Functional Servicing and Stormwater Management Report

1050 Markham Road

Zoning Bylaw Amendment and Official Plan Amendment Applications

Project No.: 24000

City of Toronto, Ontario, M1H 2Y7

Official Plan / Zoning Bylaw Amendment Application No:

Prepared For:

Canadian Apartment Properties REIT

Date: June 2024
Version: 1st Submission

counterpoint ENGINEERING

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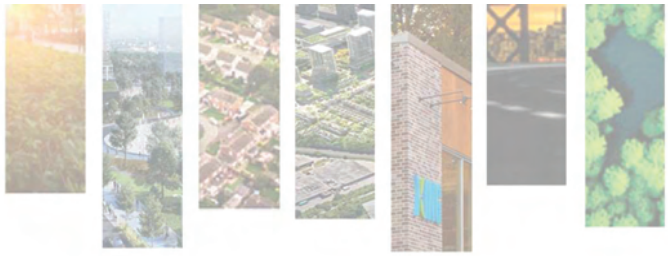


EXECUTIVE SUMMARY

This Functional Servicing and Stormwater Management Report ('FSSR') has been prepared to support Official Plan Amendment ('OPA') and Zoning Bylaw Amendment ('ZBA') submitted by Canadian Apartment Properties REIT (CAPREIT), the applicant, for the south portion of the property municipally known as 1050 Markham Road (the 'Subject Site'), which is bound by Brimorton Drive to the south, Markham Road to the east, an existing residential building to the north, and an existing townhouse complex to the west.

The Development Site today consists of an existing driveway and landscaping, representing a net development site area of 5,151 m^2 (0.515 ha). Three (3) servicing laterals (storm, sanitary and water) that service the existing residential building to the north bisects the development site and connect to municipal sewers and watermain in Brimorton Drive.

The proposed development seeks to construct two residential buildings (Building A – 37 storeys and Building B – 15 storeys). The proposed development will include 635 new dwelling units in a mix of one-bedroom, two-bedroom and three-bedroom units. It will also provide 498 bicycle parking and 208 vehicle parking spaces over two underground levels. The existing services that connect the existing residential building to the north to Brimorton Drive will be relocated to provide a more efficient development area for the proposed buildings.

The servicing strategy for the proposed development is summarized as follows:

Water Servicing:

The adjacent municipal roadways contain watermains that are of a typical size to service the proposed development. The domestic and fire flow water demands were calculated in accordance with City of Toronto criteria and 2020 FUS methodology. A hydrant flow

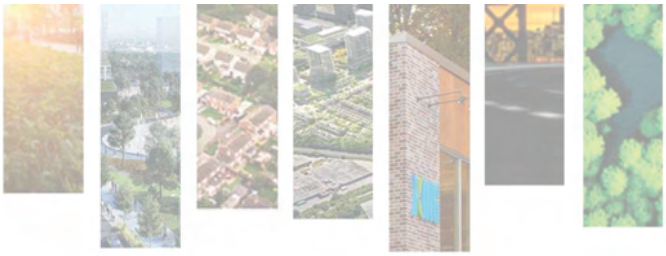
test was completed on the hydrant on Brimorton Drive fronting the development, and it was determined that the existing municipal water system has adequate capacity to support the proposed development.

Sanitary Servicing:

The only available municipal sanitary sewer fronting the development site is located in Brimorton Drive. The proposed development will result in an overall increase in equivalent population and peak flow to the City's sewer system. Three (3) new connections to the existing sanitary sewer in Brimorton Drive are proposed to service Buildings A, B, and the relocation of the existing sanitary service. A sewer extension in Brimorton Drive will be required to provide Building A and relocated the existing service to the north building a connection that is in compliance with current City design criteria. The site is located in the City of Toronto's Basement Flooding Study Area 60, which is complete. A capacity analysis of the City's sanitary sewer system was completed, and the results concluded that downstream upgrades may be required to support the proposed development. Extensive upgrades to sanitary and storm sewer in the vicinity of the development site are proposed as part of the remediation plan outlined in the 2022 EA Study. These upgrades would solve the capacity issue found in the capacity analysis and negate the need for downstream upgrades to the support the individual site.

Stormwater Servicing:

There are existing municipal storm sewers within Markham Road and Brimorton Drive. A storm sewer extension is proposed for the 600mm diameter storm sewer in Brimorton Drive in order to provide a service connection for proposed Building A and the relocation of the existing storm service in compliance with current City design criteria. On-site stormwater management ('SWM') infrastructure has been proposed for the proposed development to meet the City's quantity, quality, and water balance criteria, as outlined in the Wet Weather Flow Management Guidelines ('WWFMG').



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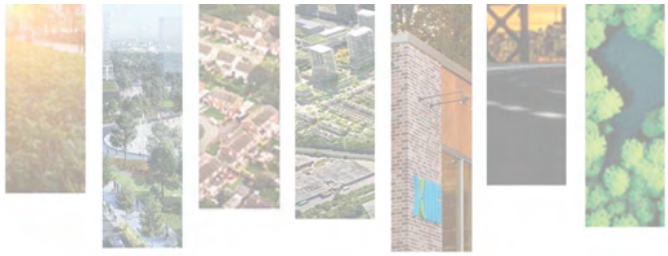


1.0 INTRODUCTION

1.1 Background

This Functional Servicing and Stormwater Management Report ('FSSR') has been prepared to support Zoning Bylaw Amendment ('ZBA') and Official Plan Amendment ('OPA') applications for the subject site municipally known as 1050 Markham Road (referred to as 'the site'). The report has been prepared on behalf of the applicant, Canadian Apartment Properties REIT (CAPREIT).

The re-development proposal for the +/- 0.515 ha site's development area is to include the construction of two fully residential towers. The proposed development will include 635 new dwelling units. Building A and B will be 37 storeys and 15 storeys tall respectively, with two levels of underground parking.

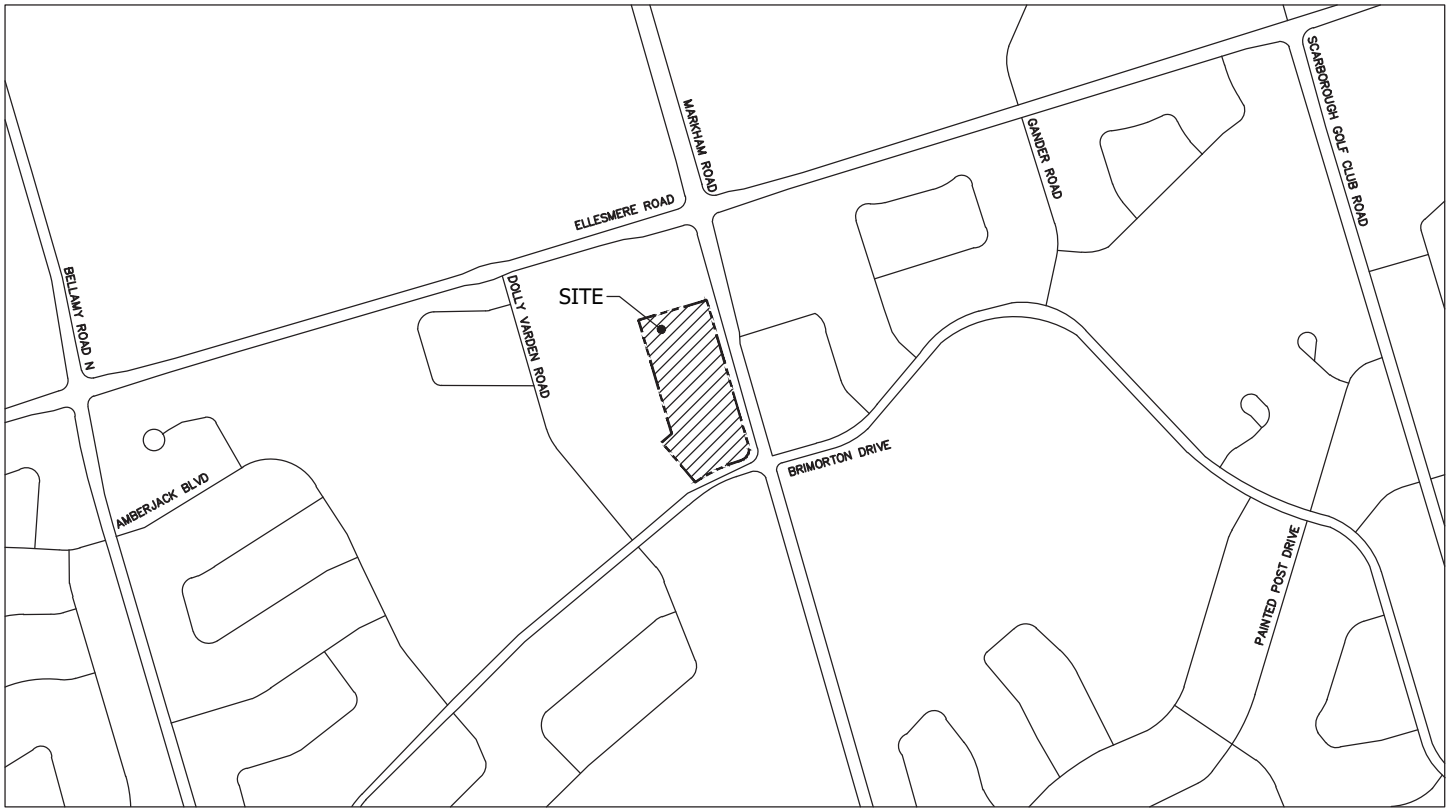
There are existing storm, sanitary and watermain services that bisect the proposed development site which provide service to the existing residential building to the north.

Figure 1 – Site Location illustrates the subject site within the context of its surroundings.

1.2 Study Parameters

This servicing assessment is based on:

- Wet Weather Flow Management Guidelines, November 2006 ('WWFMG').
- Design Criteria for Sewers and Watermains, Second Edition, January 2021 ('Design Criteria').
- Atlas Mapping, City of Toronto.
- Plan and Profile and Sewershed Drawings, City of Toronto.
- MOE Design Guidelines for Drinking-Water Systems, 2008.
- Architectural Inputs, by Wallman Architects.
- QL-B SUE Investigation, by i2S.
- Hydrant Flow Test, by Hydrant Testing Ontario
- Preliminary Hydrogeological Investigation, by DS Consultants
- Model Files for Basement Flooding Study Area 60



SITE LOCATION PLAN

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DEVELOPMENT PROJECT
1050 MARKHAM ROAD

TORONTO, ONTARIO

DRAWING BY: BN	DATE: JUNE 2024
CHECKED BY: KL	PROJECT NO.: 24000
SCALE: N.T.S.	FIGURE NO.: 1

2.0 WATER SUPPLY

2.1 Existing Water Supply

The adjacent municipal roadways all contain available watermain servicing, as follows:

- Markham Road: 400mm diameter watermain.
- Brimorton Drive: 200mm diameter watermain.

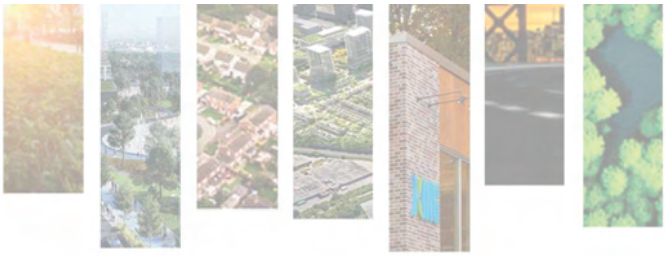
Municipal fire hydrants are located near the development site, with the closest one located on Brimorton Drive, adjacent to the property (connecting into the 200mm diameter watermain).

2.2 Proposed Water Supply

The proposed development is proposed to have three (3) private watermain connections into the municipal system as follows:

- Building A:
    - One (1) standard 'h' domestic/fire connection (100mm/150mm diameter) into the existing 200mm diameter watermain in Brimorton Drive.
    - One (1) secondary 150mm diameter fire connection into the existing 200mm diameter watermain in Brimorton Drive, to meet OBC section 3.2.9.7 (buildings greater than 84m in height).
- Building B:
    - One (1) standard 'h' domestic/fire connection (100mm/150mm diameter) into the existing 200mm diameter watermain in Brimorton Drive.

Building B is less than 84m in height and therefore will not require a secondary fire connection.



The City of Toronto requires that a secondary fire connection be made into an adjacent street watermain, if possible. In order to provide a servicing corridor for the relocation of the existing services, the underground levels between proposed Buildings A & B were split and thus have a significantly reduced footprint. To increase the efficiency of the proposed underground layout, each building will have a single mechanical room to house the necessary water service metering, backflow prevention and detector check valves. As such, both the standard 'h' domestic/fire connection and secondary fire line for Building A will be adjacent to one another and be serviced by the existing 200mm diameter watermain found in Brimorton Drive.

Refer to **Figure 2 - SP** for the proposed and existing watermain layout.

The City of Toronto's Design Criteria states that governing flows shall be the greater of: a) maximum day demand plus fire flow, or b) maximum hour demand. Fire flows for residential areas are not to be less than 4,800 L/min for a 2-hour duration, delivered with a residual pressure of not less than 140 kPa (20 psi).

Domestic water demands were calculated using a per capita rate of 190 litres/person/day and peaked in accordance with City standards. Fire flow demands were calculated using the *Water Supply for Public Fire Protection 2020* manual by Fire Underwriters Survey ('FUS'). The following FUS parameters were used:

- Construction Type: Non-Combustible.
- Total Area: It is assumed that vertical openings are protected, as such, additional floor area is the largest floor plus 25% of the two adjoining floors.
- Occupancy Reduction: non-combustible, due to fully residential use.
- Sprinkler System Type Reductions: all.

Refer to **Table 1** for a summary of water demands.

Table 1: Summary of Water Demands

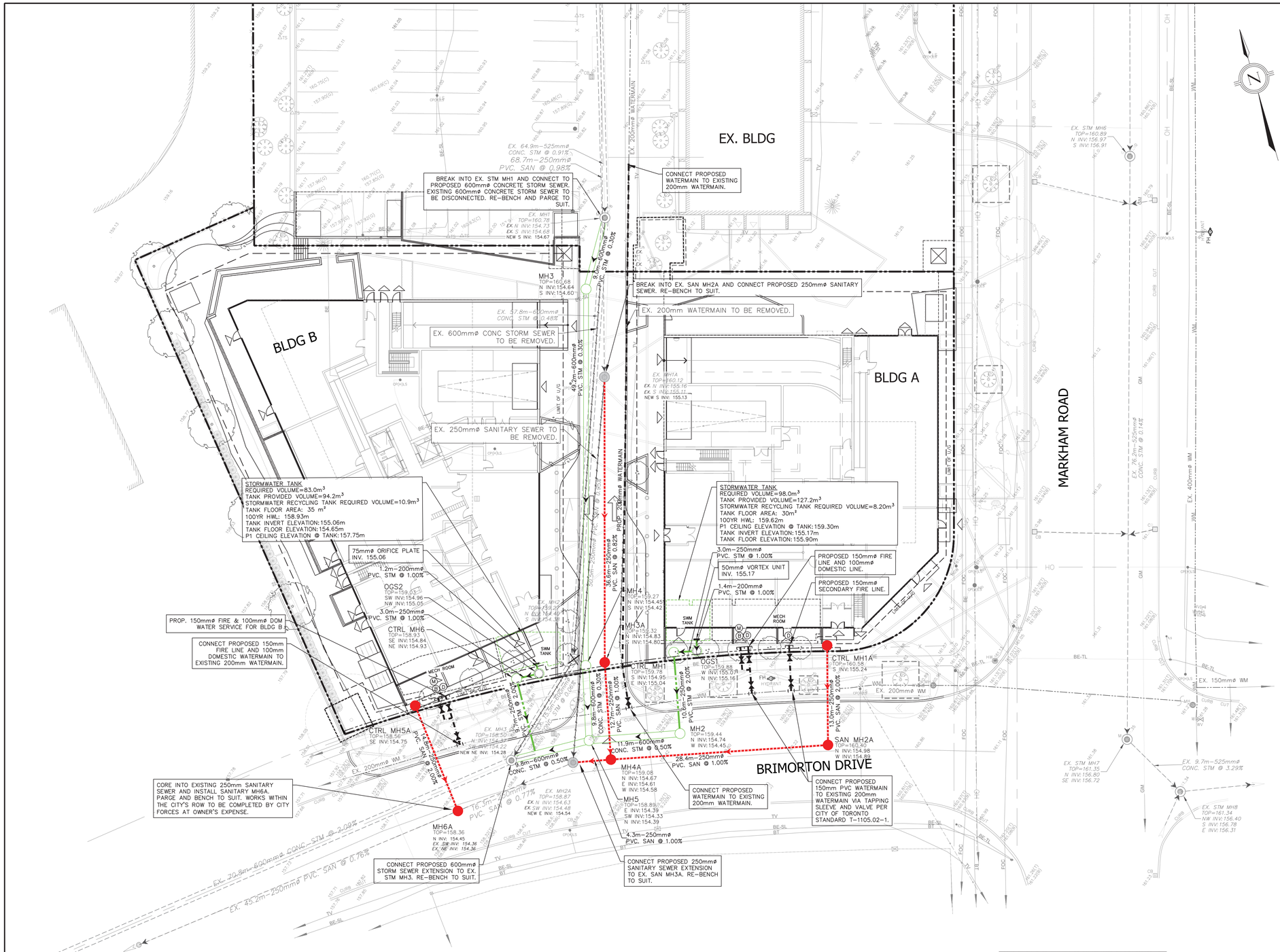
Building	Connection	Max. Day (L/s)	Peak Hour (L/s)	Fire Flow (L/s)	Max. Day + FF (L/s)
A	Brimorton Drive 200mm dia.	2.15	4.14	66.67	68.82
B	Brimorton Drive 200mm dia.	0.95	1.82	66.67	67.61

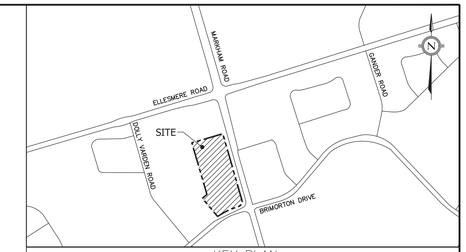
In addition to preferable ranges, the City of Toronto Design Criteria sets out watermain pressure requirements and can be summarized as follows:

1. Under normal conditions the maximum static pressure shall not exceed 690 kPa (100 psi).
2. The minimum pressure under any non-fire demand scenario will not be less than 275 kPa (40 psi).
3. Under conditions of simultaneous maximum day and fire flow demands, the pressure shall not drop below 140 kPa (20 psi) at any point in the water system.

A hydrant flow test was completed, by Hydrant Testing Ontario Inc. on May 29, 2024, on the hydrant south of the site, on Brimorton Drive. The flow on Brimorton Drive at 140 kPa (20 psi) of the municipal watermain was calculated to be **296.02 L/s** which is greater than the governing maximum day and fire flow of **68.82 L/s.**

The results show that the proposed water distribution system meets the City of Toronto requirements and can support the proposed development. Refer to **Appendix B** for all water demand calculations and flow test results.





KEY PLAN
N.T.S.

LEGEND

- EXISTING WATERMAIN CHAMBER / MH
- EXISTING CATCHBASIN
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- LINEAR REMOVALS
- PROPERTY LINE
- PROPOSED OGS UNIT
- PROPOSED DETECTOR ASSEMBLY
- PROPOSED BACKFLOW PREVENTOR
- PROPOSED WATER METER
- PROPOSED STORM SEWER MH
- PROPOSED SANITARY SEWER AND MH
- PROPOSED WATERMAIN
- PROPOSED VALVE AND BOX

CONTRACTOR TO BE RESPONSIBLE FOR LOCATION OF ALL EXISTING U/G & OVERHEAD UTILITIES. VARIOUS UTILITIES CONCERNED TO BE GIVEN REQUIRED ADVANCE NOTICE PRIOR TO ANY DIGGING, FOR STAKE OUT. THE CONSULTANT ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE LOCATION OF EXISTING UTILITIES AS INDICATED ON THIS DRAWING.

DIGITAL INFORMATION

NO.	DATE	REVISION	INITIAL	SIGNED
1.	24/06/2024	ISSUED FOR ZBA SUBMISSION #1	KL	

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ELEVATION NOTE
ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO CITY OF TORONTO BENCH MARK No. NY4007, HAVING AN ELEVATION = 172.807 metres.

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SERVICING PLAN

DESIGN: K.L.	DRAWN: B.N.	CHECKED: D.D	CONTRACT No: 24000
SCALE: 1:250		CITY DRAWING NUMBER:	DRAWING NUMBER: FIG 2 - SP
DATE: JUNE 2024			

3.0 GROUNDWATER MANAGEMENT

Discharge of groundwater and foundation drains to municipal sewers must be in accordance with Toronto Municipal Code, Chapter 681 Sewers. The quality limits for discharge in the sewers must satisfy the limits as listed in Table 1 – Limits for Sanitary and Combined Sewer Discharge and/or Table 2 – Limits for Storm Sewer Discharge of Chapter 681.

A Permit to Take Water (PTTW) from the Ontario Ministry of the Environment, Conservation and Parks (MECP) is required for short term water taking over 400 m^3/day. An Environmental Activity and Sector Registry (EASR) is required from the MECP for short term water taking between 50 m^3/day and 400 m^3/day. A PTTW is required for long term water taking from a permanent drainage system greater than 50 m^3/day.

A hydrogeological investigation was completed for the project by DS Consulting Ltd.

Short Term Discharge: The report estimated the following short-term construction groundwater inflow rates to be as follows in **Table 2**.

Table 2: Groundwater Summary

Scenario	Inflow Type	Factored Rate (L/d)	Factored Rate (L/s)
Short Term Construction During P4 Excavation	Groundwater Seepage	22,000	0.25
Short Term Construction during P4 Excavation	Stormwater Inflow	24,000	0.28
Sub-Total – Short Term Construction (Including 100% Safety Factor):		**57,000**	**0.66**
Long Term Foundation	Foundation Drainage	0	0

The maximum construction dewatering rate is 57 m^3/day, which is less than 400 m^3/day but bigger than 50 m^3/day. Therefore, an EASR registration is required, and a PTTW is not expected for the proposed development. The construction (short-term) dewatering rate is less than the post-construction sanitary peak flow rate (see Section 4.2).

Temporary discharge must meet Toronto Table 1 – Limits for Sanitary and Combined Sewer Discharge to discharge to the municipal sanitary sewer. According to the hydrological assessment completed for the project by DS Consulting, groundwater was sampled as part of the hydrogeological assessment, and it was found that the total suspended solids (TSS) and total manganese exceeded the Limits for Storm Discharge as per City of Toronto Sewer Use By-Law (Municipal Code Chapter 681, Sewers) maximum concentrations. However, the groundwater sample met the Limits for Sanitary and Combined Sewer Discharge. Therefore, should construction dewatering be required, the discharge will be to the existing 250mm diameter sanitary sewer in Brimorton Drive.

Long Term Discharge: The new Toronto Foundation Drainage Policy and guidelines does not permit connection of foundation drains to the municipal system (storm or sanitary). The proposed building will be designed as a watertight structure. Therefore, there will be no perimeter drainage directly or indirectly connected to municipal sewers in accordance with the City of Toronto Foundation Drainage Guidelines. See attached letters from the mechanical engineer, structural engineer and owner confirming so.

4.0 SANITARY SERVICING

4.1 Existing Sanitary Servicing

The adjacent municipal roadways contain available dedicated sanitary sewers, as follows:

- Brimorton Drive: 250mm diameter sanitary sewer

The existing wastewater peak flow generated is **0.13 L/s**, which is solely due to infiltration from the site area at 0.26 L/s/ha.

The development site is located in the City of Toronto's Basement Flooding Study Area 60, which is complete.

4.2 Proposed Sanitary Servicing

A sewer extension of the existing 250mm diameter sanitary sewer in Brimorton Drive is proposed to provide a service to Building A and the relocated service connection for the north building that is in compliance with current City design criteria. The proposed development is proposed to have private sanitary connections into the municipal system as follows:

- Tower A: one new 250mm diameter connection into the 250mm diameter sanitary sewer extension in Brimorton Drive.
- Tower B: one new 250mm diameter connection into the 250mm diameter sanitary sewer in Brimorton Drive.
- Existing Bldg: one new 250mm diameter connection into the 250mm diameter sanitary sewer extension in Brimorton Drive.

Refer to drawing **Figure 2 – SP** for the sanitary service and sewer extension layout.

The proposed development will contain 635 total units generating an equivalent population of 1,084. **Table 3** below, summarizes the sanitary flows generated from the development site.

Table 3: Summary of Sanitary Flows

Tower	Connection	Units	Equiv. Pop	Peak Flow incl. Infil. (L/s)
A + B	Brimorton Drive - 250mm dia. sanitary sewer.	635	1,084	11.50

The proposed peak flow rate of **11.50 L/s** is an increase of **11.37 L/s** from the existing condition. Refer to **Appendix C** for detailed sanitary calculations.

4.3 External Sanitary Sewer Capacity Assessment

The site conveys wastewater drainage to the City's sanitary sewers via the existing 250mm diameter sanitary sewer Brimorton Drive.

A detailed downstream analysis of the sanitary sewer system was completed using the InfoWorks model provided by the City of Toronto. The site is located in the City of Toronto's Basement Flooding Study Area 60. This study along with the Investigation of Chronic Basement Flooding Report were completed in May 2022. As part of the study, an InfoWorks model has been developed for Sewershed Area 60, which has been used as the source model for the capacity analysis of the development site. An analysis of the external sanitary sewers, from the development site to the trunk connection (located in Highland Creek East) was completed. As per City capacity assessment criteria, all new applications and developments discharging between the truck connection and the development site, since the initial completion of the model, must be added to the source model. An investigation found that no new development was found within the study area.

Refer to **Figure C1** in **Appendix C** for more details. A per-capita generation rate of 240L/c/d for residential, and an infiltration rate of 0.26 L/s/ha were used to assess the impact of subject development. Other parameters are described within the downstream sanitary analysis report, which is contained in **Appendix C.**

As per City capacity assessment criteria, the analysis included the following four scenarios:

1. Existing Conditions in Dry Weather Flow ('DWF').
2. Existing Condition in Extreme Wet Weather Flows ('WWF').
3. Proposed Conditions in Dry Weather Flow ('DWF').
4. Proposed Conditions in Extreme Wet Weather Flows ('WWF').

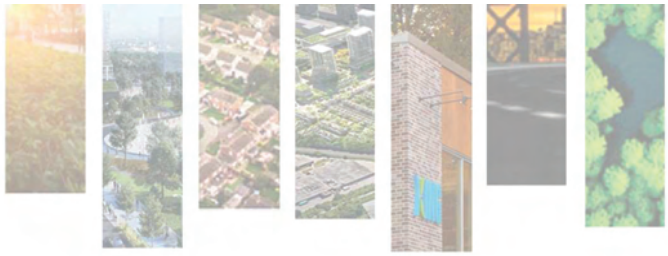
The results of this analysis found that the existing downstream sanitary sewer system did not operate in free flow condition in both the existing and proposed condition, and so fails to meet Criterion 1 of the City's Sewer Capacity Assessment Guidelines (July 2021). The HGL in the downstream sewers was found to be at least 1.8m below grade, as per Criterion 2 of the assessment guidelines, for the existing condition but failed to meet this criterion in the post-development condition. Downstream sanitary sewer upgrades are required in order to support the increase in sanitary peak flows from the proposed development and meet Criterion 2 of the assessment guidelines. The proposed upgrades include up-sizing two legs of downstream sanitary sewer from 250mm diameter to 350mm diameter pipe. The following two scenarios were added to the analysis to demonstrate capacity for the development site:

5. Existing Conditions in Dry Weather Flow ('DWF') with Sewer Improvements.
6. Proposed Conditions in Wet Weather Flows ('WWF') with Sewer Improvements.

The completed EA Study recognizes the existing wet weather flow capacity issues and includes a comprehensive solution, presented as storm and sanitary sewer improvements

(illustrated in Figure ES1 in the EA Study report), in an effort to resolve both sanitary and storm issues across the entire sewershed. These proposed upgrades were found to resolve the dry and wet weather capacity issues identified with the increase in sanitary flows from the proposed development and eliminate the need for any off-site upgrades associated with the development site. However, the timeline for these upgrades was not specified as part of the study, and their completion date is unknown. The proposed upgrade present in Scenarios 5 & 6 are to allow for the development site to be developed independently of the remediation plan presented in the EA study. Pending feedback from City staff regarding the City's projected timeline of the upgrades identified in the completed EA, the owner is prepared to undertake the proposed upgrade outlined in the Scenario 5 & 6 of the downstream sanitary capacity analysis such that the proposed development's construction and completion is not delayed.

Refer to **Appendix C** for the details of the downstream sanitary capacity analysis.



5.0 STORMWATER SERVICING

5.1 Existing Stormwater Drainage

The adjacent municipal roadways all contain available storm servicing, as follows:

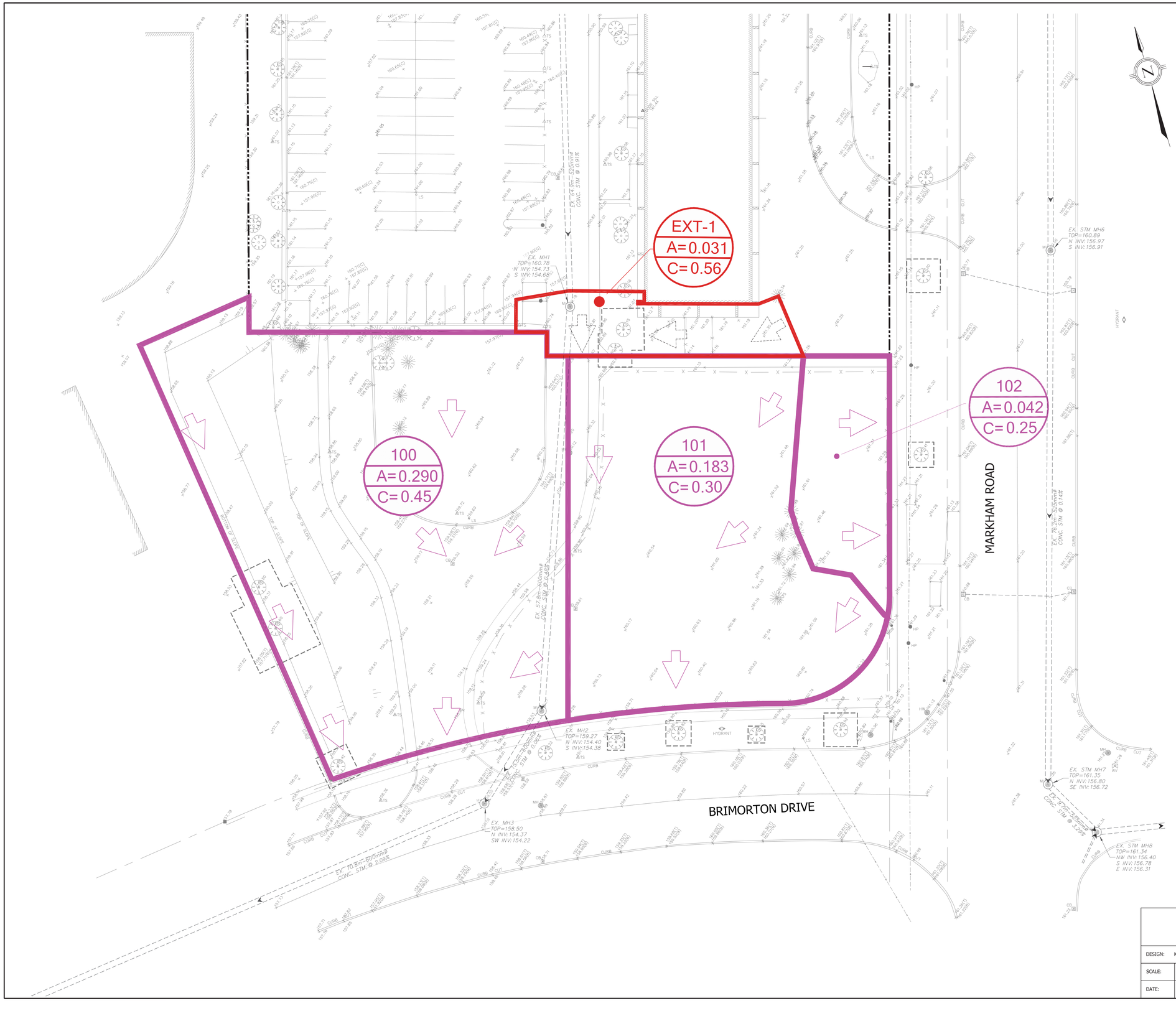
- Markham Road: 400mm diameter storm sewer.
- Brimorton Drive: 200mm diameter storm sewer.

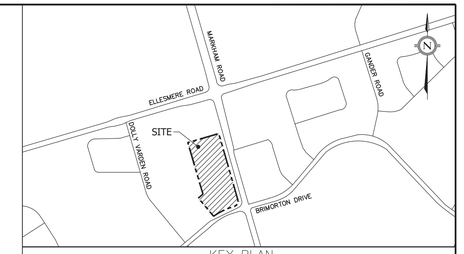
Based on the grades of the subject site, it was determined that the existing area had two (2) outlets, with the majority of the site draining to Brimorton Drive and a portion draining Markham Road. The drainage boundary for the Brimorton Drive outlet was divided into two catchment areas to allow for separate stormwater management of Buildings A and B, as per City servicing requirements for different build forms. An external area north of the development site was found to discharge stormwater into the development site. Pre-development drainage areas and existing outlets were established as following:

- Area 100: 0.290 ha, designated Building B area draining towards Brimorton Drive.
- Area 101: 0.183 ha, designated Building A area draining south towards Brimorton Drive.
- Area 102: 0.042 ha, designated Building A area draining east towards Markham Road.
- Area EXT-1: 0.031 ha, external area from the existing north property draining through development site to Brimorton Drive.

Refer to drawing **Figure 3 - SWM1** for the pre-development drainage plan.

Refer to **Table 4** for a summary of pre-development stormwater flows generated from the development site. Refer to **Figure 3 - SWM1** for a pre-development drainage plan and **Appendix D** for detailed pre-development flow calculations.





KEY PLAN
N.T.S.

LEGEND

- DRAINAGE BOUNDARY (PRE-DEVELOPMENT)
- EXTERNAL DRAINAGE BOUNDARY
- OVERLAND FLOW ARROW (PRE-DEVELOPMENT)
- EXTERNAL FLOW ARROW
- 102 / A=0.042 / C=0.25 — ID / AREA / RUNOFF COEFFICIENT

CONTRACTOR TO BE RESPONSIBLE FOR LOCATION OF ALL EXISTING U/G & OVERHEAD UTILITIES. VARIOUS UTILITIES CONCERNED TO BE GIVEN REQUIRED ADVANCE NOTICE PRIOR TO ANY DIGGING, FOR STAKE OUT. THE CONSULTANT ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE LOCATION OF EXISTING UTILITIES AS INDICATED ON THIS DRAWING.

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OWNER
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TORONTO, ON M1H 2Y5

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PRE-DEVELOPMENT STORM DRAINAGE PLAN

DESIGN: K.L.	DRAWN: B.N.	CHECKED: D.D	CONTRACT No: 24000
SCALE: 1:250		CITY DRAWING NUMBER:	DRAWING NUMBER: FIG 3 - SWM1
DATE: JUNE 2024			

Table 4: Summary of Pre-Development Storm Flows

Storm Event	Area 100 (L/s)	Area 101 (L/s)	Area 102 (L/s)	EXT-1 (L/s)
2-year	32.1	13.6	2.6	4.2
5-year	47.9	20.3	3.8	6.3
10-year	59.0	25.0	4.7	7.7
25-year	68.9	29.2	5.5	9.0
50-year	81.6	34.6	6.5	10.7
100-year	91.1	38.6	7.3	11.9
Outlet	Brimorton Drive	Brimorton Drive	Markham Road	Brimorton Drive

5.2 Stormwater Management Criteria

The following stormwater management criteria was established for the project, based on City design criteria:

- Quantity Control:
    a. Control all storm events, up to the 100-year design storm event, to the calculated allowable release rate (refer to Section 5.3).
- Quality Control: provide quality control on discharged stormwater such that 80% of total suspended solids ('TSS') are captured on an annual basis.
- Water Balance: retain, infiltrate or re-use runoff generated from a 5mm storm event.

As new development is proposed for only the south portion of the existing property (i.e. the development area), stormwater management criteria was only applied to the proposed developments and associated areas. The only modification required to support

the proposed development site is the relocation of the existing storm sewer that services the existing building to the north.

5.3 Allowable Release Rate

In accordance with the City's WWFMG, the maximum runoff coefficient to be used for calculating an allowable release rate would be limited to 0.50, or less. If the existing imperviousness was found to be greater than 0.50, a runoff coefficient of 0.50 was used. All pre-development areas were calculated to have a runoff coefficient less than 0.50, as such the calculated runoff coefficient was used for the following calculations.

The allowable release rate is calculated as the 2-year peak flow rate at the above noted runoff coefficient.

Table 5: Allowable Release Rates

Area (per SWM1)	Release Rate (L/s)	Outlet
Area 100	32.1	Brimorton Drive
Area 101	13.6	Brimorton Drive
Area 102	2.6	Markham Road

Refer to **Appendix D** for allowable release rate calculations.

5.4 Proposed Storm Servicing

The proposed development will maintain the existing outlets, while controlling run-off such that the proposed release rate does not exceed the allowable release rate for each outlet. In post-development, the drainage from the majority of the development site and external area (EXT1) will be captured by roof drains, area drains and catchbasins and conveyed internally through the proposed development via mechanical plumbing. This captured drainage will ultimately outlet to municipal storm sewers in Brimorton Drive through two

(2) new storm connections. An emergency overland flow route will be provided through the site to Brimorton Drive.

A storm sewer extension of the existing storm sewer in Brimorton Drive is proposed in order to provide the new storm service connection for Building A and the relocated storm sewer to the existing building to the north.

The post-development drainage areas are as follows, per **Figure 4 - SWM2:**

- Area 200: 0.280 ha, controlled area draining to Brimorton Drive.
- Area 200A: 0.010 ha, uncontrolled area draining to Brimorton Drive.
- Area 201: 0.204 ha, controlled area draining to Brimorton Drive.
- Area 201A: 0.015 ha, uncontrolled area draining to Brimorton Drive.
- Area 202: 0.005 ha, uncontrolled area draining to Markham Road.
- Area EXT-1: 0.031 ha, external area from the existing 1050 Markham Road development draining through development site to Brimorton Drive.

To meet the City's built form servicing requirements, service connections are proposed for each building, described as follows:

- Connection 1: 250 mm diameter storm connection for Building A into the proposed extension of the 600mm storm sewer in Brimorton Drive.
- Connection 2: 250 mm diameter storm connection for Building B into the existing 600mm storm sewer in Brimorton Drive.
- Existing Bldg: 600mm diameter storm connection for the existing north building into the proposed extension of the 600mm storm sewer in Brimorton Drive.

A 40mm and 80mm diameter orifice will be installed on the outlet of Building A and B, respectively, to ensure that all post-development flows, including from the external area,

are controlled to the effective release rate. Refer to **Figure 2 - SP** for the site servicing layout.

5.5 Stormwater Quantity Control

5.5.1 Connection 1 (Area 201 + EXT-1)

Connection 1 conveys drainage captured from Area 201 and EXT-1 and connects to the proposed extension of the 600mm diameter storm sewer in Brimorton Drive.

A Tempest LMF vortex unit, sized at 50mm, will be required to attenuate flows so that the effective allowable release rate is not exceeded. The storage required to meet this allowable release rate has been calculated to be **98 m^3**. Storage will be located in the first underground parking level of the building.

5.5.2 Connection 2 (Area 200)

Connection 2 conveys drainage captured from Area 200 and connects to the existing 600mm diameter storm sewer in Brimorton Drive.

An orifice, sized at 75mm, will be required to attenuate flows so that the effective allowable release rate is not exceeded. The storage required to meet this allowable release rate has been calculated to be **83 m^3**. Storage will be located in the first underground parking level of the building.

5.5.3 Uncontrolled Area 202

Area 202 is proposed to release stormwater flows uncontrolled to Markham Road, due to grading constraints near the property line while also allowing for a safe emergency overland flow route. The 100-year post-development flows generated from this area is **2.5 L/s**, which is less than the 2-year pre-development allowable release rate of 2.6L/s.

5.5.4 Quantity Control – Summary

The following is a summary of quantity controls provided for the re-development:

Table 6: Quantity Control Summary

Connection	Allowable (L/s)	Areas (SWM2)	Release Rate (L/s)	Storage (m^3)
1 Building A	13.6	201, EXT-1 CONTROLLED 201A UNCONTROLLED	13.6	98
2 Building B	32.1	200 CONTROLLED 200A UNCONTROLLED	29.9	83
	2.6	202 UNCONTROLLED	2.5	-
Total Site:	**48.2**		**45.9**	**181**

Refer to **Figure 3 - SWM1** and **Figure 4 - SWM2** for pre and post-development drainage plans and **Appendix D** for all stormwater management calculations.

5.6 Proposed Quality Controls

The development site will be required to provide quality control on discharged stormwater such that 80% of total suspended solids ('TSS') are captured on an annual basis.

A summary of site characteristics and initial TSS loading, by drainage areas, is included in **Appendix D**. The results indicate that an OGS unit will be required at the controlled storm connections for Areas 200 and 201, providing City-recognized treatment levels of 50% TSS removal. Areas not being routed through the control were still considered as untreated beyond their original TSS loading. A summary is as follows:

EXT-1
A=0.031
C=0.56

201
A=0.204
C=0.85

200
A=0.280
C=0.83

202
A=0.005
C=0.68

201A
A=0.015
C=0.81

200A
A=0.010
C=0.81

BLDG A

BLDG B

MARKHAM ROAD

BRIMORTON DRIVE

EX. 600mmø CONC STORM SEWER TO BE REMOVED.

EX. MH1
TOP=160.78
N INV: 154.73
S INV: 154.68

9.0m–600mmø
PVC. STM @ 0.30%

MH3
TOP=160.68
N INV: 154.64
S INV: 154.60

EX. 64.9m–525mmø
CONC. STM @ 0.91%

EX. STM MH6
TOP=160.89
N INV:156.97
S INV:156.91

EX. 78.2m–525mmø
CONC. STM @ 0.14%

STORMWATER TANK
REQUIRED VOLUME=98.0m³
TANK PROVIDED VOLUME=127.2m³
STORMWATER RECYCLING TANK REQUIRED VOLUME=8.2m³
TANK FLOOR AREA: 30m²
100YR HWL: 159.62m
P1 CEILING ELEVATION @ TANK:159.30m
TANK INVERT ELEVATION:155.17m
TANK FLOOR ELEVATION:155.90m

CTRL MH1
TOP=159.78
S INV:154.95
E INV:155.04

3.0m–250mmø
PVC. STM @ 1.00%

50mmø VORTEX UNIT
INV. 155.17

1.4m–200mmø
PVC. STM @ 1.00%

OGS1
TOP=159.88
W INV:155.07
N INV:155.16

STORMWATER TANK
REQUIRED VOLUME=83.0m³
TANK PROVIDED VOLUME=94.2m³
STORMWATER RECYCLING TANK REQUIRED VOLUME=10.9m³
TANK FLOOR AREA: 35 m²
100YR HWL: 158.93m
TANK INVERT ELEVATION:155.06m
TANK FLOOR ELEVATION:154.65m
P1 CEILING ELEVATION @ TANK:157.75m

75mmø ORIFICE PLATE
INV. 155.06

1.2m–200mmø
PVC. STM @ 1.00%

OGS2
TOP=159.03
SW INV:154.96
NW INV:155.05

3.0m–250mmø
PVC. STM @ 1.00%

49.2m–600mmø
PVC. STM @ 0.30%

MH4
TOP=159.27
N INV:154.45
S INV:154.42

SWM TANK

EX. MH2
TOP=159.27
N INV:154.40
S INV:154.38

CTRL MH6
TOP=158.93
SE INV:154.84
NE INV:154.93

9.7m–250mmø
PVC. STM @ 2.00%

9.8m–600mmø
CONC. STM @ 0.30%

11.9m–600mmø
CONC. STM @ 0.50%

MH2
TOP=159.44
N INV:154.74
W INV:154.45

9.8m–600mmø
CONC. STM @ 0.50%

MH5
TOP=158.89
E INV:154.39
SW INV:154.33
N INV:154.39

EX. MH3
TOP=158.50
N INV:154.37
SW INV:154.22
NEW NE INV: 154.28

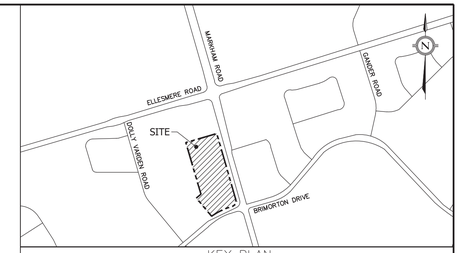
EX. 70.8m–600mmø
CONC. STM @ 2.00%

EX. STM MH7
TOP=161.35
N INV:156.80
S INV:156.72

EX. 27m–375mmø
CONC. STM @ 3.24%

EX. STM MH8
TOP=161.34
NW INV:156.40
S INV:156.78
E INV:156.31

HYDRANT



KEY PLAN
N.T.S.

LEGEND

DRAINAGE BOUNDARY (POST-DEVELOPMENT)

EXTERNAL DRAINAGE BOUNDARY

OVERLAND FLOW ARROW (POST-DEVELOPMENT)

EXTERNAL FLOW ARROW

202 — ID
A=0.006 — AREA
C=0.84 — RUNOFF COEFFICIENT

CONTRACTOR TO BE RESPONSIBLE FOR LOCATION OF ALL EXISTING U/G & OVERHEAD UTILITIES. VARIOUS UTILITIES CONCERNED TO BE GIVEN REQUIRED ADVANCE NOTICE PRIOR TO ANY DIGGING, FOR STAKE OUT. THE CONSULTANT ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE LOCATION OF EXISTING UTILITIES AS INDICATED ON THIS DRAWING.

DIGITAL INFORMATION

NO.	DATE	REVISION	INITIAL	SIGNED
1.	24/06/2024	ISSUED FOR ZBA SUBMISSION #1	KL	

OWNER
CAPREIT
1050 MARKHAM ROAD
TORONTO, ON M1H 2Y5

TOPOGRAPHIC
PROVIDED BY: R. AVIS SURVEYING INC.
SUITE 203, 235 YORKLAND BOULEVARD
TORONTO, ONTARIO M2J 4Y8
TEL. (416) 490–8352

BURIED UTILITY MAP
PROVIDED BY: URBAN X
2620 BRISTOL CIRCLE, SUITE 300
OAKVILLE ONTARIO L6H 6Z7
TEL. (884) 787–2269

ELEVATION NOTE
ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO CITY OF TORONTO BENCH MARK No. NY4007, HAVING AN ELEVATION = 172.857 metres.

BEARING NOTE
BEARINGS SHOWN HEREON ARE GRID BEARINGS AND ARE DERIVED FROM OBSERVE REFERENCE POINTS A AND B HAVING A BEARING OF N73°32'30"E BY REAL TIME NETWORK (RTN) OBSERVATION, ZONE 10, CENTRAL MERIDIAN 79° 30'WEST LONGITUDE. (3° MODIFIED TRANSVERSE MERCATOR PROJECTION, NAD 83 (CSRS–2010)

counterpoint ENGINEERING
COUNTERPOINT ENGINEERING INC.
8395 Jane St., Suite 100, Vaughan, ON L4K 5Y2 Phone 905.326.1404 Fax 905.326.1405

POST-DEVELOPMENT STORM DRAINAGE PLAN

DESIGN: K.L.	DRAWN: B.N.	CHECKED: D.D	CONTRACT No: 24000
SCALE: 1:250	CITY DRAWING NUMBER:		DRAWING NUMBER: FIG 4 - SWM2
DATE: JUNE 2024			

Table 7: Quality Control Summary

Connection / Building	Areas	Routed Area (ha)	Initial TSS Removal	Additional Removal	Final TSS Removal
A	201	0.204 ha	74.5%	50%	86%
B	200	0.280 ha	75.7%	50%	87%

Two OGS units will be selected at detailed design to provide adequate treatment. Refer to **Figure 2 - SP** for the location of the unit. Refer to **Appendix D** for detailed quality control calculations.

5.7 Water Balance

The development site will be required to meet the WWFMG water balance criteria. The minimum run-off retention requirement is to retain all run-off generated from a small design event, typically classified as a 5mm event.

In order to calculate the overall volume retention requirement, the following initial abstraction values were used:

- Conventional Roof-Top Areas: 1mm.
- Asphalt Paving Areas and Hardscape Areas: 1mm.
- Landscaped Areas: 5mm.

Both Building A and Building B will have a stormwater recycling facility in the first underground parking level as part of the stormwater quantity control tank. The storage required for Building A's facility, which include Areas 201, 201A, and 202, is **8.2 m^3.** The storage required for Building B's facility which include Areas 200 and 200A, is **10.9m^3.**

Given the extents of the underground parking structure relative to the developable area, the use of below grade infiltration measures are not feasible. The required volumes are to be reused, likely using irrigation for landscaping. Calculations that demonstrate that these volumes can be reused are provided by others.

6.0 CONCLUSIONS

This FSSR presents a site servicing strategy for the proposed development that addresses the requirements of the applicable regulatory agencies.

Sincerely,

Counterpoint Engineering Inc.

Tengteng Zhang, P.Eng.
Project Engineer
Direct: (647) 832-0622
Email: kly@counterpointeng.com

Karen Ly, P.Eng.
Associate
Direct: (416) 684-8078
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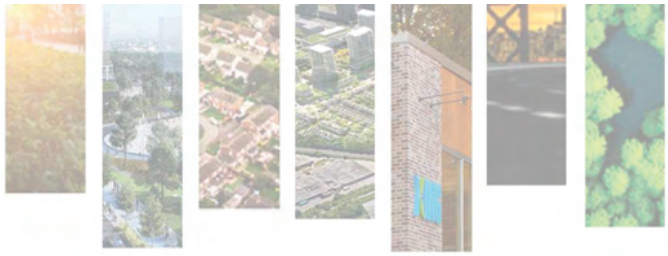

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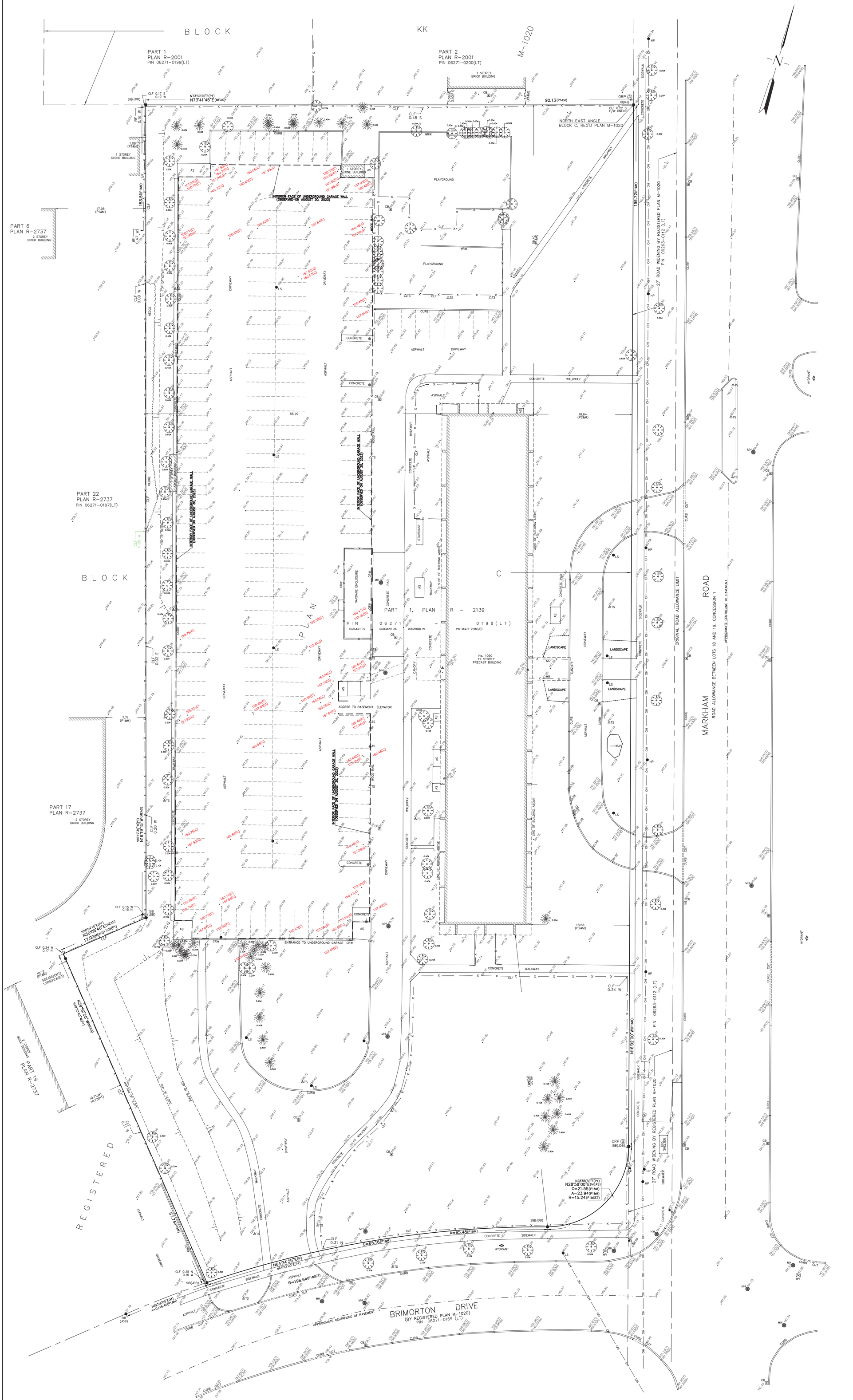
APPENDIX ‘A’



PLAN OF SURVEY OF

PART OF BLOCK C REGISTERED PLAN M-1020

CITY OF TORONTO

(FORMERLY CITY OF SCARBOROUGH)

SCALE 1 : 250

5m 4 3 2 1 0 5 10 15 20m

R. AVIS SURVEYING INC.

METRIC : DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

NOTES AND LEGEND

BEARINGS SHOWN HEREON ARE GRID BEARINGS AND ARE DERIVED FROM OBSERVED REFERENCE POINTS A AND B , HAVING A BEARING OF N16°02'00"W BY REAL TIME NETWORK (RTK) OBSERVATIONS ZONE 10, CENTRAL MERIDIAN 79° 30' WEST LONGITUDE. (3° MODIFIED TRANSVERSE MERCATOR PROJECTION, NAD 83 (CSRS-2010).

3° MTM ZONE 10 COORDINATES

NAD83(CSRS-2010) (CENTRAL MERIDIAN 79°30' WEST LONGITUDE)

	NORTHING	EASTING
ORP A	4848418.35	326403.87
ORP B	4848229.28	326458.20

(1) THE MTM COORDINATES LISTED ABOVE COMPLY WITH SUBSECTION 14(2) OF ONTARIO REGULATION 216/10 FILED UNDER THE SURVEYORS ACT

(2) THE MTM COORDINATES LISTED ABOVE ARE TO BE USED FOR GEOGRAPHIC INFORMATION SYSTEM INTEGRATION ONLY AND CANNOT BE USED TO RE-ESTABLISH THE PROPERTY CORNERS OR BOUNDARIES SHOWN HEREON

FOR BEARINGS COMPARISONS A ROTATION OF 0°12'0" CLOCKWISE HAS BEEN APPLIED TO BEARINGS SHOWN ON P1

ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO CITY OF TORONTO BENCH MARK No. MT191, HAVING AN ELEVATION = 161.502 metres.

DISTANCES SHOWN HEREON ARE GROUND DISTANCES AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 0.999887.

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT PLANTED
SIB	DENOTES	STANDARD IRON BAR
IB	DENOTES	IRON BAR
WIT	DENOTES	WITNESS
MEAS/M	DENOTES	MEASURED
JDB	DENOTES	J.D. BARNES, O.L.S
HJ	DENOTES	HOLDING & JONES LIMITED., O.L.S
P1	DENOTES	PLAN OF SURVEY BY OMARI MWINYI SURVEYING LTD., O.L.S DATED JANUARY 05, 2009
P2	DENOTES	PLAN OF SURVEY BY HOLDING & JONES LIMITED., O.L.S DATED NOVEMBER 19, 1996
N,E,W,S	DENOTES	NORTH, EAST, WEST, SOUTH
CRW	DENOTES	CONCRETE RETAINING WALL
BO	DENOTES	BOLLARD
LS	DENOTES	LIGHT STANDARD
HP	DENOTES	HYDRO POST
HLP	DENOTES	HYDRO LIGHT POST
HGW	DENOTES	HYDRO GUYWIRE
HW	DENOTES	HAND WELL
AS	DENOTES	AIR SHAFT
WV	DENOTES	WATER VALVE
MH	DENOTES	MAN HOLE
TS	DENOTES	TRAFFIC SIGN
CB	DENOTES	CATCH BASIN
(T)	DENOTES	TOP OF CURB/RETAINING WALL
(B)	DENOTES	BOTTOM OF CURB/RETAINING WALL
• 000.00	DENOTES	SPOT ELEVATION
—OH—	DENOTES	OVERHEAD WIRE

SURVEYOR'S CERTIFICATE

I CERTIFY THAT

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT AND THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.

2. THE SURVEY WAS COMPLETED ON THE 30th DAY OF AUGUST , 2023.

SEPTEMBER 10, 2023

DATE

PIRATHEEPAN RAMACHANDRAN
Ontario Land Surveyor

R. AVIS SURVEYING INC.
SUITE 203
235 YORKLAND BOULEVARD
TORONTO, ONTARIO
M2J 4Y8
TEL.: (416) 490-8352 FAX: (416) 491-6206
www.ravissurveying.com

CHECKED BY : P.R., O.L.S.	
CALCULATED BY: BL	PROJECT No. : 3691-0
DRAWN BY : BL	DRAWING No. : 3691-OT.DWG

1050 Markham Road

Project Statistics
June 6, 2024

BUILDING INFORMATION
Building Height: 37 Storey + 15 Storey

Site Stats	By law 569-2013
Gross Site Area	19,880.2 m^2
Net Development Site Area (South Site)	**5,151.6 m^2**
Building A & B Combined GFA	**39,911.1** m^2
FSI of New Development	**7.7**

STATISTICAL SUMMARY

	UNIT COUNT	GCA (Above&Below Grade)		GFA (Above&Below Grade)		PARKING COUNT
		(m^2)	(sf)	(m^2)	(sf)	
BUILDING A (37 Storeys)	438	**35,982.4**	**387,311**	**27,469.1**	**295,674**	105
BUILDING B (15 Storeys)	197	**18,998.4**	**204,498**	**12,442.1**	**133,926**	103
COMBINED	**635**	**54,980.8**	**591,809**	**39,911.1**	**429,600**	**208**
						0.33

Green Roof GFA	
	(m^2)
GCA	54,980.8
Loading Area	104.0
Parking Area	7,785.9
Total	**47,091.0**

Deductions

PARKING REQUIRED (ZBL 89-2022 PARKING ZONE B)

*Refer to Traffic Report prepared by LEA for additional detail

	Unit Count	Min. Required Spaces Rate	Min. Required Spaces Total	Max. Allowed Spaces Rate	Max. Allowed Spaces Total	Required Accessible Spaces
BUILDING A						
1-Bedroom	304		0	0.8	243.2	
2-Bedroom	89		0	0.9	80.1	
3-Bedroom	45		0	1.1	49.5	12
RESIDENTIAL SUBTOTAL			**0**		**373**	
		2 +				
Visitor Spaces	438	0.05*unit	**23.9**		**48**	
TOTAL (Bldg A)			**23.9**		**421**	**12**
BUILDING B						
1-Bedroom	146		0	0.8	116.8	
2-Bedroom	32		0	0.9	28.8	
3-Bedroom	19		0	1.1	20.9	7
RESIDENTIAL SUBTOTAL			**0**		**167**	
		2 +				
Visitor Spaces	197	0.05*unit	**11.9**		**24**	
TOTAL (Bldg B)			**11.9**		**191**	**7**

PARKING PROVIDED

LEVEL	RESIDENTIAL Accessible	RESIDENTIAL Typical	VISITOR Accessible	VISITOR Typical	TOTAL
BUILDING A					
L1	0	0	0	0	0
P1	0	0	2	21	23
P2	5	39	0	0	44
P3	5	33	0	0	38
Sub-Total	10	72	2	21	
TOTAL (Bldg A)	**82**		**23**		**105**
Rate/Unit	0.19		0.05		0.24
BUILDING B					
L1	0	0	0	0	0
P1	0	25	2	9	36
P2	5	48	0	0	53
P2 Lower	0	14	0	0	14
Sub-Total	5	87	2	9	
TOTAL (Bldg B)	**92**		**11**		**103**
Rate/Unit	0.47		0.06		0.52

BICYCLE PARKING REQUIRED (ZBL 569-2013 BIKE ZONE B)

	Unit Count	Bike Spaces per unit	Min. Required
BUILDING A			
Short Term Spaces	438	x 0.07	31
Long Term Spaces	438	x 0.68	298
TOTAL (Bldg A)			**329**
BUILDING B			
Short Term Spaces	197	x 0.07	14
Long Term Spaces	197	x 0.68	134
TOTAL (Bldg B)			**148**

BICYCLE PARKING PROVIDED

	Level 1	P1 Level	P2 Level	P3/P2 Lower Level	TOTALS
BUILDING A					
Short Term Spaces	4	28			32
Long Term Spaces		162	42	95	299
TOTAL (Bldg A)					**331**
BUILDING B					
Short Term Spaces	20	0			20
Long Term Spaces		30	86	31	147
TOTAL (Bldg B)					**167**

AMENITY AREA BREAKDOWN

	Unit Count	Indoor Amenity (m^2)	Indoor Amenity (sf)	Outdoor Amenity (m^2)	Outdoor Amenity (sf)
BUILDING A					
LEVEL 1		313.3	3,372	297.9	3,206
LEVEL 2		458.1	4,931	153.7	1,654
TOTAL (Bldg A)	**438**	**771.39**	**8,303**	**451.6**	**4,861**
BUILDING B					
LEVEL 1		199.6	2,148	708.8	7,630
LEVEL 2		306.4	3,298	123.77	1,332
TOTAL (Bldg B)	**197**	**505.95**	**5,446**	**832.6**	**8,962**
COMBINED TOTAL	**635**	**1277.3**	13,749	**1284.2**	13,823
(BLDG A + B)	Sq. m PER UNIT	**2.0**		**2.0**	

LOADING / WASTE MANAGEMENT

	Required Rate/Formula	MIN REQUIRED (m2)	PROVIDED (m2)
BUILDING A			
Waste Storage Room	[(Unit Count-50)x0.26]+25	125.9	**136.1**
Household Hazardous Waste R	1sqm for every 100 units	4.4	
Bulky Waste Storage	Min 10sm	10.0	**10.0**
Staging Area	[(Unit Count-50)/50]x5+5	43.8	**44.5**
BUILDING B			
Waste Storage Room	[(Unit Count-50)x0.26]+25	63.2	**142.2**
Household Hazardous Waste R	1sqm for every 100 units	2.0	
Bulky Waste Storage	Min 10sm	10.0	**10.0**
Staging Area	[(Unit Count-50)/50]x5+5	19.7	**58.4**
EXISTING 19 STOREY BLDG (295 UNITS)			
Waste Storage Room	[(Unit Count-50)x0.26]+25	88.7	
Staging Area	[(Unit Count-50)/50]x5+5	29.5	

Building B Waste Storage Room sized to provide waste storage for organics and garbage bins from the existing building

Building B Staging Area sized to provide loading for Building B + Existing 19 storey building

BUILDING A - 37 Storeys

Levels		GCA (m^2)	GCA (sf)	Amenity (m^2)	Elevators (m^2)	Exit Stairs (m^2)	Garb Chute (m^2)	MISC (m^2)	Total Deductions (m^2)	GFA (m^2)	GFA (sf)
Parking	P1	1,790.5	19,273		27.5	32.76		1,663.8	1724.1	**66.4**	**715**
Parking	P2	1,790.5	19,273		27.5	32.76		1,663.8	1724.1	**66.4**	**715**
Parking	P3	1,790.5	19,273								
Total Below Grade		**5,371.5**	**57,819**		**55**			**3,327.7**		132.8	1,430

UNIT SUMMARY

Levels		STUDIO	1B	1B+D	2B	2B* (inbound)	3B	Total Units	GCA (m^2)	GCA (sf)	Amenity (m^2)	Elevators (m^2)	Exit Stairs (m^2)	Garb Chute (m^2)	MISC (m^2)	Total Deductions (m^2)	GFA (m^2)	GFA (sf)
Lobby / Amenity	1	0	0	2	0	0	1	**3**	1,322.9	14,239	313.3	27.5	38.7	0.0	191.5	**571.0**	751.9	8,093
Residential / Amenity	2	0	1	2	1	2	1	**7**	1,156.2	12,445	458.1	27.5	18.4	0.3	122.4	**626.7**	529.5	5,700
Residential (Podium)	3	0	5	0	2	4	3	**14**	1,097.0	11,808		27.5	18.4	0.3		**46.1**	1,050.9	11,312
Residential (Podium)	4	0	5	0	2	4	3	**14**	1,097.0	11,808		27.5	18.4	0.3		**46.1**	1,050.9	11,312
Residential (Podium)	5	0	5	0	2	4	3	**14**	1,097.0	11,808		27.5	18.4	0.3		**46.1**	1,050.9	11,312
Residential (Podium)	6	0	5	0	2	4	3	**14**	1,097.0	11,808		27.5	18.4	0.3		**46.1**	1,050.9	11,312
Residential	7	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	8	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	9	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	10	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	11	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	12	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	13	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	14	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	15	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	16	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	17	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	18	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	19	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	20	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	21	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	22	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	23	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	24	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	25	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	26	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	27	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	28	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	29	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	30	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	31	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	32	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	33	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	34	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	35	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential	36	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Residential Penthouse	37	0	6	3	2	0	1	**12**	751.0	8,084		27.5	18.4	0.3		**46.1**	704.9	7,587
Mechanical Penthouse									462.1	4,974					462.1	**462.1**	0.0	0
Total Above Grade		**0**	**207**	**97**	**71**	**18**	**45**	**438**	**30,610.9**	**329,493**							**27,336.2**	**294,245**
		0.0%	47.3%	22.1%	16.2%	4.1%	10.3%										**TOTAL AVG. UNIT SIZE**	
		0%	**69%**		**20.3%**		**10.3%**											
Average Unit Size (sf)		**0**	**509**		**690**		**882**											
Total Above & Below Grade									**35,982.4**	**387,311**							**27,469.1**	**295,674**

BUILDING B - 15 Storeys

Levels		GCA (m^2)	GCA (sf)	Amenity (m^2)	Elevators (m^2)	Exit Stairs (m^2)	Garb Chute (m^2)	MISC (m^2)	Total Deductions (m^2)	GFA (m^2)	GFA (sf)
Parking	P1	2,327.0	25,048		23.2	32.76		2,228.6	2284.5	**42.5**	**457**
Parking	P2	2,327.0	25,048		23.2	32.76		2,229.6	2285.6	**41.4**	**446**
Total Below Grade		**4,654.0**	**50,095**		**46.4**			**4,458.2**		83.9	903

UNIT SUMMARY

Levels		STUDIO	1B	1B+D	2B	2B* (inbound)	3B	Total Units	GCA (m^2)	GCA (sf)	Amenity (m^2)	Elevators (m^2)	Exit Stairs (m^2)	Garb Chute (m^2)	MISC (m^2)	Total Deductions (m^2)	GFA (m^2)	GFA (sf)
Lobby / Amenity	1	0	2	4	0	0	1	**7**	1434.6	15,442	199.6	23.2	31.3	0.0	158.3	**412.4**	1,022.2	11,003
Residential/Amenity	2	0	2	3	2	2	1	**10**	1267.2	13,640	306.4	23.2	26.6	0.3	137.5	**493.9**	773.3	8,323
Residential (Lower Podium)	3	0	4	4	2	4	3	**17**	1204.0	12,960		23.2	26.6	0.3		**50.1**	1,153.9	12,420
Residential (Lower Podium)	4	0	7	6	2	2	1	**18**	1204.0	12,960		23.2	39.8	0.3		**63.3**	1,140.7	12,279
Residential (Lower Podium)	5	0	8	4	0	0	2	**14**	904.0	9,730		23.2	24.1	0.3		**47.6**	856.4	9,218
Residential (Upper Podium)	6	0	8	4	0	0	2	**14**	904.0	9,730		23.2	24.1	0.3		**47.6**	856.4	9,218
Residential	7	0	7	3	2	0	1	**13**	776.0	8,352		23.2	24.1	0.3		**47.6**	728.4	7,840
Residential	8	0	7	3	2	0	1	**13**	776.0	8,352		23.2	24.1	0.3		**47.6**	728.4	7,840
Residential	9	0	7	3	2	0	1	**13**	776.0	8,352		23.2	24.1	0.3		**47.6**	728.4	7,840
Residential	10	0	7	3	2	0	1	**13**	776.0	8,352		23.2	24.1	0.3		**47.6**	728.4	7,840
Residential	11	0	7	3	2	0	1	**13**	776.0	8,352		23.2	24.1	0.3		**47.6**	728.4	7,840
Residential	12	0	7	3	2	0	1	**13**	776.0	8,352		23.2	24.1	0.3		**47.6**	728.4	7,840
Residential	13	0	7	3	2	0	1	**13**	776.0	8,352		23.2	24.1	0.3		**47.6**	728.4	7,840
Residential	14	0	7	3	2	0	1	**13**	776.0	8,352		23.2	24.1	0.3		**47.6**	728.4	7,840
Residential	15	0	7	3	2	0	1	**13**	776.0	8,352		23.2	24.1	0.3		**47.6**	728.4	7,840
Mechanical Penthouse									443.2	4,770					443.2	**443.2**	0.0	**0**
Total Above Grade		**0**	**94**	**52**	**24**	**8**	**19**	**197**	**14,344.4**	**154,402**							**12,358.2**	**133,023**
		0.0%	47.7%	26.4%	12.2%	4.1%	9.6%										**TOTAL AVG. UNIT SIZE**	
		0%	**74%**		**16.2%**		**9.6%**											
Average Unit Size (sf)		**0**	**498**		**664**		**906**											
Total Above & Below Grade									**18,998.4**	**204,498**							**12,442.1**	**133,926**

1050 Markham Existing Total Units	**295**

No	Issued For	Date
1	Issued for ZBA	2024-06-07

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LICENCE 3432

Project
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1050 Markham Road,
Toronto, Ontario, M1H 2Y5

Client
CAPREIT

Drawing Title
PROJECT STATISTICS

Scale
Drawn by
Checked by
Project No. 23-11
Date 2024-06-07
Drawing No. A1.02

Statistics Template – Toronto Green Standard Version 4.0

Mid to High Rise Residential and all New Non-Residential Development

The Toronto Green Standard Version 4.0 Statistics Template is submitted with Site Plan Control Applications and stand-alone Zoning Bylaw Amendment applications. Complete the table and copy it directly onto the Site Plan submitted as part of the application.

For Zoning Bylaw Amendment applications: complete General Project Description and Section 1.
For Site Plan Control applications: complete General Project Description, Section 1 and Section 2.
For further information, please visit www.toronto.ca/greendevelopment

General Project Description	Proposed
Total Gross Floor Area	39,911.1
Breakdown of project components (m²):	
Residential	39,911.1
Retail	
Commercial	
Industrial	
Institutional/Other	
Total number of residential units	635

Section 1: For Stand Alone Zoning Bylaw Amendment Applications and Site Plan Control Applications

Low Emissions Transportation	Required	Proposed	Proposed %
Number of Parking Spaces	34	208	612%
Number of EV Parking Spaces (Residential)	174	174	100%
Number of EV Parking Spaces (non-residential)	0	0	

Cycling Infrastructure	Required	Proposed	Proposed %
Number of long-term bicycle parking spaces (all-uses)	432	446	103%
Number of long-term bicycle parking located on:			
a) first storey of building		0	
b) second storey of building		0	
c) first level below-ground		192	
d) second level below-ground		128	
e) other levels below-ground		126	

Statistics Template – Toronto Green Standard Version 4.0

Mid to High Rise Residential and all New Non-Residential Development

Cycling Infrastructure	Required	Proposed	Proposed %
Number of short-term bicycle parking spaces	45	50	111%
Number of shower and change facilities (non-residential)	N/A	0	

Tree Canopy	Required	Proposed	Proposed %
Total Soil Volume (40% of the site area ÷ 66 m2 x 30 m³)	936.65	937.05	100%
Soil volume provided within the site area (m³)		241.05	26%
Soil Volume provided within the public boulevard (m³)		696	74%

Section 2: For Site Plan Control Applications

Cycling Infrastructure	Required	Proposed	Proposed %
Number of short-term bicycle parking spaces (all uses) at-grade or on first level below grade			
Number of publicly accessible bicycle parking spaces			
Number of energized outlets for electric bicycles			

Tree Canopy	Required	Proposed	Proposed %
Total site area (m²)			
Total Soil Volume (40% of the site area ÷ 66 m² x 30 m³)			
Total number of trees planted			
Number of surface parking spaces (if applicable)		-	
Number of shade trees located in surface parking area		-	

Landscaping & Biodiversity	Required	Proposed	Proposed %
Total non-roof hardscape area (m²)			
Total non-roof hardscape area treated for Urban Heat Island (minimum residential 75% or non-residential 50%) (m²)			
Area of non-roof hardscape treated with: (indicate m²)			
a) high-albedo surface material			
b) open-grid pavement			
c) shade from tree canopy			

Statistics Template – Toronto Green Standard Version 4.0

Mid to High Rise Residential and all New Non-Residential Development

Landscaping & Biodiversity	Required	Proposed	Proposed %
d) shade from high-albedo structures			
e) shade from energy generation structures			
Percentage of Lot Area as Soft Landscaping (non-residential only)			
Total number of plants			
Total number of native plants and % of total plants			
Available Roof Space (m²)			
Available Roof Space provided as Green Roof (m²)			
Available Roof Space provided as Cool Roof (m²)		-	
Available Roof Space provided as Solar Panels (m²)		-	

Bird Collision Deterrence	Required	Proposed	Proposed %
Total area of glazing of all elevations within 16m above grade			
Total area of treated glazing (minimum 85% of total area of glazing within 16m above grade) (m²)			
Percentage of glazing within 16m above grade treated with:			
a) Visual markers			
b) non-reflective glass			
c) Building integrated structures			

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Client

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Drawing Title

TGS STATISTICS

Scale

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Project No.

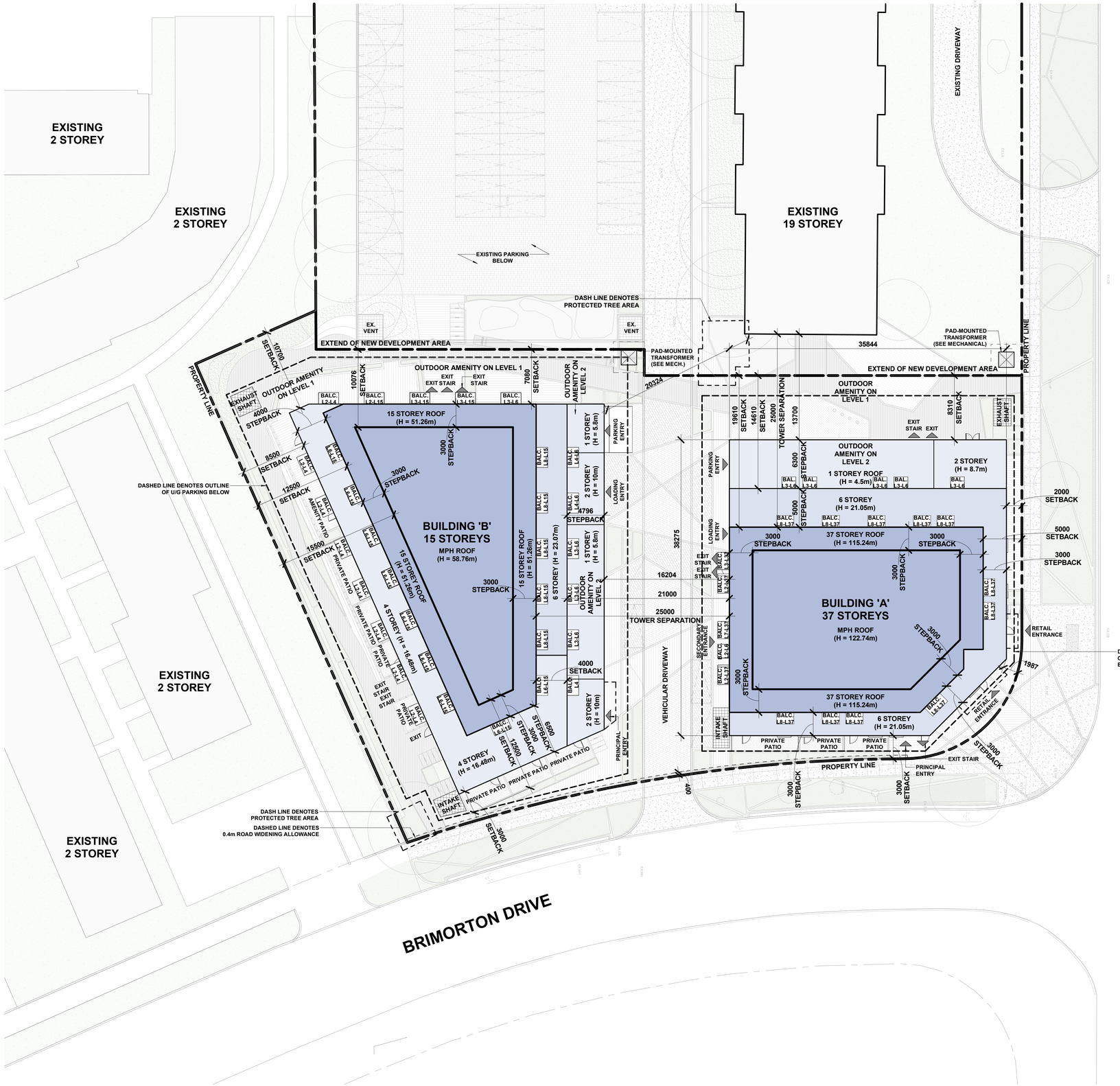
23-11

Date

2024-06-07

Drawing No.

A1.03



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Toronto, Ontario, M1H 2Y5

Client

CAPREIT

Drawing Title

SITE PLAN - ROOF PLAN

Scale	1 : 250
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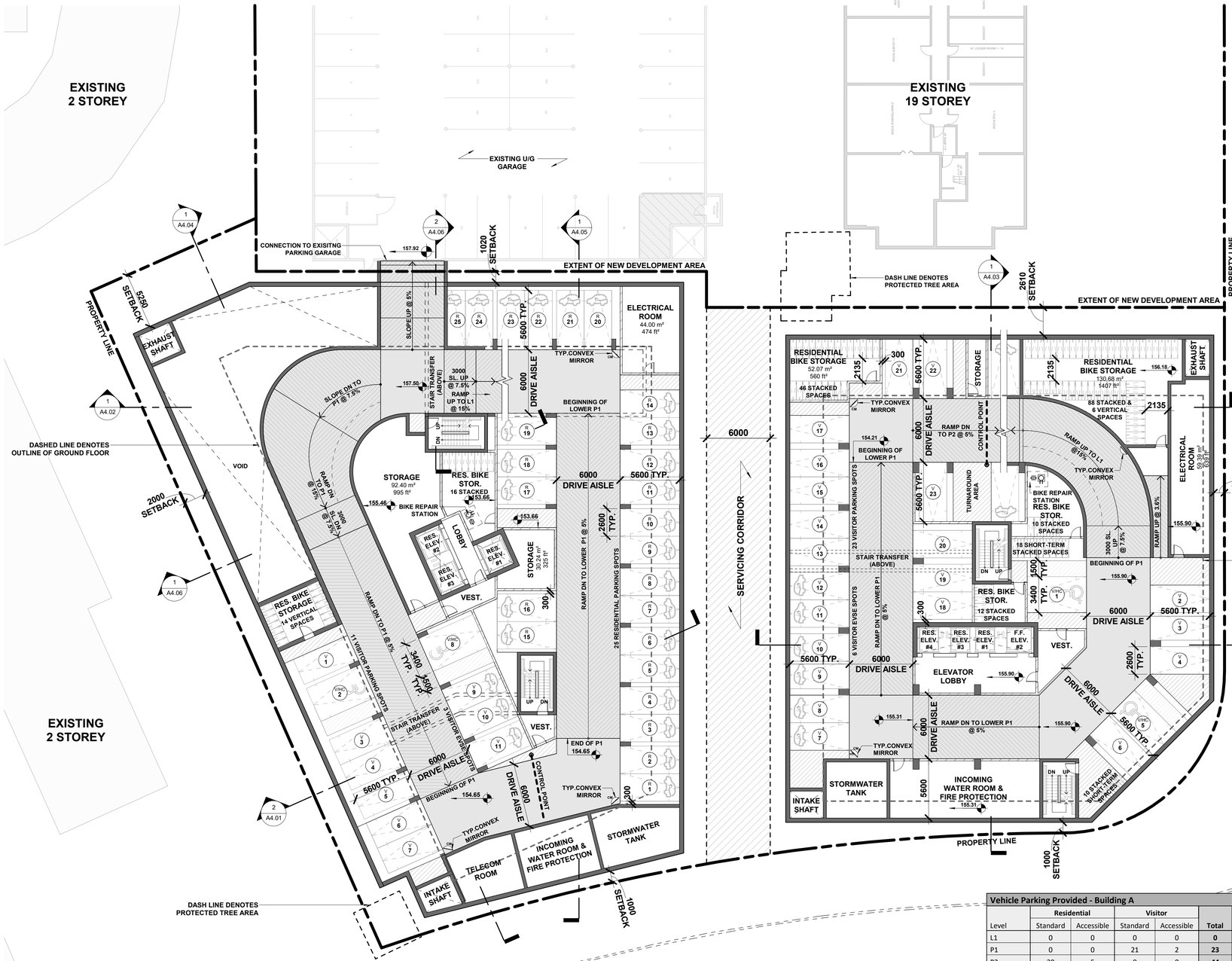
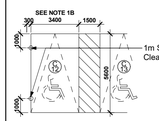
Project No.	23-11
Date	2024-06-07
Drawing No.	A1.10

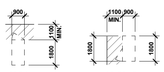


PARKING LEGEND

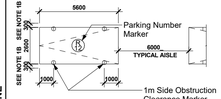
HANDICAP PARKING SPACE:



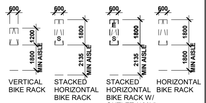
TYPICAL STORAGE LOCKER:



TYPICAL PARKING SPACE:
Drive Aisle @ 6m min.



TYPICAL BIKE PARKING



NOTE 1: ALL PARKING SPACES AND ACCESS DRIVE AISLES TO COMPLY WITH DIMENSIONAL REQUIREMENTS OF CITY OF TORONTO STANDARDS:

A) VERTICAL CLEARANCE OVER ENTIRE PARKING SPACE TO BE 2.0m MIN (UNLESS HOTED OTHERWISE)

B) THE MINIMUM WIDTH MUST BE INCREASED BY 300mm FOR EACH SIDE OF THE PARKING SPACE THAT US OBSTRUCTED BY MORE THAN 1m FROM THE FRONT OR REAR OF THE SPACE

NOTE 2: ALL ENERGIZED OUTLET (120 V) TO BE PROVIDED ADJACENT TO THE BICYCLE RACK (AS NOTED)

NOTE 3: ALL BICYCLE PARKING SPACES AND ACCESS DRIVE AISLES TO COMPLY WITH DIMENSIONAL REQUIREMENTS OF CITY OF TORONTO PARKING STANDARDS

CONVEX MIRROR

DENOTES CONVEX MIRROR

CEILING OR WALL HUNG AT A HIGH LEVEL AT ALL RIGHT-ANGLES AND AT THE TOP AND BOTTOM OF ALL RAMPS, POSITIONED TO ENSURE MOTORISTS HAVE CLEAR VIEWS OF ONCOMING TRAFFIC.

PARKING SPACE SYMBOLS:

SYMBOL DENOTES PARKING STALLS FITTED WITH ELECTRIC VEHICLE CHARGING STATION.

NOTE 1: RESIDENTAIL PARKING SPACES MUST BE EQUIPPED WITH AN ENERGIZED OUTLET FOR ELECTRIC VEHICLE CHARGING.

Parking Marker Legend

R	**Residential**
V	**Residential Visitor**
V/HC	**Residential Visitor Barrier Free**
R/HC	**Residential Barrier Free**

Vehicle Parking Provided - Building A

	Residential		Visitor			EVSE Spaces Provided
Level	Standard	Accessible	Standard	Accessible	Total	
L1	0	0	0	0	**0**	
P1	0	0	21	2	**23**	6
P2	39	5	0	0	**44**	44
P3	33	5	0	0	**38**	38
Sub Total	*72*	*10*	*21*	*2*		
Total	**82**		**23**		**105**	88
Rate/Unit	0.19		0.05		0.24	84% of spaces

Vehicle Parking Provided - Building B

	Residential		Visitor			EVSE Spaces Provided
Level	Standard	Accessible	Standard	Accessible	Total	
L1	0	0	0	0	**0**	
P1	25	0	9	2	**36**	28
P2	48	5	0	0	**53**	53
LOWER P2	14	0	0	0	**14**	14
Sub Total	*87*	*5*	*9*	*2*		
Total	**92**		**11**		**103**	95
Rate/Unit	0.47		0.06		0.52	92% of spaces

Bicycle Parking Provided - Building A

Residential						
	Short-Term			Long-Term		
Level	Stacked	Vertical	Ext. Rings	Stacked	Vertical	Total
L1	0	0	4	0	0	4
P1	0	28	0	156	6	190
P2	0	0	0	42	0	42
P3	0	0	0	82	13	95
Sub Total	*0*	*28*	*4*	*280*	*19*	
Total	**32**			**299**		**331**

Bicycle Parking Provided - Building B

Residential						
	Short-Term			Long-Term		
Level	Stacked	Vertical	Ext. Rings	Stacked	Vertical	Total
L1	0	0	20	0	0	20
P1	0	0	0	16	14	30
P2	0	0	0	54	32	86
LOWER P2	0	0	0	24	7	31
Sub Total	*0*	*0*	*20*	*94*	*53*	
Total	**20**			**147**		**167**

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Client

CAPREIT

Drawing Title

PARKING LEVEL 1

Scale	1:200
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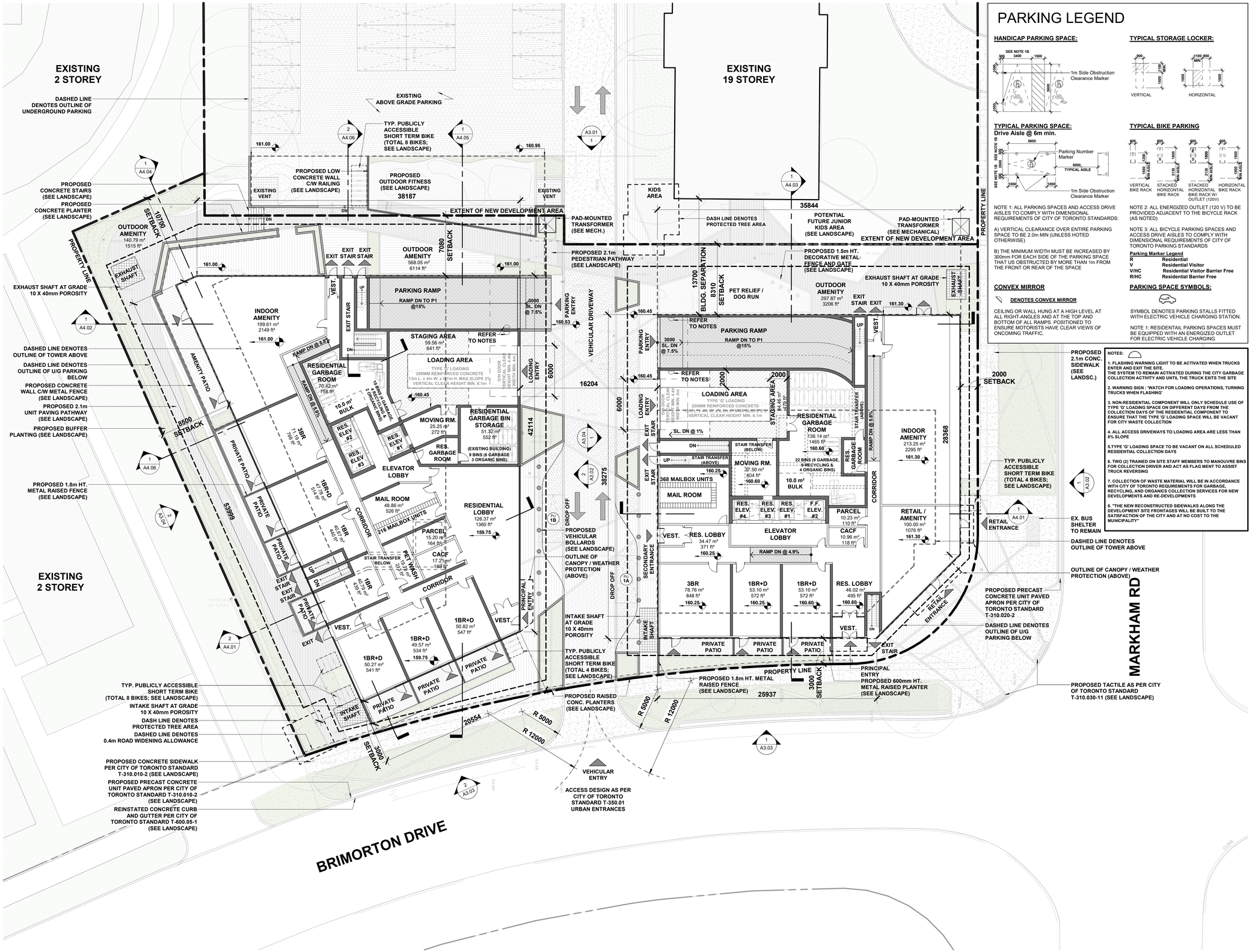
Project No.	23-11
Date	2024-06-07
Drawing No.	A2.03



PARKING LEGEND

HANDICAP PARKING SPACE:

TYPICAL STORAGE LOCKER:

TYPICAL PARKING SPACE:

Drive Aisle @ 6m min.

TYPICAL BIKE PARKING

NOTE 1: ALL PARKING SPACES AND ACCESS DRIVE AISLES TO COMPLY WITH DIMENSIONAL REQUIREMENTS OF CITY OF TORONTO STANDARDS:

A) VERTICAL CLEARANCE OVER ENTIRE PARKING SPACE TO BE 2.0m MIN (UNLESS HOTED OTHERWISE)

B) THE MINIMUM WIDTH MUST BE INCREASED BY 300mm FOR EACH SIDE OF THE PARKING SPACE THAT US OBSTRUCTED BY MORE THAN 1m FROM THE FRONT OR REAR OF THE SPACE

NOTE 2: ALL ENERGIZED OUTLET (120 V) TO BE PROVIDED ADJACENT TO THE BICYCLE RACK (AS NOTED)

NOTE 3: ALL BICYCLE PARKING SPACES AND ACCESS DRIVE AISLES TO COMPLY WITH DIMENSIONAL REQUIREMENTS OF CITY OF TORONTO PARKING STANDARDS

Parking Marker Legend

R	Residential
V	Residential Visitor
V/HC	Residential Visitor Barrier Free
R/HC	Residential Barrier Free

CONVEX MIRROR

DENOTES CONVEX MIRROR

CEILING OR WALL HUNG AT A HIGH LEVEL AT ALL RIGHT-ANGLES AND AT THE TOP AND BOTTOM OF ALL RAMPS, POSITIONED TO ENSURE MOTORISTS HAVE CLEAR VIEWS OF ONCOMING TRAFFIC.

PARKING SPACE SYMBOLS:

SYMBOL DENOTES PARKING STALLS FITTED WITH ELECTRIC VEHICLE CHARGING STATION.

NOTE 1: RESIDENTAIL PARKING SPACES MUST BE EQUIPPED WITH AN ENERGIZED OUTLET FOR ELECTRIC VEHICLE CHARGING.

NOTES:

1. FLASHING WARNING LIGHT TO BE ACTIVATED WHEN TRUCKS ENTER AND EXIT THE SITE. THE SYSTEM TO REMAIN ACTIVATED DURING THE CITY GARBAGE COLLECTION ACTIVITY AND UNTIL THE TRUCK EXITS THE SITE

2. WARNING SIGN : 'WATCH FOR LOADING OPERATIONS, TURNING TRUCKS WHEN FLASHING'

3. NON-RESIDENTIAL COMPONENT WILL ONLY SCHEDULE USE OF TYPE 'G' LOADING SPACE ON DIFFERENT DAYS FROM THE COLLECTION DAYS OF THE RESIDENTIAL COMPONENT TO ENSURE THAT THE TYPE 'G' LOADING SPACE WILL BE VACANT FOR CITY WASTE COLLECTION

4. ALL ACCESS DRIVEWAYS TO LOADING AREA ARE LESS THAN 8% SLOPE

5.TYPE 'G' LOADING SPACE TO BE VACANT ON ALL SCHEDULED RESIDENTIAL COLLECTION DAYS

6. TWO (2) TRAINED ON SITE STAFF MEMBERS TO MANOUVRE BINS FOR COLLECTION DRIVER AND ACT AS FLAG MENT TO ASSIST TRUCK REVERSING

7. COLLECTION OF WASTE MATERIAL WILL BE IN ACCORDANCE WITH CITY OF TORONTO REQUIREMENTS FOR GARBAGE, RECYCLING, AND ORGANICS COLLECTION SERVICES FOR NEW DEVELOPMENTS AND RE-DEVELOPMENTS

8. "THE NEW RECONSTRUCTED SIDEWALKS ALONG THE DEVELOPMENT SITE FRONTAGES WILL BE BUILT TO THE SATISFACTION OF THE CITY AND AT NO COST TO THE MUNICIPALITY"

No	Issued For	Date
1	Issued for ZBA	2024-06-07

WALLMANARCHITECTS
99 Spadina Avenue, Suite 600
Toronto, Ontario M5V 3P8
t 416 340 1870
f 416 340 1871
www.wallmanarchitects.com

ONTARIO ASSOCIATION OF ARCHITECTS
RUDY P. WALLMAN
LICENCE 3432

Project

1050 Markham Road

1050 Markham Road,
Toronto, Ontario, M1H 2Y5

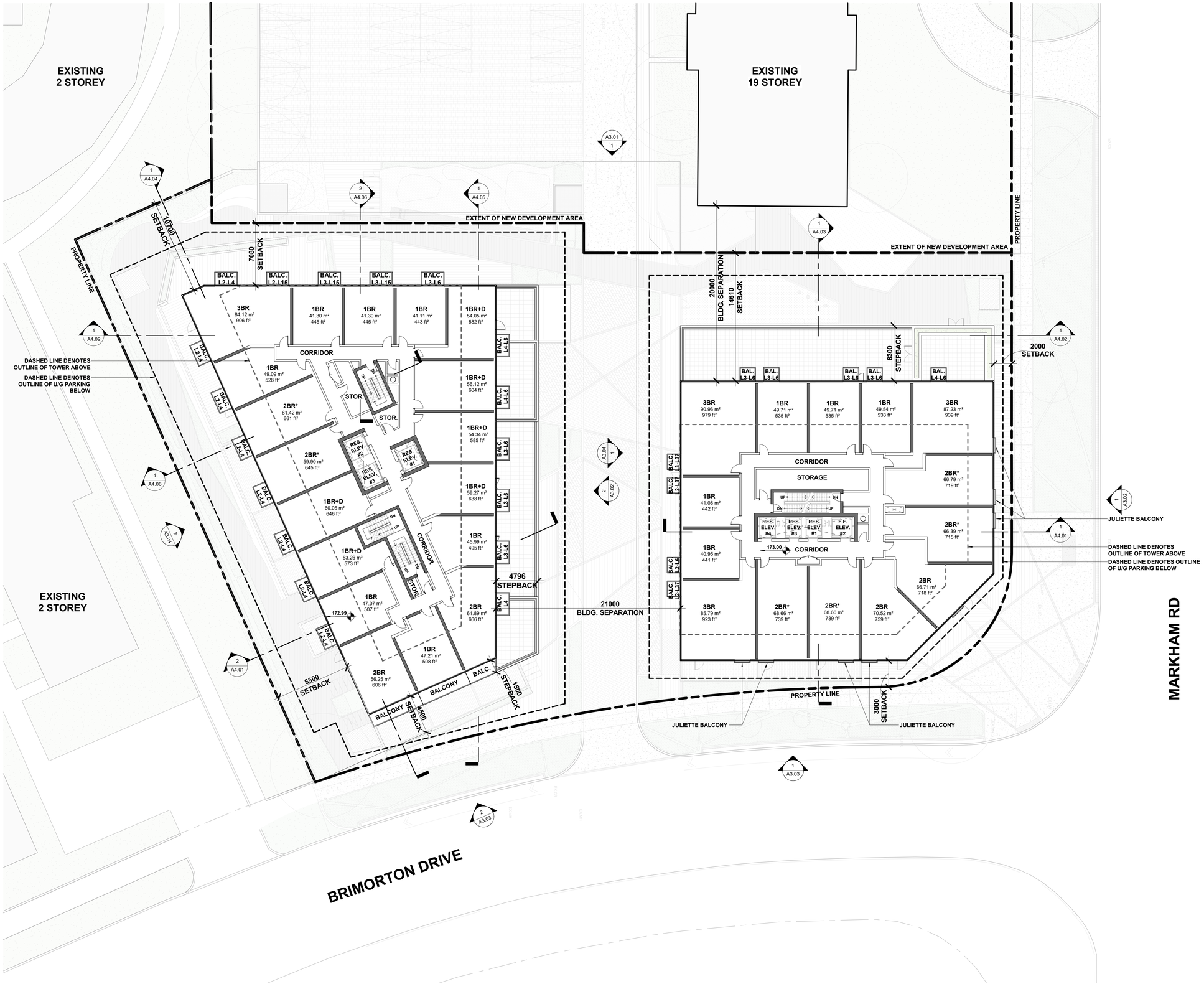
Client

CAPREIT

Drawing Title

LEVEL 1 FLOOR PLAN

Scale	1:200
Drawn by	
Checked by	
Project No.	23-11
Date	2024-06-07
Drawing No.	A2.04



No	Issued For	Date
1	Issued for ZBA	2024-06-07

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RUDY P. WALLMAN
LICENCE
3432

Project

1050 Markham Road

1050 Markham Road,
Toronto, Ontario, M1H 2Y5

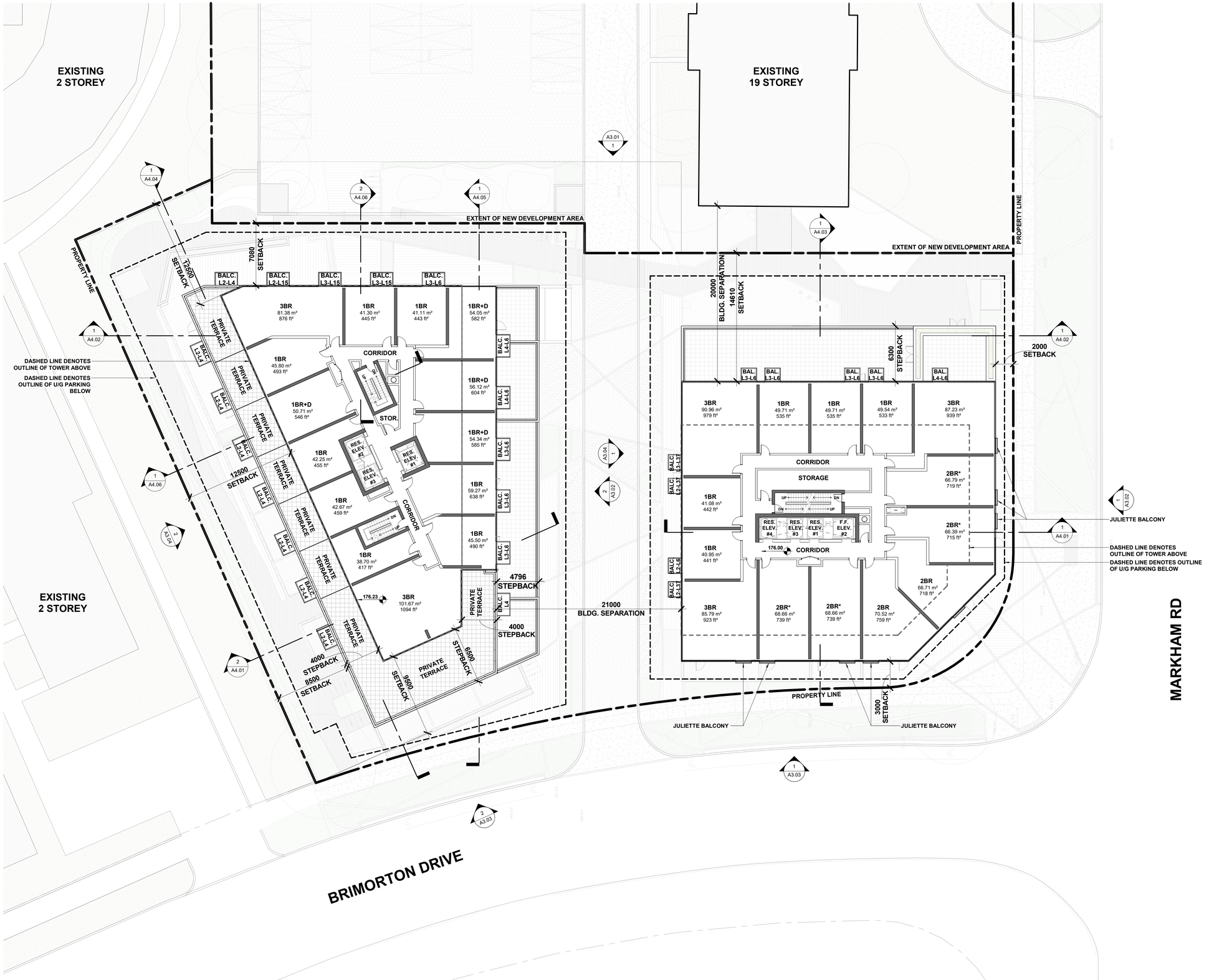
Client

CAPREIT

Drawing Title

LEVEL 4 FLOOR PLAN

Scale	1 : 200
Drawn by	
Checked by	
Project No.	23-11
Date	2024-06-07
Drawing No.	A2.09



No	Issued For	Date
1	Issued for ZBA	2024-06-07

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ONTARIO ASSOCIATION OF ARCHITECTS
RUDY P. WALLMAN
LICENCE 3432

Project
1050 Markham Road
1050 Markham Road,
Toronto, Ontario, M1H 2Y5

Client
CAPREIT

Drawing Title
LEVEL 5 FLOOR PLAN

Scale	1 : 200
Drawn by	
Checked by	
Project No.	23-11
Date	2024-06-07
Drawing No.	A2.10

APPENDIX ‘B’

Counterpoint Engineering Inc.

WATER DEMANDS BY BLOCK AND BUILDING

Project: 1050 Markham Road
Project No: 24000
Location: Toronto

Per Capita Demand

Single Family	310	litres/person/day
Multi-Unit	190	litres/person/day

Retail/Residential Population Criteria

1 Bedroom	1.4	ppu
2 Bedroom	2.1	ppu
3 Bedroom	3.1	ppu
Townhouse	2.7	ppu
Commercial/Retail	1.1	persons/100m^2
Office	3.3	persons/100m^2

Units per Bldg.		Unit Type Count			
Bldg.	Total Units	1 Bdrm.	2 Bdrm.	3 Bdrm.	Townhouse
A	438	304	89	45	0
B	197	146	32	19	0
Total	**635**	**450**	**121**	**64**	**0**

Unit and Floor Area Breakdown

POPULATION AND AVERAGE DAY DEMANDS SUMMARY												
Building	1 Bedroom Units	2 Bedroom Units	3 Bedroom Units	Townhouse	Total Residential Units*	Total Residential Population	Residential Average Demand	Office (m^2)	Total Office Population	Office Average Demand	Retail/ Commercial (m^2)	Retail/ Commercial Average Demand (28m^3/ha/day)
	1.4 persons/unit	2.1 persons/unit	3.1 persons/unit	3.7 persons/unit	Units	Equivalent Population	L/s	Area	Equivalent Population	L/s	Area	L/s
A	304	89	45	0	438	753	1.66	-	0.0	0.00	-	0.00
B	146	32	19	0	197	332	0.73	-	0.0	0.00	-	0.00
Site Total:	**450**	**121**	**64**	**0**	**635**	**1,084**	**2.38**	**0**	**0**	**0.00**	**0**	**0.00**

**Note: total units rounded up due to rounding when applying unit mix ratio percentages.*

Peaking Factors

Land Use	Minimum Hour	Maximum Hour	Maximum Day
Apartment	0.84	2.50	1.30
Commercial	0.84	1.20	1.10
Industrial	0.84	1.90	1.10
Institutional	0.84	1.90	1.10

Summary of Demands

Building	Daily Water Demand (L/sec)	Max Day Water Demand (L/sec)	Peak Hour Water Demand (L/sec)	Fire Demand Required (L/sec)	Max Day plus Fire Demand (L/sec)
A	1.66	2.15	4.14	66.67	68.82
B	0.73	0.95	1.82	66.67	67.61
Site Total:	**2.38**	**3.10**	**5.96**		

counterpoint engineering

Fire Underwriter Survey (2020) Fire Flow Calculation

Reference: https://fireunderwriters.ca/assets/img/Water%20Supply%20for%20Public%20Fire%20Protection%20in%20Canada%202020.pdf

Project: 1050 Markham Road
Building: A
Project No: 24000
Location: Toronto

A) Determine the Construction Coefficient (C). Refer to pages 20, 21.

Construction Type, see pages 20 and 21 for definitions: Type II Noncombustible Construction
Construction Coefficient (C): **0.8**

B) Determine the Total Effective Floor Area (A). Refer to pages 22, 23.

Based on the Construction Type and associated Construction Coefficient:
Check: Are any vertical openings unprotected? No
Take single largest floor areas plus 25% of each of the two immediately adjoining floors.
Total Effective Floor Area (A): 1,576 m^2

C) Calculate the Required Fire Flow (RFF), rounded to nearest 1,000 LPM. $RFF = 220C\sqrt{A}$ **7,000** L/min

D) Determine the decrease or increase for the Occupancy Contents Adjustment Factor. Apply to value obtained in C. Refer to pages 24 to 26.

Contents, see Page 24 for definitions and Pages 25-26 for examples: Limited Combustible
Adjustment Factor: -15%

Adjusted Required Fire Flow: **5,950** L/min

E) Determine decrease for having Automatic Sprinkler Protection, if warranted. Refer to pages 27 to 29.

Automatic Sprinkler System Design

Installed and Designed to NFPA 13 Standard?	Yes	[30% Reduction]
Water Supply standard for both system and fire department hose lines?	Yes	[10% Reduction]
Fully supervised system?	Yes	[10% Reduction]

Does the sprinkler system have complete building coverage? Yes

Reduction for Automatic Sprinkler Protection: 50%
2,975 L/min

F) Determine the total Exposure Adjustment Charge for exposures. Refer to pages 30 to 32.

Building Face	Distance to Exposure (m)	Length-Height Factor (L.H.F.)	L.H.F. Bracket	Bldg Type	Reduction Notes		Charge
North	10.1-20m	2261	Over 100	Type V	None applicable.	=	15%
East	Greater than 30m	960	Over 100	Type V	None applicable.	=	0%
South	Greater than 30m	1140	Over 100	Type V	None applicable.	=	0%
West	10.1-20m	698	Over 100	Type I-II (2)	Site building and exposed building fully protected with automatic sprinkler system. [100% Reduction]	=	0%
					Total Exposure Charge:		**15%**

Increase for Exposure Adjustment Charge: **893** L/min

G) Final Calculation of Required Fire Flow. Subtract the value obtained in E from the answer obtained in D, then add the value obtained in F.

F = 4,000 L/min
F = 1,057 GPM
F = 66.7 L/s

counterpoint engineering

Fire Underwriter Survey (2020) Fire Flow Calculation

Reference: https://fireunderwriters.ca/assets/img/Water%20Supply%20for%20Public%20Fire%20Protection%20in%20Canada%202020.pdf

Project: 1050 Markham Road
Building: B
Project No: 24000
Location: Toronto

A) Determine the Construction Coefficient (C). Refer to pages 20, 21.

Construction Type, see pages 20 and 21 for definitions: Type II Noncombustible Construction
Construction Coefficient (C): **0.8**

B) Determine the Total Effective Floor Area (A). Refer to pages 22, 23.

Based on the Construction Type and associated Construction Coefficient,
Check: Are any vertical openings unprotected? No
Take single largest floor areas plus 25% of each of the two immediately adjoining floors.
Total Effective Floor Area (A): 1,532 m^2

C) Calculate the Required Fire Flow (RFF), rounded to nearest 1,000 LPM. $RFF = 220C\sqrt{A}$ **7,000** L/min

D) Determine the decrease or increase for the Occupancy Contents Adjustment Factor. Apply to value obtained in C. Refer to pages 24 to 26.

Contents, see Page 24 for definitions and Pages 25-26 for examples: Limited Combustible
Adjustment Factor: -15%

Adjusted Required Fire Flow: **5,950** L/min

E) Determine decrease for having Automatic Sprinkler Protection, if warranted. Refer to pages 27 to 29.

Automatic Sprinkler System Design

Installed and Designed to NFPA 13 Standard?	Yes	[30% Reduction]
Water Supply standard for both system and fire department hose lines?	Yes	[10% Reduction]
Fully supervised system?	Yes	[10% Reduction]

Does the sprinkler system have complete building coverage? Yes

Reduction for Automatic Sprinkler Protection: 50%
2,975 L/min

F) Determine the total Exposure Adjustment Charge for exposures. Refer to pages 30 to 32.

Building Face	Distance to Exposure (m)	Length-Height Factor (L.H.F.)	L.H.F. Bracket	Bldg Type	Reduction Notes		Charge
North	Greater than 30m		0-20	Type V	None applicable.	=	0%
East	10.1-20m	1417	Over 100	Type I-II (2)	Exposed building and area between buildings are protected with automatic sprinkler systems. [100% Reduction]	=	0%
South	Greater than 30m	1140	Over 100	Type V	None applicable.	=	0%
West	10.1-20m	135	Over 100	Type V	None applicable.	=	15%
					Total Exposure Charge:		**15%**

Increase for Exposure Adjustment Charge: **893** L/min

G) Final Calculation of Required Fire Flow. Subtract the value obtained in E from the answer obtained in D, then add the value obtained in F.

F = 4,000 L/min
F = 1,057 GPM
F = 66.7 L/s

Counterpoint Engineering Inc.

NFPA Theoretical Flow Calculations

Project: 1050 Markham Road
Project No: 24000
Flow Hydrant: Hydrant south of 510 Brimorton Drive.
Residual Hydrant: Hydrant opposite of 556 Brimorton Drive.

Based on National Fire Protection Association Guidelines, the available flow at the minimum residual pressure of 20psi can be calculated based on the observed flow at the observed pressure readings, as follows:

$$\mathbf{Q_F = 29.83 \times c \times d^2 \times p^{0.5}}$$, where

Q_F = observed flow (US GPM)
c = hydrant nozzle coefficient (0.90 - 0.95)
d = nozzle diameter (in)
p = observed pitot pressure

$$\mathbf{Q_R = Q_F \times h_F^{0.54} / h_R^{0.54}}$$, where

Q_R = available flow
Q_F = observed flow (US GPM)
h_F = drop from measured static to desired baseline pressure
h_R = drop from measured static to measured residual pressure

Based on flow test results obtained by *Hydrant Testing Ontario, May 29 2024.*

c =	0.9		
d =	2.5	in	
number of ports =	2		
p =	25		
Q_F =	**1678**	**US GPM**	
Measured Static Pressure =	67	psi	
Measured Residual Pressure =	60	psi	
Desired Residual Pressure =	20	psi	, minimum per City of Toronto design criteria

Q_R =	**4692**	**US GPM**	per fire conneciton
	17,761	**L/min**	
	296.02	**L/s**	

Hydrant Testing Ontario
Tel: 289-354-1942
Info@HTOntario.ca

REPORT
N°. 2452

May 29, 2024

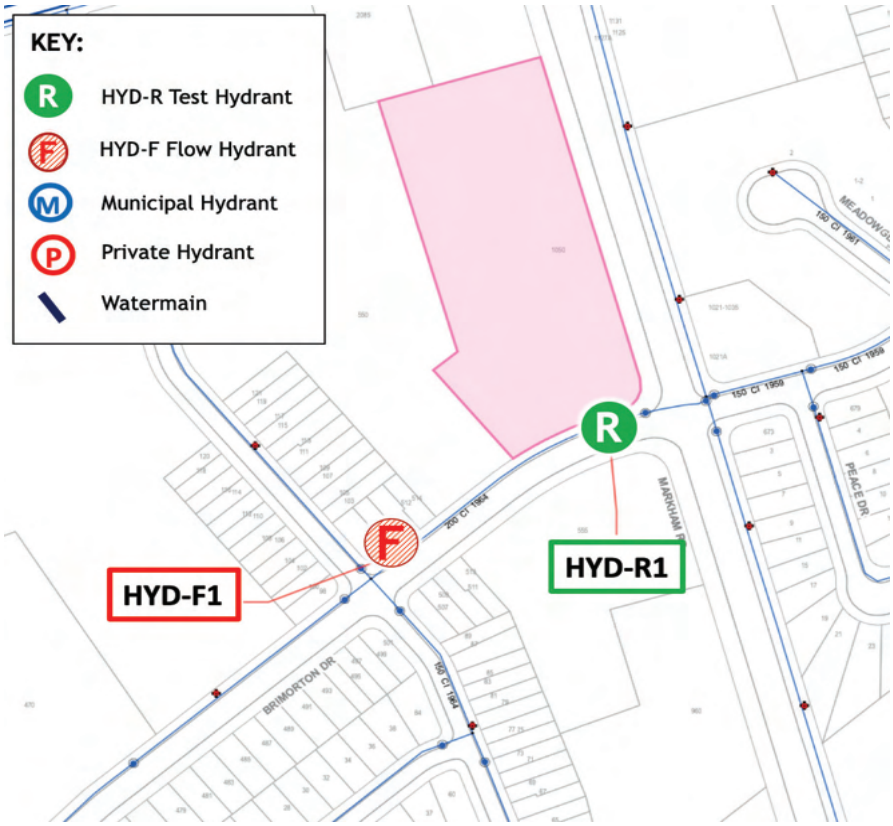
To: Karen Ly
Counterpoint Land Development
by Dillon Consulting Limited
8395 Jane Street, Suite 100
Vaughan, Ontario, Canada, E3E 1K3

RE: Hydrant Flow Test - 1050 Markham Road, Scarborough

Please find the Report for the following works

Scope: Conducted Hydrant Flow Test as per NFPA291 Recommended Practices for Water Flow Testing and Marking of Hydrants.

Hydrant Test Plan



HYDRANT FLOW TEST

TORONTO

DATE: May 17, 2024 12:00 PM

R -TEST HYDRANT	Opp 556 BRIMORTON DRIVE	HYDRANT No.	HYD-R1
HYDRANT MODEL:	CENTURY	COLOUR:	BLUE
STATIC PRESSURE psi (hr-20^0.54):	**67**	VARIANCE:	10.45%
Q - FLOW HYDRANT	510 BRIMORTON DRIVE	HYDRANT No.	HYD-F1
HYDRANT MODEL:	CENTURY	COLOUR:	BLUE

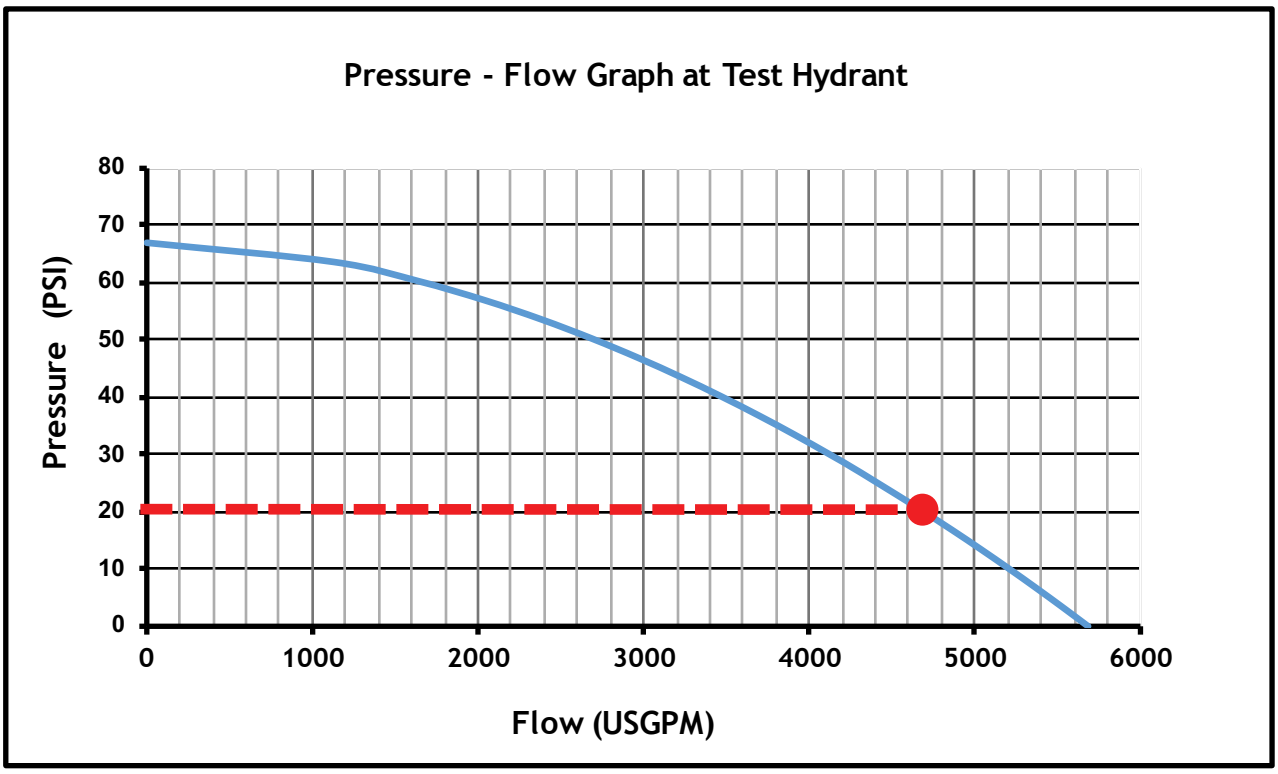
No. Outlets	Residual Pressure (hf-R^0.54)	Orifice Dia Dia. (in.) (d^2)	Coefficient	Nozzle PSI $(\sqrt{psi})$	Q = Flow (USGPM) $Q = 29.84\,(c)\,(d2)\,(\sqrt{psi})$
1	63	2.5	0.9	50	1187
2	60	2.5	0.9	25	839
			Q_F = Total Flow (USGPM)		1679

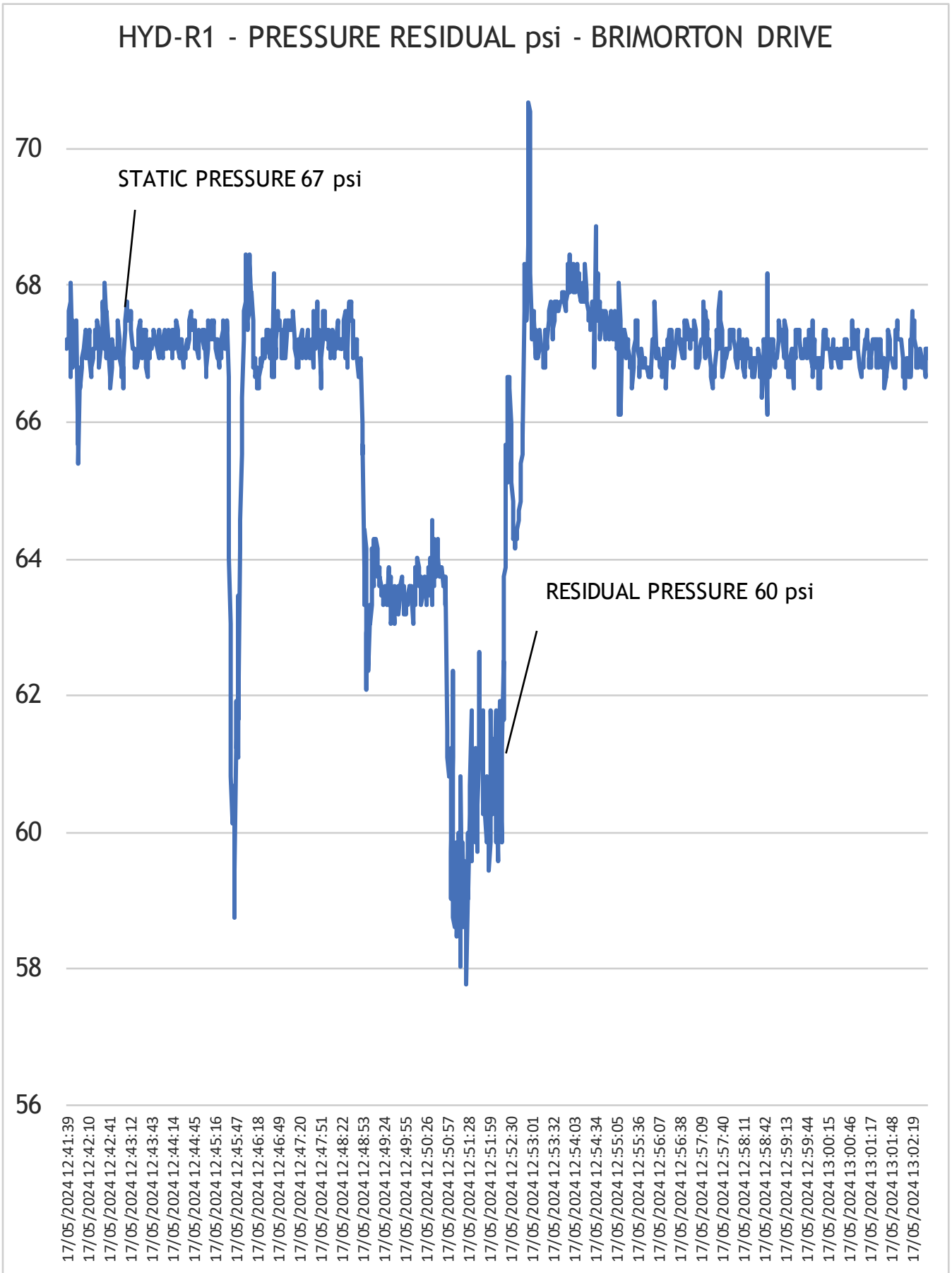
Q_R = flow predicted @ 20 psi

$Q_R = Q_F * (H_r - 20^{\wedge 0.54}) / (H_f - R^{\wedge 0.54})$

4694	USGPM
296	L/s

NFPA Rating: **CLASS AA - BLUE**




HYD-R1 - PRESSURE RESIDUAL psi - BRIMORTON DRIVE
70
68
66
64
62
60
58
56
STATIC PRESSURE 67 psi
RESIDUAL PRESSURE 60 psi
17/05/2024 12:41:39
17/05/2024 12:42:10
17/05/2024 12:42:41
17/05/2024 12:43:12
17/05/2024 12:43:43
17/05/2024 12:44:14
17/05/2024 12:44:45
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17/05/2024 12:51:59
17/05/2024 12:52:30
17/05/2024 12:53:01
17/05/2024 12:53:32
17/05/2024 12:54:03
17/05/2024 12:54:34
17/05/2024 12:55:05
17/05/2024 12:55:36
17/05/2024 12:56:07
17/05/2024 12:56:38
17/05/2024 12:57:09
17/05/2024 12:57:40
17/05/2024 12:58:11
17/05/2024 12:58:42
17/05/2024 12:59:13
17/05/2024 12:59:44
17/05/2024 13:00:15
17/05/2024 13:00:46
17/05/2024 13:01:17
17/05/2024 13:01:48
17/05/2024 13:02:19

Test Conclusion

The system at the time of testing produced an approximate projected flow rate of:

	Total Flow USGPM	Predicted Flow USGPM at 20 psi
BRIMORTON DRIVE	1679	4694

Hydrants are classified in accordance with their rated capacities as per NFPA291.

COLOUR	CLASS	Available Flow @ 20psi
BLUE	**AA**	**1500 GPM or more**
GREEN	A	1000 – 1499 GPM
ORANGE	B	500 – 999 GPM
RED	C	Below 500 GPM

We strongly feel that all attempts have been made to ensure that the required data as stipulated was captured, stored and presented in an accurate, efficient and timely manner for the required period.

We look forward to working with you in the future.

Please feel free to contact the undersigned should you require any further information.

Best Regards

Rob Gamache E.P
Manager of Operations
Hydrant Testing Ontario
Info@HTOntario.ca

MCW Consultants Ltd.

Queen's Quay Terminal
207 Queen's Quay West,
Suite 615
Toronto, Ontario M5J 1A7

Phone (416) 598-2920
Fax (416) 598-5394
Internet: www.mcw.com

June 14, 2024

City of Toronto
Engineering and Construction Services
c/o Manager, Development Engineering
North York Civic Centre, 4th Floor
5100 Yonge St.
Toronto, ON, M2N 5V7

Attention Chief Engineer and Executive Director, Engineering and Construction Services
c/o Manager, Development Engineering

c.c.: General Manager, Toronto Water
c/o Manager, Environmental Monitoring and Protection Unit
30 Dee Ave, Toronto, ON, M9N 1S9

Dear Sir or Madam,

Re: 1050 Markham Road, Scarborough
MCW Project No. 24074-01

This letter is to confirm that the new proposed above and below grade structures, namely Buildings A and B, will be designed with a fully automatic and supervised fire sprinkler system conforming to NFPA 13 and FUS 2020 requirements.

The water supply will be standard for both sprinkler and fire standpipe systems required as per the "Water Supply for Public Fire Protection 2020". Therefore a 50% reduction in the calculations for the required fire flows is appropriate.

We trust the above is to your approval.

Yours truly,
MCW Consultants Ltd.

Jorge Perez-Stone, P. Eng., LEED®AP

c.c. Tejas Bhatt <t.bhatt@capreit.net>
Shawni LO <s.lo@capreit.net>
Tina Fang <t.fang@capreit.net>
Ly, Karen <kly@counterpointeng.com>
Peera Butrsingkorn <Peera@mcw.com>
Jonathan Marrone <JMarrone@mcw.com>

June 7th, 2024

Project: **1050 Markham Rd, Toronto**
Re: **ZBA Submission: Code Compliance Commitment**

To Whom it May Concern,

This letter is to confirm that the two new buildings proposed at 1050 Markham Rd will be designed and constructed of noncombustible construction in compliance with subsection 3.1.5 of the Ontario Building Code.

At 15 and 37 storeys, the buildings will be designed in accordance with section 3.2.2.42. Group C, Any Height, Any Area, Sprinklered. As such, all structural elements, walls, and floors will be designed and constructed with a minimum 2-hour fire resistance rating.

Vertical shafts will be designed and constructed with a minimum fire separation of 1-hour fire-resistance rating per subsection 3.6.3.1. of the Ontario Building Code.

If you should have any further questions or require additional information, please contact this office at your convenience.

Sincerely,

Wallman Architects
Michael Panacci
416-340-1870 ext 227

Per Rudy Wallman, OAA

APPENDIX ‘C’

Counterpoint Engineering Inc.

Existing Conditions

Project: 1050 Markham Road
Project No: 24000
Location: Toronto
Site Area: 0.502 ha

City of Toronto Sanitary Guidelines

Average Flow		
Residential	240	litres/person/day
Commercial	180000	litres/floor ha/day
Infiltration	0.26	litres/second/ha

Residential Population Criteria		
1B/Studio	1.4	ppu
2B	2.1	ppu
3B	3.1	ppu
Single Detached	3.5	ppu
Semi-Detached	2.7	ppu
Townhouse	2.7	ppu
Office	3.3	pp/100m^2

	Residential Units					Commercial
	1B/Studio	2B/2B+D	3B/3B+D	Single Detached	Total Units	Area (m^2)
Existing Building	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0

	Population Density 1B/ Studio	Population Density 2B/2B+D	Population Density 3B/3B+D	Population Density Single Detached	TOTAL POPULATION	Average Flow (l/day)	l/s
Residential	0	0	0	0	0	0	0.00

	Area (m^2)	Average Flow (l/day)	l/s
Commercial Area	0.00	0	0.00

Harmon Peaking Factor

Total Population	Harmon Peak Factor
0	**4.00**

Commercial Peak Sanitary Flow	0.00	**l/s**
Residential Peak Sanitary Flow	0.00	**l/s**
Total Sanitary Flow	0.00	**l/s**
Infiltration	0.13	**l/s**
Total Existing Peak Flow	**0.13**	**l/s**

Counterpoint Engineering Inc.

Proposed Conditions

Project: 1050 Markham Road
Project No: 24000
Location: Toronto
Site Area: 0.502 ha

City of Toronto Sanitary Guidelines

Average Flow		
Residential	240	litres/person/day
Commercial	180000	litres/floor ha/day
Infiltration	0.26	litres/second/ha

Residential Population Criteria		
1B/Studio	1.4	ppu
2B	2.1	ppu
3B	3.1	ppu
4B	3.7	ppu
Semi-Detached	2.7	ppu
Townhouse	2.7	ppu
Office	3.3	pp/100m^2

	Residential Units					Commercial
	1B/Studio	2B/2B+D	3B/3B+D	4B/4B+D	Total Units	Area (m^2)
Building A	304	89	45	-	438	-
Building B	146	32	19	-	197	-
TOTAL	450	121	64	0	635	0

	Population Density 1B/ Studio	Population Density 2B/2B+D	Population Density 3B/3B+D	Population Density 4B/4B+D	TOTAL POPULATION	Average Flow (l/day)	l/s
Residential	630	255	199	0	1084	260160	3.01

	Area (m^2)	Average Flow (l/day)	l/s
Commercial Area	0.00	0	0.00

Harmon Peaking Factor

Total Population	Harmon Peak Factor
1084	**3.78**

Commercial Peak Sanitary Flow	0.00	**l/s**
Residential Peak Sanitary Flow	11.37	**l/s**
Total Sanitary Flow	11.37	**l/s**
Infiltration	0.13	**l/s**
Total Existing Peak Flow	**11.50**	**l/s**

LEGEND

SUBJECT SITE DEVELOPMENT

NEW DEVELOPMENT APPLICATIONS AFTER LATEST MODEL UPDATE/EA STUDY

N

counterpoint ENGINEERING
COUNTERPOINT ENGINEERING INC.
8395 Jane St., Suite 100, Vaughan, ON L4K 5Y2 Phone 905.326.1404 Fax 905.326.1405

CAPREIT
1050 MARKHAM ROAD
TORONTO, ONTARIO

SANITARY MODELING PLAN

DESIGNED BY: NJ	DATE: JUNE 2024
CHECKED BY: RK	PROJECT No. 24000
DRAWING BY: NJ	
CHECKED BY: RK	FIGURE No. C1
SCALE: NTS	

SANITARY DESIGN CALCULATIONS
Table C1: InfoWorks Model Results (Scenario 1 Pre-Develoment Condition_Dry Weather)

Project Name: 1050 Markham Rd — The Site Connection Pipe — **Prepared by:** N.J.
Municipality: Toronto — **Checked by:** R.K.
Project No.: 24000 — **Model Area #** 60
Date: June 17, 2024

Surcharged by Depth
Surcharged by Flow

HGL Freeboard < 1.8m
Flooding Manhole

Pipe ID	Cond. Height (mm)	Cond. Length (m)	US Inv (m)	DS Inv (m)	Gradient (m/m)	Capacity (m^3/s)	Max. Surcharge State	Max._US_Total Head (m)	Max._US_FLOW (m^3/s)	US_ Ground El. (m)	US_Freeboard (m)
MH4796626401.1	250	60.4	154.491	154.037	0.008	0.052	0.32	154.570	0.0104	158.670	4.100
MH4792726355.1	250	75.6	153.897	153.4	0.007	0.048	0.33	153.979	0.0106	157.159	3.180
MH4787926297.1	250	93	151.903	151.44	0.005	0.039	0.46	152.016	0.0158	156.589	4.573
MH4795026237.1	250	83.7	151.44	151.019	0.005	0.039	0.46	151.555	0.0164	155.928	4.373
MH4801426184.1	250	42.5	150.928	150.653	0.006	0.044	0.43	151.035	0.0164	155.455	4.420
MH4805526171.1	250	14.6	149.34	149.288	0.004	0.033	0.61	149.498	0.0223	155.680	6.182
CN3534.1	250	77.2	149.288	149.012	0.004	0.033	0.61	149.441	0.0223	155.727	6.286
CN3531.1	250	3.1	149.012	149.001	0.004	0.033	0.61	149.164	0.0223	156.101	6.937
MH4814626144.1	250	43.2	149.001	148.827	0.004	0.035	0.60	149.152	0.0232	156.077	6.925
CN3530.1	250	50.5	148.827	148.624	0.004	0.035	0.60	148.978	0.0232	155.673	6.695
MH4823626118.1	350	51.9	148.611	148.352	0.005	0.096	0.35	148.734	0.0245	155.614	6.880
MH4827526084.1	350	80.7	148.203	147.916	0.004	0.081	0.43	148.355	0.0309	155.571	7.216
MH4835426065.1	350	88.7	147.901	147.587	0.004	0.081	0.45	148.057	0.0325	155.715	7.658
MH4844026045.1	350	63.2	147.557	147.31	0.004	0.085	0.43	147.709	0.0325	155.411	7.702
MH4850226031.1	350	5.9	147.264	145.771	0.253	0.681	0.18	147.326	0.0325	149.878	2.552

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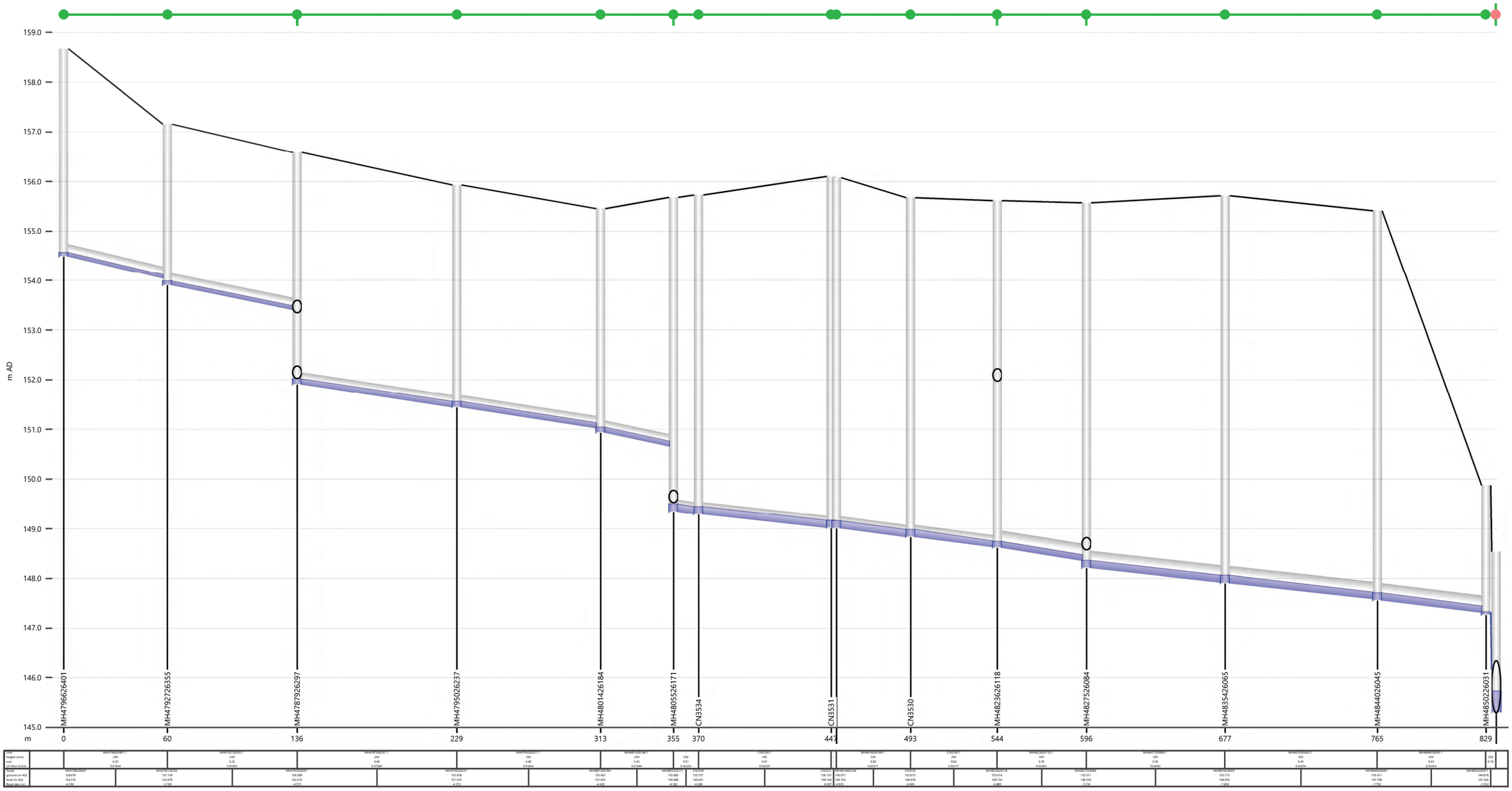

Section for Network - 2024-05 CPE Existing Conditions at 2000/01/01 12:15:00

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SANITARY DESIGN CALCULATIONS
Table C2: InfoWorks Model Results (Scenario 2 Pre-Development_Extreme Condition; May 12, 2000 Storm Event)

Project Name: 1050 Markham Rd
Municipality: Toronto
Project No.: 24000
Date: June 17, 2024

The Site Connection Pipe

Prepared by: N.J.
Checked by: R.K.
Model Area # 60

Surcharged by Depth
Surcharged by Flow

HGL Freeboard < 1.8m
Flooding Manhole

Pipe ID	Cond. Height (mm)	Cond. Length (m)	US Inv (m)	DS Inv (m)	Gradient (m/m)	Capacity (m^3/s)	Max. Surcharge State	Max._US_Total Head (m)	Max._US_FLOW (m^3/s)	US_ Ground El. (m)	US_Freeboard (m)
MH4796626401.1	250	60.4	154.491	154.037	0.008	0.052	1.00	156.775	0.0113	158.670	1.895
MH4792726355.1	250	75.6	153.897	153.4	0.007	0.048	1.00	156.769	0.0124	157.159	0.390
MH4787926297.1	250	93	151.903	151.44	0.005	0.039	2.00	156.757	0.0507	156.589	-0.168
MH4795026237.1	250	83.7	151.44	151.019	0.005	0.039	2.00	156.043	0.0514	155.928	-0.115
MH4801426184.1	250	42.5	150.928	150.653	0.006	0.044	2.00	155.354	0.0515	155.455	0.101
MH4805526171.1	250	14.6	149.34	149.288	0.004	0.033	2.00	154.995	0.0895	155.680	0.685
CN3534.1	250	77.2	149.288	149.012	0.004	0.033	2.00	154.595	0.0896	155.727	1.132
CN3531.1	250	3.1	149.012	149.001	0.004	0.033	2.00	152.988	0.0896	156.101	3.113
MH4814626144.1	250	43.2	149.001	148.827	0.004	0.035	2.00	152.916	0.0902	156.077	3.161
CN3530.1	250	50.5	148.827	148.624	0.004	0.035	2.00	151.944	0.0904	155.673	3.729
MH4823626118.1	350	51.9	148.611	148.352	0.005	0.096	1.00	150.816	0.0931	155.614	4.798
MH4827526084.1	350	80.7	148.203	147.916	0.004	0.081	2.00	150.563	0.1477	155.571	5.008
MH4835426065.1	350	88.7	147.901	147.587	0.004	0.081	2.00	149.547	0.1507	155.715	6.168
MH4844026045.1	350	63.2	147.557	147.31	0.004	0.085	2.00	148.415	0.1506	155.411	6.996
MH4850226031.1	350	5.9	147.264	145.771	0.253	0.681	1.00	147.396	0.1506	149.878	2.482

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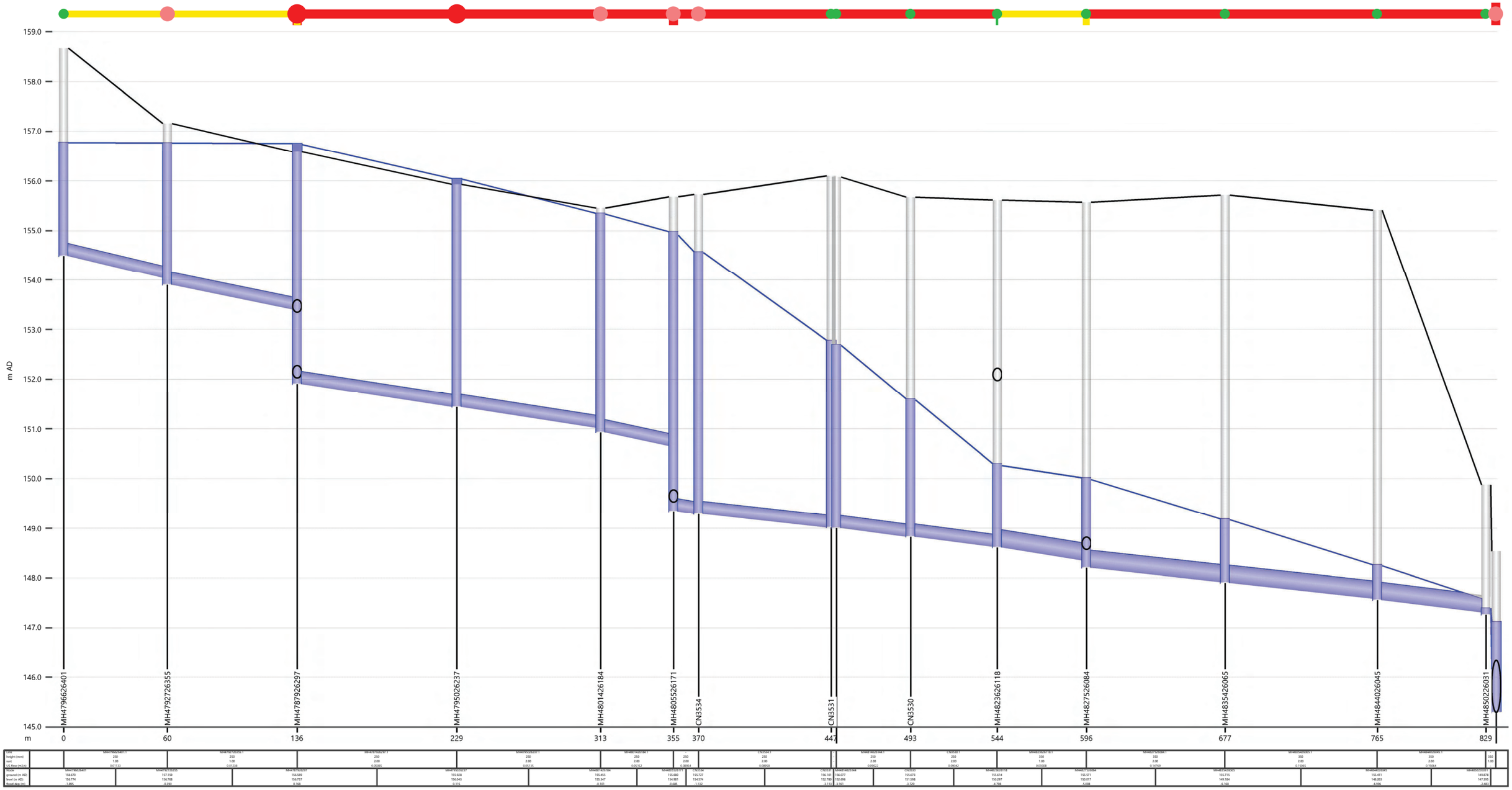

Section for Network - 2024-05 CPE Existing Conditions at 2000/05/13 00:52:30

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SANITARY DESIGN CALCULATIONS
Table C3: InfoWorks Model Results (Scenario 3 Post-Develoment Condition_Dry Weather)

Project Name: 1050 Markham Rd — The Site Connection Pipe — **Prepared by:** N.J.
Municipality: Toronto — **Checked by:** R.K.
Project No.: 24000 — **Model Area #** 60
Date: June 17, 2024

Surcharged by Depth
Surcharged by Flow

HGL Freeboard < 1.8m
Flooding Manhole

Pipe ID	Cond. Height (mm)	Cond. Length (m)	US Inv (m)	DS Inv (m)	Gradient (m/m)	Capacity (m^3/s)	Max. Surcharge State	Max._US_Total Head (m)	Max._US_FLOW (m^3/s)	US_ Ground El. (m)	US_Freeboard (m)
MH4796626401.1	250	60.4	154.491	154.037	0.008	0.052	0.46	154.607	0.0220	158.670	4.063
MH4792726355.1	250	75.6	153.897	153.4	0.007	0.048	0.48	154.018	0.0221	157.159	3.141
MH4787926297.1	250	93	151.903	151.44	0.005	0.039	0.64	152.067	0.0273	156.589	4.522
MH4795026237.1	250	83.7	151.44	151.019	0.005	0.039	0.63	151.599	0.0279	155.928	4.329
MH4801426184.1	250	42.5	150.928	150.653	0.006	0.044	0.58	151.076	0.0279	155.455	4.379
MH4805526171.1	250	14.6	149.34	149.288	0.004	0.033	2.00	149.629	0.0338	155.680	6.051
CN3534.1	250	77.2	149.288	149.012	0.004	0.033	2.00	149.542	0.0338	155.727	6.185
CN3531.1	250	3.1	149.012	149.001	0.004	0.033	0.89	149.237	0.0338	156.101	6.864
MH4814626144.1	250	43.2	149.001	148.827	0.004	0.035	0.87	149.222	0.0347	156.077	6.855
CN3530.1	250	50.5	148.827	148.624	0.004	0.035	0.81	149.032	0.0347	155.673	6.641
MH4823626118.1	350	51.9	148.611	148.352	0.005	0.096	0.43	148.761	0.0360	155.614	6.853
MH4827526084.1	350	80.7	148.203	147.916	0.004	0.081	0.52	148.385	0.0423	155.571	7.186
MH4835426065.1	350	88.7	147.901	147.587	0.004	0.081	0.53	148.087	0.0439	155.715	7.628
MH4844026045.1	350	63.2	147.557	147.31	0.004	0.085	0.51	147.737	0.0439	155.411	7.674
MH4850226031.1	350	5.9	147.264	145.771	0.253	0.681	0.20	147.334	0.0439	149.878	2.544

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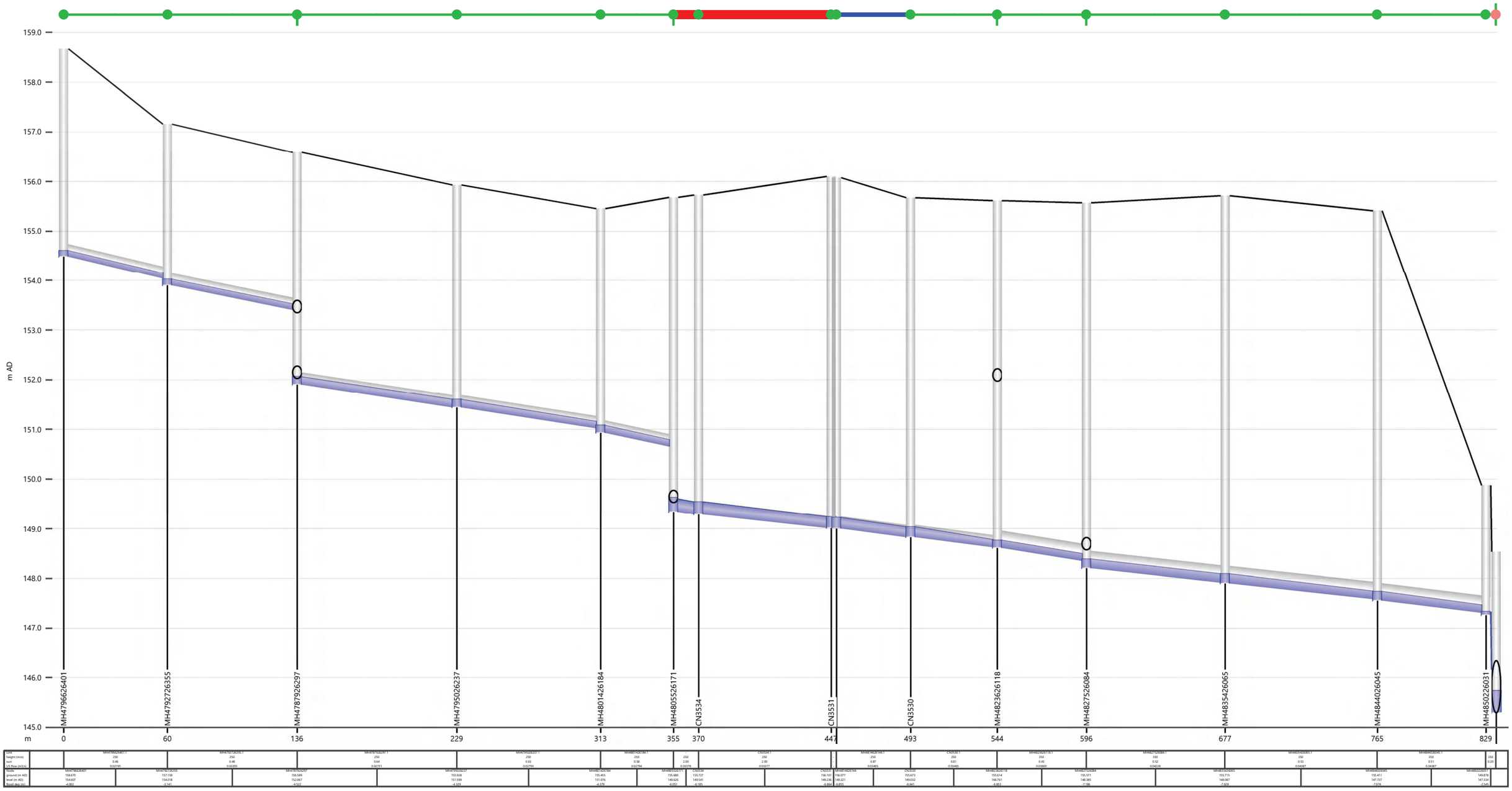

Section for Network - 2024-05 CPE Proposed Conditions at 2000/01/01 11:55:00

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SANITARY DESIGN CALCULATIONS
Table C4: InfoWorks Model Results (Scenario 4 Post-Development_Extreme Condition; May 12, 2000 Storm Event)

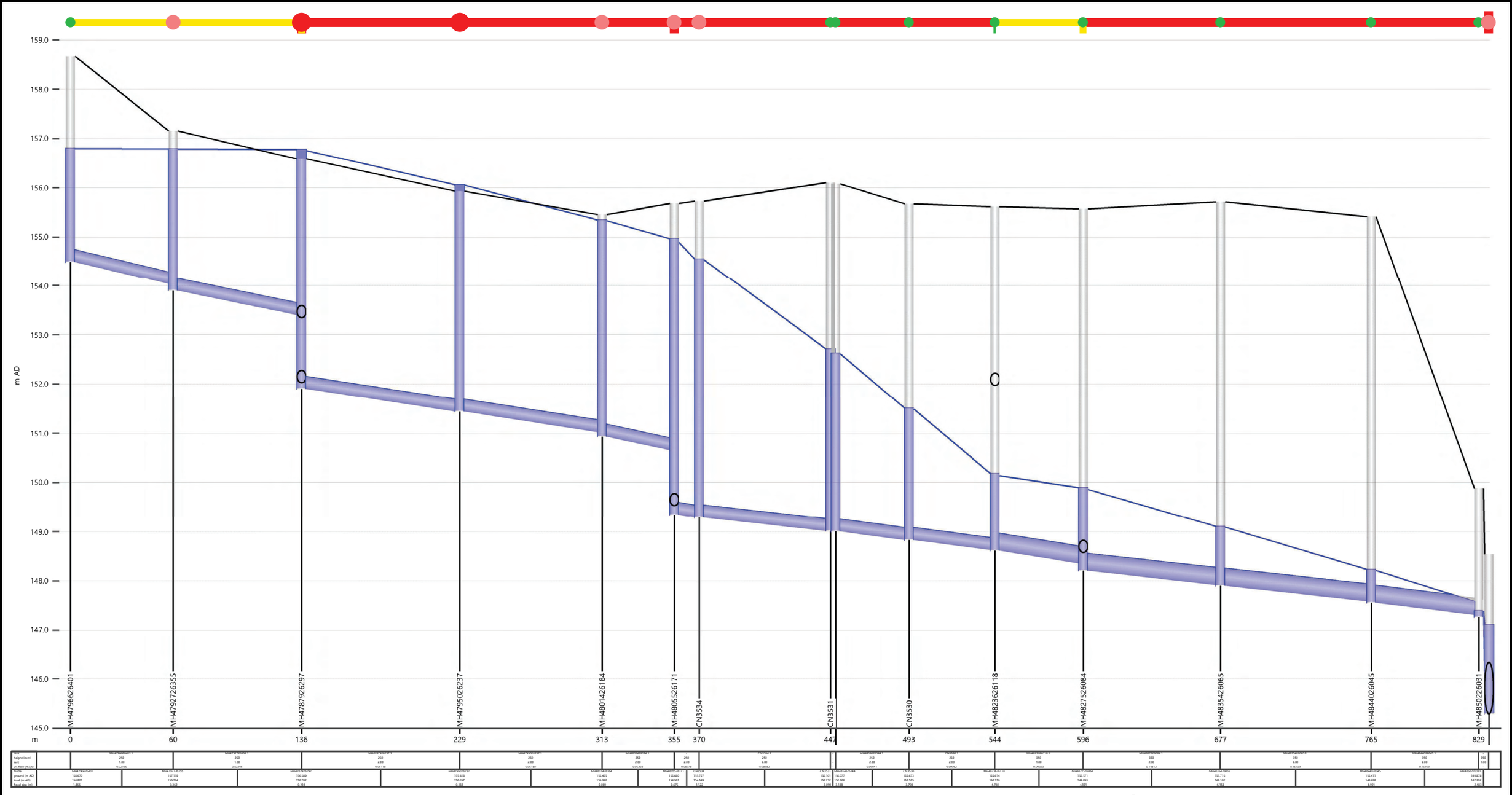
Project Name: 1050 Markham Rd — The Site Connection Pipe
Municipality: Toronto
Project No.: 24000
Date: June 17, 2024

Prepared by: N.J.
Checked by: R.K.
Model Area # 60

Surcharged by Depth
Surcharged by Flow

HGL Freeboard < 1.8m
Flooding Manhole

Pipe ID	Cond. Height (mm)	Cond. Length (m)	US Inv (m)	DS Inv (m)	Gradient (m/m)	Capacity (m^3/s)	Max. Surcharge State	Max._US_Total Head (m)	Max._US_FLOW (m^3/s)	US_ Ground El. (m)	US_Freeboard (m)
MH4796626401.1	250	60.4	154.491	154.037	0.008	0.052	1.00	156.804	0.0220	158.670	1.866
MH4792726355.1	250	75.6	153.897	153.4	0.007	0.048	1.00	156.796	0.0225	157.159	0.363
MH4787926297.1	250	93	151.903	151.44	0.005	0.039	2.00	156.783	0.0512	156.589	-0.194
MH4795026237.1	250	83.7	151.44	151.019	0.005	0.039	2.00	156.059	0.0518	155.928	-0.131
MH4801426184.1	250	42.5	150.928	150.653	0.006	0.044	2.00	155.366	0.0520	155.455	0.089
MH4805526171.1	250	14.6	149.34	149.288	0.004	0.033	2.00	155.005	0.0898	155.680	0.675
CN3534.1	250	77.2	149.288	149.012	0.004	0.033	2.00	154.605	0.0898	155.727	1.122
CN3531.1	250	3.1	149.012	149.001	0.004	0.033	2.00	153.011	0.0899	156.101	3.090
MH4814626144.1	250	43.2	149.001	148.827	0.004	0.035	2.00	152.939	0.0904	156.077	3.138
CN3530.1	250	50.5	148.827	148.624	0.004	0.035	2.00	151.965	0.0906	155.673	3.708
MH4823626118.1	350	51.9	148.611	148.352	0.005	0.096	1.00	150.834	0.0932	155.614	4.780
MH4827526084.1	350	80.7	148.203	147.916	0.004	0.081	2.00	150.580	0.1481	155.571	4.991
MH4835426065.1	350	88.7	147.901	147.587	0.004	0.081	2.00	149.559	0.1511	155.715	6.156
MH4844026045.1	350	63.2	147.557	147.31	0.004	0.085	2.00	148.420	0.1511	155.411	6.991
MH4850226031.1	350	5.9	147.264	145.771	0.253	0.681	1.00	147.396	0.1511	149.878	2.482



Section for Network - 2024-05 CPE Proposed Conditions at 2000/05/13 00:57:30

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SANITARY DESIGN CALCULATIONS
Table C5: InfoWorks Model Results (Scenario 5 Post-Development Condition with Pipe Upgrades ; Dry Weather)

Project Name: 4610 Finch Ave E
Municipality: Toronto
Project No.: 248256
Date: June 17, 2024

The Site Connection Pipe
Pipe Upsized

Surcharged by Depth
Surcharged by Flow

Prepared by: N.J.
Checked by: R.K.
Model Area # 60

HGL Freeboard < 1.8m
Flooding Manhole

Pipe ID	Cond. Height (mm)	Cond. Length (m)	US Inv (m)	DS Inv (m)	Gradient (m/m)	Capacity (m^3/s)	Max. Surcharge State	Max._US_Total Head (m)	Max._US_FLOW (m^3/s)	US_ Ground El. (m)	US_Freeboard (m)
MH4796626401.1	250	60.4	154.491	154.037	0.008	0.052	0.46	154.607	0.0220	158.670	4.063
MH4792726355.1	250	75.6	153.897	153.4	0.007	0.048	0.48	154.018	0.0221	157.159	3.141
MH4787926297.1	250	93	151.903	151.44	0.005	0.039	0.64	152.067	0.0273	156.589	4.522
MH4795026237.1	250	83.7	151.44	151.019	0.005	0.039	0.63	151.599	0.0279	155.928	4.329
MH4801426184.1	250	42.5	150.928	150.653	0.006	0.044	0.58	151.076	0.0279	155.455	4.379
MH4805526171.1	250	14.6	149.34	149.288	0.004	0.033	0.95	149.600	0.0338	155.680	6.080
CN3534.1	250	77.2	149.288	149.012	0.004	0.033	0.91	149.518	0.0338	155.727	6.209
CN3531.1	250	3.1	149.012	149.001	0.004	0.033	0.67	149.181	0.0338	156.101	6.920
MH4814626144.1	350	43.2	149.001	148.827	0.004	0.086	0.45	149.157	0.0347	156.077	6.920
CN3530.1	350	50.5	148.827	148.624	0.004	0.086	0.45	148.983	0.0347	155.673	6.690
MH4823626118.1	350	51.9	148.611	148.352	0.005	0.096	0.43	148.761	0.0360	155.614	6.853
MH4827526084.1	350	80.7	148.203	147.916	0.004	0.081	0.52	148.385	0.0423	155.571	7.186
MH4835426065.1	350	88.7	147.901	147.587	0.004	0.081	0.53	148.087	0.0439	155.715	7.628
MH4844026045.1	350	63.2	147.557	147.31	0.004	0.085	0.51	147.737	0.0439	155.411	7.674
MH4850226031.1	350	5.9	147.264	145.771	0.253	0.681	0.20	147.334	0.0439	149.878	2.544

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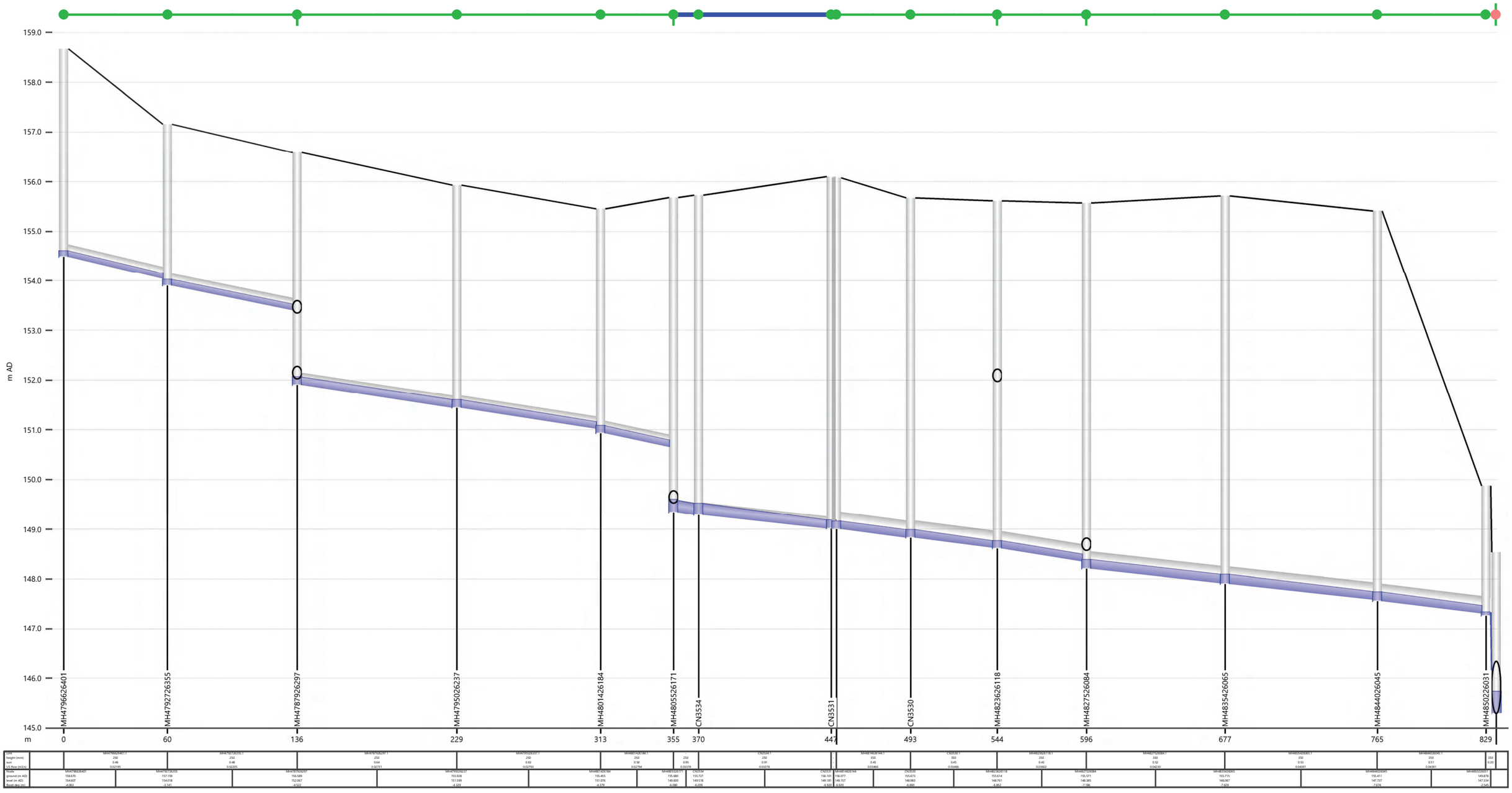

Section for Network - 2024-05 CPE Proposed Conditions + Upgrades at 2000/01/01 12:02:30

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SANITARY DESIGN CALCULATIONS
Table C6: InfoWorks Model Results (Scenario 6 Post-Development Condition with Pipe Upgrades; Dry Weather)

Project Name: 4610 Finch Ave E
Municipality: Toronto
Project No.: 248256
Date: June 17, 2024

The Site Connection Pipe
Pipe Upsized

Surcharged by Depth
Surcharged by Flow

Prepared by: N.J.
Checked by: R.K.
Model Area # 60

HGL Freeboard < 1.8m
Flooding Manhole

Pipe ID	Cond. Height (mm)	Cond. Length (m)	US Inv (m)	DS Inv (m)	Gradient (m/m)	Capacity (m^3/s)	Max. Surcharge State	Max._US_Total Head (m)	Max._US_FLOW (m^3/s)	US_ Ground El. (m)	US_Freeboard (m)
MH4796626401.1	250	60.4	154.491	154.037	0.008	0.052	1.00	156.678	0.0220	158.670	1.992
MH4792726355.1	250	75.6	153.897	153.4	0.007	0.048	1.00	156.670	0.0227	157.159	0.489
MH4787926297.1	250	93	151.903	151.44	0.005	0.039	2.00	156.654	0.0568	156.589	-0.065
MH4795026237.1	250	83.7	151.44	151.019	0.005	0.039	2.00	155.771	0.0575	155.928	0.157
MH4801426184.1	250	42.5	150.928	150.653	0.006	0.044	2.00	154.911	0.0577	155.455	0.544
MH4805526171.1	250	14.6	149.34	149.288	0.004	0.033	2.00	154.460	0.1027	155.680	1.220
CN3534.1	250	77.2	149.288	149.012	0.004	0.033	2.00	153.971	0.1028	155.727	1.756
CN3531.1	250	3.1	149.012	149.001	0.004	0.033	2.00	151.873	0.1029	156.101	4.228
MH4814626144.1	350	43.2	149.001	148.827	0.004	0.086	2.00	151.774	0.1036	156.077	4.303
CN3530.1	350	50.5	148.827	148.624	0.004	0.086	2.00	151.560	0.1040	155.673	4.113
MH4823626118.1	350	51.9	148.611	148.352	0.005	0.096	2.00	151.311	0.1072	155.614	4.303
MH4827526084.1	350	80.7	148.203	147.916	0.004	0.081	2.00	150.986	0.1580	155.571	4.585
MH4835426065.1	350	88.7	147.901	147.587	0.004	0.081	2.00	149.826	0.1608	155.715	5.889
MH4844026045.1	350	63.2	147.557	147.31	0.004	0.085	2.00	148.535	0.1608	155.411	6.876
MH4850226031.1	350	5.9	147.264	145.771	0.253	0.681	1.00	147.418	0.1608	149.878	2.460

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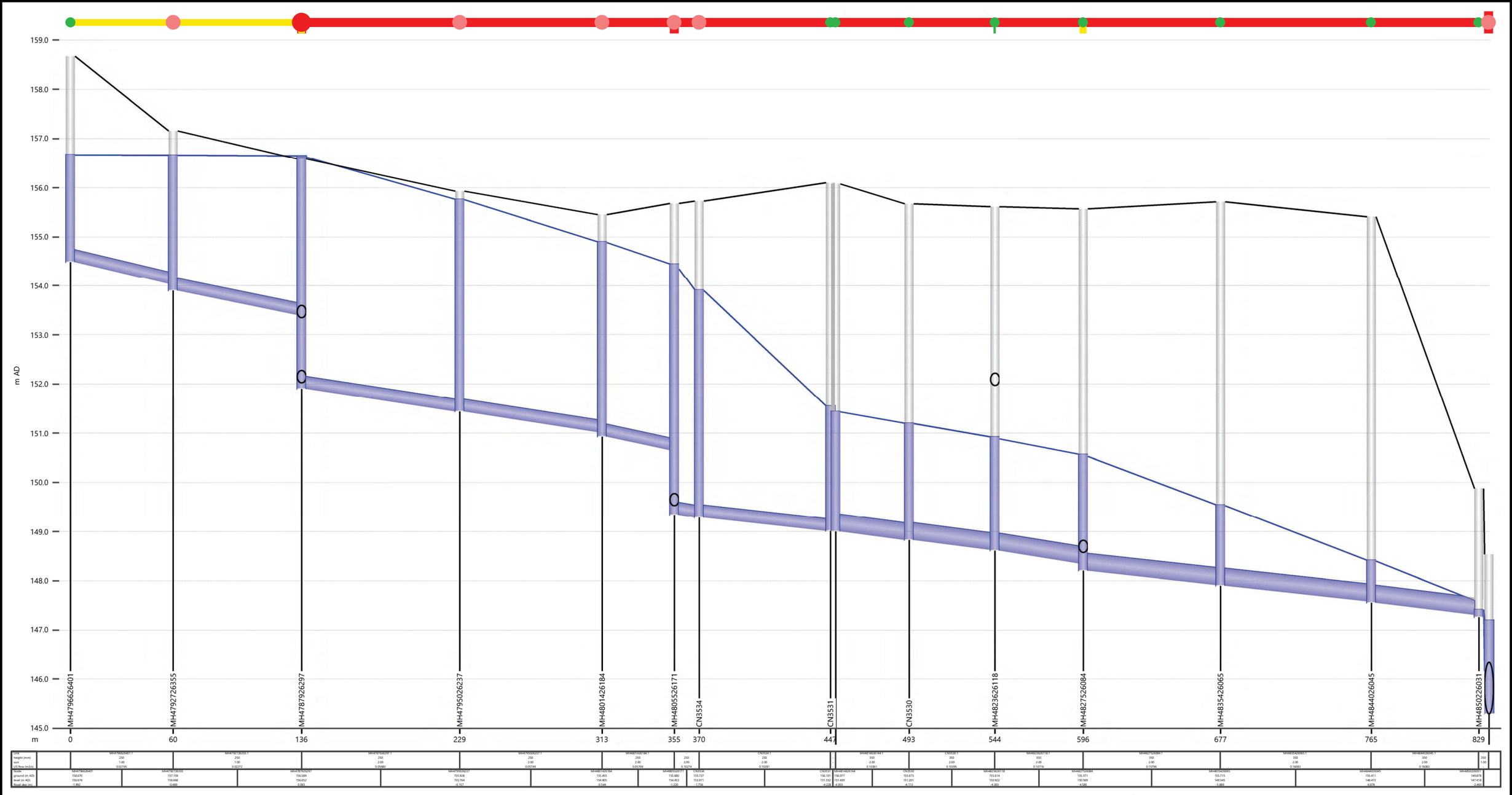

Section for Network - 2024-05 CPE Proposed Conditions + Upgrades at 2000/05/13 00:50:00

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APPENDIX ‘D’

Counterpoint Engineering

Project Name: 1050 Markham Road
Project Number: 24000

Pre-Development Stormwater Flow Rates

Area 100 - To Brimorton Drive

Rational Method - 2 Year Predevelopment

Event:		2	years
ABC's:	A	21.8	
	C	0.78	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.45	
Site Area	A	0.290	ha
Intensity $i=A/(T)^c$	i	88.19	mm/hr
Flow	Q	0.03	m^3/s
$Q=CiA/360$		32.1	l/s

Rational Method - 5 Year Predevelopment

Event:		5	years
ABC's:	A	32	
	C	0.79	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.45	
Site Area	A	0.290	ha
Intensity $i=A/(T)^c$	i	131.79	mm/hr
Flow	Q	0.05	m^3/s
$Q=CiA/360$		47.9	l/s

Rational Method - 10 Year Predevelopment

Event:		10	years
ABC's:	A	38.7	
	C	0.8	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.45	
Site Area	A	0.290	ha
Intensity $i=A/(T)^c$	i	162.27	mm/hr
Flow	Q	0.06	m^3/s
$Q=CiA/360$		59.0	l/s

Rational Method - 25 Year Predevelopment

Event:		25	years
ABC's:	A	45.2	
	C	0.8	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.45	
Site Area	A	0.290	ha
Intensity $i=A/(T)^c$	i	189.52	mm/hr
Flow	Q	0.07	m^3/s
$Q=CiA/360$		68.9	l/s

Rational Method - 50 Year Predevelopment

Event:		50	years
ABC's:	A	53.5	
	C	0.800	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.45	
Site Area	A	0.290	ha
Intensity $i=A/(T)^c$	i	224.32	mm/hr
Flow	Q	0.08	m^3/s
$Q=CiA/360$		81.6	l/s

Rational Method - 100 Year Predevelopment

Event:		100	years
ABC's:	A	59.7	
	C	0.8	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.45	
Site Area	A	0.290	ha
Intensity $i=A/(T)^c$	i	250.32	mm/hr
Flow	Q	0.09	m^3/s
$Q=CiA/360$		91.1	l/s

Counterpoint Engineering

Project Name: 1050 Markham Road
Project Number: 24000

Pre-Development Stormwater Flow Rates

Area 101 - To Brimorton Drive

Rational Method - 2 Year Predevelopment

Event:		2	years
ABC's:	A	21.8	
	C	0.78	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.30	
Site Area	A	0.183	ha
Intensity $i=A/(T)^c$	i	88.19	mm/hr
Flow	Q	0.01	m^3/s
Q=CiA/360		13.6	l/s

Rational Method - 5 Year Predevelopment

Event:		5	years
ABC's:	A	32	
	C	0.79	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.30	
Site Area	A	0.183	ha
Intensity $i=A/(T)^c$	i	131.79	mm/hr
Flow	Q	0.02	m^3/s
Q=CiA/360		20.3	l/s

Rational Method - 10 Year Predevelopment

Event:		10	years
ABC's:	A	38.7	
	C	0.8	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.30	
Site Area	A	0.183	ha
Intensity $i=A/(T)^c$	i	162.27	mm/hr
Flow	Q	0.03	m^3/s
Q=CiA/360		25.0	l/s

Rational Method - 25 Year Predevelopment

Event:		25	years
ABC's:	A	45.2	
	C	0.8	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.30	
Site Area	A	0.183	ha
Intensity $i=A/(T)^c$	i	189.52	mm/hr
Flow	Q	0.03	m^3/s
Q=CiA/360		29.2	l/s

Rational Method - 50 Year Predevelopment

Event:		50	years
ABC's:	A	53.5	
	C	0.800	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.30	
Site Area	A	0.183	ha
Intensity $i=A/(T)^c$	i	224.32	mm/hr
Flow	Q	0.03	m^3/s
Q=CiA/360		34.6	l/s

Rational Method - 100 Year Predevelopment

Event:		100	years
ABC's:	A	59.7	
	C	0.8	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.30	
Site Area	A	0.183	ha
Intensity $i=A/(T)^c$	i	250.32	mm/hr
Flow	Q	0.04	m^3/s
Q=CiA/360		38.6	l/s

Counterpoint Engineering

Project Name: 1050 Markham Road
Project Number: 24000

Pre-Development Stormwater Flow Rates

Area 102 - To Markham Road

Rational Method - 2 Year Predevelopment

Event:		2	years
ABC's:	A	21.8	
	C	0.78	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.25	
Site Area	A	0.042	ha
Intensity $i=A/(T)^c$	i	88.19	mm/hr
Flow	Q	0.00	m^3/s
Q=CiA/360		2.6	l/s

Rational Method - 5 Year Predevelopment

Event:		5	years
ABC's:	A	32	
	C	0.79	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.25	
Site Area	A	0.042	ha
Intensity $i=A/(T)^c$	i	131.79	mm/hr
Flow	Q	0.00	m^3/s
Q=CiA/360		3.8	l/s

Rational Method - 10 Year Predevelopment

Event:		10	years
ABC's:	A	38.7	
	C	0.8	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.25	
Site Area	A	0.042	ha
Intensity $i=A/(T)^c$	i	162.27	mm/hr
Flow	Q	0.00	m^3/s
Q=CiA/360		4.7	l/s

Rational Method - 25 Year Predevelopment

Event:		25	years
ABC's:	A	45.2	
	C	0.8	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.25	
Site Area	A	0.042	ha
Intensity $i=A/(T)^c$	i	189.52	mm/hr
Flow	Q	0.01	m^3/s
Q=CiA/360		5.5	l/s

Rational Method - 50 Year Predevelopment

Event:		50	years
ABC's:	A	53.5	
	C	0.800	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.25	
Site Area	A	0.042	ha
Intensity $i=A/(T)^c$	i	224.32	mm/hr
Flow	Q	0.01	m^3/s
Q=CiA/360		6.5	l/s

Rational Method - 100 Year Predevelopment

Event:		100	years
ABC's:	A	59.7	
	C	0.8	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.25	
Site Area	A	0.042	ha
Intensity $i=A/(T)^c$	i	250.32	mm/hr
Flow	Q	0.01	m^3/s
Q=CiA/360		7.3	l/s

counterpoint engineering

Allowable Release Rate Calculation

Project No: 1050 Markham Road
Project Name: 24000

Area 100 - To Brimorton Drive

Event:		2	years
ABC's:	a	21.8	
	b	0	
	c	0.78	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.45	*Maximum C=0.50
Site Area	A	0.290	ha
Intensity $i=a/(t+b)^c$	i	88.19	mm/hr
Flow Q=CiA/360	Q	0.03	m^3/s
		32.1	l/s

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Allowable Release Rate Calculation

Project No: 1050 Markham Road
Project Name: 24000

Area 101 - To Brimorton Drive

Event:		2	years
ABC's:	a	21.8	
	b	0	
	c	0.78	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.30	*Maximum C=0.50
Site Area	A	0.183	ha
Intensity $i=a/(t+b)^c$	i	88.19	mm/hr
Flow Q=CiA/360	Q	0.01	m^3/s
		13.6	l/s

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Allowable Release Rate Calculation

Project No: 1050 Markham Road
Project Name: 24000

Area 102 - To Markham Road

Event:		2	years
ABC's:	a	21.8	
	b	0	
	c	0.78	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.25	*Maximum C=0.50
Site Area	A	0.042	ha
Intensity $i=a/(t+b)^c$	i	88.19	mm/hr
Flow Q=CiA/360	Q	0.00	m^3/s
		2.6	l/s

counterpoint engineering

Project Name: 1050 Markham Road
Project Number: 24000

Quantity Control Calculations

Rainfall Data			
Location:	City of Toronto	a	59.7
Event	100-year	b	0
		c	0.80

Proposed Stormwater Management Summary

Area ID	Area (ha)	Runoff Coefficient	t_c (min)	Storage Available (m^3)	Storage Required (m^3)	Release Rate (l/s)	Allowable (l/s)	Description	Orifice Release rate (l/s)	Size
Building A										
201+EXT-1	0.235	0.82	10	TBD	98	5.0	13.6	Controlled	5.0	50mm LMF Tempest Vortex Unit
201A	0.015	0.81	10			8.6		Uncontrolled		
Building A Total						**13.6**	**13.6**			
Building B										
200	0.280	0.83	10	TBD	83	24.1	32.1	Controlled	24.1	80mm Orifice Plate
200A	0.010	0.81	10			5.7		Uncontrolled		
Builting B Total						**29.9**	**32.1**			
Total to Brimorton Drive						**43.5**	**45.7**			
202	0.005	0.68	10			2.5	2.6	Uncontrolled		
Total to Markham Road						**2.5**	**2.6**			
Total Site					**180**	**45.9**	**48.2**			

Storm Connection Capacity Summary

Storm Connection (mm)	Slope Pipe (%)	Total Flow to Connection (l/s)	Diameter Actual (m)	Pipe Area (sq.m)	Hydraulic Radius (m)	Pipe Capacity (l/s)
250	2.00%	5.0	0.250	0.05	0.063	84.1
250	2.00%	24.1	0.250	0.05	0.063	84.1

200 Controlled Site

Composite RC Value	Area [ha]	RC	RC * Area
Landscaped Area	0.030	0.25	0.0075
Conventional Roof, Paved & Pavers	0.250	0.90	0.2252
Total:	**0.280**		**0.2327**
Divided by Total Area =			**0.83**

200A Uncontrolled Site

Composite RC Value	Area [ha]	RC	RC * Area
Landscaped Area	0.001	0.25	0.0004
Green Roof	0.000	0.45	0.0000
Conventional Roof and Paved	0.009	0.90	0.0079
Total:	**0.010**		**0.0082**
Divided by Total Area =			**0.81**

201 Controlled Site

Composite RC Value	Area [ha]	RC	RC * Area
Landscaped Area	0.016	0.25	0.0039
Conventional Roof and Paved	0.189	0.90	0.1698
Total:	**0.204**		**0.1737**
Divided by Total Area =			**0.85**

201A Uncontrolled Site

Composite RC Value	Area [ha]	RC	RC * Area
Landscaped Area	0.002	0.25	0.0006
Conventional Roof and Paved	0.013	0.90	0.0118
Total:	**0.015**		**0.0124**
Divided by Total Area =			**0.81**

202 Uncontrolled Site

Composite RC Value	Area [ha]	RC	RC * Area
Landscaped Area	0.000	0.25	0.0001
Permeable Pavers	0.002	0.40	0.0007
Conventional Roof and Paved	0.003	0.90	0.0028
Total:	**0.005**		**0.0036**
Divided by Total Area =			**0.68**

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Rational Method - Uncontrolled Area 200A to Brimorton Drive

Project Name:	1050 Markham Road		
Project No:	24000		
Event:	100	years	
ABC's:	A	59.7	
	C	0.8	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.81	
Site Area	A	0.010	ha
Intensity	i	250.32	mm/hr
$i=A/(T)^c$			
Flow	Q	0.006	m^3/s
Q=CiA/360		**5.7**	**L/s**

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Orifice Control &
Detention Storage

Job 1050 Markham Road
Job No. 24000

Orifice Equation: $Q = C_d A(2gh)^{1/2}$

Area: **200**

Orifice Diameter:	75	mm
Area:	0.004	m^2
g =	9.81	m/s^2
C_d =	0.63	

	Stage	Head (m)	Storage (m3)	Discharge (L/s)
Invert E.L.	155.06	0.00	0	0.00
Tank Spill E.L.	158.93	3.83	83	24.13

Total Provided 100 Yr Storage: **83 Cu.m**

counterpoint engineering

Modified Rational **Area:** **200** Controlled to Brimorton Drive

Project Name: 1050 Markham Road
Project Number: 24000

Rainfall Data			
Location:	City of Toronto	a	59.700
Event	100-year	b	0.000
		c	0.800

Site Data		
Area	0.280	ha
Runoff Coefficient	0.83	
AC	0.23	
Tc	10	
Time Increment	10	
Release Rate	24.1	l/s
Storage Required	83	m^3

Time	Rainfall Intensity	Storm Runoff	Runoff Volume	Released Volume	Storage Volume	
(min)	(mm/hr)	(m^3/s)	(m^3)	(m^3)	(m^3)	
10	250	0.16	97	14	83	********
20	144	0.09	112	29	83	
30	104	0.07	121	43	78	
40	83	0.05	128	58	70	
50	69	0.04	134	72	62	
60	60	0.04	139	87	52	
70	53	0.03	143	101	42	
80	47	0.03	147	116	31	
90	43	0.03	151	130	20	
100	40	0.03	154	145	9	
110	37	0.02	157	159	-2	
120	34	0.02	160	174	-14	
130	32	0.02	162	188	-26	
140	30	0.02	165	203	-38	
150	29	0.02	167	217	-50	
160	27	0.02	169	232	-63	
170	26	0.02	171	246	-75	
180	25	0.02	173	261	-87	
190	24	0.02	175	275	-100	
200	23	0.01	177	290	-113	
210	22	0.01	179	304	-126	
220	21	0.01	180	319	-138	
230	20	0.01	182	333	-151	
240	20	0.01	183	348	-164	
250	19	0.01	185	362	-177	
260	18	0.01	186	377	-190	
270	18	0.01	188	391	-203	
280	17	0.01	189	405	-216	

counterpoint engineering

Rational Method - Uncontrolled Area 201A to Brimorton Drive

Project Name:		1050 Markham Road	
Project No:		24000	
Event:		100	years
ABC's:	A	59.7	
	C	0.8	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.81	
Site Area	A	0.015	ha
Intensity	i	250.32	mm/hr
$i=A/(T)^c$			
Flow	Q	0.009	m^3/s
Q=CiA/360		**8.6**	**L/s**

counterpoint engineering

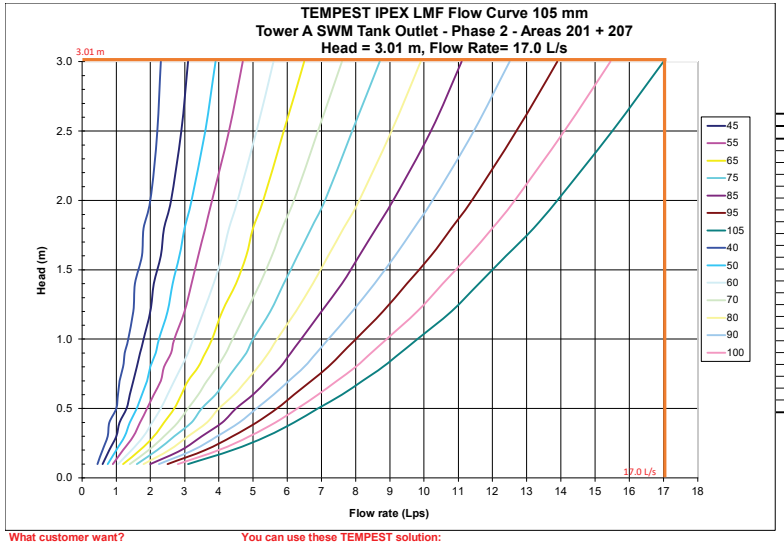
Modified Rational **Area:** **201 + EXT-1** Controlled to Brimorton Drive

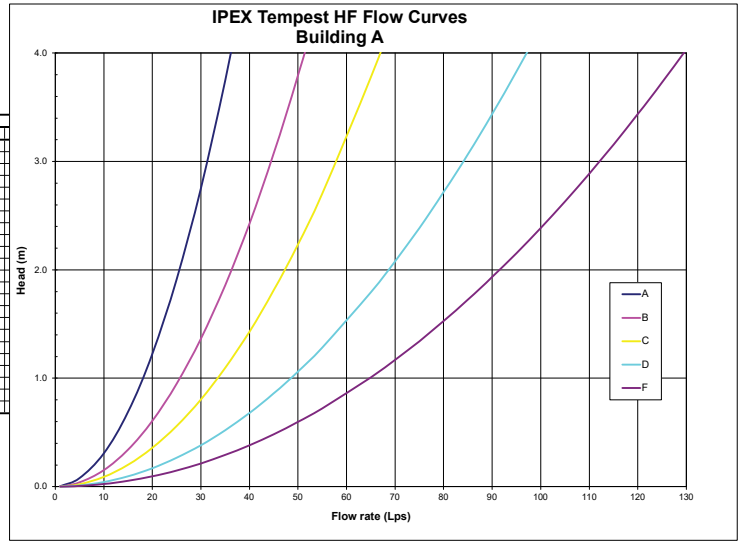
Project Name: 1050 Markham Road
Project Number: 24000

Rainfall Data			
Location:	City of Toronto	a	59.700
Event	100-year	b	0.000
		c	0.800

Site Data		
Area	0.235	ha
Runoff Coefficient	0.82	
AC	0.19	
Tc	10	
Time Increment	10	
Release Rate	5.0	l/s
Storage Required	98	m^3

Time	Rainfall Intensity	Storm Runoff	Runoff Volume	Released Volume	Storage Volume	
(min)	(mm/hr)	(m^3/s)	(m^3)	(m^3)	(m^3)	
10	250	0.13	80	3	77	
20	144	0.08	92	6	86	
30	104	0.06	100	9	91	
40	83	0.04	106	12	94	
50	69	0.04	111	15	96	
60	60	0.03	115	18	97	
70	53	0.03	118	21	97	
80	47	0.03	122	24	98	********
90	43	0.02	125	27	98	
100	40	0.02	127	30	97	
110	37	0.02	130	33	97	
120	34	0.02	132	36	96	
130	32	0.02	134	39	95	
140	30	0.02	136	42	94	
150	29	0.02	138	45	93	
160	27	0.01	140	48	92	
170	26	0.01	141	51	91	
180	25	0.01	143	54	89	
190	24	0.01	145	57	88	
200	23	0.01	146	60	86	
210	22	0.01	148	63	85	
220	21	0.01	149	66	83	
230	20	0.01	150	69	81	
240	20	0.01	152	72	80	
250	19	0.01	153	75	78	
260	18	0.01	154	78	76	
270	18	0.01	155	81	74	
280	17	0.01	156	84	72	





Elevations	
Spill MH1-1	175.40
Invert MH102	172.27
Actual Head	3.13
Head	3.03
Target Flow	22.30

Selected Curve B

Head	3.13
Actual Flow	17.00

What customer want?

Head (m)	4.43
Flow (Lps)	4.0

You can use these TEMPEST solution:

LMF:	50 mm	Cross reference with the flow curves gragh to confirm the parameters
HF or HF sump or MHF:	31 mm	Use the 4" model

counterpoint engineering

Rational Method - Uncontrolled Area 202 to Markham Road

Project Name:		1050 Markham Road	
Project No:		24000	
Event:		100	years
ABC's:	A	59.7	
	C	0.8	
Time of Concentration:	t	10	min
Runoff Coefficient:	C	0.68	
Site Area	A	0.005	ha
Intensity	i	250.32	mm/hr
$i=A/(T)^c$			
Flow	Q	0.002	m^3/s
Q=CiA/360		**2.5**	**L/s**

Counterpoint Engineering

Project Name: 1050 Markham Road
Project Number: 24000
Building A

Site Area: 0.225ha

Water Balance Calculation Sheet

Total Required Volume to be Retained (5mm across area)	**11.25**	**m^3**

Conventional Roof, Asphalt **and Paved Walkways**		
Initial Abstraction	1.0	mm
Total Area	0.204	ha
Volume for evapotranspiration	**2.04**	**m^3**

Grassed and Landscaped Areas		
Initial Abstraction	5.0	mm
Total Area	0.020	ha
Volume for evapotranspiration and infiltration	**1.00**	**m^3**

Green Roof		
Initial Abstraction	5.0	mm
Total Area	0.000	ha
Volume for evapotranspiration	**0.00**	**m^3**

Required Volume		
Total used within 72 hours	**8.2**	**m^3**

Counterpoint Engineering

Project Name: 1050 Markham Road
Project Number: 24000
Building B

Site Area: 0.290ha

Water Balance Calculation Sheet

Total Required Volume to be Retained (5mm across area)	**14.52**	**m^3**

Conventional Roof and Paved Walkways		
Initial Abstraction	1.0	mm
Total Area	0.260	ha
Volume for evapotranspiration	**2.60**	**m^3**

Grassed and Landscaped Areas		
Initial Abstraction	5.0	mm
Total Area	0.020	ha
Volume for evapotranspiration and infiltration	**1.00**	**m^3**

Green Roof		
Initial Abstraction	5.0	mm
Total Area	0.000	ha
Volume for evapotranspiration	**0.00**	**m^3**

Required Volume		
Total used within 72 hours	**10.9**	**m^3**

Counterpoint Engineering Inc.

Quality Control Calculation Sheet

Project: 1050 Markham Road
Project No: 24000
Building: A
Location: Toronto

Total Area **0.224 ha**

TSS Removal Rates

Surface Type	Fraction of Area			TSS Removal Rate (%)	Overall TSS Removal Rate (%)
Conventional/Green Roof Area	59.9%	0.13	ha	80%	47.9%
Landscape Area (softscape)	8.9%	0.02	ha	80%	7.1%
Landscaping Area (Hardscape)	24.3%	0.05	ha	80%	19.4%
Vehicular Area	6.9%	0.02	ha	0%	0.0%
				Overall TSS Removal Achieved	**74.5%**

Reference: **New Jersey Stormwater Best Management Practices Manual**
Champter 4 - TSS Removal Rates for BMP's in Series

Initial TSS Load* (1- 0.74) **0.26**

TSS Load Removed by Oil-Grit Separator

Contributing Area	0.204	ha	
Total Area	0.224	ha	
Contribution	91%		
Removal Rate of OGS	50	% TSS	(Sized for 80% + TSS removal)
Removal based on Contribution	46	% TSS	
Remaining TSS Load x Removal =	0.12		

Final TSS Load Downstream of Oil-Grit Separator

0.26 - 0.12 = **0.14**

Total TSS Removal Rate

1.0 - 0.14 = **0.86** or **86%**

Counterpoint Engineering Inc.

Quality Control Calculation Sheet

Project: 1050 Markham Road
Project No: 24000
Building: B
Location: Toronto

Total Contributing Area **0.290 ha**
TSS Removal Rates

Surface Type	Fraction of Area			TSS Removal Rate (%)	Overall TSS Removal Rate (%)
Conventional/Green Roof Area	50.4%	0.15	ha	80%	40.3%
Landscape Area (softscape)	10.3%	0.03	ha	80%	8.3%
Landscaping Area (Hardscape)	33.9%	0.10	ha	80%	27.2%
Vehicular Area	5.3%	0.02	ha	0%	0.0%
				Overall TSS Removal Achieved	**75.7%**

Reference: **New Jersey Stormwater Best Management Practices Manual**
Champter 4 - TSS Removal Rates for BMP's in Series

Initial TSS Load* (1- 0.76) **0.24**

TSS Load Removed by Oil-Grit Separator

Contributing Area	0.280	ha	
Total Area	0.290	ha	
Contribution	96%		
Removal Rate of OGS	50	% TSS	(Sized for 80% + TSS removal)
Removal based on Contribution	48	% TSS	
Remaining TSS Load x Removal =	0.12		

Final TSS Load Downstream of Oil-Grit Separator

0.24 - 0.12 = **0.13**

Total TSS Removal Rate

1.0 - 0.13 = **0.87** or **87%**