REPORT

1026 COOKE BOULEVARD

BURLINGTON, ONTARIO

NOISE AND VIBRATION IMPACT STUDY

RWDI #2305839

June 29, 2023

SUBMITTED TO

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VERSION HISTORY

Index	Date	Description	Prepared by	Reviewed by
1	June 29, 2023	Initial Submission	CWM	SVG

STATEMENT OF LIMITATIONS

This report entitled 1026 Cooke Boulevard was prepared by Rowan Williams Davies & Irwin Inc. ("RWDI") for Halton Standard Condominium Corporation No. 416 ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

EXECUTIVE SUMMARY

RWDI was retained to prepare a Noise and Vibration Impact Study (NVIS) for the proposed mixed-use development located at 1026 Cooke Boulevard in Burlington, Ontario. The proposed development will consist of one building, consisting of one 29-storey residential tower with a 5-storey podium. This assessment was completed to support the Site Plan Approval (SPA) submission as required by the City of Burlington.

The following noise control measures are recommended for the proposed development:

1. Installation of central air-conditioning so that all suites' windows can remain closed.
2. The inclusion of noise warning clauses related to:
    a. Transportation sound levels in the outdoor amenity areas
    b. Proximity to railway line
    c. Proximity to commercial/industrial land-use
3. Construction of perimeter noise barriers along the outdoor amenity areas if feasible, with the applicable warning clause.

The nearest railway is approximately 500m to the northwest of the development. A vibration assessment is not required due to the large separation distance. However, rail was assessed from a noise perspective.

The potential noise levels from stationary sources of sound were evaluated. Based on the noise modeling results and setback distances, the land use compatibility of the proposed development with respect to the nearby industrial land-uses is considered acceptable from the noise assessment perspective. However, due to the proximity of the proposed development to the commercial and industrial facilities, a warning clause is recommended to inform prospective occupants of the potential for audible noise from these facilities.

At this stage in design the noise levels produced by the development on itself and its surroundings could not be quantitatively assessed. However, the effect on both the building itself and its surroundings is expected to be feasible to meet the applicable criteria. We recommend that the building design is evaluated prior to building permit to ensure that the acoustical design is adequately implemented in order to meet the applicable criteria.

Based on the results of the analysis including implementation of the recommendations included with this assessment, the proposed development is feasible to meet the applicable sound and vibration criteria.

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1 INTRODUCTION

RWDI was retained to prepare a Noise and Vibration Impact Study (NVIS) for the proposed 1026 Cooke Boulevard located in Burlington, Ontario.

The proposed development will consist of one building, consisting of one 29-storey residential tower with a 5-storey podium. The context site plan is shown in **Figure 1**.

The site is exposed to noise from road traffic from: Waterdown Road to the west, and Plains Road East to the south. Highway 403 is located approximately 700m to the northwest and the nearest railway is located approximately 500m to the northwest. Despite the large separation distances, these transportation sources are anticipated to have an impact at the proposed development and are included in this assessment.

This assessment was completed to support the joint Zoning By-Law (ZBA) and Site Plan Approval (SPA) submission as required by the City of Burlington. This assessment was based on design drawings dated October 25, 2022 which can be found in **Appendix A**.

2 APPLICABLE CRITERIA

Applicable criteria for transportation noise sources (road) and stationary noise sources are adopted from the Ontario Ministry of the Environment, Conservation and Parks (MECP) NPC-300 Environmental Noise Guideline (MOE, 2013), with a summary of the applicable criteria included with **Appendix B**.

The proposed development site would be characterized as a “Class 1 Area”, which is defined according to NPC-300 as an area with an acoustical environment typical of a major population centre, where the background sound level is dominated by the activities of people, usually road traffic, often referred to as "urban hum”.

3 THE EFFECTS OF THE ENVIRONMENT ON THE PROPOSED DEVELOPMENT

3.1 Transportation Source Assessment

3.1.1 Road Traffic Volume Data

Waterdown Road and Plains Road traffic volumes were obtained from The City of Burlington.

An 85%/15% daytime/nighttime arterial road split was applied for Waterdown Road; and a 90%/10% daytime/nighttime local road split was applied for Plains Road.

Turning Movement Counts (TMCs) at the intersection of Waterdown Road at Plains Road East provided detailed traffic volumes for the two peak time periods: 07:30 to 08:30 and 16:30 to 17:30. The TMCs were used to determine the traffic volume and types of vehicles on each link during the AM and PM peaks and 8-hour interval which were

assumed to be 9%, 10% and 60% of the Annual Average Daily Traffic (AADT), respectively. The maximum AADTs obtained from the approximation of each of these three time periods was used for the AADT for the respective roadway.

The AADT and truck percentages for Highway 403 were provided by the Ministry of Transportation (MTO) iCorridor – Historical Provincial Highways Traffic Volumes. A 67%/33% daytime/nighttime freeway road split was applied for Highway 403.

Traffic volumes for each of the respective roadways were increased at a rate of 2% per year to represent the predicted 10-year horizon volumes.

A summary of the traffic data used is included in **Table 1** below with more detailed information included in **Appendix C**.

Table 1: Road Traffic Volumes

Roadway	Segment	2033 Future Traffic (AADT)	% Day/Night	Speed Limit (km/hr)	% Trucks
Waterdown Road	North of Plains Road	19,012	85 / 10	50	5.8
	South of Plains Road	9,503			2.8
Plains Road	East of Waterdown Road	25,029	90 / 10	60	3.4
	West of Waterdown Road	28,920			4.0
Highway 403	--	205,781	67 / 33	100	8.0

3.1.1 Rail Traffic Volume Data

Future GO transit rail traffic on the GO Metrolinx corridor, located approximately 500m to the northwest of the site, was obtained from Metrolinx.

Freight rail volumes were requested but were not provided by the rail authorities. As such, typical volumes based on line type (e.g. principal main line, secondary line) have been assumed as a basis for the analysis. The volumes were forecast 10 years into the future using a 2.5% annual growth rate that is typically used by rail authorities.

The rail corridor also services VIA Rail. VIA Rail does not provide trip forecasts. As such, the current VIA Rail train schedule was used to obtain a number of trips through Aldershot Station. The current trips were forecast 10 years into the future using a 2.5% annual growth rate to be conservative.

The data used for the analysis is summarized in **Table 2**, with details included in **Appendix D**.

Table 2: Rail Volumes and Configuration

Train Type	Daytime	Nighttime	Type of Locomotive	No of Locomotives	No of Cars	Speed (km/h)
GO Metrolinx	132	21	LRT Diesel	1	12	153
VIA Rail	14	--	LRT Diesel	2	6	130
CN Rail	20	10	Freight	4	120	80

3.1.2 Representative Receptors

The selection of receptors affected by transportation noise sources was based on the drawings reviewed for this assessment. Using the "building evaluation" feature of Cadna/A, each façade of the residential buildings was assessed.

Outdoor Living Areas (OLAs) would include outdoor areas intended and designed for the quiet enjoyment of the outdoor environment and which are readily accessible from the building. OLAs may include any common outdoor amenity spaces associated with a multi-unit residential development (e.g. courtyards, roof-top terraces), and/or private backyards and terraces with a minimum depth of 4m provided they are the only outdoor living area for the occupant. Daytime sound levels were assessed at the following identified OLAs:

- OLA01: At-grade Outdoor Amenity
- OLA02: 2nd Floor Outdoor Amenity
- OLA03: 6th Floor West Outdoor Amenity
- OLA04: 6th Floor Southeast Outdoor Amenity
- OLA05: 6th Floor Northeast Outdoor Amenity

The OLAs are indicated in **Figure 2**.

3.1.3 Transportation Source Assessment - Analysis and Results

Sound levels due to the adjacent transportation (road) sources were predicted using the RLS-90 standard (RLS,1990) as implemented in the Cadna/A software package.

To assess the effect of transportation noise on suites, the maximum sound level on each façade was determined with the results summarized in **Table 3**.

Table 3: Predicted Ground Transportation Source Sound Levels – Plane of Window

Building	Façade	Road		Rail		Combined Road and Rail		Notes
		Day L_{EQ}, 16hr	Night L_{EQ}, 8hr	Day L_{EQ}, 16hr	Night L_{EQ}, 8hr	Day L_{EQ}, 16hr	Night L_{EQ}, 8hr	
5-Storey Podium	North	57	54	53	51	58	56	1
	East	58	54	52	51	59	55	1
	South	61	55	47	46	61	55	1
	West	60	56	53	52	61	57	1
29-Storey Tower	North	57	55	57	56	60	59	1, 2
	East	58	54	55	54	60	57	1
	South	61	55	47	46	61	55	1
	West	61	56	53	52	61	58	1

Note(s):

1. Applicable for low and medium density developments: Provision for future installation of air-conditioning, warning clause "Type C". Applicable for high density developments: Installation of air-conditioning to allow for windows and doors to remain closed, warning clause "Type D". Refer to **Appendix D** for guidance regarding air-conditioning as a noise mitigation measure.
2. The acoustical performance of building components must be specified to meet the indoor sound level criteria. Installation of air conditioning to allow for windows and doors to remain closed, warning clause "Type D". Refer to **Appendix D** for guidance regarding air-conditioning as a noise mitigation measure.

To assess the effect of transportation noise on the qualifying OLAs for the development, predicted sound level results are summarized in **Table 4**.

Table 4: Transportation Sound Levels in Outdoor Living Areas (OLAs)

Receptor	Description	Daytime L_{EQ}, 16hr	Notes
OLA01	At-grade Outdoor Amenity	56	1
OLA02	2nd Floor Outdoor Amenity	58	1
OLA03	6th Floor West Outdoor Amenity	59	1
OLA04	6th Floor Southeast Outdoor Amenity	59	1
OLA05	6th Floor Northeast Outdoor Amenity	57	1

Note(s):

3. Noise mitigation is recommended to meet the ≤55 dBA OLA sound level criterion. If noise controls are not feasible to meet the 55 dBA criterion for technical, economic or administrative reasons, an exceedance of 5 dB may be acceptable (to a maximum sound level of 60 dBA). In this case, a warning clause "Type B" is recommended.

3.2 Stationary Source Assessment

Stationary sources could be grouped into two categories: Those that have a permit with the Ontario Ministry of the Environment, Conservation and Parks (MECP) through an Environmental Compliance Approval (ECA) or Environmental Activity and Sector Registry (EASR); and those that are exempt from ECA or EASR permit requirements.

In the case where a stationary source has an ECA or EASR permit with the MECP, and would be put in a position where it is no longer in compliance with the applicable sound level criteria due to the encroachment of the proposed new development, source specific mitigation and/or formal classification of the proposed development lands as a "Class 4 Area" (refer to C.4.4.2 "Class 4 Area" in NPC-300) would be required. In this case, coordination and agreements between the stationary source owner, proposed new development owner, the land-use planning authority and potentially the MECP would be needed.

In the case where a stationary source is exempt from ECA or EASR permit requirements with the MECP, the noise provisions of the applicable Municipal Code and guidance from NPC-300 would be applicable. In this case, mitigation of sound levels due to stationary sources would be from a due diligence perspective to avoid nuisance complaints from future occupants of the proposed new development. Mitigation could be in the form of mitigation at the source (with agreement from the stationary source owner) and/or mitigation at the receptor through site and building element design (building orientation, acoustical barriers, façade sound insulation design).

3.2.1 Land-Use Compatibility Review (D-6 Guideline Assessment)

The MECP Guideline D-6 (MOE, 1995) was used as a tool to classify the identified industries and asses their potential influence on the proposed development. The classifications and setback guidelines are summarized in **Appendix B**. The results of the classification and potential influence on the proposed development are shown in the Land-Use Compatibility Report.

3.2.2 Stationary Source Modeling

Stationary sources of noise surrounding the proposed development were identified using a combination of source identification from a site visit conducted on July 6th, 2022, publicly available aerial and street-level imagery, business listing and The Ministry of the Environments, Conservation and Parks' Access Environment database. Stationary source locations are shown in **Figure E.1** in **Appendix E**. Classes were assessed using the noise assessment perspective, as an air quality review was not considered for this study.

The results of the D-6 assessment from the Land-Use Compatibility Report indicate that the nearby facilities are beyond the minimum setback distance from noise sensitive (residential) buildings for the proposed development; however, some facilities would be within the potential influence area. As such, supplementary noise modeling has been conducted to further inform the stationary source assessment.

3.2.2.1 Representative Receptors

The worst-case receptor locations were assessed to evaluate the potential stationary source noise effects on the proposed development. The locations of the Outdoor Points of Reception (OPOR) used to assess the impact of the stationary sources are shown in **Figure E.2** in **Appendix E**.

3.2.2.2 Assumed Sources and Sound Power Levels

Stationary sources of noise surrounding the proposed development were identified using a combination of a site visit conducted on July 6th, 2022, publicly available aerial imagery and street-level imagery.

RWDI proxy data were used for the sound power levels of the HVAC units included in the model. The assumed sound power levels included in the screening level stationary source assessment are presented in **Table 5**.

Table 5: Stationary Source Sound Power Level Assumptions

Source	Proxy Data / Calculation	Sound Power Level (dBA)	Duty Cycle	
			Daytime and Evening (07:00h – 23:00h)	Nighttime (23:00h – 07:00h)
HVAC_1Fan	Proxy Data	78	Continuous	30 min/hr
HVAC_2Fan	Proxy Data	79	Continuous	30 min/hr
HVAC_3Fan	Proxy Data	80	Continuous	30 min/hr
HVAC_6Fan	Proxy Data	86	Continuous	30 min/hr
Cooling Tower	Proxy Data	100	Continuous	30 min/hr

The permitted facilities listed in the Land-use Compatibility Report were not included in the stationary source modelling as there are existing residences and high-rise developments approved in the direction of those industries, and closer to. Consequently, sound levels at the proposed development area expected to be less than at those existing receptors. This was confirmed during the site visit when these facilities were not audible at the corners of Waterdown Road and Masonry Court. Furthermore, other proposed developments block line-of-sight and will further reduce any sound levels as a result of stationary sources at the development.

The assumed sound power level values and duty-cycles for the stationary sources are based on reasonable assumptions for the source type.

3.2.2.3 Analysis and Results

Stationary source noise modelling was carried out using the Cadna/A software package, a commercially available implementation of the ISO 9613 (ISO, 1994 and ISO, 1996) algorithms. The predicted sound levels are assessed against the Class 1 Area limits (refer to **Appendix B**).

The highest façade sound level experienced by the proposed development due to stationary noise sources is 46 dBA during daytime hours and 43 dBA during nighttime hours, both on the southwestern facades. The highest sound level experienced at an outdoor point of reception (OPOR) due to stationary noise sources during daytime hours is 47 dBA. These sound levels meet the applicable Class 1 sound level criteria based on screening level noise modelling analysis.

3.3 Recommendations

Based on the noise and vibration assessment results, the following recommendations were determined for the project. Recommendations are provided for both transportation sources and stationary sources.

3.3.1 Transportation Sources

The following recommendations are provided to address transportation sources.

3.3.1.1 Building Façade Components

Due to the elevated transportation sound levels in the area, acoustical design of the façade components including spandrel, window glazing, and exterior doors, are recommended to be specified for the proposed development.

To assess the development's feasibility, preliminary window glazing, and exterior balcony door sound isolation requirements were determined. These were based on following assumptions:

- Typical residential living room:
  - Glazing 60% of façade, Door: 20% of façade
  - 55% Façade to floor area Ratio
- Typical residential bedroom:
  - Glazing 80% of façade, Door: N/A
  - 81% Façade to floor area Ratio
- Acoustical character of rooms: High absorption finishes/furniture for bedrooms and intermediate absorption finishes/furniture for living rooms.

Based on the predicted plane of window sound levels and the assumptions listed above, recommendations for the minimum sound insulation ratings for the building components were determined using the National Research Council of Canada "BPN-56 method" (NRCC, 1985). The reported results are in terms of Sound Transmission Class (STC) ratings as summarized in **Table 6**.

Table 6: Recommended Facade Component Minimum Sound Insulation Rating

Façade	Window Glazing	Exterior Door	Façade Wall
North Façade	OBC	OBC	OBC
East Façade	OBC	OBC	OBC
South Façade	OBC	OBC	OBC
West Façade	OBC	OBC	OBC

Note(s):
1. "OBC" denotes that the noise insulation design is not required to be specified. Building envelope assemblies meeting the minimum Ontario Building Code (OBC) requirements will also exhibit sufficient noise reduction to meet the interior sound level criteria.

Window glazing, exterior door assemblies, and façade walls meeting the Ontario Building Code are sufficient to achieve compliance for the indoor sound level limits due to transportation sources.

We recommend that the façade construction is reviewed during detailed design to ensure that the indoor sound level limits will be met, and that the window/door supplier is requested to provide STC laboratory test reports as

part of shop drawing submittal to confirm that the glazing/door components will meet the minimum STC requirements.

3.3.1.2 Ventilation Recommendations

Due to the transportation sound levels at the plane of the façade, central air conditioning is recommended for the proposed development to allow for windows and doors to remain closed as a noise mitigation measure. Further, prospective purchasers or tenants should be informed by a warning clause "Type D".

3.3.1.3 Outdoor Living Areas

Due to exposure to transportation sources, sound levels in OLAs are predicted to be elevated. The daytime average sound levels for OLA02, OLA03, and OLA04 are in the range of 55-60 dBA. To reduce the transportation sound levels in OLAs to meet the applicable criteria, noise barriers are recommended.

The recommended geometry of the noise barriers are included with **Figure 3** (to meet 55 dBA). The barrier heights are summarized in **Table 7**. General guidance with respect to noise barrier design is included with **Appendix D**. As landscaping is further refined, a detailed assessment of the outdoor amenity spaces to better quantify the sound levels, and the heights and locations of the barrier walls, is recommended.

Table 7: Barrier Height Recommendations for OLAs

Receptor	Description	Predicted OLA Sound Level	Barrier Height (m) to Meet Sound Level Criterion	
		Daytime L_{EQ}, 16hr	≤ 55 dBA[1, 2]	≤ 60 dBA
OLA01	At-grade Outdoor Amenity	56	1.2 m	--
OLA02	2nd Floor Outdoor Amenity	58	1.7 m	--
OLA03	6th Floor West Outdoor Amenity	59	1.8 m	--
OLA04	6th Floor Southeast Outdoor Amenity	59	1.2 m	--
OLA05	6th Floor Northeast Outdoor Amenity	57	1.8 m	--

Note(s):
1. Refer to Figure 3 for barrier geometry to meet 55 dBA.
2. If noise control measures are not provided, a warning clause "Type A" is recommended.

3.3.2 Stationary Sources

Based on the noise modeling results and setback distances, the proposed development is not anticipated to infringe on the compliance of any commercial or industrial operations with environmental noise permits (ECA or EASR), nor cause infractions against the local noise by-law (By-Law 019-2003). As such, the land use compatibility of the proposed development with respect to the nearby industries is considered acceptable from the noise assessment perspective.

Due to the proximity of the proposed development to the commercial and industrial facilities, a warning clause "Type E" is recommended to inform prospective occupants of the potential for audible noise from these facilities.

3.3.3 Warning Clauses

The following warning clauses are recommended for the proposed development:

1. NPC-300 Type A to address transportation sound levels in Outdoor Living Areas (OLAs) as applicable, if recommended barriers are not built.
2. NPC-300 Type D to address transportation sound levels at the plane of window.
3. NPC-300 Type E to address proximity to commercial/industrial facilities.

Warning clauses are recommended to be included on all development agreements, offers of purchase and agreements of purchase and sale or lease. The wording of the recommended warning clauses is included with **Appendix F**.

4 THE EFFECTS OF THE PROPOSED DEVELOPMENT ON ITS SURROUNDINGS AND ON ITSELF

On-site stationary sources for the development are expected to consist of HVAC related equipment in the roof-top mechanical penthouse as well as various exhaust fans. Further, consideration should be given to control airborne and structure-borne noise generated within the proposed development.

Within the development itself the main sources of noise that are likely to affect the uses of the building are the mechanical systems. The potential noise effect of the commercial component of the development is recommended to be reviewed during detailed design, to ensure the applicable criteria will be met.

Provided that best practices for the acoustical design of the building are followed, noise from building services equipment associated with the development are expected to be feasible to meet the applicable sound level criteria due to the nature (residential/mixed-use) of the proposed development.

We recommend that the potential noise effect of the proposed development is reviewed during detailed design to ensure the applicable sound level criteria will be achieved.

5 CONCLUSIONS

RWDI was retained to prepare a Noise and Vibration Impact Study (NVIS) for the proposed mixed-use development located at 1026 Cooke Boulevard in Burlington, Ontario. The proposed development will consist of one building, consisting of two residential towers (one 30-storey and one 32-storey) with shared 6-storey podium.

The following noise control measures are recommended for the proposed development:

1. Installation of central air-conditioning so that all suites' windows can remain closed.
2. The inclusion of noise warning clauses related to:
    a. Transportation sound levels in the outdoor amenity areas
    b. Proximity to railway line
    c. Proximity to commercial/industrial land-use
3. Construction of perimeter noise barriers along the outdoor amenity areas if feasible, with the applicable warning clause.

The nearest railway is approximately 500m to the northwest of the development. A vibration assessment is not required due to the large separation distance. However, rail was assessed from a noise perspective.

The potential noise levels from stationary sources of sound were evaluated. Based on the noise modeling results and setback distances, the land use compatibility of the proposed development with respect to the nearby industrial land-uses is considered acceptable from the noise assessment perspective. However, due to the proximity of the proposed development to the commercial and industrial facilities, a warning clause is recommended to inform prospective occupants of the potential for audible noise from these facilities.

At this stage in design the noise levels produced by the development on itself and its surroundings could not be quantitatively assessed. However, the effect on both the building itself and its surroundings is expected to be feasible to meet the applicable criteria. We recommend that the building design is evaluated prior to building permit to ensure that the acoustical design is adequately implemented in order to meet the applicable criteria.

Based on the results of the analysis including implementation of the recommendations included with this assessment, the proposed development is feasible to meet the applicable sound and vibration criteria.

6 REFERENCES

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FIGURES



Site Context Plan

True North

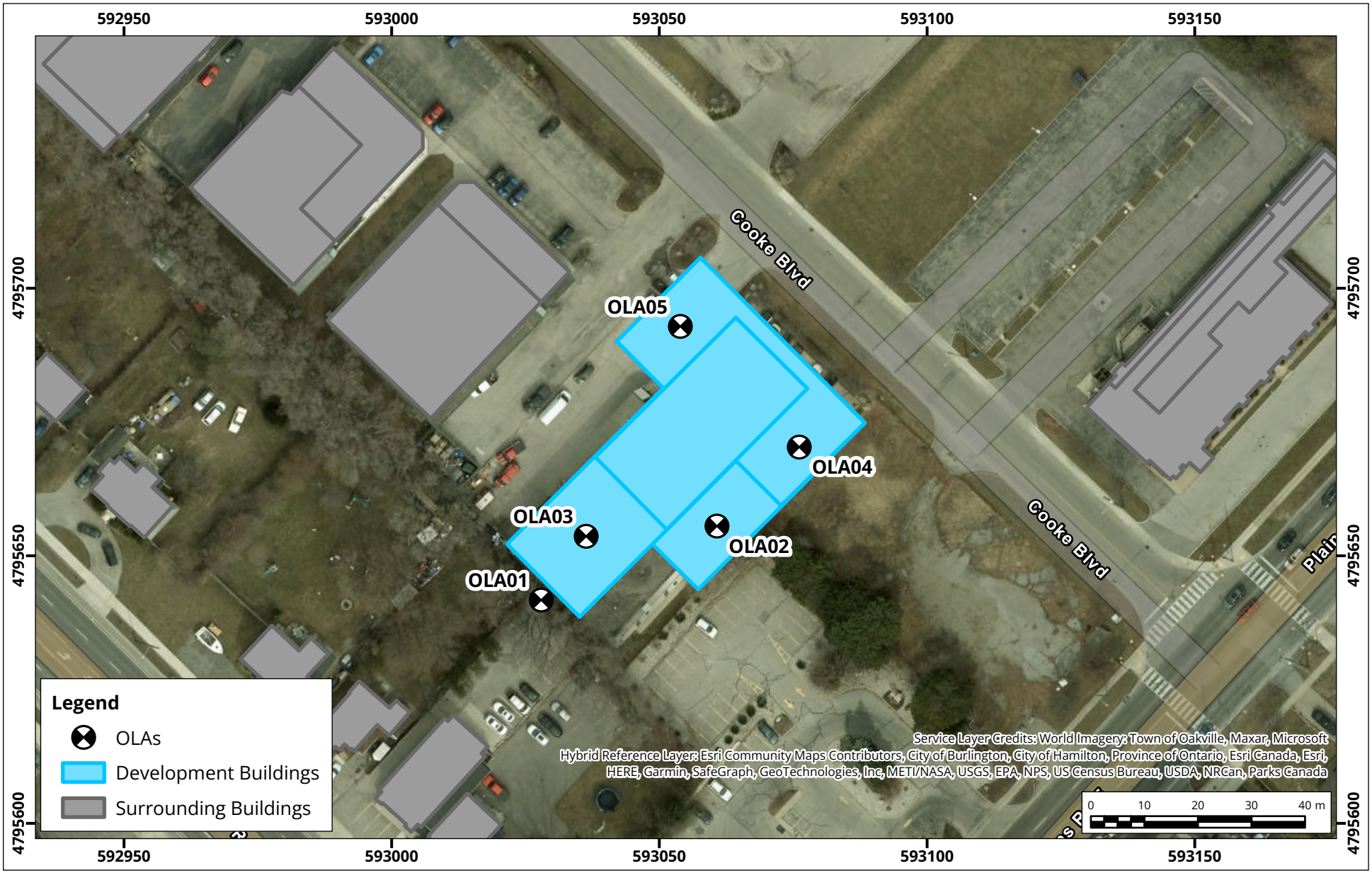
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1026 Cooke Boulevard - Brantford, Ontario

Project #: 2305839

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Date Revised:	Jun 20, 2023

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Outdoor Living Areas (OLAs) Locations

Location of Common Outdoor Amenity Areas

Map Projection: NAD 1983 UTM Zone 17N

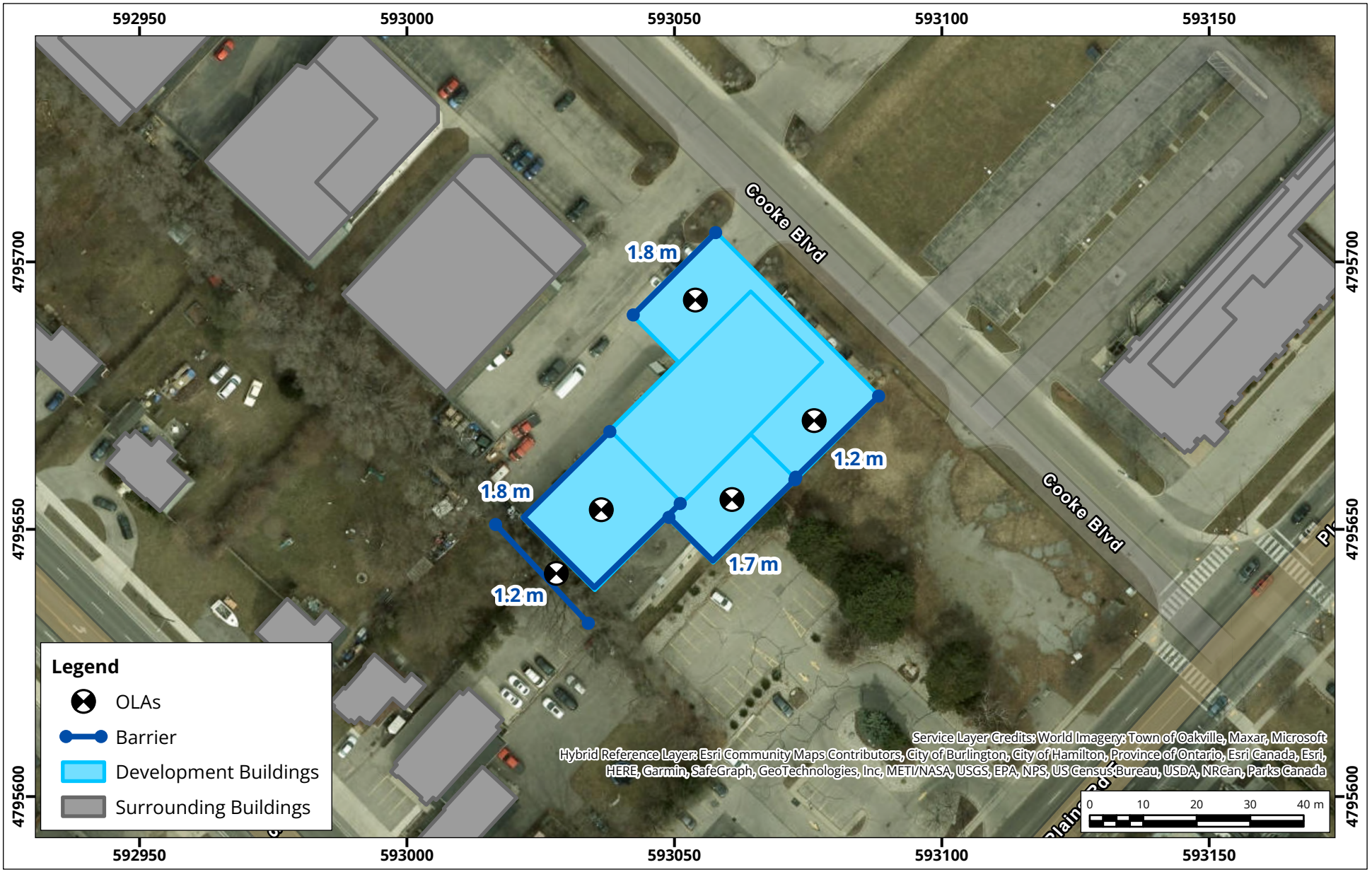
1026 Cooke Boulevard - Brantford, Ontario

True North

Project #: 2305839

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Outdoor Living Areas (OLAs) Mitigation to 55 dBA

Recommended Barrier Geometry and Height to meet 55 dBA

Map Projection: NAD 1983 UTM Zone 17N

1026 Cooke Boulevard - Brantford, Ontario

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Approx. Scale:	1:1,000		
Date Revised:	Jun 20, 2023		

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APPENDIX A



1026 COOKE BLVD, BURLNGTON, ON

Feasibility Study

22.255

2022-10-25

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TURNER FLEISCHER

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SHEET TITLE:
SCALE: 1: 200
DATE: 2022-10-25

1026 COOKE BLVD, BURLNGTON, ON
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STATISTICS	M2	SF
SITE AREA	3,200	
NEW PROPOSAL GFA	28,061	302,049
FSI	8.77	
NEW RESIDENTIAL UNIT#	334	
NET AVERAGE UNIT SIZE	60	642

GFA CALCULATION

		DESCRIPTION		RESIDENTIAL					RETAIL GFA		TOTAL GFA	
				TOTAL GFA		NET SALEABLE						
		TYPE	FLOORS #	m2	ft2	m2	ft2	UNIT#(3)	m2	ft2	m2	ft2
	U/G PARKING		3	591	6362						591	6,362
0	BASE(F1~F5)	RESIDENTIAL BASE	5	9,527	102,549	4,541	48,879	70	375	4,037	9,902	106,585
	TOWER(F6~F29)	RESIDENTIAL TOWER	24	17,568	189,102	15,360	165,335	264			17,568	189,102
TOTAL			29	27,686	298,012	19,901	214,214	334	375	4,037	28,061	302,049

PARKING REQUIRED(1)(2)(3)

	VISITOR	RESIDENTIAL	RETAIL	TOTAL
RATIO	0.10	0.75	5/250m2	
	33	250	8	291

1) RESIDENTIAL PARKING RATIO= 0.75/ UNIT
2) VISITIR PARKING RATIO= 0.1/ UNIT
3) RETAIL PARKING RATIO= 5/ 250m2

PARKING PROVIDED

SURFACE	UG1	UG2	UG3	UG4		TOTAL
	77	77	77	77		308

AMENITY REQUIRED

	RATIO	TOTAL
	15M2 (INDOOR+OUTDOOR) / UNIT	5,008

Amenity Area
The area situated within the boundaries of a project and intended for recreational purposes, which may include open spaces, patios, balconies, communal play areas, lounges, sundecks, and roofdecks, but shall not include the area occupied at grade by the buildings, service areas, parking, and driveways.

AMENITY PROVIDED

	OUTDOOR(M2)	INDOOR(M2)	BALCONIES(M2)	TOTAL
F1/ GRADE	200	250		
F2	272	1,565		
F3~F5			349	
F6	1074	0	1,320	
TOTAL	1,546	1,815	1,669	**5,030**

15 m2/ unit

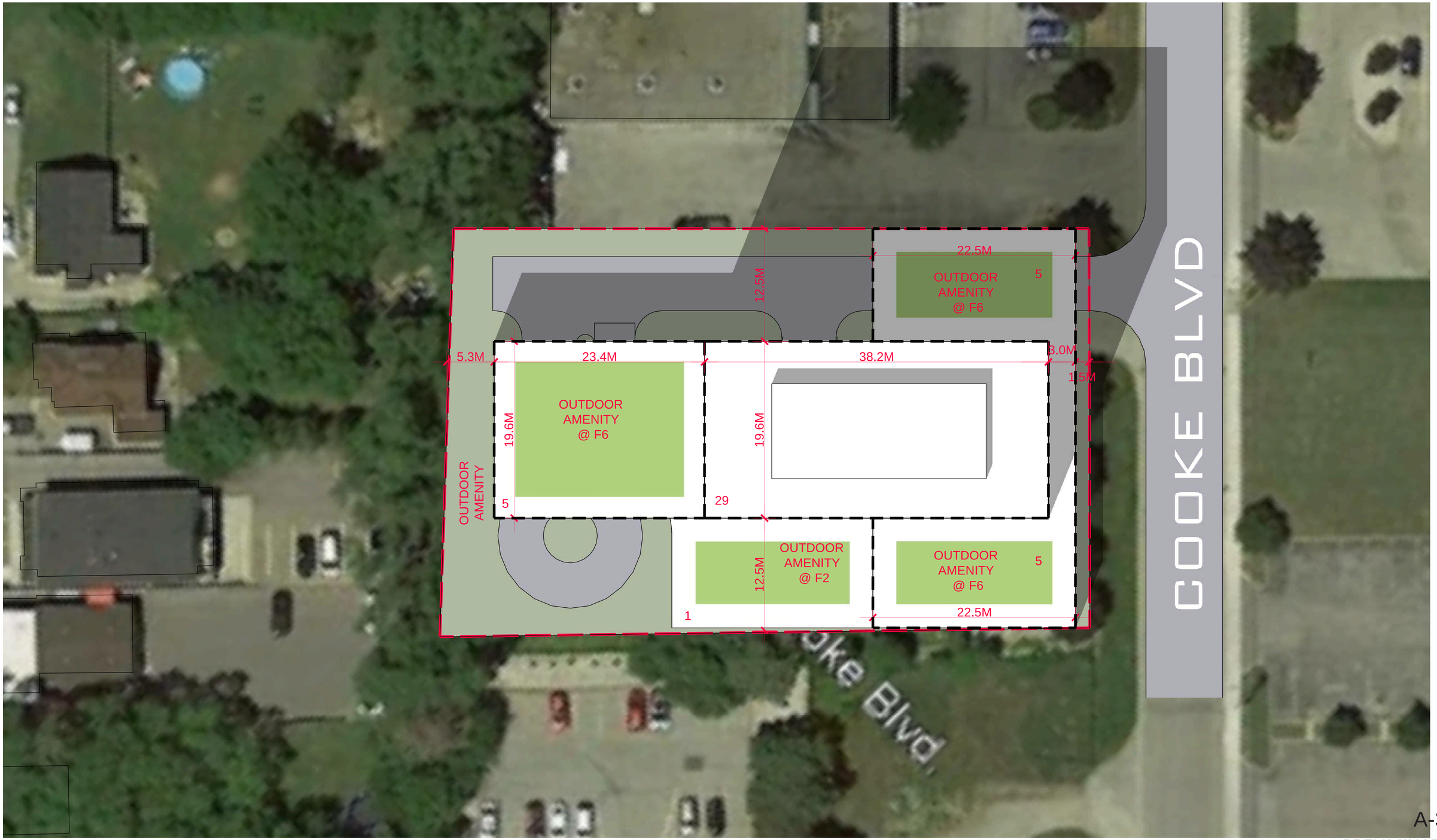
Floor Area, Gross
The sum of the areas of each floor of a building but shall include a basement or cellar when used for commercial purpose. Measurement shall be from the exterior face of outside walls, or from the centre line of partition and common walls. Gross Floor Area shall not include floor space devoted to:
• Vehicle Parking
• Storage
• Air Handling Equipment
• Enclosed mall and hallways, excluding kiosk, stairways
• Elevators and associated equipment
• Washrooms
• Foyers, lobbies, but not waiting areas/rooms

SHEET TITLE: STATISTICS
SCALE: 1:
DATE: 2022-10-25

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A-3

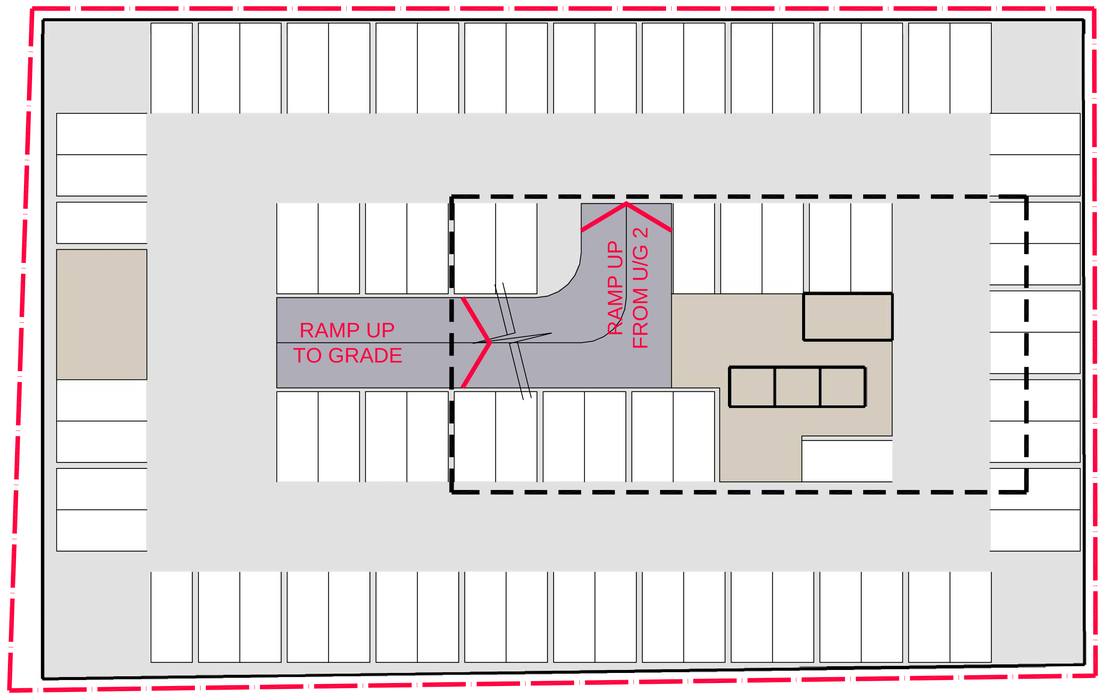
PRELIMINARY

SHEET TITLE: ROOF PLAN
SCALE: 1: 200
DATE: 2022-10-25

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A-4

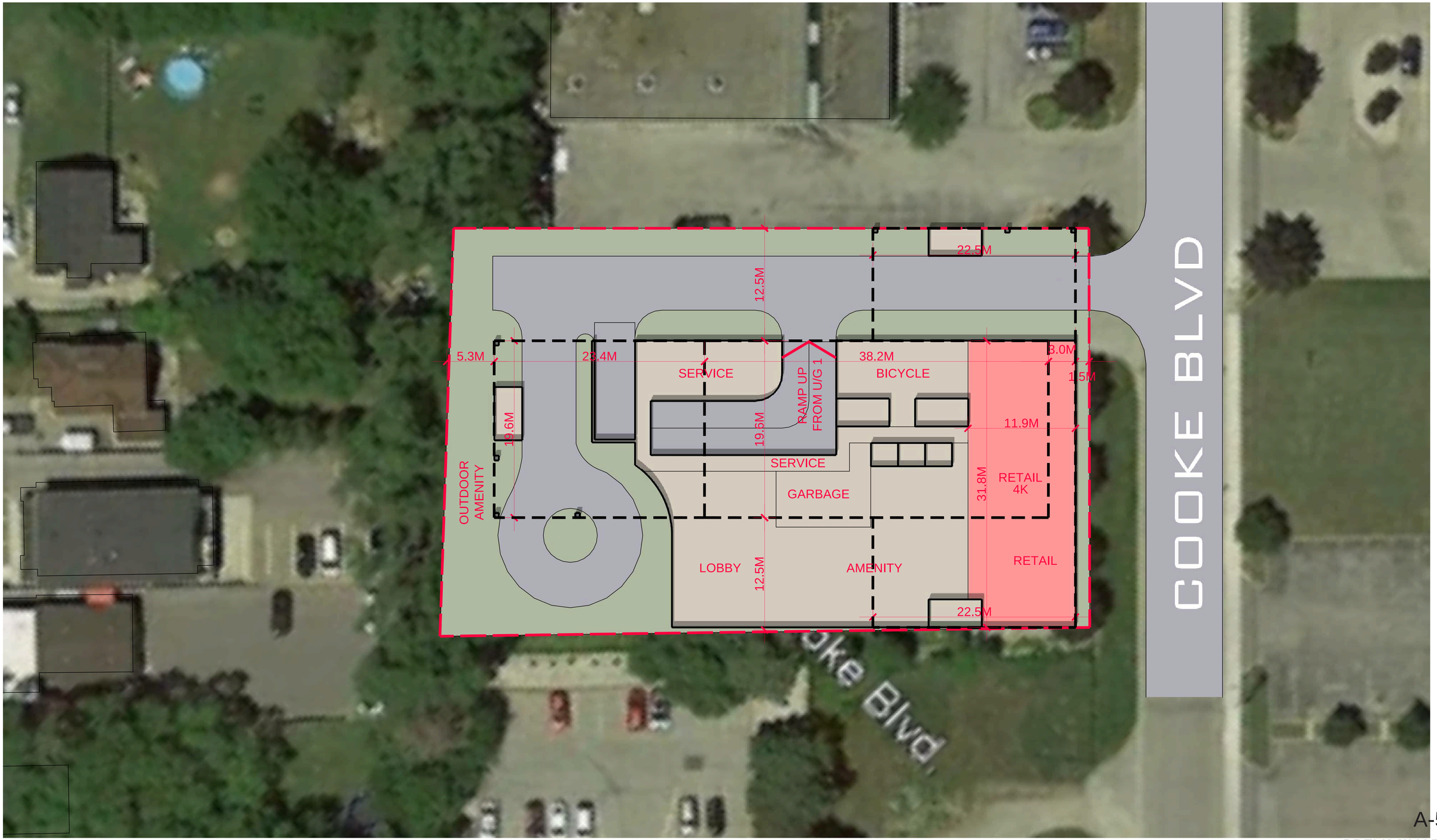
PRELIMINARY

SHEET TITLE: U/G PLAN
SCALE: 1: 200
DATE: 2022-10-25

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A-5

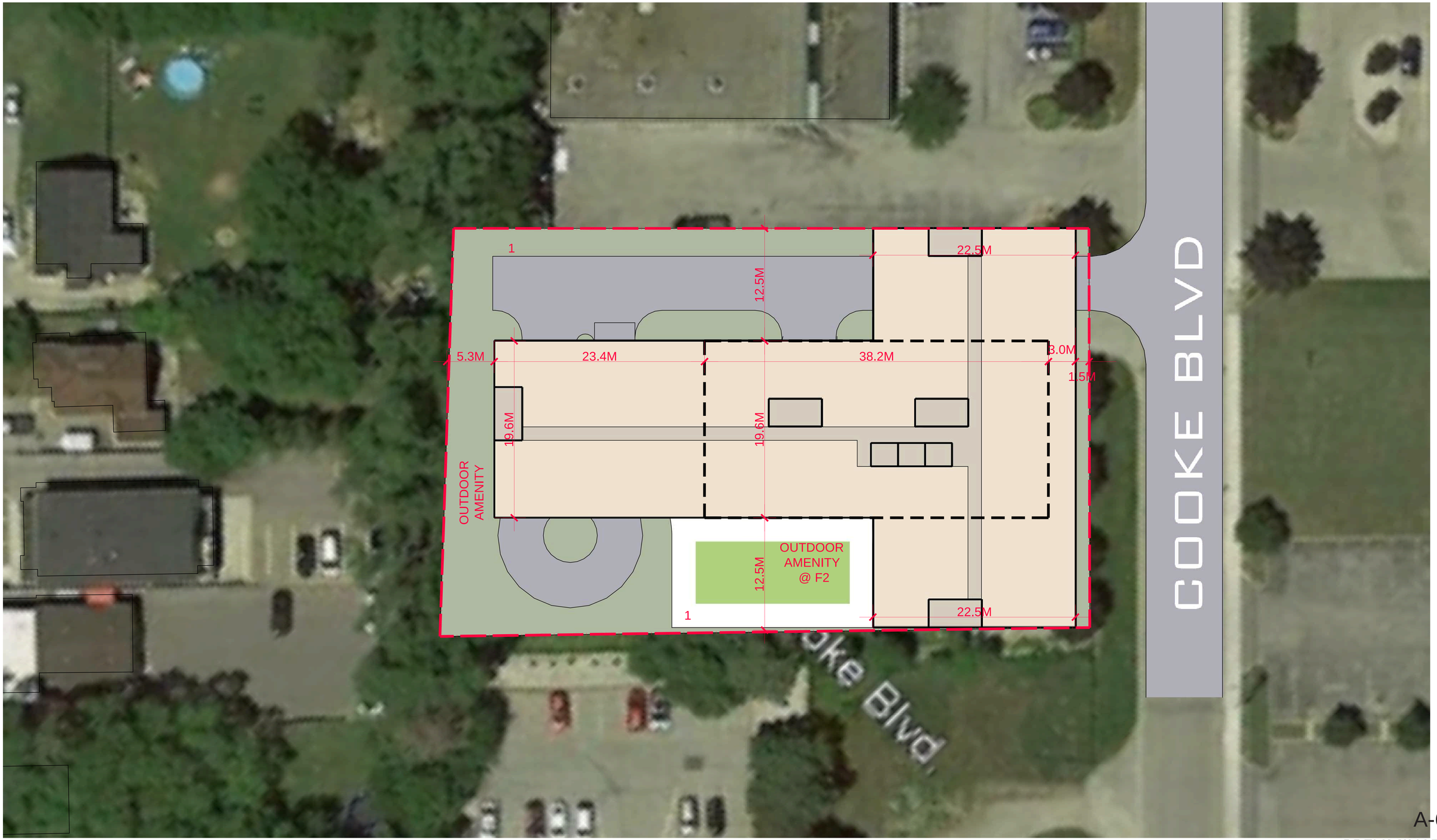
PRELIMINARY

SHEET TITLE: FLOOR 1/ SITE PLAN
SCALE: 1: 200
DATE: 2022-10-25

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A-6

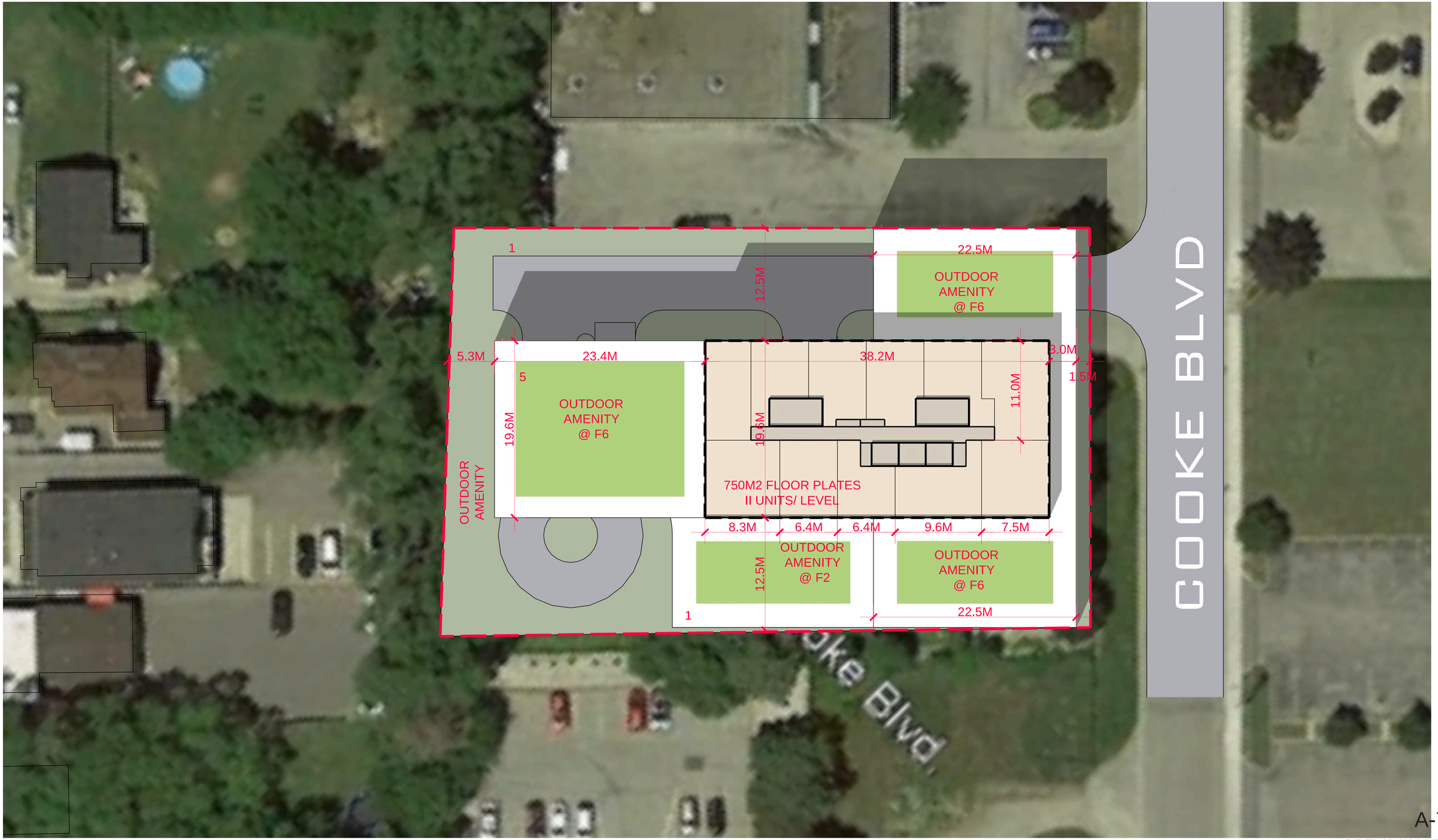
PRELIMINARY

SHEET TITLE: FLOOR 3~5
SCALE: 1: 200
DATE: 2022-10-25

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A-7

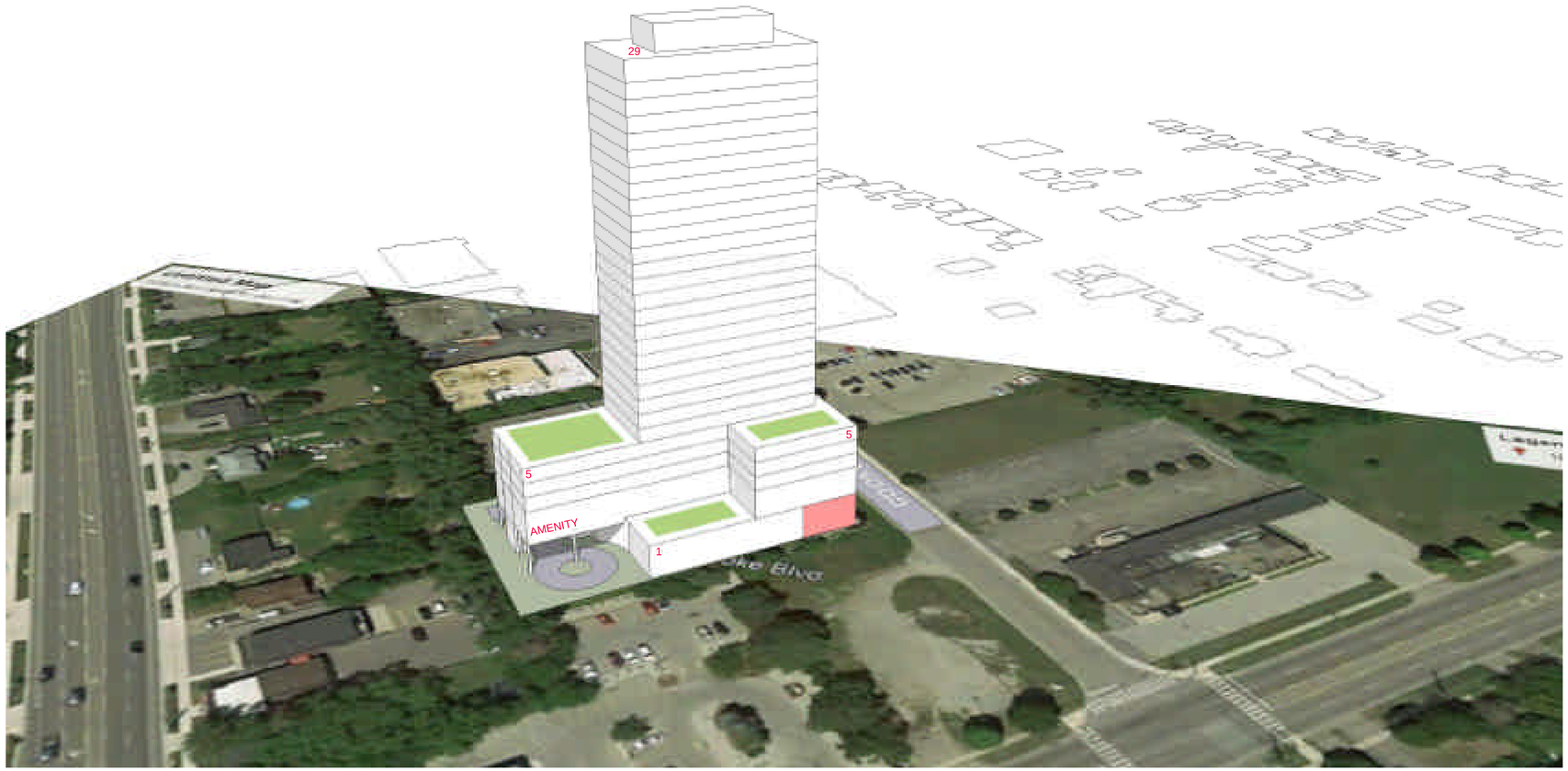
PRELIMINARY

SHEET TITLE: FLOOR TYPICAL
SCALE: 1: 200
DATE: 2022-10-25

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A-10

PRELIMINARY

SHEET TITLE: 3D IMAGE VIEW TO NORTH
SCALE: 1:
DATE: 2022-10-25

1026 COOKE BLVD, BURLNGTON, ON
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A-11

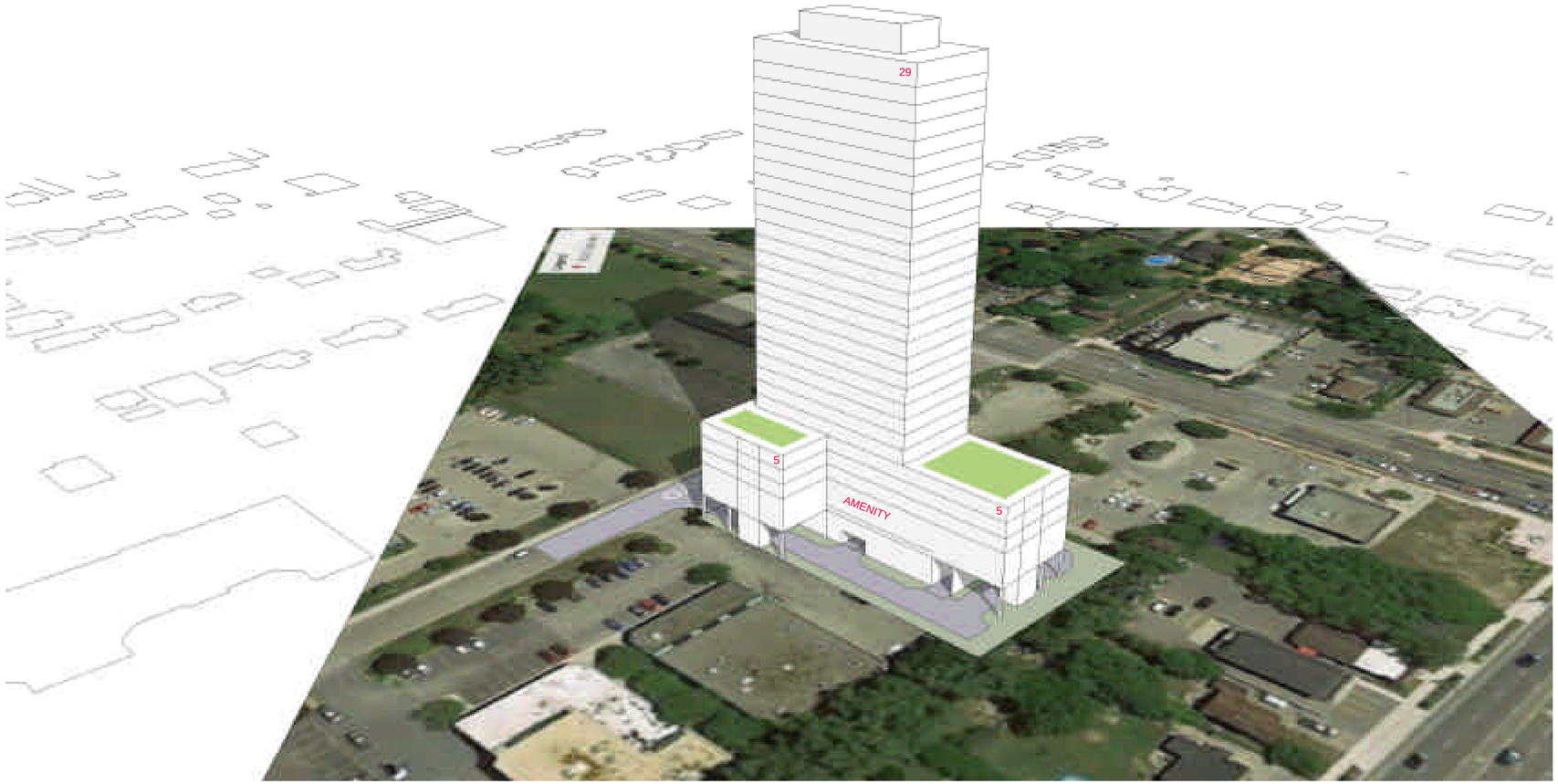
PRELIMINARY

SHEET TITLE: 3D IMAGE VIEW TO SOUTHEAST
SCALE: 1:
DATE: 2022-10-25

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A-12

PRELIMINARY

SHEET TITLE: 3D IMAGE VIEW TO SOUTHWEST
SCALE: 1:
DATE: 2022-10-25

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APPENDIX B

CRITERIA

Transportation Sources

Guidance from the Ontario Ministry of the Environment, Conservation and Parks (MECP) NPC-300 Environmental Noise Guideline was used to assess environmental noise generated by transportation-related sources. There are three aspects to consider, which include the following:

i. Transportation source sound levels in indoor living areas (living rooms and sleeping quarters), which determines building façade elements (windows, exterior walls, doors) sound insulation design recommendations.
ii. Transportation source sound levels at the plane of the window, which determines air-conditioning and ventilation system recommendations and associated warning clauses which inform the future occupants that windows and doors must be closed in order to meet the indoor sound level criteria.
iii. Transportation source sound levels in Outdoor Living Areas (OLAs), which determines OLA noise mitigation and related warning clause recommendations.

Road and Rail

Indoor Sound Level Criteria

For assessing sound originating from transportation sources, NPC-300 defines sound level criteria as summarized in **Table 1** for indoor areas of sensitive uses. The specified values are maximum sound levels and apply to the indicated indoor spaces with the windows and doors closed.

Table 1: Indoor Sound Level Criteria for Road and Rail Sources

Type of Space	Source	Sound Level Criteria (Indoors)	
		Daytime $L_{eq,16\text{-}hr}$ 07:00h – 23:00h	Nighttime $L_{eq,8\text{-}hr}$ 23:00h – 07:00h
Living Quarters Examples: Living, dining and den areas of residences, hospitals, nursing homes, schools and daycare centres	**Road**	45 dBA	
	Rail	40 dBA	
Sleeping Quarters	**Road**	45 dBA	40 dBA
	Rail	40 dBA	35 dBA

NPC-300 also provides guidelines for acceptable indoor sound levels that are extended to land uses and developments which are not normally considered noise sensitive. The guideline sound level criteria presented in **Table 2** are provided to inform good-practice design objectives.

Table 2: Supplementary Indoor Sound Level Criteria for Road and Rail Sources

Type of Space	Source	Sound Level Criteria (Indoors)	
		Daytime $L_{eq,16\text{-}hr}$ 07:00h – 23:00h	Nighttime $L_{eq,8\text{-}hr}$ 23:00h – 07:00h
General offices, reception areas, retail stores, etc.	**Road**	50 dBA	-
	Rail	45 dBA	-
Theatres, places of worship, libraries, individual or semi-private offices, conference rooms, reading rooms, etc.	**Road**	45 dBA	-
	Rail	40 dBA	-
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	**Road**	-	40 dBA
	Rail	-	35 dBA
Sleeping quarters of hotels/motels	**Road**	-	45 dBA
	Rail	-	40 dBA

Outdoor Living Areas (OLAs)

Outdoor Living Areas (OLAs) would include outdoor areas intended and designed for the quiet enjoyment of the outdoor environment and which are readily accessible from the building.

OLAs may include any common outdoor amenity spaces associated with a multi-unit residential development (e.g. courtyards, roof-top terraces), and/or private backyards and terraces with a minimum depth of 4m provided they are the only outdoor living area for the occupant. The sound level criteria for outdoor living areas is summarized in **Table 3**.

Table 3: Sound Level Criteria – Outdoor Living Area

Assessment Location	Sound Level Criteria (Outdoors)	
	Daytime $L_{eq,16\text{-}hr}$ 07:00h – 23:00h	Nighttime $L_{eq,8\text{-}hr}$ 23:00h – 07:00h
Outdoor Living Area (OLA) (Combined Road and Rail)	55 dBA	-

Outdoor and Plane of Window Sound Levels

In addition to the sound level criteria, noise control measures and requirements for ventilation and warning clauses requirements are recommended for residential land-uses based on predicted transportation source sound levels incident in the plane of window at bedrooms and living/dining rooms, and/or at outdoor living areas. These recommendations are summarized in **Table 4** below.

Table 4: Ventilation, Building Component, and Warning Clauses Recommendations for Road/Rail Sources

Assessment Location	Transportation Sound Level (Outdoors)		Recommendations
	Daytime $L_{eq,16\text{-}hr}$ 07:00h – 23:00h	Nighttime $L_{eq,8\text{-}hr}$ 23:00h – 07:00h	
Plane of Window (Road)	> 65 dBA	> 60 dBA	Installation of air conditioning to allow windows to remained closed. The sound insulation performance of building components must be specified and designed to meet the indoor sound level criteria. Warning clause "Type D" is recommended.
	> 55 dBA	> 50 dBA	Applicable for low and medium density development: Forced-air ventilation system to allow for the future installation of air-conditioning. Warning clause "Type C" is recommended. Applicable for high density development: Air conditioning to allow windows to remained closed. Warning clause "Type D" is recommended.
Plane of Window (Rail [1, 2])	> 60 dBA	> 55 dBA	The acoustical performance of building façade components should be specified such that the indoor sound level limits are predicted to be achieved. Warning clause "Type D" is recommended.
	> 60 dBA ($L_{eq,\ 24hr}$) and < 100m from tracks		Exterior walls consisting of a brick veneer or masonry equivalent for the first row of dwellings. Warning clause "Type D" is recommended.
Outdoor Living Area (Combined Road and Rail [3])	≤ 60 dBA > 55 dBA	-	If sound levels are predicted to exceed 55 dBA, but are less than 60 dBA, noise controls may be applied to reduce the sound level to 55 dBA. If noise control measures are not provided, a warning clause "Type A" is recommended.
	> 60 dBA	-	Noise controls (barriers) should be implemented to meet the 55 dBA criterion. If mitigation is not feasible to meet the 55 dBA criterion for technical, economic or administrative reasons, an exceedance of 5 dB may be acceptable (to a maximum sound level of 60 dBA). In this case a warning clause "Type B" would be recommended.

Note(s):

1. Whistle noise is included (if applicable) in the determination of the sound level at the plane of window.
2. Some railway companies (e.g. CN, CP) may require that the exterior walls include a brick veneer or masonry equivalent for the façade facing the railway line, regardless of the sound level.
3. Whistle noise is not included in the determination of the sound level at the OLA.

Rail Layover Sites

NPC-300 provides a sound level limit for rail layover sites to be the higher of the background sound level or 55 dBA $L_{eq,1\text{-}hr,}$ for any one-hour period.

Rail Vibration Criteria

An assessment of rail vibration is generally recommended for developments within 75m of a rail corridor or rail yard, and adjacent to or within a setback of 15m of a transit (subway or light-rail) rail line.

The generally accepted vibration criterion for sensitive land-uses is the threshold of perception for human exposure to vibration, being a vibration velocity level of 0.14 mm/s RMS in any one-third octave band centre frequency in the range of 4 Hz to 200 Hz.

This vibration criterion is based on a one-second exponential time-averaged maximum hold root-mean-square (RMS) vibration velocity level and is consistent with the Railway Associations of Canada (RAC, 2013) guideline, the U.S. Federal Transit Authority (FTA, 2018) criterion for residential land-uses, the Toronto Transit Commission (TTC) guidelines for the assessment of potential vibration impact of future expansion (MOEE/TTC, 1993).

Aircraft

Land-use compatibility in the vicinity of airports is addressed in Ministry of the Environment, Conservation, and Parks (MECP) Guideline NPC-300 (MOE, 2013). The guideline provides recommendations for ventilation, and noise control for different Noise Exposure Forecast (NEF) values, which would be based on NEF contour maps available from the airport authority. The NEF values can be expressed as $L_{A,eq,24hr}$ sound levels by using the expression NEF = $L_{Aeq,24hr}$ -32 dBA.

Table 5: Indoor Sound Level Criteria for Aircraft Sources

Assessment Location	Indoor Sound Level Criteria NEF ($L_{eq,\ 24hr}$) [1]
Living/dining/den areas of residences, hospitals, schools, nursing/retirement homes, daycare centres, etc.	NEF- 5 (37 dBA)
Sleeping quarters	NEF-0 (32 dBA)

NPC-300 also provides guidelines for acceptable indoor sound levels that are extended to land uses and developments which are not normally considered noise sensitive. The guideline sound level criteria presented in **Table 6** are provided to inform good-practice design objectives.

Table 6: Supplementary Indoor Sound Level Criteria for Aircraft Sources

Assessment Location	Indoor Sound Level Criteria[1]
General offices, reception areas, retail stores, etc.	NEF-15 (47 dBA)
Individual or semi-private offices, conference rooms, etc.	NEF-10 (42 dBA)
Sleeping quarters of hotels/motels, theatres, libraries, places of worship, etc.	NEF-5 (37 dBA)

Table 7: NPC-300 Sound Level Criteria for Aircraft (Outdoors)

Assessment Location	Outdoor Sound Level Criteria[1]
Outdoor areas, including OLA	NEF-30 (62 dBA)

Table 8: Ventilation, Building Component, and Warning Clauses Recommendations for Aircraft Sources

Assessment Location	Aircraft Sound Level	NPC-300 Requirements
	NEF ($L_{EQ,24\text{-}hr}$)	
Outdoors	≥NEF 30	Air conditioning to allow windows to remained closed. The sound insulation performance of building components must be specified and designed to meet the indoor sound level criteria. Warning clauses "Type D" and "Type B" are recommended.
	< NEF 30 ≥ NEF 25	The sound insulation performance of building components must be specified and designed to meet the indoor sound level criteria. Applicable for low and medium density development: Forced-air ventilation system to allow for the future installation of air-conditioning. Warning clause "Type C" is recommended. Applicable for high density development: Air conditioning to allow windows to remained closed. Warning clause "Type D" is recommended.
	< NEF 25	Further assessment not required

Stationary Sources

NPC-300 Sound Level Criteria – Stationary Sources

Guidance from the MECP NPC-300 Environmental Noise Guideline is used to assess environmental noise generated by stationary sources, for example industrial and commercial facilities.

Noise from stationary sources is treated differently from transportation sources and requires sound levels be assessed for the predictable worst-case one-hour average sound level (L_{eq}) for each period of the day. For assessing sound originating from stationary sources, NPC-300 defines sound level criteria for two types of Points of Reception (PORs): outdoor and plane of window.

The assessment criteria for all PORs is the higher of either the exclusion limit per NPC-300 or the minimum background sound level that occurs or is likely to occur at a POR. The applicable exclusion limit is determined based on the level of urbanization or "Class" of the area. The NPC-300 exclusion limits for continuously operating stationary sources are summarized in **Table 9**.

Table 9: NPC-300 Exclusion Limits – Continuous and Quasi-Steady Impulsive Stationary Sources (LAeq-1hr)

Time Period	Class 1 Area		Class 2 Area		Class 3 Area		Class 4 Area	
	Outdoor	Plane of Window	Outdoor	Plane of Window	Outdoor	Plane of Window	Outdoor	Plane of Window
Daytime 0700-1900h	50 dBA	50 dBA	50 dBA	50 dBA	45 dBA	45 dBA	55 dBA	60 dBA
Evening 1900-2300h	50 dBA	50 dBA	45 dBA	50 dBA	40 dBA	40 dBA	55 dBA	60 dBA
Nighttime 2300-0700h	--	45 dBA	--	45 dBA	--	40 dBA	--	55 dBA

Note(s):

1. The applicable sound level criterion is the background sound level or the exclusion limit, whichever is higher.
2. Class 1, 2 and 3 sound level criteria apply to a window that is assumed to be open.
3. Class 4 area criteria apply to a window that is assumed closed. Class 4 area requires formal designation by the land-use planning authority.
4. Sound level criteria for emergency backup equipment (e.g. generators) operating in non-emergency situations such as testing or maintenance are 5 dB greater than the applicable sound level criteria for stationary sources.

For impulsive sound, other than quasi-steady impulsive sound, from a stationary source, the sound level criteria at a POR is expressed in terms of the Logarithmic Mean Impulse Sound Level (L_{LM}), and is summarized in **Table 10**.

Table 10: NPC-300 Exclusion Limits – Impulsive Stationary Sources (L_{LM})

Time Period	Number of Impulses in Period of One-Hour	Class 1 and 2 Areas		Class 3 Areas		Class 4 Areas	
		Outdoor	Plane of Window	Outdoor	Plane of Window	Outdoor	Plane of Window
Daytime (0700-2300h)	9 or more	50 dBAI	50 dBAI	45 dBAI	45 dBAI	55 dBAI	60 dBAI
Nighttime (2300–0700h)		-	45 dBAI	-	40 dBAI	-	55 dBAI
Daytime (0700-2300h)	7 to 8	55 dBAI	55 dBAI	50 dBAI	50 dBAI	60dBAI	65 dBAI
Nighttime (2300–0700h)		-	50 dBAI	-	45 dBAI	-	60 dBAI
Daytime (0700-2300h)	5 to 6	60 dBAI	60 dBAI	55 dBAI	55 dBAI	65 dBAI	70 dBAI
Nighttime (2300–0700h)		-	55 dBAI	-	50 dBAI	-	65 dBAI
Daytime (0700-2300h)	4	65 dBAI	65 dBAI	60 dBAI	60 dBAI	70 dBAI	75 dBAI
Nighttime (2300–0700h)		-	60 dBAI	-	55 dBAI	-	70 dBAI
Daytime (0700-2300h)	3	70 dBAI	70 dBAI	65 dBAI	65 dBAI	75 dBAI	80 dBAI
Nighttime (2300–0700h)		-	65 dBAI	-	60 dBAI	-	75 dBAI
Daytime (0700-2300h)	2	75 dBAI	75 dBAI	70 dBAI	70 dBAI	80 dBAI	85 dBAI
Nighttime (2300–0700h)		-	70 dBAI	-	65 dBAI	-	80 dBAI
Daytime (0700-2300h)	1	80 dBAI	80 dBAI	75 dBAI	75 dBAI	85 dBAI	90 dBAI
Nighttime (2300–0700h)		-	75 dBAI	-	70 dBAI	-	85 dBAI

Note(s):
1. The applicable sound level criterion is the background sound level or the exclusion limit, whichever is higher.

D-Series Guidelines

The MECP D-series guidelines (MOE, 1995) provide direction for land use planning to maximize compatibility of industrial uses with adjacent land uses. The goal of Guideline D-6 is to minimize encroachment of sensitive land uses on industrial facilities and vice versa, in order to address potential incompatibility due to adverse effects such as noise, odour and dust.

For each class of industry, the guideline provides an estimate of potential influence area and states that this influence area shall be used in the absence of the recommended technical studies. Guideline D-6 also recommends a minimum separation distance between each class of industry and sensitive land uses (see **Table 11**). Section 4.10 of D-6 identifies exceptional circumstances with respect to redevelopment, infill and mixed-use areas. In these cases, the guideline suggests that separation distances at, or less than, the recommended minimum separation distance may be acceptable if a justifying impact assessment is provided.

Table 11: Summary of Guideline D-6

Industry Class	Definition	Potential Influence Area	Recommended Minimum Separation Distance (property line to property line)
Class I	Small scale, self-contained, daytime only, infrequent heavy vehicle movements, no outside storage.	70 m	20 m
Class II	Medium scale, outdoor storage of wastes or materials, shift operations and frequent heavy equipment movement during the daytime.	300 m	70 m
Class III	Large scale, outdoor storage of raw and finished products, large production volume, continuous movement of products and employees during daily shift operations.	1000 m	300 m

Guideline D-6 provides criteria for classifying industrial land uses, based on their outputs, scale of operations, processes, schedule and intensity of operations. **Table 12** provides the classification criteria and examples.

Table 12: Guideline D-6 Industrial Categorization Criteria

Criteria	Class I	Class II	Class III
Outputs	• Sound not audible off property • Infrequent dust and/ or odour emissions and not intense • No ground-borne vibration	• Sound occasionally audible off property • Frequent dust and/ or odour emissions and occasionally intense • Possible ground-borne vibration	• Sound frequently audible off property • Persistent and intense dust and/ or odour emissions • Frequent ground-borne vibration
Scale	• No outside storage • Small scale plant or scale is irrelevant in relation to all other criteria	• Outside storage permitted • Medium level of production	• Outside storage of raw and finished products • Large production levels
Process	• Self-contained plant or building which produces / stores a packaged product • Low probability of fugitive emissions	• Open process • Periodic outputs of minor annoyance • Low probability of fugitive emissions	• Open process • Frequent outputs of major annoyances • High probability of fugitive emissions
Operation / Intensity	• Daytime operations only • Infrequent movement of products and/or heavy trucks	• Shift operations permitted • Frequent movements of products and/or heavy trucks with majority of movements during daytime hours	• Continuous movement of products and employees • Daily shift operations permitted
Examples	• Electronics Manufacturing • Furniture refinishing • Beverage bottling • Auto parts • Packaging services • Dairy distribution • Laundry and linen supply	• Magazine printing • Paint spray booths • Metal command • Electrical production • Dairy product manufacturing • Feed packing plant	• Paint and varnish manufacturing • Organic chemicals manufacturing • Breweries • Solvent recovery plant • Soap manufacturing • Metal manufacturing

APPENDIX C

201468-Plains Rd W @ Waterdown Rd

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

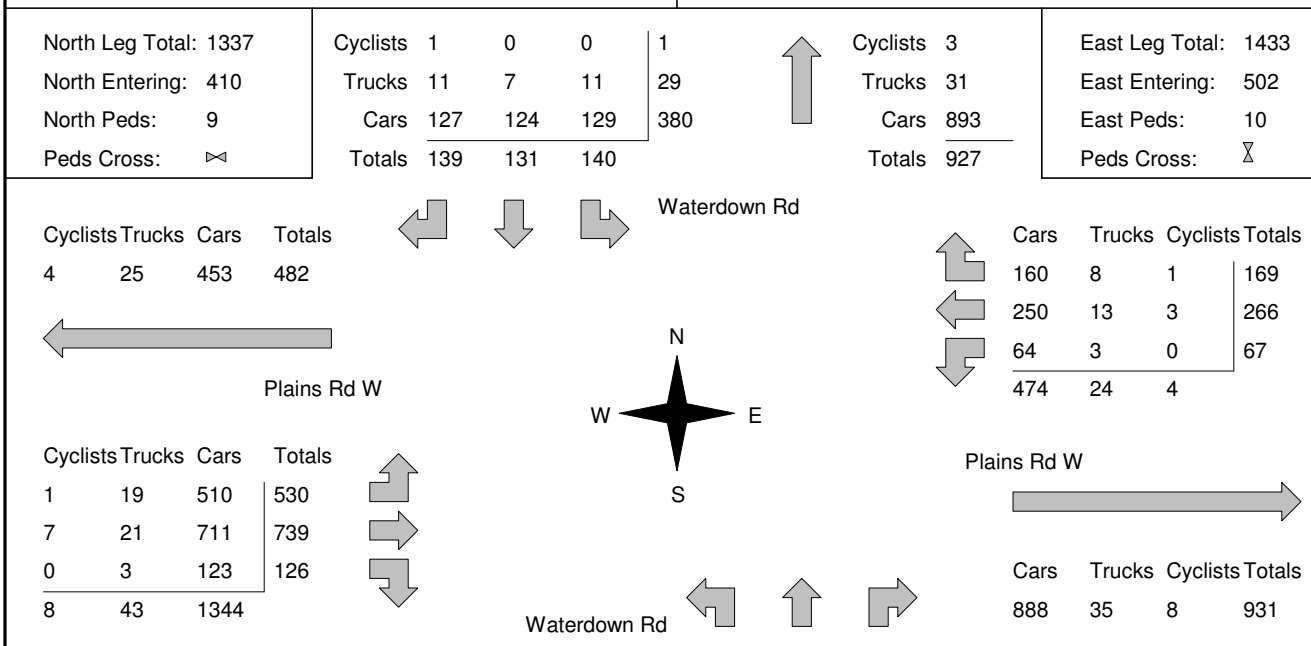
Municipality: Burlington
Site #: 0000201468
Intersection: Plains Rd W & Waterdown Rd
TFR File #: 1
Count date: 18-Sep-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik

**** Signalized Intersection ****

Major Road: Plains Rd W runs W/E



Comments

201468-Plains Rd W @ Waterdown Rd

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 11:45:00
To: 12:45:00

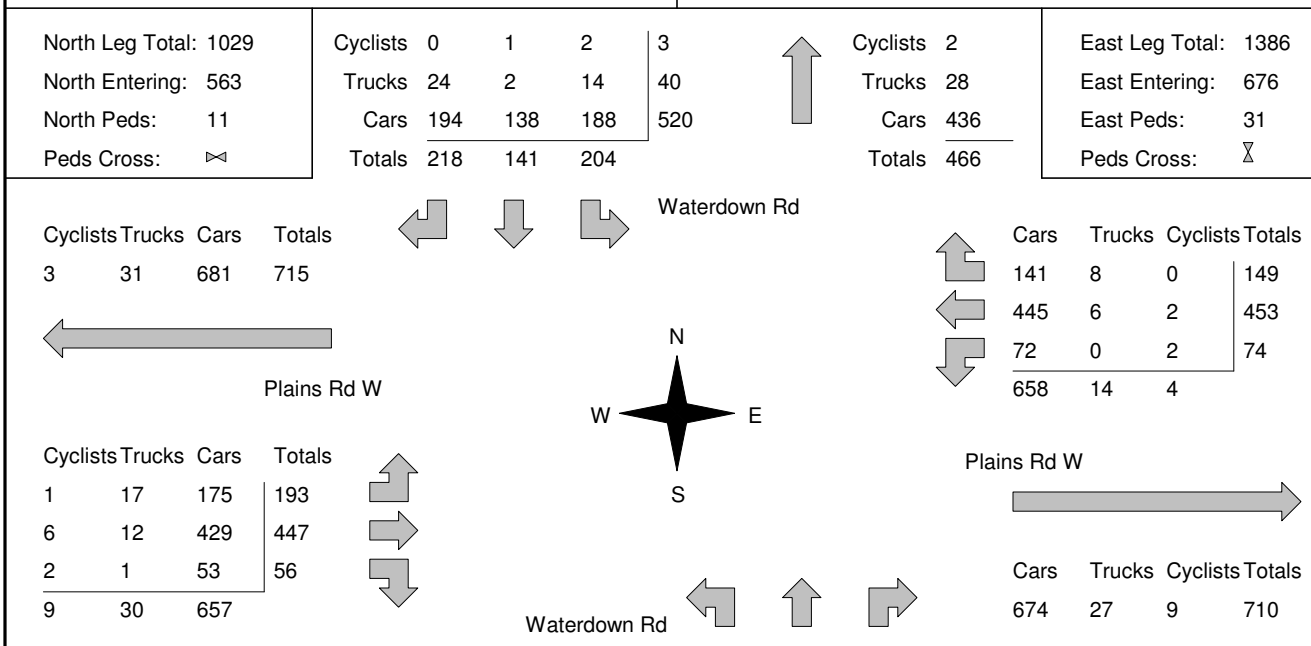
Municipality: Burlington
Site #: 0000201468
Intersection: Plains Rd W & Waterdown Rd
TFR File #: 1
Count date: 18-Sep-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik

**** Signalized Intersection ****

Major Road: Plains Rd W runs W/E



Comments

201468-Plains Rd W @ Waterdown Rd

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

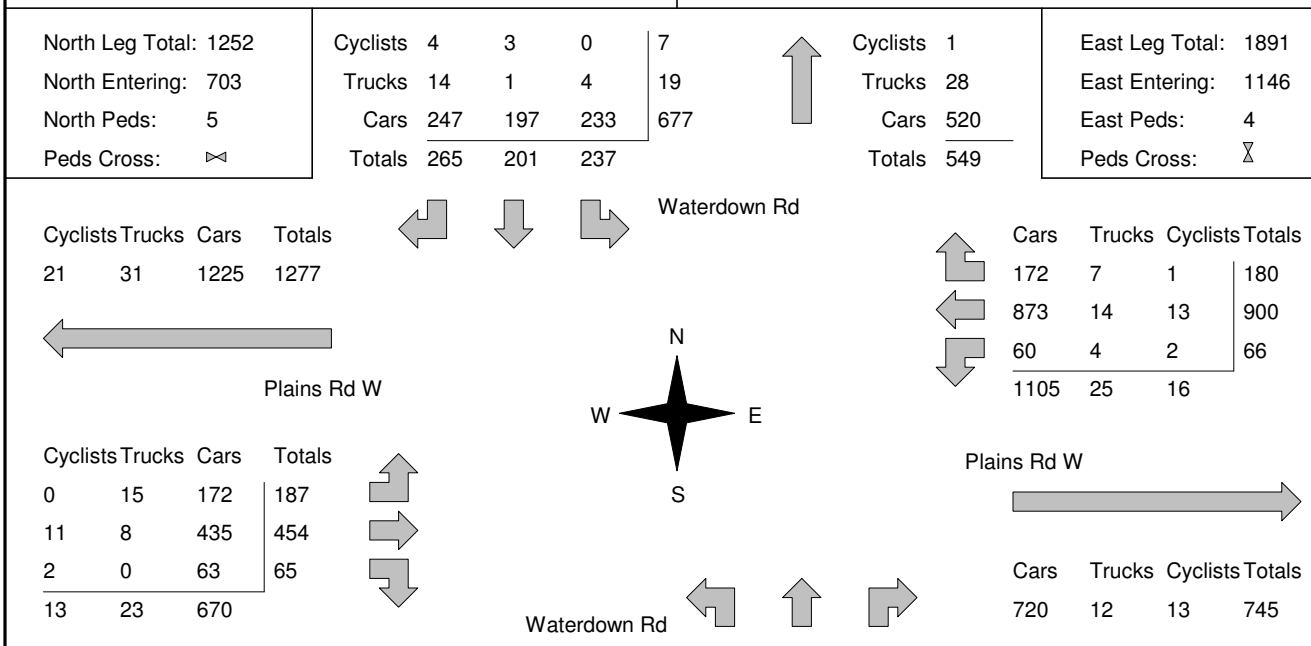
Municipality: Burlington
Site #: 0000201468
Intersection: Plains Rd W & Waterdown Rd
TFR File #: 1
Count date: 18-Sep-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik

**** Signalized Intersection ****

Major Road: Plains Rd W runs W/E



Comments

201468-Plains Rd W @ Waterdown Rd

Total Count Diagram

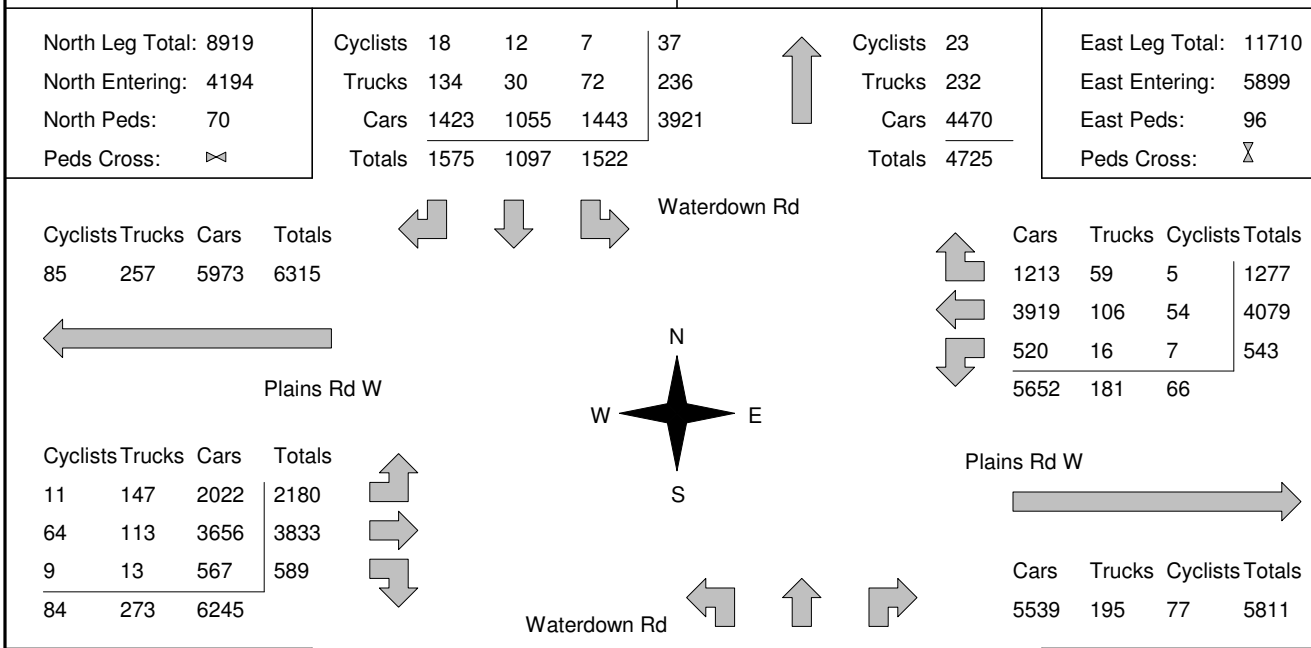
Municipality: Burlington
Site #: 0000201468
Intersection: Plains Rd W & Waterdown Rd
TFR File #: 1
Count date: 18-Sep-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik

**** Signalized Intersection ****

Major Road: Plains Rd W runs W/E



Comments

201468-Plains Rd W @ Waterdown Rd
Traffic Count Summary

Intersection: Plains Rd W & Waterdown Rd | **Count Date:** 18-Sep-2018 | **Municipality:** Burlington

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	1	0
8:00:00	112	111	108	331	7	606
9:00:00	177	116	169	462	6	815
11:00:00	0	0	0	0	4	0
12:00:00	213	117	171	501	10	751
13:00:00	200	143	212	555	9	790
14:00:00	179	91	169	439	4	705
15:00:00	0	0	0	0	2	0
16:00:00	203	154	216	573	13	874
17:00:00	218	187	260	665	9	1034
18:00:00	220	178	270	668	5	1004
Totals:	1522	1097	1575	4194	70	6579

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	47	184	44	275	9
9:00:00	88	218	47	353	8
11:00:00	0	0	0	0	0
12:00:00	70	131	49	250	13
13:00:00	46	119	70	235	7
14:00:00	56	137	73	266	5
15:00:00	0	0	0	0	0
16:00:00	99	138	64	301	20
17:00:00	127	177	65	369	7
18:00:00	128	164	44	336	8
Totals:	661	1268	456	2385	77

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	56	211	154	421	8	1735
9:00:00	55	300	142	497	3	1709
11:00:00	0	0	0	0	0	0
12:00:00	55	353	144	552	32	1238
13:00:00	80	453	148	681	12	1351
14:00:00	67	396	154	617	25	1287
15:00:00	0	0	0	0	0	0
16:00:00	88	623	193	904	12	1620
17:00:00	77	799	191	1067	3	1760
18:00:00	65	944	151	1160	1	1801
Totals:	543	4079	1277	5899	96	12501

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	490	701	123	1314	5
9:00:00	457	650	105	1212	4
11:00:00	0	0	0	0	0
12:00:00	198	415	73	686	13
13:00:00	188	427	55	670	16
14:00:00	217	399	54	670	3
15:00:00	0	0	0	0	0
16:00:00	247	395	74	716	7
17:00:00	196	439	58	693	3
18:00:00	187	407	47	641	0
Totals:	2180	3833	589	6602	51

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	356	490	459	417	400	475	538	527

RAIL VOLUMES

Freight Rail Line Class	Characteristics	Freight Train Modelling Assumptions
Principal Main Line	• Traffic volume generally exceeds 10 trains per day • High speeds, usually exceeding 80 kph (50 mph) • Includes heavy trains with 3 or 4 locomotives per train, commuter and passenger trains	• Assume one freight train per hour, or 16 trains per 16-hour day and 8 trains per 8-hour night (24 total per 24 hours) • Continuously welded rail • 100 kph speed • Assume 4 locomotives per train
Secondary Main Line	• Traffic volume generally exceeds 10 trains per day • High speeds, usually exceeding 80 kph (50 mph) • Trains generally of light to moderate weight with 3 or 4 locomotives per train • Majority of traffic may be commuter and passenger trains	• Assume one freight train per 2 hours, or 8 trains per 16-hour day and 4 trains per 8-hour night (12 total per 24 hours) • Continuously welded rail • 80 kph speed • Assume 3 locomotives per train
Principal Branch Line	• Regular scheduled traffic, usually less than 5 trains per day • Low speeds, generally limited to 50 kph (30 mph) • Trains generally of light to moderate weight with 1 or 2 locomotives per train but may include heavier trains with more units	• Assume one freight train per 4 hours, or 4 trains per 16-hour day and 2 trains per 8-hour night (6 total per 24 hours) • Continuously welded rail • 50 kph speed • Assume 2 locomotives per train
Secondary Branch Line	• Intermittent, unscheduled traffic, usually less than 1 train per day • Low speeds, generally limited to 50 kph (30 mph) • Trains generally of light to moderate weight with 1 locomotive per train	• Assume one freight train per 8 hours, or 2 trains per 16-hour day and 1 train per 8-hour night (3 total per 24 hours) • Continuously welded rail • 50 kph speed • Assume 1 locomotive per train
Spur Line	• Unscheduled traffic on a demand basis • Low speeds, limited to 24kph (15 mph) • Trains generally of light to moderate weight with 1 locomotive per train	• Assume one freight train per 12 hours, or 1 train per 16-hour day and 1 train per 8-hour night (2 total per 24 hours) • Jointed rail • 24 kph speed • Assume 1 locomotive per train
NOTES:	1. Canadian Rail Atlas has been used to determine rail line classification and ownership (i.e., CN/CP/other) 2. Commuter (GO) and passenger (VIA) rail volumes are based on data received from the responsible authority.	

Caelan Weber-Martin

From: Amy Patenaude
Sent: Monday, June 19, 2023 4:43 PM
To: Caelan Weber-Martin
Subject: FW: 1026 Cooke Boulevard (#2305839) - Rail Data Request

Amy Patenaude | Senior Technical/Administrative Assistant
Americas Noise/Acoustics/Vibration
RWDI
Direct Line: 226-314-1280

From: Amy Patenaude <Amy.Patenaude@rwdi.com>
Sent: Monday, June 19, 2023 4:22 PM
To: Lorenzo Carboni <Lorenzo.Carboni@rwdi.com>
Subject: FW: 1026 Cooke Boulevard (#2305839) - Rail Data Request

Amy Patenaude | Senior Technical/Administrative Assistant
Americas Noise/Acoustics/Vibration
RWDI
Direct Line: 226-314-1280

From: Rail Data Requests <RailDataRequests@metrolinx.com>
Sent: Monday, June 19, 2023 4:19 PM
To: Amy Patenaude <Amy.Patenaude@rwdi.com>
Subject: RE: 1026 Cooke Boulevard (#2305839) - Rail Data Request

Hi Amy,

I'd be happy to provide you with the latest and most current data given it differs from you last request.

Further to your request dated June 7th, 2023, the subject lands (1062-1074 Cooke Blvd, Toronto) are located within 300 metres of the CN Oakville Subdivision (which carries Lakeshore West GO rail service).

It's anticipated that GO rail service on this Subdivision will be comprised of diesel trains. The GO rail fleet combination on this Subdivision will consist of up to 1 locomotives and 10 passenger cars. The typical GO rail weekday train volume forecast near the subject lands, including both revenue and equipment trips is in the order of 153 trains. The planned detailed trip breakdown is listed below:

	1 Diesel Locomotive		1 Diesel Locomotive
Day (0700-2300)	132	Night (2300-0700)	21

The current track design speed near the subject lands is 95 mph (153 km/h).

There are no *anti-whistling by-laws* in affect near the subject lands.

Operational information is subject to change and may be influenced by, among other factors, service planning priorities, operational considerations, funding availability and passenger demand.

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

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

Thank You,

Justin Neale
Third Party Projects Review Team
Metrolinx | 10 Bay Street | Toronto | Ontario | M5J 2W3

From: Amy Patenaude <Amy.Patenaude@rwdi.com>
Sent: June 7, 2023 10:58 AM
To: Rail Data Requests <RailDataRequests@metrolinx.com>
Subject: FW: 1026 Cooke Boulevard (#2305839) - Rail Data Request

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Good Day,

We are again doing a study on Cooke Boulevard and are inquiring if the data we received last July is the most recent available.

This was the response from Metrolinx last July:

Further to your request dated July 4, 2022, the subject lands (1062-1074 Cooke Blvd., Toronto) are located within 300 metres of the CN Oakville Subdivision (which carries Lakeshore West GO rail service).

It's anticipated that GO rail service on this Subdivision will be comprised of diesel trains. The GO rail fleet combination on this Subdivision will consist of up to 2 locomotives and 12 passenger cars. The typical GO rail weekday train volume forecast near the subject lands, including both revenue and equipment trips is in the order of 83 trains. The planned detailed trip breakdown is listed below:

	1 Diesel Locomotive	2 Diesel Locomotives		1 Diesel Locomotive	2 Diesel Locomotives
Day (0700-2300)	60	11	Night (2300-0700)	8	4

The current track design speed near the subject lands is 95 mph (153 km/h).

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

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

Thank you.

Amy

Amy Patenaude | Senior Technical/Administrative Assistant
Americas Noise/Acoustics/Vibration
RWDI
Direct Line: 226-314-1280

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Train Schedule:

New York - Niagara Falls - Toronto

- Locations in bold indicate a possible connection.

# Train		98-63	98
Business class		No	No
Baggage check-in		No	No
Dates		All year round	From 2023-07-06 to 2032-05-11
Days		Day 1 MTWTFSS	Day 1 MTWTFSS
New York, NY	Departure	**07:16 Eastern Time**	**06:40 Eastern Time**
Yonkers, NY Amtrak schedules are subject to changes.	Departure	07:44	07:39
Croton-on-Hudson, NY Amtrak schedules are subject to changes.	Departure	08:03	07:58
Poughkeepsie, NY Amtrak schedules are subject	Departure	08:45	08:38

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# Train		98-63	98
Amtrak schedules are subject to changes.			
Albany, NY Amtrak schedules are subject to changes.	Arrival Departure	09:50 10:10	- 10:03
Schenectady, NY Amtrak schedules are subject to changes.	Departure	10:34	10:26
Amsterdam, NY Amtrak schedules are subject to changes.	Departure	10:54	10:43
Utica, NY Amtrak schedules are subject to changes.	Departure	11:51	11:42
Rome, NY Amtrak schedules are subject to changes.	Departure	12:04	11:58
Syracuse, NY Amtrak schedules are subject to changes.	Departure	12:53	12:48
Rochester, NY Amtrak schedules are subject to changes.	Departure	14:12	14:04
Buffalo (Depew), NY Amtrak schedules are subject to changes.	Departure	15:21	15:10
Buffalo (Exchange), NY Amtrak schedules are subject to changes.	Departure	15:37	15:24

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# Train		98-63	98
Niagara Falls, ON	Arrival Departure	**16:58** **17:45**	**-** **17:40**
St. Catharines, ON	Departure	18:08	18:03
Grimsby, ON	Departure	18:27	18:22
Aldershot, ON	Arrival Departure	- 19:07	19:02 -
Days		-	Day 2 M T W T F ~~S S~~
Aldershot, ON	Departure	-	18:59
Oakville, ON	Arrival Departure	- 19:19	19:16 -
Days		-	Day 3 M T W T F ~~S S~~
Oakville, ON	Departure	-	19:14
Toronto, ON Shuttle service runs between the station and the airport.	Arrival	**19:43** **Eastern Time**	**19:38** **Eastern Time**

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Train Schedule:

Sarnia - London - Toronto

- Locations in bold indicate a possible connection.

# Train		84
Business class		Yes
Baggage check-in		No
Dates		All year round
Days		Day 1 MTWTFSS
Sarnia, ON	Departure	**08:40 Eastern Time**
Wyoming, ON	Departure	08:56
Strathroy, ON	Departure	09:29
London, ON	Departure	**09:54**
St. Marys, ON	Departure	10:46
Stratford, ON	Departure	11:16

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# Train		84
Brampton, ON	Departure	13:01
Malton, ON	Departure	13:13
Toronto, ON Shuttle service runs between the station and the airport.	Arrival	**13:38** **Eastern Time**

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Train Schedule:

Toronto - London - Sarnia

- Locations in bold indicate a possible connection.

# Train		87
Business class		Yes
Baggage check-in		No
Dates		All year round
Days		Day 1 MTWTFSS
Toronto, ON Shuttle service runs between the station and the airport.	Departure	**17:40 Eastern Time**
Malton, ON	Departure	18:01
Brampton, ON	Departure	18:14
Georgetown, ON	Departure	18:26
Guelph, ON	Departure	18:51
Kitchener, ON	Departure	19:18

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# Train		87
London, ON	Arrival Departure	**21:09** **21:14**
Strathroy, ON	Departure	21:37
Wyoming, ON	Departure	22:05
Sarnia, ON	Arrival	**22:20** **Eastern Time**

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Train Schedule:

Toronto - London - Windsor

- Locations in bold indicate a possible connection.

# Train		71	73	75	79
Business class		Yes	Yes	Yes	Yes
Baggage check-in		No	No	No	No
Dates		All year round	All year round	From 2023-07-06 to 2033-06-15	All year round
Days		Day 1 MTWTFSS	Day 1 MTWTFSS	Day 1 MTWTFSS	Day 1 MTWTFSS
Toronto, ON Shuttle service runs between the station and the airport.	Departure	**06:50 Eastern Time**	**12:15 Eastern Time**	**17:22 Eastern Time**	**19:45 Eastern Time**
Oakville, ON	Arrival	-	12:36	-	-
	Departure	07:15	12:40	17:48	20:09
Aldershot, ON	Arrival	-	12:54	-	-
	Departure	07:31	12:58	18:04	20:23
Brantford, ON	Arrival	07:55	-	-	-
	Departure	07:59	13:27	18:36	20:51

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# Train		71	73	75	79
departure for a train stop at Ingersoll and Glencoe					
London, ON	Arrival Departure	**09:06** **09:11**	**14:23** **14:30**	**-** **19:53**	**21:52** **21:57**
Glencoe, ON Reservations are required before 7:00 the day of departure for a train stop at Ingersoll and Glencoe Conditional stop	Departure	09:40	-	20:22	22:26
Chatham, ON	Arrival Departure	- 10:19	15:35 15:39	- 20:58	- 22:59
Windsor, ON	Arrival	**11:08 Eastern Time**	**16:30 Eastern Time**	**21:50 Eastern Time**	**23:44 Eastern Time**

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Train Schedule:

Toronto - Niagara Falls - New York

- Locations in bold indicate a possible connection.

# Train		97-64
Business class		No
Baggage check-in		No
Dates		All year round
Days		Day 1 MTWTFSS
Toronto, ON Shuttle service runs between the station and the airport.	Departure	**08:20 Eastern Time**
Oakville, ON	Departure	08:45
Aldershot, ON	Arrival Departure	08:55 09:01
Grimsby, ON	Departure	09:38
St. Catharines, ON	Departure	09:58

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Amtrak schedules are subject to changes.	# Train	97-64
Buffalo (Exchange), NY Amtrak schedules are subject to changes.	Departure	12:56
Buffalo (Depew), NY Amtrak schedules are subject to changes.	Departure	11:00
Rochester, NY Amtrak schedules are subject to changes.	Departure	14:07
Syracuse, NY Amtrak schedules are subject to changes.	Departure	15:28
Rome, NY Amtrak schedules are subject to changes.	Departure	16:08
Utica, NY Amtrak schedules are subject to changes.	Departure	16:26
Amsterdam, NY Amtrak schedules are subject to changes.	Departure	17:27
Schenectady, NY Amtrak schedules are subject to changes.	Departure	18:10
Albany, NY Amtrak schedules are subject to changes.	Arrival Departure	18:33 19:15
Hudson, NY		

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# Train Amtrak schedules are subject to changes.		97-64
Croton-on-Hudson, NY Amtrak schedules are subject to changes.	Departure	20:56
Yonkers, NY Amtrak schedules are subject to changes.	Departure	21:16
New York, NY	Arrival	**21:55 Eastern Time**

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Train Schedule:

Windsor - London - Toronto

- Locations in bold indicate a possible connection.
- Schedules are valid all year round

# Train		70	72	76	78
Business class		Yes	Yes	Yes	Yes
Baggage check-in		Yes	No	No	No
Dates		All year round	All year round	All year round	All year round
Days		Day 1 MTWTFSS	Day 1 MTWTFSS	Day 1 MTWTFSS	Day 1 MTWTFSS
Windsor, ON	Departure	**05:40 Eastern Time**	**08:43 Eastern Time**	**13:46 Eastern Time**	**17:41 Eastern Time**
Chatham, ON	Arrival Departure	06:24 06:28	09:25 09:28	14:28 14:31	18:25 18:28
Glencoe, ON Stops on request. Conditional stop	Departure	-	10:05	15:04	19:00
London, ON	Arrival Departure	**07:30** **07:40**	**10:38** **10:44**	**15:38** **15:44**	**19:32** **19:38**
Ingersoll, ON	Departure	08:02	11:05	-	19:58
Woodstock, ON	Arrival Departure	08:13 08:17	11:20 11:23	-	- 20:10

# Train		70	72	76	78
Brantford, ON	Departure	08:51	11:54	16:41	20:41
Aldershot, ON	Arrival Departure	09:28 09:31	- 12:26	17:10 17:14	- 21:11
Oakville, ON	Arrival Departure	09:43 09:46	- 12:41	- 17:29	- 21:26
Toronto, ON Shuttle service runs between the station and the airport.	Arrival	**10:10 Eastern Time**	**13:05 Eastern Time**	**17:53 Eastern Time**	**21:50 Eastern Time**

APPENDIX D

NOISE MITIGATION GUIDANCE

Acoustic/Noise Barrier

Generally, noise controls to attenuate transportation sound levels at Outdoor Living Areas (OLAs) would consist of the implementation of acoustic/noise barriers with materials that would meet the guidance included in NPC-300, for example:

- A wall, berm, wall/berm combination or similar structure, used as a noise control measure, and high enough to break the line-of-sight between the source and the receptor.
- The minimum surface density (face weight) is 20 kg/m^2
    - Many materials could satisfy the surface density requirement, e.g. wood, glass, concrete, Plexiglas, Acrylite.
    - The required thickness can be determined by dividing the 20 kg/m^2 face weight by the material density (kg/m^3). Typically, this would imply:
        - 50 mm (2") thickness of wood
        - 13 mm (0.5") thickness of lighter plastic (like Plexiglas or PVC)
        - 6 mm (0.25") thickness of heavier material (like aluminum, glass, concrete)
- The barrier should be structurally sound, appropriately designed to withstand wind and snow load, and constructed without cracks or surface gaps. Joints between panels may need to be overlapped to ensure surfaces are free of gaps, particularly for wood construction.
- Any gaps under the barrier that are necessary for drainage purposes should be minimized and localized, so that the acoustical performance of the barrier is maintained.
- If a sound absorptive face is to be included in the barrier design, the minimum noise reduction coefficient is recommended to be NRC 0.7.

Building Ventilation and Air Conditioning

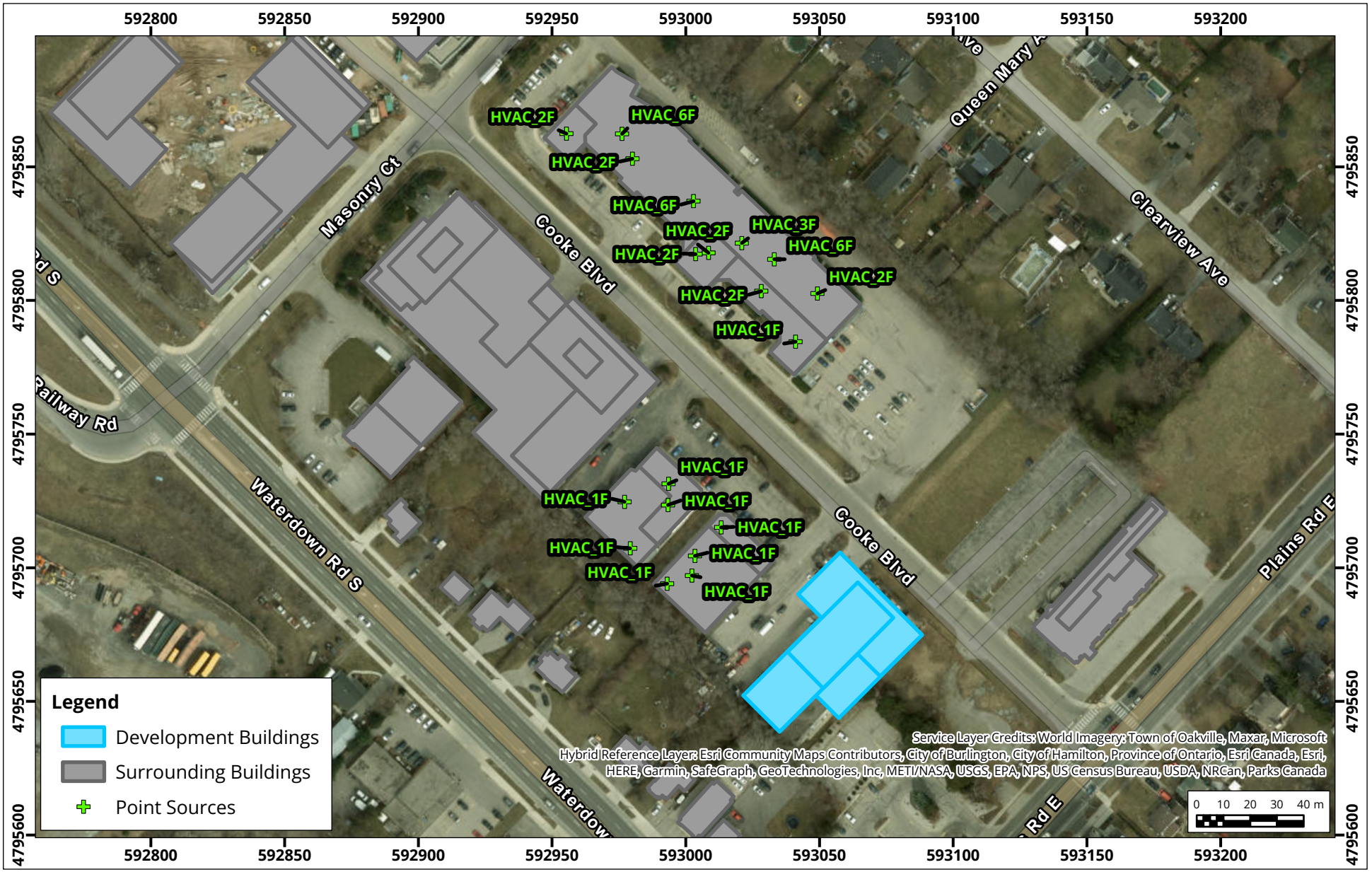
The use of air conditioning itself is not a noise control measure; however, it allows for windows and doors to remain closed, thereby reducing the indoor sound levels.

NPC-300 provides the following guidance with respect to implementation of building ventilation and air conditioning:

a. the noise produced by the proposed ventilation system in the space served does not exceed 40 dBA. In practice, this condition usually implies that window air conditioning units are not acceptable;
b. the ventilation system complies with all national, provincial and municipal standards and codes;
c. the ventilation system is designed by a heating and ventilation professional; and
d. the ventilation system enables the windows and exterior doors to remain closed.

Air conditioning systems also need to comply with Publication NPC-216, and/or any local municipal noise by-law that has provisions relating to air conditioning equipment.

APPENDIX E



Stationary Sources

Location of Stationary Sources in Relation to the Proposed Development

Map Projection: NAD 1983 UTM Zone 17N

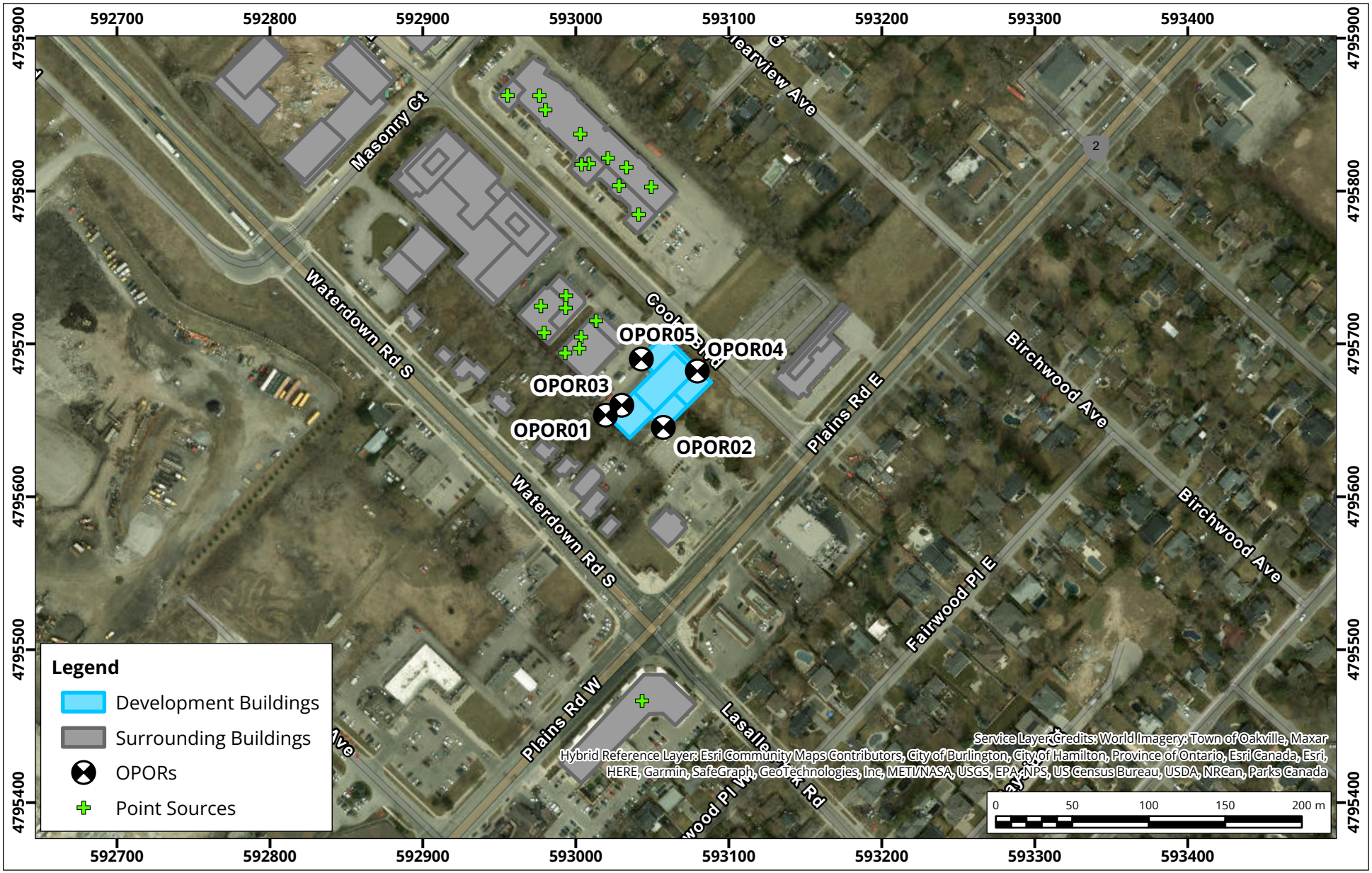
1026 Cooke Boulevard - Brantford, Ontario

True North

Project #: 2305839

Drawn by:CWM	Figure: E.1
Approx. Scale:	1:2,000
Date Revised:	Jun 20, 2023

Map Document: \\rwdgroup\guelph\Jobs_1\2305839\03WorkItems\20EnvironmentalNoiseAnalysis\ArcGIS\1026 Cooke Blvd.aprx



Location of Worst Case Receptors for Stationary Source Assessment

Stationary Source Assessment

Map Projection: NAD 1983 UTM Zone 17N

1026 Cooke Boulevard - Brantford, Ontario

True North

Project #: 2305839

Drawn by:CWM	Figure: E.2
Approx. Scale:	1:3,500
Date Revised:	Jun 26, 2023

Map Document: \\rwdgroup\guelph\Jobs_1\2305839\03WorkItems\20EnvironmentalNoiseAnalysis\ArcGIS\1026 Cooke Blvd.aprx

APPENDIX F

WARNING CLAUSES

Warning clauses are recommended to be included on all development agreements, offers of purchase and agreements of purchase and sale or lease. Warning clauses may be used individually or in combination.

The following warning clauses are recommended based on the applicable guidelines; however, wording may be modified/customized during consultation with the planning authority to best suit the proposed development:

Transportation Sources

NPC-300 Type A: Recommended to address surface transportation sound levels in OLAs if sound level is in the range of >55 dBA but ≤ 60 dBA, and noise controls have not been provided.

"Purchasers/tenants are advised that sound levels due to increasing road traffic (rail traffic) (air 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."

NPC-300 Type B: Recommended to address surface transportation sound levels in OLAs if the sound level is in the range of >55 dBA but ≤ 60 dBA, and noise controls have been provided. Recommended to address outdoor aircraft sound levels ≥NEF 30.

"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 (rail traffic) (air 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."

NPC-300 Type C: Applicable for low and medium density developments only, recommended to address transportation sound levels at the plane of window.

"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."

NPC-300 Type D: Recommended to address transportation sound levels at the plane of window.

"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."

Proximity to Railway Line: Metrolinx/CN/CP/VIA Warning Clause for developments that are within 300 metres of the right-of-way

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

Stationary Sources

NPC-300 Type E: Recommended to address proximity to commercial/industrial land-use

"Purchasers/tenants are advised that due to the proximity of the adjacent industrial/commercial land-uses, noise from the industrial/commercial land-uses may at times be audible."

NPC-300 Type F: Recommended to for Class 4 Area Notification

"Purchasers/tenants are advised that sound levels due to the adjacent industry (facility) (utility) are required to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. This dwelling unit has been supplied with a ventilation/air conditioning system which will allow windows and exterior doors to remain closed."