REPORT

1062-1074 COOKE BOULEVARD

BURLINGTON, ONTARIO

NOISE AND VIBRATION IMPACT STUDY

RWDI #2205162

August 16, 2022

SUBMITTED TO

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VERSION HISTORY

Index	Date	Description	Prepared by	Reviewed by
1	August 12, 2022	Draft	EMJI	SVG
2	August 16, 2022	Revision 1 – Final	EMJI	SVG

STATEMENT OF LIMITATIONS

This report entitled 1062-1074 Cooke Boulevard was prepared by RWDI Air ("RWDI") for Camarro Developments Inc. ("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 1062-1074 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. 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.
4. Minimum sound isolation performance:
    a. Suite bedroom window glazing with sound isolation performance up to STC-30 for the north and east façades. Upgraded windows are not required for the south and west facades.

Rail is located further than 75m from the proposed development and therefore vibration measurements were not required. 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 1062-1074 Cooke Boulevard located 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 context site plan is shown in **Figure 1**.

The site is exposed to noise from road traffic from: Masonry Crescent to the north, Waterdown Road to the west, Highway 403 to the north and Plains Road East to the east.

The site is exposed to noise from rail traffic from: the Metrolinx GO corridor (CN Oakville Subdivision), VIA rail, and CN (Aldershot rail yard) to the north.

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 received August 9, 2022 which can be found in **Appendix F**.

2 APPLICABLE CRITERIA

Applicable criteria for transportation noise sources (road and rail), stationary noise sources and rail vibration 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 A**.

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

Masonry Crescent, Waterdown Road, Highway 403, and Plains Road East traffic volumes were obtained from The City of Burlington.

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; 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 Masonry Court and Plains Road East.

Turning Movement Counts (TMCs) at the intersection of Waterdown Road and Masonry Court, Waterdown Road at Plains Road East, and Waterdown at Highway 403 Southbound Ramp provided detailed traffic volumes for the two peak time periods: 07:30 to 08:30 and 17:00 to 18:00, 07:30 to 08:30 and 16:30 to 17:30, and 07:00 to 08:00 and 16:45 to 17:45 respectively. 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.

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 D**.

Table 1: Road Traffic Volumes

Roadway	Segment	2032 Future Traffic (AADT)	% Day/Night	Speed Limit (km/hr)	% Trucks
Waterdown Road	North of Masonry Court	23,718	85 / 10	50	5.7
	South of Masonry Court	22,690			
Masonry Court	East of Waterdown Road	3,825	90 / 10	50	8.1
	West of Waterdown Road	628			46.2[1]
Plains Road East	East of Waterdown Road	24,538	90 / 10	60	3.4
	West of Waterdown Road	28,353			4.0
Highway 403 Southbound Ramp	East	16,214	67 / 33	50	7.0
	West	9,168		80	5.8
Highway 403	--	205,781	67 / 33	100	6.5

Notes:

1 – Traffic in this direction is to/from adjacent industry.

3.1.2 Rail Traffic Volume Data

Future GO transit rail traffic on the GO Metrolinx corridor, located approximately 300m to the north 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 of the data used 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	77	10	LRT Diesel	1	12	153
	14	5	LRT Diesel	2		
VIA Rail	13	--	LRT Diesel	2	6	130
CN Rail	20	10	Freight	4	120	80

3.1.3 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:

- OLA_01abc: 4th Floor
- OLA_02a: 5th Floor
- OLA_02b: 5th Floor
- OLA_02c: 5th Floor
- OLA_03a: 7th Floor
- OLA_03b: 7th Floor

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

3.1.4 Transportation Source Assessment - Analysis and Results

Sound levels due to the adjacent transportation (road and rail) sources were predicted using the RLS-90 standard (RLS,1990), and FTA method (FTA, 2018) 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

Façade	Road		Rail		Notes
	Day L_{EQ}, 16hr	Night L_{EQ}, 8hr	Day L_{EQ}, 16hr	Night L_{EQ}, 8hr	
North	61	59	59	58	2
East	60	59	59	58	2
South	58	55	52	51	1
West	61	58	54	53	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 C** 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 C** 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
OLA_01abc	4th Floor	58-60	2
OLA_02a	5th Floor	61	3
OLA_02b	5th Floor	57	2
OLA_02c	5th Floor	59	2
OLA_03a	7th Floor	57	2
OLA_03b	7th Floor	59	2

Note(s):
1. The predicted sound level meets the NPC-300 criterion for OLAs. Noise control measures are not required.
2. For OLA sound levels >55 dBA and ≤60 dBA, noise controls may be applied to meet the 55 dBA criterion. If noise control measures are not provided, a warning clause "Type A" is recommended.
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 A**.

The area within a 1000 m radius of the subject lands is, for the most part, residential, commercial, and industrial land use. The majority of the residential lands in the study area consist of one and two-storey residences with some high-rise developments to the north. Facilities with ECA and/or EASRs available on the MECP's Access Environment website found within 1000 m of the subject lands were reviewed.

3.2.1.1 Class III Industries

No facilities within the 1000m radius of the proposed development were identified as Class III.

3.2.1.2 Class II Industries

There are several industries within the 1000 m area surrounding the proposed development that have been classified as Class II. Class II industries within the potential influence area of 300 m from the proposed development are summarized in **Table 5.** A summary of the Class II facilities is provided in **Table 5** and their locations are shown in **Appendix E**, in **Figure E-1**.

3.2.1.3 Class I Industries

There are several industries within the 1000 m area surrounding the proposed development that have been classified as Class I. Class I industries beyond 300 m were not documented as their potential influence areas fall far short of the subject lands. There were two facilities identified as Class I within 70m potential influence area of the proposed development.

Table 5 lists all identified Class I industries within 300m, and all Class II and III industries within 1000 m and their location is shown on **Figure F-1**.

Table 5: Industries within the minimum recommended separation distance of the proposed development

Industry Class	Address	Potential Influence Area (m)	Actual Influence Area	ECA or EASR Registration #
I	Gentherm (Formerly 1500118 ONTARIO INC. / Etratech Inc.)	70	20	0441-A4RS6Q / R-003-9341213792
II	St. Marys Cement Inc. (Canada) operating as CBM Ready Mix	300	86	9841-BNUR2A
II	King Paving & Construction Ltd.	300	281	2090-BXNT5G
II	Bulkwood Products Inc.	300	218	4307-8XUJ9Q
I	Primary Fluid Systems Inc.	70	0 (adjacent)	--

Most industries described in **Table 5** have environmental permits (ECA or EASR), and therefore potential noise was further investigated to ensure facilities can demonstrate compliance at the proposed development, and the development would not encroach on any permits.

A detailed noise assessment of the nearby stationary sources is provided in **Section 3.2.2** to inform the proposed development noise insulation design.

3.2.2 Stationary Source Modeling

Stationary sources of noise surrounding the proposed development were identified using a combination of source identification during 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. Classes were assessed using the noise assessment perspective, as an air quality review was not considered for this study. A scale plan **Figure E-1** is included in **Appendix E** indicating the 20 m, 70 m and 300 m D-6 Guideline setback distances for the three industry classes.

The results of the D-6 assessment from a noise assessment perspective are summarized in **Appendix E**, **Figure E-1** and **Table 5**. The results of the D-6 assessment 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.

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 6**. The locations of the sources summarized in **Table 6** included in the stationary source assessment are illustrated in **Appendix E**, **Figure E-2**.

Table 6: 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

Note(s):
1. Transformer sound power levels include a 5dB penalty for tonality. Sound power level calculations are presented in Appendix G.

The permitted facilities listed in **Table 5** 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. 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 A**).

The predicted sound levels during the worst-case 1-hour from existing stationary sources are presented in **Table 7**. Included in the noise model is the 2m noise barrier as shown in the drawings.

Table 7: Predicted Sound Levels at Worst-case Receptor Locations – Continuous Stationary Sources

Time Period	Receptor		Sound Level Criteria		Notes
	POR_01 Outdoor $L_{EQ,1hr}$	POR_02 Plane of Window $L_{EQ,1hr}$	Class 1 Outdoor / Plane of Window L_{EQ-1hr}	Class 4 Outdoor / Plane of Window L_{EQ-1hr}	
Daytime-Evening 0700-2300h	47 dBA	47 dBA	50 / 50 dBA	55 / 60 dBA	Meets Class 1 criteria
Nighttime 2300-0700h [1]	--	44 dBA	-- / 45 dBA	-- / 55 dBA	Meets Class 1 criteria

Note(s):
1. Outdoor areas are not assessed during the nighttime period.

As shown in **Table 7**, the daytime-evening and nighttime continuous sound levels at the sound levels at the façade due to existing stationary sources are predicted to 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 8**.

Table 8: Recommended Facade Component Minimum Sound Insulation Rating

Façade	Window Glazing	Exterior Door	Façade Wall
North Façade	STC_30	OBC	OBC
East Façade	STC-30	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.
2. Exterior walls to include a minimum brick veneer or masonry equivalent for the façade with exposure to the railway line.

The maximum requirement for the window glazing was determined to be STC-30, which is considered feasible as this can be achieved by various double-glazed configurations of insulated glazing units.

Taking into account the assumptions used as a basis to determine the glazing requirements, the applicable indoor transportation source sound level criteria are predicted to be achieved.

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 and rail corridor, sound levels in OLAs are predicted to be elevated. The combined (rail and road) daytime average sound levels for the OLAs included in the assessment 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 3a** (to meet 55 dBA) and **Figure 3b** (to meet 60 dBA). The barrier heights are summarized in **Table 9**. General guidance with respect to noise barrier design is included with **Appendix C**. 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 9: 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]	≤ 60 dBA[2]
OLA_01ab	4th Floor	58-60	1.8m	--
OLA_01c	4th Floor	61	2.4m	--
OLA_02a	5th Floor	57	1.9m	0.6m
OLA_02b	5th Floor	59	1.0m	--
OLA_02c	5th Floor	57	2.0m	--
OLA_03a	7th Floor	59	1.5	--
OLA_03b	7th Floor	58-60	2.0m	--

Note(s):

1. Refer to Figure 3a for barrier geometry to meet 55 dBA.
2. Refer to Figure 3b for barrier geometry to meet 60 dBA. A warning clause "Type B" is recommended in cases where the OLA sound level is >55 dBA (to a maximum of 60 dBA).
3. 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.
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 B**.

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 1062-1074 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 at the building façade and 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.
4. Minimum sound isolation performance:
    a. Suite bedroom window glazing with sound isolation performance up to STC-30 for the north and east façades. Upgraded windows are not required for the south and west facades.

Rail is located further than 75m from the proposed development and therefore vibration measurements were not required. 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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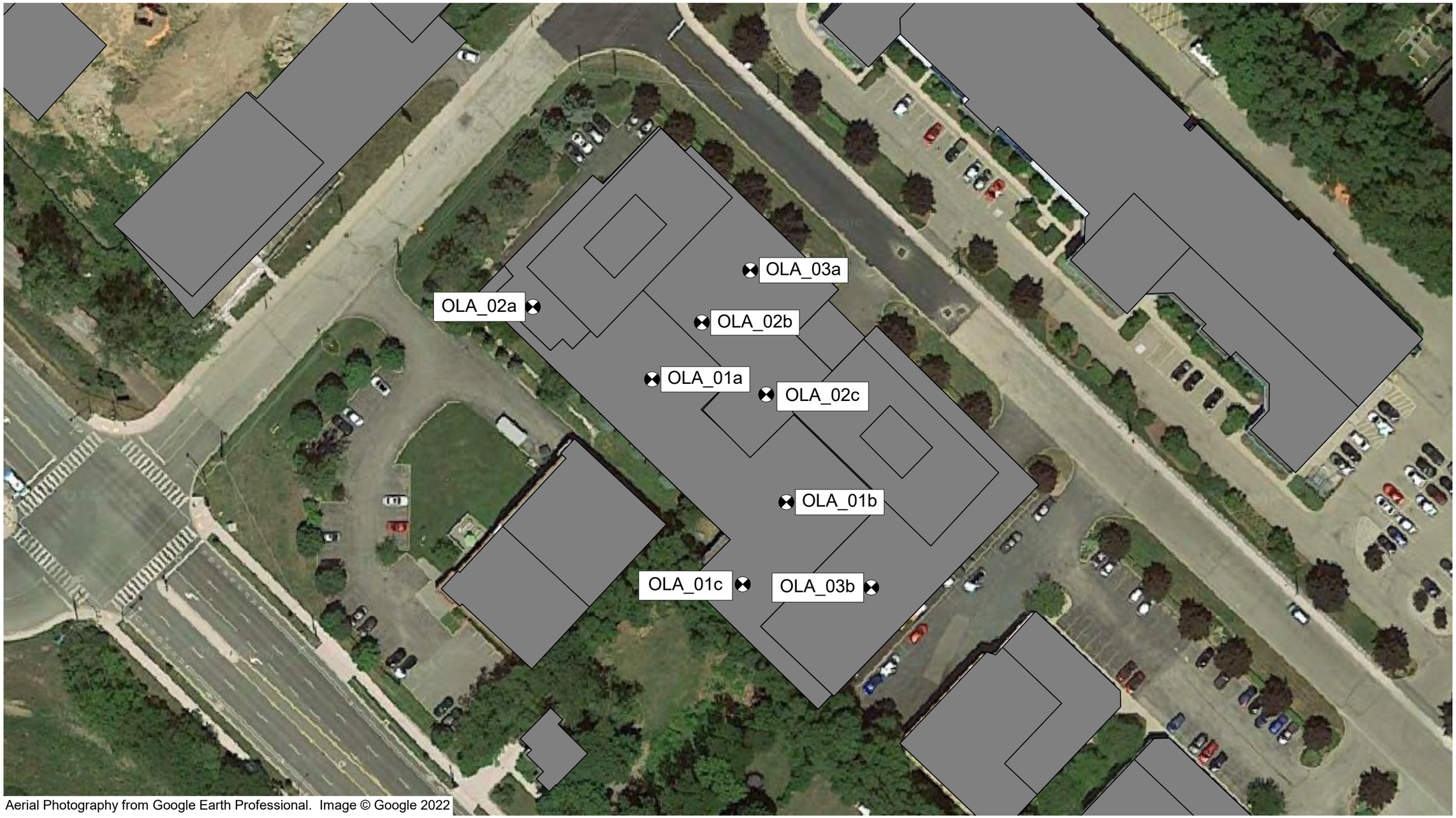
FIGURES



Context Site Plan

1062-1074 Cooke Blvd.

Drawn by:	EMJI	Figure:	1
Project #:			2205162
Date:			2022-08-12



Aerial Photography from Google Earth Professional. Image © Google 2022

Outdoor Living Areas (OLAs)

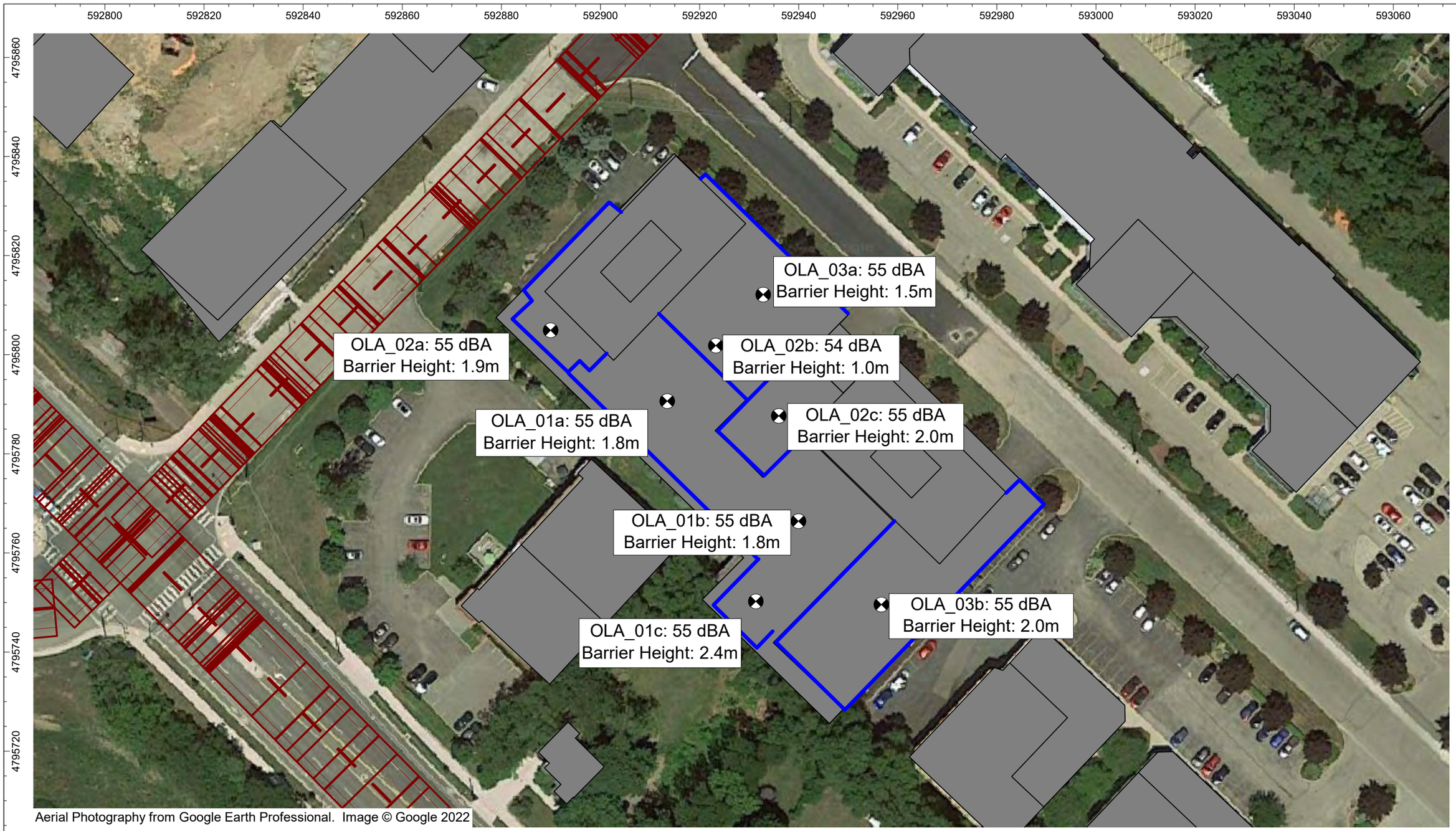
Location of Common Outdoor Amenity Areas

1062-1074 Cooke Blvd., Burlington, Ontario

True North

Project #: 2205162

Drawn by: EMJI	Figure: **02**
Scale:	1:750
Date:	11.08.2022



Outdoor Living Areas (OLAs) Mitigation to 55 dBA

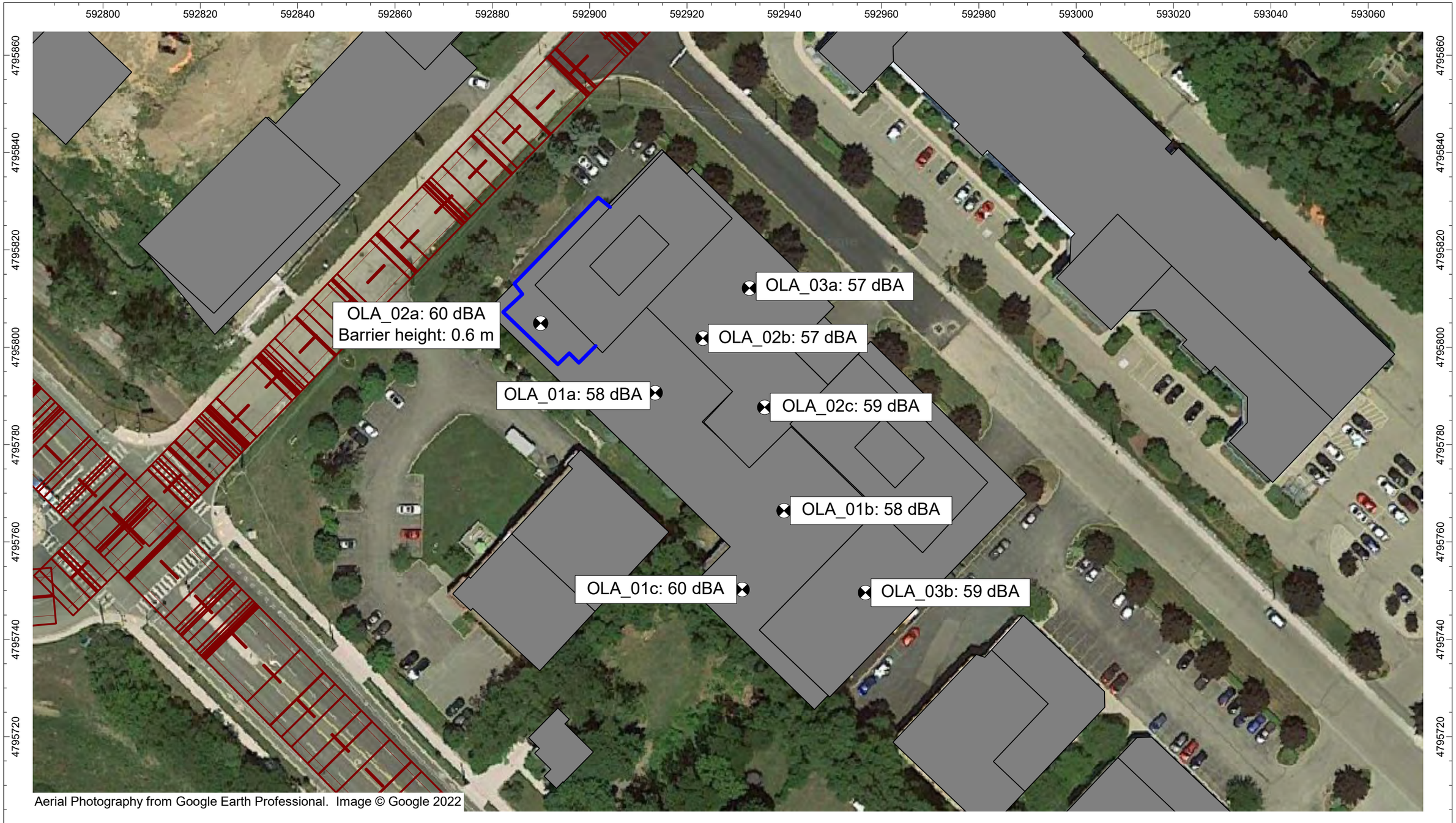
Recommended Barrier Geometry and Height to meet 55 dBA

1062-1074 Cooke Blvd., Burlington, Ontario

True North

Project #: 2205162

Drawn by: EMJI	Figure **03a**
Scale:	1:750
Date:	11.08.2022



Outdoor Living Areas (OLAs) Mitigation to 60 dBA

Recommended Barrier Geometry and Height to meet 60 dBA

1062-1074 Cooke Blvd., Burlington, Ontario

True North

Project #: 2205162

Drawn by: EMJI	Figure **03b**
Scale:	1:750
Date:	11.08.2022

APPENDIX A

APPENDIX A: CRITERIA

A.1 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.

A.1.1 Road and Rail

A.1.1.1 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

A.1.1.2 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	-

A.1.1.3 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.

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 (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.

Notes:

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.

A.1.1.4 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.

A.1.1.5 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).

A.1.2 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

A.2 Stationary Sources

A.2.1 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

Notes:

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

Notes:

1. The applicable sound level criterion is the background sound level or the exclusion limit, whichever is higher.

A.2.2 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 B

APPENDIX B: 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:

B.1 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."

B.2 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."

APPENDIX C

APPENDIX C: NOISE MITIGATION GUIDANCE

C.1 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.

C.2 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 D

APPENDIX D:
RAIL VOLUMES

D.1 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 • 80 kph speed • 4 locomotives and 120 cars

From: Amy Patenaude
Sent: Wednesday, July 6, 2022 11:46 AM
To: Eva Johnston-Iafelice
Subject: FW: 1062-1074 Cooke Blvd. RWDI 2205162 - Rail Data Request

SUMMER HOURS: Our organization is moving to summer hours from May 30 through September 2.
I will be finished work at 12:30 most Friday afternoons during this time. Enjoy your summer.

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

From: Rail Data Requests <RailDataRequests@metrolinx.com>
Sent: July 6, 2022 11:30 AM
To: Amy Patenaude <Amy.Patenaude@rwdi.com>
Subject: RE: 1062-1074 Cooke Blvd. RWDI 2205162 - Rail Data Request

Hi Amy,

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.

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

Tara Kamal Ahmadi

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

METROLINX

From: Amy Patenaude <Amy.Patenaude@rwdi.com>
Sent: June 29, 2022 10:13 AM
To: Rail Data Requests <RailDataRequests@metrolinx.com>
Cc: Eva Johnston-Iafelice <Eva.Johnston-Iafelice@rwdi.com>
Subject: FW: 1062-1074 Cooke Blvd. RWDI 2205162 - Rail Data Request

EXTERNAL SENDER: Do not click any links or open any attachments unless you trust the sender and know the content is safe.
EXPÉDITEUR EXTERNE: Ne cliquez sur aucun lien et n'ouvrez aucune pièce jointe à moins qu'ils ne proviennent d'un expéditeur fiable, ou que vous ayez l'assurance que le contenu provient d'une source sûre.

Hello,

We are a noise study for the above-referenced address and require rail data on the Aldershot rail yard.

We are looking for:

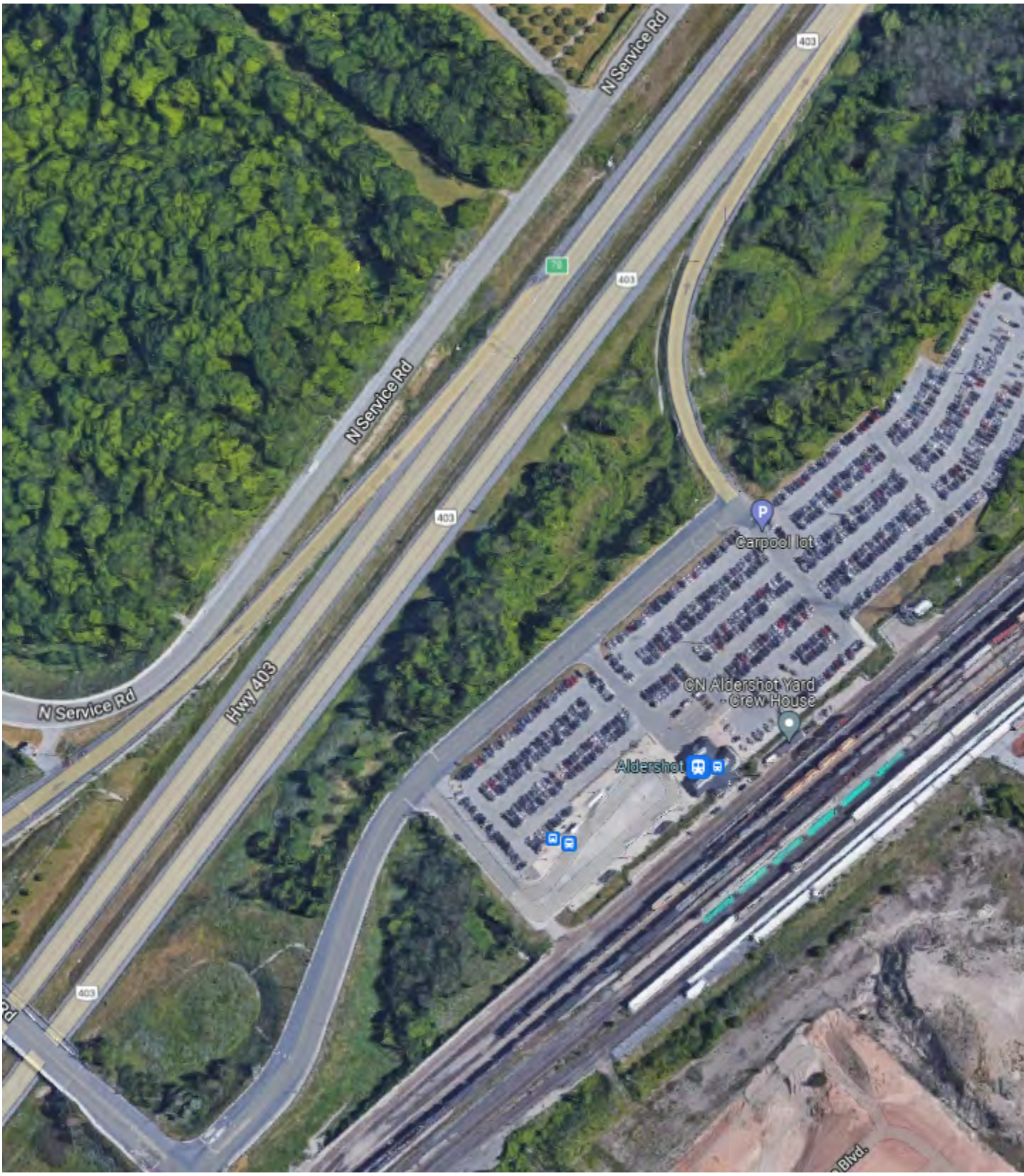
- Growth rate per annum for a 10-year period
- Day and night train volumes
- Average number of cars per train
- Number of Locomotives per train
- Maximum permissible speed
- Whistles used at crossings in the area
- Type of track (continuously welded, or jointed)
- Any idling of locomotive in the vicinity, and approximate duration of idling

Thank you.

Amy

SUMMER HOURS: Our organization is moving to summer hours from May 30 through September 2.
I will be finished work at 12:30 most Friday afternoons during this time. Enjoy your summer.

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


N Service Rd
403
N Service Rd
403
N Service Rd
Hwy 403
Carpool lot
CN Aldershot Yard
- Crew House
Aldershot
403

RWDI - A Platinum Member of Canada's 50 Best Managed Companies
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Please be aware that when you contact us with a business query we may collect and use your details for future communications.

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Train Schedule:

New York - Niagara Falls - Toronto

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

Train Status

# Train		98-63	698-63
Business class		No	No
Baggage check-in		No	No
Dates		All year round	All year round
Days		Day 1 M T W T F S S	Day 1 M T W T F S S
New York, NY Amtrak schedules are subject to changes.	Departure	**07:16 Eastern Time**	**07:16 Eastern Time**
Yonkers, NY Amtrak schedules are subject to changes.	Departure	07:44	07:44
Croton-on-Hudson, NY Amtrak schedules are subject to changes.	Departure	08:03	08:03
Poughkeepsie, NY Amtrak schedules are subject to changes.	Departure	08:45	08:45
Rhinecliff, NY Amtrak schedules are subject to changes.	Departure	09:00	09:00

# Train		98-63	698-63
Hudson, NY Amtrak schedules are subject to changes.	Departure	09:21	09:21
Albany, NY Amtrak schedules are subject to changes.	Arrival Departure	09:50 10:10	09:50 10:10
Schenectady, NY Amtrak schedules are subject to changes.	Departure	10:34	10:34
Amsterdam, NY Amtrak schedules are subject to changes.	Departure	10:54	10:54
Utica, NY Amtrak schedules are subject to changes.	Departure	11:51	11:51
Rome, NY Amtrak schedules are subject to changes.	Departure	12:04	12:04
Syracuse, NY Amtrak schedules are subject to changes.	Departure	12:53	12:53
Rochester, NY Amtrak schedules are subject to changes.	Departure	14:12	14:12
Buffalo (Depew), NY Amtrak schedules are subject to changes.	Departure	15:21	15:21
Buffalo (Exchange), NY Amtrak schedules are subject to changes.	Departure	15:37	15:37
Niagara Falls, NY Amtrak schedules are subject to changes.	Departure	16:53	16:53

# Train		98-63	698-63
Niagara Falls, NY	Departure	16:54	16:54
Niagara Falls, ON	Arrival Departure	**16:58** **17:45**	**16:58** **18:20**
St. Catharines, ON	Departure	18:08	18:43
Grimsby, ON	Departure	18:27	19:02
Aldershot, ON	Departure	19:07	19:39
Oakville, ON	Departure	19:19	19:54
Toronto, ON Shuttle service runs between the station and the airport.	Arrival	**19:43** **Eastern Time**	**20:18** **Eastern Time**

Train Schedule:

Sarnia - London - Toronto

- Locations in bold indicate a possible connection.

Train Status

# Train		**84**
Business class		Yes
Baggage check-in		No
Dates		All year round
Days		Day 1 M T W T F S S
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
Kitchener, ON	Departure	12:04
Guelph, ON	Departure	12:26
Georgetown, ON	Departure	12:49

# 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**

Train Schedule:

Toronto - London - Sarnia

- Locations in bold indicate a possible connection.

Train Status

# Train		87
Business class		Yes
Baggage check-in		No
Dates		All year round
Days		Day 1 M T W T F S S
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
Stratford, ON	Departure	19:55
St. Marys, ON	Departure	20:23

# 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**

Train Schedule:

Toronto - London - Windsor

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

Train Status

# Train		71	73	75	79
Business class		Yes	Yes	Yes	Yes
Baggage check-in		Yes	No	No	Yes
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
Toronto, ON Shuttle service runs between the station and the airport.	Departure	**06:50 Eastern Time**	**12:15 Eastern Time**	**17:30 Eastern Time**	**19:45 Eastern Time**
Oakville, ON	Arrival Departure	- 07:15	12:36 12:40	17:53 17:56	- 20:09
Aldershot, ON	Arrival Departure	- 07:31	12:54 12:58	18:09 18:12	- 20:23
Brantford, ON	Arrival Departure	07:55 07:59	- 13:27	18:41 18:44	- 20:51
Woodstock, ON	Departure	08:31	13:55	19:14	21:18

# Train		71	73	75	79
Ingersoll, ON Reservations are required before 7:00 the day of departure for a train stop at Ingersoll and Glencoe	Departure	08:44	-	19:28	21:31
London, ON	Arrival Departure	**09:06** **09:11**	**14:23** **14:30**	**19:55** **20:01**	**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	-	20:30	22:26
Chatham, ON	Arrival Departure	- 10:19	15:35 15:39	21:03 21:06	- 22:59
Windsor, ON	Arrival	**11:08 Eastern Time**	**16:30 Eastern Time**	**21:58 Eastern Time**	**23:44 Eastern Time**

Train Schedule:

Toronto - Niagara Falls - New York

- Locations in bold indicate a possible connection.

Train Status

# Train		97-64
Business class		No
Baggage check-in		No
Dates		All year round
Days		Day 1 M T W T F S S
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
Niagara Falls, ON	Departure	**10:22**
Niagara Falls, NY	Departure	10:37

# Train		97-64
Niagara Falls, NY Amtrak schedules are subject to changes.	Arrival Departure	10:38 12:17
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	18:33
Days		Day 2 MTWTFSS

# Train		97-64
Albany, NY Amtrak schedules are subject to changes.	Departure	07:15
Hudson, NY Amtrak schedules are subject to changes.	Departure	19:37
Rhinecliff, NY Amtrak schedules are subject to changes.	Departure	19:59
Poughkeepsie, NY Amtrak schedules are subject to changes.	Departure	20:15
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 Amtrak schedules are subject to changes.	Arrival	**21:55** **Eastern Time**

Train Schedule:

Windsor - London - Toronto

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

Train Status

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

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

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

North Leg Total: 1337
North Entering: 410
North Peds: 9
Peds Cross: ⋈

Cyclists	1	0	0	1
Trucks	11	7	11	29
Cars	127	124	129	380
Totals	139	131	140	

Cyclists	3
Trucks	31
Cars	893
Totals	927

East Leg Total: 1433
East Entering: 502
East Peds: 10
Peds Cross: ⧖

Waterdown Rd

Cyclists	Trucks	Cars	Totals
4	25	453	482

Cars	Trucks	Cyclists	Totals
160	8	1	169
250	13	3	266
64	3	0	67
474	24	4	

Plains Rd W

N
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Cyclists	Trucks	Cars	Totals
1	19	510	530
7	21	711	739
0	3	123	126
8	43	1344	

Plains Rd W

Cars	Trucks	Cyclists	Totals
888	35	8	931

Waterdown Rd

Peds Cross: ⧖
West Peds: 4
West Entering: 1395
West Leg Total: 1877

Cars	311
Trucks	13
Cyclists	0
Totals	324

Cars	76	223	48	347
Trucks	1	4	3	8
Cyclists	0	1	1	2
Totals	77	228	52	

Peds Cross: ⋈
South Peds: 9
South Entering: 357
South Leg Total: 681

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

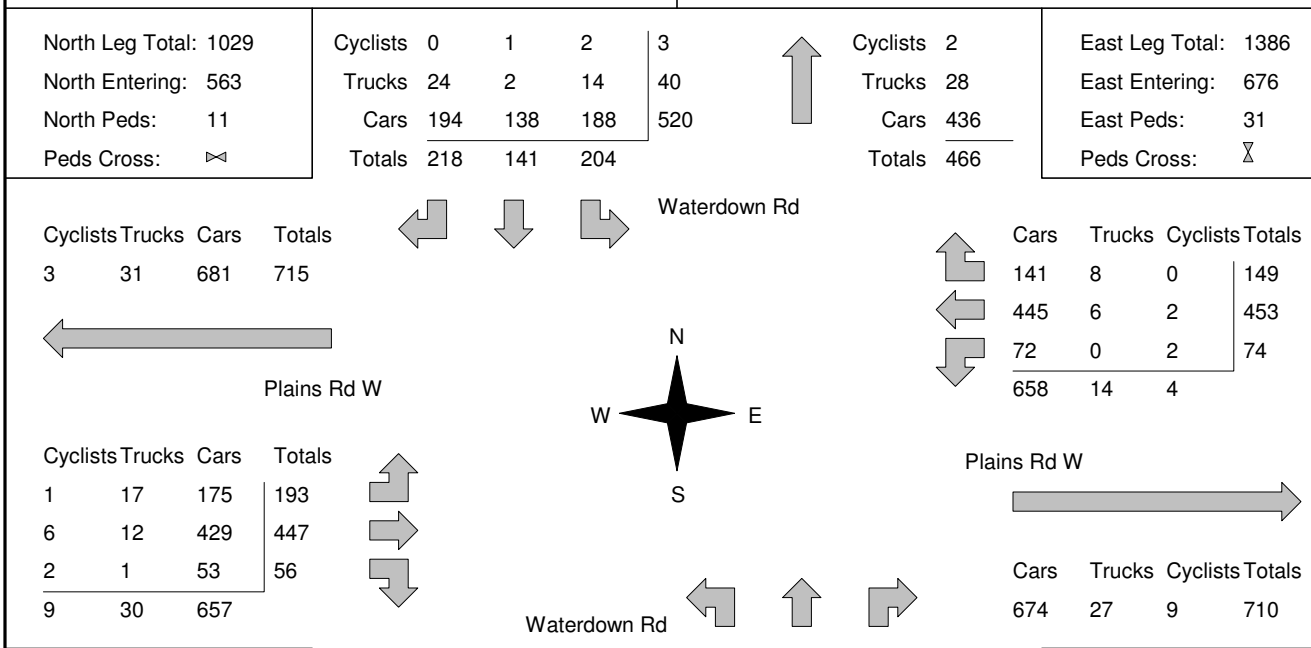
Municipality: Burlington
Site #: 0000201468
Intersection: Plains Rd W & Waterdown Rd
TFR File #: 1
Count date: 18-Sep-2018

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

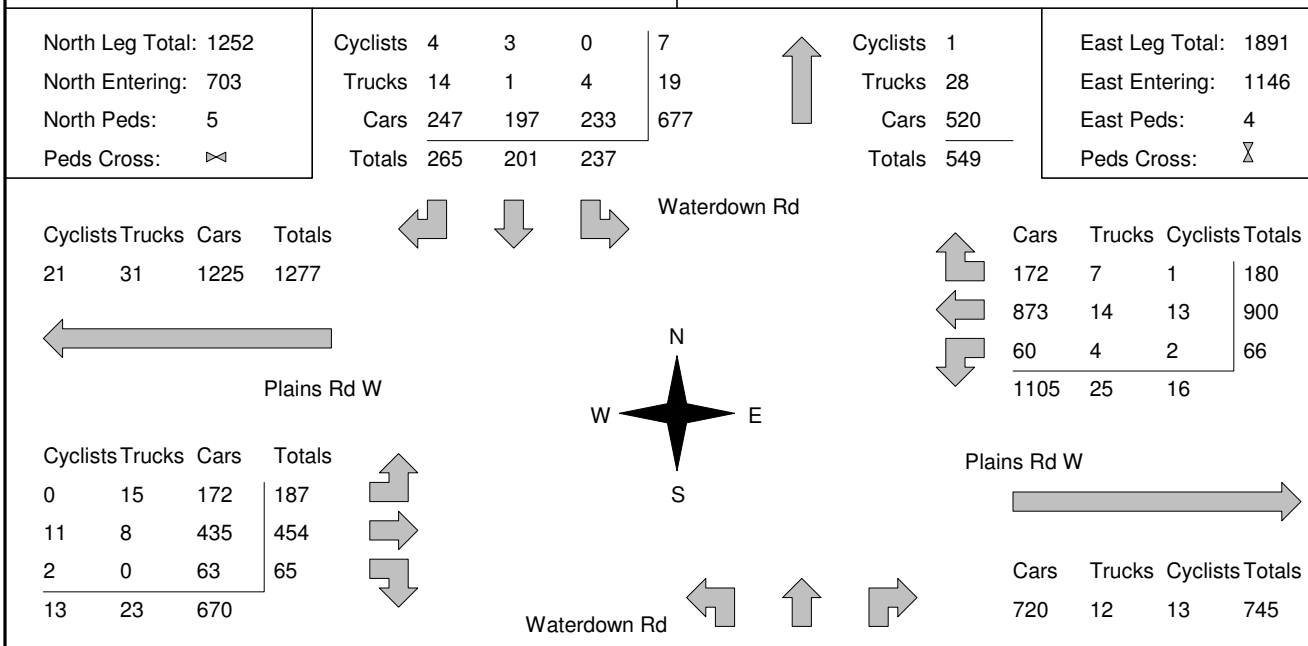
Municipality: Burlington
Site #: 0000201468
Intersection: Plains Rd W & Waterdown Rd
TFR File #: 1
Count date: 18-Sep-2018

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

North Leg Total:	8919			
North Entering:	4194			
North Peds:	70			
Peds Cross:	⋈			

Cyclists	18	12	7	37
Trucks	134	30	72	236
Cars	1423	1055	1443	3921
Totals	1575	1097	1522	

Cyclists	23
Trucks	232
Cars	4470
Totals	4725

East Leg Total:	11710
East Entering:	5899
East Peds:	96
Peds Cross:	⧖

Waterdown Rd

Cyclists	Trucks	Cars	Totals
85	257	5973	6315

Cars	Trucks	Cyclists	Totals
1213	59	5	1277
3919	106	54	4079
520	16	7	543
5652	181	66	

Plains Rd W

N
W E
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Cyclists	Trucks	Cars	Totals
11	147	2022	2180
64	113	3656	3833
9	13	567	589
84	273	6245	

Plains Rd W

Cars	Trucks	Cyclists	Totals
5539	195	77	5811

Waterdown Rd

Peds Cross:	⧖		
West Peds:	51		
West Entering:	6602		
West Leg Total:	12917		

Cars	2142
Trucks	59
Cyclists	28
Totals	2229

Cars	631	1235	440	2306
Trucks	17	26	10	53
Cyclists	13	7	6	26
Totals	661	1268	456	

Peds Cross:	⋈		
South Peds:	77		
South Entering:	2385		
South Leg Total:	4614		

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

201964-Waterdown Rd @ QEW South Ramp

Morning Peak Diagram

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

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

Municipality: Burlington
Site #: 0000201964
Intersection: Waterdown Rd & QEW South Ramp
TFR File #: 1
Count date: 26-Sep-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik

**** Signalized Intersection ****

Major Road: Waterdown Rd runs N/S

North Leg Total: 1378
North Entering: 752
North Peds: 1
Peds Cross: ⋈

Cyclists	0	1	0	1
Trucks	0	26	15	41
Cars	0	308	402	710
Totals	0	335	417	

Cyclists	0
Trucks	32
Cars	594
Totals	626

East Leg Total: 1290
East Entering: 96
East Peds: 0
Peds Cross: ⧖

Cyclists	Trucks	Cars	Totals
0	0	0	0

QEW South Ramp

Cyclists	Trucks	Cars	Totals
0	1	174	175
0	3	311	314
0	13	212	225
0	17	697	

Waterdown Rd

Cars	Trucks	Cyclists	Totals
64	9	0	73
0	0	0	0
18	5	0	23
82	14	0	

N
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QEW South Ramp

Cars	Trucks	Cyclists	Totals
1147	47	0	1194

Waterdown Rd

Peds Cross: ⧖
West Peds: 0
West Entering: 714
West Leg Total: 714

Cars	538
Trucks	44
Cyclists	1
Totals	583

Cars	0	356	434	790
Trucks	0	22	29	51
Cyclists	0	0	0	0
Totals	0	378	463	

Peds Cross: ⋈
South Peds: 0
South Entering: 841
South Leg Total: 1424

Comments

201964-Waterdown Rd @ QEW South Ramp

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

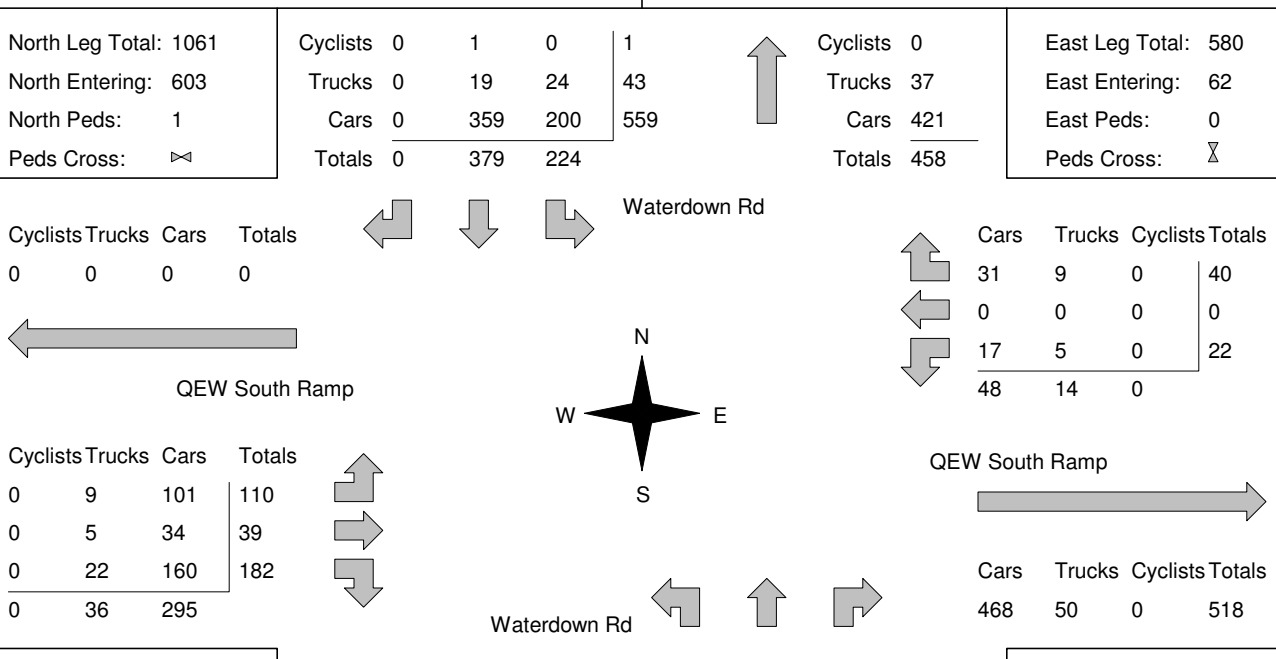
Municipality: Burlington
Site #: 0000201964
Intersection: Waterdown Rd & QEW South Ramp
TFR File #: 1
Count date: 26-Sep-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik

**** Signalized Intersection ****

Major Road: Waterdown Rd runs N/S



Comments

201964-Waterdown Rd @ QEW South Ramp

Afternoon Peak Diagram

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

One Hour Peak
From: 16:45:00
To: 17:45:00

Municipality: Burlington
Site #: 0000201964
Intersection: Waterdown Rd & QEW South Ramp
TFR File #: 1
Count date: 26-Sep-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik

**** Signalized Intersection ****

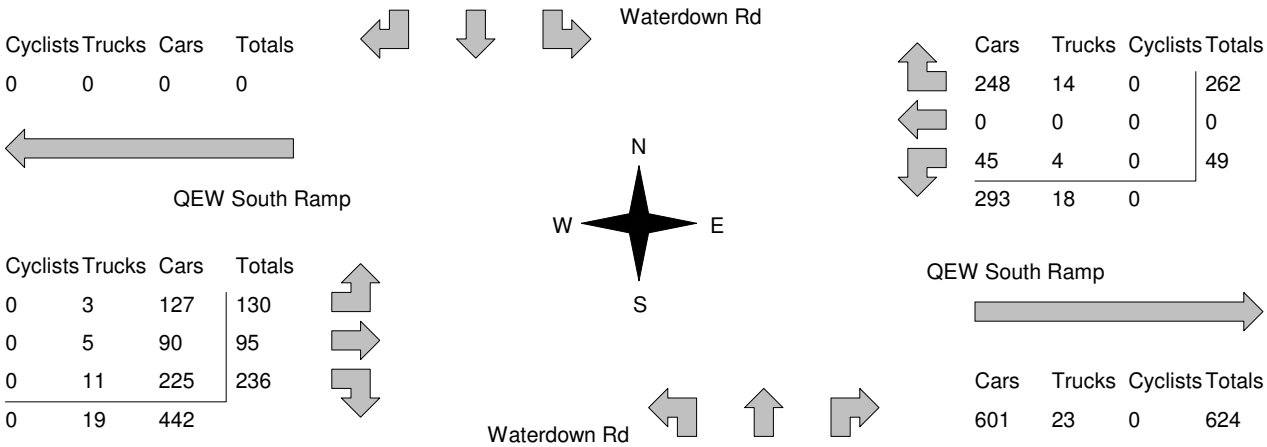
Major Road: Waterdown Rd runs N/S

North Leg Total: 1611
North Entering: 717
North Peds: 3
Peds Cross: ⋈

Cyclists	0	2	0	2
Trucks	0	11	11	22
Cars	0	438	255	693
Totals	0	451	266	

Cyclists	0
Trucks	28
Cars	866
Totals	894

East Leg Total: 935
East Entering: 311
East Peds: 1
Peds Cross: ⧖



Cyclists	Trucks	Cars	Totals
0	0	0	0

Cars	Trucks	Cyclists	Totals
248	14	0	262
0	0	0	0
45	4	0	49
293	18	0	

Cyclists	Trucks	Cars	Totals
0	3	127	130
0	5	90	95
0	11	225	236
0	19	442	

Cars	Trucks	Cyclists	Totals
601	23	0	624

Peds Cross: ⧖
West Peds: 6
West Entering: 461
West Leg Total: 461

Cars	708			
Trucks	26			
Cyclists	2			
Totals	736			

Cars	0	491	256	747
Trucks	0	11	7	18
Cyclists	0	0	0	0
Totals	0	502	263	

Peds Cross: ⋈
South Peds: 1
South Entering: 765
South Leg Total: 1501

Comments

201964-Waterdown Rd @ QEW South Ramp

Total Count Diagram

Municipality: Burlington
Site #: 0000201964
Intersection: Waterdown Rd & QEW South Ramp
TFR File #: 1
Count date: 26-Sep-2018

Weather conditions: Sunny
Person(s) who counted: Nik

**** Signalized Intersection ****

Major Road: Waterdown Rd runs N/S

North Leg Total:	10200			
North Entering:	5187			
North Peds:	8			
Peds Cross:	⋈			
Cyclists	0	6	0	6
Trucks	0	160	118	278
Cars	0	2882	2021	4903
Totals	0	3048	2139	
Cyclists	2			
Trucks	278			
Cars	4733			
Totals	5013			
East Leg Total:	6145			
East Entering:	967			
East Peds:	8			
Peds Cross:	⧖			

Waterdown Rd

Cyclists	Trucks	Cars	Totals
0	0	0	0

QEW South Ramp

Cars	Trucks	Cyclists	Totals
676	81	0	757
0	0	0	0
173	37	0	210
849	118	0	

N
W E
S

Cyclists	Trucks	Cars	Totals
0	50	1128	1178
0	35	747	782
0	121	1496	1617
0	206	3371	

QEW South Ramp

Cars	Trucks	Cyclists	Totals
4863	315	0	5178

Waterdown Rd

Peds Cross:	⧖			
West Peds:	7			
West Entering:	3577			
West Leg Total:	3577			
Cars	4551			
Trucks	318			
Cyclists	6			
Totals	4875			
Cars	0	2929	2095	5024
Trucks	0	147	162	309
Cyclists	0	2	0	2
Totals	0	3078	2257	
Peds Cross:	⋈			
South Peds:	6			
South Entering:	5335			
South Leg Total:	10210			

Comments

201964-Waterdown Rd @ QEW South Ramp
Traffic Count Summary

Intersection: Waterdown Rd & QEW South Ram | **Count Date:** 26-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	0	0
8:00:00	417	335	0	752	1	1593
9:00:00	343	370	0	713	1	1475
11:00:00	0	0	0	0	0	0
12:00:00	242	345	0	587	1	1116
13:00:00	223	379	0	602	0	1151
14:00:00	172	356	0	528	2	1081
15:00:00	0	0	0	0	0	0
16:00:00	233	390	0	623	0	1248
17:00:00	269	402	0	671	0	1430
18:00:00	240	471	0	711	3	1428
Totals:	2139	3048	0	5187	8	10522

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	0	378	463	841	0
9:00:00	0	382	380	762	1
11:00:00	0	0	0	0	0
12:00:00	0	304	225	529	1
13:00:00	0	305	244	549	0
14:00:00	0	334	219	553	1
15:00:00	0	0	0	0	0
16:00:00	0	418	207	625	1
17:00:00	0	490	269	759	1
18:00:00	0	467	250	717	1
Totals:	0	3078	2257	5335	6

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	23	0	73	96	0	810
9:00:00	11	0	52	63	0	510
11:00:00	0	0	0	0	0	0
12:00:00	27	0	48	75	1	384
13:00:00	14	0	35	49	1	371
14:00:00	35	0	56	91	0	452
15:00:00	0	0	0	0	0	0
16:00:00	20	0	90	110	3	580
17:00:00	29	0	147	176	2	669
18:00:00	51	0	256	307	1	768
Totals:	210	0	757	967	8	4544

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	175	314	225	714	0
9:00:00	237	56	154	447	1
11:00:00	0	0	0	0	0
12:00:00	90	45	174	309	0
13:00:00	105	42	175	322	0
14:00:00	93	85	183	361	0
15:00:00	0	0	0	0	0
16:00:00	175	55	240	470	0
17:00:00	169	89	235	493	0
18:00:00	134	96	231	461	6
Totals:	1178	782	1617	3577	7

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:	513	306	164	161	216	251	288	285

Waterdown Rd @ Masonry Crt

Morning Peak Diagram

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

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

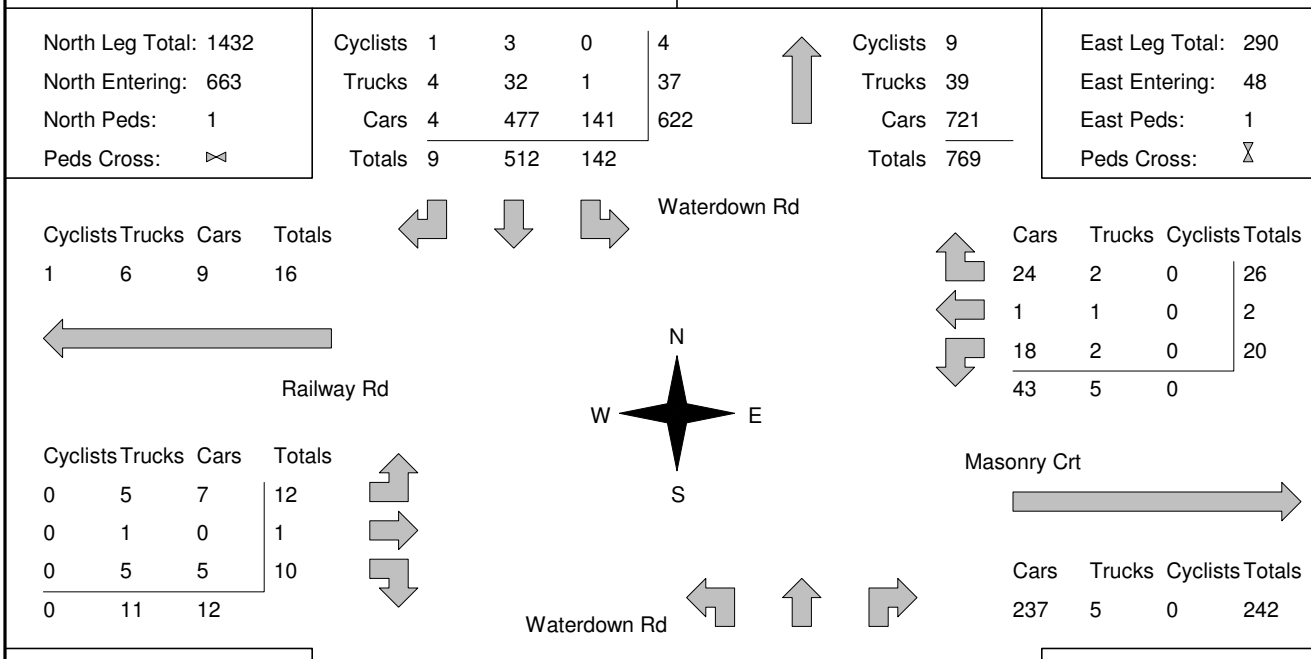
Municipality: Burlington
Site #: 0000202006
Intersection: Waterdown Rd & Masonry Crt
TFR File #: 1
Count date: 21-Jun-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik

**** Signalized Intersection ****

Major Road: Waterdown Rd runs N/S



Comments

Waterdown Rd @ Masonry Crt

Mid-day Peak Diagram

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

One Hour Peak
From: 12:15:00
To: 13:15:00

Municipality: Burlington
Site #: 0000202006
Intersection: Waterdown Rd & Masonry Crt
TFR File #: 1
Count date: 21-Jun-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik

**** Signalized Intersection ****

Major Road: Waterdown Rd runs N/S

North Leg Total: 1224
North Entering: 629
North Peds: 1
Peds Cross: ⋈

Cyclists	0	7	0	7
Trucks	6	36	6	48
Cars	5	540	29	574
Totals	11	583	35	

Cyclists	4
Trucks	39
Cars	552
Totals	595

East Leg Total: 90
East Entering: 37
East Peds: 0
Peds Cross: ⧖

Waterdown Rd

Cyclists	Trucks	Cars	Totals
0	11	11	22

Cars	Trucks	Cyclists	Totals
17	1	0	18
0	3	0	3
14	2	0	16
31	6	0	

Railway Rd

N
W E
S

Cyclists	Trucks	Cars	Totals
0	8	6	14
0	2	0	2
0	1	5	6
0	11	11	

Masonry Crt

Cars	Trucks	Cyclists	Totals
45	8	0	53

Waterdown Rd

Peds Cross: ⧖
West Peds: 2
West Entering: 22
West Leg Total: 44

Cars	559			
Trucks	39			
Cyclists	7			
Totals	605			

Cars	6	529	16	551
Trucks	2	30	0	32
Cyclists	0	4	0	4
Totals	8	563	16	

Peds Cross: ⋈
South Peds: 1
South Entering: 587
South Leg Total: 1192

Comments

Waterdown Rd @ Masonry Crt

Afternoon Peak Diagram

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

One Hour Peak
From: 17:00:00
To: 18:00:00

Municipality: Burlington
Site #: 0000202006
Intersection: Waterdown Rd & Masonry Crt
TFR File #: 1
Count date: 21-Jun-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik

**** Signalized Intersection ****

Major Road: Waterdown Rd runs N/S

North Leg Total: 1788
North Entering: 928
North Peds: 0
Peds Cross: ⋈

Cyclists	0	10	0	10
Trucks	6	23	1	30
Cars	3	848	37	888
Totals	9	881	38	

Cyclists	6
Trucks	34
Cars	820
Totals	860

East Leg Total: 336
East Entering: 264
East Peds: 0
Peds Cross: ⧖

Waterdown Rd

Cyclists	Trucks	Cars	Totals
0	11	9	20

Cars	Trucks	Cyclists	Totals
171	1	0	172
1	3	0	4
86	2	0	88
258	6	0	

Railway Rd

N
W E
S

Cyclists	Trucks	Cars	Totals
0	3	5	8
0	3	0	3
0	1	3	4
0	7	8	

Masonry Crt

Cars	Trucks	Cyclists	Totals
67	5	0	72

Waterdown Rd

Peds Cross: ⧖
West Peds: 0
West Entering: 15
West Leg Total: 35

Cars	937
Trucks	26
Cyclists	10
Totals	973

Cars	5	644	30	679
Trucks	2	30	1	33
Cyclists	0	6	0	6
Totals	7	680	31	

Peds Cross: ⋈
South Peds: 0
South Entering: 718
South Leg Total: 1691

Comments

Waterdown Rd @ Masonry Crt

Total Count Diagram

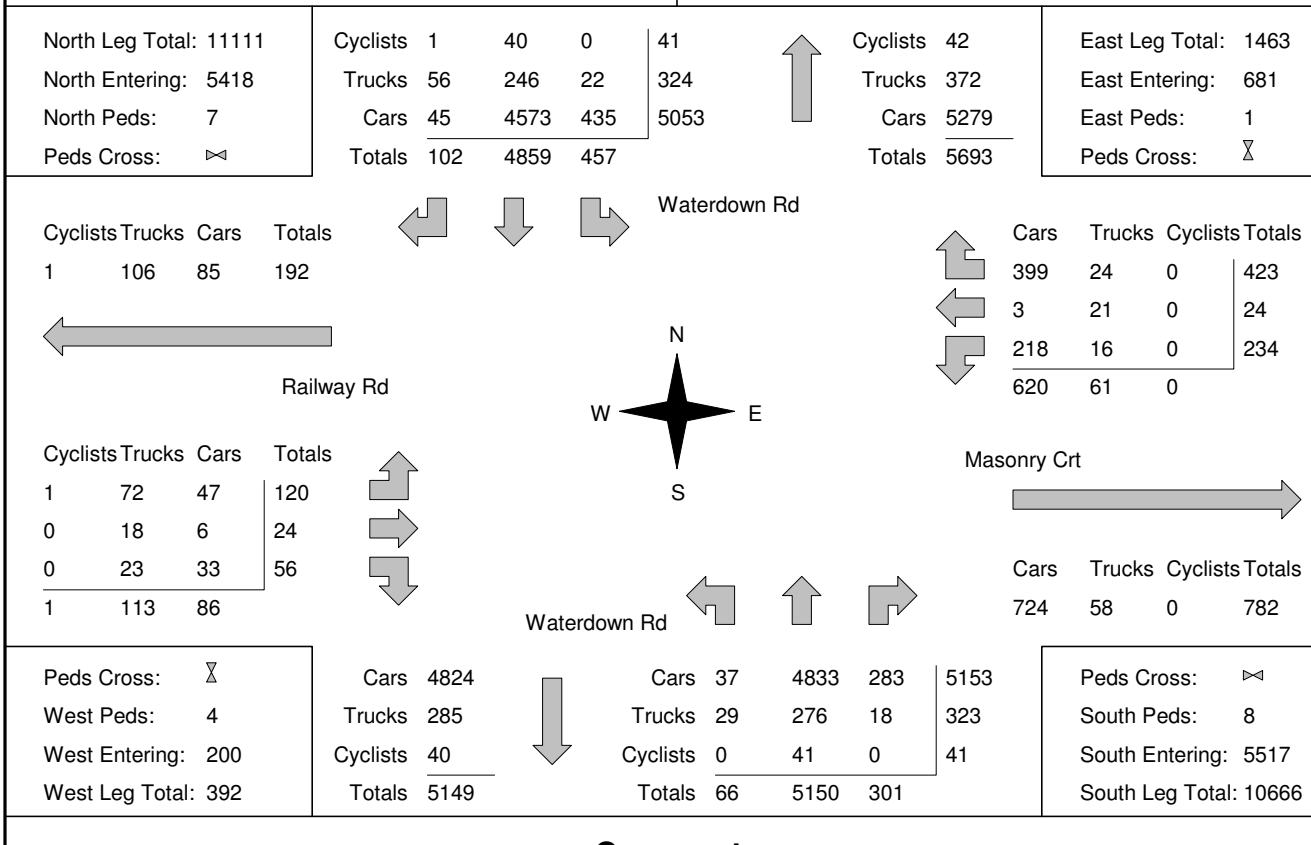
Municipality: Burlington
Site #: 0000202006
Intersection: Waterdown Rd & Masonry Crt
TFR File #: 1
Count date: 21-Jun-2018

Weather conditions:
Sunny

Person(s) who counted:
Nik

**** Signalized Intersection ****

Major Road: Waterdown Rd runs N/S



Comments

Waterdown Rd @ Masonry Crt
Traffic Count Summary

Intersection: Waterdown Rd & Masonry Crt | **Count Date:** 21-Jun-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	0	0
8:00:00	221	382	15	618	3	1432
9:00:00	68	555	19	642	0	1409
11:00:00	0	0	0	0	0	0
12:00:00	26	574	9	609	0	1163
13:00:00	28	576	12	616	0	1188
14:00:00	26	530	18	574	1	1135
15:00:00	0	0	0	0	0	0
16:00:00	30	618	12	660	3	1479
17:00:00	20	743	8	771	0	1483
18:00:00	38	881	9	928	0	1646
Totals:	457	4859	102	5418	7	10935

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	8	646	160	814	2
9:00:00	11	720	36	767	1
11:00:00	0	0	0	0	0
12:00:00	13	527	14	554	0
13:00:00	7	556	9	572	1
14:00:00	6	535	20	561	2
15:00:00	0	0	0	0	0
16:00:00	6	801	12	819	1
17:00:00	8	685	19	712	1
18:00:00	7	680	31	718	0
Totals:	66	5150	301	5517	8

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	29	2	25	56	1	95
9:00:00	14	2	20	36	0	60
11:00:00	0	0	0	0	0	0
12:00:00	16	2	19	37	0	71
13:00:00	15	2	21	38	0	60
14:00:00	15	3	26	44	0	61
15:00:00	0	0	0	0	0	0
16:00:00	14	5	52	71	0	89
17:00:00	43	4	88	135	0	166
18:00:00	88	4	172	264	0	279
Totals:	234	24	423	681	1	881

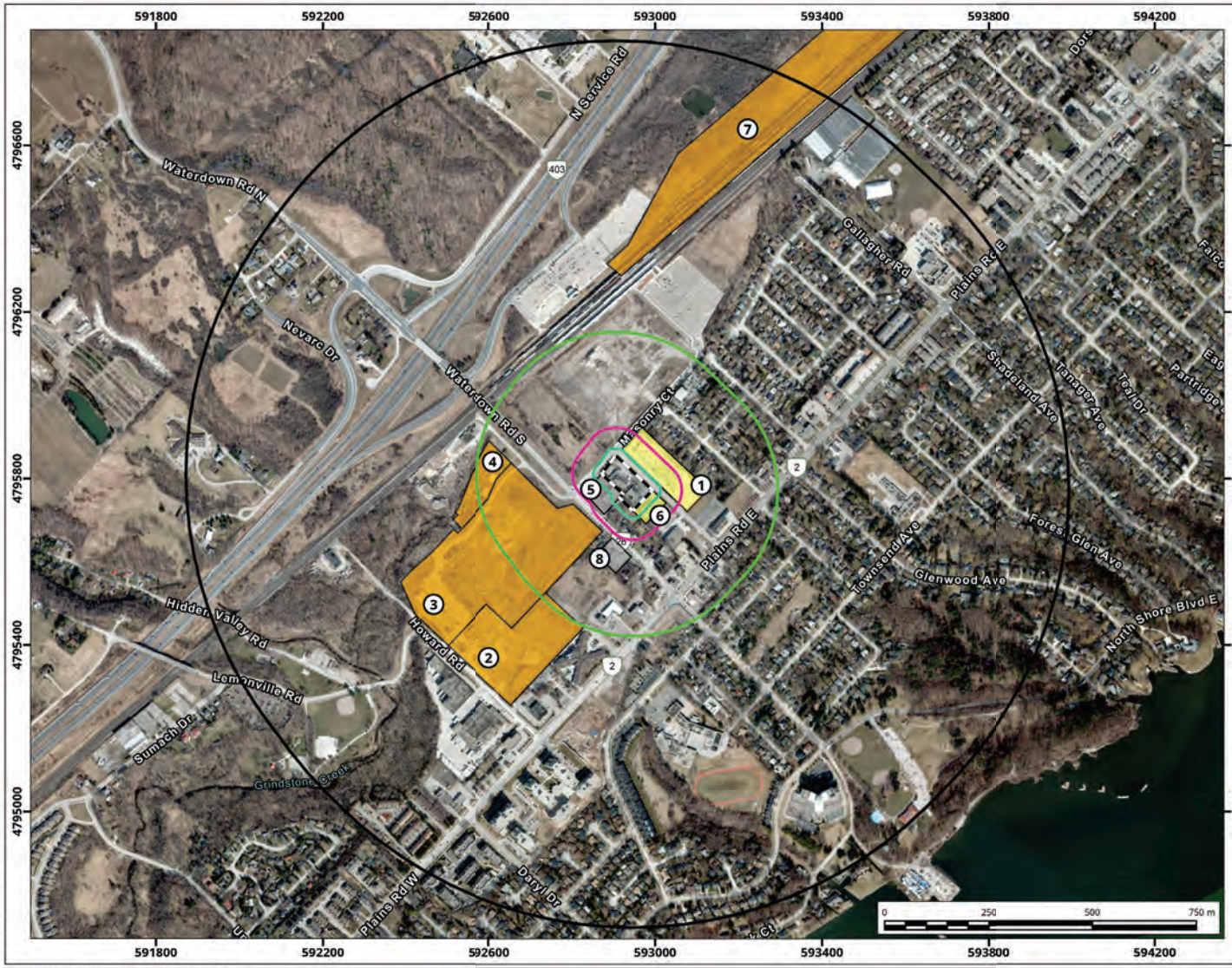
West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	22	3	14	39	0
9:00:00	14	2	8	24	0
11:00:00	0	0	0	0	0
12:00:00	20	3	11	34	0
13:00:00	12	2	8	22	2
14:00:00	10	4	3	17	2
15:00:00	0	0	0	0	0
16:00:00	12	2	4	18	0
17:00:00	22	5	4	31	0
18:00:00	8	3	4	15	0
Totals:	120	24	56	200	4

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:	59	31	39	30	32	35	71	100

APPENDIX E



Legend

- Property Line
- 20 m Setback
- 70 m Setback
- 300 m Setback
- 1,000 m Setback

Industrial Properties

- Class I Industries
- Class II Industries
- N/A - Non-Industrial

ID	Business Name	Class
1	Gentherm (formerly 1500118 ONTARIO INC. - Etratech Inc.)	I
2	St. Marys Cement Inc. (Canada) operating as CBM Ready Mix	II
3	King Paving & Construction Ltd.	II
4	Bulkwood Products Inc.	II
5	Cougar Shoes Inc.	N/A
6	Primary Fluid Systems Inc.	I
7	CN Aldershot Yard	II
8	CORPORATION OF THE CITY OF BURLINGTON	N/A

Service Layer Credits: MapCast Mapping ; Hybrid Reference Layer (road and water labels only): Esri Community Maps Contributors, City of Burlington, City of Hamilton, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada

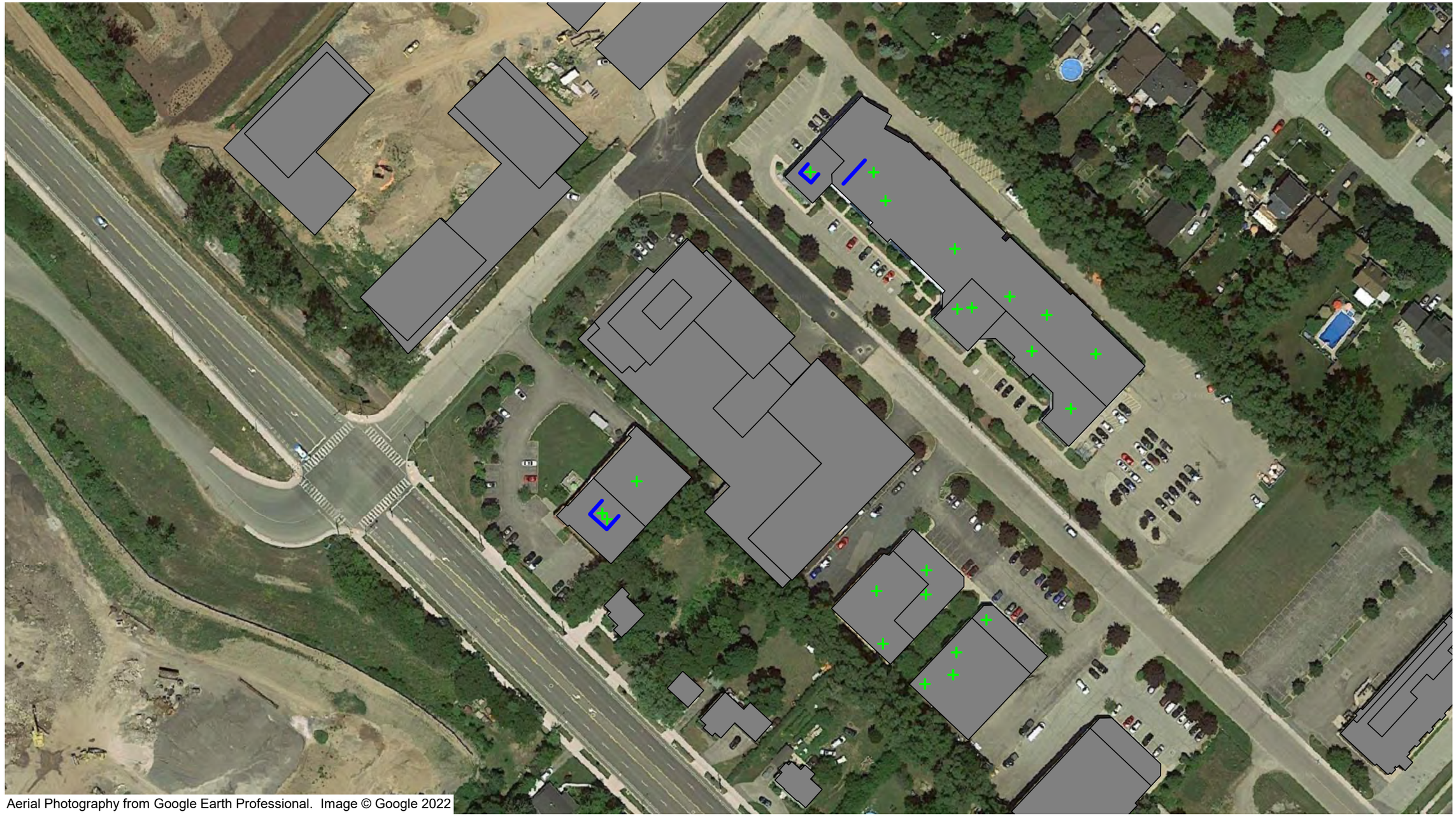
Facilities in the Study Area

Map Projection: NAD 1983 UTM Zone 17N
1062-1074 Cooke Boulevard - Burlington, ON

True North

Project #: 2205162

Drawn by: RCL	Figure: E-1
Approx. Scale:	1:10,200
Date Revised:	Aug 11, 2022



Stationary Sources

Location of Stationary Sources in Relation to the Proposed Development

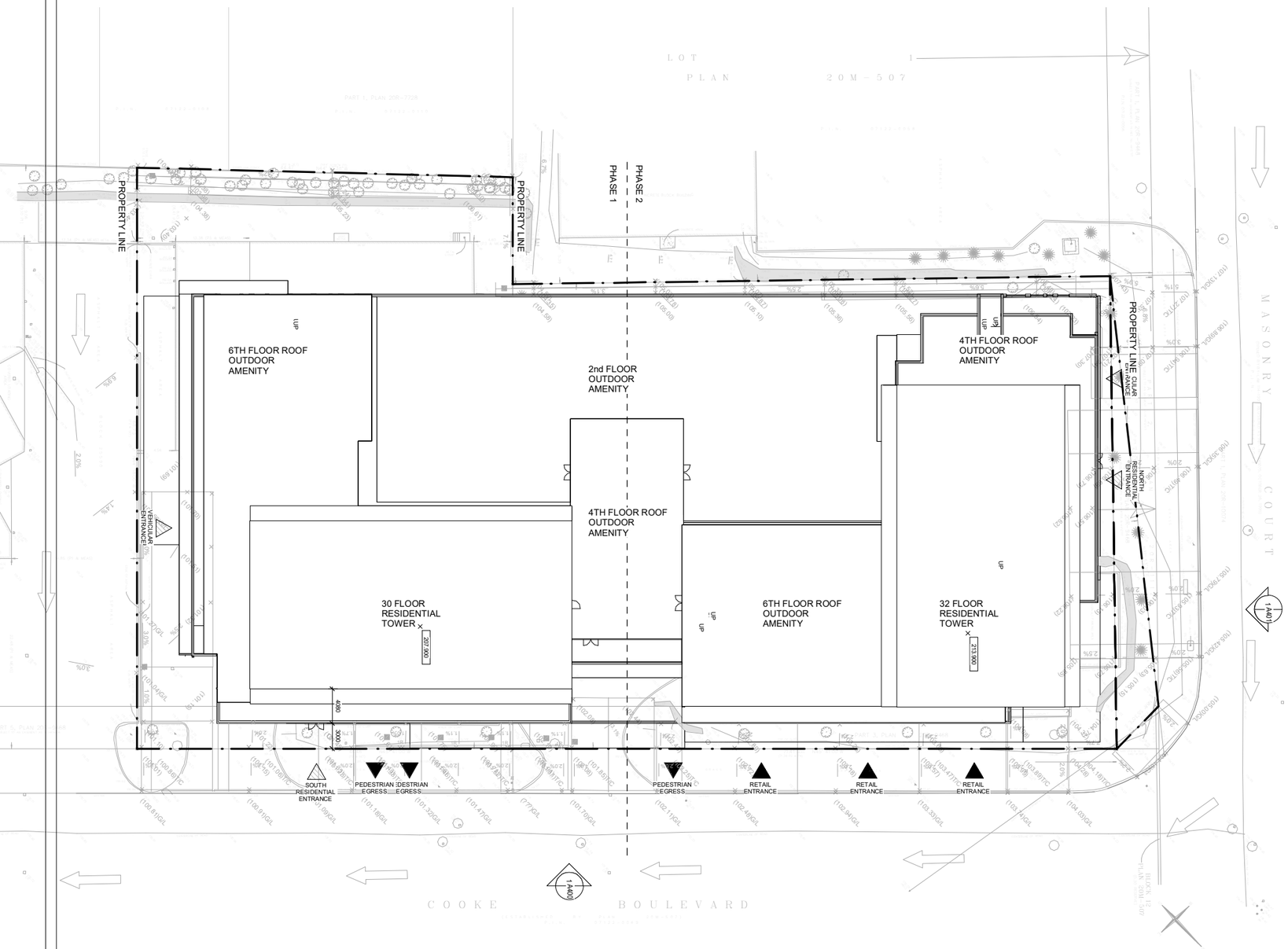
1062-1074 Cooke Blvd., Burlington, Ontario

True North

Project #: 2205162

Drawn by: EMJI	Figure: **E-2**
Scale:	1:1250
Date:	11.08.2022

APPENDIX F



SITE PLAN LEGEND

- 00.00 EXISTING ELEVATION
- + 00.000 PROPOSED ELEVATION
- + 00.000 T.O.S. TOP OF STRUCTURE
- + 00.000 T.O.W. TOP OF WALL
- + 00.000 T.O.C. TOP OF CURB
- VEHICULAR EXIT/ENTRANCE
- PEDESTRIAN EXIT/ENTRANCE
- PRIMARY RES ENTRANCE
- EXISTING EXTERIOR TO REMAIN
- NEW WALLS
- ITEM ABOVE
- (S) SCREEN REF. #
- (W) WALL TYPE
- (D) DOOR REF #

NOTES:
REFER TO CONSULTANTS DRAWINGS FORINFORMATION RELATING TO SITE SERVICING, GRADING AND LANDSCAPE. ALL ITEMS NEW CONSTRUCTION UNLESS NOTED OTHERWISE

Abbreviations

AD	AREA DRAIN
CACF	CENTRAL ALARM CONTROL FACILITY
CB	CATCH BASIN
FH	FIRE HYDRANT
FD	FLOOR DRAIN
HB	HOSE BIB
HLP	HYDRO LIGHT POLE
MH	MAN HOLE
TLS	TRAFFIC LIGHT STANDARD

SITE PLAN INFORMATION TAKEN FROM :

TOPOGRAPHIC PLAN SURVEY OF PART OF LOT X
REGISTERED PLAN XXXX
CITY OF XXXXX
PREPARED BY XXXX LAND SURVEYORS
(DATE).

XXX.Xm = 000 ESTABLISHED GRADE

XXX.Xm = TOS GROUND FLOOR AVERAGE

SITE PLAN NOTES

1. THE BUILDING IS TO BE [NOT SPRINKLERED] /[SPRINKLERED].

2. THE SOLID WASTE ROOMS IS XX SM AND AND WILL ACCOMMODATE GARBAGE VIA USE OF ONE CHUTE. GARBAGE CHUTE ACCCESS OCCURS ON LEVELS X,X AND X. ADDITIONAL BULK STORAGE IS PROVIDED AT A MINIMUM OF XXSM.

3. COLLECTION OF WASTE MATERIALS FOR THIS DEVELOPMENT WILL TAKE PLACE ON SITE IN THE LOADING AREA DESIGNATED ON THE GROUND FLOOR PLAN. AN ON-SITE TRAINED STAFF/ MAINTENANCE PERSON IS RESPONSIBLE FOR MOVING THE BINS FROM THE SOLID WASTE ROOM TO THE COLLECTION POINT AND PROVIDE VEHICULAR DIRECTIVES TO THE COLLECTION VEHICLE OPERATOR,AS REQUIRED. IN THE EVENT THE ON-SITE STAFF IS UNAVAILABLE AT THE TIME THE CITY COLLECTION VEHICLE ARRIVES AT THE CITY, THE COLLECTION VEHICLE WILL LEAVE THE SITE AND NOT RETURN UNTIL THE NEXT SCHEDULED COLLECTION DAY.

4. SIDEWALKS AND BOULEVARDS WITHIN THE RIGHT OF WAY TO HAVE A MINIMUM 2% AND MAXIMUM 4% SLOPE TOWARDS THE ROADWAY.

5. REFER TO SITE SERVICING PLAN, FOR SEWER AND WATER SERVICE INFORMATION.

6. ALL EXISTING ACCESSES, CURB CUTS, TRAFFIC CONTROL SIGNS, ETC. ALONG THE DEVELOPMENT SITE FRONTAGE THAT ARE NO LONGER REQUIRED ARE TO BE REMOVED. THE BOULEVARD WITHIN THE PUBLIC RIGHT OF WAY, IN ACCORDANCE WITH CITY STANDARDS AND TO THE SATISFACTION OF THE EXECUTIVE DIRECTOR OF TECHNICAL SERVICES ARE TO BE REINSTATED.

7. PROPOSED ACCESS TO THE DRIVEWAY FOR THIS PROJECT TO BE DESIGNED IN ACCORDANCE WITH CITY STANDARD NO. T310-050-1 FOR COMBINED CURB AND SIDEWALK VEHICULAR ENTRANCES.

8. THIS BUILDING IS DESIGNED WITH A SHARED LOADING SPACE. A FLASHING WARNING LIGHT SYSTEM AND / OR APPROPRIATE SIGNAGE ADJACENT TO THE SPACE, AT NO COST TO THE CITY, WILL BE IN PLACE AND ACTIVATED DURING COLLECTION AND REMAIN ACTIVE UNTIL THE VEHICLE EXITS THE SITE.

9. SOLID WASTE MANAGEMENT TO BE NOTIFIED UPON COMPLETION OF THE DEVELOPMENT AND SHOULD PUBLIC WASTE COLLECTION BE USED. ALL NECESSARY APPLICATION AND WAVER FORMS TO BE COMPLETED PRIOR TO COMMENCEMENT OF CITY REFUSE COLLECTION.

10. NO SPEED BUMPS SHALL BE INSTALLED ON ANY MAIN DRIVEWAY AISLE OR DESIGNATED FIRE ROUTE.

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ISSUE RECORD

REVISION RECORD

North

RAW

405-317 ADELAIDE STREET WEST
TORONTO CANADA M5V 1P9
+1 416 599 9729
WWW.RAWDESIGN.CA

18072

1074 COOKE BLV
BURLINGTON

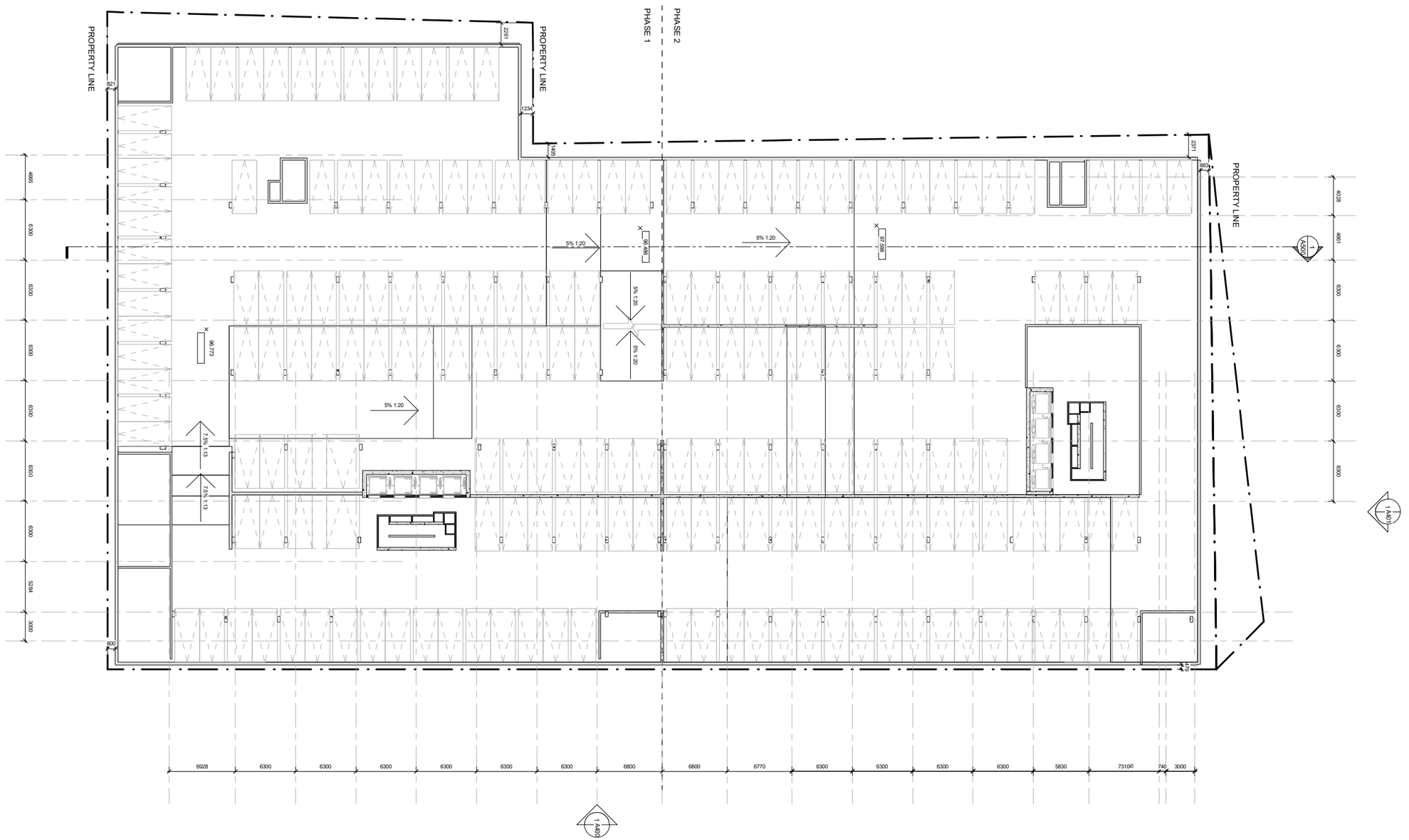
CAMARRO

SITE PLAN

As indicated

A100

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ISSUE RECORD

REVISION RECORD

North

405-317 ADELAIDE STREET
WEST
TORONTO CANADA M5V 1P9
+1 416 599 9729
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18072

1074 COOKE BLV
BURLINGTON

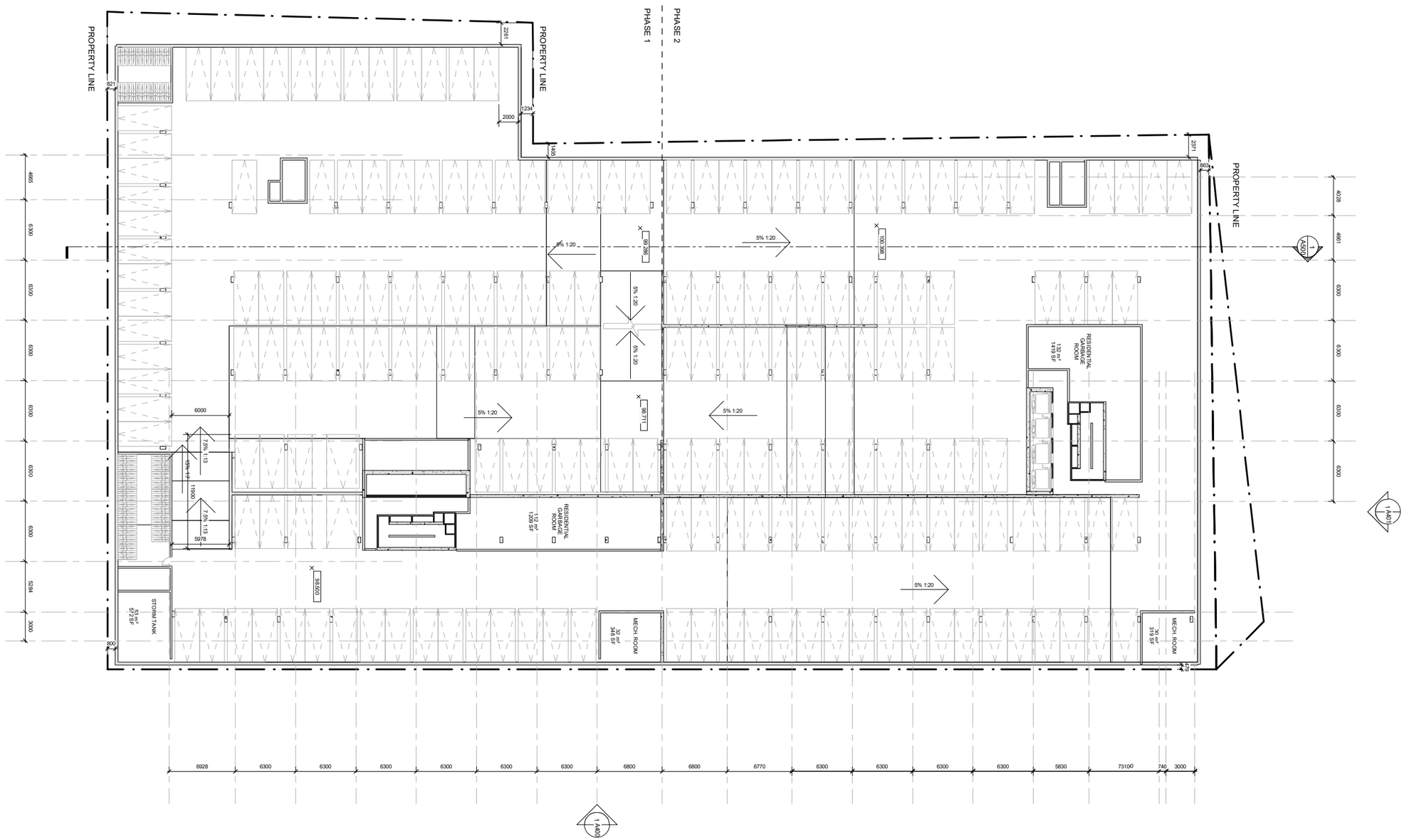
CAMARRO

P2 PARKING LEVEL

1 : 200

A102

2022-08-10 5:45:17 PM



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ISSUE RECORD

REVISION RECORD

North

RAW

405-317 ADELAIDE STREET WEST
TORONTO CANADA M5V 1P9
+1 416 599 9729
WWW.RAWDESIGN.CA

18072

1074 COOKE BLV
BURLINGTON

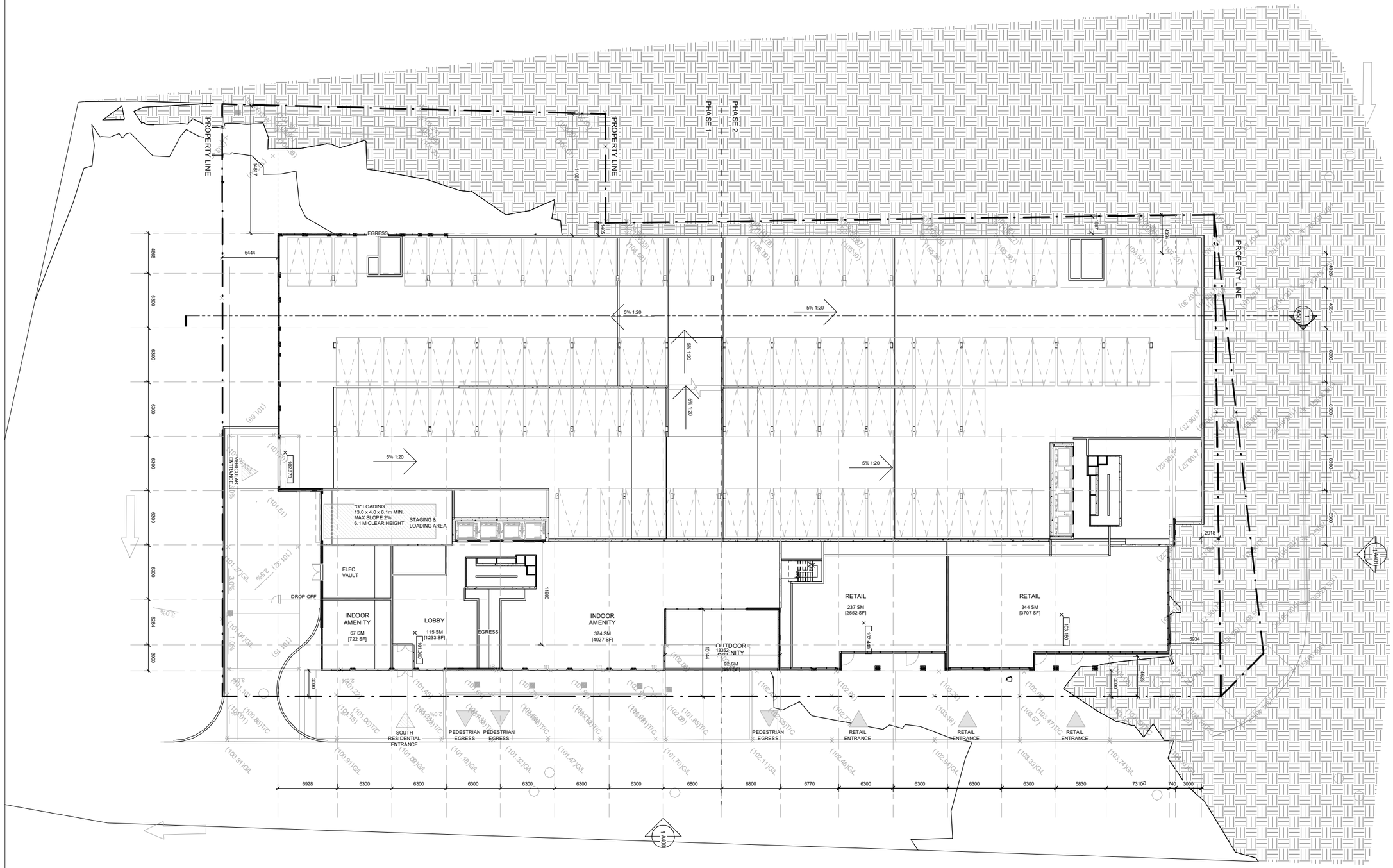
CAMARRO

P1 PARKING LEVEL

1 : 200

A101

2022-08-10 5:45:14 PM



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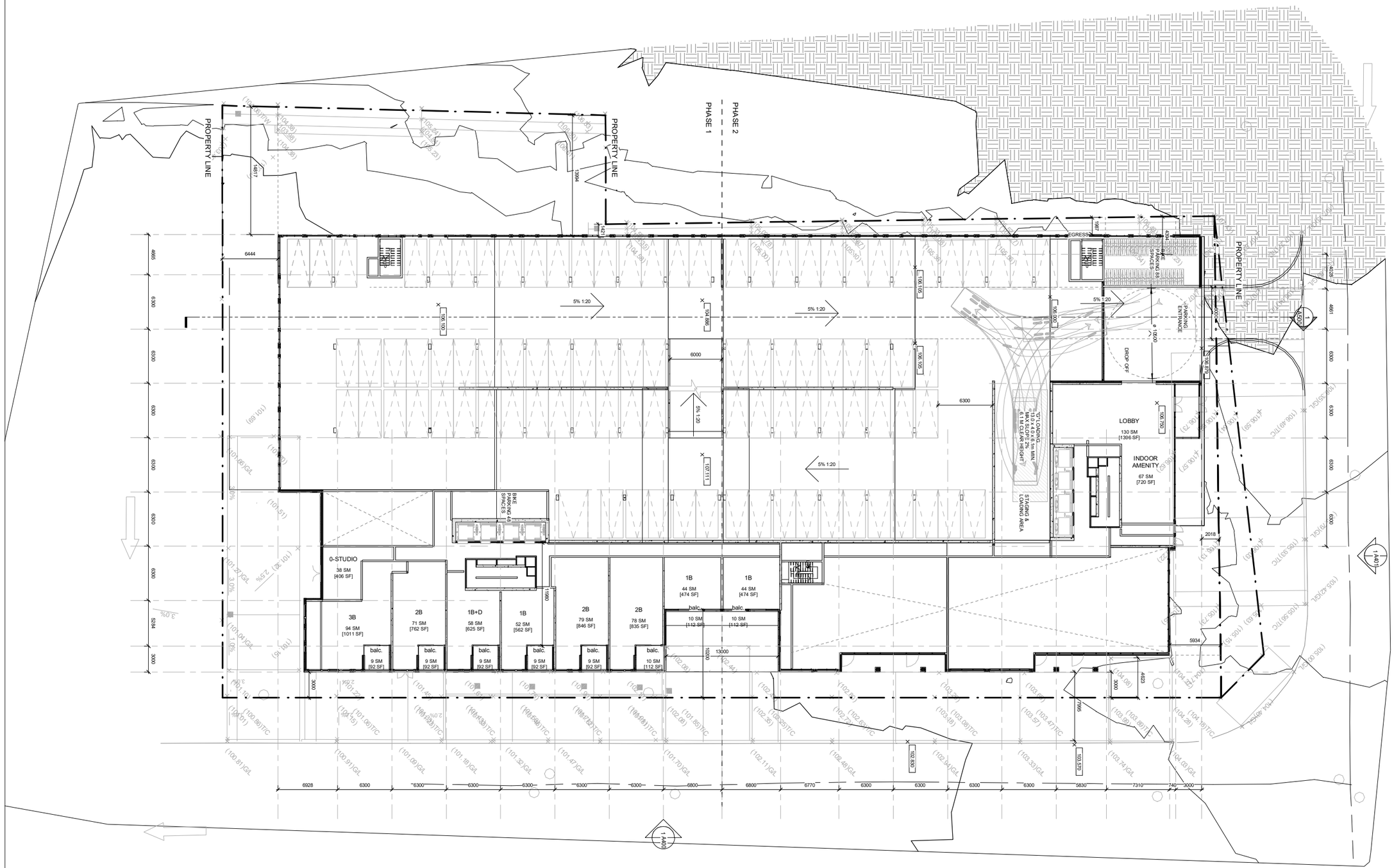
CAMARRO

GROUND LEVEL
SOUTH

1 : 200

A201-S

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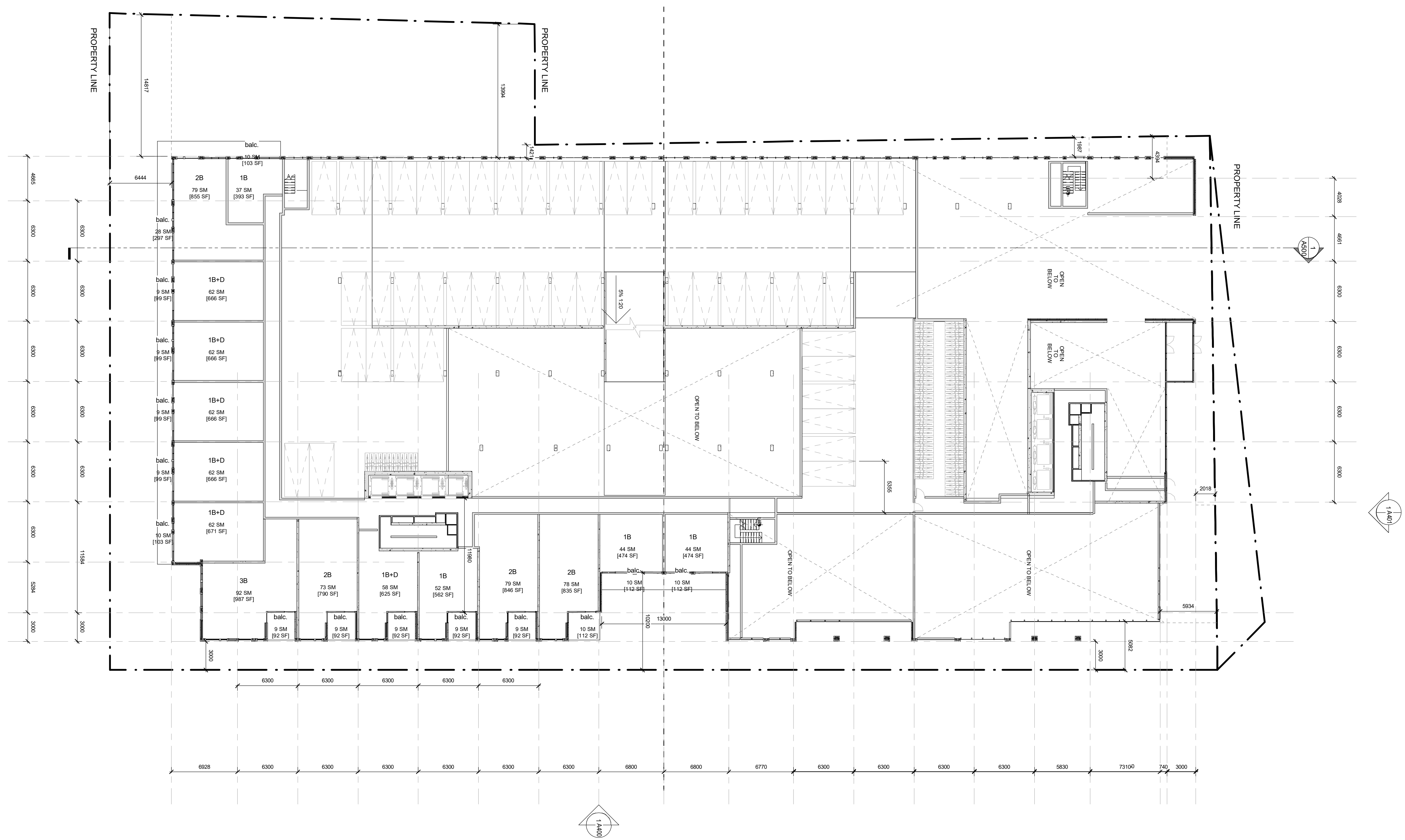
CAMARRO

GROUND LEVEL
NORTH

1 : 200

A201-N

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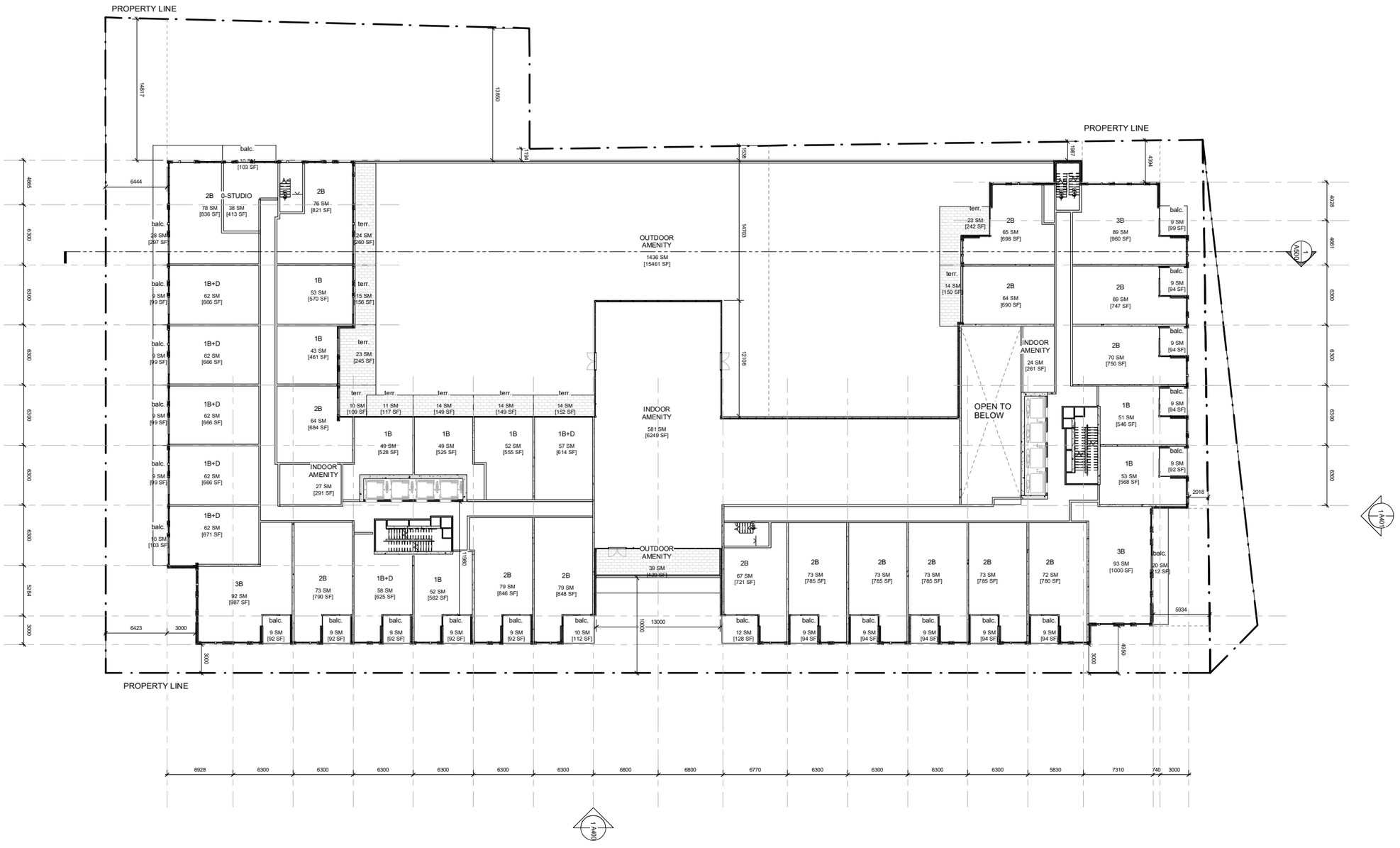
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CAMARRO

MEZZANINE LEVEL

1 : 200

A201M



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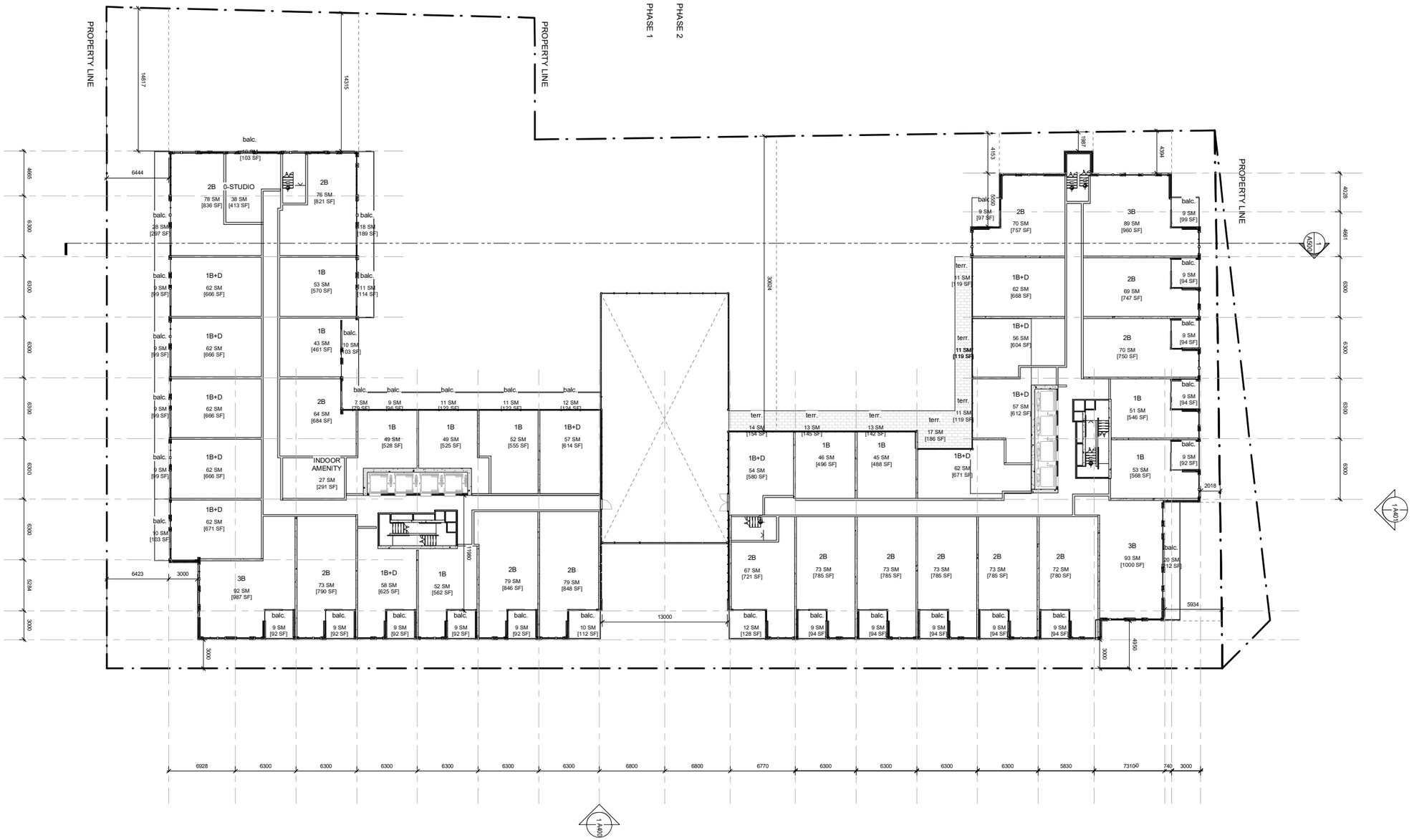
CAMARRO

SECOND & THIRD FLOOR

1 : 200

A202

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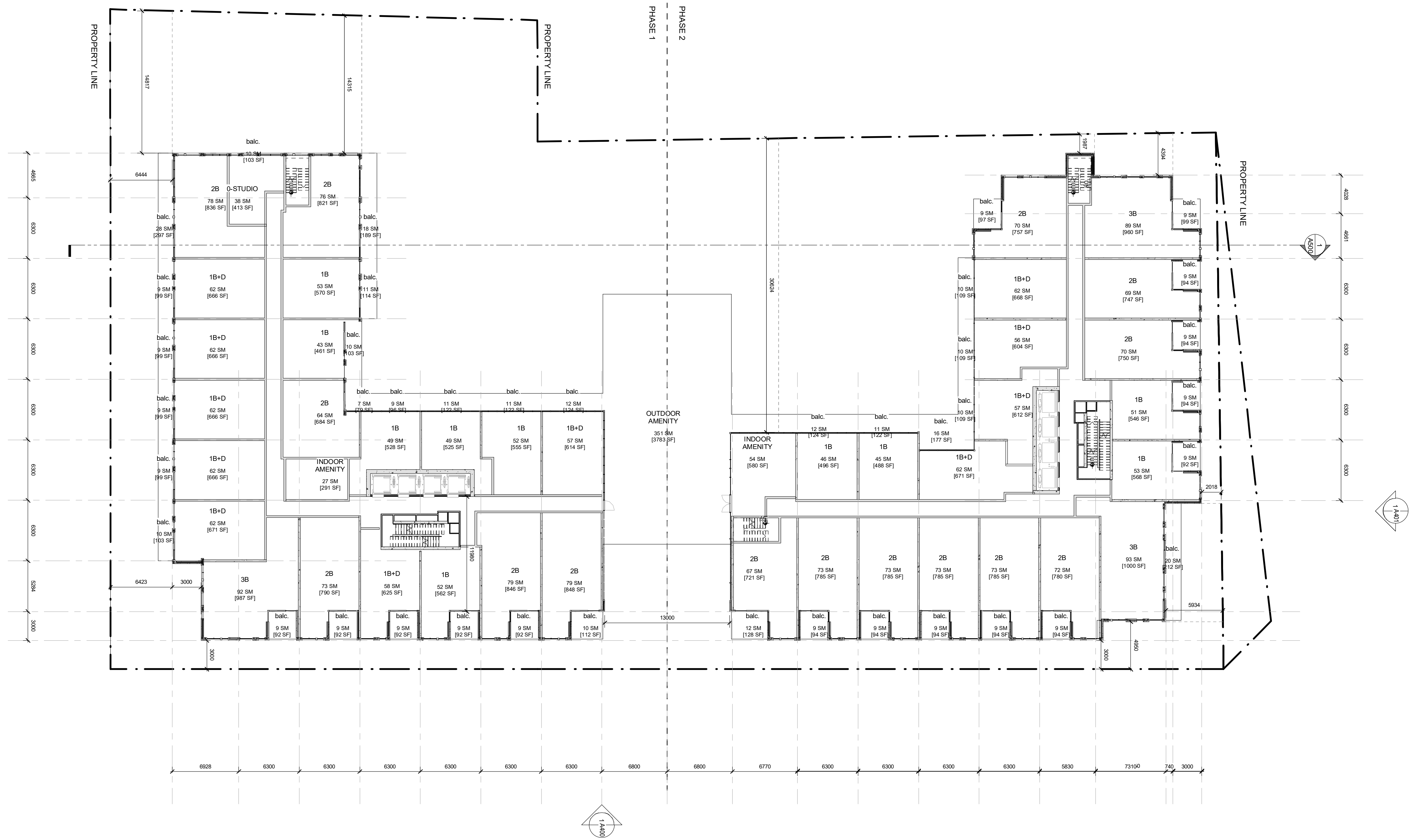
CAMARRO

THIRD FLOOR

1 : 200

A203

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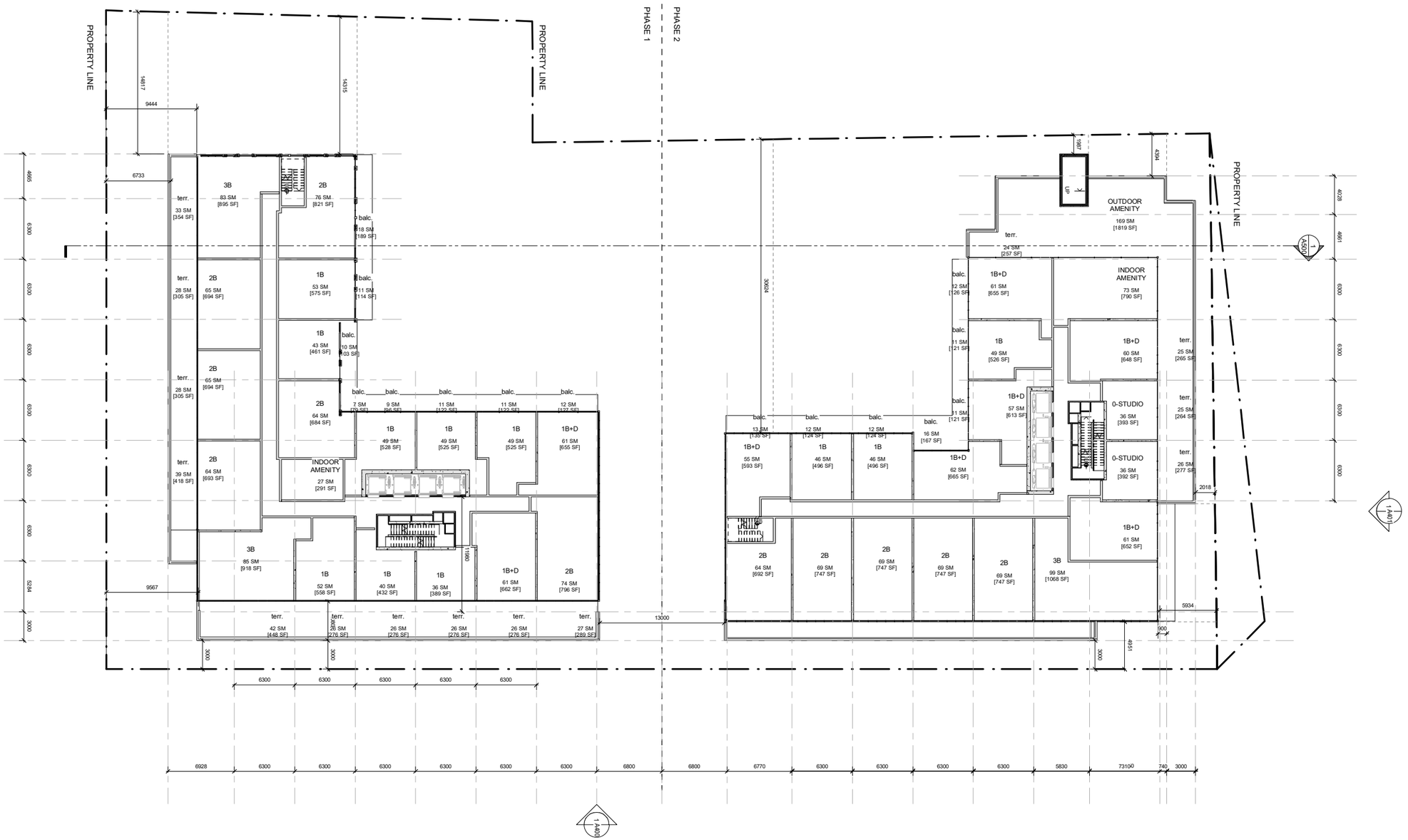
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FOURTH FLOOR

1 : 200

A204

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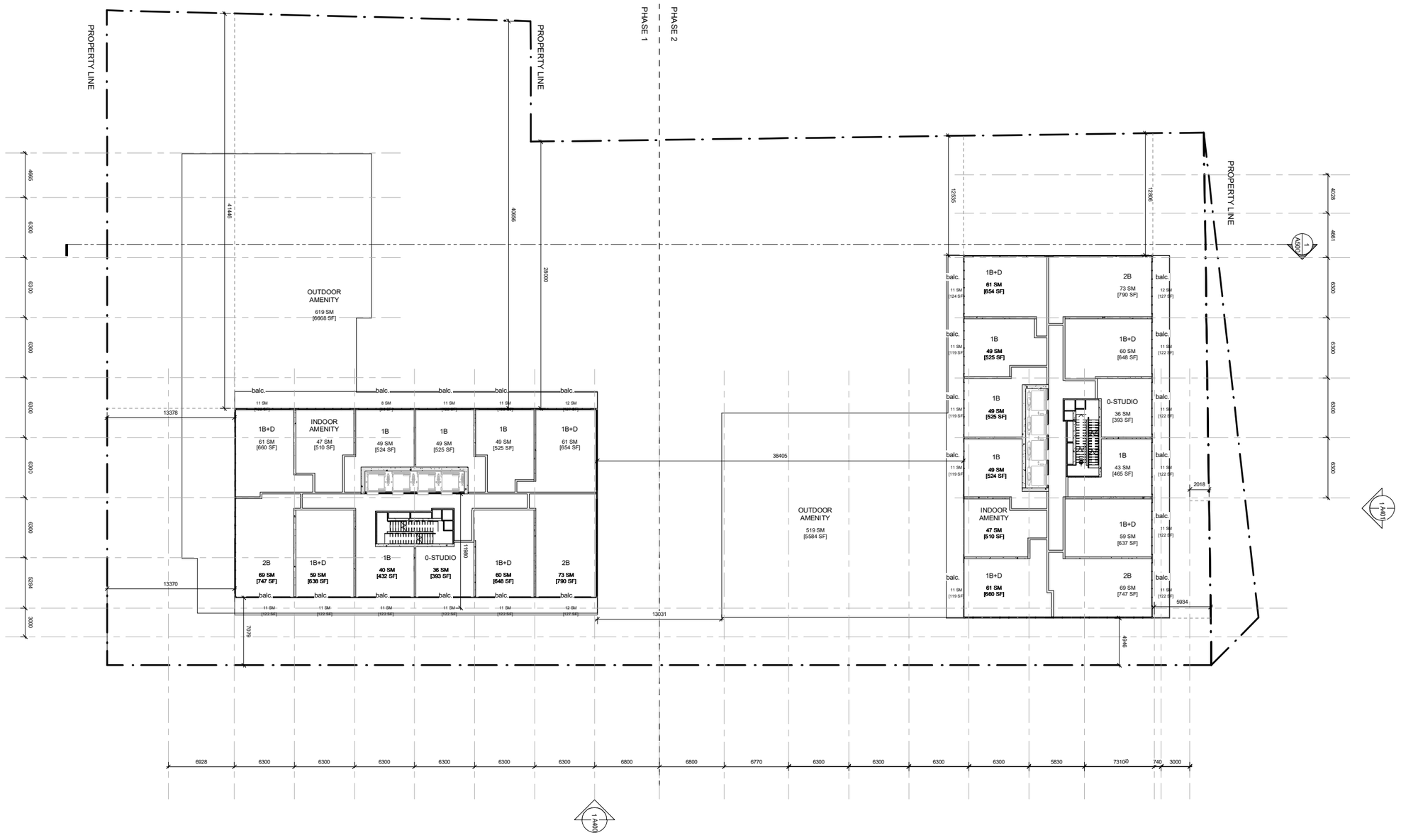
CAMARRO

FIFTH & SIXTH FLOOR

1 : 200

A205

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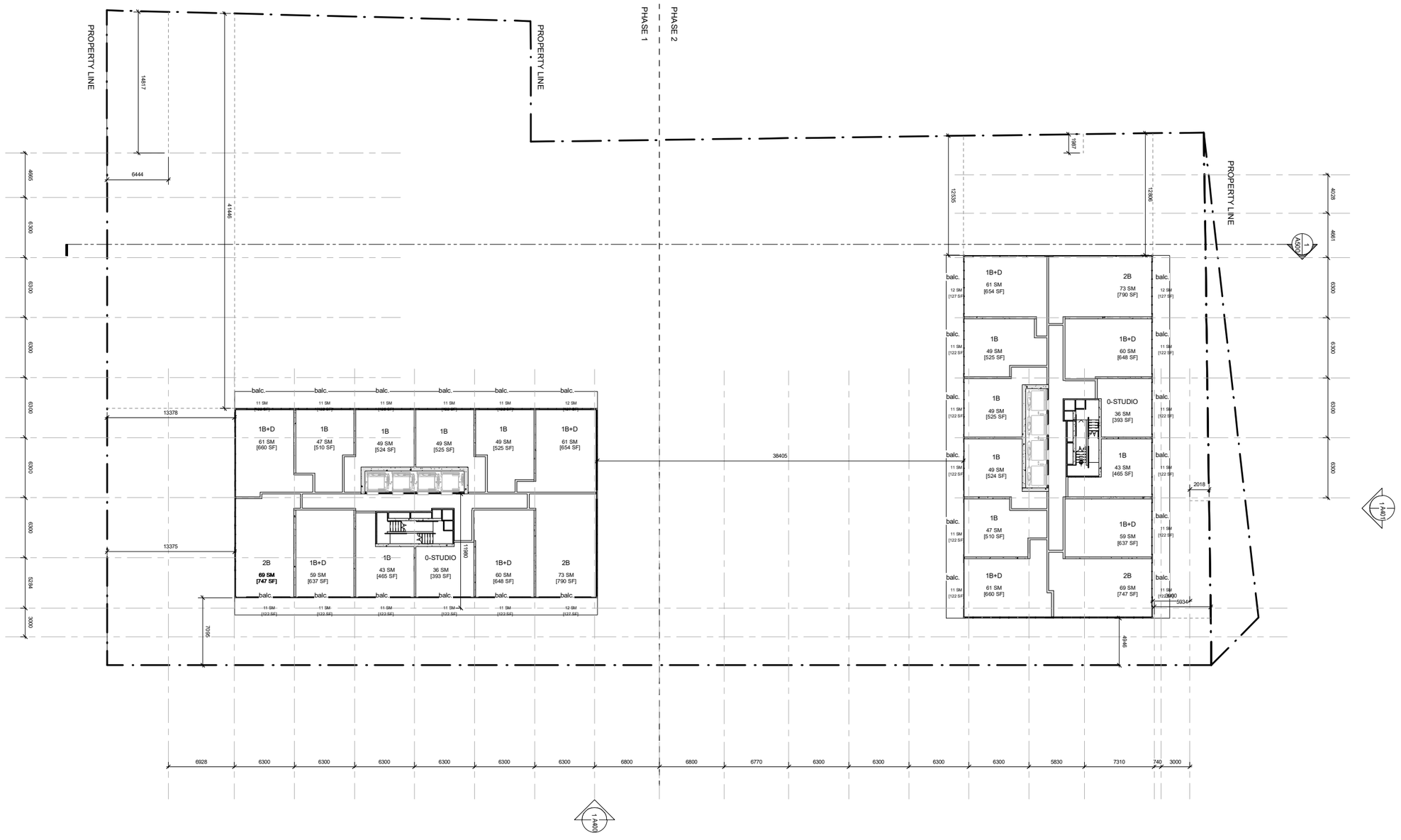
CAMARRO

SEVENTH FLOOR

1 : 200

A207

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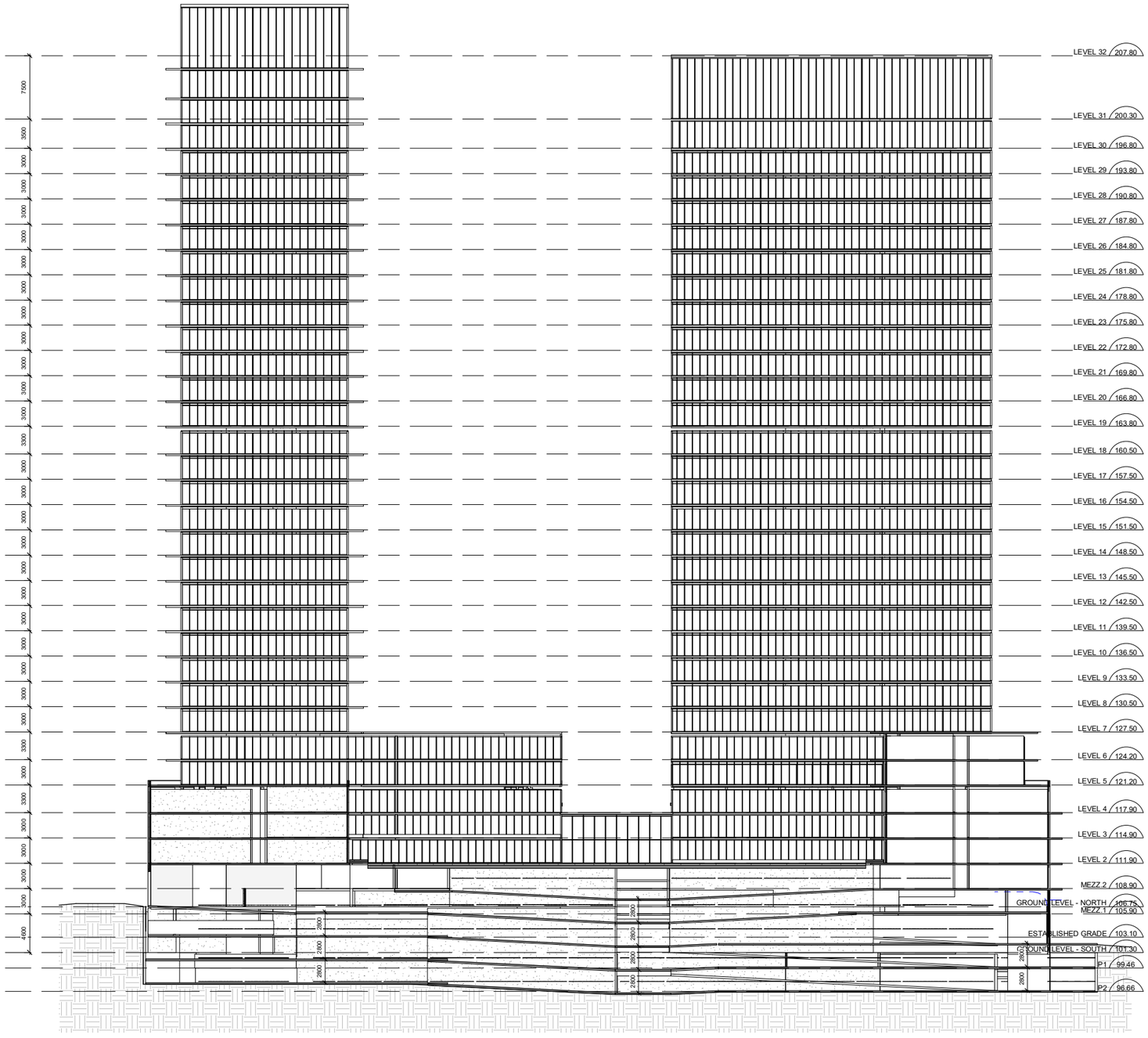
CAMARRO

EIGHT TO 30TH FLOOR

1 : 200

A208

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CAMARRO

BUILDING SECTION

1 : 250

A500

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