SF
	4,688 SF
LEVEL 5 - AL	4,842 SF
	4,842 SF
LEVEL 4 - AL	4,847 SF
	4,847 SF
LEVEL 3 - MC	4,792 SF
	4,792 SF
LEVEL 2	6,558 SF
	6,558 SF
LEVEL 1	16,919 SF
	16,919 SF
Grand total	55,256 SF

TABLE C

OUTDOOR AMENITY AREA	
Level	Area
LEVEL 7	5,299 SF
	5,299 SF
LEVEL 6	1,938 SF
	1,938 SF
LEVEL 5 - AL	1,969 SF
	1,969 SF
LEVEL 4 - AL	1,938 SF
	1,938 SF
LEVEL 3 - MC	4,026 SF
	4,026 SF
LEVEL 1	11,929 SF
	11,929 SF
Grand total	27,098 SF

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reviewed by: KH
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4 A0.20 FROM QEW
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3 A0.20 NORTH ELEVATION
1 : 1

2 A0.20 SOUTH EAST CORNER
1 : 1

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AMICA NORTH SHORE

1161 - 1167 North Shore Boulevard
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RENDERINGS

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reviewed by:	KH
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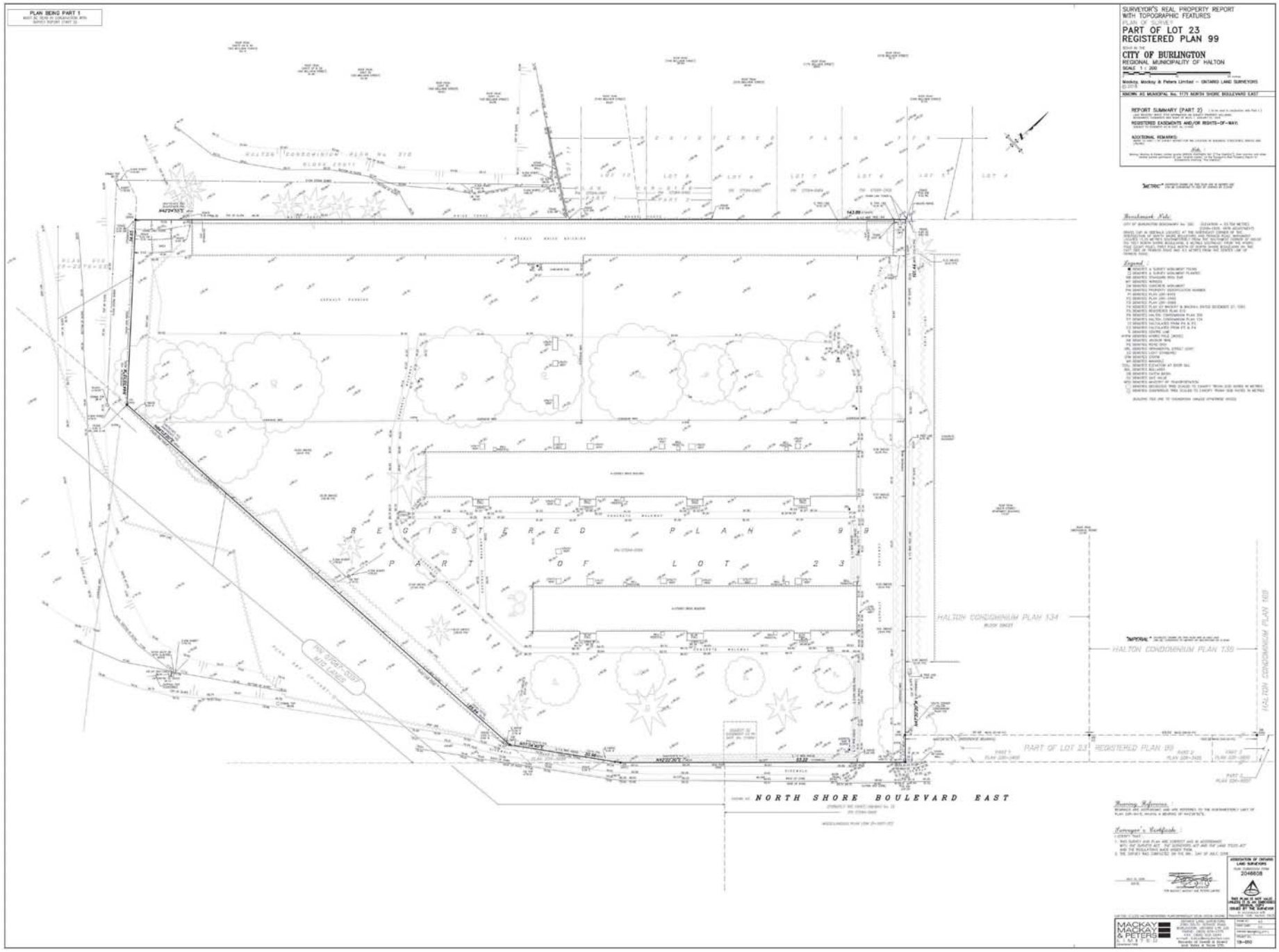
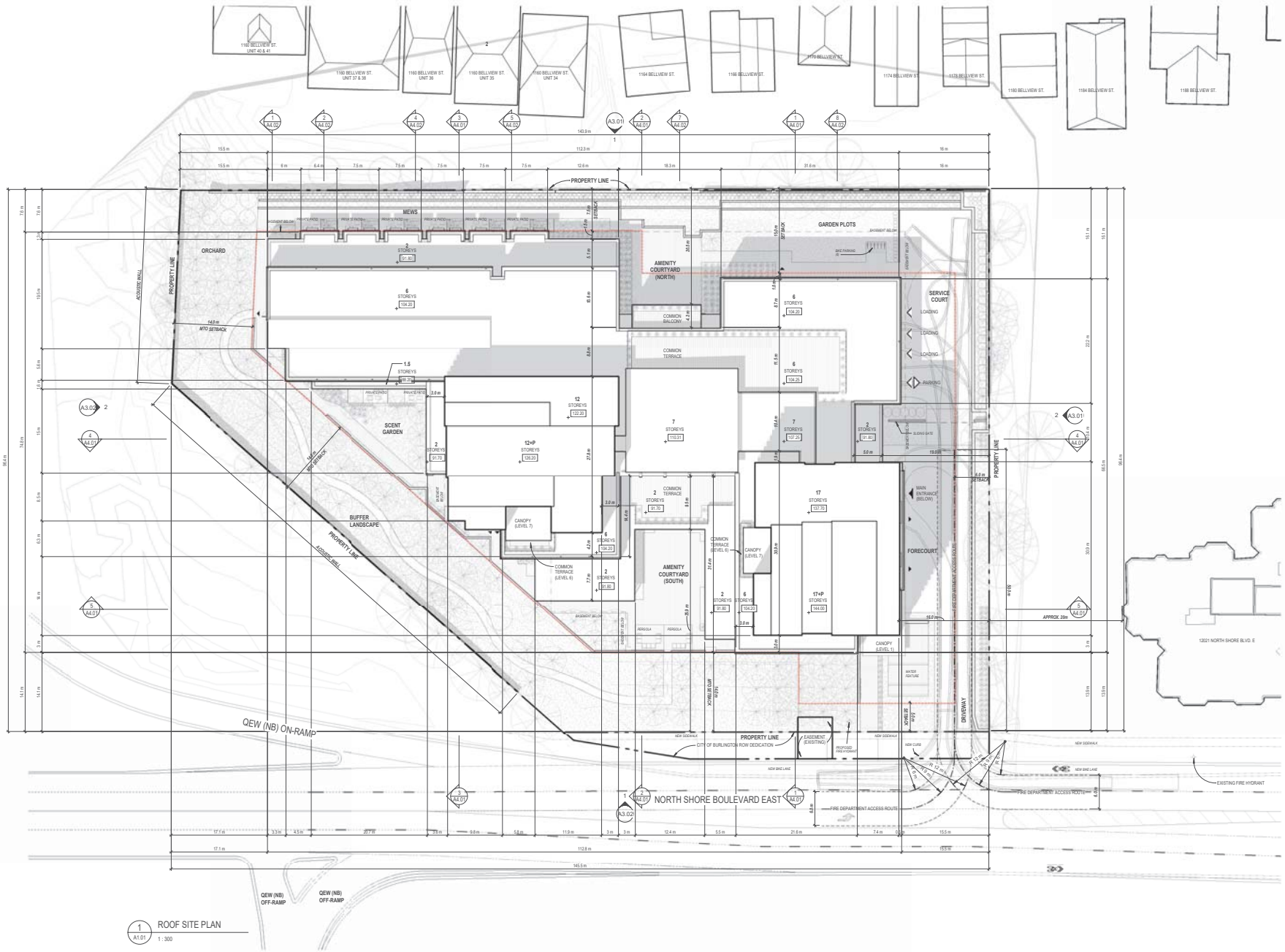

PLAN BEING PART 1
SURVEYOR'S REAL PROPERTY REPORT
WITH TOPOGRAPHIC FEATURES
PLAN OF SURVEY
PART OF LOT 23
REGISTERED PLAN 99
CITY OF BURLINGTON
REGIONAL MUNICIPALITY OF HALTON
SCALE 1 : 200
Mackay, Mackay & Peters Limited – ONTARIO LAND SURVEYORS
KNOWN AS MUNICIPAL No. 1171 NORTH SHORE BOULEVARD EAST
REPORT SUMMARY (PART 2)
REGISTERED EASEMENTS AND/OR RIGHTS-OF-WAY:
ADDITIONAL REMARKS:
Benchmark Note:
Legend :
REGISTERED PLAN 99
PART OF LOT 23
HALTON CONDOMINIUM PLAN 134
HALTON CONDOMINIUM PLAN 139
HALTON CONDOMINIUM PLAN 168
THE GREAT SOUTH WEST LANDS
NORTH SHORE BOULEVARD EAST
Bearing Reference :
Surveyor's Certificate :
ASSOCIATION OF ONTARIO LAND SURVEYORS
2046808
MACKAY MACKAY & PETERS LIMITED
19-050



1 A1.01 ROOF SITE PLAN
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ROOF SITE PLAN

scale:	As indicated
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job number:	17099
plot date:	2019/08/09

drawing number:

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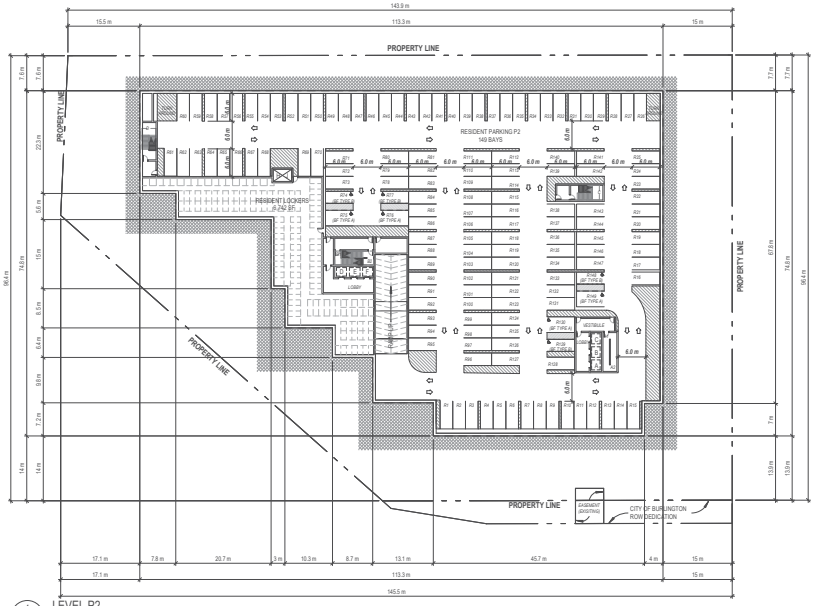

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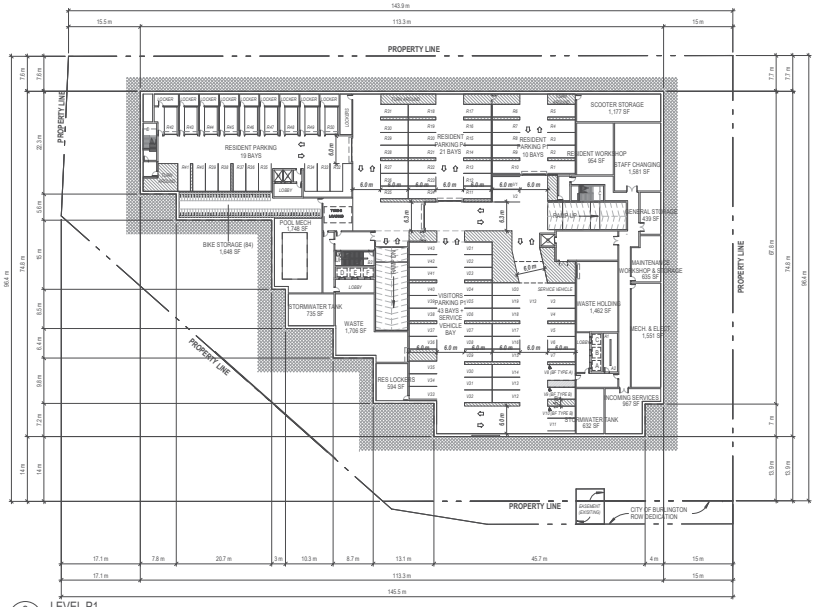
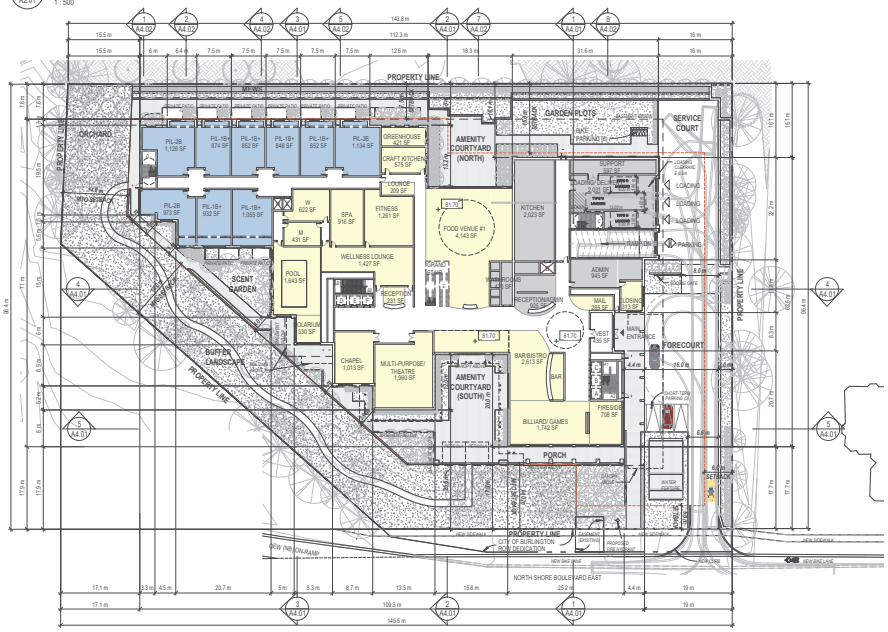
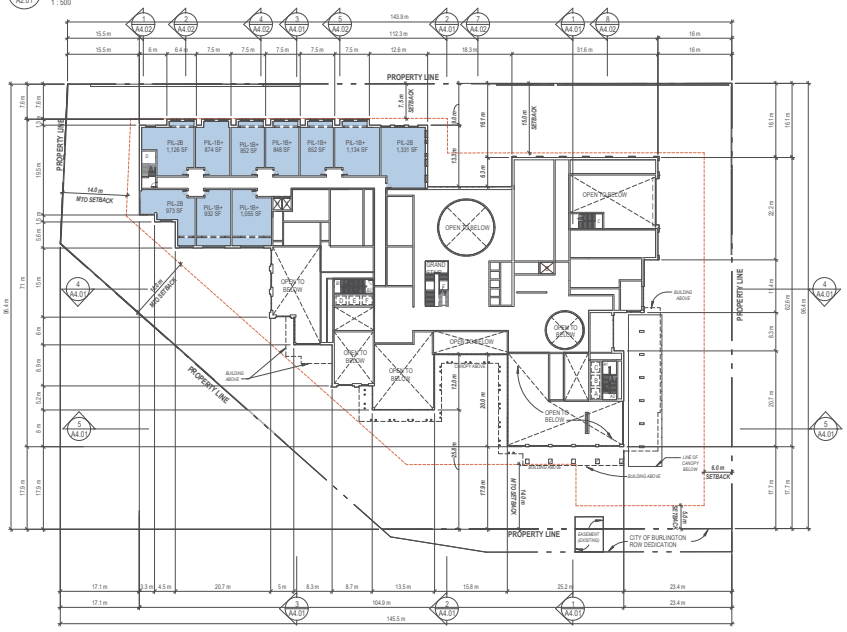


2 A2.01 LEVEL P1
1 : 500

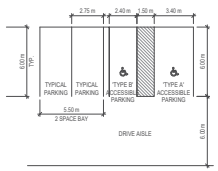


3 A2.01 LEVEL 1
1 : 500



4 A2.01 MEZZANINE
1 : 500

BICYCLE PARKING
1 : 100



PARKING
1 : 200

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AMICA NORTH SHORE

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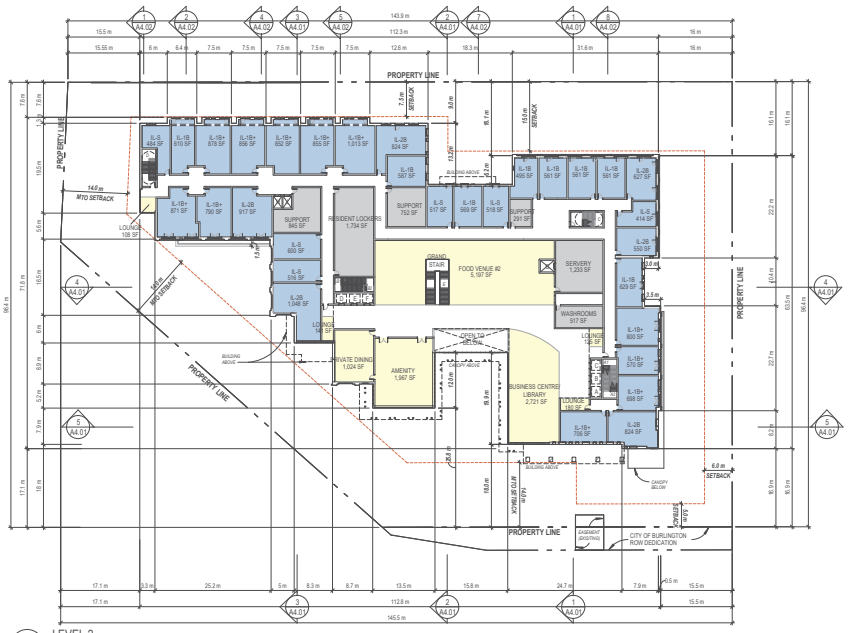
FLOOR PLANS - P2, P1, LEVEL 1, MEZZANINE

scale:	As indicated
drawn by:	KK
reviewed by:	KH
job number:	17099
plot date:	2019/08/09

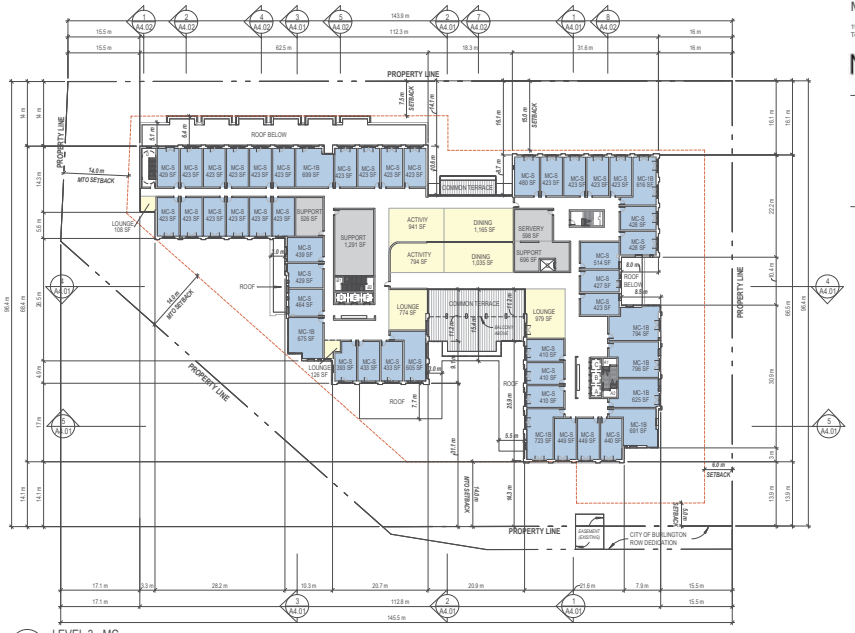
drawing number:

A2.01

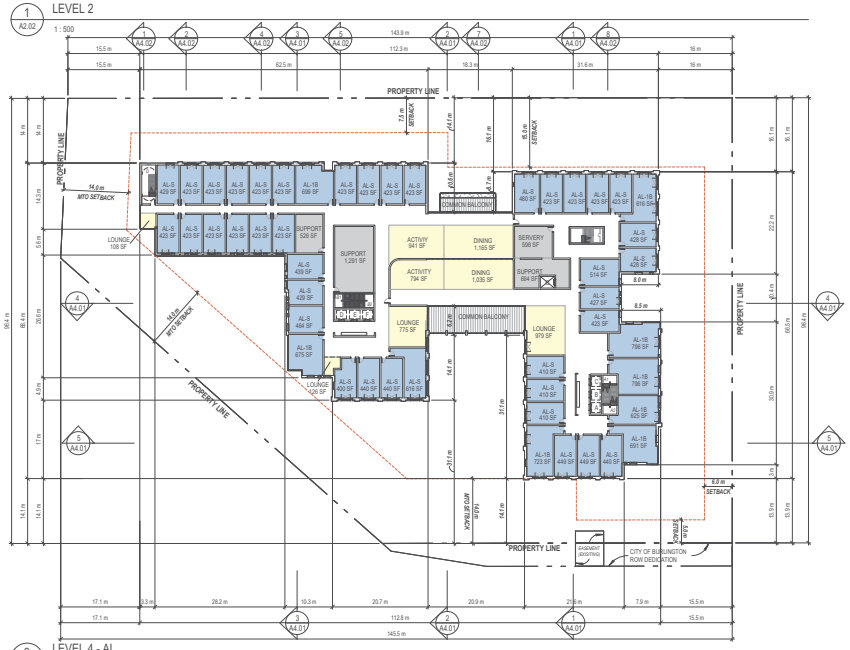
2019-08-12 3:20:34 PM C:\Users\kkrawczyk\Documents\M3A_NorthShore_2015_C_kkrawczyk.rvt



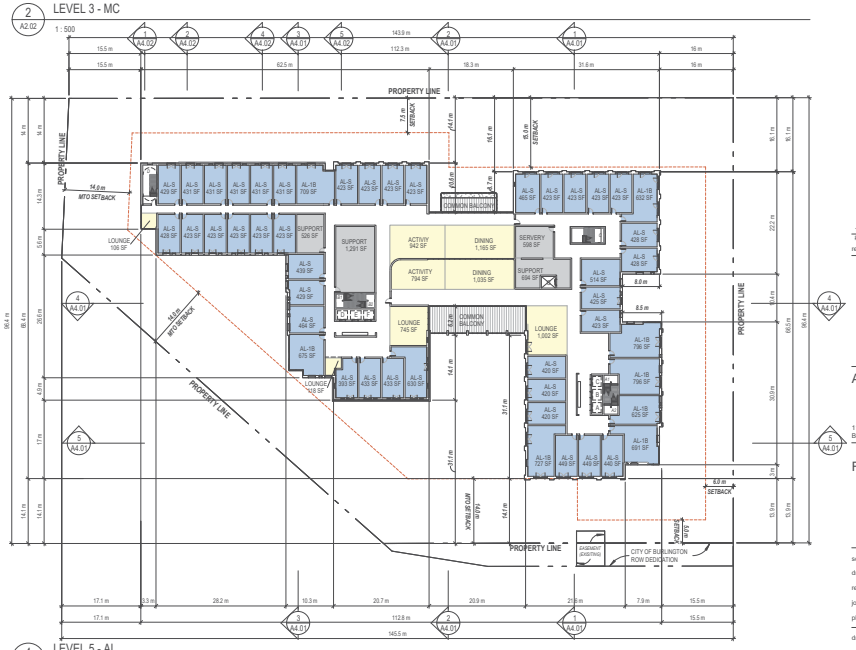
1 A2.02 LEVEL 2 1 : 500



2 A2.02 LEVEL 3 - MC 1 : 500



3 A2.02 LEVEL 4 - AL 1 : 500



4 A2.02 LEVEL 5 - AL 1 : 500

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FLOOR PLANS - LEVELS 2-5

scale:	As indicated
drawn by:	KK
reviewed by:	KH
job number:	17099
plot date:	2019/08/09

drawing number: A2.02

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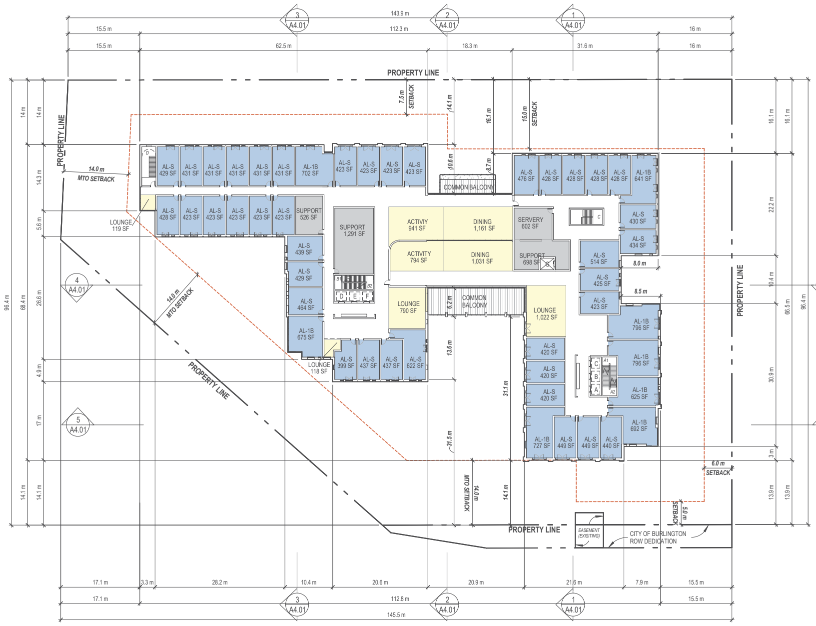

1 LEVEL 6
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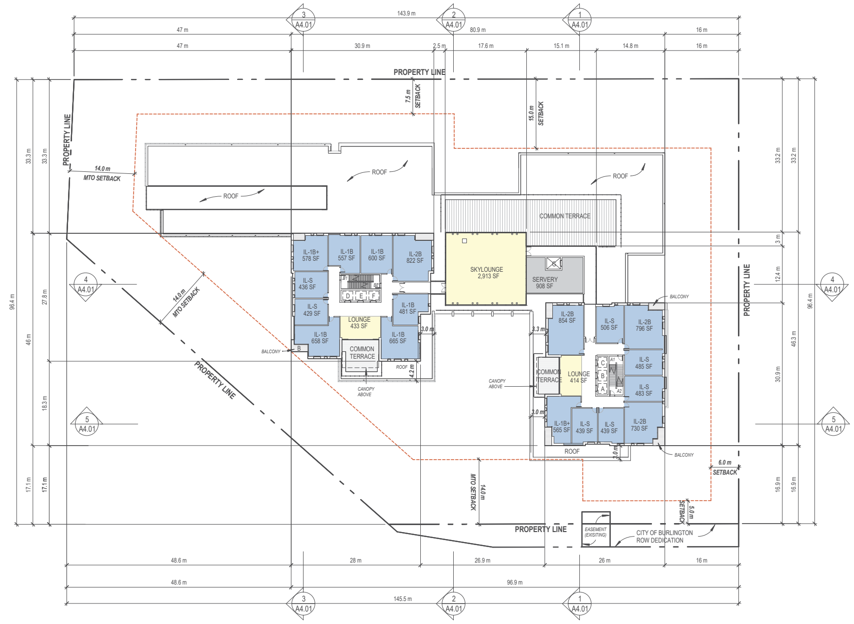
1 : 500



2 LEVEL 7
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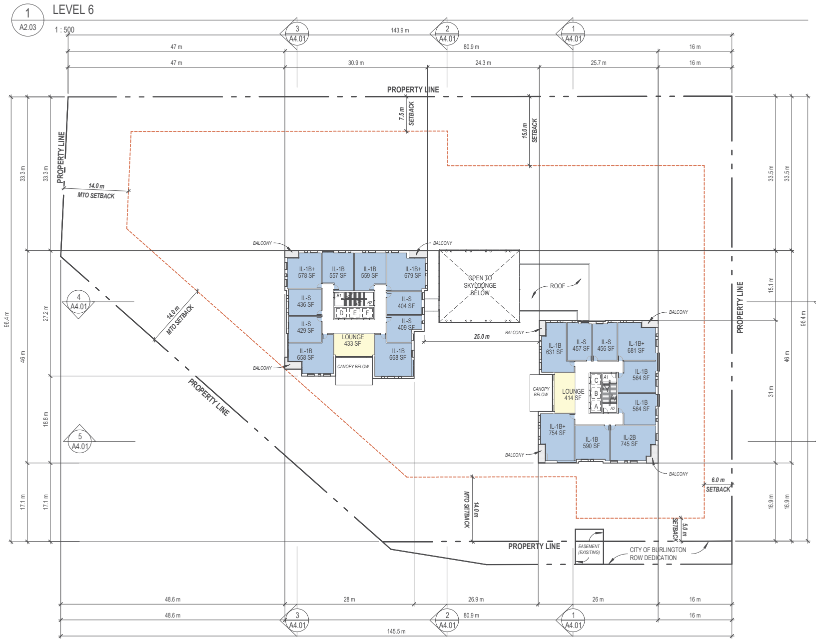
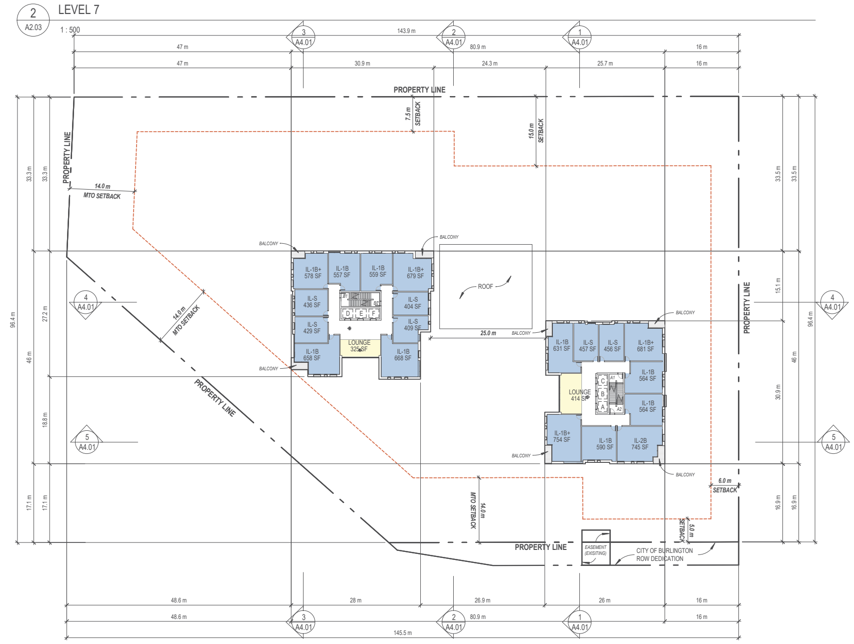


3 LEVEL 8
A2.03
1 : 500



4 LEVEL 9
A2.03
1 : 500

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FLOOR PLANS- LEVELS 6-9

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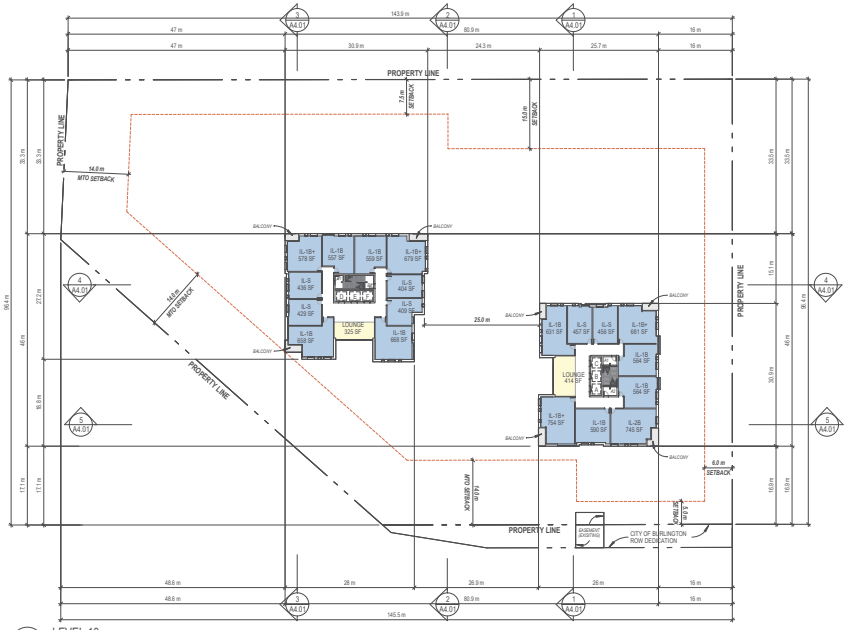
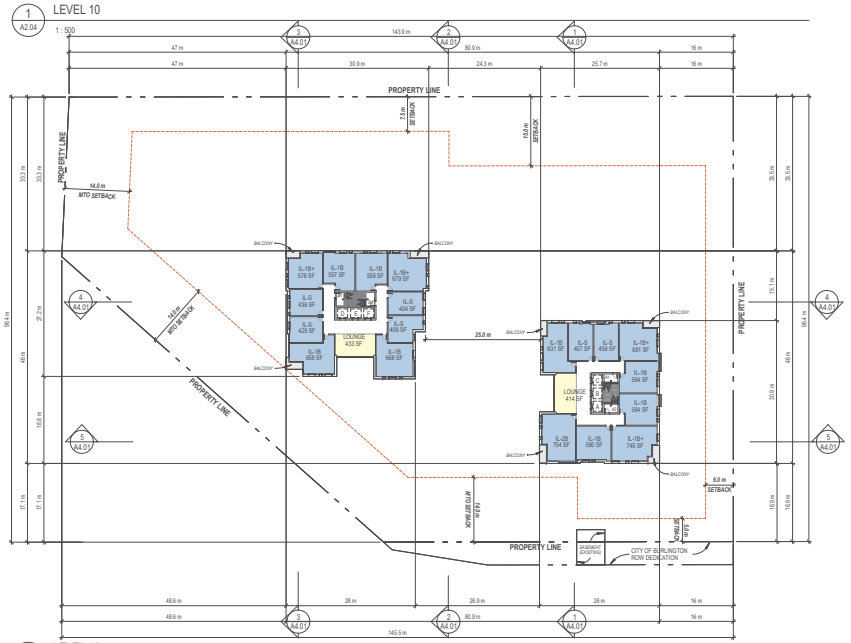
job number:	17099
plot date:	2019/08/09

drawing number:

A2.03



1 A2.04 LEVEL 10
1 : 500



2 A2.04 LEVEL 11
1 : 500

3 A2.04 LEVEL 12
1 : 500

4 A2.04 LEVEL 13
1 : 500

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TRUE NORTH

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FLOOR PLANS - LEVELS 10-13

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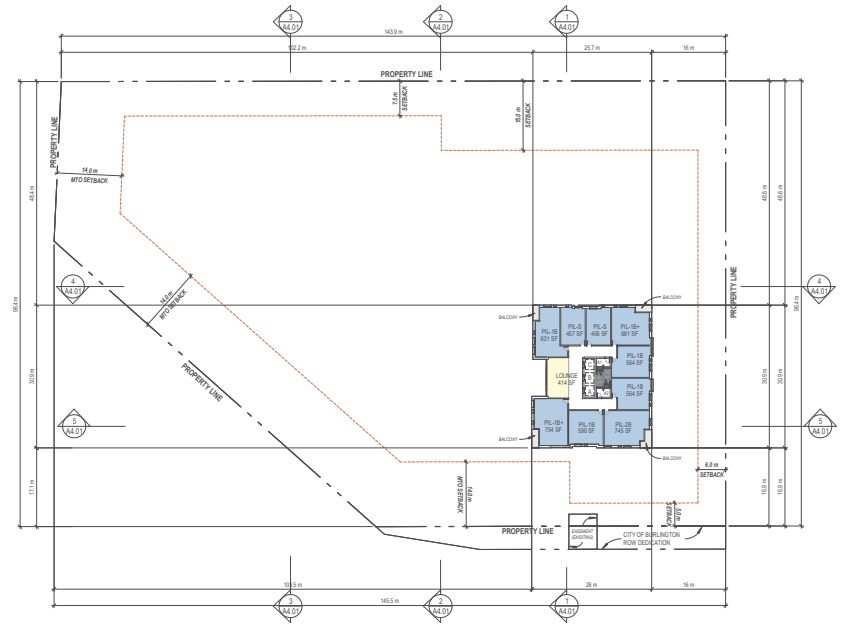
job number:	17099
plot date:	2019/08/09

drawing number:

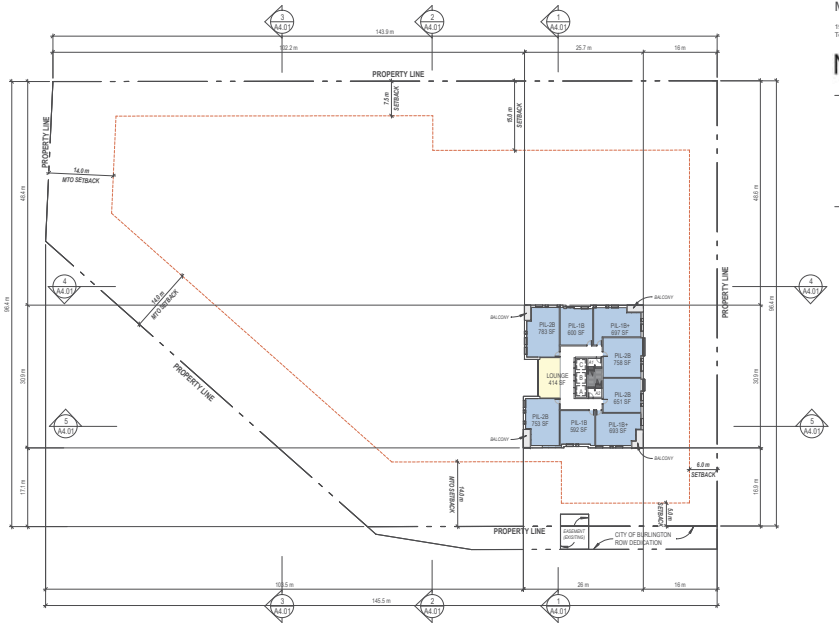
A2.04

2019-08-12 3:21:08 PM C:\Users\kkrawczyk\Documents\MSA_NorthShore_2015_C_kkrawczyk.rvt



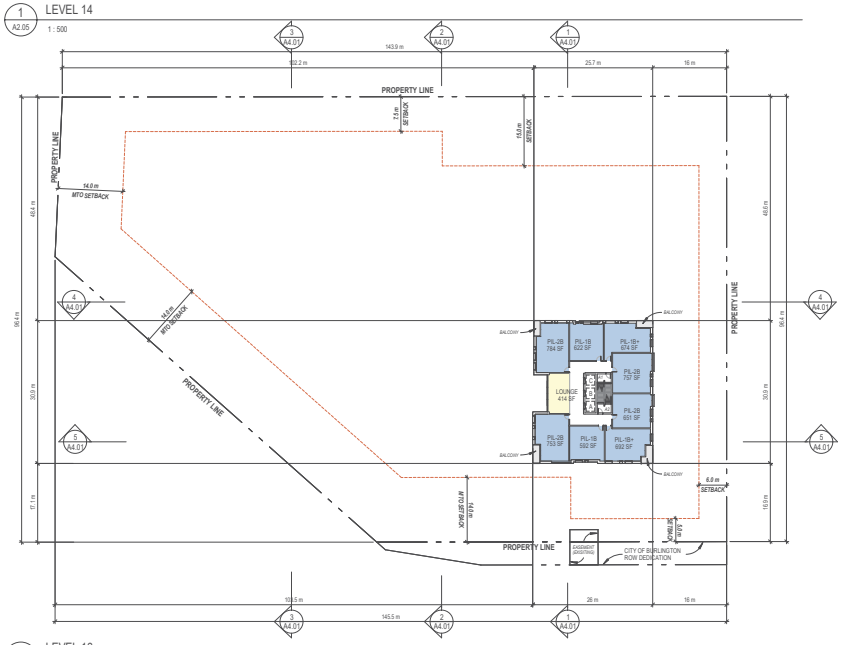
1 A2.05 LEVEL 14

1 : 500



2 A2.05 LEVEL 15

1 : 500



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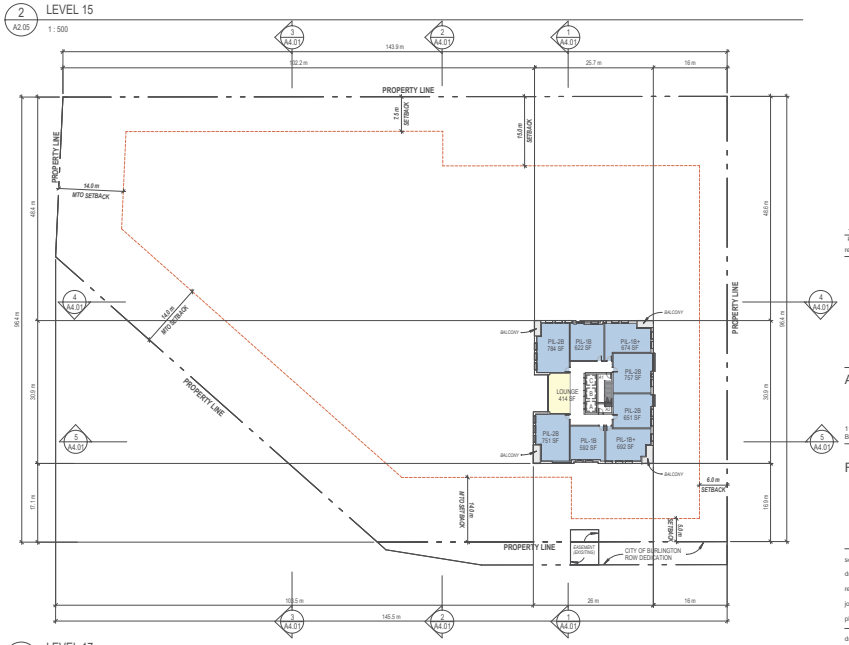
1 : 500



4 A2.05 LEVEL 17

1 : 500

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FLOOR PLANS - LEVELS 14-17

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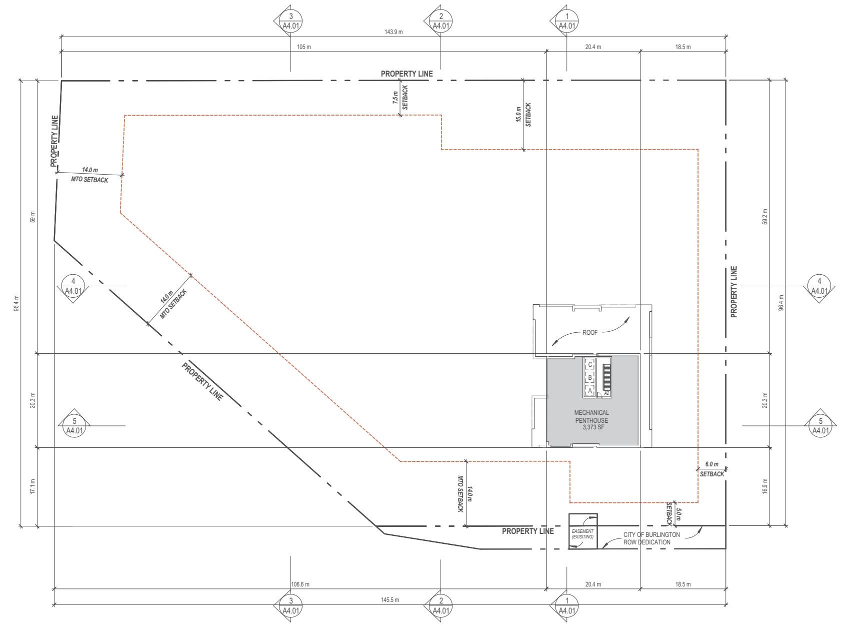
reviewed by:	KH
job number:	17099
plot date:	2019/08/09

drawing number:

A2.05

2019-08-12 12:13:13 PM C:\Users\kkawczyk\Documents\MSA_NorthShore_2019_C_kkawczyk.rvt



1
A2.06
MECHANICAL PENTHOUSE
1 : 500

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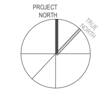

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FLOOR PLAN - PENTHOUSE

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job number:	17099
plot date:	2019/08/09

drawing number:
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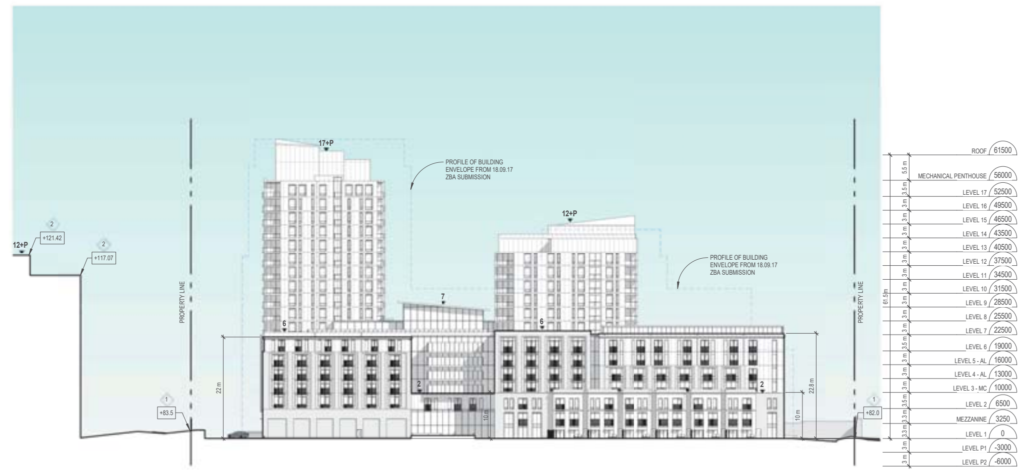
2019-08-12 3:21:14 PM C:\Users\kkrawczyk\Documents\MSA_NorthShore_2019_C_kkrawczykW492T.rvt



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A3.01
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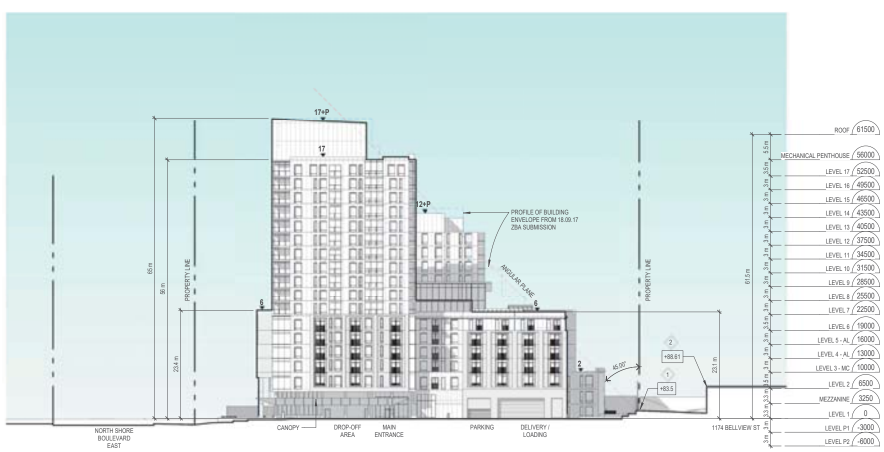

2 EAST
A3.01
1 : 500

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BUILDING ELEVATION KEYNOTE LEGEND

- 1 NEAREST GRADE
- 2 NEAREST ROOF PEAK

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BUILDING ELEVATIONS- NORTH AND EAST

scale:	As indicated
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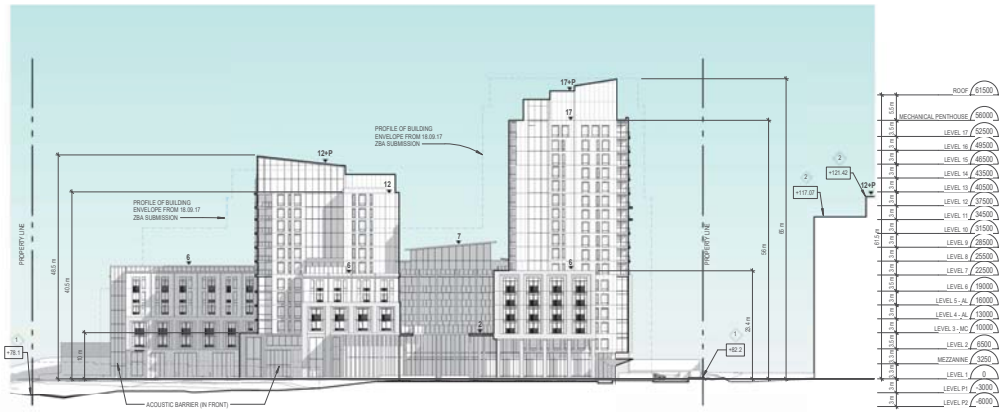
reviewed by:	KH
job number:	17099
plot date:	2019/08/09

drawing number:

A3.01

2019-08-12 3:21:45 PM C:\Users\kkrawczyk\Documents\MSA_NorthShore_2019_C_kkrawczykW492T.rvt



1 / A3.02 SOUTH

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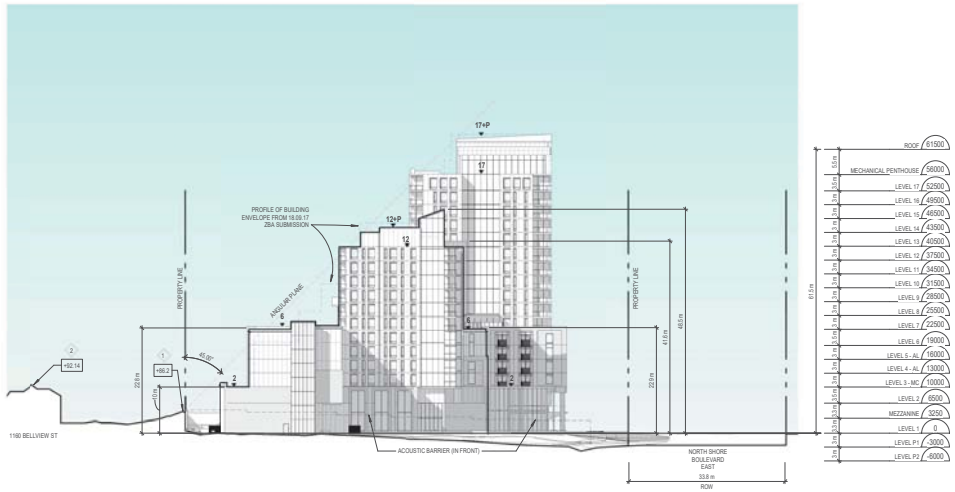

2 / A3.02 WEST

1 : 500

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BUILDING ELEVATION KEYNOTE LEGEND

1 NEAREST GRADE

2 NEAREST ROOF PEAK

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1	18.09.17	ISSUED FOR REZONING	MSA

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AMICA NORTH SHORE

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BUILDING ELEVATION - SOUTH AND WEST

scale:	As indicated
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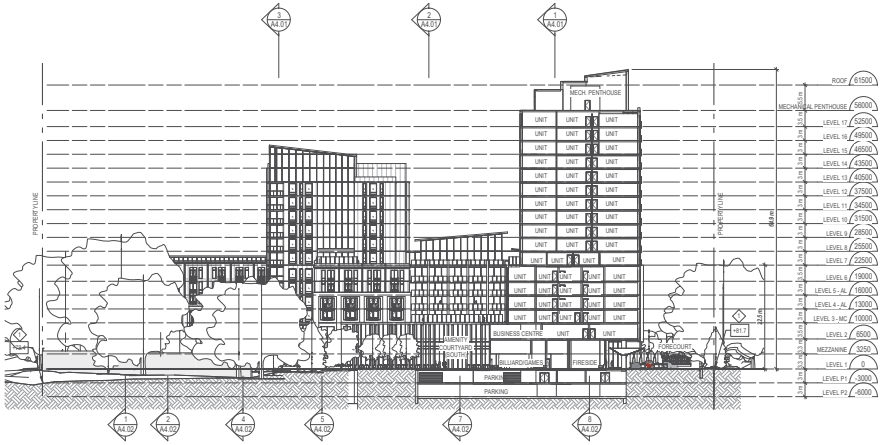
reviewed by:	KH
job number:	17099
plot date:	2019/08/09

drawing number:

A3.02



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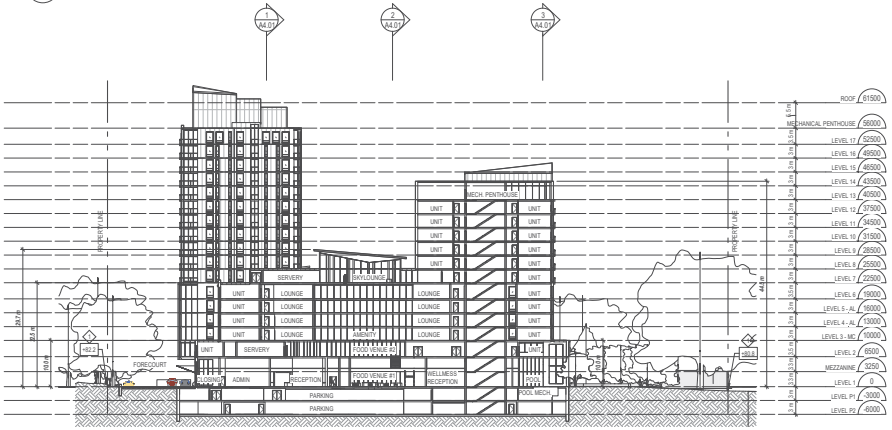

4 A4.01 SECTION EAST-WEST

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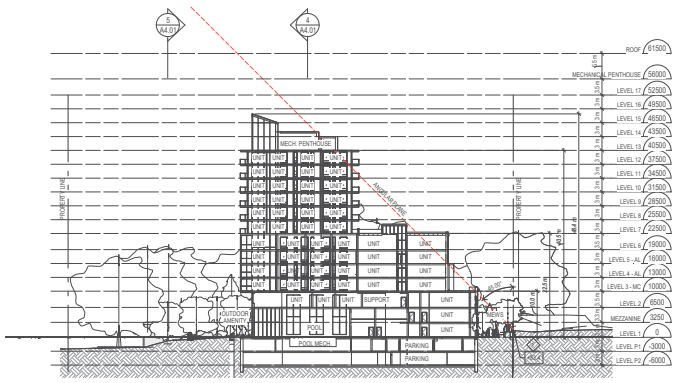

3 A4.01 SECTION SOUTH-NORTH2

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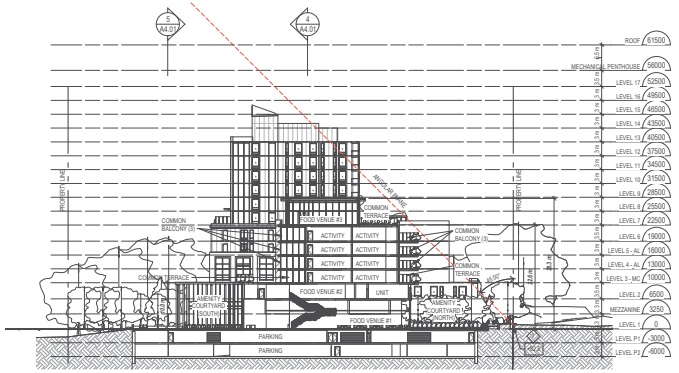

2 A4.01 SECTION SOUTH-NORTH1

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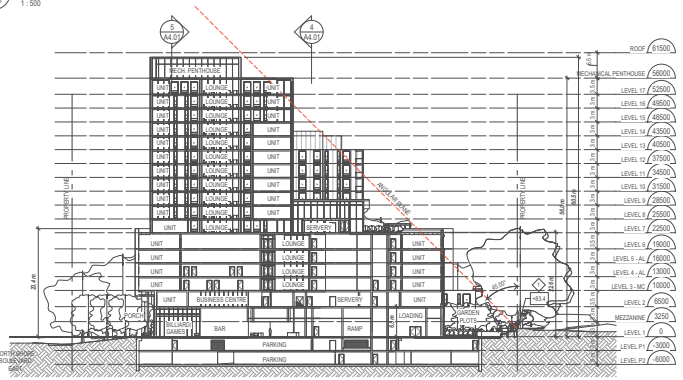

1 A4.01 SECTION SOUTH-NORTH

1 : 500

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SITE SECTION KEYNOTE LEGEND

1 NEAREST GRADE

2 NEAREST ROOF PEAK

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SITE SECTIONS

scale:	As indicated
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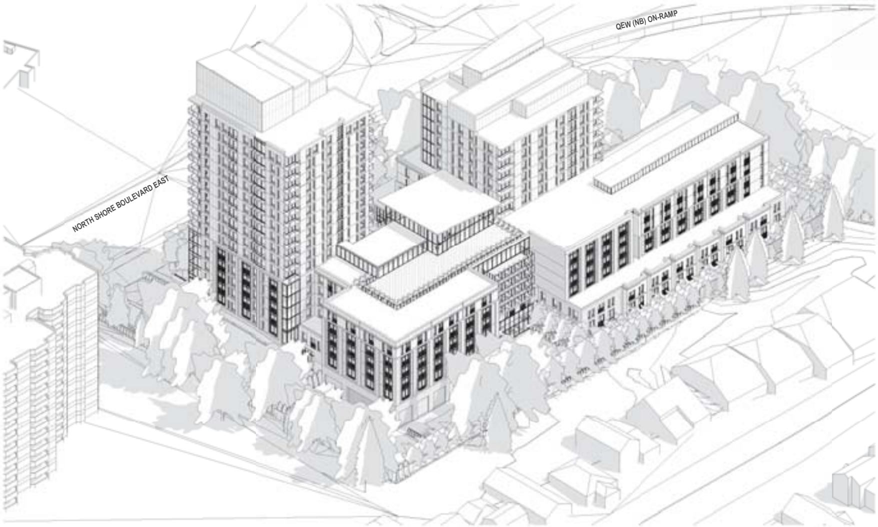
job number:	17099
plot date:	2019/08/09

drawing number:

A4.01

2019-08-12 3:23:54 PM C:\Users\kkrawczyk\Documents\MSA_NorthShore_2015_C_kkrawczyk.rvt



1 A5.01 AXONOMETRIC - NORTH EAST

2 A5.01 AXONOMETRIC - SOUTH WEST

2019-08-12 3:24:10 PM C:\Users\kkrawczyk\Documents\MSA_NorthShore_2019_C_kkrawczykW492T.rvt

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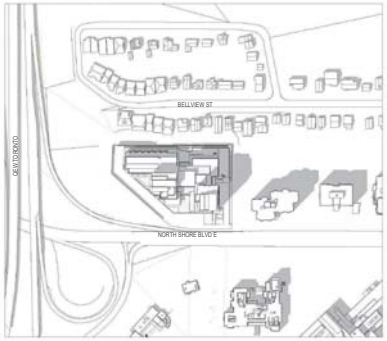
BUILDING MASSING

scale:
drawn by: KK
reviewed by: KH
job number: 17099
plot date: 2019/08/09

drawing number:
A5.01

[3 of 12] [March 21, 2010 - 09:30]

[6 of 12] [March 21, 2010 - 12:30]



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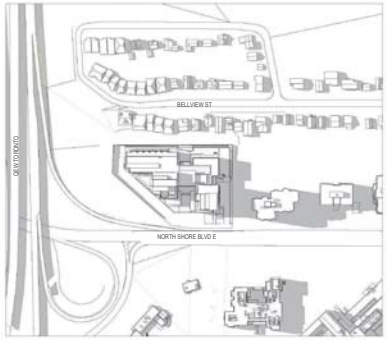
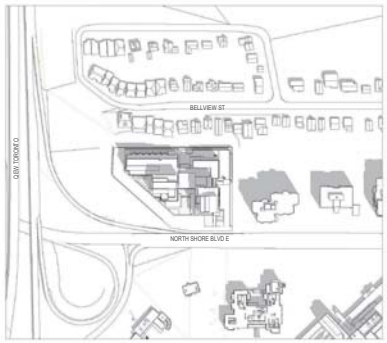
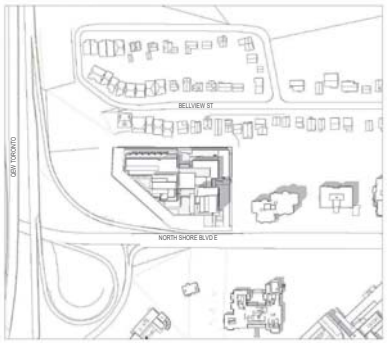


[3 of 12] [June 21, 2010 - 09:30]



[6 of 12] [June 21, 2010 - 12:30]



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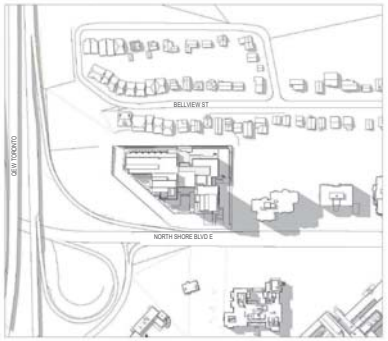
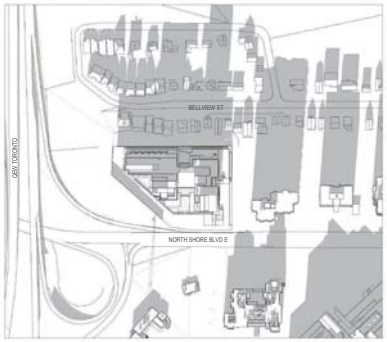


[3 of 12] [December 21, 2010 - 09:30]



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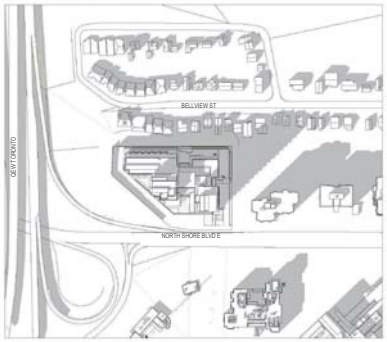

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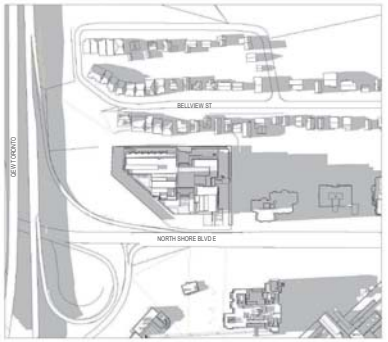

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AMICA NORTH SHORE

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SHADOW STUDY- MARCH 21, JUNE 21 AND DECEMBER 21

scale:	1 : 1
drawn by:	KK
reviewed by:	KH
job number:	17099
plot date:	2019/08/09

drawing number:

A6.01

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Appendix B

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Ontario

Ministry of Transportation | Highway Standards Branch | Traffic Office

Provincial Highways

Traffic Volumes 1988-2013

King's Highways / Secondary Highways / Tertiary Roads

Ministry Contact:
Traffic Office (905)-704-2960

Abstract:
This annual publication contains averaged traffic volume information and accident rate information for each of the sections of highway under MTO jurisdiction.

Key Words:
Annual Average Daily Traffic volume (AADT), Summer Average Daily Traffic volume (SADT), Summer Average Weekday Traffic volume (SAWDT), Winter Average Daily Traffic volume (WADT), Accident Rate (AR)

Highway	Location Description	Dist. (KM)	Year	Pattern Type	AADT	SADT	SAWDT	WADT	AR
			2000	CR	112,000	124,900	125,900	99,200	0.5
			2001	CR	117,400	131,500	131,500	103,300	0.2
			2002	CR	122,100	136,100	137,200	107,600	0.3
			2003	CR	124,000	152,500	145,100	105,400	0.2
			2004	CR	128,200	156,200	150,000	108,500	0.4
			2005	CR	131,800	159,900	153,700	111,000	0.4
			2006	CR	135,400	164,200	157,500	114,300	0.3
			2007	CR	139,000	168,200	168,200	117,100	0.4
			2008	CR	142,600	172,600	171,200	120,200	0.4
			2009	CR	142,600	176,000	169,600	123,600	0.2
			2010	CR	142,600	179,500	173,300	126,700	0.3
			2011	CR	142,600	166,800	168,300	126,900	N/A
			2012	CR	144,000	172,800	169,900	122,400	N/A
			2013	CR	145,000	174,000	178,400	123,300	N/A
QEW	FAIRVIEW ST IC-99	1.0	1988	IC	68,000	78,800	76,800	59,800	0.7
			1989	IC	76,600	88,000	86,500	68,100	0.8
			1990	IC	80,500	91,700	90,100	71,600	0.8
			1991	IC	82,900	93,600	91,900	73,700	1.1
			1992	IC	83,500	94,300	93,500	74,300	0.8
			1993	IC	84,100	93,300	92,500	76,500	0.6
			1994	IC	92,100	102,700	103,500	81,600	0.8
			1995	IC	95,900	106,900	108,400	85,000	0.3
			1996	IC	99,700	111,200	112,700	88,300	0.4
			1997	IC	103,600	115,500	117,100	91,200	0.4
			1998	IC	107,400	119,800	120,700	95,200	0.3
			1999	IC	111,300	124,100	125,100	98,600	0.6
			2000	IC	115,100	128,300	129,400	102,000	0.4
			2001	IC	118,900	133,200	133,200	104,600	0.3
			2002	IC	122,800	136,900	138,000	108,200	0.4
			2003	IC	126,600	140,500	141,800	111,400	0.3
			2004	IC	130,400	145,300	146,700	115,500	0.4
			2005	IC	134,300	149,300	150,800	118,400	0.5
			2006	IC	138,100	153,400	154,900	122,300	0.5
			2007	IC	141,900	157,600	162,500	125,400	0.4
			2008	IC	145,800	161,500	156,300	128,600	0.4
			2009	IC	149,600	165,800	167,300	132,600	0.4
			2010	IC	153,400	169,800	171,200	136,000	0.3
			2011	IC	157,300	173,000	179,300	141,500	N/A

iCorridor

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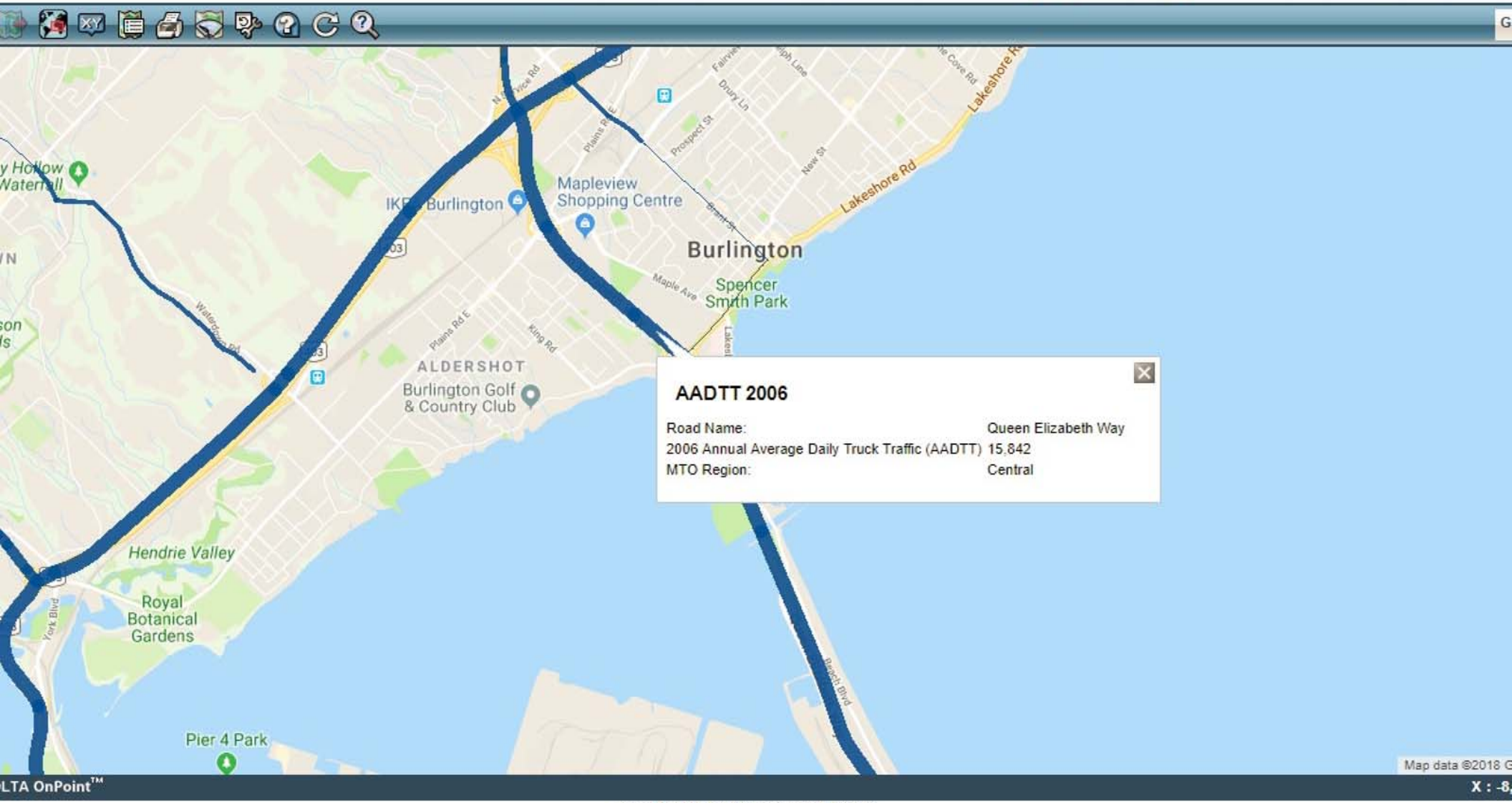

AADTT 2006

Road Name:	Queen Elizabeth Way
2006 Annual Average Daily Truck Traffic (AADTT)	15,842
MTO Region:	Central

LTA OnPoint™

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Ministry of Transportation | Highway Standards Branch | Traffic Office

Provincial Highways Traffic Volumes 2016

King's Highways / Secondary Highways / Tertiary Roads

Ministry Contact:
Traffic Office (905)-704-2960

Abstract:
This annual publication contains averaged traffic volume information for each of the sections of highway under MTO jurisdiction for the year 2016 only.

Key Words:
Annual Average Daily Traffic volume (AADT

Highway	Location Description From	Location Description To	Dist. (KM)	2016 AADT
QEW	FORT ERIE-GODERICH ST-PEACE BRIDGE PLAZA	CENTRAL AV IC	0.2	14,600
QEW	CENTRAL AV IC	CONCESSION RD IC-1	0.9	18,700
QEW	CONCESSION RD IC-1	THOMPSON RD IC-2	1.0	15,500
QEW	THOMPSON RD IC-2	GILMORE RD IC-5	2.4	17,700
QEW	GILMORE RD IC-5	BOWEN RD IC-7	2.0	24,200
QEW	BOWEN RD IC-7	NETHERBY RD IC-12 NIAGARA FALLS LTS	5.5	25,700
QEW	NETHERBY RD IC-12 NIAGARA FALLS LTS	SODOM RD IC-16	3.2	22,000
QEW	SODOM RD IC-16	LYONS CREEK RD IC-21	6.6	29,000
QEW	LYONS CREEK RD IC-21	MCLEOD RD IC-27	4.4	36,700
QEW	MCLEOD RD IC-27	HWY 420 IC-30	2.9	45,100
QEW	HWY 420 IC-30	THOROLD STONE RD IC-32	2.0	70,400
QEW	THOROLD STONE RD IC-32	MOUNTAIN RD IC-34	2.5	67,400
QEW	MOUNTAIN RD IC-34	HWY 405(WBL)IC-37	2.4	71,000
QEW	HWY 405(WBL)IC-37	GLENDALE AV IC-38	1.3	88,100
QEW	GLENDALE AV IC-38	NIAGARA ST SERVICE RDS	4.8	90,500
QEW	NIAGARA ST SERVICE RDS	NIAGARA ST IC-44	1.2	78,600
QEW	NIAGARA ST IC-44	LAKE ST IC-46	1.6	81,900
QEW	LAKE ST IC-46	ONTARIO ST IC-47	1.3	117,000
QEW	ONTARIO ST IC-47	MARTINDALE RD IC-48	0.7	97,400
QEW	MARTINDALE RD IC-48	HWY 406 IC-49	0.7	74,400
QEW	HWY 406 IC-49	SEVENTH ST IC-51	1.9	97,100
QEW	SEVENTH ST IC-51	JORDAN RD IC-55	4.3	98,100
QEW	JORDAN RD IC-55	VICTORIA AV IC-57	2.8	104,300
QEW	VICTORIA AV IC-57	ONTARIO ST IC-64	6.7	105,100
QEW	ONTARIO ST IC-64	BARTLETT AV IC-68	3.8	99,800
QEW	BARTLETT AV IC-68	MAPLE AV IC-71	2.5	99,300
QEW	MAPLE AV IC-71	CASABLANCA BV IC-74	3.6	107,100
QEW	CASABLANCA BV IC-74	FIFTY RD IC-78	3.5	112,300
QEW	FIFTY RD IC-78	FRUITLAND RD IC-83	5.1	120,300
QEW	FRUITLAND RD IC-83	HAMILTON 20 IC 88-CENTENNIAL PKWY	5.2	119,000
QEW	HAMILTON 20 IC 88-CENTENNIAL PKWY	BURLINGTON ST IC-89	1.6	130,000
QEW	BURLINGTON ST IC-89	EASTPORT RD IC-93 (7189)	4.0	135,000
QEW	EASTPORT RD IC-93 (7189)	HAMILTON HARBOUR ENTRANCE	0.9	149,400
QEW	HAMILTON HARBOUR ENTRANCE	NORTH SHORE BLVD IC 97	2.3	271,300
QEW	NORTH SHORE BLVD IC 97	FAIRVIEW ST IC-99	2.3	161,300
QEW	FAIRVIEW ST IC-99	HWY 403/407 IC-100	1.0	172,900
QEW	HWY 403/407 IC-100	BRANT ST IC 101	0.8	164,300
QEW	BRANT ST IC 101	GUELPH LINE IC-102	1.8	162,100
QEW	GUELPH LINE IC-102	WALKERS LINE IC-105	2.0	195,000
QEW	WALKERS LINE IC-105	APPLEBY LINE IC-107	2.0	190,000
QEW	APPLEBY LINE IC-107	BURLOAK DR IC-109	1.9	195,000
QEW	BURLOAK DR IC-109	BRONTE SERVICE RD IC-110	1.5	204,000
QEW	BRONTE SERVICE RD IC-110	REG. RD 25(N) BRONTE RD(S) IC-111	0.4	202,200
QEW	REG. RD 25(N) BRONTE RD(S) IC-111	THIRD LINE RD IC 113	2.0	191,300

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North Shore Blvd @ QEW East Ramp

Annual Average Daily Traffic Diagram

Total Factor = Monthly Factor(1.02) x Daily Factor(1.02) x 24 Hour Factor(1.85) = 1.924740

Municipality: Burlington
Site #: 0000201394
Intersection: North Shore Blvd & QEW E Ramp
TFR File #: 7
Count date: 11-Apr-2016

Weather conditions:
Overcast/Wet

Person(s) who counted:
Rick W

**** Signalized Intersection ****

Major Road: North Shore Blvd runs W/E

North Leg Total:	3124
North Entering:	0
North Peds:	8
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	0	0	0	0
Cars	0	0	0	0
Totals	0	0	0	

Cyclists	0
Trucks	112
Cars	3012
Totals	3124

East Leg Total:	24696
East Entering:	12495
East Peds:	2
Peds Cross:	⧖

QEW On Ramp

Cyclists	Trucks	Cars	Totals
6	304	10721	11031

Cars	Trucks	Cyclists	Totals
3012	112	0	3124
9102	264	6	9372
0	0	0	0
12114	375	6	

North Shore Blvd

N
W E
S

Cyclists	Trucks	Cars	Totals
0	0	0	0
6	189	5245	5439
0	31	897	928
6	219	6142	

North Shore Blvd

Cars	Trucks	Cyclists	Totals
11829	366	6	12201

QEW On/Off Ramp

Peds Cross:	⧖
West Peds:	2
West Entering:	6367
West Leg Total:	17398

Cars	897			
Trucks	31			
Cyclists	0			
Totals	928			

Cars	1619	0	6585	8203
Trucks	40	0	177	217
Cyclists	0	0	0	0
Totals	1659	0	6762	

Peds Cross:	⋈
South Peds:	13
South Entering:	8421
South Leg Total:	9348

Comments

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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	Roadway Name	Link Description	Speed (kph)	Period (h)	Total Traffic Volumes 2031	Auto %	Med %	Hvy %	Auto	Med	Heavy	Road Gradient (%)	Cadna/A Ground Absorption G	PWL (dBA)	Source Height, s (m)
QEW_NB	QEW NB	Daytime	100	16	85529	88.3%	2.9%	8.8%	75522	2502	7505	0	0.00	**98.2**	**1.7**
QEW_SB	QEW SB	Daytime	100	16	85529	88.3%	2.9%	8.8%	75522	2502	7505	0	0.00	**98.2**	**1.7**
NS_EB_QEW_NBR	North Shore EB to QEW NB Ramp	Daytime	40	16	984	96.7%	1.8%	1.5%	951	18	15	0	0.00	**66.4**	**1.1**
NS_WB_QEW_NBR	North Shore WB to QEW NB Ramp	Daytime	50	16	3313	96.4%	1.9%	1.7%	3194	64	55	0	0.00	**73.9**	**1.1**
QEW_NBR_NS	QEW NB Offramp to North Shore	Daytime	60	16	8931	97.4%	1.4%	1.2%	8701	123	107	0	0.00	**79.3**	**1.0**
NS_EL_EB	North Shore East of Ramp EB	Daytime	60	16	12934	97.0%	1.6%	1.4%	12546	208	180	0	0.00	**81.2**	**1.1**
NS_EL_WB	North Shore East of Ramp WB	Daytime	60	16	13245	97.0%	1.6%	1.4%	12847	213	186	0	0.00	**81.3**	**1.1**
NS_WL_EB	North Shore West of Ramp EB	Daytime	60	16	6747	96.5%	1.9%	1.6%	6514	125	108	0	0.00	**78.7**	**1.1**
NS_WL_WB	North Shore West of Ramp WB	Daytime	60	16	11692	97.2%	1.5%	1.3%	11370	172	151	0	0.00	**80.6**	**1.1**
QEW_NB	QEW NB	Nighttime	100	8	9503	88.3%	2.9%	8.8%	8391	278	834	0	0.00	**91.6**	**1.7**
QEW_SB	QEW SB	Nighttime	100	8	9503	88.3%	2.9%	8.8%	8391	278	834	0	0.00	**91.6**	**1.7**
NS_EB_QEW_NBR	North Shore EB to QEW NB Ramp	Nighttime	40	8	109	96.7%	1.8%	1.5%	106	2	2	0	0.00	**59.8**	**1.1**
NS_WB_QEW_NBR	North Shore WB to QEW NB Ramp	Nighttime	50	8	368	96.4%	1.9%	1.7%	355	7	6	0	0.00	**67.4**	**1.1**
QEW_NBR_NS	QEW NB Offramp to North Shore	Nighttime	60	8	992	97.4%	1.4%	1.2%	967	14	12	0	0.00	**72.8**	**1.0**
NS_EL_EB	North Shore East of Ramp EB	Nighttime	60	8	1437	97.0%	1.6%	1.4%	1394	23	20	0	0.00	**74.7**	**1.1**
NS_EL_WB	North Shore East of Ramp WB	Nighttime	60	8	1472	97.0%	1.6%	1.4%	1427	24	21	0	0.00	**74.8**	**1.1**
NS_WL_EB	North Shore West of Ramp EB	Nighttime	60	8	750	96.5%	1.9%	1.6%	724	14	12	0	0.00	**72.1**	**1.1**
NS_WL_WB	North Shore West of Ramp WB	Nighttime	60	8	1299	97.2%	1.5%	1.3%	1263	19	17	0	0.00	**74.1**	**1.1**

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

Receptor ID	Receptor Description	Sound Levels			Room / Façade Inputs					Source Inputs		Veneer - Component 1		Glazing - Component 2	
		Façade Sound Level: (dBA)	Free - field Corr: (dBA)	Req'd Indoor Sound Level: (dBA)	Glazing as % of Wall Area	Exp Wall Ht (m)	Exp Wall Length (m)	Room Depth (m)	Room Absorption:	Incident Sound Angle: (deg)	Spectrum type:	Veneer STC (STC)	Component Category:	Component Category:	Req'd Glazing STC (STC)
DAYTIME															
East Tower (Northwest Façade)	East Tower (Northwest Façade) - Living Room	68	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**26**
East Tower (Northwest Façade)	East Tower (Northwest Façade) - Bedroom	68	3	45	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**28**
East Tower (Southeast Façade)	East Tower (Southeast Façade) - Living Room	71	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**29**
East Tower (Southeast Façade)	East Tower (Southeast Façade) - Bedroom	71	3	45	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**32**
East Tower (Southwest Façade)	East Tower (Southwest Façade) - Living Room	72	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**30**
East Tower (Southwest Façade)	East Tower (Southwest Façade) - Bedroom	72	3	45	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**33**
Mid-rise Tower (Northwest Façade)	South Tower (Northwest Façade) - Living Room	71	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**29**
Mid-rise Tower (Northwest Façade)	South Tower (Northwest Façade) - Bedroom	71	3	45	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**32**
Mid-rise Tower (Southeast Façade)	South Tower (Southeast Façade) - Living Room	71	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**29**
Mid-rise Tower (Southeast Façade)	South Tower (Southeast Façade) - Bedroom	71	3	45	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**32**
Mid-rise Tower (Southwest Façade)	South Tower (Southwest Façade) - Living Room	74	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**32**
Mid-rise Tower (Southwest Façade)	South Tower (Southwest Façade) - Bedroom	74	3	45	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**35**
Podium (Northwest façade)	Podium (Northwest Façade) - Living Room	72	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**30**
Podium (Northwest façade)	Podium (Northwest Façade) - Bedroom	72	3	45	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**33**
Podium (Southeast façade)	Podium (Southeast Façade) - Living Room	72	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**30**
Podium (Southeast façade)	Podium (Southeast Façade) - Bedroom	72	3	45	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**33**
Podium (Southwest façade)	Podium (Southwest Façade) - Living Room	69	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**27**
Podium (Southwest façade)	Podium (Southwest Façade) - Bedroom	69	3	45	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**29**
NIGHT-TIME															
East Tower (Northwest Façade)	East Tower (Northwest Façade) - Living Room	62	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**20**
East Tower (Northwest Façade)	East Tower (Northwest Façade) - Bedroom	62	3	40	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**27**
East Tower (Southeast Façade)	East Tower (Southeast Façade) - Living Room	64	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**22**
East Tower (Southeast Façade)	East Tower (Southeast Façade) - Bedroom	64	3	40	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**29**
East Tower (Southwest Façade)	East Tower (Southwest Façade) - Living Room	65	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**23**
East Tower (Southwest Façade)	East Tower (Southwest Façade) - Bedroom	65	3	40	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**30**
Mid-rise Tower (Northwest Façade)	South Tower (Northwest Façade) - Living Room	64	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**22**
Mid-rise Tower (Northwest Façade)	South Tower (Northwest Façade) - Bedroom	64	3	40	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**29**
Mid-rise Tower (Southeast Façade)	South Tower (Southeast Façade) - Living Room	65	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**23**
Mid-rise Tower (Southeast Façade)	South Tower (Southeast Façade) - Bedroom	65	3	40	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**30**
Mid-rise Tower (Southwest Façade)	South Tower (Southwest Façade) - Living Room	67	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**25**
Mid-rise Tower (Southwest Façade)	South Tower (Southwest Façade) - Bedroom	67	3	40	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**33**
Podium (Northwest façade)	Podium (Northwest Façade) - Living Room	66	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**24**
Podium (Northwest façade)	Podium (Northwest Façade) - Bedroom	66	3	40	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**32**
Podium (Southeast façade)	Podium (Southeast Façade) - Living Room	65	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**23**
Podium (Southeast façade)	Podium (Southeast Façade) - Bedroom	65	3	40	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**30**
Podium (Southwest façade)	Podium (Southwest Façade) - Living Room	62	3	45	70%	2.8	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**20**
Podium (Southwest façade)	Podium (Southwest Façade) - Bedroom	62	3	40	50%	2.8	3.0	3.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	43	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**27**

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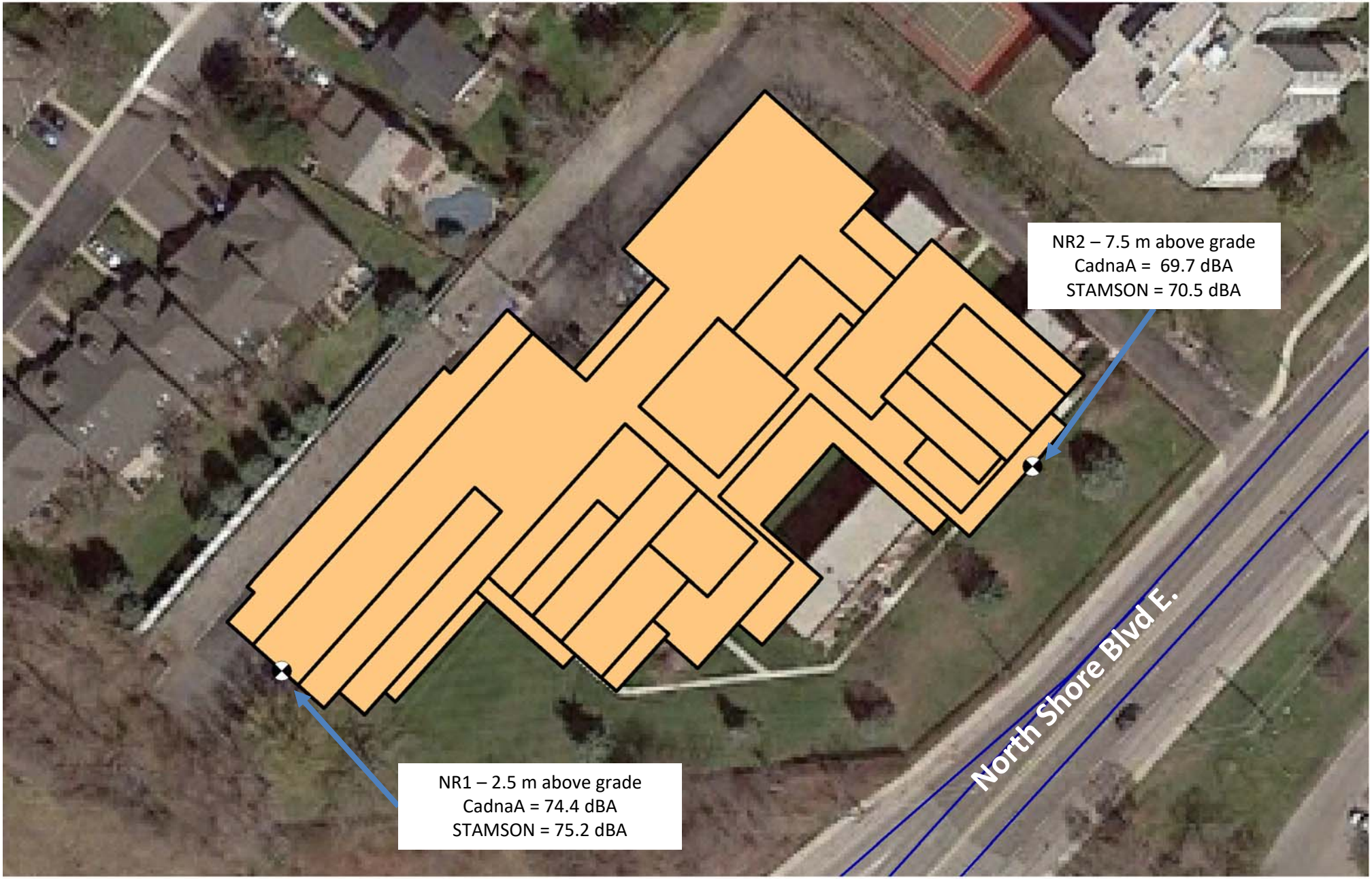

Figure No. **B.1**

Stamson / CandaA Validation Files

18-0085 – 1157-1171 North Shore Development
Burlington, Ontario

True North

Scale:	1: 750
Date:	19/08/01
File No.:	18-0085
Drawn By:	AKH

novus ENVIRONMENTAL

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Appendix C

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Warning Clauses

The following warning clause must be included in agreements registered on Title and included in all agreements of purchase and sale or lease and all rental agreements for the development:

Transportation Noise Sources

MECP Type A: "Purchasers/tenants are advised that sound levels due to increasing road 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, Conservation and Parks."

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 road 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, Conservation and Parks."

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 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, Conservation and Parks."

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