

**FUNCTIONAL SERVICING & STORMWATER  
MANAGEMENT REPORT**

**1470 WILLIAMSPORT DRIVE**

**CITY OF MISSISSAUGA  
REGION OF PEEL**

**PREPARED FOR:**

**1470 WILLIAMSPORT HOLDINGS INC. C/O  
COMPTEN MANAGEMENT INC.**

**PREPARED BY:**

**C.F. CROZIER & ASSOCIATES INC.  
2800 HIGH POINT DRIVE, SUITE 100  
MILTON, ON L9T 6P4**

**SEPTEMBER 2025**

**CFCA FILE NO. 2719-7179**

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Submission Number	Date	Comments
Sub. 1	February 14, 2025	Issued for ZBA
Sub. 2	February 25, 2025	Issued for SPA
Sub. 3	September 30, 2025	Issued for ZBA

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## 1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by 1470 Williamsport Holdings Inc. (Client) to prepare a Functional Servicing & Stormwater Management Report to support the Zoning By-Law Amendment application for the proposed infill development located at 1470 Williamsport Drive in the City of Mississauga, Regional Municipality of Peel (Region of Peel) (hereby known as Site).

The purpose of this report is to demonstrate that the proposed development can be developed in accordance with the City of Mississauga (City) Region of Peel (Region), and Credit Valley Conservation (CVC) guidelines and standards from a water, wastewater, and stormwater management perspective.

## 2.0 Site Description

The site is bound by Williamsport Drive to the north, residential apartment buildings to the east and south, and a commercial shopping mall to the west. **Figure 1 – Site Location** illustrates the subject site within the context of its surroundings. Existing underground servicing infrastructure is available on Williamsport Drive. The **0.59 ha** site currently consists of a 6-storey residential building with associated driveway, surface parking lot and landscaped areas. The existing building has one (1) level of underground. For the existing conditions, refer to the topographical survey of the site included in **Appendix A**.

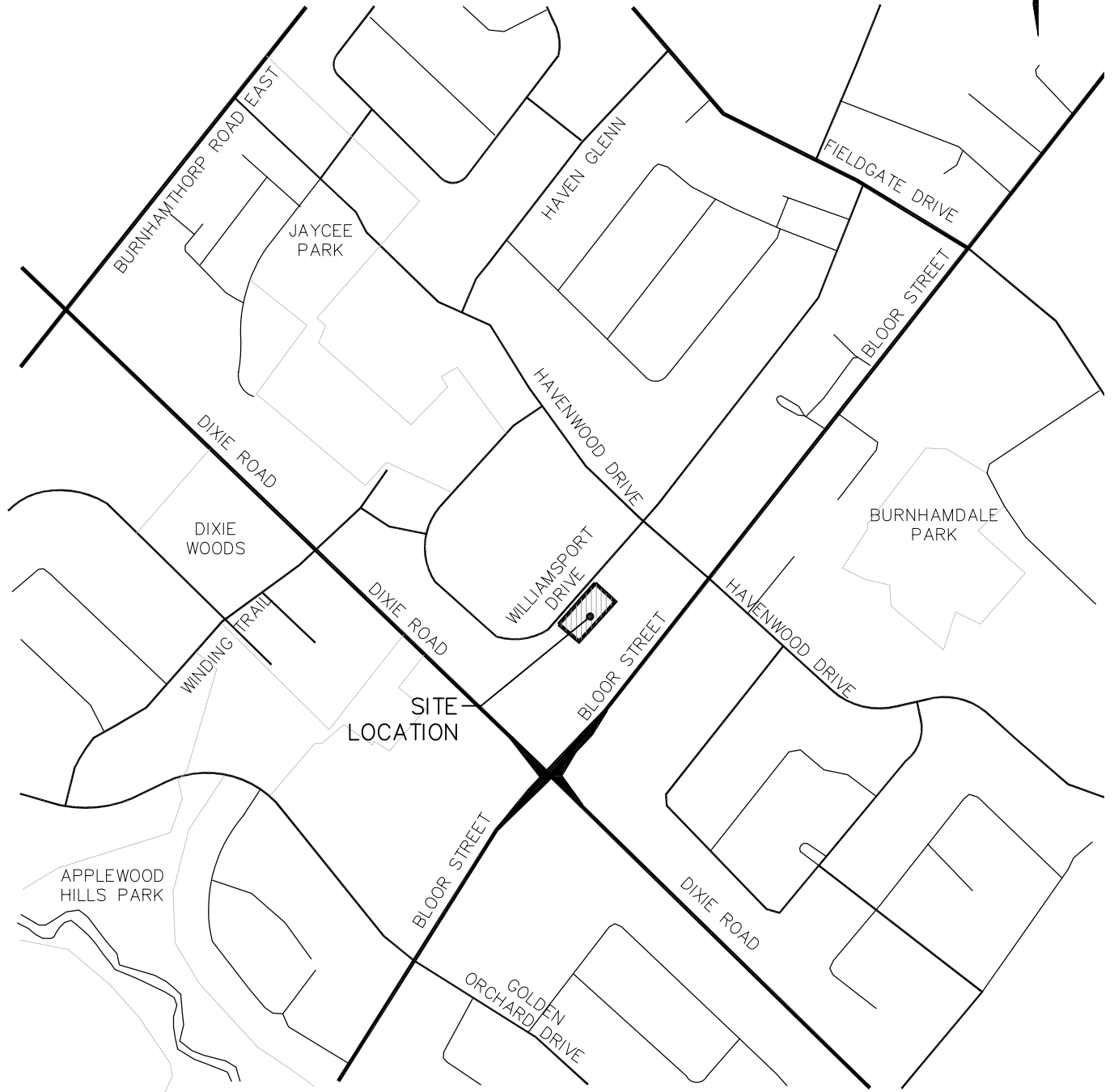
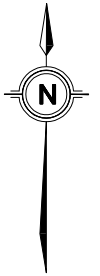
The proposed development includes the construction of two 12-storey residential towers conjoined with a 1-storey podium at the ground level, with a total of 283 residential units. Site access will be provided via Williamsport Drive on the west side of the development. The drive aisle on the west side of the development will potentially connect to Bloor Street to the south in the future. A layby will be provided on Williamsport Drive. The building will be equipped with two (2) levels of underground parking.



The expected population for the Site was calculated using the equivalent population density factors from both the Region of Peel Public Works Linear Wastewater Standards (2023) and residential unit information obtained from the Site Plan and Statistics provided by BDP Quadrangle. **Table 1** below summarizes the proposed population for the subject property.

**Table 1: Equivalent Population Estimate  
(2023 Region of Peel Linear Wastewater Standards)**

Type	Unit Type	Number of Units	Population Density	Population
Existing	Residential – 1 bedroom or <	19 units	1.7 persons/unit	33
	Residential > 1 bedroom	34 units	3.1 persons/unit	106
			<b>Total</b>	<b>139</b>
Proposed	Residential – 1 bedroom or <	107units	1.7 persons/unit	182
	Residential > 1 bedroom	176 units	3.1 persons/unit	546
			<b>Total</b>	<b>728</b>

The total proposed population for the Site is 728 persons.



Legend	Project	<div> <b>CROZIER</b> CONSULTING ENGINEERS</div>			
	Drawing				
<div> = SUBJECT LANDS</div>	1470 WILLIAMSPORT DRIVE MISSISSAUGA, ONTARIO	Drawn By	E.C.M	Design By	Project
	SITE LOCATION	Scale	N.T.S.	Date	2719-7179
			SEPTEMBER 2025	Check By	Drawing
					FIG. 1

### 3.0 Water Servicing

The Region of Peel is responsible for the operation and maintenance of the public water supply and treatment system in the City of Mississauga. Any local water supply system will connect to the Region's municipal water network. The existing and proposed water servicing is discussed in the following sections.

#### 3.1 Existing Water Servicing

The Region of Peel plan and profile drawings indicate that there is an existing 300 mm diameter watermain on the north side of Williamsport Drive fronting the Site (Town of Mississauga drawing 39812-D dated August 2009). A 100 mm diameter water service extends to the Site in the existing conditions. Refer to **Appendix A** for the plan and profile drawings and the utility locates completed by 4Sight Utility Engineers.

Any existing water service connections will be removed and capped as part of the redevelopment.

#### 3.2 Proposed Water Servicing

The proposed development will have a single connection to the existing 300 mm diameter PVC watermain on the north side of Williamsport Drive. The connection will be a standard 'h' connection as per Region of Peel Standard for Fire line and Domestic connection. A 200 mm diameter fire line and 150 mm domestic connection will be provided. The services will extend to within 1.5m of the underground parking level.

The proposed water servicing design is shown on the **Servicing Plan (C102A)**. The Mechanical Engineer will design the internal private water system including the internal sprinkler system within the building and underground parking structure at detailed design stage.

#### 3.3 Design Water Demand

The Region of Peel Development Changes Background Study (2020) identifies a marginally lower population per unit (page 3-7) therefore the population densities noted in Linear Wastewater Standards (March 2023) were used to be conservative. The Region of Peel Development Changes Background Study (2020) was used to determine the maximum domestic water demand generated by the proposed development based on the equivalent population estimate and an average daily residential water demand of 270 L/cap/day along with the associated peaking factors for max day (1.8) and peak hour (3.0) demands. **Table 2** summarizes the estimated design water demand. Refer to **Appendix B** for detailed water demand calculations.

**Table 2: Existing and Proposed Domestic Water Demand**

Site	Average Daily Demand (L/min)	Maximum Daily Demand (L/min)	Peak Hourly Demand (L/min)
Existing Site	26.1	46.9	78.2
Proposed Site	136.5	245.70	409.50

As shown in **Table 2**, it is proposed that following development, the peak hourly water demand will be 409.50 L/min, an increase of 331.3 L/min

### 3.4 Fire Flow Demand

The Fire Underwriters Survey (2020) method was used to estimate the fire flow demand for the proposed building within the development area. It is assumed that the development will be fire-resistive construction and therefore, a construction coefficient of 0.60 was applied to the fire flow calculations. The area of the largest floor plus 25% of each of the two immediately adjoining floors was used, which was calculated to be 3,710 m<sup>2</sup>. As the proposed building use is residential, a "Limited-Combustible" occupancy hazard has been applied. The proposed building shall have a fire line connection to the same municipal watermain system as the fire department connection and will be supported by an automatic and fully supervised fire suppression system in conformance with NFPA 13 sprinkler standards. We have also assumed the proposed residential building will be equipped with automatic sprinkler systems from a standard water supply which reduces the initial fire flow demand by 50%.

The automated sprinkler system is to be designed by the Mechanical Engineer at detailed design stage. **Table 3** summarizes the required fire flow demand and duration of flow required for the proposed development.

**Table 3: Estimated Fire Flow Demand**

Method	Demand Flow (L/min)	Duration (h)
Water Supply for Public Fire Protection by Fire Underwriters Survey (2020)	5,000	1.75

As shown in **Table 3**, the proposed fire line is required to accommodate a fire flow demand of **5,000 L/min** for a duration of 1.75 hours. Detailed calculations are provided in **Appendix B**.

Hydrant flow testing has been completed on the local hydrants by Hydrant Testing Ontario to verify that water pressures and flows are adequate to supply the maximum domestic and fire supply required for the proposed development, and to show that the minimum required fire flows can be met for this development.

Based on the results of the tests (see **Appendix B** for results) it is estimated that approximately **20,520 L/min** (342 L/s) is available at the Williamsport Drive hydrant fronting the Site, at 140 KPa (20 psi). Therefore, based on the results of the test, the existing watermains surrounding the Site can all provide sufficient flow to service the maximum domestic demand (maximum daily) plus fire flow (**5,246 L/min**).

## 4.0 Sanitary Servicing

The Region of Peel is responsible for the operation and maintenance of the public sewage collection and treatment system in the City of Mississauga. Any local sewage system will connect to the Region's municipal sanitary sewage network.

### 4.1 Existing Sanitary Servicing

Region of Peel plan and profile drawings indicate that there is an existing 250 mm diameter PVC sanitary sewer within the Williamsport Drive right-of-way (City of Mississauga drawings 39812-D and C-06433 dated August 2009 and February 1964, respectively). Refer to **Appendix A** for the plan and profile drawings and the utility locates completed by 4Sight Utility Engineers.

Any existing sanitary service connections will be removed and capped as part of the redevelopment.

## 4.2 Proposed Sanitary Servicing

The development is proposed to be serviced by a 200 mm diameter sanitary sewer at a slope of 2%. The service lateral will extend from the underground parking structure to the existing 250 mm PVC sanitary sewer located in the center of Williamsport Drive.

The proposed sanitary servicing design is shown on the **Servicing Plan (C102A)**. The internal building plumbing will be designed by the Mechanical Engineer's details and specifications.

## 4.3 Design Sanitary Flow

The sanitary design flow for the proposed development was calculated using the Region of Peel Linear Wastewater Standards (March 2023) and the equivalent population estimate described in **Table 1**. A unit sewage flow of 290 L/cap/d was used, and infiltration rate of 0.26 L/s/ha and a peaking factor were applied to the unit sewage flow to obtain the total estimated design sewage flow.

**Table 4** summarizes the results and **Appendix C** contains the detailed design sanitary flow demand for the Site.

**Table 4: Existing and Proposed Sanitary Design Flows**

	<b>Residential Peak Flow (L/s)</b>	<b>Infiltration Flow (L/s)</b>	<b>Total Peak Flow (L/s)</b>
<b>Existing</b>	1.87	0.15	2.02
<b>Proposed</b>	9.49	0.15	9.65

As shown in **Table 4**, the total peak sanitary flow for the proposed development is **9.65 L/s**. There is a **7.63 L/s** increase in theoretical flow from existing conditions.

## 5.0 Groundwater Drainage Conditions

A Hydrogeological Investigation for the subject site was completed by DS Consultants Ltd. dated October 15, 2024, which detailed the site's subsurface and groundwater conditions. The major conclusions of the report are summarized below:

- Groundwater Elevation = 129.24 – 131.27 masl (maximum) or 11.46 to 7.93 mbgs
- Groundwater Quality does not meet Region of Peel Storm Sewer Limits = TSS exceedance
- Groundwater Quality meets Region of Peel Sanitary Sewer Limits = No exceedance
- Short-Term (Construction Dewatering) = 119,000 L/day (1.38 L/s)
- Long-Term (Post-Construction Dewatering) = 37,950 L/day (0.44 L/s)

The short-term dewatering rate includes a safety factor of 2 and the long-term rate includes a safety factor of 1.5.

An Environmental Activity Sector Registration (EASR) is required to be submitted to the Ministry of the Environment, Conservation and Parks (MECP) if the taking of groundwater and stormwater for a temporary construction project is between 50,000 L/day and 400,000 L/day. The EASR application is an online registry and should be submitted to the MECP before any construction dewatering. A

PTTW is only required to be submitted to the MECP if the taking of groundwater and stormwater for a temporary construction project is more than 400,000 L/day, which is not expected for this proposed development.

Since the expected design dewatering rate for the unsealed excavation is between the MECP's daily water-taking limit of 50,000 and 400,000 L/day, an EASR application will be required to be submitted to the MECP for short-term dewatering before starting construction. Since the long-term (permanent) flow rate is expected to be lower than the MECP's minimum pumping limit of 50,000 L/day, a permit to take water (PTTW) application is not required to be submitted to the MECP permanently.

#### Short-Term Discharge (Construction Dewatering)

As determined by DS Consultants, short-term dewatering is required for the Site. Short-term dewatering is to be designed by the dewatering contractor. The maximum short-term construction dewatering rate is **119,000 L/day (1.4 L/s)**. The short-term discharge will outlet to the existing 600 mm diameter storm sewer found in Williamsport Drive.

Groundwater quality should be confirmed by the dewatering contractor to assess the required level of pre-treatment necessary, if any. Current quality results indicate that the short-term discharge will require treatment prior to discharge to the municipal storm sewer.

The Property Owner shall obtain short-term discharge approval to discharge private water to the municipal storm sewer ensuring any short-term discharge follows the City's Storm Sewer Use By-law (0046-2022)

#### Long-Term Discharge (Permanent Dewatering)

The report prepared by DS Consultants indicates an estimated long-term discharge rate of **37,950 L/day (0.44 L/s)**. Groundwater will be collected in the foundation drainage system and conveyed to the stormwater management tank. The mechanical consultant (Novatrend) has advised that groundwater will be pumped at a rate of **0.63 L/s** which has been accounted for in the stormwater management calculations. The long-term groundwater discharge will be directed to the existing 600 mm diameter storm sewer in Williamsport Drive via the proposed stormwater management tank.

The discharge will require treatment to meet the City of Mississauga Storm Sewer Use By-Law and Peel Region's Storm Sewer-Use By-Law. Details of the required treatment will be provided during detailed design. However, space has been provisionally allocated within the underground for the anticipated treatment.

## 6.0 Stormwater Management

As the site is in the City of Mississauga, the proposed stormwater management design must comply with the following documents:

- Section 8: Storm Drainage Design Requirements (City of Mississauga Development Requirements Manual, Revised November 2020)
- City of Mississauga Development Requirements Manual (September 2016)
- CVC Stormwater Management Criteria (August 2012)

### Water Quantity Control

The Site is located in the Little Etobicoke Creek sub-watershed. For sites located in the Little Etobicoke Creek sub-watershed, it will be necessary to implement on-site stormwater management techniques into the design to provide post-development to pre-development quantity control for all storms (i.e. 2, 5, 10, 25, 50 & 100-year) using unit rates (m<sup>3</sup>/s/ha) found in Table 6 of the City's Storm Drainage Design Requirements.

### Water Quality Control

Private stormwater discharging from the proposed development must achieve Ontario's Ministry of the Environment, Conservation and Parks (MECP) Enhanced Level of protection (80% total suspended solids (TSS) removal) for water quality control prior to discharging to the City's storm sewer network or watercourse.

### Water Balance & Erosion Control

Retention of the first 5 mm of rainfall on impervious areas for private development areas is required by the City of Mississauga Development Requirements Manual (September 2016) to achieve the water balance criteria, and by the CVC Stormwater Management Criteria (August 2012) to achieve the erosion control criteria.

## 6.1 Existing Stormwater Servicing

Region of Peel plan and profile drawings indicate that there is an existing 525 mm & 600 mm diameter concrete storm sewer within the Williamsport Drive right-of-way (City of Mississauga drawings 39812-D and C-06433 dated August 2009 and February 1964, respectively). Refer to **Appendix A** for the plan and profile drawings and the utility locates completed by 4Sight Utility Engineers.

Any existing storm service connections will be removed and capped as part of the redevelopment.

## 6.2 Existing Drainage Conditions

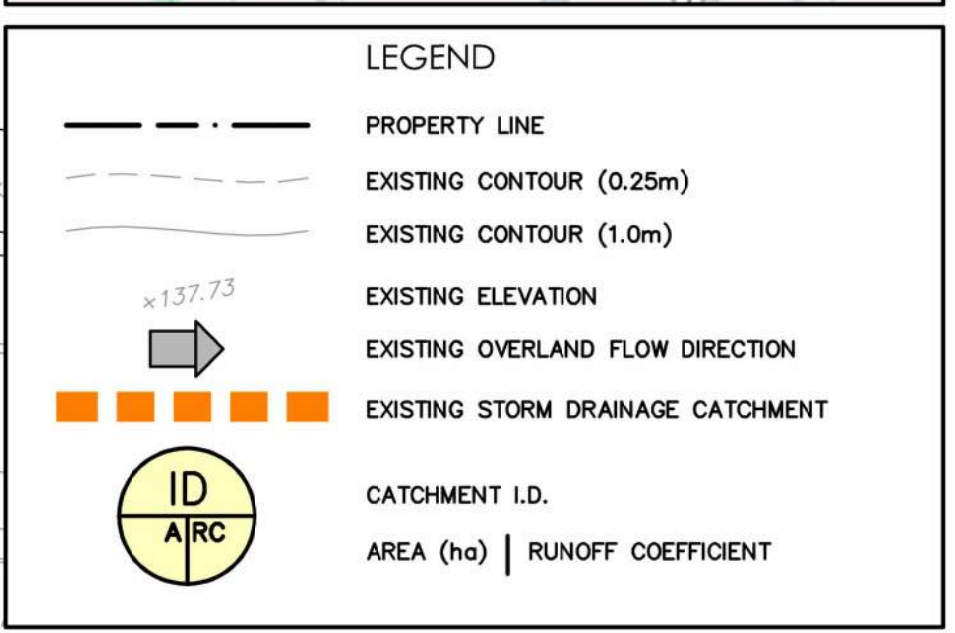
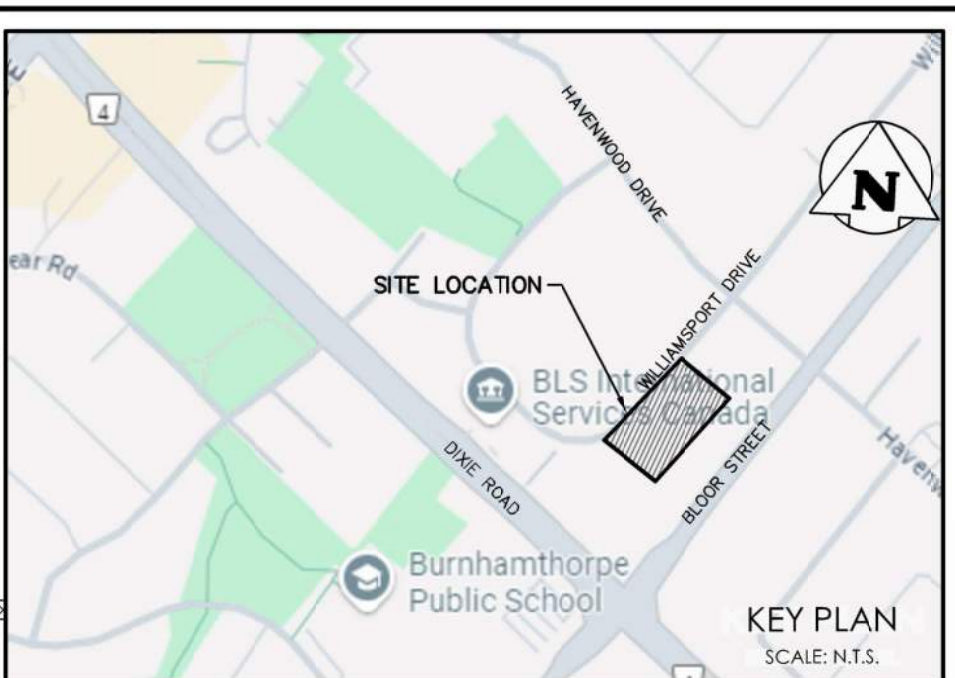
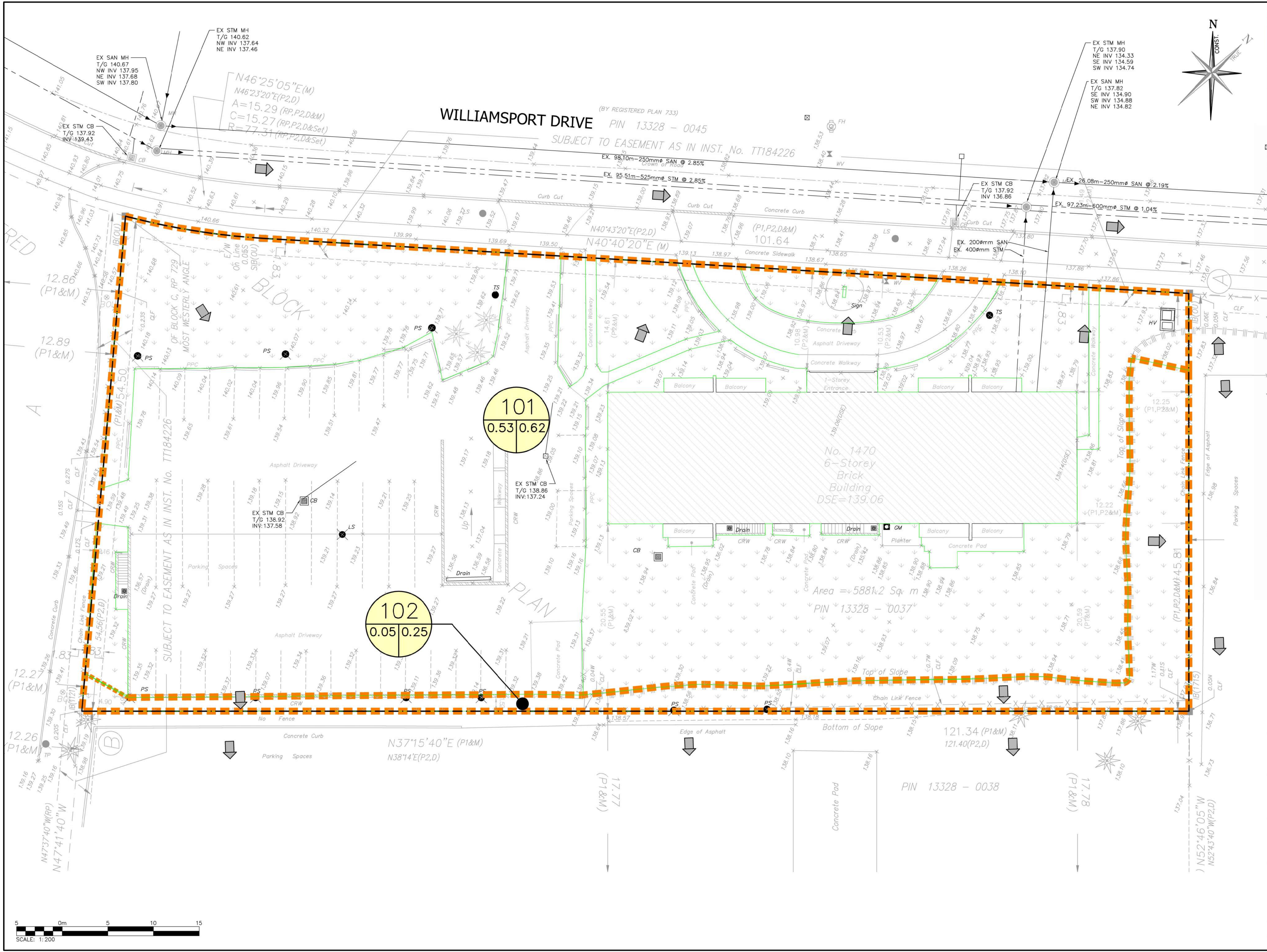
The existing Site contains a six-storey apartment building, landscaped areas, and a paved parking lot. A review of the survey completed by IBW Surveyors shows that the majority of the Site is captured by catchbasins or flows overland to the Williamsport Drive right-of-way where it is conveyed to the 525mm & 600 mm diameter municipal storm sewers. There is also a minor area along the south and east property lines that flows overland south of the Site and ultimately ends up at Bloor Street.

**Table 5** provides a breakdown of the pre-development site areas and associated runoff coefficients with the existing drainage conditions shown on **Figure 2 - Pre-Development Drainage Plan**.

**Table 5: Pre-Development Land Areas and Runoff Coefficients**

<b>Catchment No.</b>	<b>Outlet Location</b>	<b>Area (m<sup>2</sup>)</b>	<b>Weighted Runoff Coefficient (RC)</b>
<b>101</b>	Storm Sewers on Williamsport Drive	5,345	0.62
<b>102</b>	Overland to the South (Bloor Street)	536	0.25
<b>Total</b>		<b>5,881</b>	-





**BEARING NOTE:**  
BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK OBSERVATION, UTM ZONE 17 (81° WEST LONGITUDE), NAD83(CRS) v6(2010).

**BENCHMARK NOTE:**  
ELEVATIONS ARE GEODETIC AND REFERRED TO CITY OF MISSISSAUGA B.M. No. 690, ELEVATION = 134.702m

**SURVEY NOTES:**  
SURVEY COMPLETED BY IBW SURVEYORS  
SURVEY PREPARED FOR 1470 WILLIAMSPORT HOLDINGS INC.

**SITE PLAN NOTES:**  
DESIGN ELEMENTS ARE BASED ON SITE PLAN BY BPD QUADRANGLE  
DRAWING No.: A201.S PROJECT No.: 23057

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**MISSISSAUGA**

Project  
**1470 WILLIAMSPORT DRIVE**  
CITY OF MISSISSAUGA  
PEEL REGION

Drawing  
**PRE-DEVELOPMENT DRAINAGE PLAN**

REGION FILE NO.: C601060  
SITE PLAN NO.: SP-25-011M

**CROZIER**  
CONSULTING ENGINEERS

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Drawn  
D.B. Design  
E.M. Project No.  
Check  
E.M. Check  
E.M. Scale  
1:200  
Dwg.  
**2719-7179**  
**FIG. 2**



### 6.3 Allowable Release Rate

The Site is located in the Little Etobicoke Creek sub-watershed. For sites located in the Little Etobicoke Creek sub-watershed, it will be necessary to implement on-site stormwater management techniques into the design to provide post-development to pre-development quantity control for all storms (i.e. 2, 5, 10, 25, 50 & 100-year) using unit rates (m<sup>3</sup>/s/ha) found in Table 6 of the City's Storm Drainage Design Requirements.

Based on Table 6 of the City's Storm Drainage Design Requirements the allowable release rates for each storm event for the proposed development area are summarized in **Table 6** below.

**Table 6: Allowable Release Rates (Little Etobicoke Creek sub-watershed)**

Allowable Release Rates (L/s)					
2-year	5-year	10-year	25-year	50-year	100-year
21.02	27.91	32.61	38.57	43.02	47.49

### 6.4 Proposed Stormwater Servicing & Drainage Conditions

The proposed storm connection will be a 300 mm diameter storm connection at a 2.0% slope to the existing 600 mm diameter municipal storm sewer located on Williamsport Drive. The proposed storm servicing design is shown on the **Servicing Plan (C102A)**.

The Site will be graded to promote positive drainage away from the building and to convey stormwater from the Site to area drains and catch basins proposed within the driveway, and surrounding areas (hardscaped and landscape areas). The roof drains, area drains and catchbasins will be connected to the proposed underground stormwater management tank via the internal system designed by the mechanical engineer at detailed design stage.

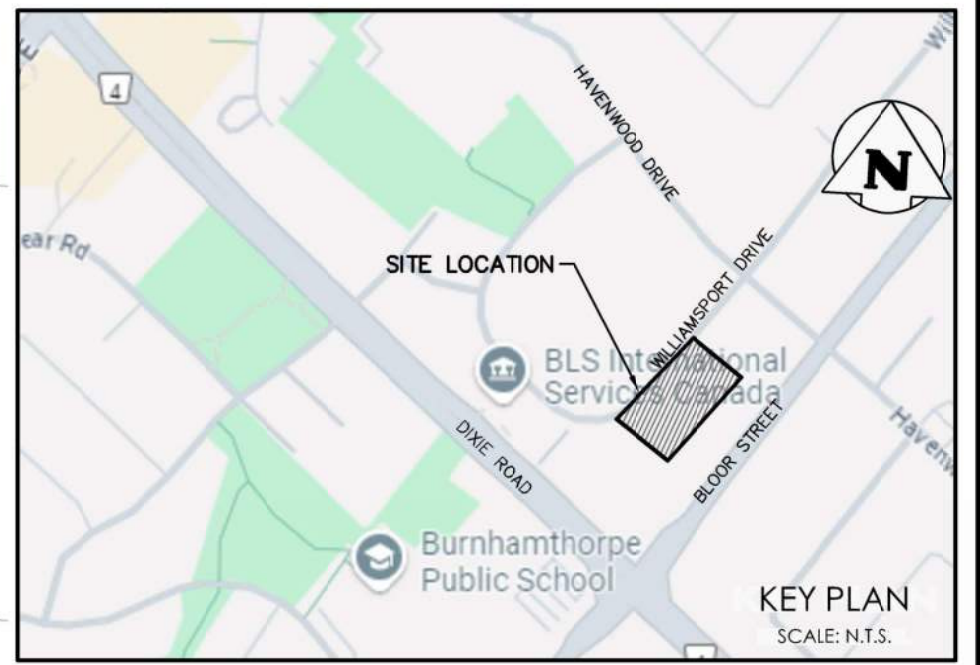
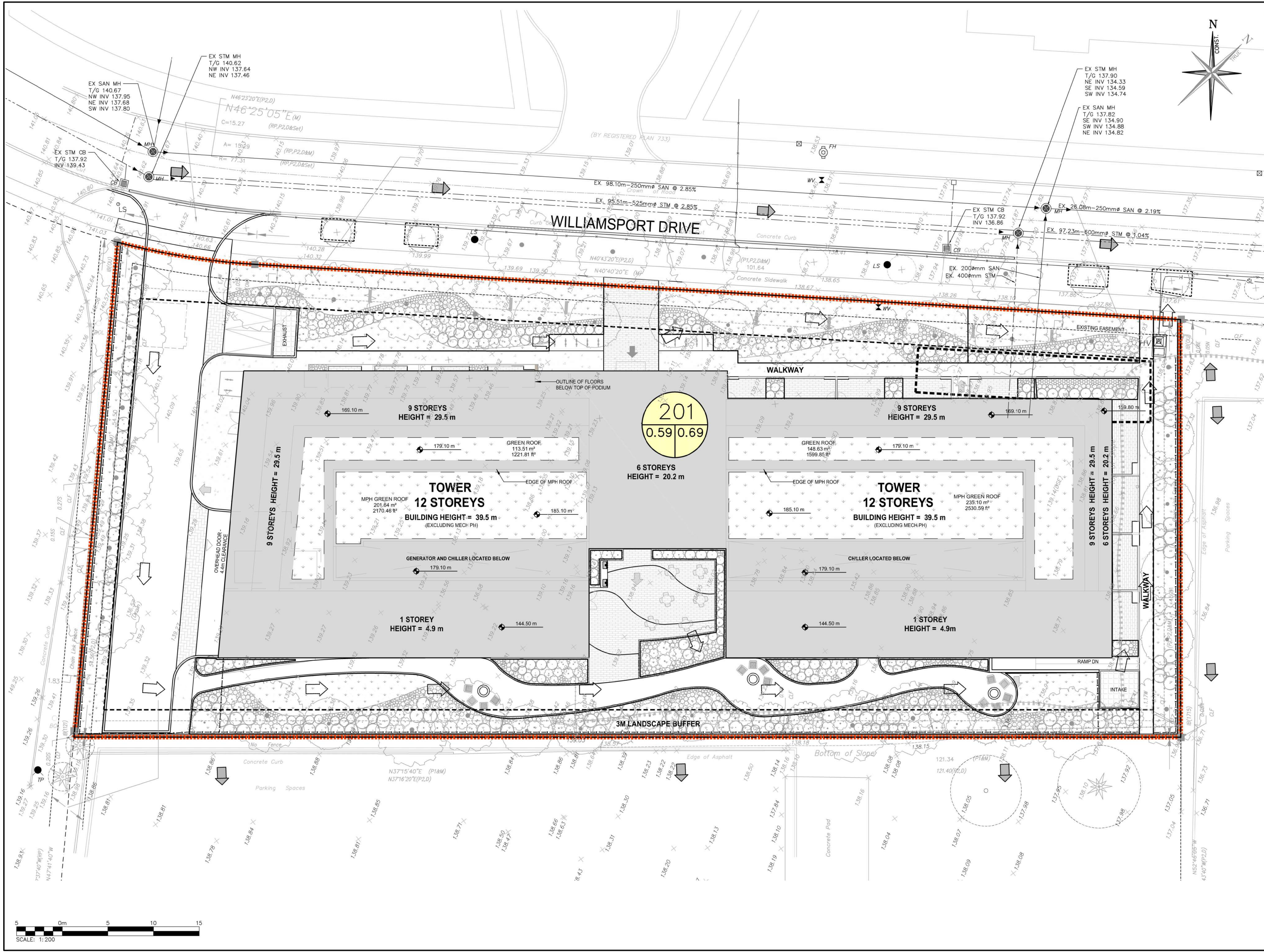
**Table 7** provides a breakdown of the post-development site areas and associated runoff coefficient with the proposed drainage conditions shown on the **Figure 3 - Post-Development Drainage Plan**.

**Table 7: Post-Development Land Areas and Runoff Coefficients**

Catchment No.	Outlet Location	Pervious <sup>1</sup> (m <sup>2</sup> )	Impervious (m <sup>2</sup> )	Weighted Runoff Coefficient (RC)
201	Controlled to Storm Sewer on Williamsport Drive	2,186	3,695	0.69
<b>Total</b>		<b>5,881</b>		-

1. Includes proposed green roof areas.





LEGEND	
	PROPERTY LINE
	EXISTING CONTOUR (0.5m)
	EXISTING CONTOUR (1.0m)
	EXISTING GRADE
	PROPOSED OVERLAND FLOW DIRECTION
	EXISTING OVERLAND FLOW DIRECTION
	PROPOSED STORM DRAINAGE CATCHMENT
	CATCHMENT I.D.
	AREA (ha)   RUNOFF COEFFICIENT

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Project

1470 WILLIAMSPORT DRIVE  
CITY OF MISSISSAUGA  
PEEL REGION

Drawing

POST-DEVELOPMENT DRAINAGE PLAN

REGION FILE NO.: C601060  
SITE PLAN NO.: SP-25-011M

211 YONGE STREET  
SUITE 600  
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Drawn	D.B.	Design	E.M.	Project No.	2719-7179
Check	E.M.	Check	E.M.	Scale	1:200
				Dwg.	FIG_3



## 6.5 Stormwater Quantity Control

The Modified Rational Method (MRM) was used to determine the pre-development and post-development stormwater flow rates for the Site using the City of Mississauga's intensity, duration and frequency (IDF) rainfall data. These peak stormwater flow rates were then used to determine the required stormwater quantity control for the proposed development.

In accordance with the Storm Drainage Design Requirements, the post-development runoff rates must be controlled to the allowable rates as noted in **Table 6** in Section 6.3.

Runoff from Catchment 201 will be conveyed to the stormwater management storage tank location is the northeast corner of the underground.

Quantity control will be provided on site by a storage tank located at the P1 level in combination with an outlet control device (**100 mm diameter Orifice Tube**) to ensure that the post development peak flows are attenuated to allowable release rates for the required storm events. A constant flow rate of **0.63 L/s** from the foundation drainage system was included in the stormwater management calculations. Adjustment factors of 1.1, 1.2 and 1.25 were used for the 25, 50 and 100 year storm event calculations. There is no roof top storage proposed. A maximum storage volume of approximately **203.1 m<sup>3</sup>** will be required to control the 100-year post development flows to the allowable release rate. The full 100-year volume will be contained within the stormwater management tank on the P1 level. There will be no surface ponding in the 100-year storm event. Note that the required water reuse volume will be available below the outlet invert and is discussed in further detail later in this report in **Section 6.7**.

A summary of the peak storm flows and required storage volume have been provided in **Table 8**.

**Table 8: Summary of 100-year Peak Stormwater Flow Rates and Storage**

Storm Event (yr)	Peak Flow Rate		Required Storage (m <sup>3</sup> )
	Allowable Release Rate(L/s)	Post-Development (L/s)  Controlled	
2	21.02	18.81	56.1
5	27.91	22.50	80.3
10	32.61	25.51	103.2
25	38.57	29.34	136.4
50	43.02	33.04	173.1
100	47.49	36.07	206.2

As shown above in **Table 8**, the proposed site release rates of during the 2, 5, 10, 25, 50 and 100 year storm events are less than the allowable release rate.

Refer to **Appendix D** for the detailed calculations. Refer to the **Servicing Plan (C102A)** for the proposed size and location of the underground storage tank.

## 6.6 Stormwater Quality Control

Stormwater quality controls for the site must incorporate measures to provide an Enhanced Protection Level according to Section 3.3 of the MECP Guidelines (March 2003). Enhanced water quality protection involves the removal of at least 80% of TSS from 90% of the annual runoff volume.

A 1200 mm Up-Flo Filter is proposed to provide the requisite water quality control for the entire site. The filtration unit is proposed to be installed downstream of the proposed tank and will treat the stormwater runoff from the site prior to being discharged to the municipal storm sewer.

Refer to **Appendix D** for the treatment unit sizing, specifications and Operation and Maintenance Manual. Refer to the **Servicing Plan (C102A)** for the proposed location of treatment unit.

## 6.7 Water Balance & Erosion Control

Water balance and erosion control criteria for the City of Mississauga are satisfied through retention of the first 5 mm of a rainfall event:

- Per the City of Mississauga Development Requirements Manual (September 2016), the minimum requirement to promote water balance is retention of the first 5 mm of a rainfall event.

The City of Mississauga's water balance criteria to retain the first 5 mm of a rainfall event was taken as the governing criteria because it requires a more stringent stormwater control strategy to be implemented. The required water balance and erosion control retention volume was calculated based on impervious areas from Catchment 201.

**Table 9** below depicts the volume required to be retained to satisfy the water balance and erosion control criteria.

**Table 9: Water Balance and Erosion Control Storage Requirement**

Standard	Criteria	Impervious Area (m <sup>2</sup> )	Volume Required (m <sup>3</sup> )
City of Mississauga Development Requirements Manual (September 2016) to achieve water balance	Retention of first 5 mm <sup>1</sup>	3,695	18.5

Note 1: The City of Mississauga's water balance criteria to retain the first 5 mm is the governing constraint.

As noted above, the water balance requirement is **18.5 m<sup>3</sup>**, which has been accounted for in the tank design. Water balance will be achieved using water re-use methods such as irrigation. Note due to the infill nature of this project and the limits of the proposed underground foundation, infiltration is not feasible.

A water reuse sump located below the outlet invert of the stormwater management tank will be used to store water for on-site water reuse via an irrigation system. The sump has been sized to hold rainfall volume larger than the 72-hour reuse volume and irrigation demand to maximize the amount of reuse water available for irrigation over the course of May to September.

A pump will be designed for the rainwater re-use water system cistern volume by the Mechanical Consultant/Irrigation consultant. A volume of **74.4 m<sup>3</sup>** will be available in the bottom section of the stormwater management tank for re-use purposes. If the stored rainwater is depleted, the municipal water supply will be used to satisfy the remaining irrigation demand.

The irrigation demand provided by Creative Irrigation Solutions Inc. indicates that the 72 hr irrigation demand for the at grade landscaping is **21.12 m<sup>3</sup>**. Refer to **Appendix D** for the irrigation calculations. As such this development satisfies the water balance criteria.

## **6.8 Stormwater Management Operation and Maintenance**

The proposed stormwater tank should be pumped dry (hydrovac), cleaned, and inspected on a yearly basis to ensure sediments and debris which may accumulate within the cisterns do not build up and compromise the proposed storage or reuse volumes. The proposed orifice tube does not require regular maintenance but should be inspected on a yearly basis when the tank is cleaned and inspected, to ensure there is no debris around or within the orifice tube. After completion of the project, the tank should be inspected after the first six (6) months to visually inspect the sediment accumulation in the tank, and to determine a more specific maintenance schedule.

## **7.0 Erosion and Sediment Control During Construction**

Erosion and sediment controls will be installed prior to the commencement of any construction activities and will be maintained until the site is stabilized or as directed by the site engineer and/or the City of Mississauga. Controls will be inspected after each significant rainfall event and maintained in proper working conditions.

The following erosion and sediment controls will be provided during construction:

### Silt Fencing

Silt fencing will be installed on the perimeter of the site to intercept sheet flow. Additional silt fence may be added based on field decisions by the site engineer and Owner prior to, during and following construction.

### Rock Mud Mat

A rock mud mat will be installed at the entrance of the construction zone to prevent mud tracking from the site onto the surrounding lands and perimeter roadway network. All construction traffic will be restricted to this access only.

### Sediment Control Devices

The existing catchbasins fronting the property along John Street shall be equipped with silt sacks in accordance with City standards.

## **8.0 Conclusions and Recommendations**

The proposed development can be serviced for water, sanitary, and stormwater in accordance with the City of Mississauga, Region of Peel, and CVC requirements and standards. Our conclusions and recommendations include:

1. Water servicing is proposed to be provided by the existing 300 mm diameter watermain on Williamsport Drive through a 200 mm diameter water service connection.
2. Sanitary servicing for the new development is proposed through a 200 mm diameter sanitary service with a connection to the existing 250 mm diameter sanitary sewer on Williamsport Drive.
3. Storm servicing for the new development is proposed through a 300 mm diameter storm service with a connection to the existing 600 mm diameter storm sewer on Williamsport Drive.
4. The Site will be graded to promote positive drainage away from the building and to convey stormwater towards the proposed area drains located throughout the property. Stormwater management is proposed to be provided through a stormwater tank located on the P1 level.
5. The water quality requirement of 80% TSS removal from the Site is achieved through the use of a 1200mm Up-Flo Filter system.
6. Site water balance objective will be achieved through rainwater re-use methods such as irrigation.

Based on the above conclusions we support the proposed development application from the perspective of water supply, sanitary servicing, and stormwater management.

Respectfully submitted,

**C.F. CROZIER & ASSOCIATES INC.**



Matt Coleridge, P.Eng  
Manager, Toronto

**C.F. CROZIER & ASSOCIATES INC.**



Emily McNamee, P.Eng.  
Senior Project Engineer

# APPENDIX A

## Plan and Profile Drawings & Background Materials



SURVEYOR'S REAL PROPERTY REPORT-PART 1  
PLAN OF  
PART OF BLOCK C  
REGISTERED PLAN 729  
CITY OF MISSISSAUGA

REGIONAL MUNICIPALITY OF PEEL  
SCALE 1:400  
5 0 5 10 20 30m  
© COPYRIGHT

PART 2: REPORT  
SUBJECT TO EASEMENT AS IN INST. No. TT184226  
FENCES AS SHOWN  
SURVEY PREPARED FOR 1470 WILLIAMSPORT HOLDINGS INC.

- LEGEND
- DENOTES SURVEY MONUMENT FOUND
  - DENOTES SURVEY MONUMENT SET
  - ▣ DENOTES STANDARD IRON BAR
  - ▤ DENOTES IRON BAR
  - RP DENOTES REGISTERED PLAN 729
  - P1 DENOTES SURVEY BY ERTL SURVEYORS, O.L.S.
  - P2 DENOTES SURVEY BY CARTER & HORWOOD, O.L.S.
  - D DENOTES DEED INSTRUMENT No. VS108942
  - OU DENOTES ORIGIN UNKNOWN
  - 1121 DENOTES PAUL JAYSON, O.L.S.
  - 1715 DENOTES ROWAN-STANCIU LTD., O.L.S.
  - N.S.E.W DENOTES NORTH, SOUTH, EAST, WEST
  - M DENOTES MEASURED
  - DSE DENOTES DOOR SILL ELEVATION
  - CLF DENOTES CHAIN LINK FENCE
  - CRW DENOTES CONCRETE RETAINING WALL
  - PPC DENOTES PRECAST PARKING CURB
  - WV DENOTES WATER VALVE/KEY
  - FH DENOTES FIRE HYDRANT
  - CB DENOTES CATCH BASIN
  - GM DENOTES GAS METER
  - HV DENOTES HYDRO VAULT
  - BOL DENOTES BOLLARD
  - TS DENOTES TRAFFIC SIGN POST
  - PS DENOTES PARKING SIGN POST
  - LS DENOTES LIGHT STANDARD
  - MH DENOTES MAINTENANCE HOLE
  - ✱ DENOTES CONIFEROUS TREE
  - DENOTES DECIDUOUS TREE

BENCHMARK  
ELEVATIONS ARE GEODETIC AND REFERRED TO CITY OF MISSISSAUGA B.M. No. 690, ELEVATION = 134.702m

TREE NOTE  
ALL TREES FRONTING THE PROPERTY, WITHIN THE BOULEVARD, ARE SHOWN. TREES ON THE PROPERTY AND ITS PROXIMITY ARE SHOWN, IF THEY HAVE A TRUNK DIAMETER LARGER THAN 0.15m.

BEARING NOTES  
BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK OBSERVATIONS, UTM ZONE 17 (81° WEST LONGITUDE), NAD83(CRS)v6(2010).  
FOR BEARING COMPARISONS, THE FOLLOWING ROTATIONS WERE APPLIED:  
RP,P1,P2,D - 0°57'40" COUNTER-CLOCKWISE

DISTANCE NOTES - METRIC  
DISTANCES AND COORDINATES ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.  
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999740.

CAUTION  
THE WORK AND DRAWINGS HEREIN WERE COMPLETED FOR THE EXCLUSIVE USE OF OUR CLIENT AND NO LIABILITY IS ASSUMED TO ANY THIRD PARTIES OR SUBSEQUENT OWNERS.

ASSOCIATION OF ONTARIO  
LAND SURVEYORS  
PLAN SUBMISSION FORM  
2184066

THIS PLAN IS NOT VALID  
UNLESS IT IS AN EMBOSSED  
ORIGINAL COPY  
ISSUED BY THE SURVEYOR.  
In accordance with  
Regulation 1026, Section 29(3).

REVISION NOTE  
PLAN GEOREFERENCED ON SEPTEMBER 11, 2024

SURVEYOR'S CERTIFICATE  
I CERTIFY THAT :  
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.  
2. THE SURVEY WAS COMPLETED ON THE 16TH DAY OF DECEMBER, 2021

Date \_\_\_\_\_ Lawrence O. Ertl  
Ontario Land Surveyor

INTEGRATION DATA

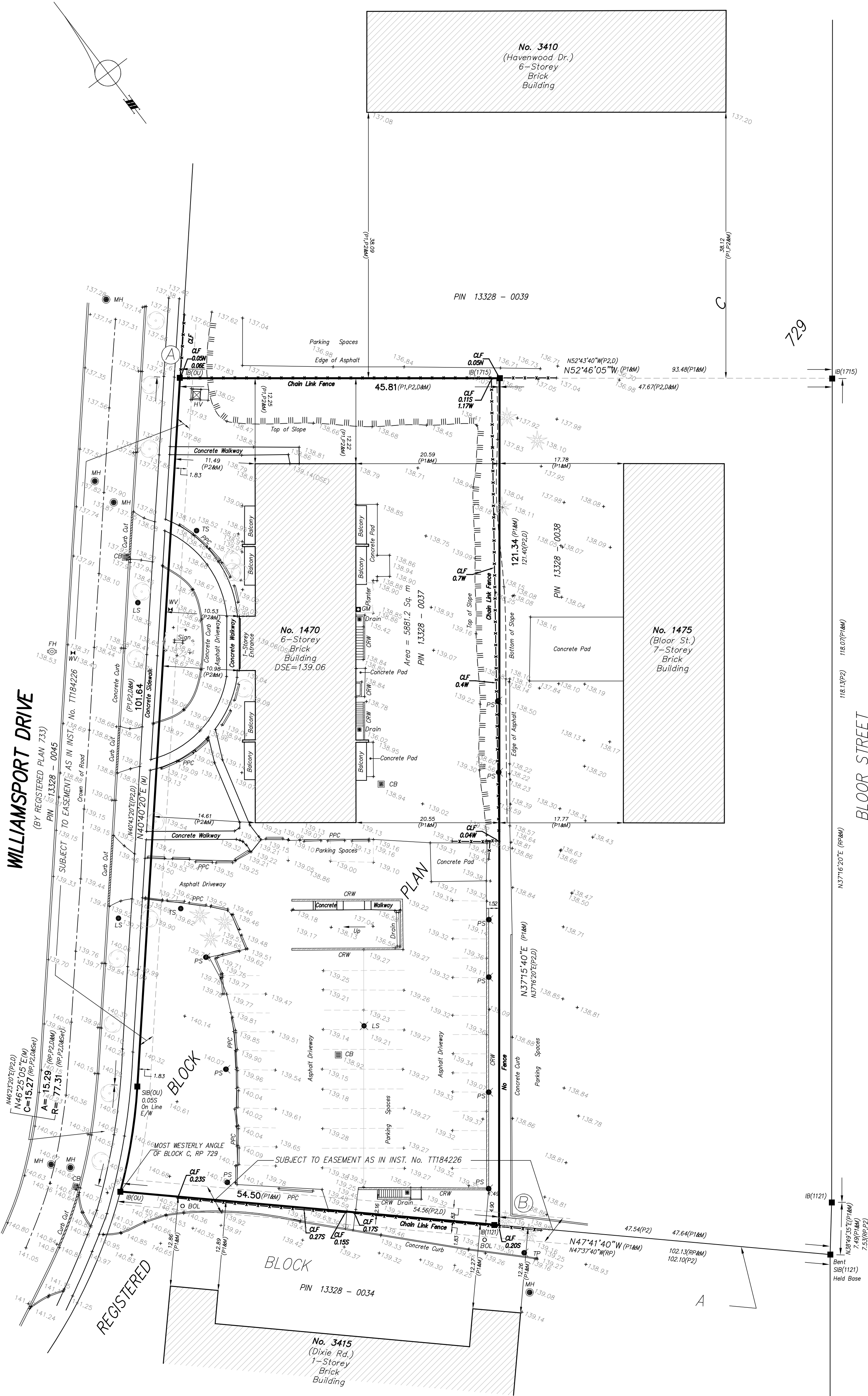
OBSERVED REFERENCE POINTS DERIVED FROM GPS OBSERVATIONS USING A REAL TIME NETWORK AND ARE REFERRED TO UTM ZONE 17 (81° WEST LONGITUDE) NAD83(CRS)v6(2010).

POINT ID	NORTHING	EASTING
A	4830546.94	613477.56
B	4830422.68	613440.58

CAUTION: COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN



IBWSURVEYORS.COM | 1.800.667.0696  
copies available at ProtectYourBoundaries.ca  
PARTY CHIEF: JA | DRAWN: DH/DV | CHECKED: \* | PLOT DATE: SEPT. 19, 2024  
FILE: A-049825-21648-TB\_V A-049825






KEY PLAN (N.T.S.)

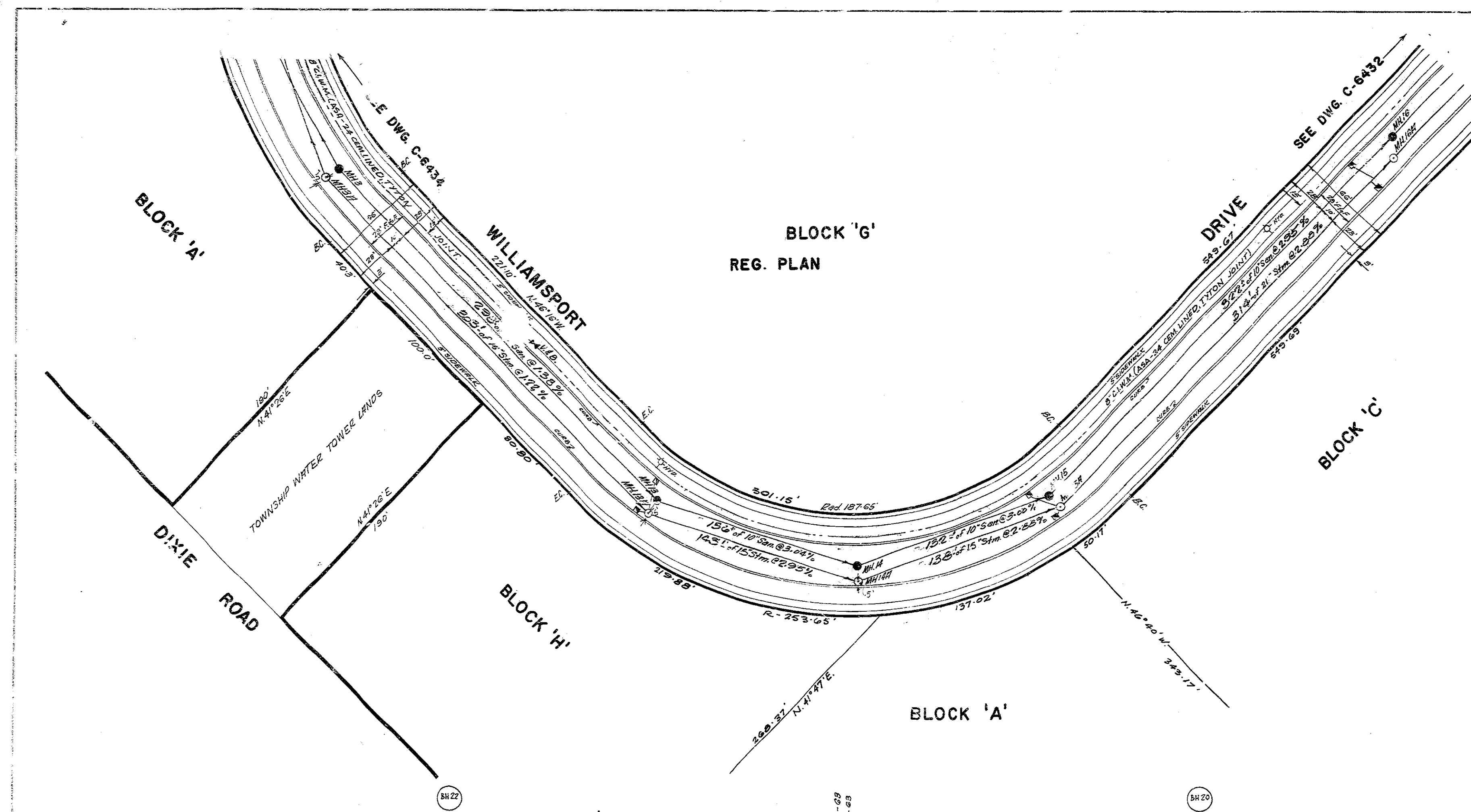
THIS DRAWING TO BE USED FOR  
WATERMAIN CONSTRUCTION ONLY.

[illegible]

 <p><b>Ainley</b> CONSULTING ENGINEERS PLANNERS</p>	<p>Approved by</p>
--	--------------------

The diagram shows two scales used for drawing. The top scale is labeled 'HORIZONTAL SCALE' and has markings for 10m, 0, 10, 20, and 30m. The bottom scale is labeled 'VERTICAL SCALE' and has markings for 1m, 0, 1, 2, and 3m. Both scales are represented by a bar divided into alternating black and white segments, with a checkered pattern at the beginning.





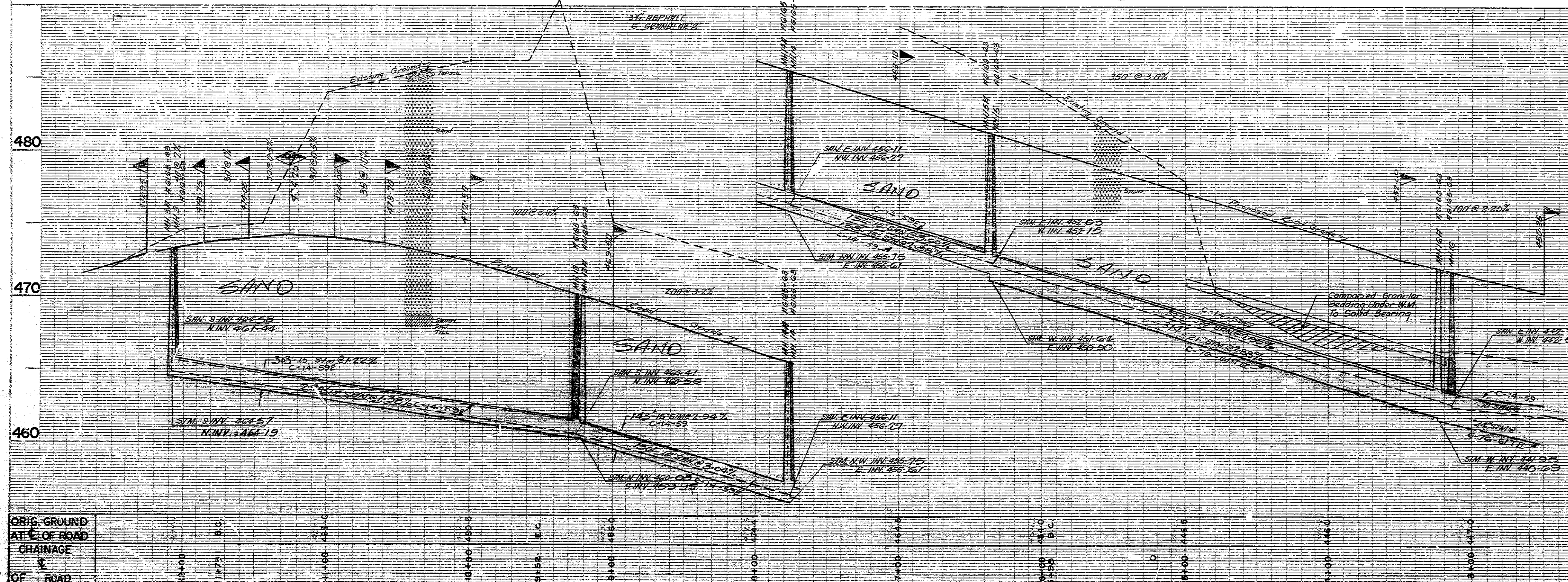
SERVICE DATA					
SERVICE	DATE	INT.	SERVICE	DATE	INT.
SAN. SEWERS			SAN. SEWERS		
STORM SEWERS			STORM SEWERS		
WATERMANS			WATERMANS		

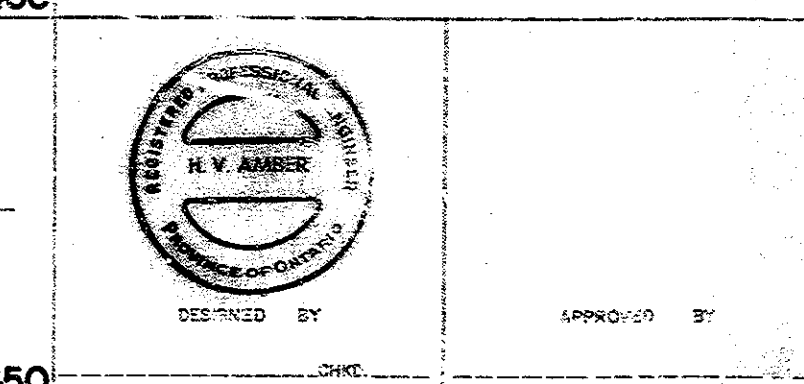
REVISIONS		
DATE	DETAILS	INT.
12 APR 64	Changes following 1st submission	
28 JUN 64	Revisions for 2nd submission	
10 JUL 64	P.S. REVISIONS	
12 JUL 64	P.S. REVISIONS	
12 JUL 64	P.S. REVISIONS	

SCHEDULE OF WATERMAIN QUANTITIES			
ITEM	QTY	SIZE	TYPE
WATERMAIN	890'	8"	C.I. W.M. (ASA-24 CEM. LINED TYPON JOINT)
VALVES	1	8" V.B.	Mc AVITY No. 20075-0 OR EQUAL
HYDRANTS	2		Mc AVITY H-59-M OR EQUAL
WATER SERVICES			
TEES			
REDUCERS			
SAKES			
ELONGATIONS			

- Double Sewer Services to Lot Line
- Single Sewer Services to 5' from 1st Lot Line
- Water Services to 2' of Lot
- For Largest Pipes: 10" to 18" Use M.H. As Per A-6165 or A-6163
- 20" to 36" Use M.H. As Per A-6166
- Over 36" Use M.H. As Per A-6167



- GENERAL NOTES
- ALL DRIVEWAYS GRAVEL UNLESS OTHERWISE NOTED.
  - ALL SERVICE LOCATIONS ARE APPROXIMATE AND MUST BE LOCATED ACCURATELY IN FIELD.
  - ⊙ DENOTES BUILDING - NOT LOCATED
  - ⊙ DENOTES BUILDING - LOCATED
  - T.S.M. No. 28 ELEV. 466.851
  - TEMP. BENCH MARK ELEV. 473.34 SEE DWG. C-6435
  - DESCRIPTION OF HYD. TOP OF S/W NUT.
  - ALL SEWER BEDDING TYPE 'B' UNLESS SHOWN OTHERWISE.



R.E. WINTER & ASSOCIATES LIMITED  
CONSULTING ENGINEERS

BURNHAMDALE WOODS  
SUBDIVISION

PROJECT No. 297

TOWNSHIP OF TORONTO  
COUNTY OF PEEI

ENGINEERING DEPARTMENT

WILLIAMSPORT DRIVE

STN. 2+60 TO STN. 2+100

LOT/S 5 CON. / RANGE 1 NOS. PROJECT NO. 297

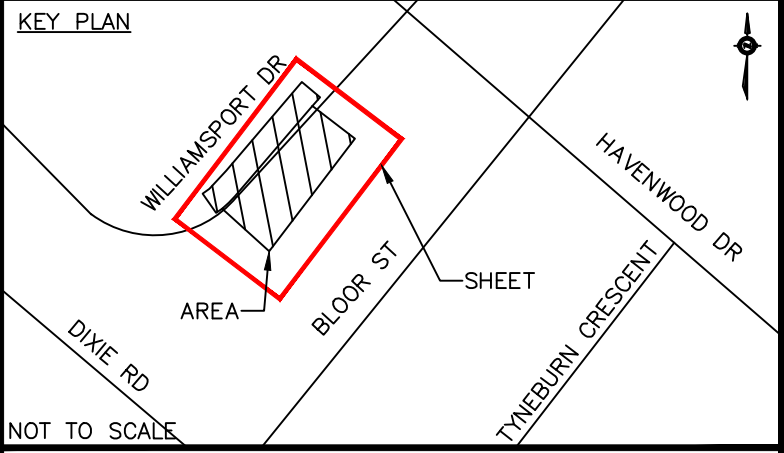
SCALE 1" = 20' DRAWN BY D.R. - M.W. CHECKED BY

DATE FEBRUARY 14, 1964 SHEET OF PLAN NO. C-6435









- GENERAL NOTES**
1. THE FIELD INVESTIGATION WAS COMPLETED IN NOVEMBER 2024.
  2. THE LIMITS OF THE INVESTIGATION ARE AS PER SHOWN ON THE DRAWING.
  3. THE BASE PLAN FOR THIS DRAWING WAS PROVIDED BY THE CLIENT AND IS NOT RESPONSIBLE FOR ITS ACCURACY.
  4. UTILITY SIZES AND MATERIALS ARE SHOWN IF AVAILABLE FROM RECORD INFORMATION.
  5. KNOWN UTILITY OWNERS IDENTIFIED WITHIN PUBLIC RIGHT OF WAY INCLUDE:
    - a. WATER & SEWERS – REGION OF PEEL & CITY OF MISSISSAUGA
    - b. ELECTRICAL – ALECTRA
    - c. TELECOM – BELL, ROGERS
    - d. GAS – ENBRIDGE
  6. SEE PROJECT REPORT FOR ADDITIONAL DETAILS.

LEGEND:

- |    |                           |
|----|---------------------------|
| TE | BELL TELECOMMUNICATIONS   |
| TC | TELEPHONE COAXIAL         |
| TP | PRIVATE COMMUNICATIONS    |
| FO | FIBER OPTIC               |
| BF | BELL FIBER OPTIC          |
| RF | ROGERS FIBER OPTIC        |
| CF | COGECO FIBER OPTIC        |
| ZF | ZAYO FIBER OPTIC          |
| H  | HYDRO                     |
| SL | STREETLIGHT               |
| TL | TRAFFIC LIGHT             |
| E  | PRIVATE ELECTRICAL        |
| G  | GAS                       |
| PL | PIPELINE                  |
| W  | WATER                     |
| WS | WATER SERVICE             |
| SA | SANITARY SEWER            |
| FM | SANITARY FORCEMAIN        |
| ST | STORM SEWER               |
| U  | UNKNOWN CONDUCTIVE SIGNAL |

- |                 |                        |
|-----------------|------------------------|
| _____           | QUALITY LEVEL "B"      |
| _____           | QUALITY LEVEL "C"      |
| _____           | QUALITY LEVEL "D"      |
| _____LIMIT_____ | LIMIT OF INVESTIGATION |

- |                         |                                     |
|-------------------------|-------------------------------------|
| CONTINUES OUT OF LIMITS |                                     |
| ➤                       | FLOW ARROW                          |
| [                       | END CAP                             |
| #                       | LOCATION BASED ON RECORD INFO       |
| *                       | LOCATION BASED ON FIELD OBSERVATION |
| △                       | LOSS OF SIGNAL                      |
| ⊙                       | STORM MAINTENANCE HOLE              |
| ⊙                       | SANITARY MAINTENANCE HOLE           |
| ■                       | CATCH BASIN                         |
| ⊙                       | WATER CHAMBER                       |
| ⊙                       | FIRE HYDRANT                        |
| ⊙                       | WATER VALVE                         |
| ⊙                       | GAS VALVE                           |
| ●UP                     | UTILITY POLE                        |
| oLS                     | LIGHT STANDARD                      |
| oHW                     | HAND WELL                           |
| ⊙                       | HYDRO MAINTENANCE HOLE              |
| ⊙                       | HYDRO VAULT / TRANSFORMER           |
| ⊙                       | TELECOM PEDESTAL                    |
| ⊙                       | FLUSH-TO-GRADE                      |
| ⊙                       | BELL MAINTENANCE HOLE               |
| ⊙                       | ROGERS MAINTENANCE HOLE             |
| ⊙                       | UNKNOWN MAINTENANCE HOLE            |
| ⊙TH                     | TEST HOLE                           |

### ASCE QUALITY LEVELS

THE QUALITY INFORMATION SHOWN ON THIS DRAWING WAS COLLECTED IN ACCORDANCE TO ASCE STANDARD 38-22. THE INFORMATION IS SHOWN BY QUALITY LEVEL WHICH INDICATES THE INVESTIGATION EFFORT USED TO DETERMINE THE LOCATION OF THE DATA.

QUALITY LEVEL "D" -- INFORMATION DERIVED FROM EXISTING RECORDS OR VERBAL RECOLLECTIONS.

QUALITY LEVEL "C" -- INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGEMENT IN CORRELATING THE INFORMATION TO THE QUALITY LEVEL "D" INFORMATION.

QUALITY LEVEL "B" -- INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF THE UTILITIES.

QUALITY LEVEL "A" -- PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES.



	Floor	Gross Building Area (no exclusions)		GFA Exclusions*		Mississauga By-Law 0225-2007 GFA (Res)		UNIT BREAKDOWN							Notes:
		sm	sf	sm	sf	sm	sf	1B	1B+D	2B	2B+D	3B	Total Units		
ABOVE GRADE	MPH	560.9	6,037	560.9	6,037										
	12	1,315.0	14,155	89.3	961	1,225.7	13,193	1	4	4	4	5	18		
	11	1,315.0	14,155	89.3	961	1,225.7	13,193	1	4	4	4	5	18		
	10	1,315.0	14,155	89.3	961	1,225.7	13,193	1	4	4	4	5	18		
	9	1,620.0	17,438	89.3	961	1,530.7	16,476	4	8	5	3	4	24		
	8	1,620.0	17,438	89.3	961	1,530.7	16,476	4	8	5	3	4	24		
	7	1,620.0	17,438	89.3	961	1,530.7	16,476	5	6	8	2	3	24		
	6	2,076.8	22,354	89.3	961	1,987.5	21,393	4	7	7	10	2	30		
	5	2,076.8	22,354	89.3	961	1,987.5	21,393	4	7	7	10	2	30		
	4	2,076.8	22,354	89.3	961	1,987.5	21,393	4	7	7	10	2	30		
	3	2,076.8	22,354	89.3	961	1,987.5	21,393	4	7	7	10	2	30		
	2	2,076.8	22,354	180.6	1,944	1,896.2	20,411	3	4	5	9	3	24		
	Ground	2,671.3	28,754	739.9	7,964	1,931.4	20,789	3	3	2	4	1	13		
BELOW GRADE	P1	4,730.8	50,922	4,730.8	50,922										
	P2	4,730.8	50,922	4,730.8	50,922										
TOTALS	P2 Lower	830.1	8,935	830.1	8,935										
						20,046.8 sm	215,782 sf	38	69	65	73	38	283		
						Indoor Amenity Deduction	806.1 sm	8,677 sf	107		138				
		32,712.9 sm	352,118 sf			19,240.7 sm	207,105 sf	38%		49%		13%	100%	% of Unit Type	
Site Area Totals & FSI						Gross Site Area	5,880.7 sm	63,299 sf	0.6 ha						
						Landscape Buffers (North+South)	890.7 sm	9,587 sf							
						Landscape Area (not including amenity areas or buffers)	1,075.0 sm	11,571 sf							
						Outdoor Amenity Area at Grade	515.1 sm	5,544 sf							
						Total Landscaped Area	2,480.8 sm	26,703 sf	42.2% of Gross Site Area						
						Land Coverage	2,671.3 sm	28,754 sf	45.4% of Gross Site Area						
						FSI (Total GFA/Net Site Area)	3.3								
						TOTAL GFA	19,240.7 sm	207,105 sf							

**GFA:** Means the sum of the areas of each storey of a building above or below grade, excluding a parking structure above or below grade, measured from the exterior of the outside walls. Includes all shafts, stairs, open to below areas, loading areas, below grade areas and mechanical penthouse.

**GFA - Apartment:** \*As per By-law 0225-2007, Gross Floor Area (GFA - Apartment) excludes any part of the building used for mechanical floor area, stairwells, elevators, vehicle parking, bicycle parking, storage lockers, below-grade storage, any enclosed area used for collection/storage of garbage/recycling, common facilities for the use of residents in the building, a day care and amenity area.

**NOTE:** All open to below areas are included in GFA, unless otherwise indicated in the Notes column above.

The Statistics below are based on requirements as per the Mississauga Zoning By-law 0225-2007

VEHICULAR PARKING			
Precinct 4 - Parking Master Plan 2019	Required	Provided	
Refer to Traffic Report prepared by C.F. Crozier & Associates Inc., for additional information.			
Rental Apartment	1.00 x 283	283	242
Res Visitor	0.20 x 283	57	30
Accessible Parking Spaces (equal number Type A & Type B) (13-100 Required Visitor Spaces = min. 4% of the total to be Accessible Spaces)			
		3	3
TOTAL PARKING			
		340	272
(20% of residential parking and 10% of visitor parking spaces are provided with EV ready spaces)			

BICYCLE PARKING			
	Required	Provided	
Class A (0.6/unit) (In an enclosed area with controlled access)			
	0.6 x 283	170	236
Class B (greater of: 0.05/unit or 6 spaces) (In a publicly accessible location)			
	0.05 x 283	15	24
TOTAL BICYCLES			
		185	260
(50% of occupant bicycle parking to be located in secure weather protected area)			

PROJECT STATISTICS SUMMARY	
Municipal Address:	1470 Williamsport Drive
Mississauga Zoning Bylaw 0225-2007:	RA2-40
Gross Site Area	5,880.7 sm
Established Grade:	139.26
(By-Law 0225-2007, average elevation of grade around the building)	
Building Height (Storeys): (excl. Mech Penthouse)	12 ST
Building Height above Established Grade:	39.5 m
(excl. Mech Penthouse)	
GFA - Residential Uses	19,240.7 sm
GFA - Non-Residential Uses	0.0 sm
Total Combined Gross Floor Area	19,240.7 sm
Floor Space Index (FSI)	3.3
Number of Residential Units	283
Amenity Space Required	1,584.8 sm
Indoor Amenity Space Provided	806.1 sm
Outdoor Amenity Space Provided	1,030.4 sm
Total Amenity Space Provided	1,836.5 sm
Vehicular Parking Total Required	340
Vehicular Parking Total Provided	272
Bicycle Parking Total Required	185
Bicycle Parking Total Provided	260
Loading Spaces Required	
Loading Spaces Provided	1

LOADING / GARBAGE			
Loading Spaces	Required	Provided	
Refer to Traffic Report prepared by C.F. Crozier & Associates Inc., for additional information.			
Residential	283 Units (loading space size 3.5m x 9m)	1	1
TOTAL LOADING SPACES			
		1	
GARBAGE & RECYCLABLE MATERIAL BIN CALCULATION			
# Units	Bin Type	Requirement	Required Bins
Garbage Bins	283 3-cubic Yards	1 bin/54 units	6
Recycle Bins	283 3-cubic Yards	1 bin/45 units	7
* 3-cubic Yard storage bin area: 1.26m high, 2.03m long, 1.07m deep			

AMENITY AREA			
	Required	Provided	
Total Amenity Area			
	5.6 sm/unit	1,584.8	1,836.5 sm
(Amenity Required - the greater of 5.6sm/unit or 10% of the Site Area)			
Indoor Amenity			
	min. 50% contiguous area	Ground	587.0 sm
		2nd	219.1 sm
		Total	806.1 sm
Outdoor Amenity			
	min. 55sm provided at grade	Ground	515.1 sm
		2nd	279.5 sm
		7th	235.8 sm
		Total	1,030.4 sm

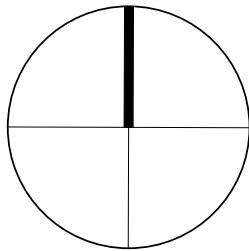
RENTAL REPLACEMENT				
Existing Building - Suite Breakdown				
Floor	1B	2B	3B	
6	3	5		1
5	3	5		1
4	3	5		1
3	3	5		1
2	3	5		1
Ground	4	3		1
Total	19	28		6
		53		
*The above suites will be replaced in proposed development with the equivalent configuration				



1 Context Plan  
A100.S 1:2000

Date	No.	Description
REVISION RECORD		

2025-07-15	Issued for ZBA Resubmission/SPA
2025-02-25	Issued for ZBA/SPA
ISSUE RECORD	



**BDP. Quadrangle**

Quadrangle Architects Limited  
The Well, 8 Spadina Avenue, Suite 2100, Toronto, ON M5V 0S8  
t 416 598 1240 www.bdpquadrangle.com

1470 Williamsport Drive  
  
Mississauga, ON  
for  
1470 Williamsport Holdings Inc.

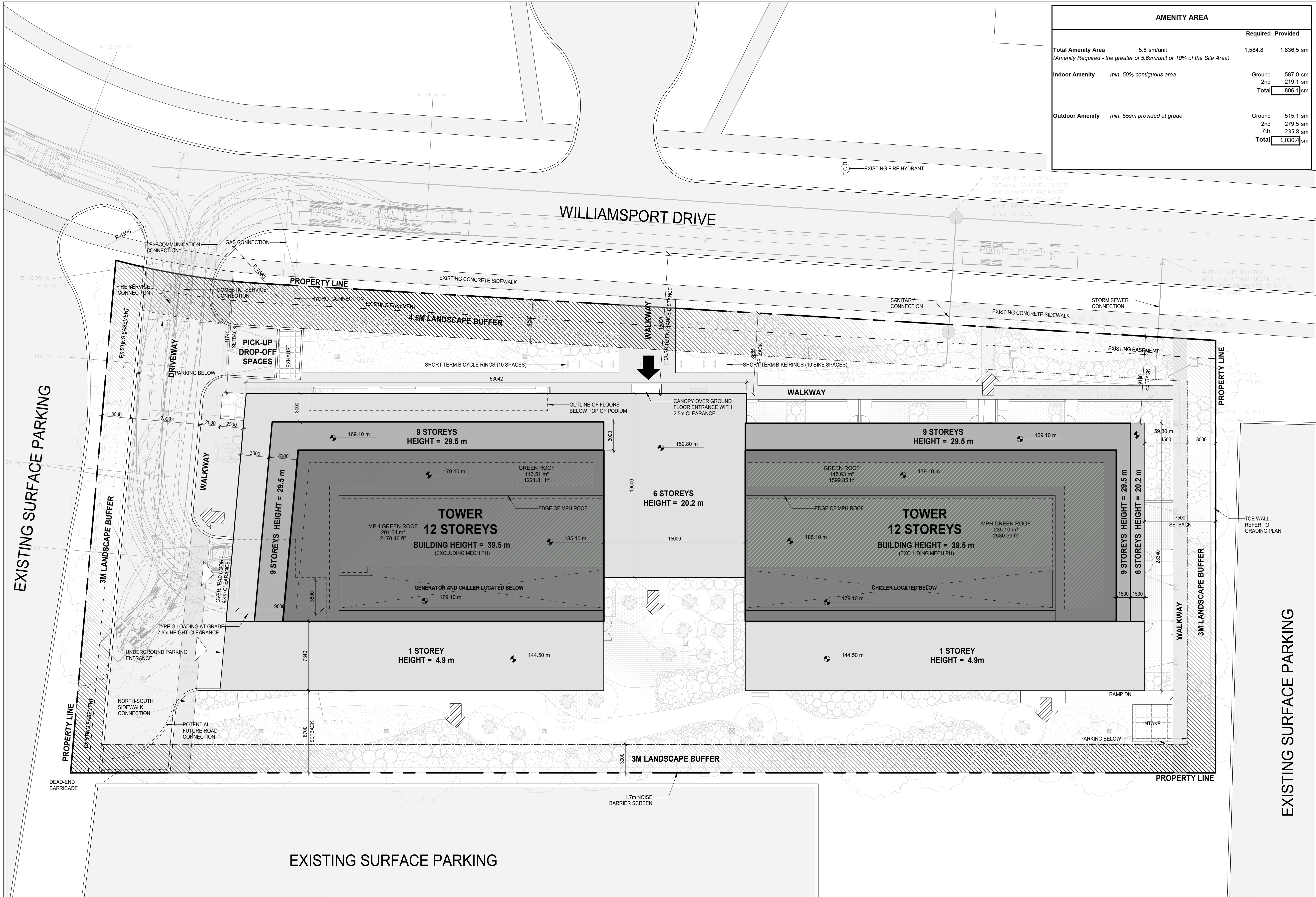
23057 1:1000 AS AB  
PROJECT SCALE DRAWN REVIEWED

Context Plan & Statistics

A100.S

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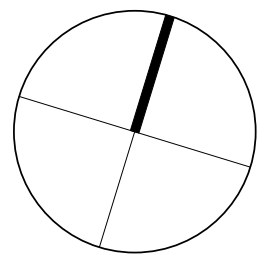


AMENITY AREA			
		Required	Provided
Total Amenity Area		5.6 sm/unit (Amenity Required - the greater of 5.6sm/unit or 10% of the Site Area)	1,584.8    1,836.5 sm
Indoor Amenity	min. 50% contiguous area	Ground	587.0 sm
		2nd	219.1 sm
		Total	806.1 sm
Outdoor Amenity	min. 55sm provided at grade	Ground	515.1 sm
		2nd	279.5 sm
		7th	235.8 sm
		Total	1,030.4 sm

SITE PLAN LEGEND	
	PROPERTY LINE
	LINE OF UNDER GROUND GARAGE BELOW
	MAIN BUILDING ENTRANCE
	EXIT
	VEHICLE / LOADING ENTRANCE / EXIT
	PROPOSED ELEVATION
	BUILDING ENVELOPE

Date	No.	Description
REVISION RECORD		

2025-07-15	Issued for ZBA
	Resubmission/SPA
2025-02-25	Issued for ZBA/SPA
ISSUE RECORD	



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1470 Williamsport Drive  
  
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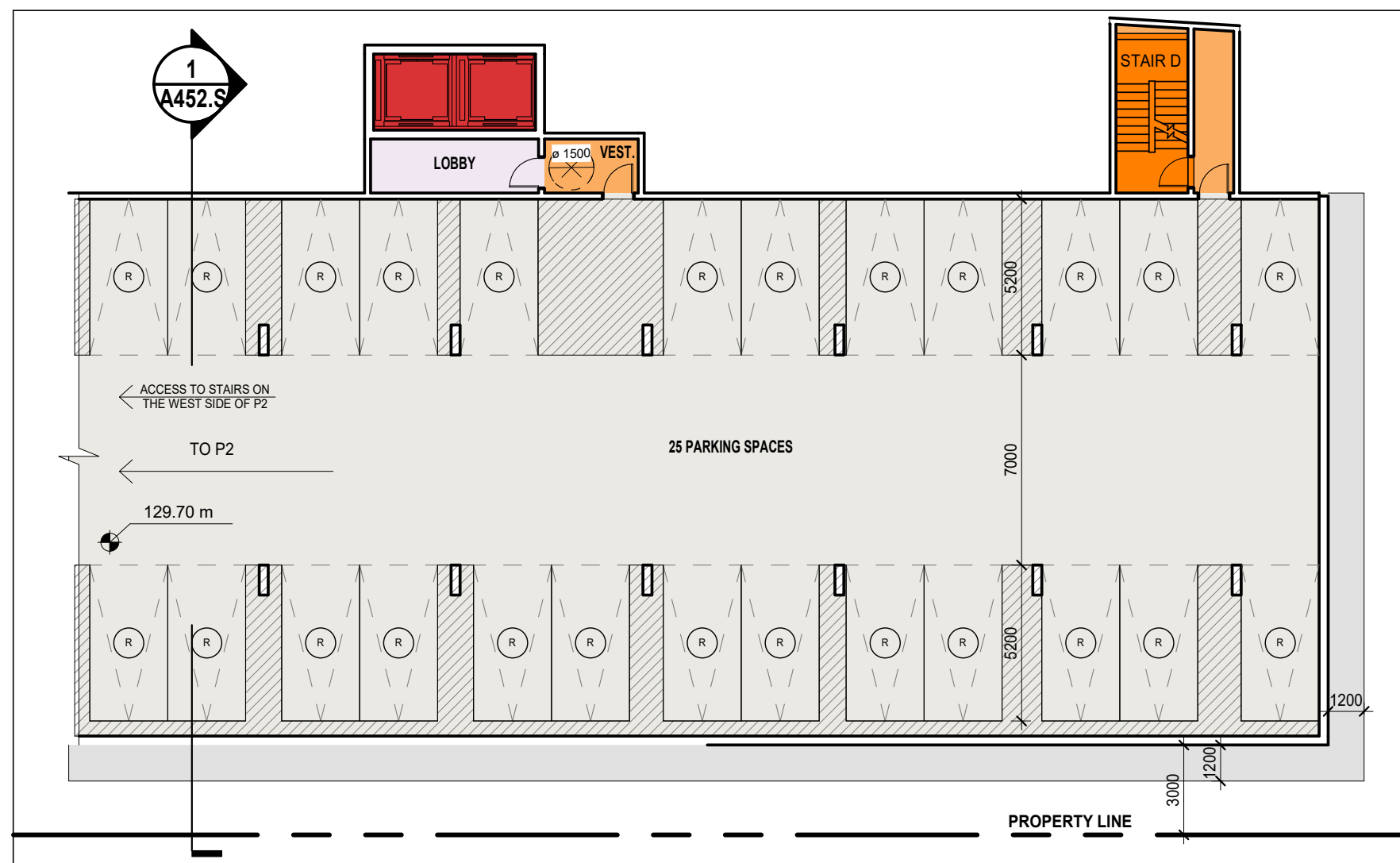
23057	1:200	SJ	AB
PROJECT SCALE		DRAWN REVIEWED	

Site Plan

A101.S

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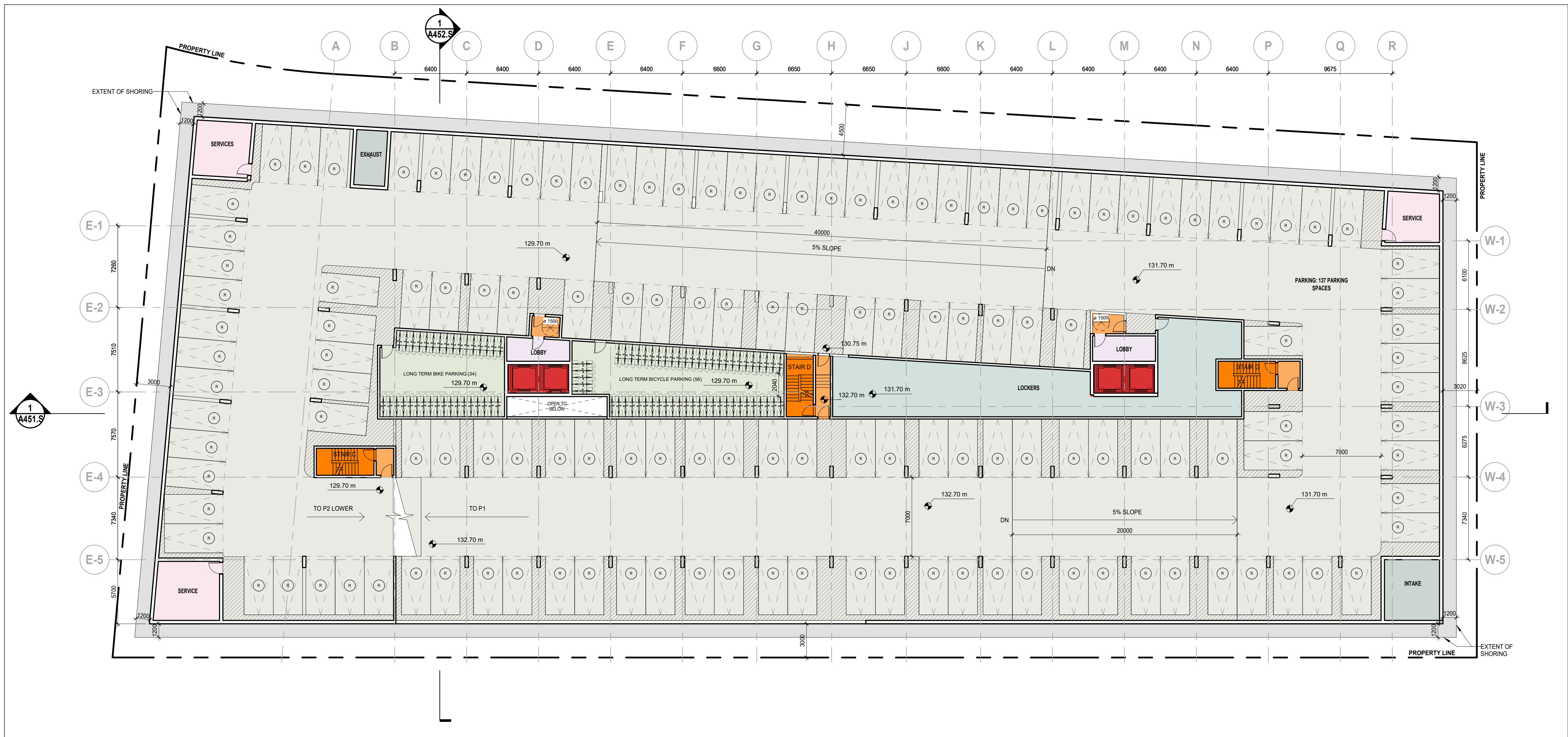
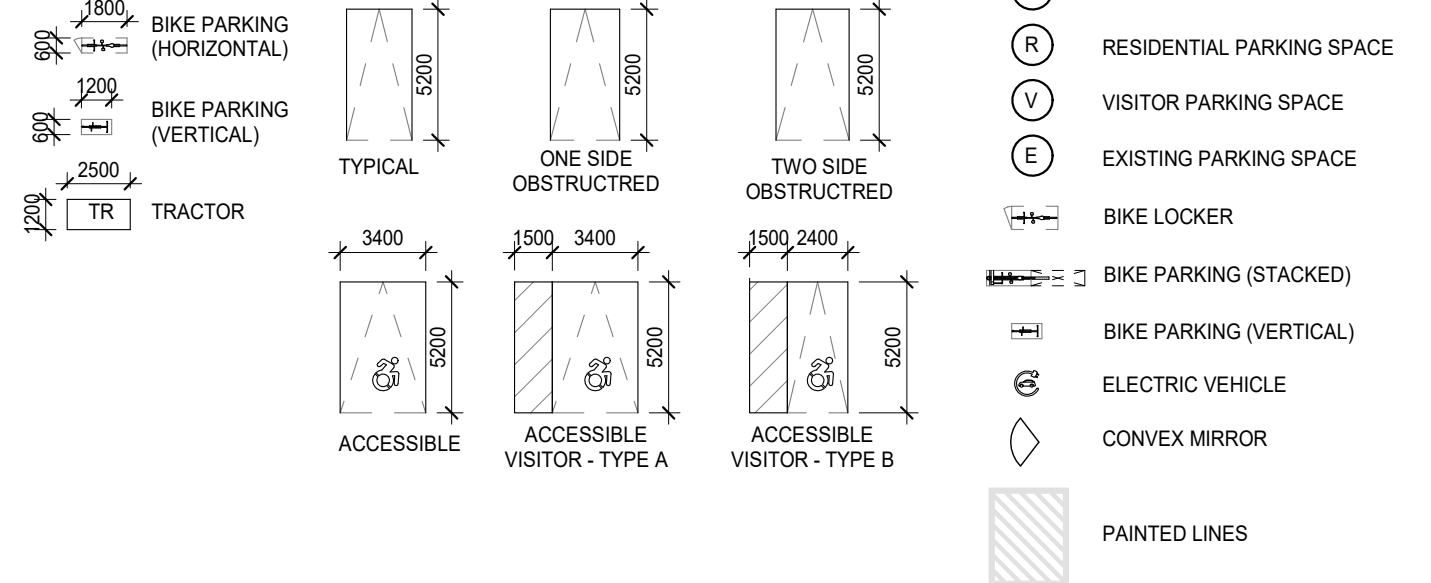


2 P2 Lower Underground Plan

PARKING NOTES:

1. MINIMUM PARKING SPACE SIZES (UNLESS OTHERWISE NOTED):
  - 2600mm WIDE X 5200mm LONG (NO SIDES OBSTRUCTED)
  - 2750mm WIDE X 5200mm LONG (ONE SIDE OBSTRUCTED)
  - 2900mm WIDE X 5200mm LONG (TWO SIDES OBSTRUCTED)
2. MAINTAIN MINIMUM DRIVE AISLE WIDTH OF 7000mm UNLESS OTHERWISE NOTED.
3. MAINTAIN MINIMUM HEADROOM CLEARANCE OF 2100mm THROUGHOUT.

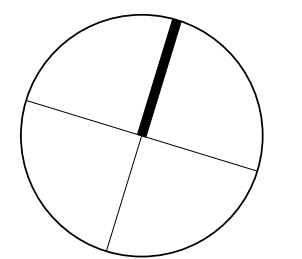
PARKING LEGEND:



1 P2 Underground Plan

Date	No.	Description
REVISION RECORD		

2025-07-15	Issued for ZBA
	Resubmission/SPA
2025-02-25	Issued for ZBA/SPA
ISSUE RECORD	



**BDP.**  
**Quadrangle**

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t 416 598 1240 www.bdpquadrangle.com

1470 Williamsport Drive  
Mississauga, ON  
for  
1470 Williamsport Holdings Inc.

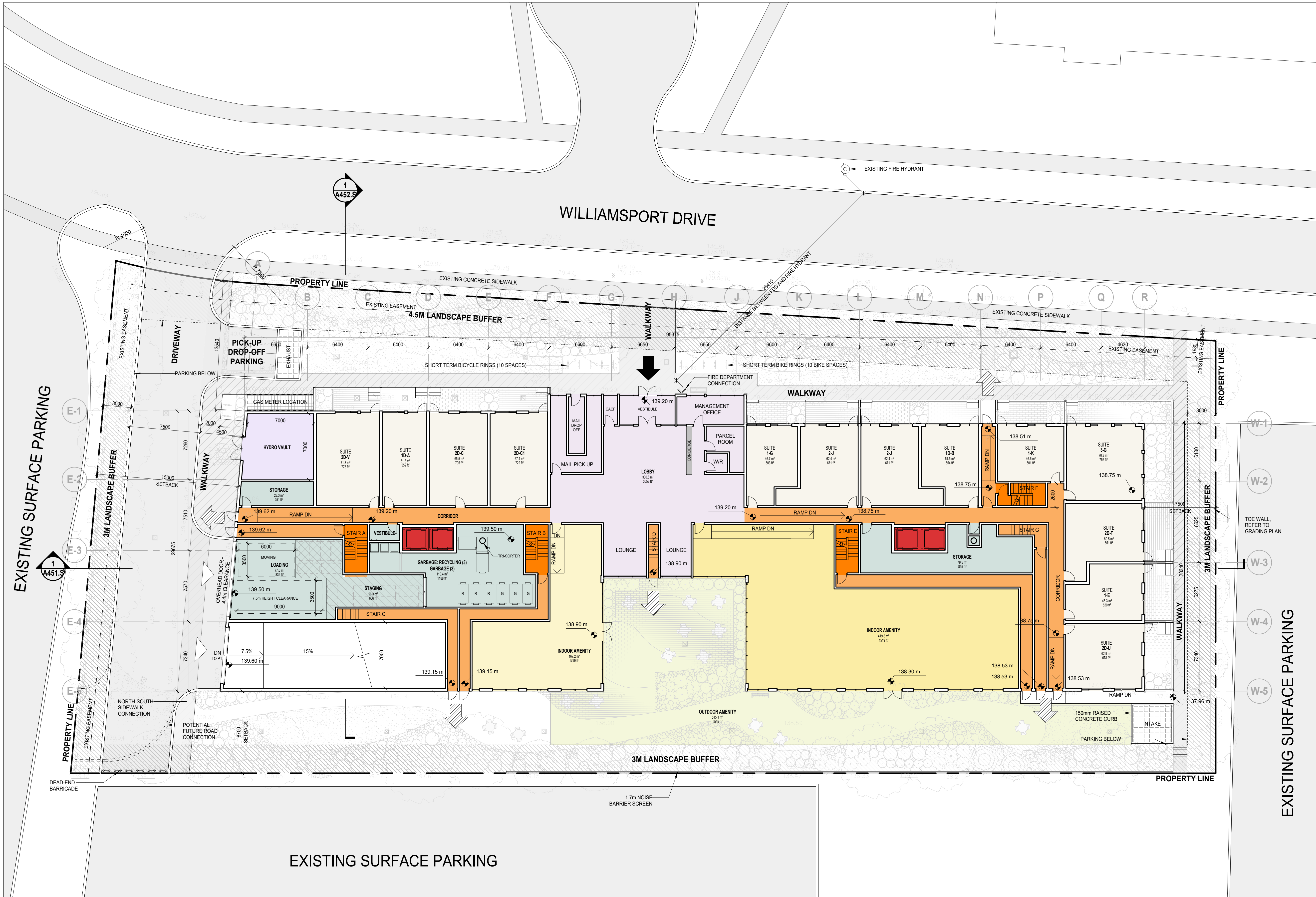
23057 1:200 SJ AB  
PROJECT SCALE DRAWN REVIEWED

P2 Underground Plan

**A102.S**

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SITE PLAN LEGEND

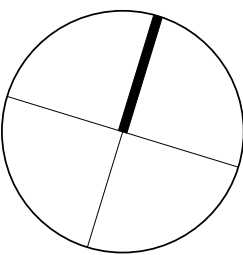
- PROPERTY LINE
- LINE OF UNDER GROUND GARAGE BELOW
- MAIN BUILDING ENTRANCE
- EXIT
- VEHICLE / LOADING ENTRANCE / EXIT
- PROPOSED ELEVATION
- BUILDING ENVELOPE

Date No. Description

REVISION RECORD

2025-07-15 Issued for ZBA  
Resubmission/SPA  
2025-02-25 Issued for ZBA/SPA

ISSUE RECORD



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1470 Williamsport Drive

Mississauga, ON  
for  
1470 Williamsport Holdings Inc.

23057 1:200 SJ AB  
PROJECT SCALE DRAWN REVIEWED

Ground Floor Plan

**A201.S**

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# APPENDIX B

## Water Demand Calculations



Project: 1470 Williamsport Drive  
Project No.: 2719-7179

Created By: ECM  
Checked By: RS

Date: 2024-08-16  
Updated: 2025-02-25

## Existing Domestic Water Demand

Site Area: 0.59 ha

### Residential:

	<u>Bachelor + 1 Bedroom</u>	<u>Greater than 1 Bedroom</u>
Population Density:	1.7	3.1
Number of Units:	19	34
Population:	33	106
<b>Total Residential Population:</b>	<b>139</b>	<b>persons</b>

### Design Parameters:

<b>Avg. Consumption Rate (L/capita/day)</b>
270

### Water Demand:

Average Daily Demand = 37,530 L/day  
**0.43 L/s**

#### Peaking Factors

Max Day = 1.8  
Peak Hour = 3.0

Average Day = 0.43 L/s  
Max Day = **0.78** L/s  
Peak Hour = **1.30** L/s

Municipality	Average Daily Water Demand (L/min)	Max Day Demand (L/min)	Peak Hourly Demand (L/min)
Region of Peel	26.1	46.9	78.2

### Notes & References

2023 Region of Peel Linear Wastewater Standards.  
These unit rates were used to be conservative.

Region of Peel, 2020 Development Charges  
Background Study

Region of Peel, 2020 Development Charges  
Background Study

Max Day = Avg. Day Demand \* Max Day Factor  
Peak Hour = Avg. Day Demand \* Peak Hour Factor



**Project:** 1470 Williamsport Drive  
**Project No.:** 2719-7179

**Created By:** ECM  
**Checked By:** RS

**Date:** 2024-08-16  
**Updated:** 2025-02-25

## Proposed Domestic Water Demand

Proposed Domestic Water Demand				Notes & References
Site Area: 0.59 ha				
Residential:				
	Bachelor + 1 Bedroom	Greater than 1 Bedroom		
Population Density:	1.7	3.1		
Number of Units:	107	176		
Population:	182	546		
Total Residential Population:	728	persons		
Design Parameters:				
Avg. Consumption Rate (L/capita/day)				
270				
Water Demand:				
Average Daily Demand =		196,560	L/day	
		2.28	L/s	
Peaking Factors				
Max Day =		1.8		
Peak Hour =		3.0		
Average Day =		2.28	L/s	
Max Day =		4.10	L/s	
Peak Hour =		6.83	L/s	
Municipality	Average Daily Water Demand (L/min)	Max Day Demand (L/min)	Peak Hourly Demand (L/min)	
Region of Peel	136.50	245.70	409.50	

## Required Fire Flow Worksheet - Proposed Development

Water Supply for Public Fire Protection - 2020  
Fire Underwriters Survey

## Part II - Guide for Determination of Required Fire Flow

1. An estimate of fire flow required for a given area may be determined by the formula:

$$RFF = 220 * C * \sqrt{A}$$

where

RFF = the required fire flow in litres per minute

C = coefficient related to the type of construction:

=	1.5	for Type V Wood Frame Construction (structure essentially all combustible)
=	0.8	for Type IV-A Mass Timber Construction (encapsulated mass timber)
=	0.9	for Type IV-B Mass Timber Construction (rated mass timber)
=	1.0	for Type IV-C Mass Timber Construction (ordinary mass timber)
=	1.5	for Type IV-D Mass Timber Construction (un-rated mass timber)
=	1.0	for Type III Ordinary Construction (brick or other masonry walls, combustible floor and interior)
=	0.8	for Type II Non-combustible Construction (unprotected metal structural components)
=	0.6	for Type I Fire-resistive Construction (fully protected frame, floors, roof)

## Area Inputs:

Largest Floors			
Ground	2,671	sq.m	100%
Level 2	2,077	sq.m	25%
Level 3	2,077	sq.m	25%

## Fire Flow:

Type of Construction:

C = 0.6  
A\* = 3710 m<sup>2</sup>  
RFF= 9,000 L/min

Assumes Type I Fire-resistive Construction (fully protected frame, floors, roof)

Area of the single largest floor plus 25% of each of the two immediately adjoining floors.  
(rounded to nearest 1,000 L/min)

2. Values obtained in No. 1 may be reduced by as much as 25% for occupancies having low contents fire hazard or may be increased by up to 25% surcharge for occupancies having a high fire hazard.

Non-Combustible (NC)	-25%	Free Burning (FB)	15%
Limited Combustible (LC)	-15%	Rapid Burning (RB)	25%
Combustible (C)	0% (No Change)		

## Occupancy &amp; Contents Adjustment Factor:

Contents Factor: LC  
Reduction/Surcharge of: -15% L/min reduction = -1350 L/min  
RFF= 7,650 L/min

Note: Flow determined shall not be less than 2,000 L/min

3. Sprinklers - The value obtained in No. 2 above may be reduced by up to 50% for complete automatic sprinkler protection.

## Automatic Sprinkler Protection:

NFPA 13 Sprinkler:	Yes	-30%
Standard Water Supply:	Yes	-10%
Fully Supervised System:	Yes	-10%
Total Adjustment:		-50%
RFF=	3,825 L/min	reduction = -3825 L/min

### Required Fire Flow Worksheet - Proposed Development

#### Water Supply for Public Fire Protection - 2020 Fire Underwriters Survey

##### Part II - Guide for Determination of Required Fire Flow

4. Exposure - To the value obtained in No. 2, a percentage should be added for structures exposed within 30 metres by the fire area under consideration. The percentage shall depend upon the height, area, and construction of the building(s) being exposed, the separation, openings in the exposed building(s), the length and height of exposure, the provision of automatic sprinklers and/or outside sprinklers in the building(s) exposed, the occupancy of the exposed building(s) and the effect of hillside locations on the possible spread of fire.

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	> 30 m	0%
10.1 to 20 m	15%		

##### Exposure Adjustment Charge:

Direction	Description	Distance (m)	Charge (%)
North	1485 Williamsport Drive	43.5	0%
East	3410 Havenwood Dr.	45.7	0%
South	1475 Bloor St.	26.4	10%
West	3415 Dixie Rd.	27.8	10%
			20%
RFF=		4,590	L/min
		surcharge =	765 L/min

Note: Maximum exposure charge can be 75%

##### Determine Required Fire Flow = Summary

No.1	9,000 L/min
No. 2	-1,350 L/min adjustment
No. 3	-3,825 L/min adjustment
No. 4	765 L/min adjustment
<b>Required Flow:</b>	<b>4,590 L/min</b>
<b>Rounded to nearest 1000 L/min:</b>	<b>5,000 L/min</b> or <b>83.3 L/s</b> 1,321 USGPM

##### Determine Required Duration

Rounded to nearest 1000 L/min: 5,000 L/min  
 Duration for 2,000 L/min: **1.75** hour



## Hydrant Testing Ontario

Tel: 289-354-1942

[Info@HTOntario.ca](mailto:Info@HTOntario.ca)

## REPORT

Nº. 2523

September 5, 2024

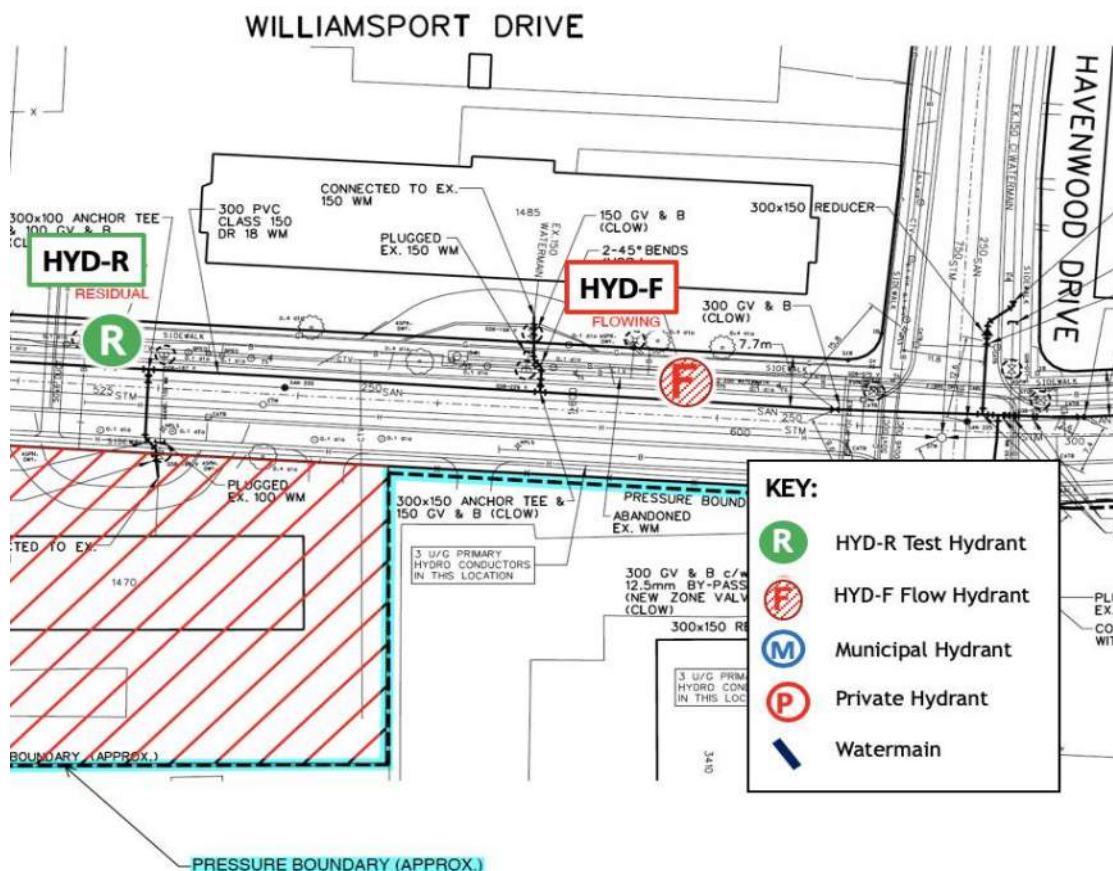
To:

Jack Greenberg  
1470 Williamsport Holdings Inc. c/o Compten Management Inc.  
181 Eglinton Ave East, Suite #204  
Toronto, ON M4P 1J4

RE: Hydrant Flow Test - 1470 WILLIAMSPORT DRIVE, MISSISSAUGA

Please find the Report for the following works

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





## HYDRANT FLOW TEST

### TORONTO

DATE: September 3, 2024

TIME: 11:00 AM

R - TEST HYDRANT 1470 WILLIAMSPORT DRIVE

HYDRANT No. HYD-R

HYDRANT MODEL: McAVITY

COLOUR: BLUE

STATIC PRESSURE psi (hr-20<sup>0.54</sup>): 97

VARIANCE: 12.37%

Q - FLOW HYDRANT 1485 WILLIAMSPORT DRIVE

HYDRANT No. HYD-F

HYDRANT MODEL: McAVITY

COLOUR: BLUE

No. Outlets	Residual Pressure ( $h_f \cdot R^{0.54}$ )	Orifice Dia Dia. (in.) ( $d^2$ )	Coefficient	Nozzle PSI ( $\sqrt{psi}$ )	$Q$ = Flow (USGPM) $Q = 29.83 (c) (d2) (\sqrt{psi})$
1	91	2.5	0.9	75	1453
2	85	2.5	0.9	35	993
$Q_F$ = Total Flow (USGPM)					1985

$Q_R$  = flow predicted @ 20 psi

5417

USGPMA

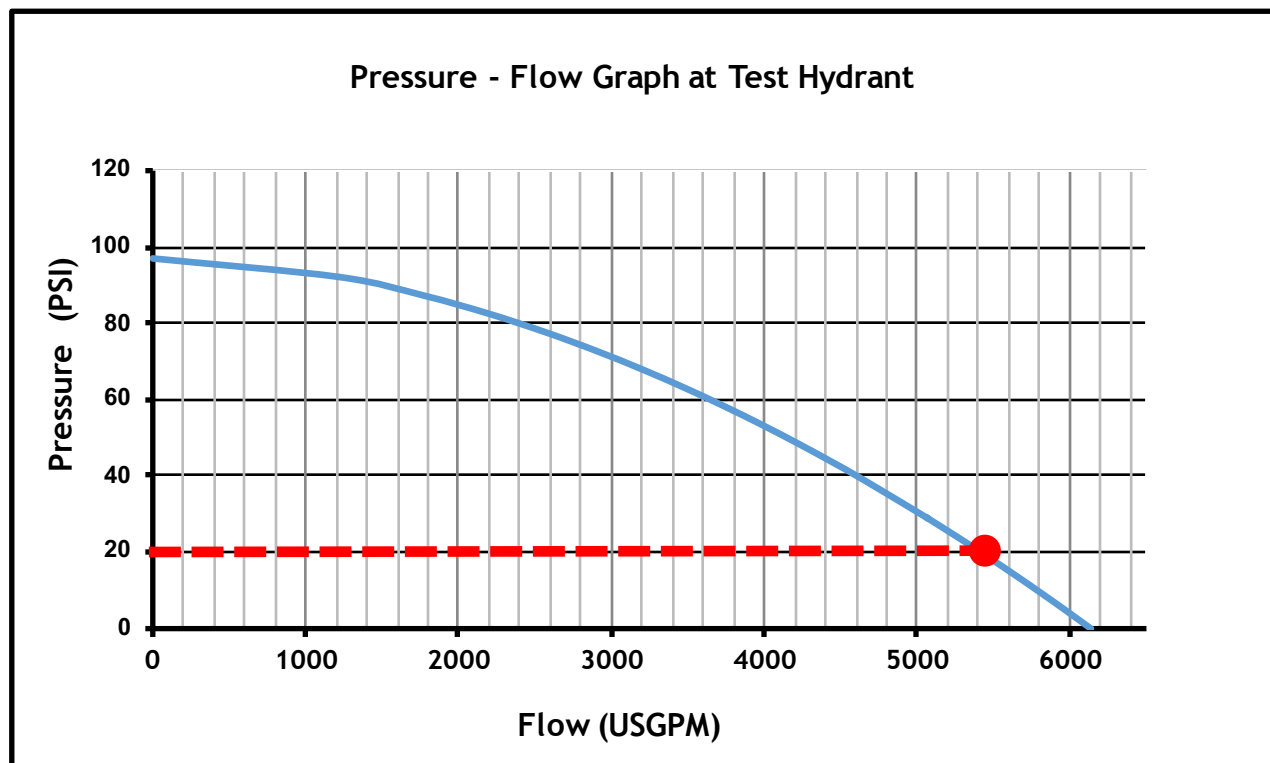
$$Q_R = Q_F \cdot (H_r - 20^{0.54}) / (H_f - R^{0.54})$$

342

L/s

NFPA Rating:

**CLASS AA - BLUE**





## Test Conclusion

The system at the time of testing produced a theoretical projected flow rate of:

LOCATION	Total USGPM	USGPM at 20 psi	lps at 20 psi	TEST #
WILLIAMSPORT DR	1985	5417	342	TEST 1

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

COLOUR	CLASS	Available Flow @ 20psi
<b>BLUE</b>	<b>AA</b>	<b>1500 GPM or more</b>
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 Reg



Rob Gamble  
Manager of Operations  
Hydrant Testing Ontario  
[Info@HTOntario.ca](mailto:Info@HTOntario.ca)

# APPENDIX C

## Sanitary Flow Calculations

## Existing Domestic Sanitary Design Flow

Site Area: 0.59 ha

### Residential:

	Bachelor + 1 Bedroom	Greater than 1 Bedroom	
Population Density:	1.7	3.1	persons/unit
Number of Units:	19	34	units
Population:	33	106	persons
<b>Total Residential Population:</b>	<b>139</b>	<b>persons</b>	

### Design Parameters

Average Flow		
Residential	290	L/capita/d
No-residential	270	L/capita/d
Infiltration	0.26	L/s/ha

Harmon Peak Factor:  $M = 4.00$

Average Daily Flow = 0.47 L/s

Peaked Flow = 1.87 L/s

Infiltration = 0.15 L/s

Total Peak Flow = **2.02** L/s

### Summary Table

Average Daily Flow* (L/s)	Peaking Factor	Peak Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)
0.47	4.00	1.87	0.15	2.02

### Notes & References

2023 Region of Peel Linear Wastewater Standards

2023 Region of Peel Linear Wastewater Standards

$M = 1 + (14 / (4 + (P / 1000)^{1/2}))$   
\*Min of 2 and Max of 4.

Total Peak Flow = Peak Flow + Total Infiltration

## Proposed Domestic Sanitary Design Flow

Site Area: 0.59 ha

### Residential:

	Bachelor + 1 Bedroom	Greater than 1 Bedroom	
Population Density:	1.7	3.1	persons/unit
Number of Units:	107	176	units
Population:	182	546	persons
<b>Total Residential Population:</b>	<b>728</b>	<b>persons</b>	

### Design Parameters

Average Flow		
Residential	290	L/capita/d
No-residential	270	L/capita/d
Infiltration	0.26	L/s/ha

Harmon Peak Factor:  $M = 3.88$

Average Daily Flow = 2.44 L/s

Peaked Flow = 9.49 L/s

Infiltration = 0.15 L/s

Total Peak Flow = **9.65** L/s

### Summary Table

Average Daily Flow* (L/s)	Peaking Factor	Peak Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)
2.44	3.88	9.49	0.15	9.65

### Notes & References

2023 Region of Peel Linear Wastewater Standards

2023 Region of Peel Linear Wastewater Standards

$M = 1 + (14 / (4 + (P / 1000)^{1/2}))$   
\*Min of 2 and Max of 4.

Total Peak Flow = Peak Flow + Total Infiltration

# APPENDIX D

## Stormwater Management Calculations



**Project:** 1470 Williamsport Drive  
**Project No.:** 2719-7179  
**Created By:** ECM  
**Checked By:** MC  
**Updated:** 2025-09-30

## Modified Rational Calculations - Summary

Storm Event (yr)	Peak Flow Rate		Required Storage (m <sup>3</sup> )
	Allowable Release Rate(L/s)	Post-Development (L/s) Controlled	
2	21.02	18.81	56.1
5	27.91	22.50	80.3
10	32.61	25.51	103.2
25	38.57	29.34	136.4
50	43.02	33.04	173.1
100	47.49	36.07	206.2

### Modified Rational Calculations - Input Parameters

Storm Data: City of Mississauga

Time of Concentration:  $T_c = 15.00$  mins

Return Period	A	B	C	I (mm/hr)
2 yr	610.0	4.6	0.78	59.89
5 yr	820.0	4.6	0.78	80.51
10 yr	1010.0	4.6	0.78	99.17
25 yr	1160.0	4.6	0.78	113.89
50 yr	1300.0	4.7	0.78	127.13
100 yr	1450.0	4.9	0.78	140.69

#### Pre-Development Conditions

Land Use	Area (ha)	Area (m <sup>2</sup> )	C	Weighted Average C
<b>Catchment 101 to Storm Sewers on Williamsport Drive</b>				
Pervious	0.23	2310	0.25	0.11
Impervious	0.30	3035	0.90	0.51
<b>Total Subcatchment</b>	<b>0.53</b>	<b>5345</b>	<b>-</b>	<b>0.62</b>
<b>Catchment 102 Overland to the South (Bloor Street)</b>				
Pervious	0.05	536	0.25	0.25
Impervious	0.00	0	0.90	0.00
<b>Total Subcatchment</b>	<b>0.05</b>	<b>536</b>	<b>-</b>	<b>0.25</b>
<b>Total</b>	<b>0.59</b>	<b>5881</b>	<b>-</b>	<b>0.59</b>

#### Post-Development Conditions

Land Use	Area (ha)	Area (m <sup>2</sup> )	C	Weighted Average C
<b>Catchment 201 to Storm Sewer on Williamsport Drive via SWM TANK</b>				
Pervious/Sodded	0.15	1487	0.25	0.06
Pervious (Green Roof)	0.07	699	0.50	0.06
Impervious	0.37	3695	0.90	0.57
<b>Total</b>	<b>0.59</b>	<b>5881</b>	<b>-</b>	<b>0.69</b>

#### References

Development Requirements Manual (Nov 2020)

$$I = A / (T+B)^C$$

$$Q = 0.0028 \cdot C \cdot I \cdot A$$

## Modified Rational Calculations - Peak Flow Summary

### Pre-Development

Catchment 101 to Storm Sewers on Williamsport Drive					
Storm Event	C	i (mm/hr)	A (ha)	Q (m <sup>3</sup> /s)	Q (L/s)
2 yr	0.62	59.89	0.534	0.055	55.09
100 yr	0.62	140.69		0.129	129.42

Catchment 102 Overland to the South (Bloor Street)					
Storm Event	C	i (mm/hr)	A (ha)	Q (m <sup>3</sup> /s)	Q (L/s)
2 yr	0.25	59.89	0.05	0.002	2.23
100 yr	0.25	140.69		0.005	5.24

Little Etobicoke Creek Unit Flow Rates (m <sup>3</sup> /s/ha)					
2-year	5-year	10-year	25-year	50-year	100-year
0.03575	0.04746	0.05546	0.06559	0.07315	0.08075

Allowable Release Rates (L/s)					
2-year	5-year	10-year	25-year	50-year	100-year
21.02	27.91	32.61	38.57	43.02	47.49

### Post-Development

Catchment 201 to Storm Sewer on Williamsport Drive via SWM TANK					
Storm Event	C	i (mm/hr)	A (ha)	Q (m <sup>3</sup> /s)	Q (L/s)
2 yr	0.69	59.89	0.59	0.067	67.4
5 yr		80.51		0.091	90.6
10 yr		99.17		0.112	111.6
25 yr		113.89		0.128	128.1
50 yr		127.13		0.143	143.0
100 yr		140.69		0.158	158.3



### MODIFIED RATIONAL METHOD

Rainfall IDF Coefficients

100-Year

A =	1450.0
B =	4.9
C =	0.78

Rational Method Calculation

Area =	0.59	ha	
Runoff Coefficient, C* =	0.86		*100 Year Adjustment factor of 1.25 has been applied.
C*A =	0.51		
Time of Concentration, t <sub>c</sub> =	15.0	min	
Storm Duration Increment =	5.0	min	
Constant Inflow (groundwater seepage) =	0.63	L/s	*Rate provided by mechanical consultant (Novatrend)
Allowable Release Rate -	<b>47.49</b>	L/s	
Design 100-YR Release Rate =	36.07	L/s	
Storage Required =	206.2	m <sup>3</sup>	

#### 100-Year

Storm Duration (min)	Rainfall Intensity (mm/hr)	Max. Runoff Flow (L/s)	Runoff Volume (m <sup>3</sup> )	Released Volume (m <sup>3</sup> )	Storage Volume (m <sup>3</sup> )	Max. Storage Volume Required (m <sup>3</sup> )	Notes
15.0	140.69	198.31	178	32	146.0		
20.0	118.12	166.60	200	38	162.0		
25.0	102.41	144.53	217	43	173.5		
30.0	90.77	128.18	231	49	182.0		
35.0	81.77	115.53	243	54	188.5		
40.0	74.58	105.42	253	60	193.5		
45.0	68.68	97.14	262	65	197.3		
50.0	63.75	90.21	271	70	200.3		
55.0	59.56	84.32	278	76	202.5		
60.0	55.95	79.25	285	81	204.1		
65.0	52.81	74.83	292	87	205.2		
70.0	50.03	70.93	298	92	205.9		
75.0	47.58	67.48	304	97	206.2	206.2	
80.0	45.38	64.39	309	103	206.2		
85.0	43.39	61.60	314	108	206.0		
90.0	41.60	59.08	319	114	205.4		
95.0	39.97	56.79	324	119	204.6		
100.0	38.47	54.69	328	124	203.7		
105.0	37.10	52.76	332	130	202.5		
110.0	35.84	50.98	336	135	201.2		
115.0	34.66	49.34	340	141	199.7		
120.0	33.58	47.81	344	146	198.1		
125.0	32.57	46.39	348	152	196.4		

## ORIFICE SIZING

100-Year		
<b>Orifice Sizing</b>		
<b>Orifice Equation:</b>  <i>where:</i>	$Q = C_d A \sqrt{2gH}$ $Q = \text{flow rate (m}^3/\text{s)}$ $H = \text{head on the weir (m)}$ $A = \text{area of orifice (m}^2)$	$g = 9.81 \text{ (m/s}^2\text{) gravity}$ $C_d = \text{coefficient of discharge}$ $C_d = 0.63 \text{ for Sharp Orifice}$ $C_d = 0.84 \text{ for Tube Orifice}$
100-yr HWL =	136.78	m
Orifice Invert =	135.25	m
Height =	1.53	m
C =	0.84	(orifice tube)
d <sub>orifice</sub> =	100	mm
r <sub>orifice</sub> =	50	mm
Q <sub>Orifice</sub> =	36.07	L/s
<b>Allowable Flow</b>	<b>47.49</b>	<b>L/s</b>
<b>Tank Sizing</b>		
Required Quantity Storage	<b>206.2</b>	m <sup>3</sup>
Required Reuse Storage	<b>18.5</b>	m <sup>3</sup>
<b>Tank Dimensions</b>		
Area	135.2	m <sup>2</sup>

### MODIFIED RATIONAL METHOD

Rainfall IDF Coefficients

50-Year

A =	1300.0
B =	4.7
C =	0.78

#### Rational Method Calculation

Area =	0.59	ha	
Runoff Coefficient, C* =	0.83		*50 Year Adjustment factor of 1.2 has been applied.
C*A =	0.49		
Time of Concentration, t <sub>c</sub> =	15.0	min	
Storm Duration Increment =	5.0	min	
Constant Inflow (groundwater seepage) =	0.63	L/s	*Rate provided by mechanical consultant (Novatrend)
Allowable Release Rate -	<b>43.02</b>	L/s	
Design 50-YR Release Rate =	33.04	L/s	
Storage Required =	173.1	m <sup>3</sup>	

#### 50-Year

Storm Duration (min)	Rainfall Intensity (mm/hr)	Max. Runoff Flow (L/s)	Runoff Volume (m <sup>3</sup> )	Released Volume (m <sup>3</sup> )	Storage Volume (m <sup>3</sup> )	Max. Storage Volume Required (m <sup>3</sup> )	Notes
15.0	127.13	172.12	155	30	125.2		
20.0	106.57	144.38	173	35	138.6		
25.0	92.30	125.13	188	40	148.0		
30.0	81.75	110.90	200	45	155.0		
35.0	73.60	99.91	210	50	160.2		
40.0	67.10	91.14	219	55	164.2		
45.0	61.77	83.95	227	59	167.2		
50.0	57.32	77.95	234	64	169.4		
55.0	53.54	72.85	240	69	171.0		
60.0	50.28	68.46	246	74	172.1		
65.0	47.45	64.63	252	79	172.8		
70.0	44.95	61.27	257	84	173.1	173.1	
75.0	42.74	58.28	262	89	173.0		
80.0	40.76	55.61	267	94	172.7		
85.0	38.97	53.20	271	99	172.2		
90.0	37.36	51.02	276	104	171.4		
95.0	35.89	49.04	280	109	170.5		
100.0	34.54	47.23	283	114	169.4		
105.0	33.31	45.56	287	119	168.1		
110.0	32.17	44.03	291	124	166.7		
115.0	31.12	42.61	294	129	165.1		
120.0	30.14	41.29	297	134	163.4		
125.0	29.23	40.06	300	139	161.7		

## ORIFICE SIZING

50-Year		
<b>Orifice Sizing</b>		
<b>Orifice Equation:</b>  <i>where:</i>	$Q = C_d A \sqrt{2gH}$ $Q$ = flow rate (m <sup>3</sup> /s) $H$ = head on the weir (m) $A$ = area of orifice (m <sup>2</sup> )	$g = 9.81 \text{ (m/s}^2\text{)}$ gravity $C_d$ = coefficient of discharge $C_d = 0.63$ for Sharp Orifice $C_d = 0.84$ for Tube Orifice
50-yr HWL =	136.53	m
Orifice Invert =	135.25	m
Height =	1.28	m
C =	0.84	(orifice tube)
d <sub>orifice</sub> =	100	mm
r <sub>orifice</sub> =	50	mm
Q <sub>Orifice</sub> =	33.04	L/s
<b>Allowable Flow</b>	<b>43.02</b>	<b>L/s</b>
<b>Tank Sizing</b>		
Required Quantity Storage	<b>173.1</b>	m <sup>3</sup>
Required Reuse Storage	<b>18.5</b>	m <sup>3</sup>
<b>Tank Dimensions</b>		
Area	135.2	m <sup>2</sup>

### MODIFIED RATIONAL METHOD

Rainfall IDF Coefficients	25-Year
A =	1160.0
B =	4.6
C =	0.78

Rational Method Calculation		
Area =	0.59	ha
Runoff Coefficient, C* =	0.76	*25 Year Adjustment factor of 1.1 has been applied.
C*A =	0.45	
Time of Concentration, t <sub>c</sub> =	15.0	min
Storm Duration Increment =	5.0	min
Constant Inflow (groundwater seepage) =	0.63	L/s
Allowable Release Rate -	<b>38.57</b>	L/s
Design 25-YR Release Rate =	29.34	L/s
Storage Required =	136.4	m <sup>3</sup>

25-Year							
Storm Duration (min)	Rainfall Intensity (mm/hr)	Max. Runoff Flow (L/s)	Runoff Volume (m <sup>3</sup> )	Released Volume (m <sup>3</sup> )	Storage Volume (m <sup>3</sup> )	Max. Storage Volume Required (m <sup>3</sup> )	Notes
15.0	113.89	141.46	127	26	100.9		
20.0	95.40	118.58	142	31	111.5		
25.0	82.58	102.73	154	35	118.9		
30.0	73.11	91.03	164	40	124.2		
35.0	65.80	82.00	172	44	128.2		
40.0	59.98	74.79	179	48	131.1		
45.0	55.21	68.89	186	53	133.2		
50.0	51.22	63.96	192	57	134.7		
55.0	47.84	59.78	197	62	135.7		
60.0	44.92	56.18	202	66	136.2		
65.0	42.39	53.04	207	70	136.4	136.4	
70.0	40.15	50.28	211	75	136.4		
75.0	38.17	47.83	215	79	136.0		
80.0	36.40	45.64	219	84	135.5		
85.0	34.81	43.67	223	88	134.7		
90.0	33.36	41.88	226	92	133.7		
95.0	32.05	40.26	229	97	132.7		
100.0	30.85	38.77	233	101	131.4		
105.0	29.74	37.41	236	106	130.1		
110.0	28.73	36.15	239	110	128.6		
115.0	27.79	34.99	241	114	127.0		
120.0	26.91	33.91	244	119	125.3		
125.0	26.10	32.90	247	123	123.5		

## ORIFICE SIZING

25-Year		
<b>Orifice Sizing</b>		
<b>Orifice Equation:</b>  <i>where:</i>	$Q = C_d A \sqrt{2gH}$ $Q = \text{flow rate (m}^3/\text{s)}$ $H = \text{head on the weir (m)}$ $A = \text{area of orifice (m}^2)$	$g = 9.81 \text{ (m/s}^2\text{) gravity}$ $C_d = \text{coefficient of discharge}$ $C_d = 0.63 \text{ for Sharp Orifice}$ $C_d = 0.84 \text{ for Tube Orifice}$
25-yr HWL =	136.26	m
Orifice Invert =	135.25	m
Height =	1.01	m
C =	0.84	(orifice tube)
d <sub>orifice</sub> =	100	mm
r <sub>orifice</sub> =	50	mm
Q <sub>Orifice</sub> =	29.34	L/s
<b>Allowable Flow</b>	<b>38.57</b>	<b>L/s</b>
<b>Tank Sizing</b>		
Required Quantity Storage	<b>136.4</b>	m <sup>3</sup>
Required Reuse Storage	<b>18.5</b>	m <sup>3</sup>
<b>Tank Dimensions</b>		
Area	135.2	m <sup>2</sup>

### MODIFIED RATIONAL METHOD

Rainfall IDF Coefficients

10-Year

A =	1010.0
B =	4.6
C =	0.78

Rational Method Calculation

Area =	0.59	ha	
Runoff Coefficient, C* =	0.69		
C*A =	0.40		
Time of Concentration, t <sub>c</sub> =	15.0	min	
Storm Duration Increment =	5.0	min	
Constant Inflow (groundwater seepage) =	0.63	L/s	*Rate provided by mechanical consultant (Novatrend)
Allowable Release Rate -	<b>32.61</b>	L/s	
Design 10-YR Release Rate =	25.51	L/s	
Storage Required =	103.2	m <sup>3</sup>	

#### 10-Year

Storm Duration (min)	Rainfall Intensity (mm/hr)	Max. Runoff Flow (L/s)	Runoff Volume (m <sup>3</sup> )	Released Volume (m <sup>3</sup> )	Storage Volume (m <sup>3</sup> )	Max. Storage Volume Required (m <sup>3</sup> )	Notes
15.0	99.17	112.10	101	23	77.9		
20.0	83.06	94.00	113	27	86.0		
25.0	71.90	81.45	122	31	91.6		
30.0	63.66	72.18	130	34	95.5		
35.0	57.30	65.03	137	38	98.3		
40.0	52.22	59.33	142	42	100.3		
45.0	48.07	54.66	148	46	101.7		
50.0	44.60	50.76	152	50	102.5		
55.0	41.65	47.45	157	54	103.0		
60.0	39.11	44.60	161	57	103.2	103.2	
65.0	36.91	42.11	164	61	103.0		
70.0	34.96	39.93	168	65	102.7		
75.0	33.24	37.99	171	69	102.1		
80.0	31.69	36.26	174	73	101.3		
85.0	30.31	34.70	177	77	100.4		
90.0	29.05	33.28	180	80	99.4		
95.0	27.90	32.00	182	84	98.2		
100.0	26.86	30.82	185	88	96.9		
105.0	25.90	29.74	187	92	95.5		
110.0	25.01	28.75	190	96	94.1		
115.0	24.19	27.83	192	99	92.5		
120.0	23.43	26.97	194	103	90.9		
125.0	22.72	26.17	196	107	89.2		

## ORIFICE SIZING

10-Year		
<b>Orifice Sizing</b>		
<b>Orifice Equation:</b>  <i>where:</i>	$Q = C_d A \sqrt{2gH}$ $Q = \text{flow rate (m}^3/\text{s)}$ $H = \text{head on the weir (m)}$ $A = \text{area of orifice (m}^2)$	$g = 9.81 \text{ (m/s}^2\text{) gravity}$ $C_d = \text{coefficient of discharge}$ $C_d = 0.63 \text{ for Sharp Orifice}$ $C_d = 0.84 \text{ for Tube Orifice}$
10-yr HWL =	136.01	m
Orifice Invert =	135.25	m
Height =	0.76	m
C =	0.84	(orifice tube)
d <sub>orifice</sub> =	100	mm
r <sub>orifice</sub> =	50	mm
Q <sub>Orifice</sub> =	25.51	L/s
<b>Allowable Flow</b>	<b>32.61</b>	<b>L/s</b>
<b>Tank Sizing</b>		
Required Quantity Storage	<b>103.2</b>	m <sup>3</sup>
Required Reuse Storage	<b>18.5</b>	m <sup>3</sup>
<b>Tank Dimensions</b>		
Area	135.2	m <sup>2</sup>



### MODIFIED RATIONAL METHOD

Rainfall IDF Coefficients

5-Year

A =	820.0
B =	4.6
C =	0.78

Rational Method Calculation

Area =	0.59	ha	
Runoff Coefficient, C* =	0.69		
C*A =	0.40		
Time of Concentration, $t_c$ =	15.0	min	
Storm Duration Increment =	5.0	min	
Constant Inflow (groundwater seepage) =	0.63	L/s	*Rate provided by mechanical consultant (Novatrend)
Allowable Release Rate -	<b>27.91</b>	L/s	
Design 5-YR Release Rate =	22.50	L/s	
Storage Required =	80.3	m <sup>3</sup>	

#### 5-Year

Storm Duration (min)	Rainfall Intensity (mm/hr)	Max. Runoff Flow (L/s)	Runoff Volume (m <sup>3</sup> )	Released Volume (m <sup>3</sup> )	Storage Volume (m <sup>3</sup> )	Max. Storage Volume Required (m <sup>3</sup> )	Notes
15.0	80.51	91.13	82	20	61.8		
20.0	67.43	76.43	92	24	68.1		
25.0	58.37	66.25	99	27	72.4		
30.0	51.68	58.72	106	30	75.3		
35.0	46.52	52.92	111	34	77.4		
40.0	42.40	48.29	116	37	78.8		
45.0	39.02	44.50	120	41	79.6		
50.0	36.21	41.33	124	44	80.1		
55.0	33.82	38.64	128	47	80.3	80.3	
60.0	31.76	36.33	131	51	80.1		
65.0	29.96	34.31	134	54	79.8		
70.0	28.38	32.54	137	57	79.3		
75.0	26.98	30.96	139	61	78.6		
80.0	25.73	29.55	142	64	77.7		
85.0	24.60	28.29	144	68	76.8		
90.0	23.58	27.14	147	71	75.7		
95.0	22.66	26.10	149	74	74.5		
100.0	21.81	25.14	151	78	73.2		
105.0	21.03	24.27	153	81	71.9		
110.0	20.31	23.46	155	84	70.4		
115.0	19.64	22.71	157	88	68.9		
120.0	19.02	22.02	159	91	67.4		
125.0	18.45	21.37	160	95	65.8		

## ORIFICE SIZING

5-Year		
<b>Orifice Sizing</b>		
<b>Orifice Equation:</b>  <i>where:</i>	$Q = C_d A \sqrt{2gH}$ $Q = \text{flow rate (m}^3/\text{s)}$ $H = \text{head on the weir (m)}$ $A = \text{area of orifice (m}^2)$	$g = 9.81 \text{ (m/s}^2\text{) gravity}$ $C_d = \text{coefficient of discharge}$ $C_d = 0.63 \text{ for Sharp Orifice}$ $C_d = 0.84 \text{ for Tube Orifice}$
5-yr HWL =	135.84	m
Orifice Invert =	135.25	m
Height =	0.59	m
C =	0.84	(orifice tube)
d <sub>orifice</sub> =	100	mm
r <sub>orifice</sub> =	50	mm
Q <sub>Orifice</sub> =	22.50	L/s
<b>Allowable Flow</b>	<b>27.91</b>	<b>L/s</b>
<b>Tank Sizing</b>		
Required Quantity Storage	<b>80.3</b>	m <sup>3</sup>
Required Reuse Storage	<b>18.5</b>	m <sup>3</sup>
<b>Tank Dimensions</b>		
Area	135.2	m <sup>2</sup>

### MODIFIED RATIONAL METHOD

Rainfall IDF Coefficients

2-Year

A =	610.0
B =	4.6
C =	0.78

Rational Method Calculation

Area =	0.59	ha	
Runoff Coefficient, C* =	0.69		
C*A =	0.40		
Time of Concentration, t <sub>c</sub> =	15.0	min	
Storm Duration Increment =	5.0	min	
Constant Inflow (groundwater seepage) =	0.63	L/s	*Rate provided by mechanical consultant (Novatrend)
Allowable Release Rate -	<b>21.02</b>	L/s	
Design 2-YR Release Rate =	18.81	L/s	
Storage Required =	56.1	m <sup>3</sup>	

#### 2-Year

Storm Duration (min)	Rainfall Intensity (mm/hr)	Max. Runoff Flow (L/s)	Runoff Volume (m <sup>3</sup> )	Released Volume (m <sup>3</sup> )	Storage Volume (m <sup>3</sup> )	Max. Storage Volume Required (m <sup>3</sup> )	Notes
15.0	59.89	67.95	61	17	44.2		
20.0	50.16	57.02	68	20	48.7		
25.0	43.42	49.44	74	23	51.6		
30.0	38.45	43.85	79	25	53.5		
35.0	34.60	39.53	83	28	54.8		
40.0	31.54	36.08	87	31	55.6		
45.0	29.03	33.26	90	34	56.0		
50.0	26.94	30.91	93	37	56.1	56.1	
55.0	25.16	28.91	95	39	55.9		
60.0	23.62	27.19	98	42	55.6		
65.0	22.29	25.69	100	45	55.0		
70.0	21.12	24.37	102	48	54.4		
75.0	20.07	23.19	104	51	53.6		
80.0	19.14	22.15	106	54	52.7		
85.0	18.30	21.21	108	56	51.7		
90.0	17.54	20.35	110	59	50.7		
95.0	16.85	19.58	112	62	49.5		
100.0	16.22	18.87	113	65	48.3		
105.0	15.64	18.21	115	68	47.0		
110.0	15.11	17.61	116	71	45.7		
115.0	14.61	17.06	118	73	44.3		
120.0	14.15	16.54	119	76	42.9		
125.0	13.72	16.06	120	79	41.4		

## ORIFICE SIZING

2-Year		
<b>Orifice Sizing</b>		
<b>Orifice Equation:</b>  <i>where:</i>	$Q = C_d A \sqrt{2gH}$ $Q$ = flow rate (m <sup>3</sup> /s) $H$ = head on the weir (m) $A$ = area of orifice (m <sup>2</sup> )	$g = 9.81 \text{ (m/s}^2\text{) gravity}$ $C_d$ = coefficient of discharge $C_d = 0.63$ for Sharp Orifice $C_d = 0.84$ for Tube Orifice
5-yr HWL =	135.66	m
Orifice Invert =	135.25	m
Height =	0.41	m
C =	0.84	(orifice tube)
d <sub>orifice</sub> =	100	mm
r <sub>orifice</sub> =	50	mm
Q <sub>Orifice</sub> =	18.81	L/s
<b>Allowable Flow</b>	<b>21.02</b>	<b>L/s</b>
<b>Tank Sizing</b>		
Required Quantity Storage	<b>56.1</b>	m <sup>3</sup>
Required Reuse Storage	<b>18.5</b>	m <sup>3</sup>
<b>Tank Dimensions</b>		
Area	135.2	m <sup>2</sup>

# Hydro Up-Flo® CPZ Filter



Rev. 13

**Project Name:** 1470 Williamsport Drive **Report Date:** 9/20/2024 Paste  
**Street:** 1470 Williamsport Drive **City:** Mississauga  
**Province:** Ontario **Country:** Canada  
**Designer:** **email:**

Rev. 13

## Treatment Parameters:

**Site ID:**   
**Area:** 0.59 ha  
**Percent Impervious:**   
**Rational C value:** 0.75  
**Rainfall Station:** Toronto Pearson Intl AP, ONT MAP  
**Peak Storm Flow:** 44.5 L/s  
**Peak Storm Flow Return:** 100 yrs  
**Number of Filter Modules** 6

## Installation Configuration:

Required head pressure for maximum flow is approximatley 750 mm. This design assumes full head pressure is available.

**Outlet Pipe Size:** mm  
**Inlet Pipe Size:** mm

**Rim Level:** m  
**Outlet Pipe Invert:** m  
**Inlet Pipe Invert:** m *Rim Level to low*

Intensity*	Fraction of Annual Distribution*	Filter Removal Efficiency	Weighted Net Annual Efficiency
(mm/hr)	(%)	(%)	(%)
0.50	0.2%	92.2%	0.17%
1.00	16.3%	91.2%	14.87%
1.50	13.1%	90.2%	11.86%
2.00	13.2%	89.2%	11.82%
2.50	4.5%	88.3%	3.96%
3.00	2.2%	87.3%	1.91%
3.50	8.4%	86.3%	7.25%
4.00	4.8%	85.3%	4.06%
4.50	1.5%	84.3%	1.26%
5.00	5.0%	83.3%	4.14%
6.00	4.4%	81.3%	3.57%
7.00	4.8%	79.4%	3.80%
8.00	3.5%	77.4%	2.74%
9.00	2.2%	75.4%	1.67%
10.00	2.4%	73.4%	1.77%
20.00	8.8%	53.7%	4.74%
30.00	2.7%	33.9%	0.91%
40.00	0.9%	14.1%	0.13%
50.00	0.4%	0.0%	0.00%
100.00	0.5%	0.0%	0.00%
150.00	0.1%	0.0%	0.00%
200.00	0.0%	0.0%	0.00%

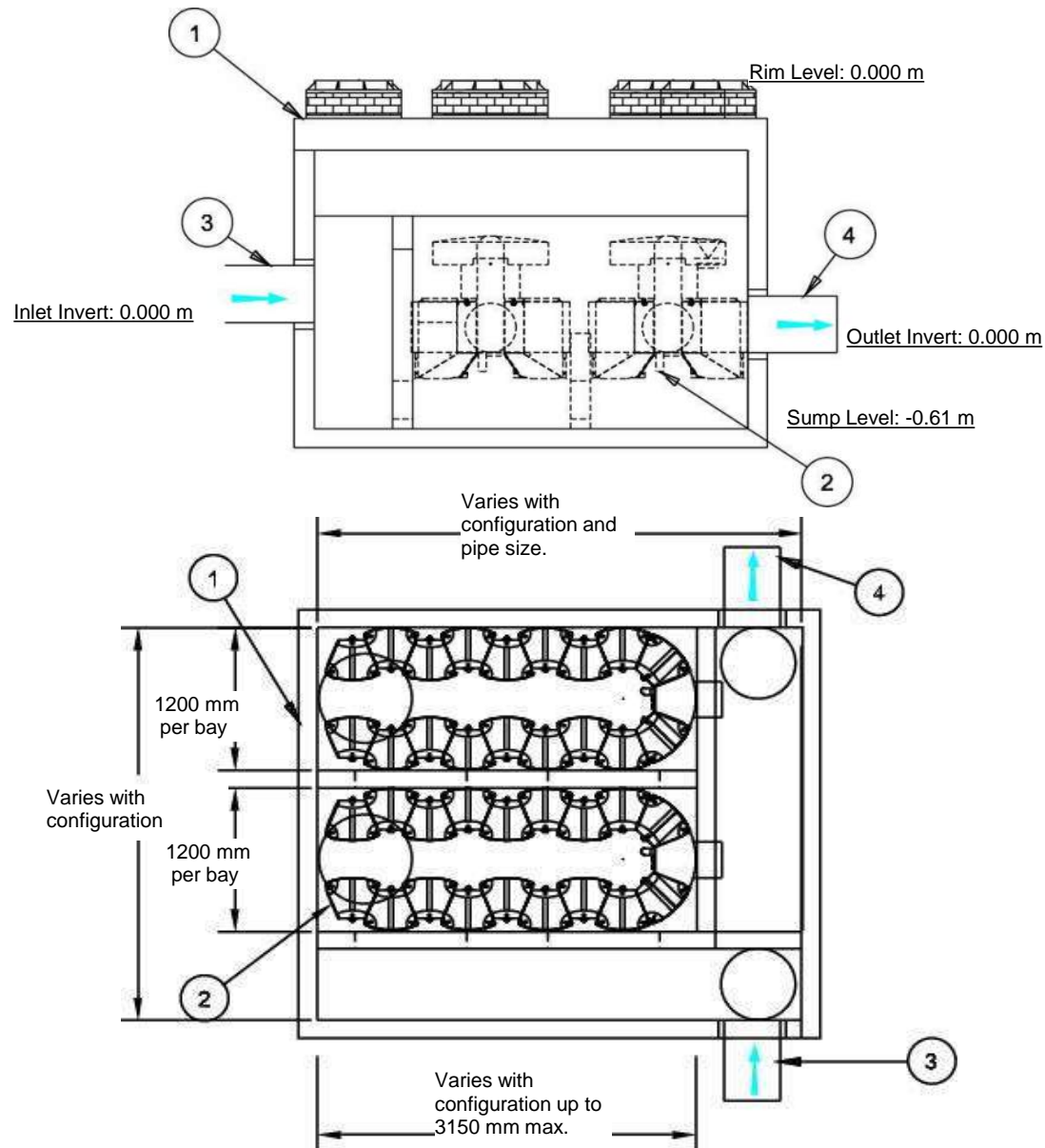
**Total Net Annual Removal Efficiency:** 80.6%

**Total Runoff Volume Treated:** 90.0%

- Rainfall Data: 1960:2013, HLY03, Toronto Pearson Intl AP , ON, 6158733.
- Based on NJDEP test protocols post 2015 independently verified.
- Adjustment for use of 60 minute time step data with Tc < 30 min.

## Designer Notes:

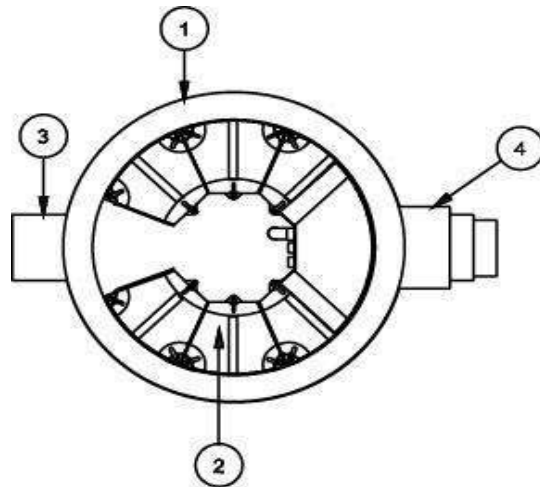
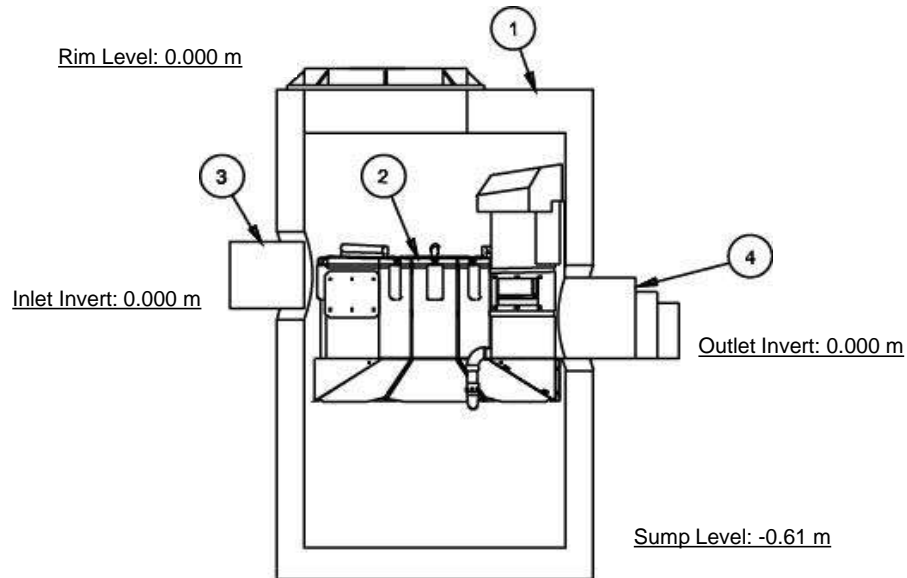
## Detail 1 - Up-Flo® Filter - Vault Configuration



### Up Flo® Filter Vault Layout

1	Filter Vault	1 Bay(s)
2	Modules	6 Filter Modules
3	Inlet Pipe	0 mm
4	Outlet Pipe	0 mm

## Detail 2 - Up-Flo® Filter - Manhole Configuration



### Up Flo® Filter Vault Layout

1	Manhole	1200 mm
2	Modules	6 Filter Modules
3	Inlet Pipe	0 mm
4	Outlet Pipe	0 mm

## Verification Statement



### Hydro International Up-Flo® Filter with CPZ™ Media

Registration number: (V-2019-06-01)

Date of issue: (2020-May-13)

<b>Technology type</b>	Stormwater Filtration Device		
<b>Application</b>	Technology to remove sediment, nutrients and metals from stormwater runoff		
<b>Company</b>	Hydro International	<b>Website</b>	<a href="https://www.hydro-int.com">https://www.hydro-int.com</a>
<b>Address</b>	94 Hutchins Drive, Portland, Maine USA 04102		
<b>E-mail</b>	TechSupport@hydro-int.com	<b>Phone</b>	+1 (207) 756 6200

This Verification Statement was prepared by VerifiGlobal to summarize the results reported in the Verification Report for the Hydro International Up-Flo® Filter with CPZ™ Media, dated November 26, 2019. The Verification Report was prepared by Good Harbour Laboratories Inc. (GHL) for VerifiGlobal in accordance with the requirements of the International Organization for Standardization (ISO) 14034 Environmental Technology Verification (ETV) standard and the VerifiGlobal Performance Verification Protocol. All the information provided in this Statement are based on the independent, third-party review and verification of technical information, performance test reports, performance data and specific performance claims documented in the Verification Report.

#### Technology Description

The [Up-Flo® Filter with CPZ™ Media](#) is a stormwater remedial device that incorporates gravitational separation of floating and settling materials, screening, and filtration of polluted stormwater to offer treatment train capabilities in a standalone device. Each Up-Flo® Filter consists of a highly configurable array of modules that are typically supplied as a complete system housed in a 4-ft (1.2 m) diameter manhole or precast vault. Manhole configurations consist of a single ring assembly containing one to six modules. Vaulted systems are highly configurable and may contain single or multiple arrays each consisting of one to 18 Filter Modules depending on availability of vault sizes.

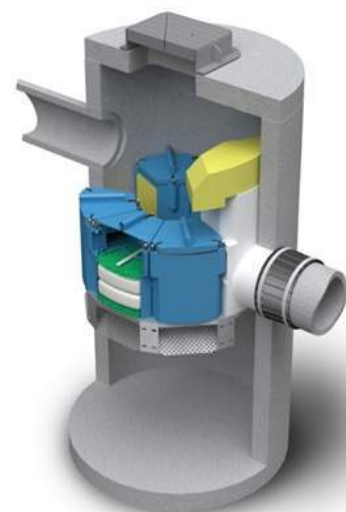


Figure 1: Up-Flo® Filter with CPZ™ Media



## Hydro International Up-Flo® Filter with CPZ™ Media Verification Statement

### Verified Performance Claims

Verification of the Hydro International Up-Flo® Filter with CPZ™ Media is based on existing performance test data from two different locations with different rainfall characteristics, catchment areas and pollutant loadings. Supporting data were obtained from three independent performance monitoring studies. One was conducted by Engineering School of Sustainable Infrastructure and Environment (ESSIE) at the University of Florida (UF) under the supervision of Dr. John Sansalone and two were conducted by Department of Civil, Construction, and Environmental Engineering (CCEE) at the University of Alabama (UA) under the supervision of Dr. Bob Pitt.

All three studies performance monitoring studies were conducted following the requirements of the New Jersey Department of Environmental Protection (NJDEP) Technology Acceptance Reciprocity Partnership (TARP) Tier II Protocol for Stormwater Best Management Practice Demonstrations (2003) and its 2006 and 2009 amendments. In total, there were 66<sup>1</sup> storms assessed to verify that an Up-Flo® Filter with CPZ™ Media achieves the performance listed in Tables 1 and 2, when designed to the following parameters:

- System hydraulic loading rate of 25 gpm (1.58 L/s) per filter module, with bypass of higher flows.
- Filter flux rate of 22.7 gpm/ft<sup>2</sup> (15.4 L/s/m<sup>2</sup>)
- Operating head of ≤30 in. (76.2 cm)
- Effective Sedimentation/ Filtration Treatment Area (ESA/EFTA) –12.6/6.6 (1.91)
- Maximum sediment storage volume of 16.8 ft<sup>3</sup> (0.476 m<sup>3</sup>) at a sediment depth of 16 inches (0.41m).

**Table 1. Up-Flo® Filter with CPZ™ Media – Verified Concentration Removal Efficiency**

Constituent	Lower 95% Confidence Interval	Median	Upper 95% Confidence Interval
SSC *	85.9%	92.8%	94.7%
SSC **	73.9%	82.8%	86.3%
TSS *	79.0%	89.2%	91.0%
TSS **	72.0%	78.3%	85.2%
TN *	9.0%	28.5%	64.7%
TP *	33.8%	43.9%	50.9%
Zn **	39.4%	50.0%	62.1%
Cu **	72.6%	80.7%	85.2%

\* Based on ESSIE (UF) Performance monitoring results  
 \*\* Based on CCEE (UA) Performance monitoring results

**Table 2. Up-Flo® Filter with CPZ™ Media – Verified Flow Weighted Mass Removal Efficiency**

Constituent	ESSIE (UF) Performance monitoring results		CCEE (UA) Performance monitoring results
	6-month	12-month	12-month
SSC	93%	92%	86%
TSS*	89%	87%	87%
TN **	68%	39%	***
TP **	48%	48%	***
Zn	***	***	59%
Cu	***	***	70%

\* TSS results for UF are a function of SSC.  
 \*\* TN and TP load data was time dependent after 6-months  
 \*\*\* No data submitted

<sup>1</sup>Of the total 66 storms (16 storms from UF and 50 storms from UA), 62 were identified as qualifying events having quality data for TSS, and 59 for SSC. Fewer events with metals detected in the runoff limited the metals data sets. There were a total of 28 and 17 storms for Zn and Cu, respectively, solely from the UA data. Total Nitrogen and Total Phosphorous claims were based on the 16 storms recorded solely from the UF data.

## Description of Test Procedure

Table 3 shows the target criteria as outlined by the TARP and TAPE programs as well as the results achieved at the two locations. Table 4 provides a more detailed description of the observed operating conditions over the testing period. At the time of testing, the TARP and TAPE programs both allowed for field testing data to be used to obtain certification in participating states. They were the most widely used protocols and were generally accepted as industry standards. The TARP program has since stopped accepting field data, but the TAPE program remains in effect and is currently referenced to benchmark the quality of data obtained from stormwater monitoring programs.

**Table 3. Up-Flo® Filter with CPZ™ Media Performance Testing - Specified TARP & TAPE criteria, and achieved results, for storm selection and sampling**

Description	TARP Criteria	TAPE Criteria	Achieved value	
			ESSIE - UF	CCEE - UA
Total rainfall/storm	≥2.5 mm (0.1")	≥3.81 mm (0.15")	>2.5 mm (0.1")	≥4.6 mm (0.18")
Minimum inter-event period	6 h	6 h	≥ 6 h	≥ 6 h
Minimum flow-weighted composite sample storm coverage	70% including as much of the first 20% of the storm	75% including as much of the first 20% of the storm	100%	87.6%
Minimum influent/effluent samples	10, but a minimum of 5 subsamples for composite samples	12, but a minimum of 10 subsamples for composite samples	5, whole manual samples	11
Total sampled rainfall	≥ 381 mm (15")	NA	195 mm (7.66")	765 mm (30.07")
Total sampled storms	≥ 20	≥ 12	16	29

**Table 4. Up-Flo® Filter with CPZ™ Media Performance Testing - Observed operational conditions for events monitored over each performance test period**

Operating parameter	Observed range	
	ESSIE - UF	CCEE - UA Total*
Storm duration	0.35-5.78 h	0.67-64.7 h
Previous dry hours**	6-213	> 6 hrs for the 20 storms in 1 <sup>st</sup> study and 12-632 hrs for 30 storms in second study
Rainfall depth	0.10-1.64 in	0.18-2.44 in
Runoff volume	223-4095 gal (0.84-15.5 m <sup>3</sup> )	2,065-61,131 gal (7.82-231 m <sup>3</sup> )
Peak rainfall intensity (5 min)	1.2-5.4 in/h (3.0-13.7 cm)	0.24-4.68 in/h (0.61-11.9 cm)
Peak runoff flow rate	27.7-233 gpm (1.75-14.7 L/s)	68-1023 gpm (4.29-64.5 L/s)
Event median flow rate	2.4-21.4 gpm (0.15-1.35 L/s)	28-175 gpm (1.75-11.0 L/s)

\* The UA data ranges cover the storms for both studies; ranges for individual studies might be narrower.

\*\* This is the same as the time period between events, or time since it last rained a qualifying event.

## Hydro International Up-Flo® Filter with CPZ™ Media Verification Statement

For the UF study, performance monitoring was conducted at the Reitz Union surface parking lot, which had a drainage area of 0.12-0.20 acres (0.049-0.081 ha), which was 76% impervious, depending on storm intensity and wind direction. The area generated a flow rate in excess of the 150 gpm (9.55 L/s) maximum treatment flow rate (MTFR) in 3 of the 16 storms. The 4-ft diameter (1.2 m) test unit was installed above ground in a temporary installation at the bottom of a hill sloping down from the lot. An inlet catch basin conveyed runoff from the parking lot through a Pashall flume into the filter. Monitoring occurred over a period of 12 months and the UF team recovered the captured mass at the end of the performance monitoring study. No maintenance was required or conducted during the year long monitoring period from 12 September 2015 through 1 September 2016.

The UA performance monitoring studies covered a total of 50 storms, but not all of them yielded useful data for all parameters. The site used in both cases was the Riverwalk parking lot near the Bama Belle in Tuscaloosa, Alabama. The drainage area was about 0.9 acres (0.36 ha), 68% impervious. The unit was installed in a 4 ft. (1.2 m) diameter below-grade catch basin inlet manhole on the site. Monitoring occurred in two stages of approximately 12 months each over a total of 32 months. The first round of testing occurred from July 16, 2010 to April 11, 2011 and the second from May 31st, 2012 to March 30th, 2013.

The UA performance monitoring study used autosamplers to generate the flow-weighted composite samples and the event mean concentration data. This data was used to calculate removal efficiencies. However, in the UF performance monitoring study, sediment removal performance was assessed by taking full cross section samples of the influent and effluent streams at regular intervals for the duration of the storm and combining the samples into flow-weighted composites. The data was converted into event mean concentrations for the purposes of calculating removals.

The following approved analytical methods were used:

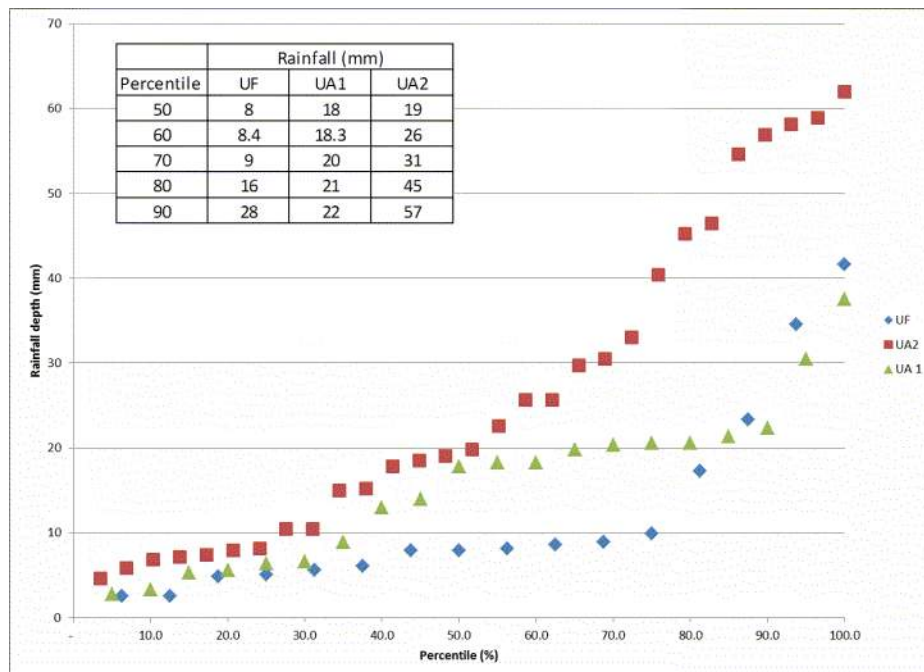
- TSS – ASTM D2540
- SSC – ASTM D3977-97(2013) Standard Test Methods for Determining Sediment Concentration in Water Samples
- PSD – ASTM D422 – 63 Standard Test Method for Particle-Size Analysis of Soils and ASTM C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
- PSD – ASTM 2560- C, D (UF used 2560D laser diffraction or light-scattering method and UA used 2560C Coulter Counter or light-blocking method)
- TP – S.M.4500-P-B Acid Hydrolysis
- TN – Persulfate Digestion Method
- Cu – EPA 200.8 Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma – Mass Spectrometry
- Zn – EPA 200.8 Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma – Mass Spectrometry

As part of the mass balance measurements, the UF team allowed all samples to sit for an hour and reported concentrations of suspended solids, measured using ASTM 2540D, as TSS, in addition to the usual SSC measurement using SM3977. In order to be able to report a TSS comparable to other performance monitoring studies, Dr. Sansalone developed a correlation equation for  $TSS^* = f(SSC)$  as well as equations for the 95% confidence limits of  $TSS^*$ .

### Summary of Verification Results

The cumulative frequency of rainfall depths monitored during the three performance monitoring studies is presented in Figure 2. The median rainfall depths in the three performance monitoring studies were 0.31, 0.71, and 0.75 inches (8, 18 & 19 mm) while the 90<sup>th</sup> percentile rainfall depths were 1.1, 0.9 and 2.2 inches (28, 22 and 57 mm). Thus the data presented covers a comparatively wide range of rain events.

Figure 2. Rainfall depth frequency curves



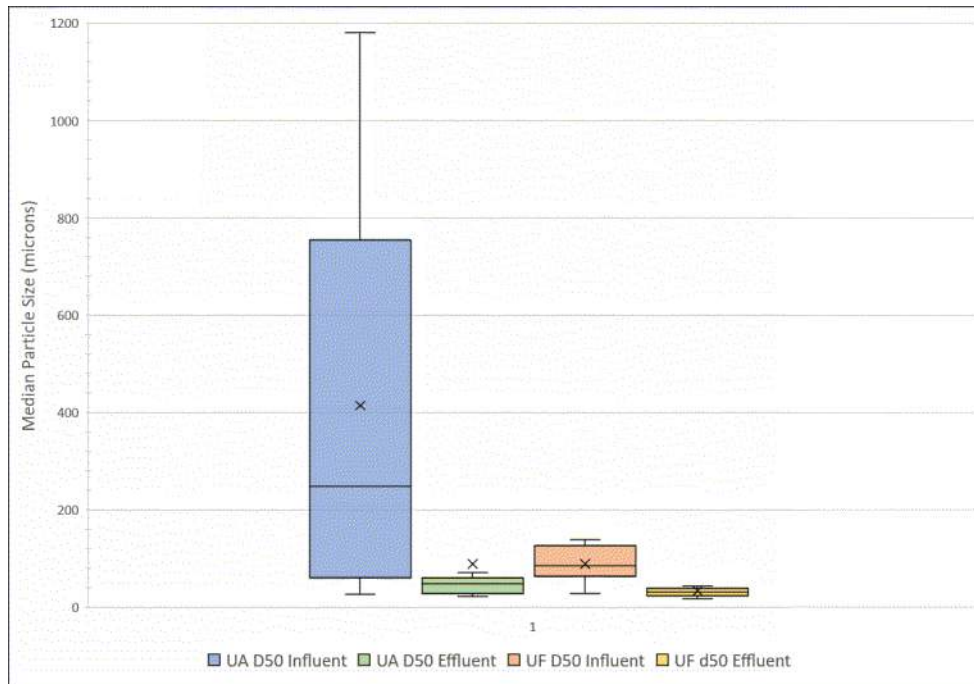
For UF monitoring, a total of 16 storm events, with varying rainfall intensity and runoff volume from event to event, were monitored. The cumulative rainfall depth was 7.66 inches (195 mm) and the cumulative influent runoff volume was 20,022 gallons (7.65 m<sup>3</sup>). The entire volume was treated by the Up-Flo® Filter system. Of the 16 storms treated, three storms generated flow rates exceeding the MTRF of 150 gpm (9.55 L/s) but there was no bypass, because the excess was not sufficient to top the overflow weir, and all sampled flows passed through the filtration media. Median driving head difference for an event never exceeded 13.1 inches (33.3 cm) and peak driving head difference never exceeded 27.1 inches (68.8 cm), which indicates the media was not occluded.

For the UA site, all of the storm events from May 31<sup>st</sup>, 2012 to March 30<sup>th</sup>, 2013 were monitored for flow but only 30 events were sampled. The total rainfall depth for this period was 49 inches (124.5 cm) or 982,192 gal. (3,718 m<sup>3</sup>) of runoff volume that was routed through the filter. Actual storm data from the monitoring period showed about 624,503 gal. (2,364 m<sup>3</sup>) of runoff (from about 30 inches or 76.2 cm of rainfall) was treated by the media filter system. This included about 28.5 % of bypass flow volume, which was sampled and included in the performance results. Given that the total bypassed volume was almost three times the expected bypass volume at the UA site, the UA results are considered conservative.

Influent particle sizes varied considerably between the two monitored locations and between storm events. Catchment characteristics and available sources, sampling methods (auto sampling vs. grab sampling), storm intensities, duration and volumes all influence the particle size range. The particle size analyses were completed for just the median particle size for each storm. A comparison of statistical descriptive values for influent and effluent median particle sizes for the two monitored sites is illustrated with the Whisker-Box-Plot shown in Figure 3.

Due to larger storm events and curbside erosion, the median UA influent particle size range and d<sub>50</sub> were substantially the larger of the two monitored sites. The interquartile range for the influent median particles sizes was 659 µm for UA compared to 59 µm for UF and the UA d<sub>50</sub> was 247 µm compared to 85 µm for UF. However, despite the influent particle size differences between locations, the median UA and UF effluent particle size range and d<sub>50</sub> were similar. The interquartile range for the effluent median particles sizes was 33 µm for UA compared to 13 µm for UF and the UA d<sub>50</sub> was 48 µm compared to 30 µm for UF.

**Figure 3. UF and UA Summary of Influent and Effluent Median Particle Sizes**



Summary statistics for the influent and effluent concentration removal efficiencies as well as the overall mass load reductions are shown in Table 4 and Table 5 for UF and UA, respectively.

While the flow weighted removal efficiency for TP and TN were 48% and 39%, respectively, TP and TN reduction tended to decrease with the overall volume treated. Results showed that if the filter maintenance cycle is limited to 6-8 months, the long-term load reduction for TP and TN would have been 50% and 70%, respectively.

**Table 4: Up-Flo® Filter with CPZ™ Media Performance Testing - Summary statistics for influent and effluent event mean concentrations (EMCs) and the overall mass load reductions for selected constituents (UF Test)**

Parameter	Sample Location	Min	Max	Median	SD	Mass Load Reduction
SSC	Influent	146	1584	487	360	92%
	Effluent	19.9	96.5	43.25	20.2	
TSS*	Influent	93.3	870	277	194	87%
	Effluent	25.0	66.4	37.6	10.9	
TP	Influent	0.79	6.05	1.9	1.70	48%
	Effluent	.56	2.19	1.1	0.56	
TN	Influent	.41	7.89	2.1	2.18	39%
	Effluent	.52	3.84	1.2	1.21	

## Hydro International Up-Flo® Filter with CPZ™ Media Verification Statement

**Table 5. Up-Flo® Filter with CPZ™ Media Performance Testing - Summary statistics for influent and effluent event mean concentrations (EMCs) and the overall mass load reductions for selected constituents (UA Tests)**

Parameter	Sample Location	Min	Max	Median	SD	Mass Load Reduction
SSC (mg/L)	Influent	23	879	88	166	86%
	Effluent	3	69	17	18	
TSS (mg/L)	Influent	11	571	89	128	87%
	Effluent	3	64	19	22	
Total Zn (µg/L)	Influent	7.0	157	22.0	0.71	59%
	Effluent	2.5*	72	14.0	0.68	
Total Cu (µg/L)	Influent	6	181	9	42	70%
	Effluent	1.3**	42	1.3	20.9	

\* There was a single effluent value that was non-detect (ND). Since it was only 1 value  $\frac{1}{2}$  the detection limit 1.3 µg/L, was substituted when calculating statistics.

\*\*The Cu data was highly censored (many non-detect, ND, effluents). Statistics were calculated by substituting  $\frac{1}{2}$  the detection limit, 1.3 µg/L, for all ND data then bootstrapping as usual.

As the independent third-party verifier, following the requirements of ISO 14034, GHJ has confirmed that:

- The Hydro International Up-Flo® Filter with CPZ™ Media is based on sound scientific and engineering principles, providing a net environmental benefit.
- Performance testing of the Hydro International Up-Flo® Filter with CPZ™ Media was based on defined parameters and was conducted following the requirements of the NJDEP TARP Tier II Protocol for Stormwater Best Management Practice Demonstrations (2003) and its 2006 and 2009 amendments.
- Performance testing of the Hydro International Up-Flo® Filter with CPZ™ Media was performed by a qualified testing organization.
- Sample analyses were carried out as part of the test plan by a third-party analytical laboratory in a manner that meets the quality requirements of ISO 17025. Operating conditions and performance during each testing run were documented.
- Frequency of sampling and duration of each performance test were determined based on the specifications in a credible test plan and the requirements to produce sufficient data to support the performance claim at a 95% confidence level.
- Performance measurements and calculations were based on the technology application and relevant performance parameters as outlined in the Verification Plan.
- Performance calculations were done according to generally accepted test methods described in the test design, including the applicable mathematical and statistical principles and procedures.
- Data storage, transfer and control were adequate, carried out in accordance with the intent of ISO 9001 enabling control and retrieval of documents and records.
- Quality assurance requirements were addressed throughout the performance testing process and in the generation of performance test results. This confirmation included reviewing all data sheets and data downloads, as well as overall management of test system quality.

### Quality Assurance

Performance testing and verification of the Hydro International Up-Flo® Filter with CPZ™ Media were performed in accordance with the requirements of ISO 14034:2016 and the VerifiGlobal Performance Verification Protocol. The verifier, Good Harbour Laboratories, has confirmed that quality assurance requirements were addressed throughout the performance testing process and in the generation of performance test results. This includes reviewing all data sheets and data downloads, as well as overall management of the test system, quality control and data integrity.



## **References**

Technology Acceptance Reciprocity Partnership (TARP) Protocol and New Jersey Department of Environmental Protection (NJDEP amendments to the TARP Protocol, dated August 5, 2009 and Revised December 5<sup>th</sup>, 2009

“Development and Testing of Protocols for Evaluating Emerging Technologies for the treatment of Stormwater”, Noboru Togawa, Dissertation, Department of Civil, Construction, Construction, and Environmental Engineering, Graduate School of the University Of Alabama, Tuscaloosa, Alabama, 2011.

“Up-Flo® Filter Verification Testing, Quality Assurance Project Plan, Bama Belle Field Verification Test Site”, Tuscaloosa, AL, Hydro International, July 2012.

“Full-Scale Up-Flo® Filter Field Performance Verification Tests”, Department of Civil, Construction, and Environmental Engineering University of Alabama, Tuscaloosa, AL 35487 USA - December 26, 2013.

“NJCAT Technology Verification Up-Flo® Filter”, January 2015.

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Up-Flo® Filter with CPZ™ Media - Performance Claims submitted by Hydro International, 2018-05-15.

“Physical Model Testing and Monitoring of a Hydro International (HI) Up-Flo® Filter Subject to Rainfall-Runoff Loading Events”, University of Florida Engineering School of Sustainable Infrastructure and Environment (ESSIE), University of Florida, Gainesville, FL 32611 USA - Version 7-12-17.

Particulate Matter Fraction Analyses. (Sansalone & Kim: Transport of Particulate Matter Fractions in Runoff, Journal of Environmental Quality • Volume 37 • September–October 2008)

New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device, January 2013

2009 Urban Stormwater BMP Performance Monitoring Guidelines  
<http://www.bmpdatabase.org/contacts.html>

Description of Up-Flo® Filter

Up-Flo® Filter Design Manual [https://www.hydroint.com/sites/default/files/uff\\_dg\\_nashville\\_f1504.pdf](https://www.hydroint.com/sites/default/files/uff_dg_nashville_f1504.pdf)

Up-Flo® Filter Verification Brochure

ISO/IEC 14034, Environmental management – Environmental technology verification

ISO/IEC 17025, General requirements for the competence of testing and calibration laboratories

ISO/IEC 9001, Quality Management Systems.

VerifiGlobal Performance Verification Protocol (Applying ISO 14034:2016)

VerifiGlobal Test Body Assessment – Guidance (2018)

## What is ISO 14034?

The purpose of environmental technology verification is to provide a credible and impartial account of the performance of environmental technologies. Environmental technology verification is based on a number of principles to ensure that verifications are performed and reported accurately, clearly, unambiguously and objectively. The International Organization for Standardization (ISO) standard for environmental technology verification (ETV) is ISO 14034, which was published in November 2016.

## Benefits of ETV

ETV contributes to protection and conservation of the environment by promoting and facilitating market uptake of innovative environmental technologies, especially those that perform better than relevant alternatives. ETV is particularly applicable to those environmental technologies whose innovative features or performance cannot be fully assessed using existing standards. Through the provision of objective evidence, ETV provides an independent and impartial confirmation of the performance of an environmental technology based on reliable test data. ETV aims to strengthen the credibility of new, innovative technologies by supporting informed decision-making among interested parties.

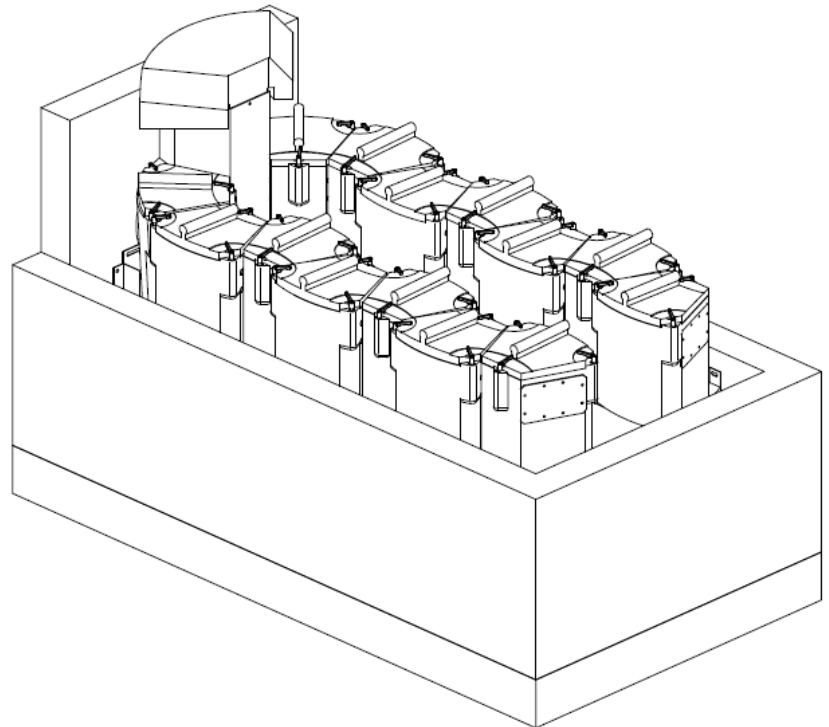
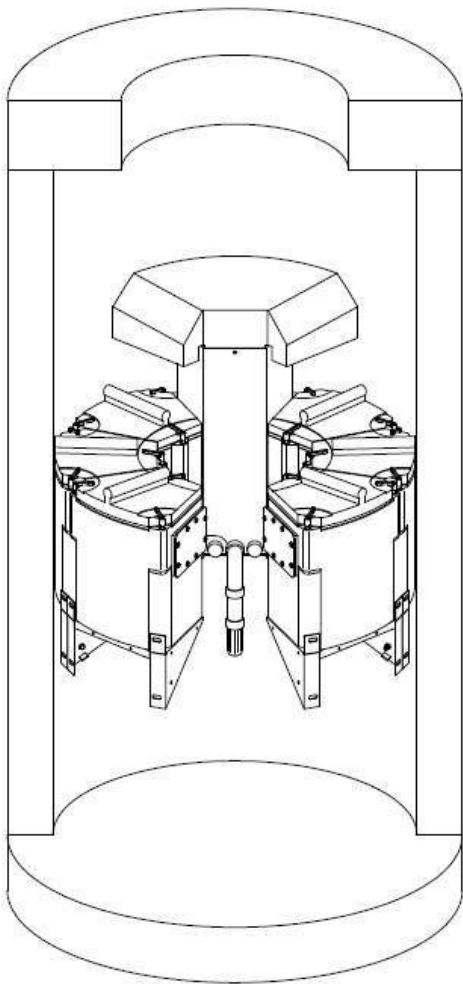
For more information on the Hydro International Up-Flo® Filter, contact:	For more information on VerifiGlobal, contact:
Hydro International 94 Hutchins Drive, Portland, ME USA 04102 t +1 (207) 756 6200 e: TechSupport@hydro-int.com w: www.hydro-int.com	VerifiGlobal c/o ETA-Danmark A/S Göteborg Plads 1, DK-2150 Nordhaven t +45 7224 5900 e: info@verifiglobal.com w: www.verifiglobal.com
<p>Signed for Hydro International:</p> <p><i>Original signed by:</i></p> <p><i>Phillip Taylor</i></p> <p>Phillip Taylor Technical Product Manager, Americas Stormwater</p>	<p>Signed for VerifiGlobal:</p> <p><i>Original signed by:</i></p> <p><i>Thomas Bruun</i></p> <p>Thomas Bruun, Managing Director</p> <p><i>Original signed by:</i></p> <p><i>John Neate</i></p> <p>John Neate, Managing Director</p>

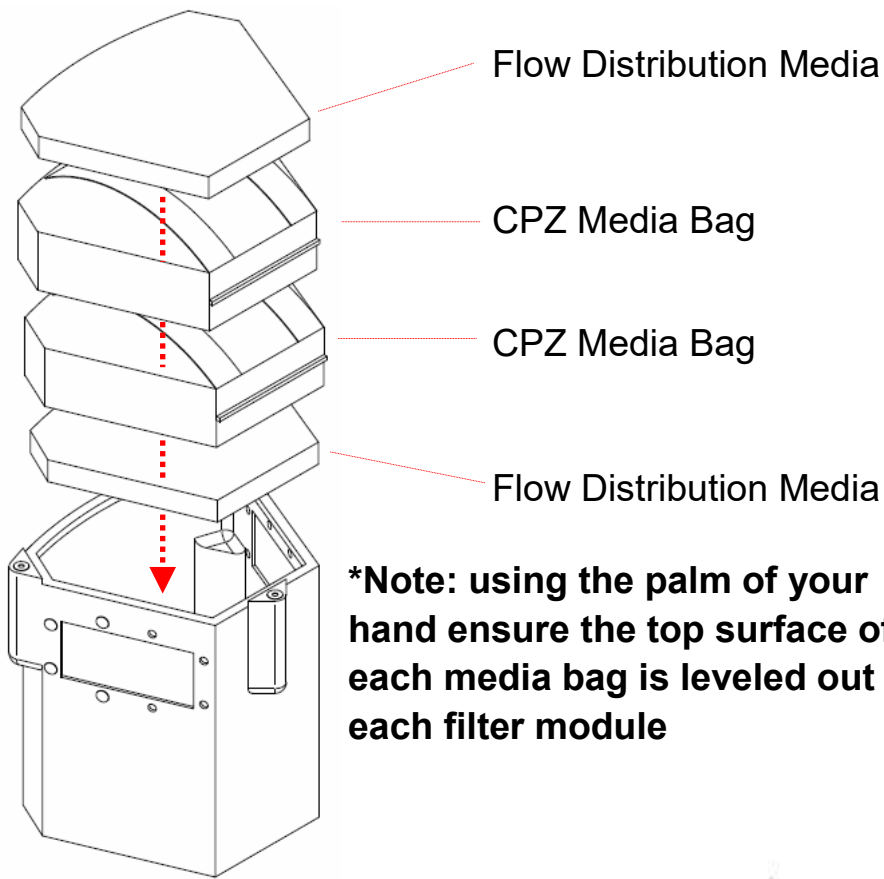
**NOTICE:** Verifications are based on an evaluation of technology performance under specific, predetermined operational conditions and parameters and the appropriate quality assurance procedures. VerifiGlobal and the Verification Expert, Good Harbour Laboratories, make no expressed or implied warranties as to the performance of the technology and do not certify that a technology will always operate as verified. The end user is solely responsible for complying with any and all applicable regulatory requirements. Mention of commercial product names does not imply endorsement.

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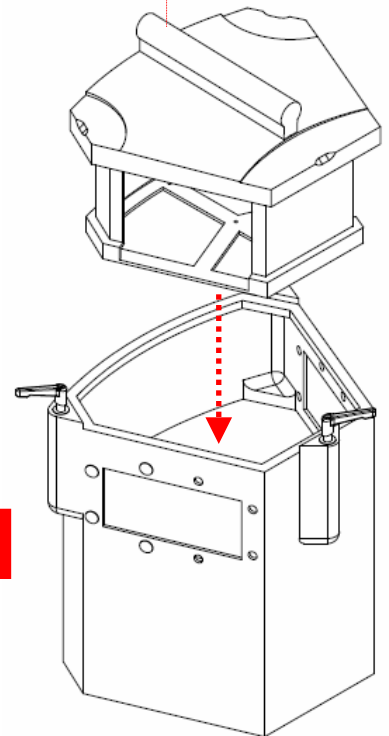


## Up-Flo® Filter Media Pack Installation Guidelines

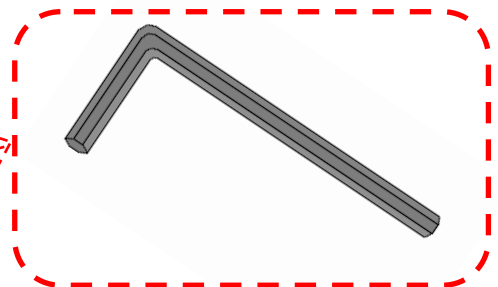
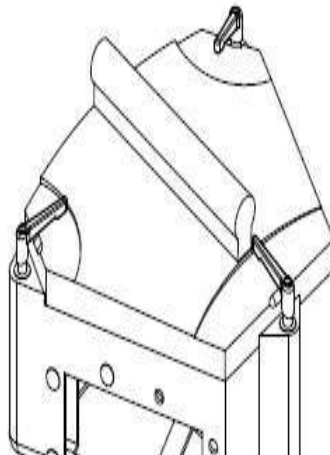




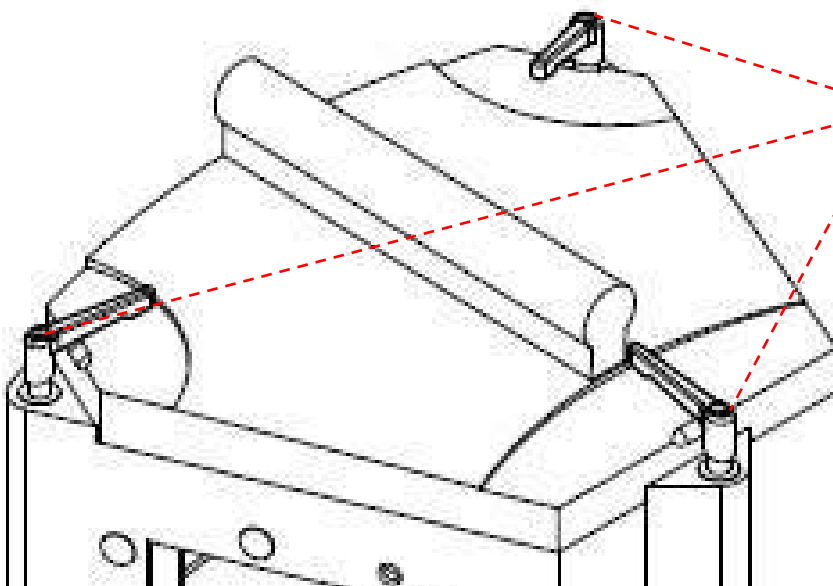
Filter Module Lid

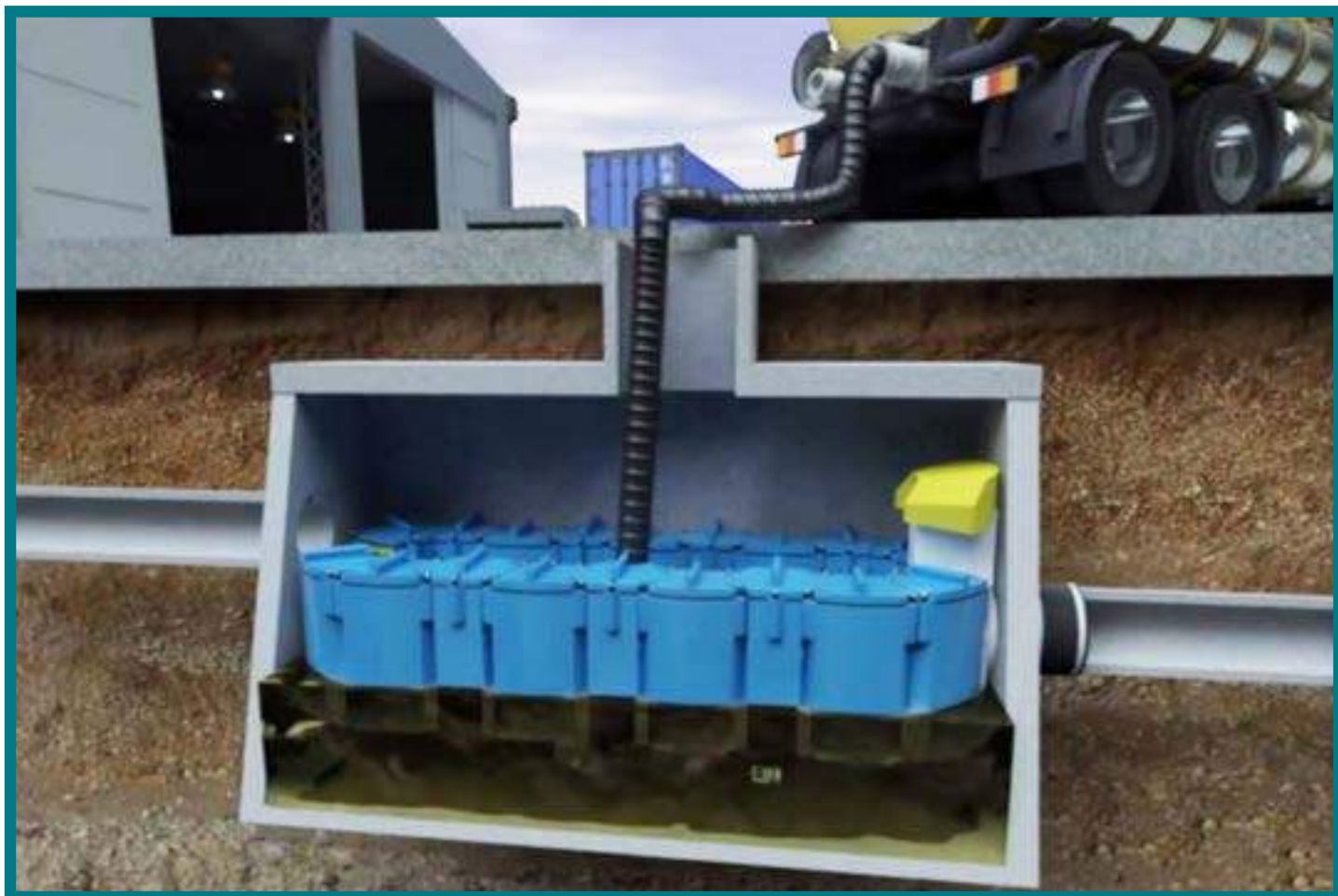


**\*Note: Ensure top layer of flow distribution media is leveled out below the conveyance channels and the Filter Module Lid forms a tight seal.**



**\*Note: Ensure each cam latch is centered over its corresponding indentation in the Filter Module Lid before fully tightening.**





## Operation and Maintenance Manual

### Stormwater Solutions

#### Up-Flo® Filter

#### Filtration System for Stormwater Treatment

94 Hutchins Drive  
Portland, ME 04102

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Fax: (207) 756-6212  
[stormwaterinquiry@hydro-int.com](mailto:stormwaterinquiry@hydro-int.com)

[www.hydro-int.com](http://www.hydro-int.com)

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## IMPORTANT - ORDER REPLACEMENT PARTS FOR MAINTENANCE - IMPORTANT

Annual maintenance requires replacement of the Media Packs and the Drain Down Filter. Contact Hydro International to order replacements. Allow 2-4 weeks for delivery.

Office hours Monday thru Friday 8:00 A.M. to 5:00 P.M. EST

Toll free: 1-888-382-7808

Phone: 207-756-6200

Fax: 207-756-6212

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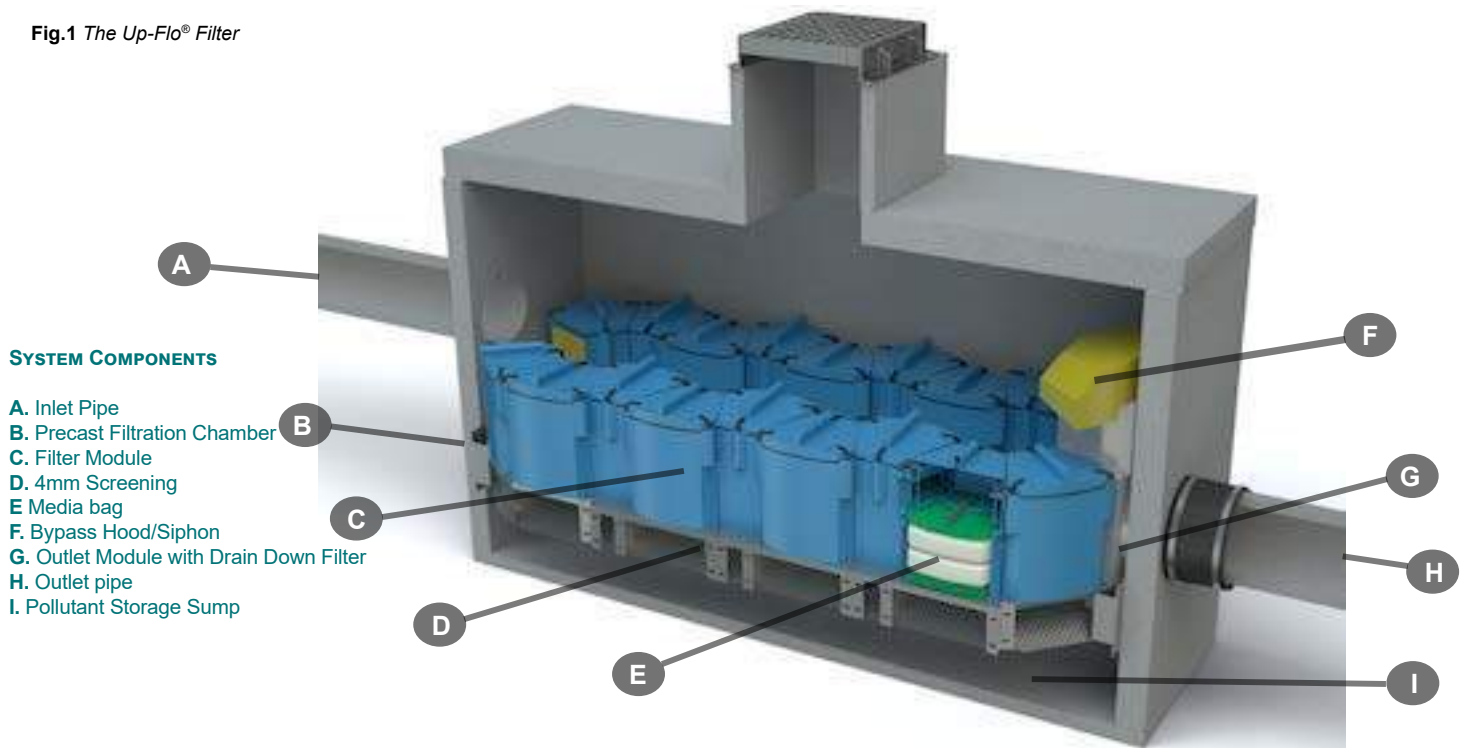
**DISCLAIMER:** Information and data contained in this manual is exclusively for the purpose of assisting in the operation and maintenance of Hydro International plc's Up-Flo® Filter. No warranty is given nor can liability be accepted for use of this information for any other purpose. Hydro International plc have a policy of continuous product development and reserve the right to amend specifications without notice.

## OVERVIEW & PRODUCT DESCRIPTION

The Up-Flo® Filter is a modular high-rate stormwater filtration device designed to capture trash, oil, sediment and remove fine pollutants such as dissolved and particulate metals and nutrients from stormwater runoff. Designed with efficiency, longevity and upkeep in mind, this high performance, low maintenance filter option that offers higher loading rates and longer media life for higher quality stormwater for longer periods between servicings.

In general, a minimum of two inspections are required per year to monitor sediment and gross pollutant accumulations. In order to achieve an annual TSS removal rate of 80% for the Up-Flo® Filter, the minimum maintenance frequency specified in the maintenance section for replacement of the Media Pack and removal of accumulated sediment from the sump is mandatory.

**Fig.1** The Up-Flo® Filter



## PRODUCT CONFIGURATIONS



**Fig.2** The Up-Flo® Filter is installed in a) 4-ft (1.2m) round manholes or b) in rectangular precast vaults. Both configurations have a wide central opening in the Up-Flo® Filter.



## HYDRO MAINTENANCE SERVICES

Hydro International has been engineering stormwater treatment systems for over 30 years. We understand the mechanics of removing pollutants from stormwater and how to keep systems running at an optimal level.

### NOBODY KNOWS OUR SYSTEMS BETTER THAN WE DO



## AVOID SERVICE NEGLIGENCE

Sanitation services providers not intimately familiar with stormwater treatment systems are at risk of the following:

- Inadvertently breaking parts or failing to clean/replace system components appropriately.
- Charging you for more frequent maintenance because they lacked the tools to service your system properly in the first place.
- Billing you for replacement parts that might have been covered under your Hydro warranty plan
- Charging for maintenance that may not yet have been required.

## LEAVE THE DIRTY WORK TO US

Trash, sediment and polluted water is stored inside treatment systems until they are removed by our team with a vactor truck. Sometimes teams must physically enter the system chambers in order to prepare the system for maintenance and install any replacement parts. Services include are are not limited to:

- Solids removal
- Removal of liquid pollutants
- Replacement media installation (when applicable)



## BETTER TOOLS, BETTER RESULTS

Not all vacor trucks are created equal. Appropriate tools and suction power are needed to service stormwater systems appropriately. Companies who don't specialize in stormwater treatment won't have the tools to properly clean systems or install new parts.



## SERVICE WARRANTY

Make sure you're not paying for service that is covered under your warranty plan. Only Hydro International's service teams can identify tune-ups that should be on us, not you.

## TREATMENT SYSTEMS SERVICED BY HYDRO:

- Stormwater filters
- Stormwater separators
- Baffle boxes
- Biofilters/biorention systems
- Storage structures
- Catch basins
- Stormwater ponds
- Permeable pavement



SAVE TIME & MONEY: CALL HYDRO FOR A QUOTE

**1 (800) 382-7808**

LEARN MORE AT [HYDRO-INT.COM/SERVICE](http://HYDRO-INT.COM/SERVICE)

## OPERATION

### INTRODUCTION

The Up-Flo® Filter operates on simple fluid hydraulics. It is self-activating, has no moving parts, no external power requirements and is fabricated with durable non-corrosive components. Personnel are not required to operate the unit and maintenance is limited to periodic inspections, sediment and floatables removal, Media Pack replacement and Drain Down Filter replacement.

### POLLUTANT CAPTURE

The Up-Flo® Filter is designed to operate as a “treatment train” by incorporating multiple treatment technologies into a single device. Trash and gross debris are removed by sedimentation and screening before they are introduced to the filtration media, preventing surface blinding of the filter media. The Up-Flo® Filter is a wet-sump device. Between storm events, oil and floatables are stored on the water surface separate from the sediment storage volume in the sump (see **Fig.1**). The high-capacity bypass siphon acts as a floatables baffle to prevent washout of captured floatable pollutants during high intensity events.

### REDUCED CLOGGING

The Up-Flo® Filter has been designed to minimize the occurrence of clogging and blinding and employs a unique Drain Down Filter that allows the water level in the chamber to drop below the filter media between events. The Drain Down Filter mechanism creates a reverse flow that flushes captured pollutants off the surface of the Media Bag, helping to prevent blinding. By allowing the water to drain out, the Drain Down Filter also reduces the weight of the Media Bags. This makes the bags easier and safer to remove during maintenance operations.

### OVERFLOW PROTECTION

The Angled Screens are designed to prevent ragging and blinding and are situated below the Filter Modules, sheltering them from the direct path of the influent. Coarse debris settles in the sump before the runoff flows up through the screens, protecting them from blinding. In the unlikely event of a blockage, the high capacity siphonic Bypass Hood is designed to convey high enough flow to minimize the risk of large storm creating upstream flooding.

### BEST PRACTICES

Good housekeeping upstream of the Up-Flo® Filter can significantly extend Media Bag life. For example, sweeping paved surfaces, collecting leaves and grass trimmings, and protecting bare ground from erosion will reduce loading to the system. Media Packs should not be installed in the Filter Modules until construction activities are complete and site stabilization is effective.

### DAMAGE DUE TO LACK OF MAINTENANCE

Delayed maintenance would result in clogged Media Bags and/or blinded Angled Screens. In that situation, the Up-Flo® Filter would go into bypass and there would be no treatment of the incoming stormwater. Because the Bypass Weir can easily convey all of the flow to the Outlet Module, there would be no lasting damage to the system. Replacement of the Media Bags and removal of sediment from the sump would restore the Up-Flo® Filter to its original treatment efficiency. Establishing and adhering to a regular maintenance schedule ensures optimal performance of the system.





Fig.3 a) The water level in a properly functioning Up-Flo® Filter will drain down to the base of the Filter Modules. b) When the Drain Down Filter becomes clogged, the base of the Filter Modules will be submerged in standing water. Note, above right, that the Drain Down Filter is submerged in standing water.

## INSPECTION & MAINTENANCE

### OVERVIEW

The Up-Flo® Filter protects the environment by removing a wide range of pollutants from stormwater runoff. Periodic removal of these captured pollutants is essential to the proper functioning of the Up-Flo® Filter.

Maintenance activities can be categorized as those that may be performed from outside the Up-Flo® vessel and those that are performed inside the vessel. Maintenance performed from outside the modules includes removal of floatables and oils that have accumulated on the water surface and removal of sediment from the sump. Maintenance performed inside the vessel includes removal and replacement of Media Bags, Flow Distribution Media and the Drain Down Filter. A vactor truck is required for removal of oils, water, sediment, and to completely pump out the vessel to allow for maintenance inside. If you are not using Hydro International or a trained service provider you must follow OSHA Confined Space Entry procedures when entering the Up-Flo® vessel.

The Up-Flo® Filter design has a wide central opening between the Filter Modules for easy access to all of the components (see **Fig.3**). In the case of inspection and floatables removal, a vactor truck is not required. Otherwise, a vactor truck is normally required for oil removal, removal of sediment from the sump, and replacement of the Media Packs and Drain Down Filter. In most cases, entry into the Up-Flo® Filter vessel is required for replacement of the Media Packs and Drain Down Filter.

**The minimum required frequency for replacement of the Media Pack is annually**, whereas the minimum required frequency for removal of accumulated sediment from the sump is dependent on the Up-Flo® Filter configuration. Configurations with a larger sediment storage volume per module will require less frequent removal of accumulated sediment. Regardless, whenever sediment depth in the sump is found to be greater than 16 inches, sediment removal is required.



**AT A MINIMUM, MEDIA BAGS MUST BE REPLACED AT LEAST ONCE A YEAR.**

Fig.4 a) A new Media Bag of Hydro Filter Sand. b) A spent media bag of Hydro Filter Sand.

## MAKE SURE YOUR SYSTEM WAS INSTALLED CORRECTLY

### First Year Inspection and Maintenance

The frequency of inspection and maintenance can be determined in the field after installation. The frequency of ongoing maintenance needs is based on site characteristics such as contributing area, types of surfaces (e.g., paved and/or landscaped), site activities (e.g., short-term or long-term parking), and other site maintenance (e.g., sanding and sweeping). At a minimum, inspection and maintenance should be conducted at intervals of no more than six months during the first year of operation. Maintenance personnel should observe and record pollutant accumulations during the first year of service in order to benchmark the maintenance intervals that will later be established for the site. Pollutant accumulations should be measured or monitored using the following procedures:

- **Measurement of sediment depth in the sump:** A minimum of 8 inches (20 cm) should separate the Drain Down Filter inlet from stored sediment in the sump in order to minimize sediment migration into the Drain Down Filter. A simple probe, such as the Sludge-Judge®, can be used to determine the depth of the solids in the sump. In a typical 4-ft (1.2m) diameter manhole installation, the sediment depth should be no more than 16 inches (41 cm).
- **Maintenance personnel should then enter the structure, remove the Media Pack from one of the Filter Modules, and weigh the Media Bags.** Media Bags with a wet weight of approximately 40 lbs (18 kg) or more are an indication that the filter media has become full and that the Media Packs in all of the Filter Modules will require replacement (Fig.4). Minimum filtration rate is generally reached when the Media Bags have accumulated approximately 20 lbs (9 kg) of sediment. Determining the amount of accumulated sediment will be accomplished by removing both of the Media Bags from one of the Media Packs and weighing the bags separately. Since a new Media Bag weighs approximately 30 lbs (14 kg) wet, the difference in weight will approximately equal the weight of solids that have accumulated in the bag. A spent Media Bag weighs approximately 50 lbs (23 kg) wet.
- **Measurement of oil layer on water surface:** Since water in the Up-Flo® vessel drains down to an elevation below the bottom of the Filter Modules when the system is idle, the amount of accumulated oil must be minimized so that oil is not entrained in the Media Pack when stormwater begins to fill the vessel at the start of a storm event. Oil accumulation should be limited to 1.5 inches (4 cm) or less. Probes can be used to measure oil thickness.
- **Monitoring for Drain Down Filter clogging:** The water level in the Up-Flo® Filter should be monitored to ensure that the Drain Down Filter is operating properly. The Drain Down Filter is designed to lower the water level in the Up-Flo® vessel to an elevation below the bottom of the Filter Modules between storm events. Periodically conduct an inspection one to two days after a storm event during the first year of operation. Approximately 36 hours after a 1-in (2.5-cm) rainfall, the water level inside the vessel should have dropped to a point where it is equal with the base of the Filter Modules. If the water level has not reached that point, then the Drain Down Filter has either become clogged or blinded by trash or debris (Fig.5 a and b). If there is no evidence of trash or debris around the Drain Down Filter inlet, then it has likely become clogged with particles.
- **Monitoring for slime and debris covering the Flow Distribution Media or Angled Screens:** After removal of the Media Bags, the bottom Flow Distribution Media should be removed and inspected to determine if it is coated with slime or debris. Similarly, the Angled Screen should be inspected for blockages and ragging.

## FIND OUT HOW FREQUENTLY YOUR SYSTEM NEEDS MAINTENANCE

Monitoring for floatables on the water surface: Similar to oil, the amount of accumulated floatables must be minimized to prevent trash and loose debris from becoming trapped on the Angled Screens when stormwater begins to fill the Up-Flo® vessel at the start of a storm event. Visual inspection is adequate to determine the amount of floatables. Floatables should be removed before they form a mat on the surface of the water.

The solids loading rate in the sump will be calculated by measuring the sediment depth in the sump and dividing the depth by the correlating interval of time since the sump was last cleaned. Similarly, starting with fresh Media Bags, the solids loading rate in the Media Packs will be calculated by weighing the Media Bags and dividing the weights by the correlating interval of time since they were installed. The wet weight of the heaviest bag will be used to determine the loading rate. As previously mentioned, a spent Media Bag weighs approximately 50 lbs (23 kg) wet. The spent Media Bag weight estimate was based on calculations of sediment loading in an Up-Flo® Filter that was run to exhaustion during laboratory testing.

The rate of oil accumulation will be calculated by measuring the thickness of the oil layer and dividing the thickness by the correlating interval of time since the sump was last cleaned. Ordinarily, oil thickness will not be measurable unless a spill has occurred. Consequently, any oil will typically be removed along with water when cleaning the sump.

Monitoring the Drain Down Filter for clogging, monitoring the Flow Distribution Media and Angled Screens for slime and debris, and monitoring the accumulation of floatables will provide an estimate of how long the Up-Flo® Filter can operate before its performance can become impaired by one of these factors.

### Routine Inspection and Maintenance

After completion of the first year of operation, determining and then following the established inspection and maintenance intervals will keep pollutant loadings within their respective limits. Removal of oils and floatables, replacement of the Drain Down Filter, replacement of Flow Distribution Media (see Fig.9, pg 11), and cleaning of Angled Screens will occur at the same frequency as cleaning of the sump and replacement of Media Bags unless the first year of operation indicates otherwise. Keeping to the established maintenance intervals will keep treatment flow rates at, or above, the design flow rate. Typically, annual maintenance is adequate.

In addition to scheduled maintenance, occasional checks for Up-Flo® Filter clogging can be performed by removing the manhole cover during a storm, monitoring the water level in the manhole or vault, and determining whether the filter is in bypass. A properly-sized filter (on-line or off-line) that is in bypass during a storm that is producing runoff at, or below, the filter's design filtration rate needs maintenance.

**DON'T WANT TO GO IT ALONE? CALL HYDRO AND WE'LL TAKE CARE OF INSPECTION, REPLACEMENT MEDIA AND CLEANOUT.**

**CALL 1 (888) 382-7808 FOR A QUOTE**

## INSPECTION & MAINTENANCE

### ROUTINE INSPECTION

Inspection is a simple process that requires monitoring pollutant accumulations. Maintenance crews should be familiar with the Up-Flo® Filter and its components prior to inspection.

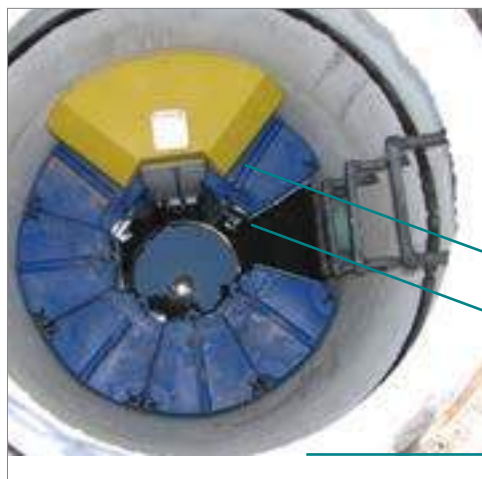
**THE FOLLOWING INSTRUCTIONS ARE INTENDED FOR NON-HYDRO MAINTENANCE SERVICE PROVIDERS AND/OR THOSE INTENDING TO MAINTAIN THEIR OWN UP-FLO® FILTER:**

#### SCHEDULING

- Inspection may be conducted during any season of the year but should occur shortly after a predicted rainfall to ensure components are operating properly.

#### NECESSARY EQUIPMENT

- Safety Equipment and Personal Protective Equipment (traffic cones, work gloves, etc.)
- Scale to measure the weight of the Media Bags
- Crow bar to remove grate or lid
- Pole with skimmer or net
- Sediment probe (such as a Sludge-Judge®)
- Hydro International Up-Flo® Filter Maintenance Log
- Trash bags for removed floatables



Bypass siphon sits evenly on Outlet Module.

Standing water level is no higher than the base of the Filter Module. The Drain Down Filter will be visible if the water level is correct.

Filter Module Lids are closed.

### ROUTINE INSPECTION PROCEDURES

1. Set up any necessary safety equipment (such as traffic cones) to provide access to the Up-Flo® Filter. Safety equipment should notify passing pedestrian and road traffic that work is being done.
2. Remove the grate or lid to the manhole or vault.
3. Without entering the vessel, look down into the chamber to inspect the inside and to determine whether the high-water level indicator has been activated. Make note of any irregularities. See Fig.6 for a typical Inspection View.
4. Without entering the vessel, use the pole with the skimmer net to remove floatables and loose debris from the chamber.
5. Using a sediment probe such as a Sludge-Judge®, measure the depth of sediment that has collected in the sump of the vessel. Maximum sediment depth is 16 inches (41 cm).
6. If the high-water level indicator has been activated after two consecutive storms, remove the Filter Module lid by turning the cam latch and remove the Filter Media Pack (*refer to page 11 Replacement Procedures*). Weigh the Media Bags from one or two modules. Media Bags should be replaced if the wet weight exceeds 40 lbs (18 kg).
7. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components or a high standing water level (see Fig.6 for the standard standing water level).
8. Securely replace the grate or lid.
9. Remove safety equipment.
10. Contact Hydro International at (800) 848-2706 to discuss any irregularities noted during inspection.

Fig.6 Inspection view of the Up-Flo® Filter.



## ROUTINE MAINTENANCE

Maintenance activities are grouped into two categories:

- **Activities *Not Requiring Man Entry Into the Up-Flo® Filter***  
These activities include floatables removal, oil removal and removal of sediment from the sump.
- **Activities *Requiring Man Entry Into the Up-Flo® Filter***  
Media Pack replacement and Drain Down Filter replacement.

Maintenance intervals are determined from monitoring the Up-Flo® Filter during its first year of operation. Depending on the site, some maintenance activities may have to be performed on a more frequent basis than others. In the case of floatables removal, a vactor truck is not required. Floatables and loose debris can be netted with a skimmer and pole.

A vactor truck is normally required for oil removal, removal of sediment from the sump, and to dewater the vessel for replacement of the Media Packs and Drain Down Filter (Fig.7). All inspection and maintenance activities would be recorded in an Inspection and Maintenance Log.

Completion of all the maintenance activities for a typical 4-ft (1.2m) diameter manhole installation takes less than one hour. Approximately 360 gallons of water and up to 0.6 yd<sup>3</sup> (0.5 m<sup>3</sup>) of sediment may be removed in the process. In an installation equipped with six Filter Modules, 12 Media Bags (2 bags per module) would be removed and replaced. Assuming a spent Media Bag weight of 50 lbs (23 kg), up to 600 lbs (272 kg) of spent Media Bags would be removed. All consumables, including Media Bags, Flow Distribution Media, and replacement Drain Down Filters are supplied by Hydro International.

The access port located at the top of the manhole provides unobstructed access for a vactor hose and/or skimmer pole to be lowered to the base of the sump.

## MAINTENANCE ACTIVITIES NOT REQUIRING MAN ENTRY

These activities include floatables removal, oil removal and removal of sediment from the sump.

## SCHEDULING

- Floatables and sump cleanout may typically be done during any season of the year - before and after rainy season
- Floatables and sump cleanout should occur as soon as possible following a contaminated spill in the contributing drainage area

## RECOMMENDED EQUIPMENT

- Safety Equipment (traffic cones, etc)
- Crow bar to remove grate or lid
- Pole with skimmer or net (if only floatables are being removed)
- Sediment probe (such as a Sludge-Judge®)
- Vactor truck (flexible hose preferred)
- Pressure nozzle attachment or other screen-cleaning device



Fig.7 Sediment is removed from the sump with a vactor hose. Man entry is not required for this step.

**NO MAN ENTRY REQUIRED: FLOATABLES, OIL AND SEDIMENT:**

1. Set up any necessary safety equipment (such as traffic cones) around the access of the Up-Flo® Filter. Safety equipment should notify passing pedestrian and road traffic that work is being done.
2. Remove the grate or lid to the manhole or vault.
3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities.
4. If the standing water level in the sump is above the base of the Filter Modules (see Fig.8), tug the Pull Chain(s) to release the Drain Down Filter plug(s). Allow the excess water to drain out of the chamber.
5. Use the skimmer pole to fit the Drain Down Filter plug back into the open port.
6. Once all floatables and oil have been removed, drop the vactor hose to the base of the sump. Vactor out the sediment and gross debris from the sump floor. Up to 0.3 yd<sup>3</sup> (0.2 m<sup>3</sup>) of sediment and 360 gallons (1,363 L) of water will be removed from a typical manhole Up-Flo® Filter during this process.
7. Retract the vactor hose from the vessel.
8. Inspect the Angled Screens for blockages and ragging. If present, remove the obstruction or ragging materials from the surface using a hose or other screen-cleaning device.
9. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables, oils, and gross debris removed, and the depth of sediment measured. Note any apparent irregularities such as damaged components or blockages.
10. Securely replace the grate or lid. Remove safety equipment.
11. Dispose of sediment and gross debris following local regulations.
12. Dispose of oil and sump water at a licensed water treatment facility or following local regulations.
13. Contact Hydro International at (800) 848-2706 to discuss any irregularities noted during cleanup.

These activities include replacement of the Media Packs and Drain Down Filter.

Unless the Up-Flo® Filter has been installed as a very shallow unit, it is necessary to have an OSHA-confined space entry trained person enter the vessel to replace Media Packs.

The access port located at the top of the manhole or vault provides access to the Up-Flo® vessel for maintenance personnel to enter the vessel and remove and replace Media Packs. The same access would be used for maintenance personnel working from the surface to net or skim debris and floatables or to vactor out sediment, oil, and water. Unless the Up-Flo® Filter has been installed in a very shallow configuration, it is necessary to have personnel with OSHA Confined Space Entry training performing the maintenance that occurs inside the vessel.

**SCHEDULING**

- Call Hydro International to order replacement Media Packs and Drain Down Filter prior to scheduling maintenance.
- Because Media Pack replacement requires entry into the Up-Flo® chamber, maintenance events should be scheduled during dry weather.
- Media Pack replacement should occur immediately after a contaminated spill in the contributing drainage area.

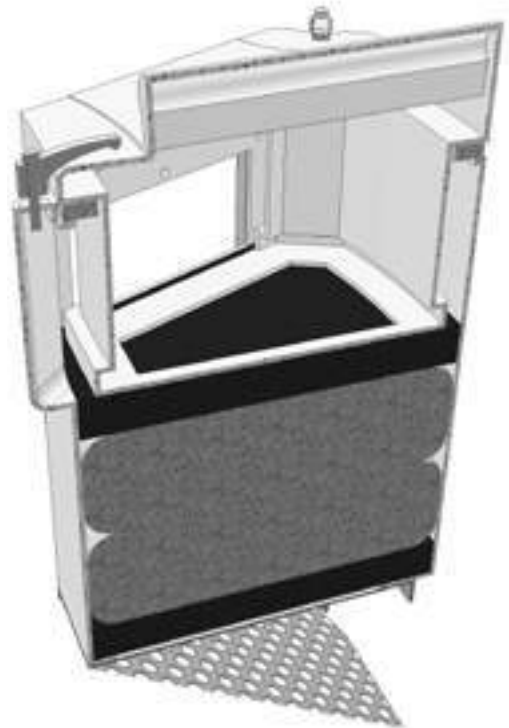


Fig.8 Cutaway view of the Filter Module

**MAINTENANCE ACTIVITIES REQUIRING MAN ENTRY**

### Recommended Equipment

- Safety Equipment (traffic cones, etc.)
- Crow bar to remove grate or lid
- Pole with skimmer or net (if floatables removal is not to be done with vactor hose)
- Sediment probe (such as a Sludge-Judge®)
- Vactor truck (flexible hose preferred)
- OSHA Confined Space Entry Equipment
- Up-Flo® Filter Replacement Media Packs (available from Hydro International)
- Hydro International Up-Flo® Filter Maintenance Log
- Screwdriver (flat head)
- Replacement Drain Down Filter components supplied by Hydro International

### Man Entry Required: Media Pack and Drain Down Filter

1. Follow Floatables and Sump Cleanout Procedures, 1 – 13.
2. Following OSHA Confined Space Entry procedures, enter the

Up-Flo® Filter Chamber.

3. Open the Filter Module by turning the three cam latches on the front and sides of the module. Remove the lid **1** to gain access to the Media Pack (Fig.9).
4. Remove and discard the spent Media Pack. The Media Pack contents include:
  - A top layer of **A** Flow Distributing Sheets
  - Two (2) Media Bags **B** equipped with nylon handles.
  - A bottom layer of **A** Flow Distributing Media.
5. Insert a new Media Pack, supplied by Hydro International.
  - First, insert a bottom layer of green Flow Distributing Media. Be sure that the media sits snugly and level at the bottom of the Filter Module.
  - Next, insert the first of two (2) replacement Media Bags. Smooth the bag out with your hands to make sure that the bag extends snugly to the walls and corners of the Filter Module.
  - Insert the second Media Bag, following the same procedure.
  - Insert the top layer of green Flow Distributing Media.

1. Filter Module Cover and Media Restraint

2. Replaceable Media Pack:

- a) Flow distribution sheets
- b) Filter Media Bags

3. Cam Latch

4. Conveyance Channel

5. Filter Module

6. Support Bracket / Angled Screen

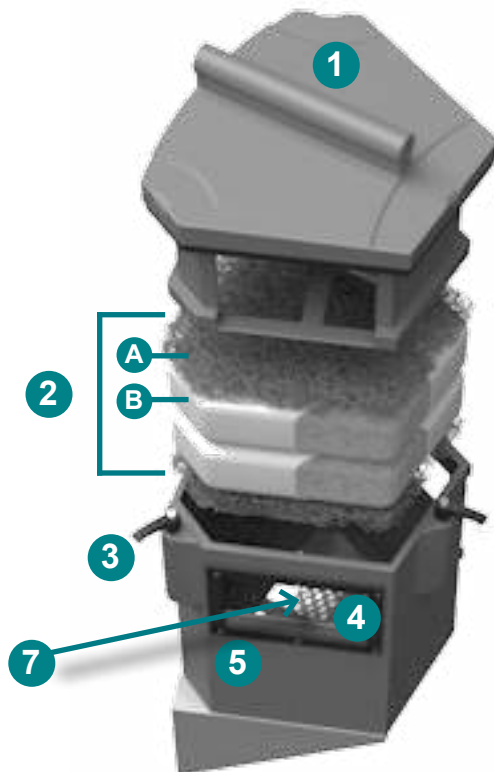


Fig.9 The Filter Module houses the Media Restraint and the Media Pack.

Be sure that the piece fits snugly against the walls and corners of the Filter Module.

- Put the lid on and secure the three latches. Check to make sure that the latches are closed properly.

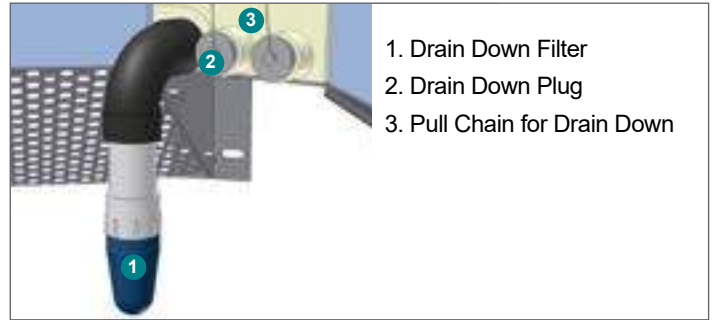
6. Use a screwdriver to unscrew the Drain Down Filter from the face of the Outlet Module (see Fig.10). **DO NOT DISCARD THIS PIECE.**

7. Install new Drain Down Filter supplied by Hydro International.

8. Exit the Up-Flo® Filter chamber and securely replace the grate \_\_\_ or lid.

9. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables, oil and gross debris removed, and the depth of sediment measured. Note the number of Media Packs replaced. Note any irregularities such as damaged components or blockages.

**Fig.10** The Drain Down Filter.



10. Remove safety equipment.

11. Dispose of spent media packs at your local landfill, following local regulations.

12. Return the spent Drain Down Filter to Hydro International.

13. Contact Hydro International to discuss any irregularities noted during annual maintenance.

### Solids Disposal

Sediment, floatables, gross debris, and spent Media Bags can generally be disposed of at the local landfill in accordance with local regulations. The toxicity of the residues captured will depend on the activities in the contributing drainage area, and testing of the residues may be required if they are considered potentially hazardous.

Sump water can generally be disposed of at a licensed water treatment facility but the local sewer authority should be contacted for permission prior to discharging the liquid. Significant accumulations of oil removed separately from sump water should be transported to a licensed hazardous waste treatment facility for treatment or disposal. **In all cases, local regulators should be contacted about disposal requirements.**

## MAINTENANCE AT A GLANCE

Activity	Frequency
Inspection	<ul style="list-style-type: none"> <li>- Regularly during first year of installation</li> <li>- Every 6 months after the first year of installation</li> </ul>
Floatables/Oils Removal	<ul style="list-style-type: none"> <li>- Twice per year or as needed</li> <li>- Following a contaminated spill in the drainage area</li> </ul>
Sediment Removal	<ul style="list-style-type: none"> <li>- Every six to 12 months, depending on the Up-Flo® Filter Configuration</li> <li>- The maximum allowable sediment depth in any Up-Flo Filter configuration is 16 inches (41 cm)</li> <li>- Following a contaminated spill in the drainage area</li> </ul>
Media Pack Replacement	<ul style="list-style-type: none"> <li>- Once per year</li> <li>- Replacement is required anytime inspection reveals that the high-water level indicator has been activated after two consecutive storms and the subsequent weighing of the Media Bags shows a wet weight greater than 40 lbs</li> <li>- Following a contaminated spill in the drainage area</li> </ul>
Drain Down Filter Replacement	<ul style="list-style-type: none"> <li>- Once per year with Media Pack replacement</li> <li>- Replacement is required anytime inspection reveals that the water level inside the vessel has not reached a level equal with the base of the Filter Modules approximately 36 hours after a 1-inch (2.5 cm) rainfall</li> <li>- As needed, in the event of continuous base flow conditions</li> </ul>



## UP-FLO® FILTER INSTALLATION LOG



SITE REFERENCE NAME OR NUMBER FOR THIS UP-FLO® FILTER LOCATION:	
SITE NAME:	
SITE LOCATION:	
OWNER:	SITE CONTRACTOR:
CONTACT NAME:	CONTACT NAME:
COMPANY NAME:	COMPANY NAME:
ADDRESS:	ADDRESS:
TELEPHONE:	TELEPHONE:
FAX:	FAX:

INSTALLATION DATE:    /    /

CONFIGURATION (CIRCLE ONE):      MANHOLE      VAULT SYSTEM

TOTAL NUMBER OF UP-FLO® FILTER MODULES: \_\_\_\_\_



## UP-FLO® FILTER INSPECTION LOG

Site Name: \_\_\_\_\_ Owner Change since last inspection? Y N

Location: \_\_\_\_\_

Owner Name: \_\_\_\_\_

Address: \_\_\_\_\_ Phone Number: \_\_\_\_\_

Site Status: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Site conditions\*: \_\_\_\_\_  
 \*(Stable, Under Construction, Needing Maintenance, etc.)

Inspection Frequency Key: A=annual; M=monthly; S=after major storms

Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
<b>Debris Removal</b>				
Adjacent area free of debris?	M			
Inlets and Outlets free of debris?	M			
Facility (internally) free of debris?	M			
<b>Vegetation</b>				
Surrounding area fully stabilized? (no evidence of eroding material into Up-Flo® Filter)	A			
Grass mowed?	M			
<b>Water retention where required</b>				
Water holding chamber(s) at normal pool?	A			
Evidence of erosion?	A			
<b>Sediment Deposition</b>				
Filtration Chamber free of sediments?	A			
Sedimentation sump not more than 50% full?	A			
<b>Structural Components</b>				
Any evidence of structural deterioration?	A			
Grates in good condition?	A			
Spalling or cracking of structural parts?	A			
Outlet/Overflow Spillway	A			
<b>Other</b>				
Noticeable odors?	A			
Any evidence of filter(s) clogging?	M			
Evidence of flow bypassing facility?	A			



Inspector Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Overall Condition of Up-Flo® Filter\*\*: ☐ Acceptable ☐ Unacceptable

*\*\*"Acceptable" would mean properly functioning; "unacceptable" would mean damaged or required further maintenance.*

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed", list Maintenance actions and their completion dates below or on the Maintenance Log provided on page 15 of the Up-Flo® Filter Operation & Maintenance Manual:

Maintenance Action Needed	Due Date

The next routine inspection is schedule for approximately: (date) \_\_\_\_\_

Inspected by: (signature) \_\_\_\_\_

Inspected by: (printed) \_\_\_\_\_



## UP-FLO® FILTER MAINTENANCE LOG

Site Name: \_\_\_\_\_ Owner Change since last inspection? Y N

Location: \_\_\_\_\_

Owner Name: \_\_\_\_\_

Address: \_\_\_\_\_ Phone Number: \_\_\_\_\_

Site Status: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Site conditions: \_\_\_\_\_  
*\*(Stable, Under Construction, Needing Maintenance, etc.)*

Estimated volume of oil/floatable trash removed: \_\_\_\_\_

Sediment depth measured in sump prior to removal: \_\_\_\_\_

Number of Filter Modules fitted with new media packs: \_\_\_\_\_

Inspector Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Overall Condition of Up-Flo® Filter: ☐ Acceptable ☐ Unacceptable

*\*\*"Acceptable" would mean properly functioning; "unacceptable" would mean damaged or required further maintenance.*

Maintained by: (signature) \_\_\_\_\_

Maintained by: (printed) \_\_\_\_\_

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Fax: (207) 756-6212  
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[www.hydro-int.com](http://www.hydro-int.com)

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UFF\_OMM\_D1608





**PROJECT:** 1470 Williamsport Drive  
**PROJECT No.:** 2719-7179

**DESIGN:** ECM  
**CHECK:** MC

**DATE:** 2024-09-16  
**UPDATED:** 2025-09-30

## WATER BALANCE CALCULATIONS

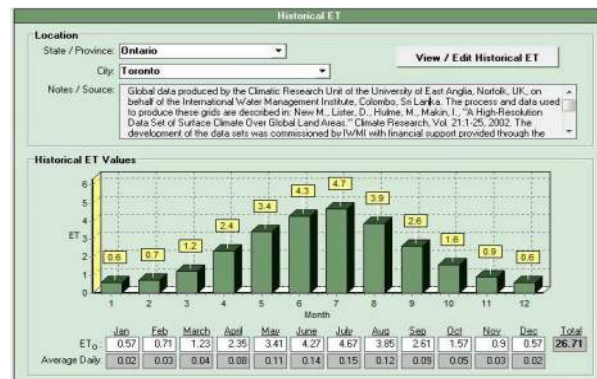
Impervious Area =	3695	m <sup>2</sup>
Rainfall Depth =	0.005	mm
Required Retention Volume =	18.5	m <sup>3</sup>

The following is the water requirement calculation for **1470 Williamsport Dr, Mississauga, Ont.** An irrigation system will be design to distribute the water required to maintain plant life. The system, as well as the calculations, take into consideration the plant material and the different plant species water requirements.

Along with of the irrigation design, a pumping system will be and specified designed (by others) with the capacity to deliver the required flow rates and pressure to the all Points of Connections located on the irrigation plans.

This document will verify the irrigation system's portion in the water management process. The formula seen below is used world wide to determine landscape water requirements. The Landscape Coefficient is base on the plant material and in conjunction with the LEED standards and calculating system (Standard LEED Calculator). The Distribution Uniformity figures are base on the same criteria as the Landscape Coefficient and are in line with the manufactures data sheet claims . The Effective Rainfall is a constant % used in all Water Requirement calculations.

The Reference Evapotranspiration rate is based on the rates used by Rainbird for all their E.T. based Controllers in the City of Toronto and comes from Global data produced by the Climatic Research Unit of the University of East Anglia, Norfolk, UK, on behalf of the International Water Management Institute, Colombo, Sri Lanka. The process and data used to produce these grids are described in: New M., Lister, D., Hulme, M., Makin, I., "A High-Resolution Data Set of Surface Climate Over Global Land Areas." Climate Research, Vol. 21:1-25, 2002. The development of the data sets was commissioned by IWMI with financial support provided through the United States Assistance International Development (USAID) and the Official Development Assistance of the Government of Japan. The station data used in the data set have been collated over many years at the Climatic Research.



# **Water Requirement Calculations 1470 Williamsport Dr, Mississauga , Ont.**

$$WR = \frac{((ET_0 \times KL) - Re) \times A}{DU \times EWM \times CU}$$

WR = Water Requirement  
ET<sub>0</sub> = Reference Evapotranspiration  
KL = Landscape Coefficient  
CU = Constant to Arrive at 1000's of Gallons

Re = Effective Rainfall  
A = Area in Acres  
DU = Distribution Uniformity

## **Total Combined WR in Cubic Metres**

May	163.43
June	234.38
July	281.68
August	234.38
September	163.43
Total WR M <sup>3</sup> :	1077.32
Average Daily Water Use (153 Days)	7.04
Average 72 Hour Water Use	21.12

ET <sub>0</sub> (reference in mm)	ET <sub>0</sub> (reference in inches )	K <sub>L</sub> Landscape Coefficient	Re.(50% effective rainfall in mm	July Base Re.(50% effective rainfa in inches	Area M <sup>2</sup>	Area (Acres)	DU (Distribution Uniformity)	EWM (water manger efficiency-gooc factor	CU (conversion 1000's	WR (water requiren in 1000's of Gallons)	WR (in M <sup>3</sup> )
118.618	4.67	0.7	33.02	1.30	2823.20	0.697627	0.75	0.85	0.0368	58.55	221.64
118.618	4.67	0.65	33.02	1.30	753.20	0.18612	0.75	0.85	0.0368	13.77	52.12
118.618	4.67	0.65	33.02	1.30	50.35	0.012442	0.75	0.85	0.0368	0.92	3.48
118.618	4.67	0.65	33.02	1.30	64.10	0.015839	0.75	0.85	0.0368	1.17	4.44
118.618	4.67	0.65	33.02	1.30	0.00	0	0.75	0.85	0.0368	0.00	0.00
118.618	4.67	0.77	33.02	1.30	0.00	0	0.75	0.85	0.0368	0.00	0.00
118.618	4.67	0.65	33.02	1.30	0.00	0	0.9	0.85	0.0368	0.00	0.00

May													
Irrigation Area	% (percentage Of July Reference)	ET. (reference in mm)	ET. (reference in inches )	K <sub>L</sub> Landscape Coefficient	Re.(50% effective rainf in mm	Re.(50% effective rainfall in inches	Area M <sup>2</sup>	Area (Acres)	DU (Distribution Uniformity)	EWM (water manger efficiency-good factor	CU (conversion 1000's	WR (water requirement in 1000's of Gallons)	WR (in M <sup>3</sup> )
Trees	75%	88.9635	3.5025	0.7	33.02	1.30	2823.20	0.6976273	0.75	0.85	0.0368	34.25	129.65
Mixed P	75%	88.9635	3.5025	0.65	33.02	1.30	753.20	0.1861196	0.75	0.85	0.0368	7.75	29.33
Planting	75%	88.9635	3.5025	0.65	33.02	1.30	50.35	0.0124417	0.75	0.85	0.0368	0.52	1.96
Shrubs	75%	88.9635	3.5025	0.65	33.02	1.30	64.10	0.0158394	0.75	0.85	0.0368	0.66	2.50
Grn/Cov	75%	88.9635	3.5025	0.65	33.02	1.30	0.00	0	0.75	0.85	0.0368	0.00	0.00
Sod	75%	88.9635	3.5025	0.77	33.02	1.30	0.00	0	0.75	0.85	0.0368	0.00	0.00
In.Gr Roof	75%	88.9635	3.5025	0.65	33.02	1.30	0.00	0	0.9	0.85	0.0368	0.00	0.00
Total for Month													163.43
Scheduled Irrigation Flow Per 72 Hours in M <sup>3</sup> :													15.82
June													
Irrigation Area	% (percentage Of July Reference)	ET. (reference in mm)	ET. (reference in inches )	K <sub>L</sub> Landscape Coefficient	Re.(50% effective rainf in mm	Re.(50% effective rainfall in inches	Area M <sup>2</sup>	Area (Acres)	DU (Distribution Uniformity)	EWM (water manger efficiency-good factor	CU (conversion 1000's	WR (water requirement in 1000's of Gallons)	WR (in M <sup>3</sup> )
Trees	90%	106.7562	4.203	0.7	33.02	1.30	2823.20	0.6976273	0.75	0.85	0.0368	48.83	184.85
Mixed P	90%	106.7562	4.203	0.65	33.02	1.30	753.20	0.1861196	0.75	0.85	0.0368	11.36	43.00
Planting	90%	106.7562	4.203	0.65	33.02	1.30	50.35	0.0124417	0.75	0.85	0.0368	0.76	2.87
Shrubs	90%	106.7562	4.203	0.65	33.02	1.30	64.10	0.0158394	0.75	0.85	0.0368	0.97	3.66
Grn/Cov	90%	106.7562	4.203	0.65	33.02	1.30	0.00	0	0.75	0.85	0.0368	0.00	0.00
Sod	90%	106.7562	4.203	0.77	33.02	1.30	0.00	0	0.75	0.85	0.0368	0.00	0.00
In.Gr Roof	90%	106.7562	4.203	0.65	33.02	1.30	0.00	0	0.9	0.85	0.0368	0.00	0.00
Total for Month													234.38
Scheduled Irrigation Flow Per 72 Hours in M <sup>3</sup> :													23.44
July													
Irrigation Area	% (percentage Of July Reference)	ET. (reference in mm)	ET. (reference in inches )	K <sub>L</sub> Landscape Coefficient	Re.(50% effective rainf in mm	Re.(50% effective rainfall in inches	Area M <sup>2</sup>	Area (Acres)	DU (Distribution Uniformity)	EWM (water manger efficiency-good factor	CU (conversion 1000's	WR (water requirement in 1000's of Gallons)	WR (in M <sup>3</sup> )
Trees	100%	118.618	4.67	0.7	33.02	1.30	2823.20	0.6976273	0.75	0.85	0.0368	58.55	221.64
Mixed P	100%	118.618	4.67	0.65	33.02	1.30	753.20	0.1861196	0.75	0.85	0.0368	13.77	52.12
Planting	100%	118.618	4.67	0.65	33.02	1.30	50.35	0.0124417	0.75	0.85	0.0368	0.92	3.48
Shrubs	100%	118.618	4.67	0.65	33.02	1.30	64.10	0.0158394	0.75	0.85	0.0368	1.17	4.44
Grn/Cov	100%	118.618	4.67	0.65	33.02	1.30	0.00	0	0.75	0.85	0.0368	0.00	0.00
Sod	100%	118.618	4.67	0.77	33.02	1.30	0.00	0	0.75	0.85	0.0368	0.00	0.00
In.Gr Roof	100%	118.618	4.67	0.65	33.02	1.30	0.00	0	0.9	0.85	0.0368	0.00	0.00

Total for Month	281.68
Scheduled Irrigation Flow Per 72 Hours in M <sup>3</sup> :	27.26

August													
Irrigation Area	% (percentage Of July Reference)	ET. (reference in mm)	ET. (reference in inches )	K <sub>L</sub> Landscape Coefficient	Re.(50% effctive rainf in mm	Re.(50% effective rainfall in inches	Area M <sup>2</sup>	Area (Acres)	DU (Distribution Uniformity)	EWM (water manger efficiency-good factor	CU (conversion 1000's	WR (water requirement in 1000's of Gallons)	WR (in M <sup>3</sup> )
Trees	90%	106.7562	4.203	0.7	33.02	1.30	2823.20	0.6976273	0.75	0.85	0.0368	48.83	184.85
Mixed P	90%	106.7562	4.203	0.65	33.02	1.30	753.20	0.1861196	0.75	0.85	0.0368	11.36	43.00
Planting	90%	106.7562	4.203	0.65	33.02	1.30	50.35	0.0124417	0.75	0.85	0.0368	0.76	2.87
Shrubs	90%	106.7562	4.203	0.65	33.02	1.30	64.10	0.0158394	0.75	0.85	0.0368	0.97	3.66
Grn/Cov	90%	106.7562	4.203	0.65	33.02	1.30	0.00	0	0.75	0.85	0.0368	0.00	0.00
Sod	90%	106.7562	4.203	0.77	33.02	1.30	0.00	0	0.75	0.85	0.0368	0.00	0.00
In.Gr Roof	90%	106.7562	4.203	0.65	33.02	1.30	0.00	0	0.9	0.85	0.0368	0.00	0.00

Total for Month	234.38
Scheduled Irrigation Flow Per 72 Hours in M <sup>3</sup> :	22.68

September													
Irrigation Area	% (percentage Of July Reference)	ET. (reference in mm)	ET. (reference in inches )	K <sub>L</sub> Landscape Coefficient	Re.(50% effctive rainf in mm	Re.(50% effective rainfall in inches	Area M <sup>2</sup>	Area (Acres)	DU (Distribution Uniformity)	EWM (water manger efficiency-good factor	CU (conversion 1000's	WR (water requirement in 1000's of Gallons)	WR (in M <sup>3</sup> )
Trees	75%	88.9635	3.5025	0.7	33.02	1.30	2823.20	0.6976273	0.75	0.85	0.0368	34.25	129.65
Mixed P	75%	88.9635	3.5025	0.65	33.02	1.30	753.20	0.1861196	0.75	0.85	0.0368	7.75	29.33
Planting	75%	88.9635	3.5025	0.65	33.02	1.30	50.35	0.0124417	0.75	0.85	0.0368	0.52	1.96
Shrubs	75%	88.9635	3.5025	0.65	33.02	1.30	64.10	0.0158394	0.75	0.85	0.0368	0.66	2.50
Grn/Cov	75%	88.9635	3.5025	0.65	33.02	1.30	0.00	0	0.75	0.85	0.0368	0.00	0.00
Sod	75%	88.9635	3.5025	0.77	33.02	1.30	0.00	0	0.75	0.85	0.0368	0.00	0.00
In.Gr Roof	75%	88.9635	3.5025	0.65	33.02	1.30	0.00	0	0.9	0.85	0.0368	0.00	0.00

Total for Month	163.43
Scheduled Irrigation Flow Per 72 Hours in M <sup>3</sup> :	16.34

Submitted by:



18-Jul-25

Joseph Carter  
Creative Irrigation Solutions Inc.

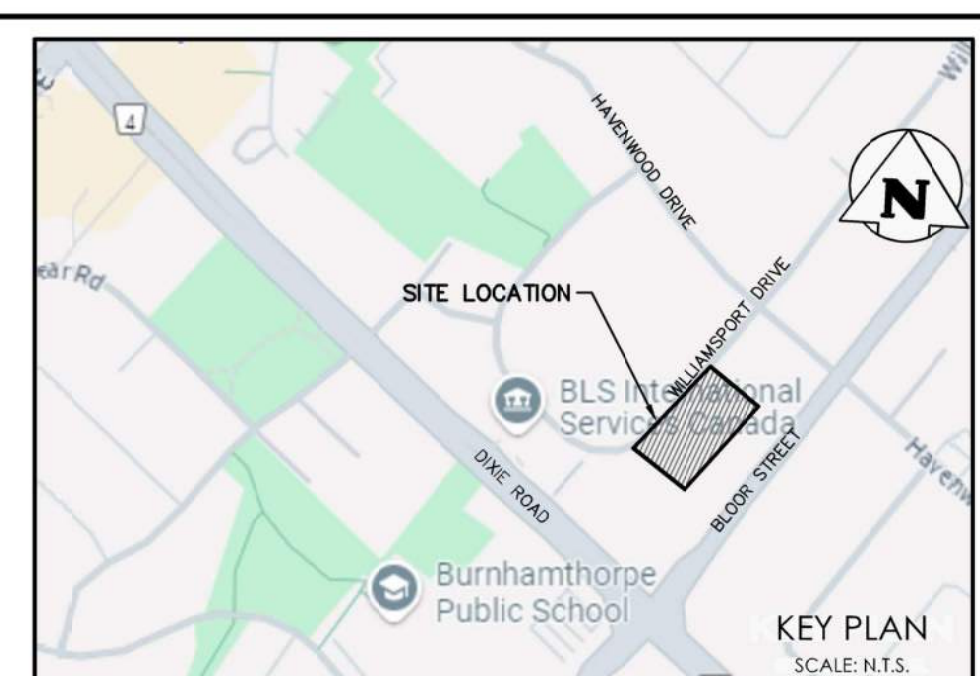
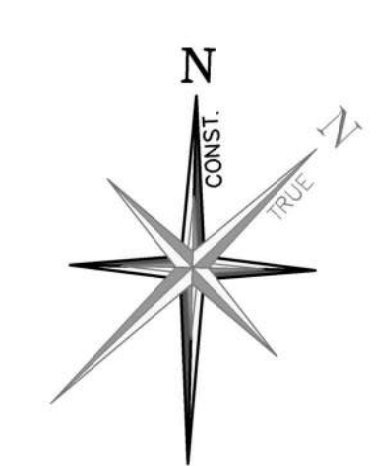
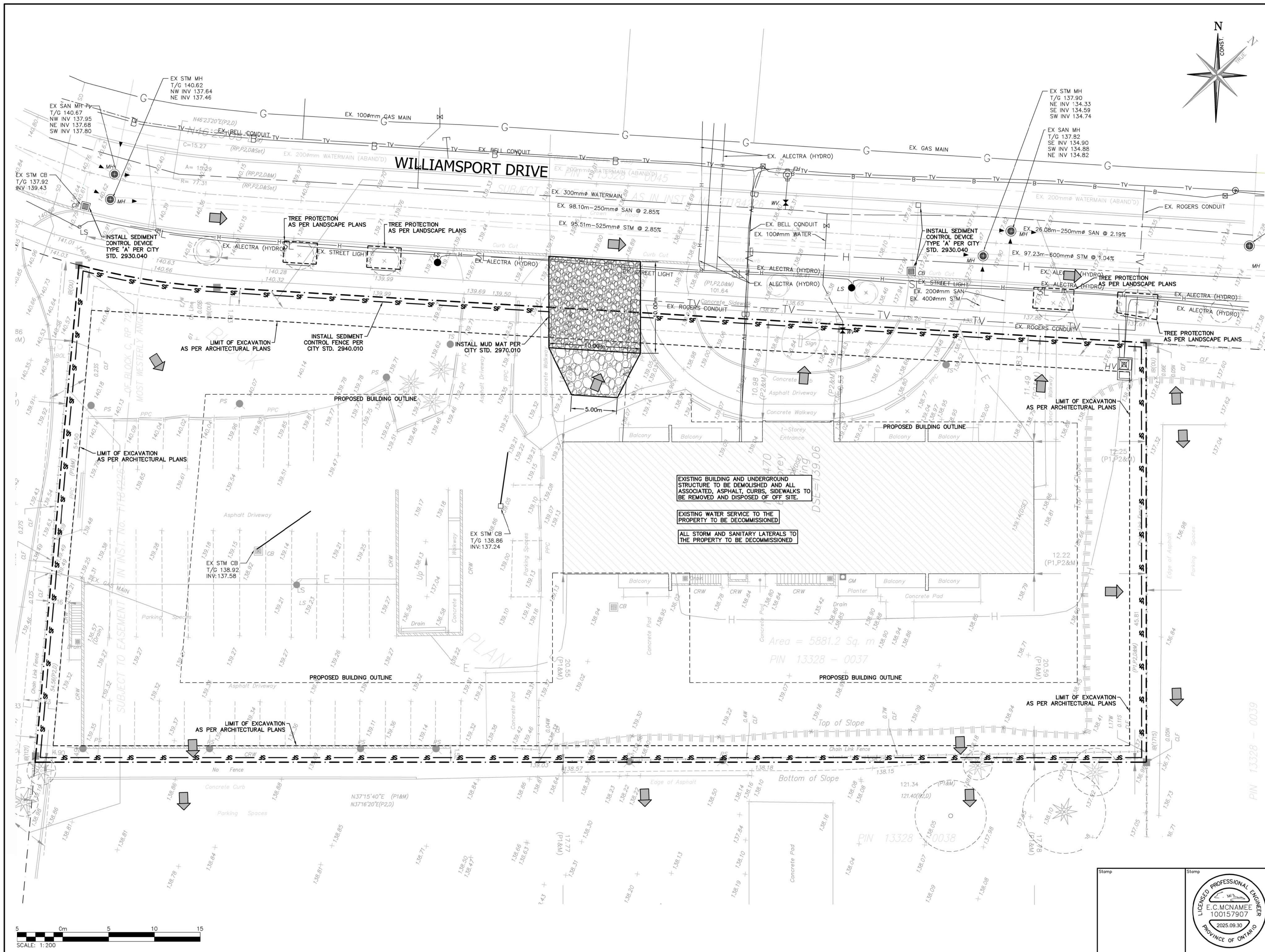
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# DRAWINGS

<b>C101A:</b>	Erosion & Sediment Control Plan
<b>C101B:</b>	Erosion & Sediment Control Notes & Details
<b>C102A:</b>	Servicing Plan
<b>C102B:</b>	Servicing Sections
<b>C103:</b>	Site Grading Plan
<b>C104A:</b>	Construction Details
<b>C104B:</b>	Construction Details
<b>C105:</b>	Construction Notes





LEGEND	
	PROPERTY LINE
	EXISTING FENCE
	EXISTING GRADE
	EXISTING OVERLAND FLOW DIRECTION
	MUD-MAT; SEE DETAIL ON C 101A
	SILT FENCE; SEE DETAIL ON C 101A
	SEDIMENT CONTROL DEVICE; SEE DETAIL ON C 101A

No.	ISSUE / REVISION	DATE
2	ISSUED FOR REZONING	2025/09/30
1	ISSUED FOR SITE PLAN APPLICATION	2025/02/25

**BEARING NOTE:**  
BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK OBSERVATION, UTM ZONE 17 (81° WEST LONGITUDE), NAD83(CRS) v6(2010).

**BENCHMARK NOTE:**  
ELEVATIONS ARE GEODETIC AND REFERRED TO CITY OF MISSISSAUGA B.M. No. 690, ELEVATION = 134.702m

**SURVEY NOTES:**  
SURVEY COMPLETED BY IBW SURVEYORS  
SURVEY PREPARED FOR 1470 WILLIAMSPORT HOLDINGS INC.

**SITE PLAN NOTES:**  
DESIGN ELEMENTS ARE BASED ON SITE PLAN BY BPD QUADRANGLE  
DRAWING NO.: A201.5 PROJECT NO.: 23057

**DRAWING NOTES:**  
THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE REPRODUCTION OF ANY PART OF IT WITHOUT PRIOR WRITTEN CONSENT OF THIS OFFICE IS STRICTLY PROHIBITED.  
THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.  
THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.  
ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

Project  
**1470 WILLIAMSPORT DRIVE**  
CITY OF MISSISSAUGA  
PEEL REGION

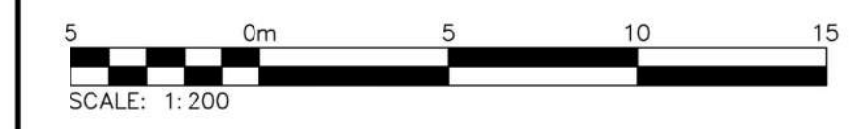
Drawing  
**EROSION SEDIMENT CONTROL & REMOVALS PLAN**

REGION FILE NO.: C601060  
SITE PLAN NO.: SP-25-011M

**CROZIER**  
CONSULTING ENGINEERS

211 YONGE STREET  
SUITE 600  
TORONTO, ON, M5B 1M4  
416-477-3392 T  
WWW.CFCROZIER.CA  
INFO@CFCROZIER.CA

Drawn	D.B.	Design	E.M.	Project No.	<b>2719-7179</b>
Check	E.M.	Check	E.M.	Scale	1:200
				Dwg.	<b>C 101A</b>





THE FOLLOWING GENERAL NOTES ARE FOR REMOVALS AND EROSION AND SEDIMENT CONTROL WORKS ONLY. ADDITIONAL GENERAL NOTES ARE TO BE REFERENCED FROM THE SERVICING AND GRADING DRAWING. ALL NOTES AND GENERAL NOTES SHALL BE READ IN CONJUNCTION WITH THE CONTRACT SPECIFICATIONS.

#### GENERAL

1. CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE EPA 832/R-92-005, CHAPTER 3, AND THE "ONTARIO OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS".
2. ALL DIMENSIONS ARE IN METRES OR MILLIMETRES.
3. THE POSITION OF EXISTING POLES, OVERHEAD LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND OR ABOVEGROUND UTILITIES, STRUCTURES AND APPURTENANCES IS NOT NECESSARILY SHOWN ON THE DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES IS NOT GUARANTEED.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN ALL NECESSARY UTILITY STAKEOUTS TO VERIFY THE LOCATION OF ANY HYDRO, BELL, CABLE TV OR GAS UTILITY LINES, AND WHERE REQUIRED, PROVIDE ADEQUATE PROTECTION OF EXISTING UTILITY LINES AND BEFORE COMMENCING CONSTRUCTION, THE CONTRACTOR SHALL SATISFY HIMSELF OF THE EXACT LOCATION OF ALL EXISTING UTILITIES AND STRUCTURES, AND ASSUME ALL LIABILITY RESULTING FROM DAMAGE TO THEM DURING THE COURSE OF CONSTRUCTION.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING POSITIVE SURFACE DRAINAGE FOR THE DURATION OF THE CONSTRUCTION PERIOD.
6. ALL GEOTECHNICAL INFORMATION, INCLUDING BOREHOLE LOGS AND ENGINEERED-FILL SPECIFICATIONS, ARE TO BE OBTAINED FROM THE GEOTECHNICAL CONSULTANT.
7. CONSTRUCTION SHALL NOT COMMENCE UNTIL ALL UTILITY LOCATIONS HAVE BEEN VERIFIED AND ALL PERMITS HAVE BEEN RECEIVED.

#### SITE CONTROL MEASURES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONDITION OF THE SITE AT ALL TIMES.
2. IF CONSTRUCTION IS INTERRUPTED AND/OR INACTIVITY EXCEEDS 30 DAYS, STRIPPED/BARE AREAS WILL BE STABILIZED BY SEEDING.
3. ALL EROSION AND SEDIMENT CONTROL MEASURES INCLUDING THE SEDIMENTATION FENCING, CATCHBASIN CONTROL DEVICE, MUD MAT AND OTHER EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF ANY EARTH MOVING.
4. CONTRACTOR SHALL NOTIFY THE CONSULTANT 48 HOURS PRIOR TO THE COMMENCEMENT OF GRADING ACTIVITIES OF CONSTRUCTION.
5. ALL ROADSIDE CATCHBASINS TO HAVE SEDIMENT PROTECTION AS PER DETAIL ON THIS DRAWING. SEDIMENT PROTECTION BARRIER TO BE MAINTAINED ON A REGULAR BASIS OR TO THE SATISFACTION OF THE CITY OF MISSISSAUGA.
6. ALL SEDIMENT REMOVED FROM SEDIMENT TRAPS SHALL BE DISPOSED OFF-SITE IN LOCATIONS ACCEPTABLE TO AND IN ACCORDANCE WITH CITY REGULATIONS.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL EROSION AND SEDIMENT CONTROL DEVICES IN GOOD WORKING ORDER AT ALL TIMES. THE CONTRACTOR SHALL INSPECT SUCH DEVICES AT LEAST ONCE A WEEK AND AFTER EACH RAIN FALL EVENT, AND MAKE ALL NECESSARY REPAIRS AS REQUIRED.
8. ONGOING INSPECTION, MONITORING AND MAINTENANCE OF THE SILTATION CONTROL FENCE SHALL BE PROVIDED; RELOCATION OF THE SILTATION CONTROL FENCE SHALL BE UNDERTAKEN DURING CONSTRUCTION WHEN IT IS DEEMED NECESSARY BY THE PRACTITIONER OR WHEN IT IS RECOMMENDED BY THE ENVIRONMENTAL INSPECTOR.

#### TRAFFIC CONTROL AND MUD TRACKING

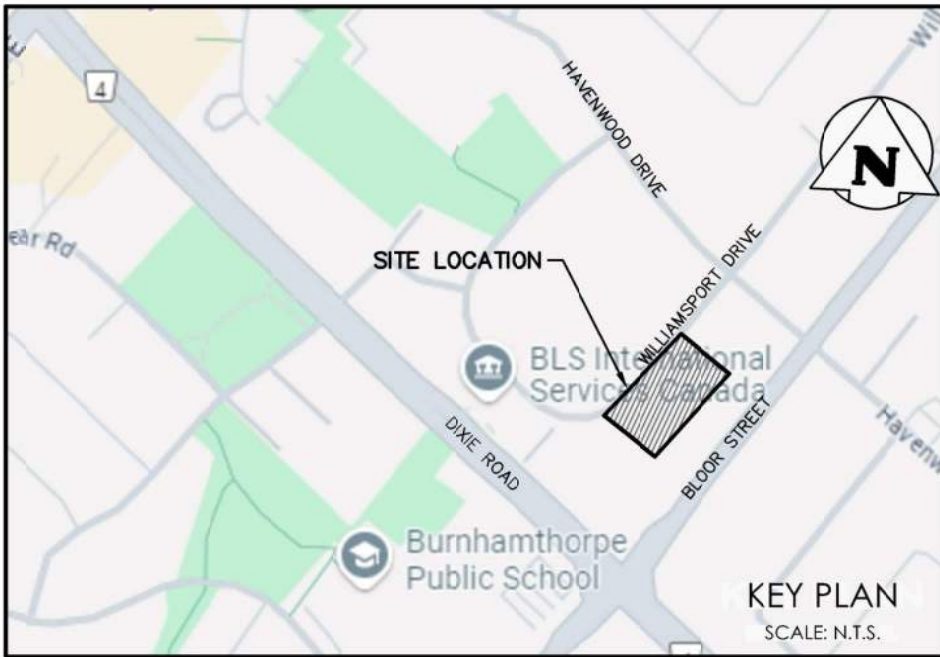
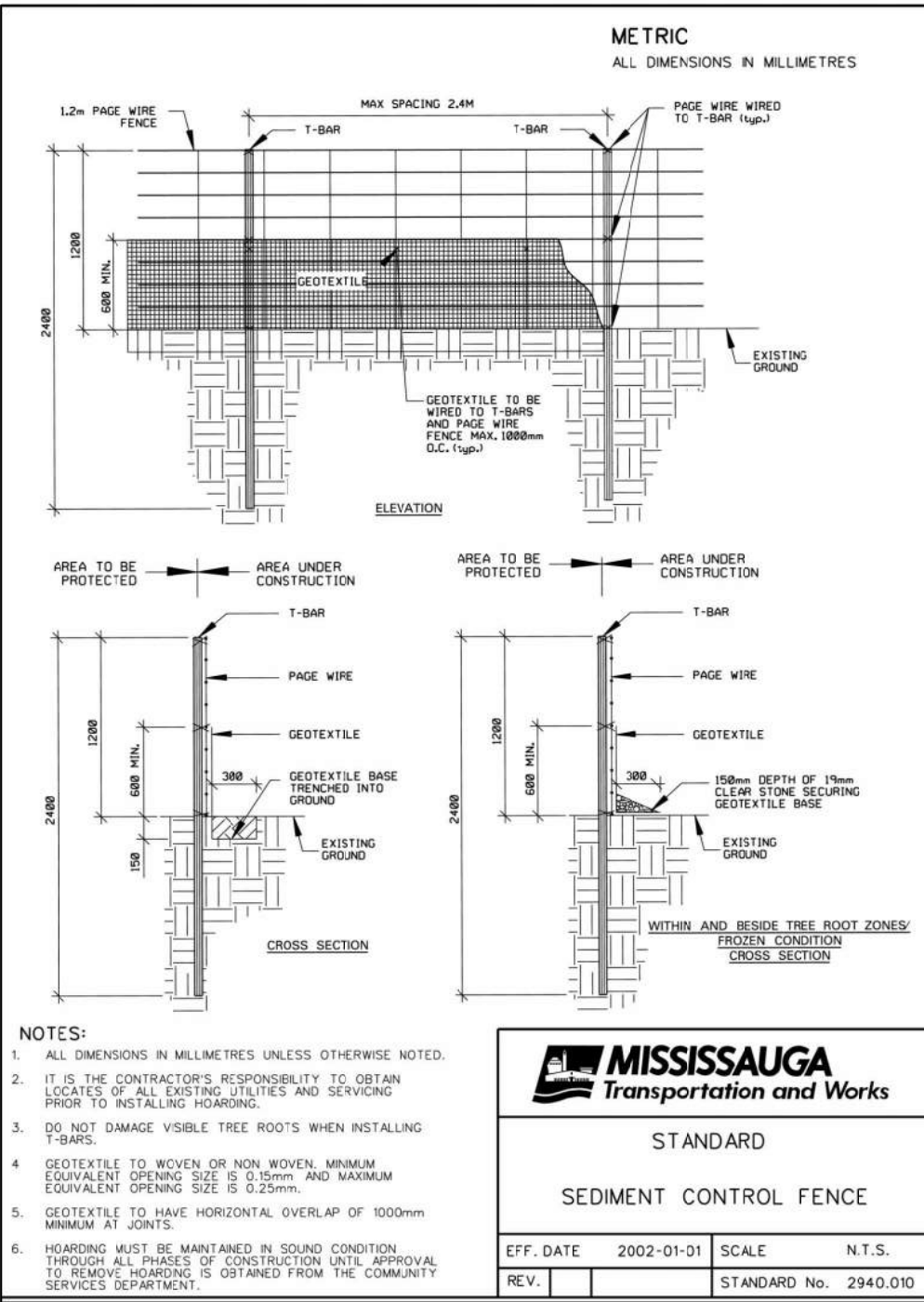
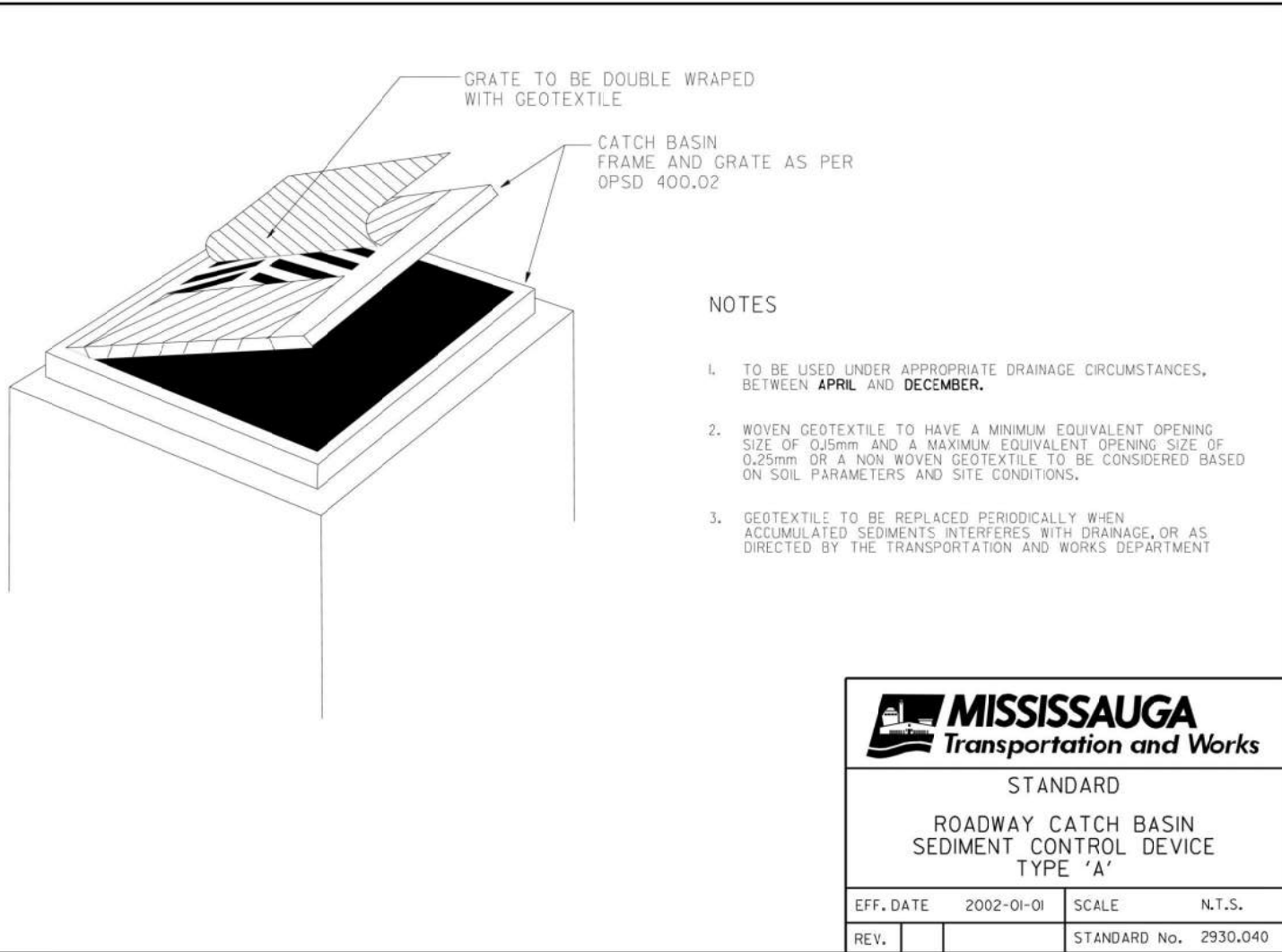
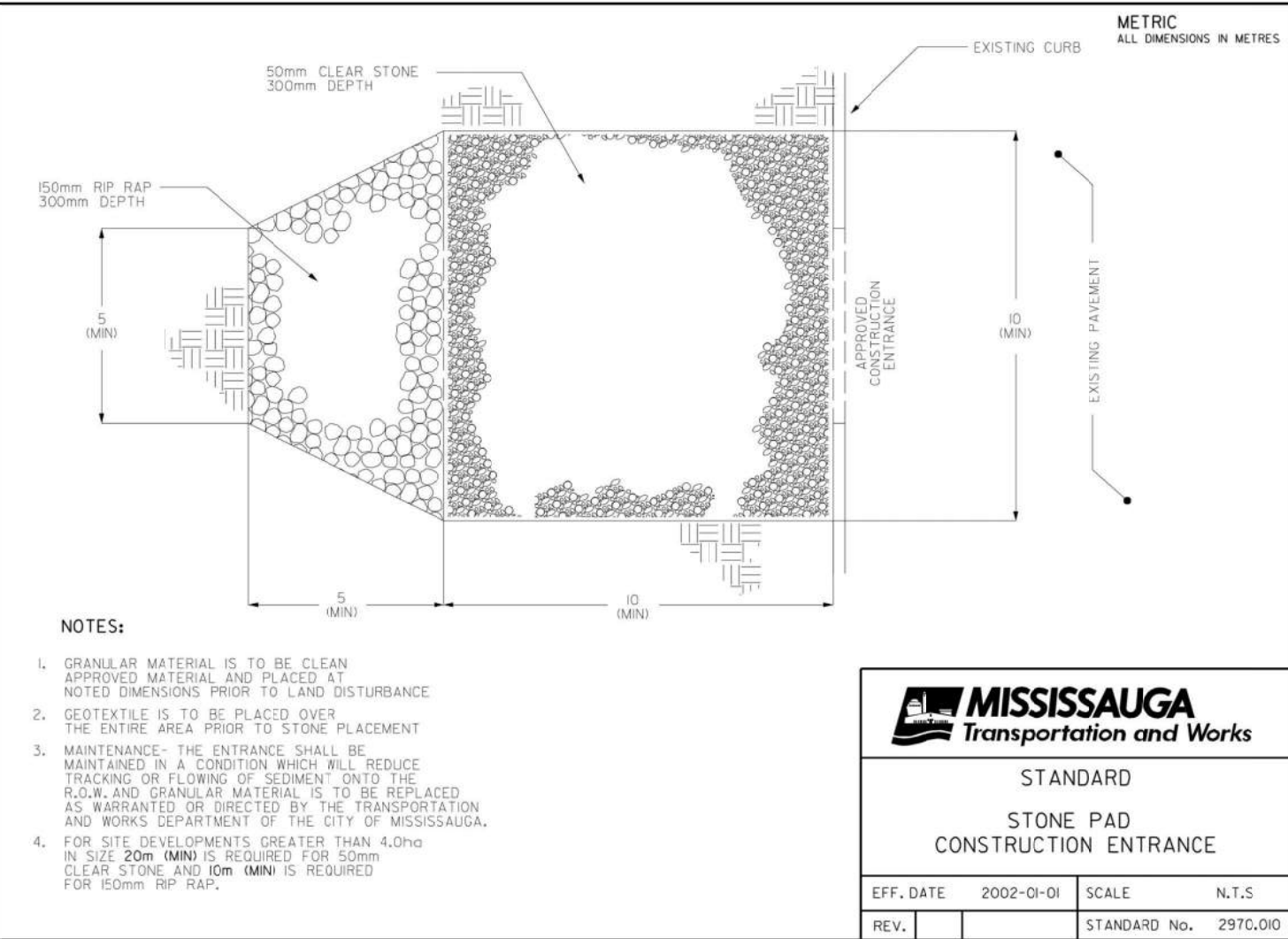
1. CONTRACTOR TO BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND SIGNAGE. CONTRACTOR IS REQUIRED TO ADHERE TO ALL CONDITIONS SET OUT BY THE CITY OF MISSISSAUGA.
2. DURING ALL CONSTRUCTION PHASES, MUD TRACKING CONTROL, CONSISTING OF FLUSHING AND SWEEPING ROADS, IS TO BE PROVIDED FOR ALL ROADS, AS WARRANTED, IN ACCORDANCE WITH THE CITY OF MISSISSAUGA POLICES.
3. ALL CONSTRUCTION VEHICLES TO ENTER AND LEAVE THE SITE AT APPROVED LOCATIONS ONLY. ALL VEHICLES MUST TRAVEL OVER A VIBRATORY MUD MAT WHEN LEAVING THE SITE.
4. THE CONTRACTOR IS RESPONSIBLE FOR CLEANUP OF MUDTRACKING ON A DAILY BASIS OR ON A MORE FREQUENT BASIS IF DIRECTED BY THE CITY OR THE CONSULTANT.
5. CONTRACTOR TO LIMIT CONSTRUCTION ACTIVITIES WITHIN THE LIMITS OF CONSTRUCTION SHOWN ON THE DRAWINGS. CONTRACTOR TO RESTORE ALL DISTURBED AREAS OUTSIDE THE WORKING AREA TO ORIGINAL CONDITIONS AND TO THE SATISFACTION OF THE CITY OF MISSISSAUGA.
6. IF NECESSARY, TRUCKS SHALL BE WASHED DOWN BEFORE LEAVING THE SITE.
7. CONTRACTOR TO CONFORM TO ALL CITY OF MISSISSAUGA NOISE AND DUST CONTROL STANDARDS AND BY-LAWS. THE SITE MUST BE WET DOWN IF NECESSARY TO CONTROL DUST.

#### EROSION AND SEDIMENT CONTROL

1. EROSION AND SEDIMENT CONTROL (ESC) MEASURES WILL BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING CONSTRUCTION PHASES, TO PREVENT ENTRY OF SEDIMENT INTO THE PLANT. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE REPAIRED OR REPLACED WITHIN 48 HOURS OF INSPECTION OR BOTH.
2. ALL DISTURBED AREAS WILL BE MINIMIZED TO THE EXTENT POSSIBLE, AND TEMPORARILY OR PERMANENTLY STABILIZED OR RESTORED AS WORK PROGRESSES.
3. THE EROSION AND SEDIMENT CONTROL STRATEGIES OUTLINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREA. IF THE PRESCRIBED MEASURES MUST BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS AND A CREDIT VALLEY CONSERVATION AUTHORITY ENFORCEMENT OFFICE SHOULD BE IMMEDIATELY CONTACTED. ADDITIONAL ESC MEASURES TO BE KEPT ON SITE AND USED AS NECESSARY.
4. ALL GRADES WITHIN THE REGULATORY FLOOD PLAN WILL BE MAINTAINED OR MATCHED

#### REMOVALS AND REINSTATEMENT

1. ALL STRUCTURES, SURFACE TREATMENTS AND MATERIALS REMOVED FROM THIS SITE MUST BE DISPOSED OF OFF-SITE MEETING ALL REGULATIONS AND REQUIREMENTS OF THE MINISTRY OF THE ENVIRONMENT AND THE CITY OF MISSISSAUGA.
2. ALL SITE EXCAVATION AND RESULTING DRAINAGE PATTERNS SHALL NOT ADVERSELY AFFECT ADJACENT LANDS.
3. ANY DE-WATERING OF EXCAVATIONS ON THIS SITE MUST CONFORM TO THE CITY OF MISSISSAUGA SEWER USE BY LAW.
4. IF ANY SEWER OR WATER SERVICES THAT ARE NOT IDENTIFIED ON THIS PLAN ARE DISCOVERED ON THIS SITE BY THE CONTRACTOR, THEY SHALL NOTIFY THE CONSULTANT IMMEDIATELY. IF IT IS DETERMINED THAT THE EXISTING SEWER OR WATER SERVICE IS ABANDONED OR NO LONGER REQUIRED, THE CONTRACTOR SHALL REMOVE THE SERVICE AND ALL ASSOCIATED STRUCTURES TO THE LIMIT OF THE PROPERTY AND DISPOSE OFF-SITE. THE EXISTING SERVICE STUB AT THE PROPERTY LINE SHALL BE PLUGGED WITH A WATERTIGHT PLUG. THE CONTRACTOR SHALL THEN NOTIFY CITY OF MISSISSAUGA OF THE ABANDONED SERVICE CONNECTION SO THAT CITY OF MISSISSAUGA WATER CAN COMPLETE A FORMAL DISCONNECT OF THE MUNICIPAL SERVICE CONNECTION.
5. ALL SURFACE FEATURES TO REMAIN SUCH AS ASPHALT, CURBS AND SIDEWALKS THAT ARE DISTURBED, DAMAGED OR REMOVED DURING THE CONTRACTOR ACTIVITIES SHALL BE REINSTATED TO THE ORIGINAL CONDITION.



2	ISSUED FOR REZONING	2025/09/30
1	ISSUED FOR SITE PLAN APPLICATION	2025/02/25
No.	ISSUE / REVISION	YYYY/MM/DD

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**BENCHMARK NOTE:**

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**SURVEY NOTES:**

SURVEY COMPLETED BY IBW SURVEYORS  
SURVEY PREPARED FOR 1470 WILLIAMSPORT HOLDINGS INC.

**SITE PLAN NOTES:**

DESIGN ELEMENTS ARE BASED ON SITE PLAN BY BPD QUADRANGLE  
DRAWING No.: A201.S PROJECT No.: 23057

**DRAWING NOTES:**

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# MISSISSAUGA

Project

1470 WILLIAMSPORT DRIVE  
CITY OF MISSISSAUGA  
PEEL REGION

Drawing

EROSION SEDIMENT CONTROL  
NOTES AND DETAILS

REGION FILE NO.: C601060  
SITE PLAN NO.: SP-25-011M

Stamp

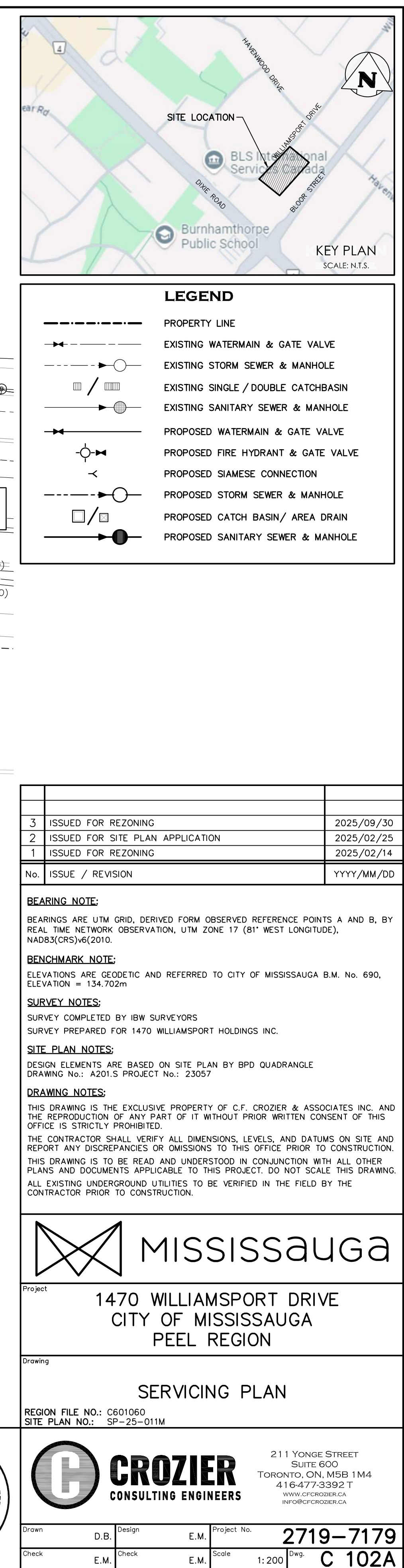
Stamp

LICENCED PROFESSIONAL ENGINEER  
E.C. MCNAMEE  
100157907  
2025.09.30  
PROVINCE OF ONTARIO

211 YONGE STREET  
SUITE 600  
TORONTO, ON, M5B 1M4  
416-477-3392 T  
WWW.CFCROZIER.CA  
INFO@CFCROZIER.CA

Drawn	D.B.	Design	E.M.	Project No.	2719-7179
Check	E.M.	Check	E.M.	Scale	1:200
				Dwg.	C 101B





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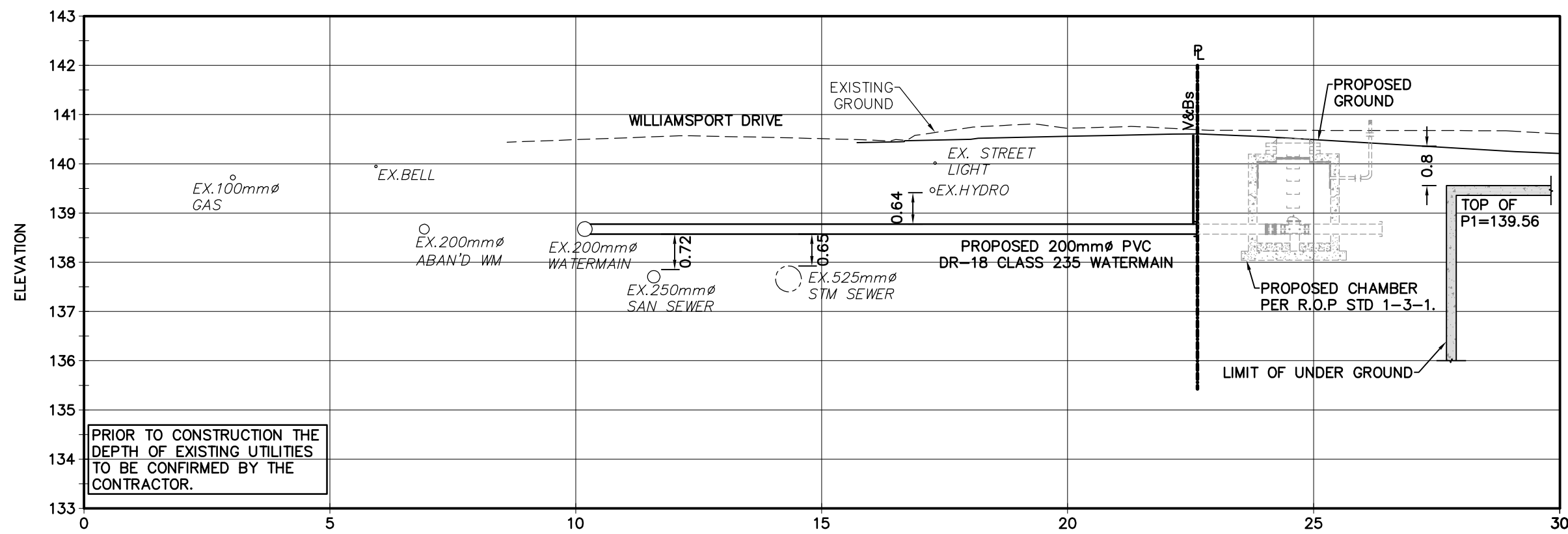
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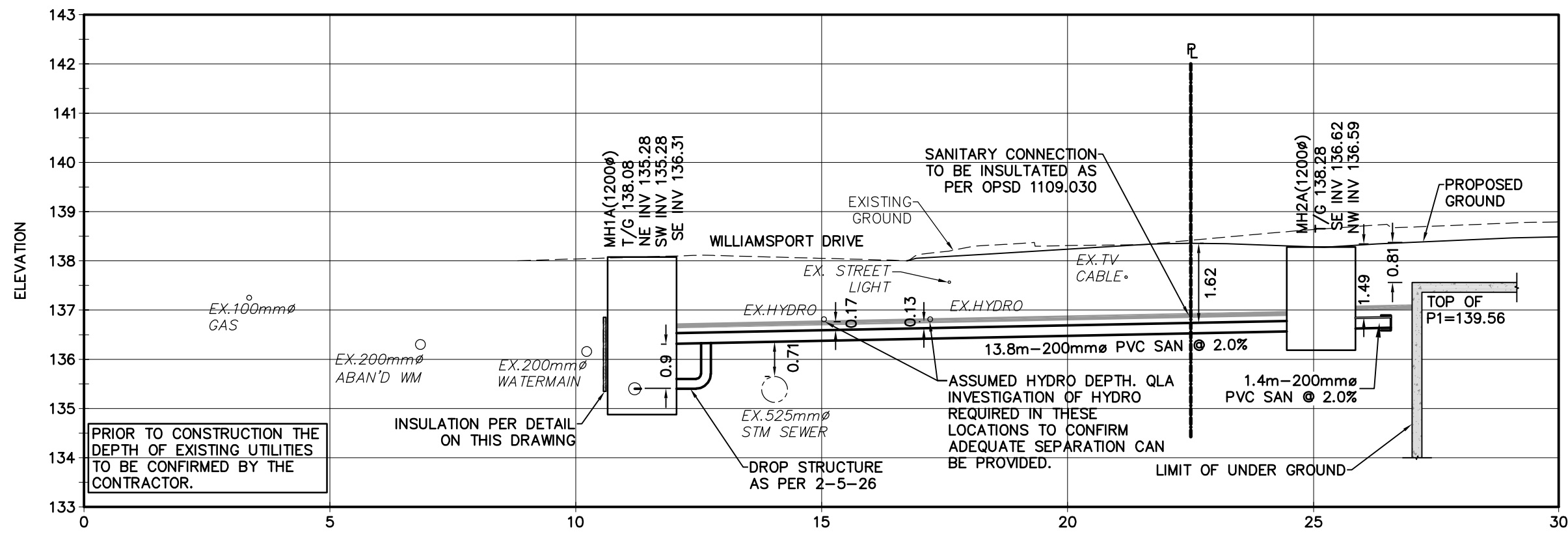
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 <h1>MISSISSAUGA</h1>			
<p>Project</p> <p>1470 WILLIAMSPORT DRIVE CITY OF MISSISSAUGA PEEL REGION</p>			
<p>Drawing</p> <p>SERVICING PLAN</p>			
<p>REGION FILE NO.: C601060 SITE PLAN NO.: SP-25-011M</p>			
 <p><b>CROZIER</b> CONSULTING ENGINEERS</p>		<p>211 YONGE STREET SUITE 600 TORONTO, ON, M5B 1M4 416-477-3392 T WWW.CFCROZIER.CA INFO@CFCROZIER.CA</p>	
Drawn	D.B.	Design	E.M.
Check	E.M.	Check	E.M.
Project No.		2719-7179	
Scale	1:200	Dwg.	C 102A

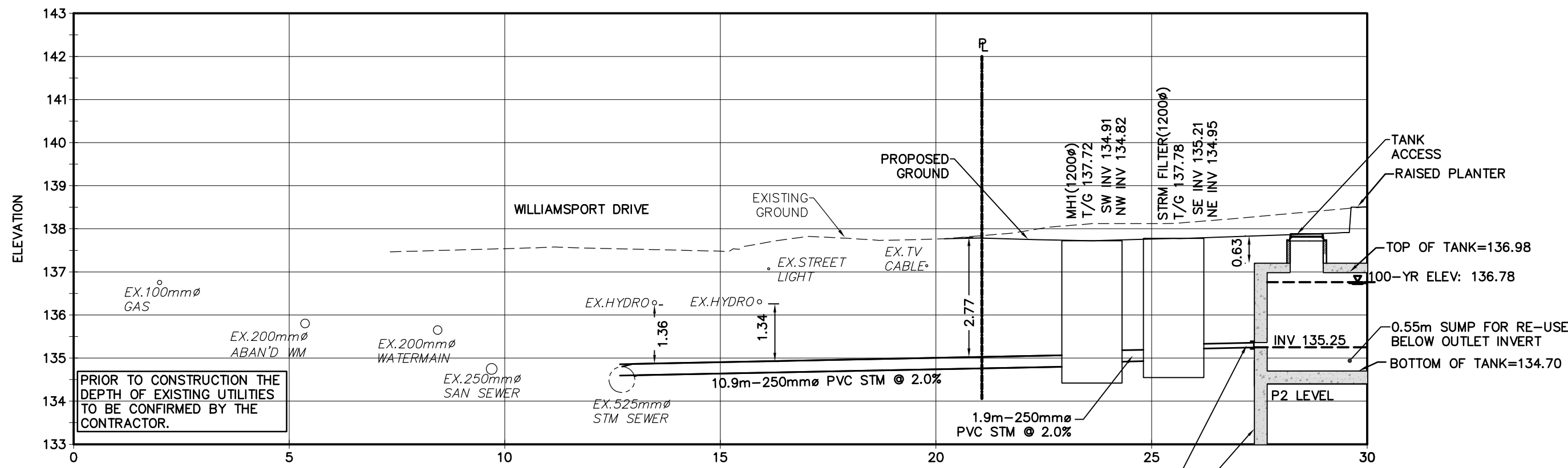




SECTION AA-WATERMAIN SERVICE CONNECTION  
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V:100

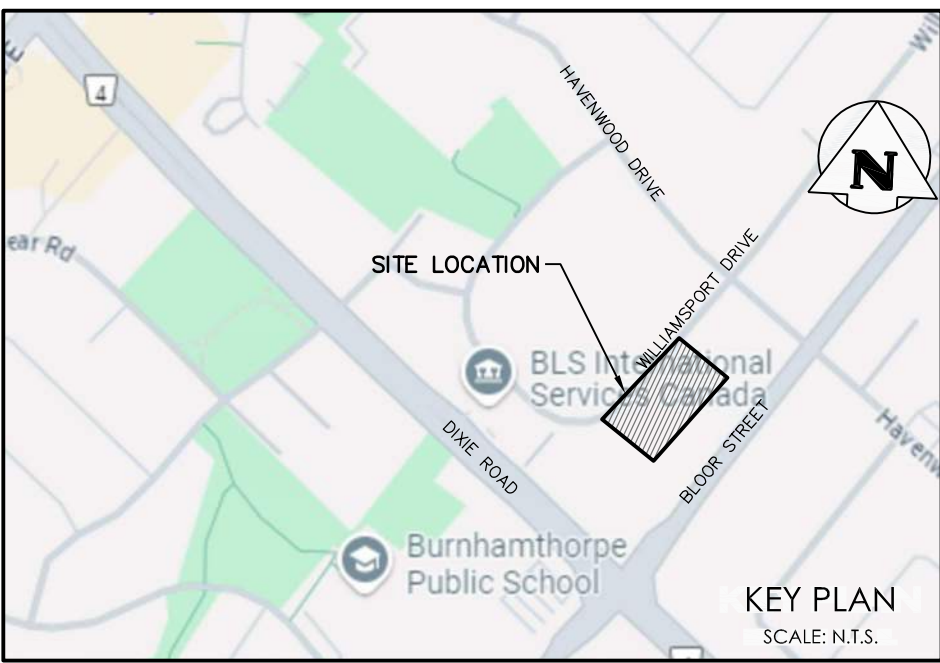
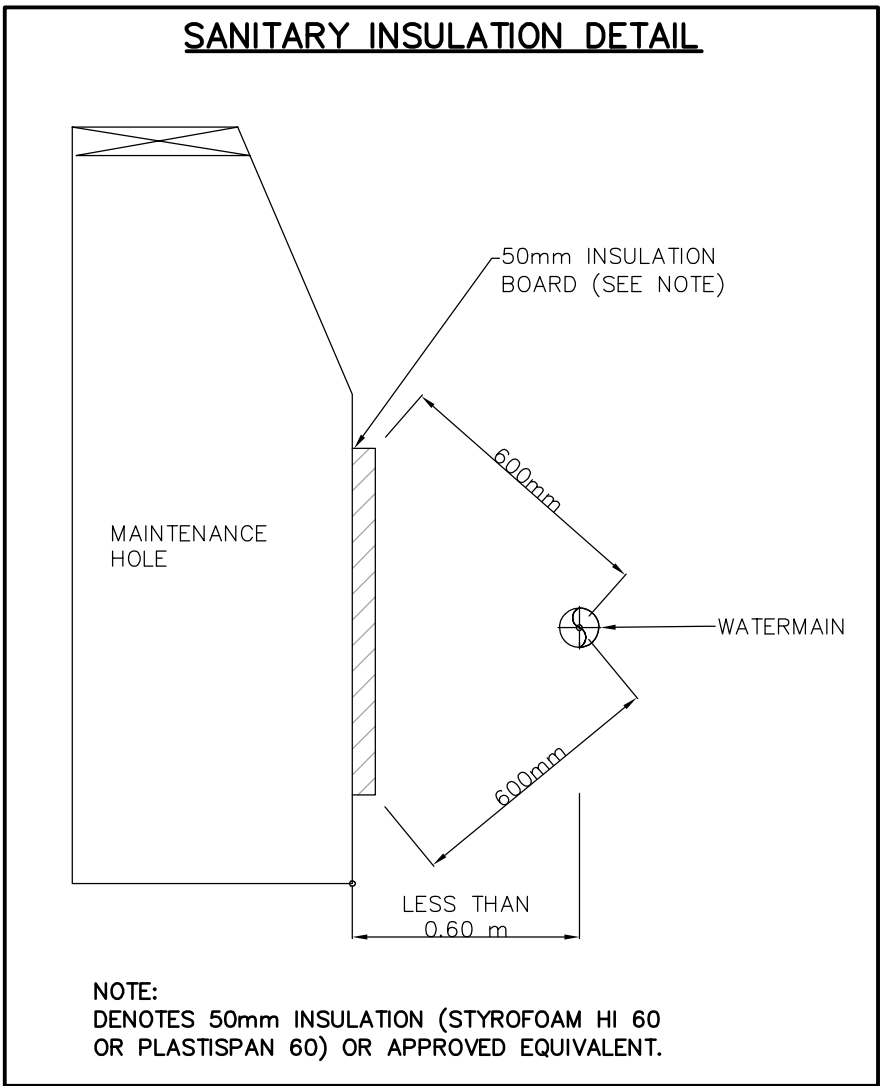


SECTION BB-SANITARY SERVICE CONNECTION  
H:100  
V:100



- PROPOSED NORTH STORMWATER MANAGEMENT TANK
- TANK WILL BE FULLY WATERPROOFED.
  - FOR WALL THICKNESS AND DESIGN REFER TO STRUCTURAL DRAWINGS.
  - SUMP TO BE PROVIDED AS PER MECHANICAL PUMP REQUIREMENTS FOR STORMWATER REUSE.

SECTION CC-STORM SERVICE CONNECTION  
H:100  
V:100



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MISSISSAUGA

Project  
1470 WILLIAMSPORT DRIVE  
CITY OF MISSISSAUGA  
PEEL REGION

Drawing  
SERVICING SECTIONS

REGION FILE NO.: C601060  
SITE PLAN NO.: SP-25-011M





CROZIER  
CONSULTING ENGINEERS

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WWW.CFCROZIER.CA  
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Drawn  
D.B.

Design  
E.M.

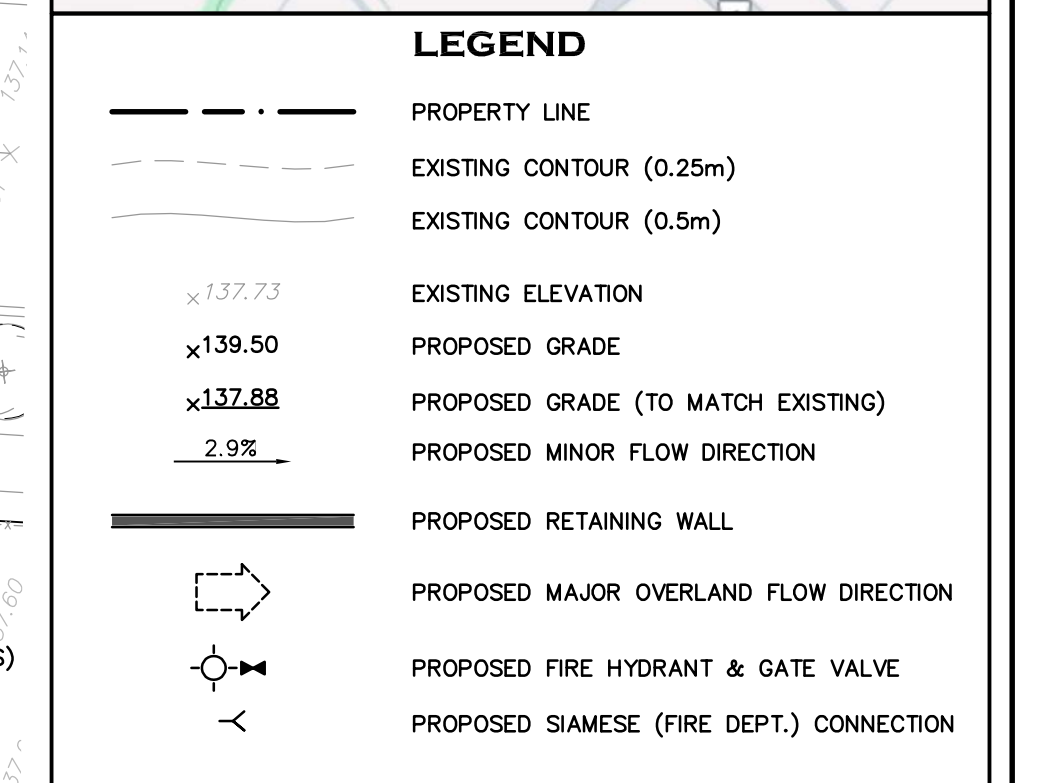
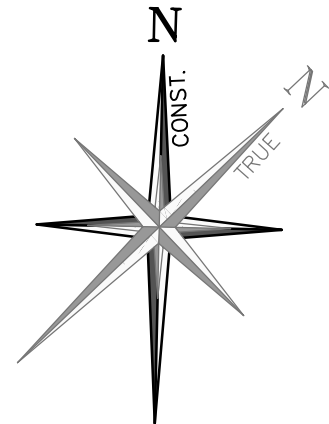
Project No.  
2719-7179

Check  
E.M.

Scale  
1:200

Dwg.  
C 102B





3	ISSUED FOR REZONING	2025/09/30
2	ISSUED FOR SITE PLAN APPLICATION	2025/02/25
1	ISSUED FOR REZONING	2025/02/14
No.	ISSUE / REVISION	YYYY/MM/DD

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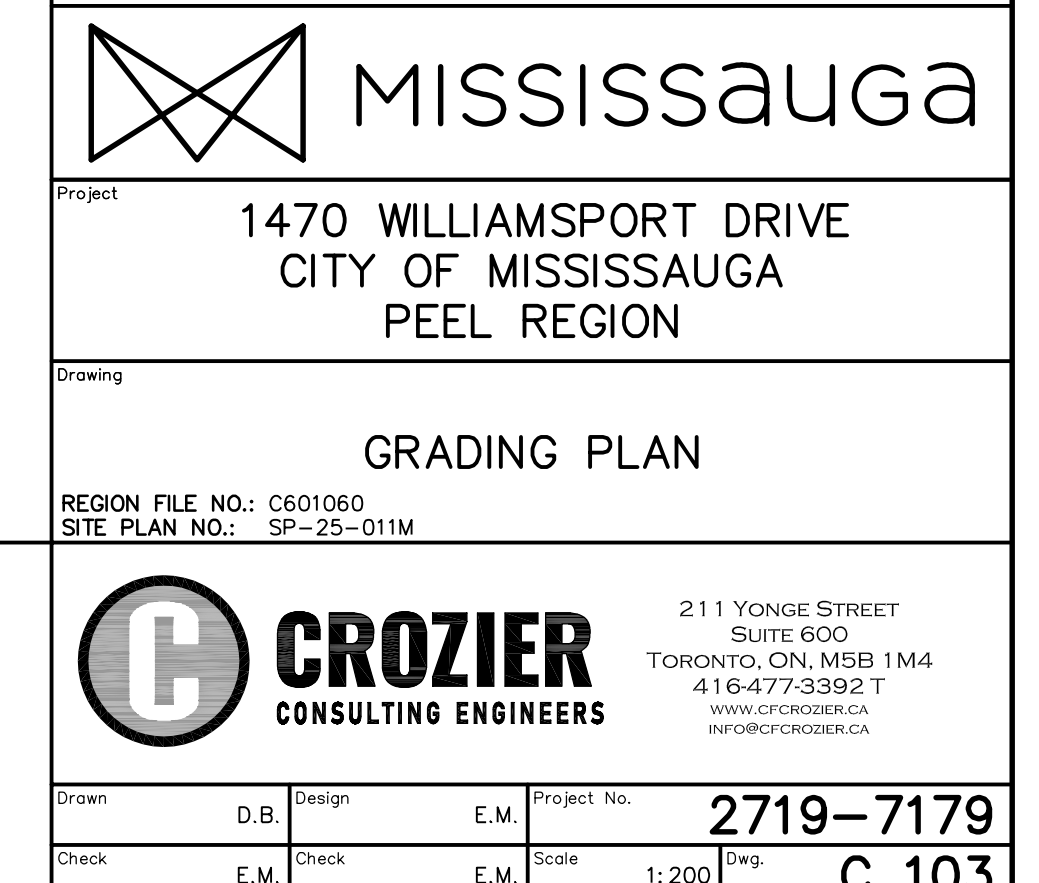
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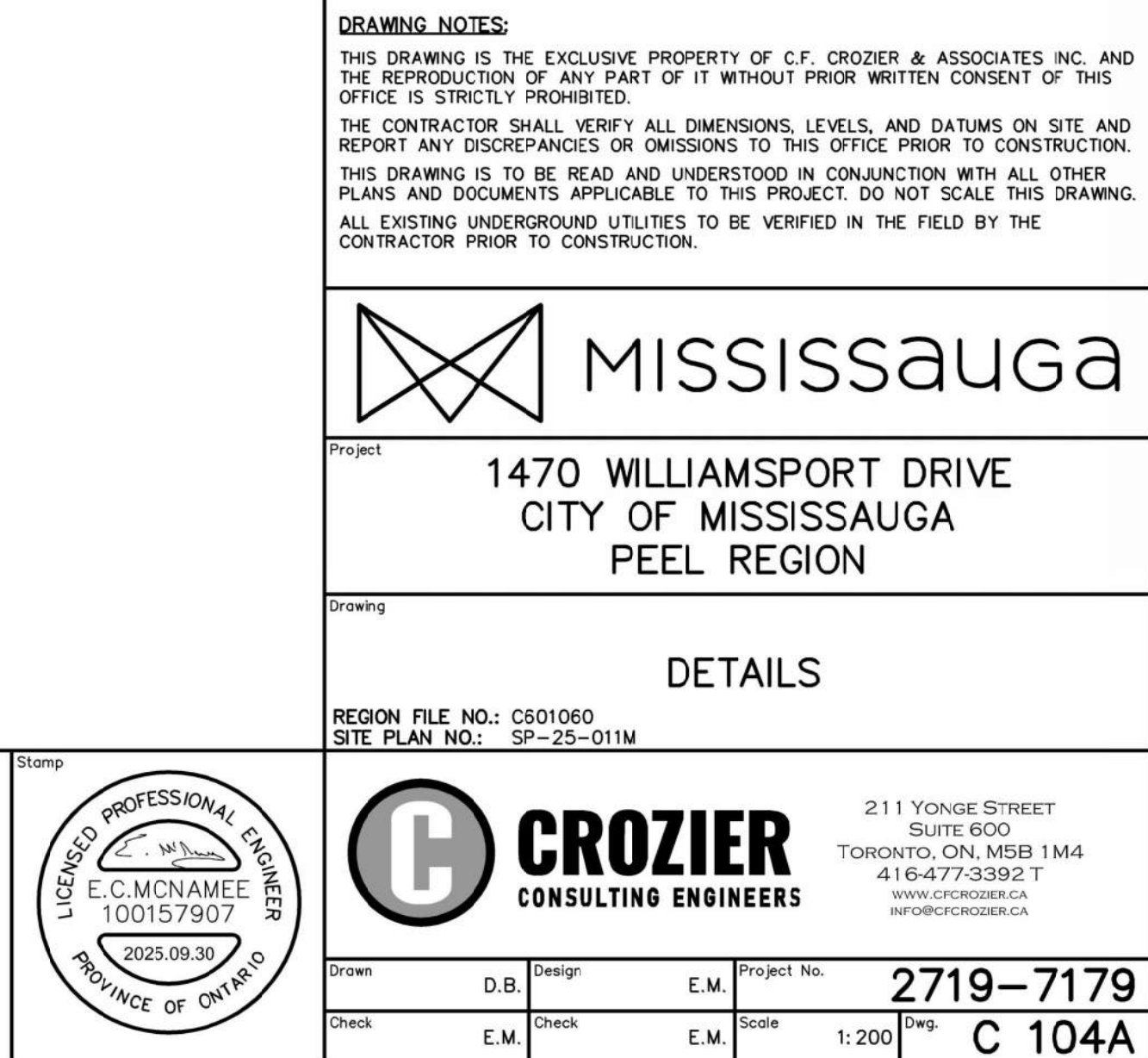
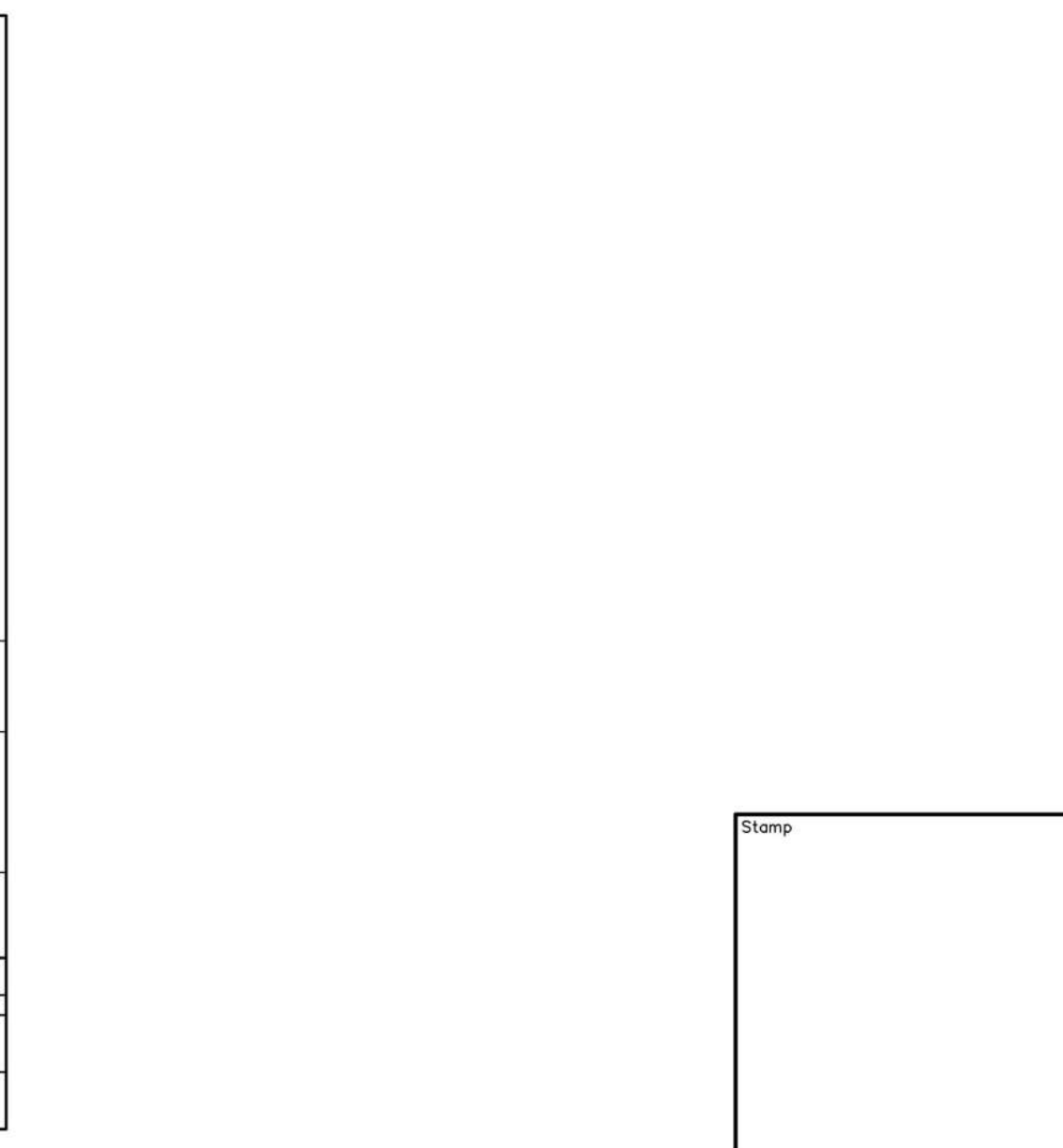
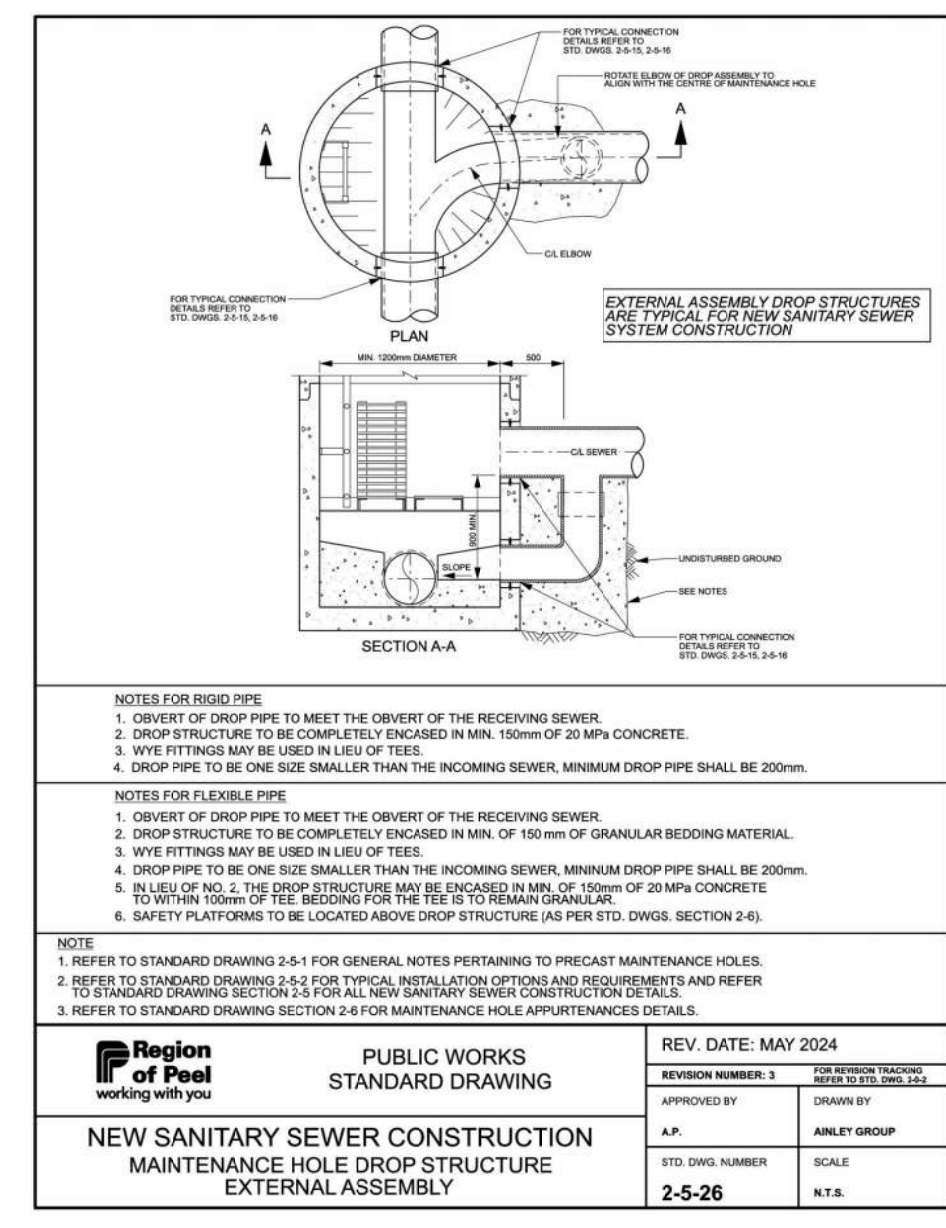
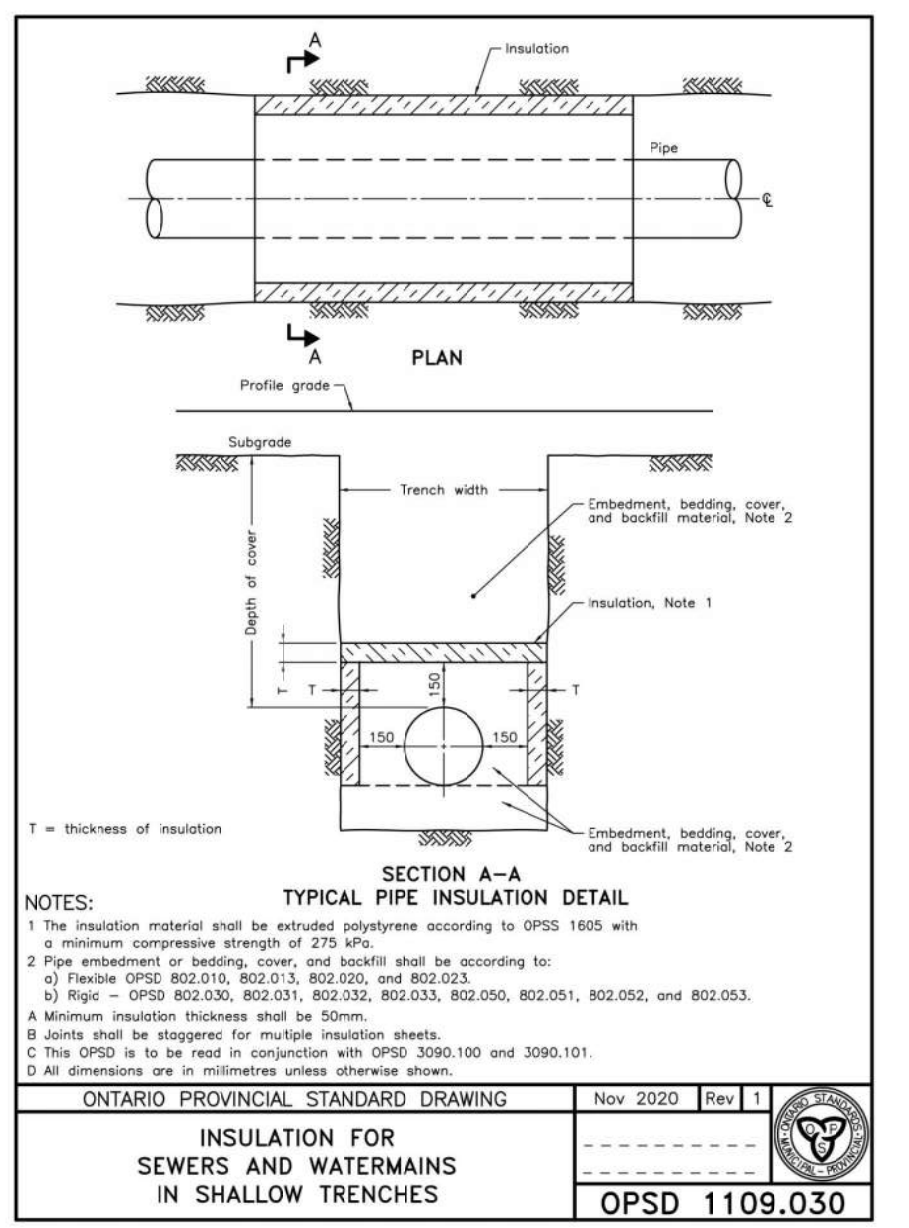
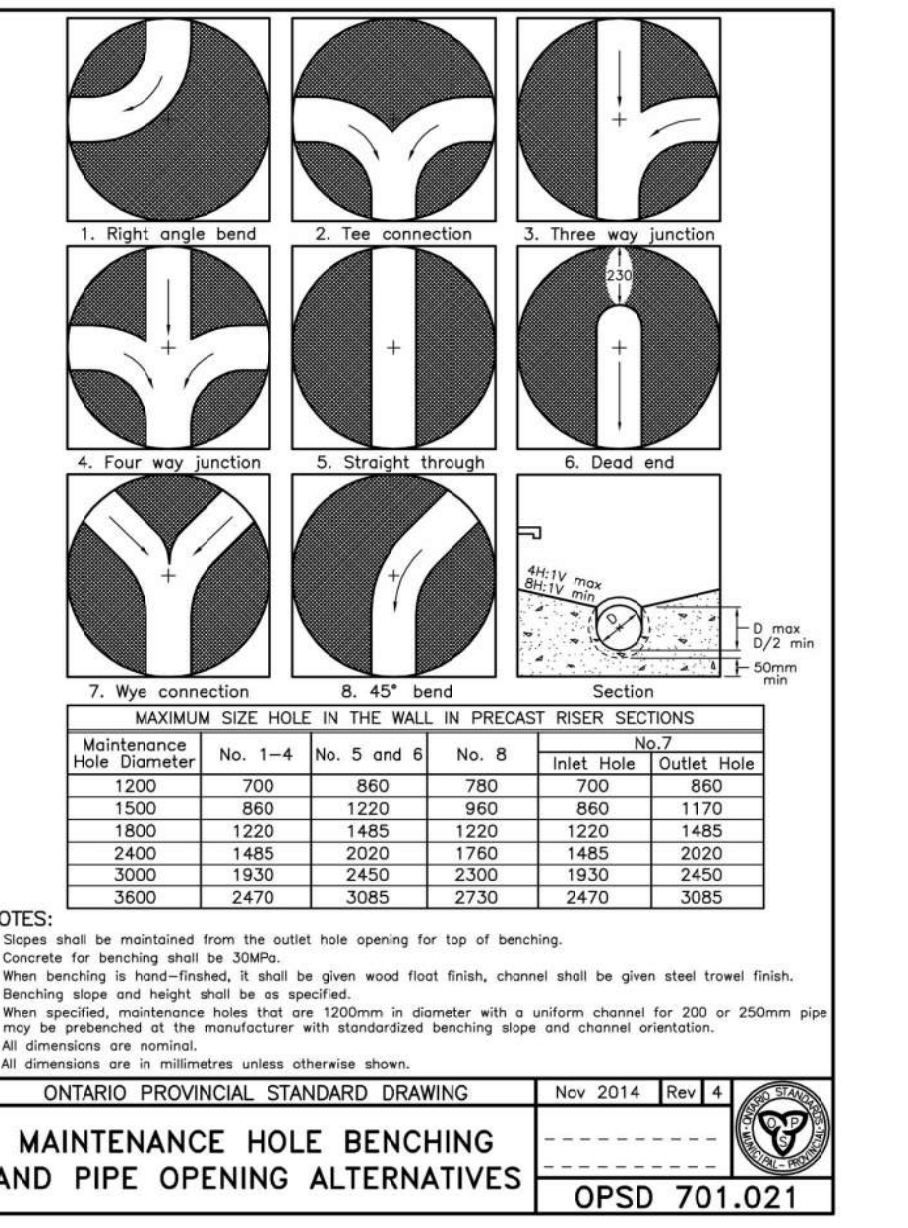
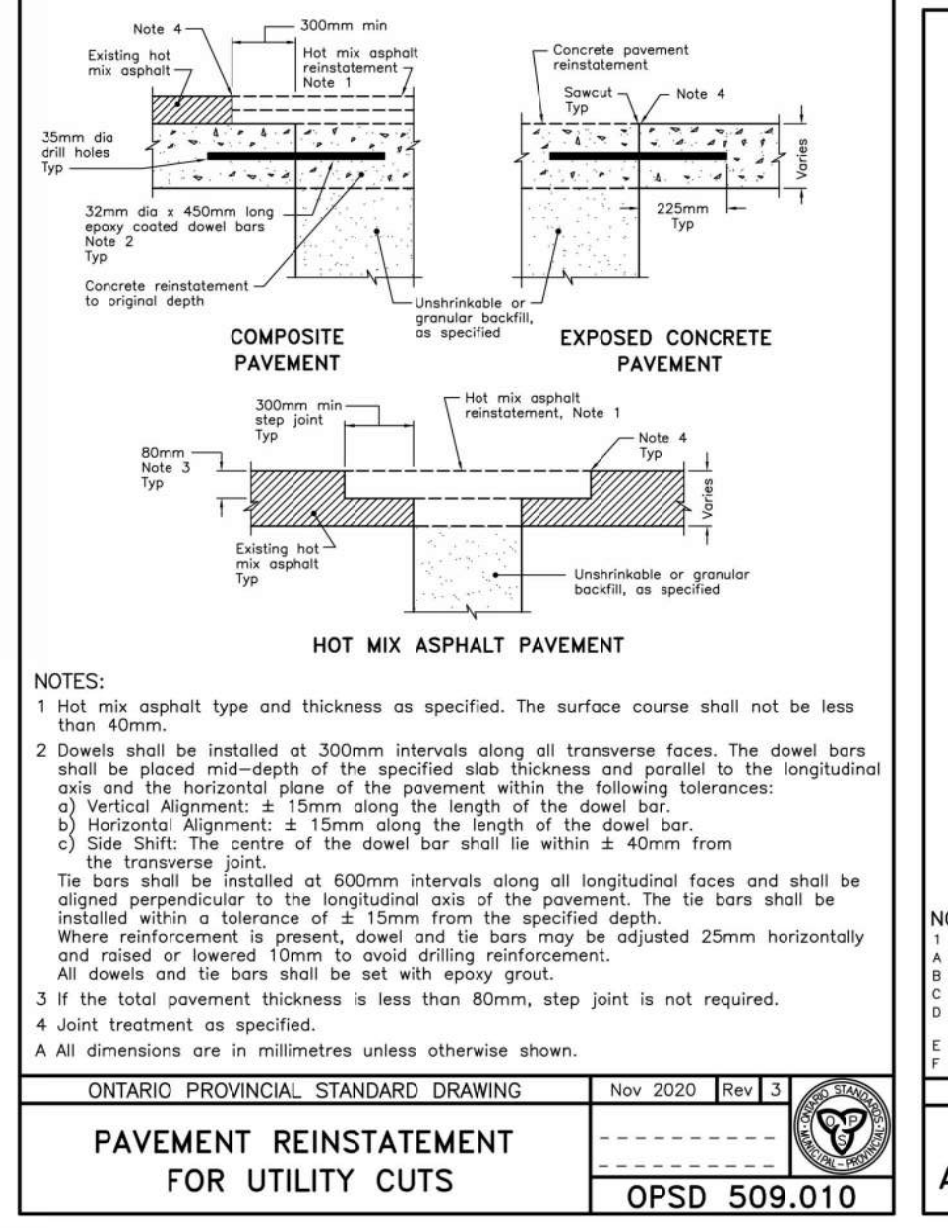
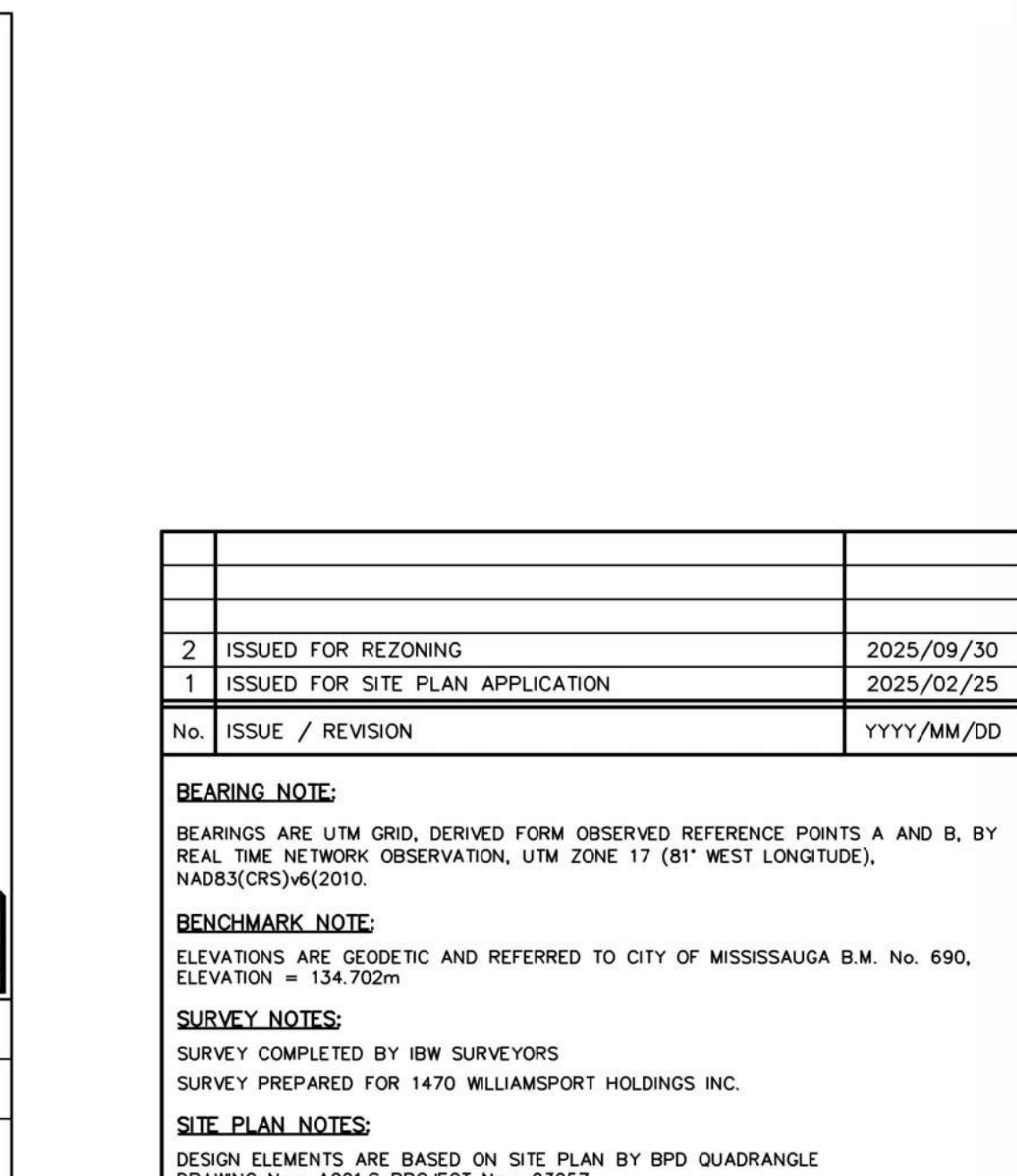
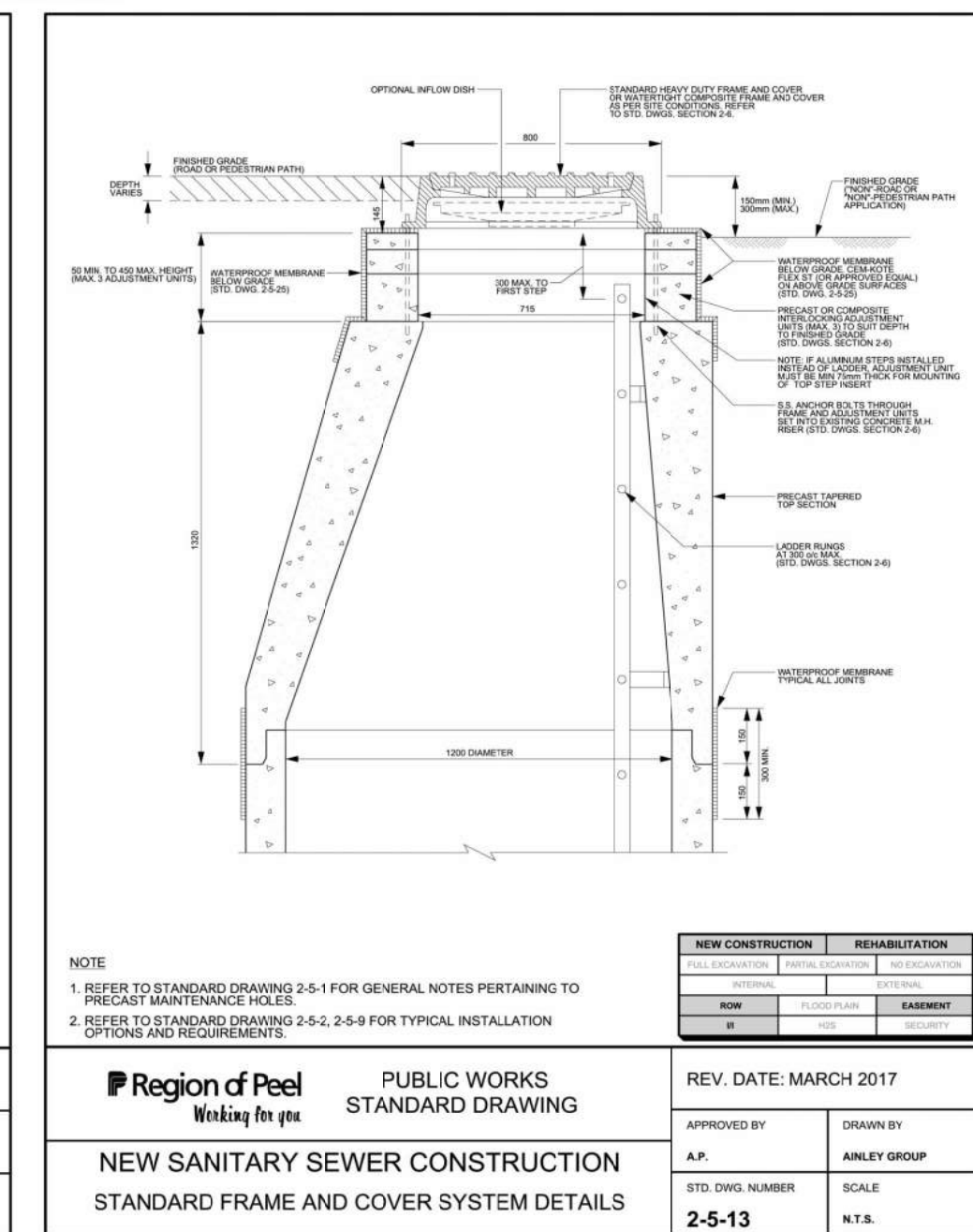
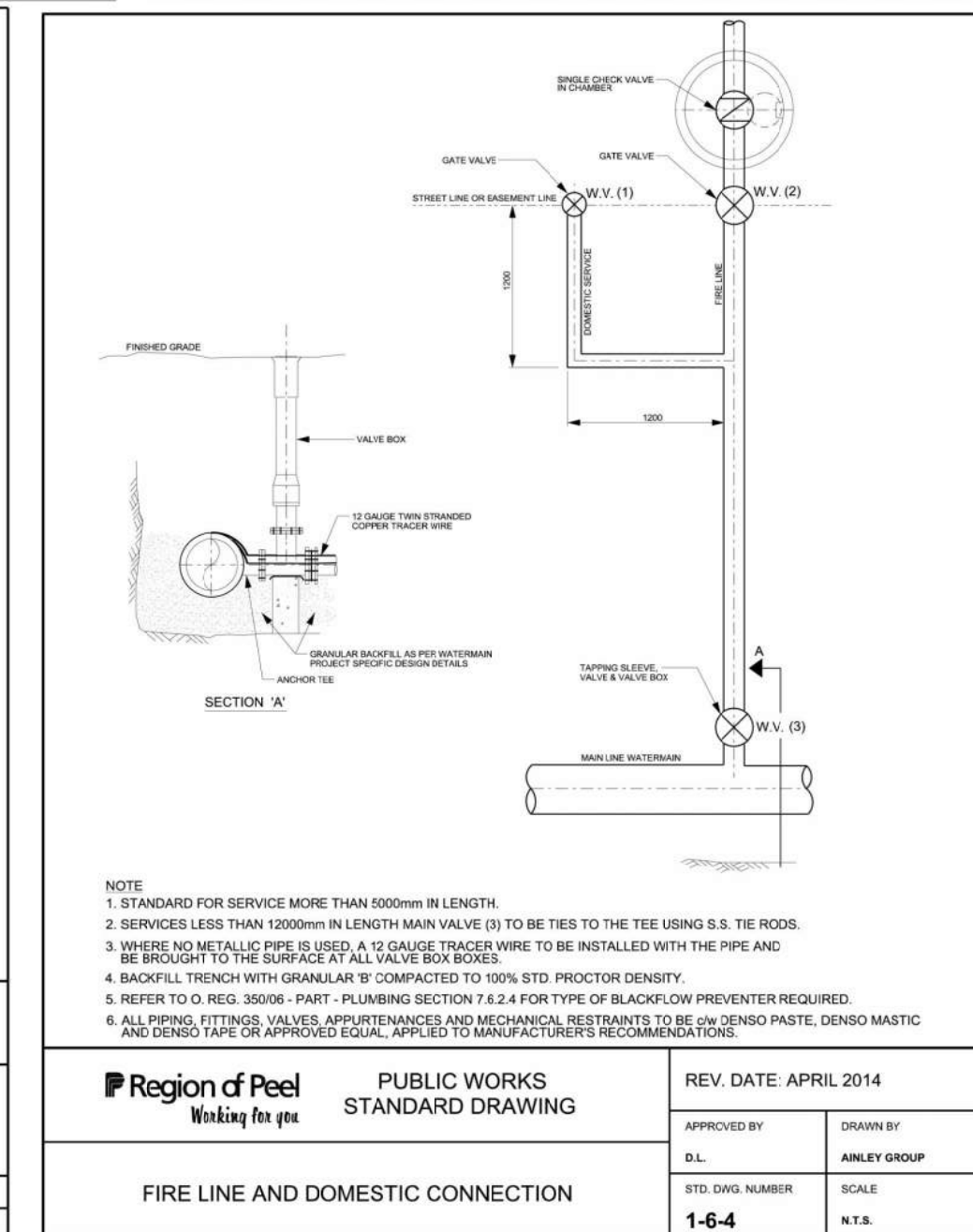
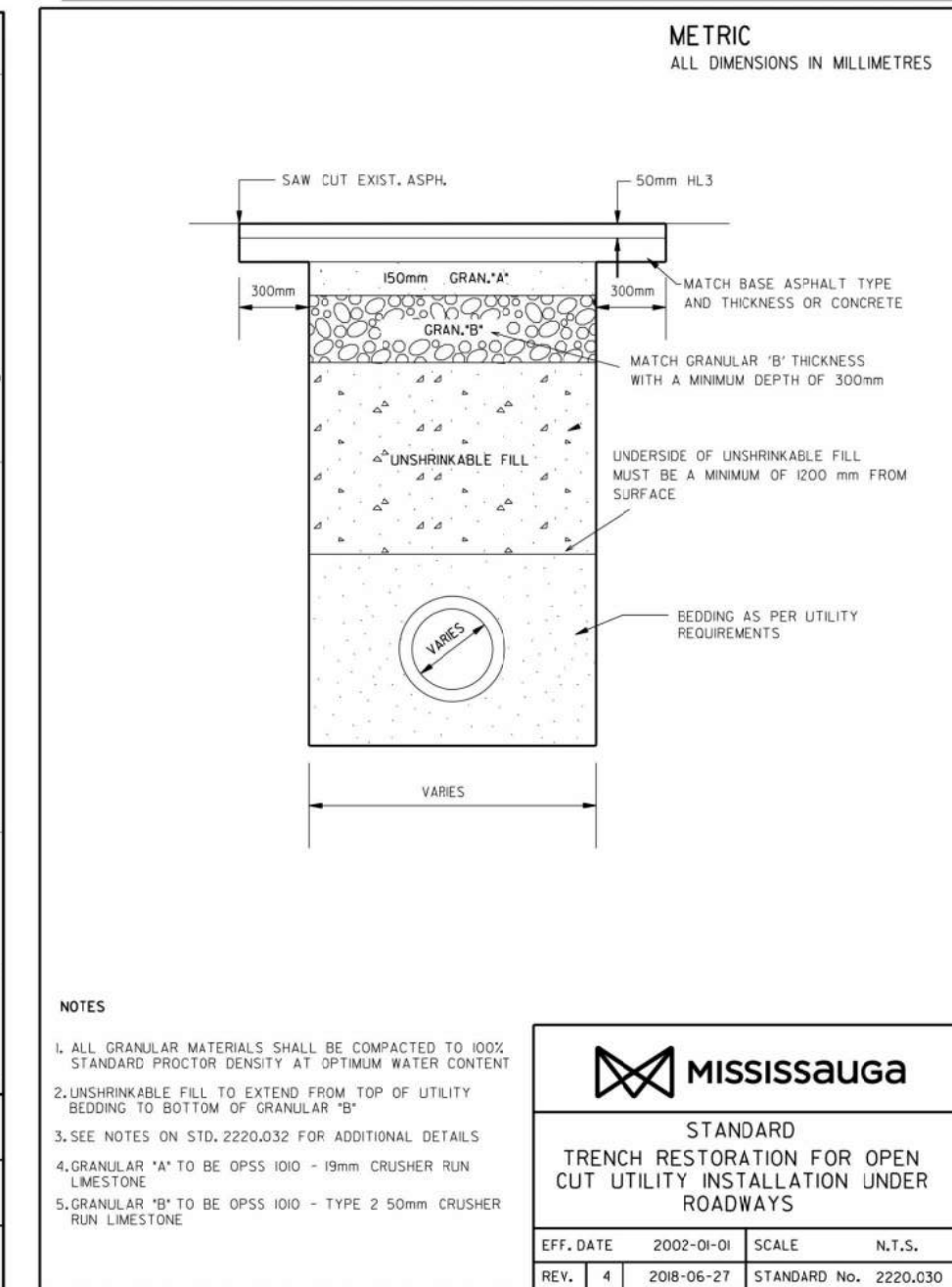
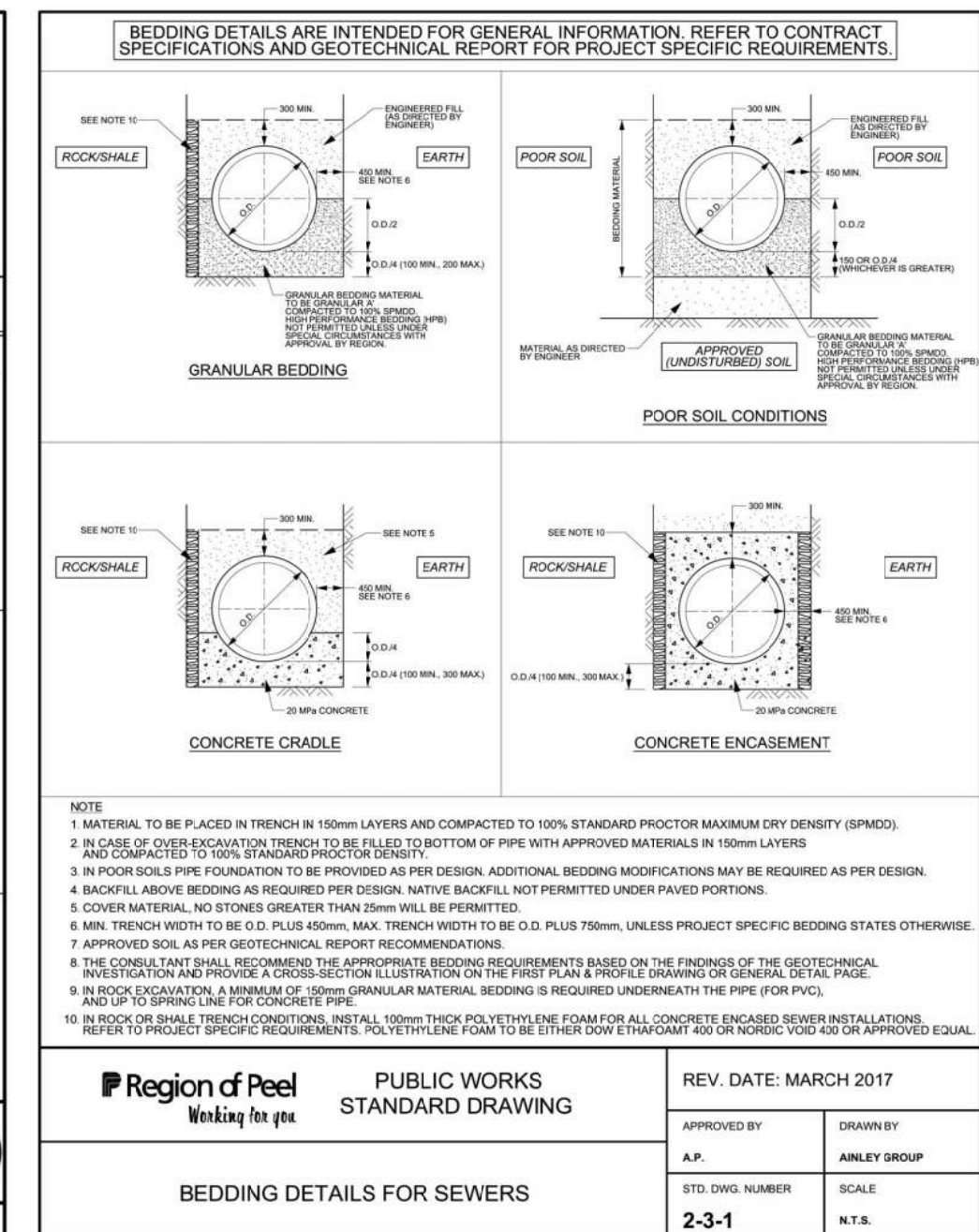
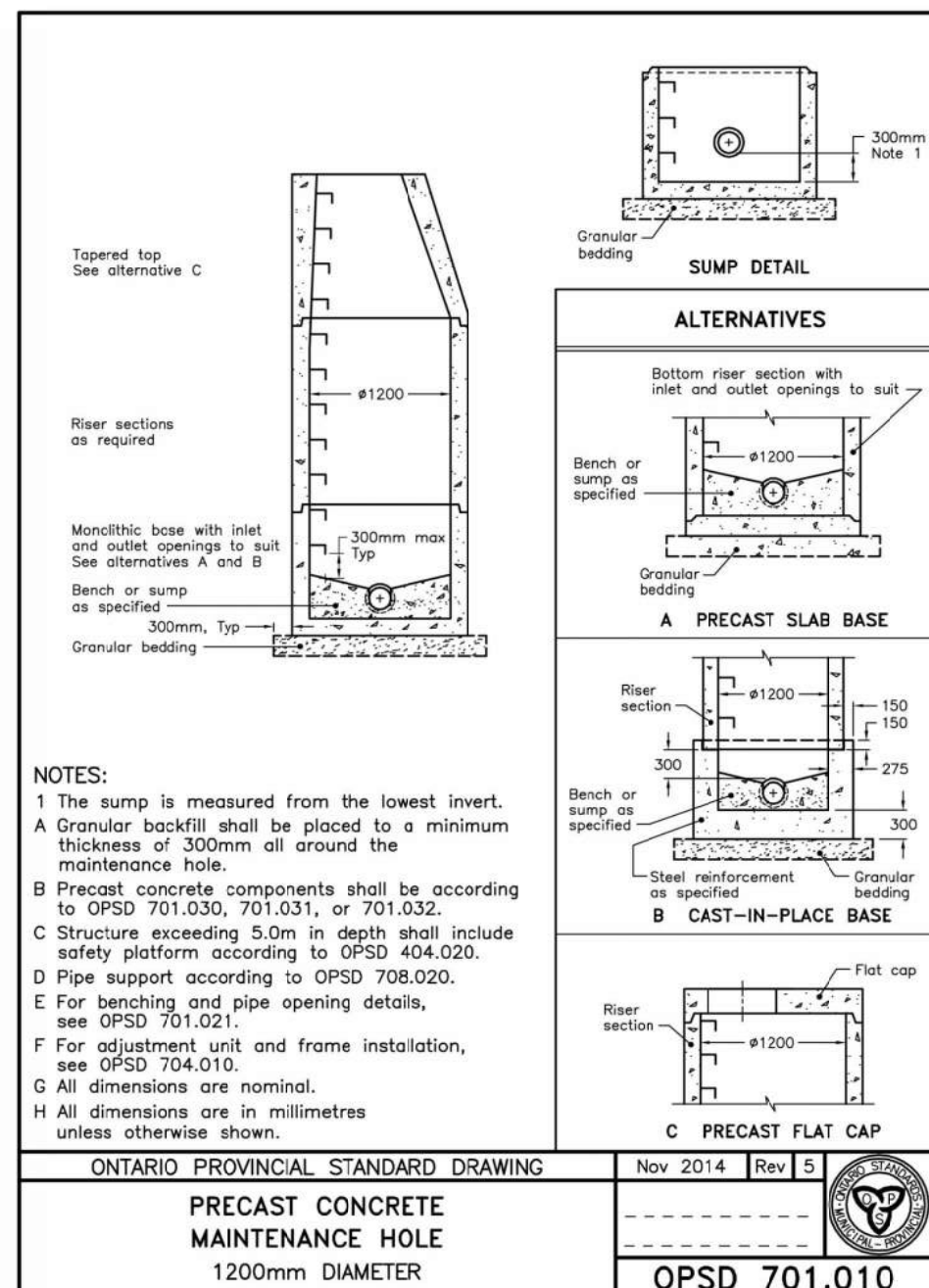
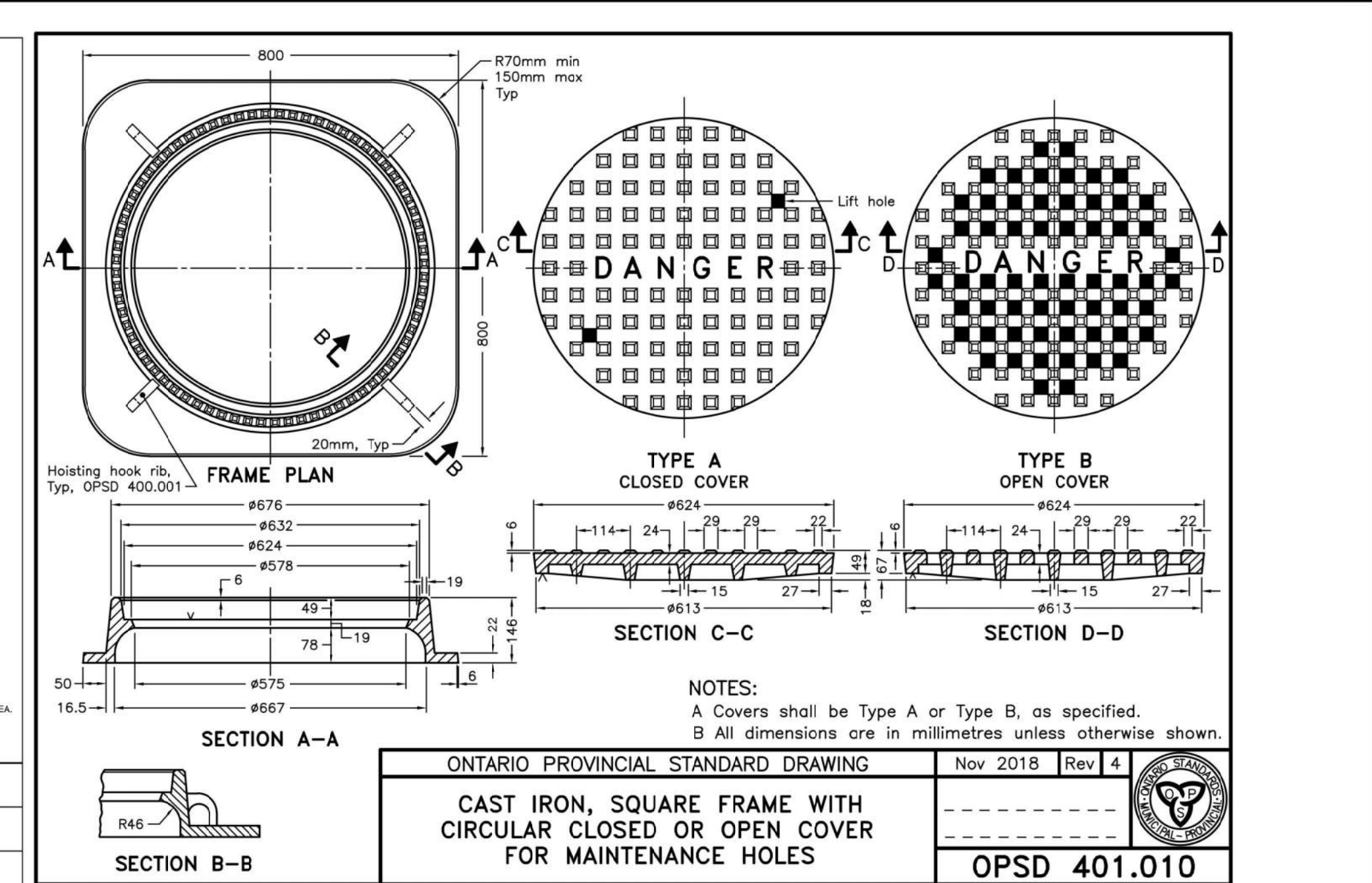
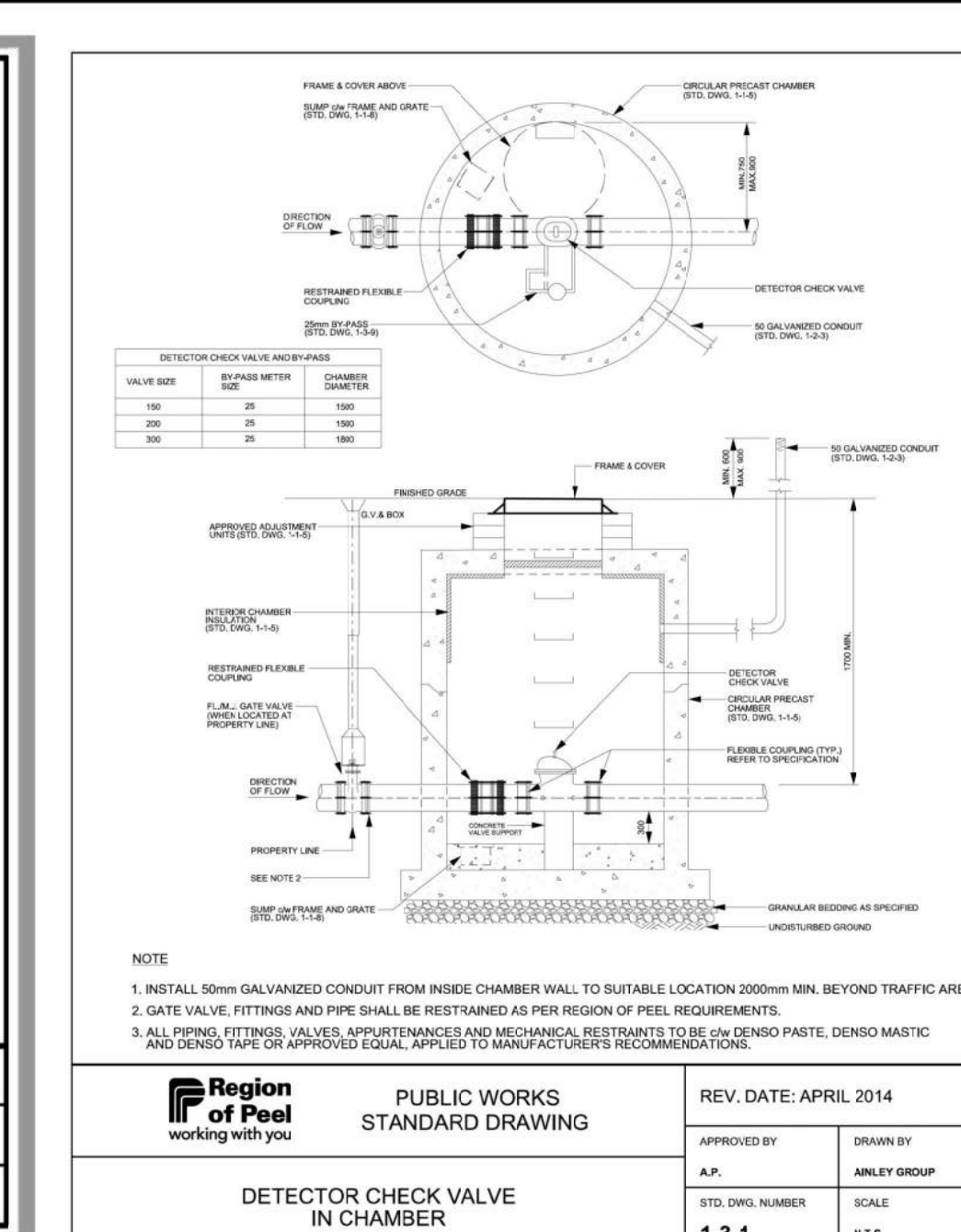
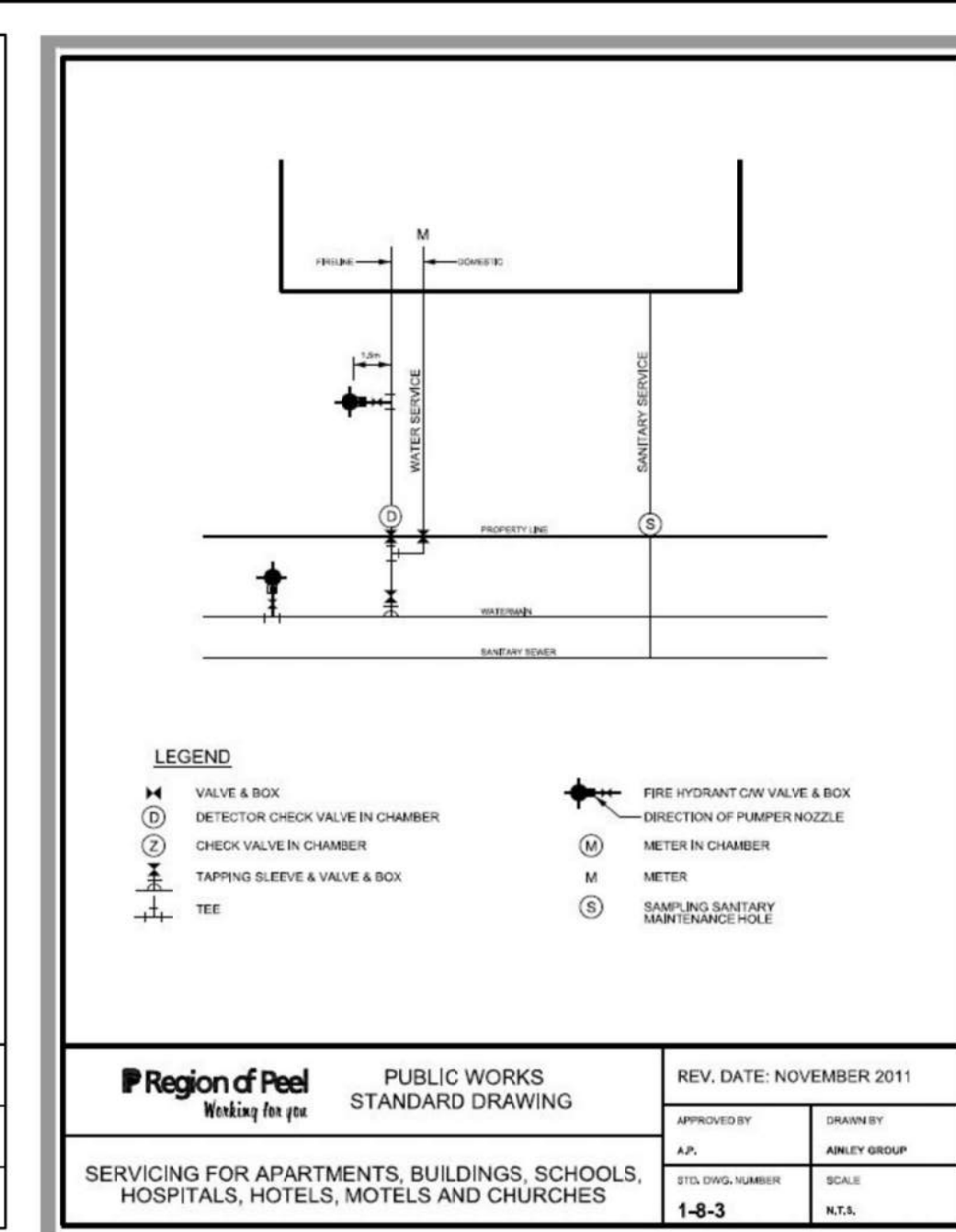
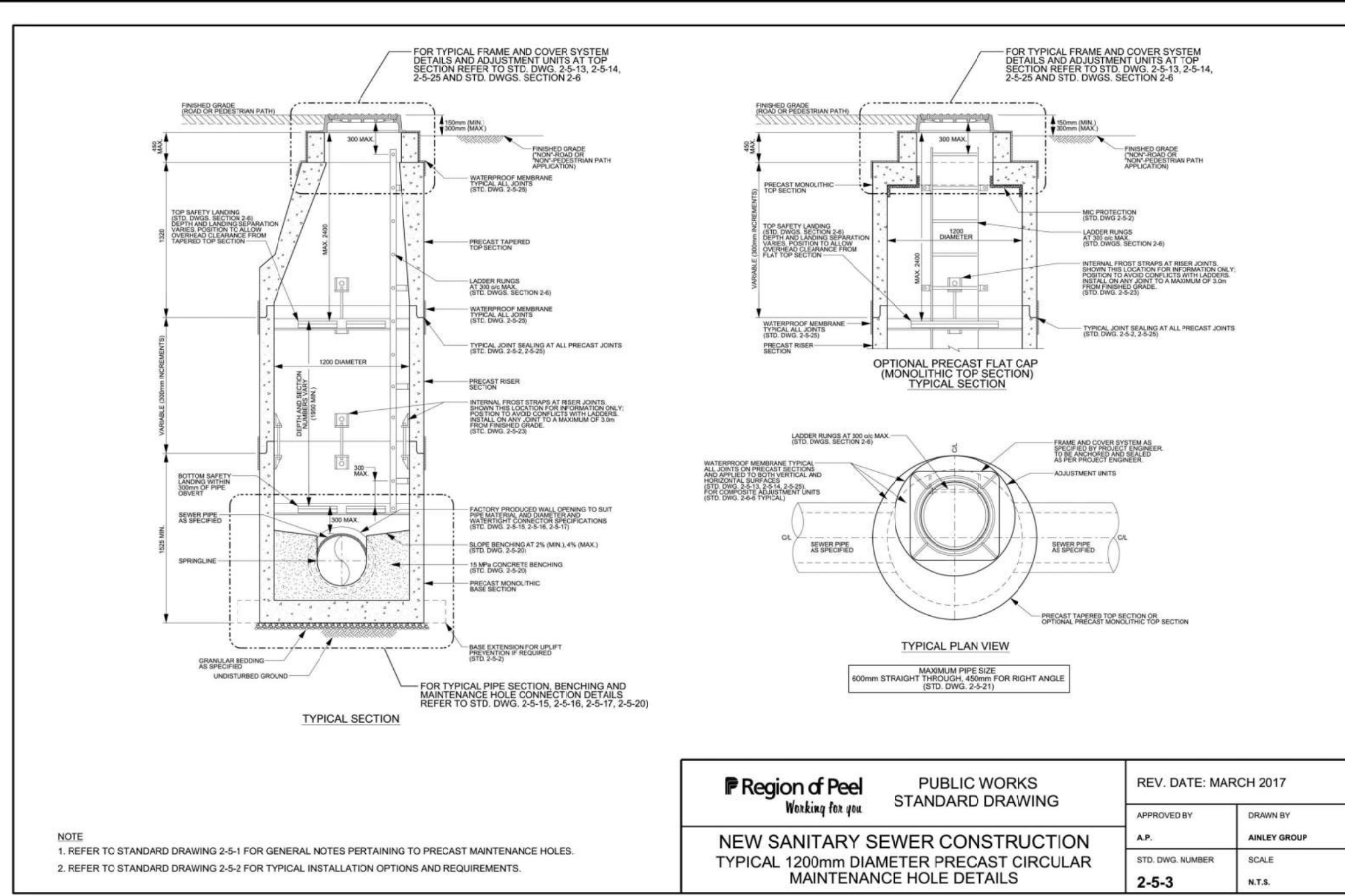
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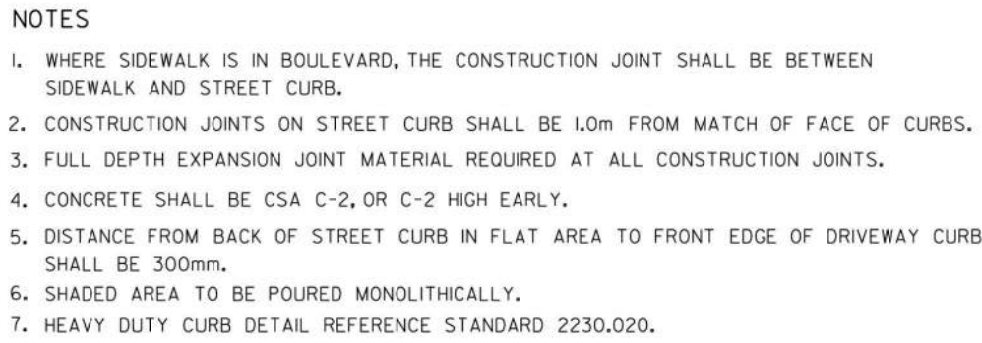
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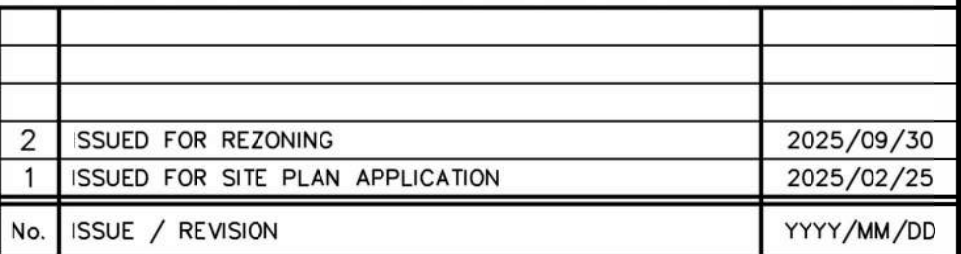
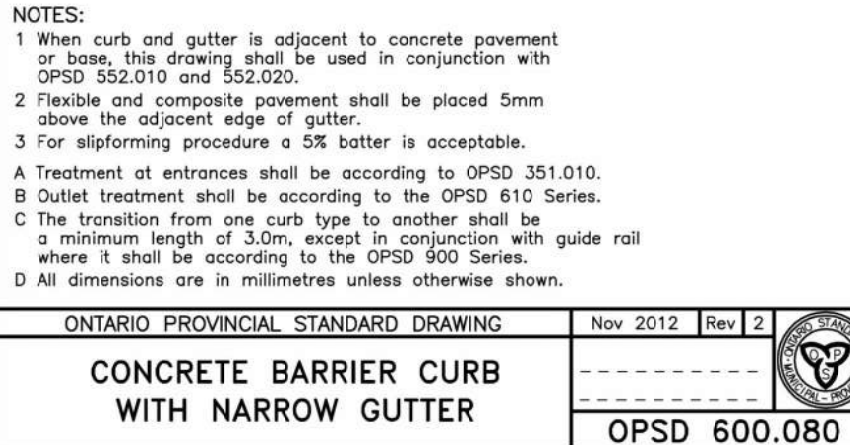
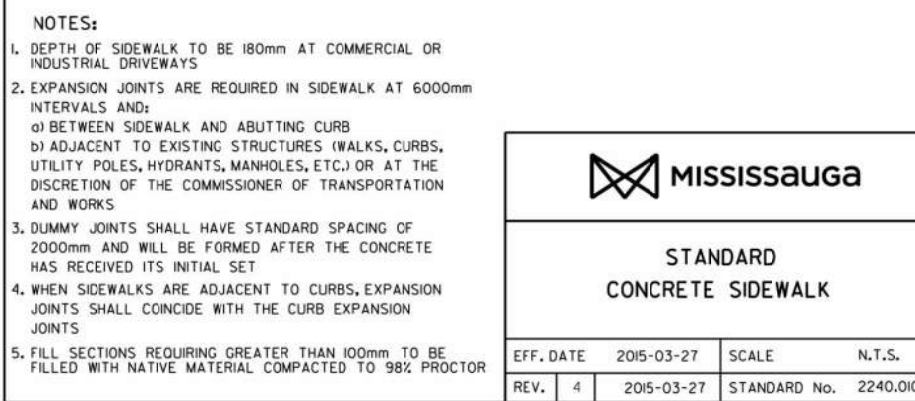
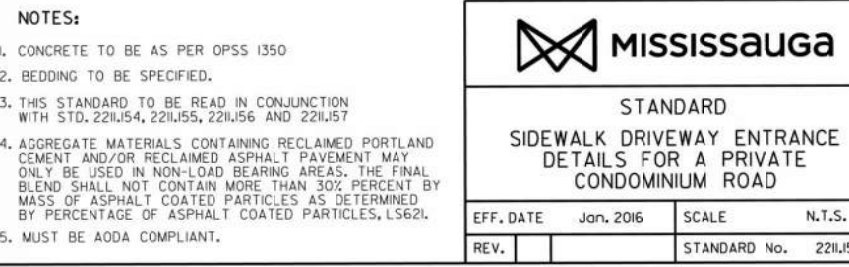
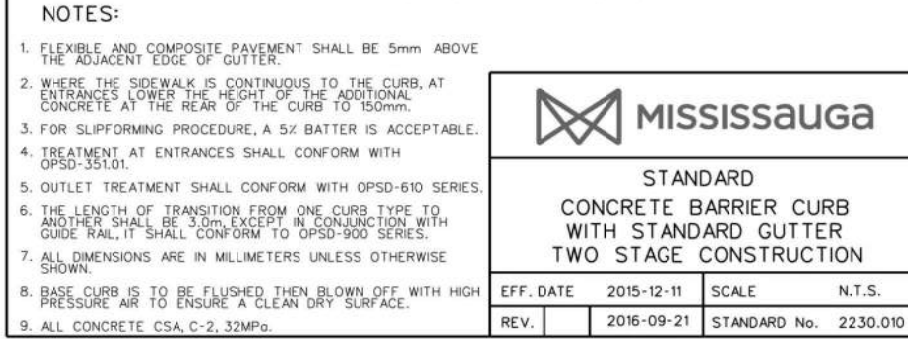
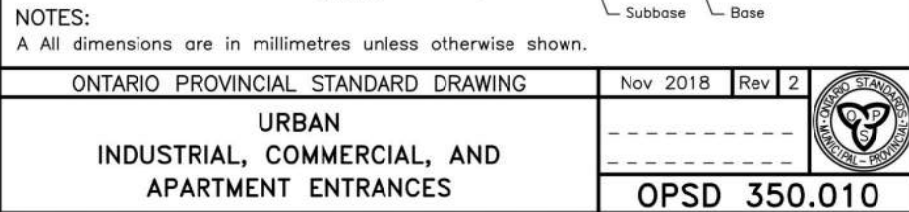








		<b>MISSISSAUGA</b>	
<p align="center"> <b>COMMERCIAL INDUSTRIAL          DRIVEWAY CURB RETURNS          AT STREET CURB</b> </p>			
EFF. DATE: DEC 2015		SCALE N.T.S.	
REV. 1	APRIL 2017	STANDARD No. 2240.031	



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1470 WILLIAMSPORT DRIVE  
CITY OF MISSISSAUGA  
PEEL REGION

## DETAILS

REGION FILE NO.: C601060  
SITE PLAN NO.: SP-25-011M



211 YONGE STREET  
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Check	E.M.	Check	E.M.	Scale 1: 200	Dwg. C 104B





CONSTRUCTION NOTES:

1.0 REMOVALS/EROSION & SEDIMENT CONTROLS (GENERAL)

- 1.1 THE APPLICANT IS RESPONSIBLE FOR THE INSTALLATION OF HOARDING TO PROTECT THE ADJACENT LANDS TO COMMUNITY SERVICES STANDARDS. THE APPLICANT ACCEPTS THE RESPONSIBILITY FOR ARRANGING ALL NECESSARY REPAIRS THE AND THE REINSTATEMENT OF THE ADJOINING LANDS, DUE TO DAMAGES INCURRED BY THE CONSTRUCTION WORKS ASSOCIATED WITH THIS APPLICATION. THESE WORKS WILL BE COMPLETED PRIOR TO SUBMITTING THE REQUEST FOR INSPECTION AND THE SUBSEQUENT REQUEST FOR THE RELEASE OF SECURITIES FROM THE COMMUNITY SERVICES DEPARTMENT. THE APPLICANT ACKNOWLEDGES THAT SECURITIES BEING HELD BY THE CITY WILL BE RELEASED ONLY UPON COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND THE REPAIRS/REINSTATEMENT WORKS FOR THE ADJACENT LANDS, TO THE SATISFACTION OF THE COMMUNITY SERVICES DEPARTMENT.
- 1.2 NO MAINTENANCE OR REPAIR WORK ON CONSTRUCTION EQUIPMENT IS ALLOWED WITHIN 30m OF AN EXISTING WATER COURSE OR DITCH.
- 1.3 ALL SEDIMENT AND EROSION CONTROL FACILITIES AND WORKS ARE TO BE CONSTRUCTED AND IN PLACE TO THE APPROVAL OF THE SITE ENGINEER PRIOR TO ANY GRADING OPERATIONS COMMENCING. TYPICAL WORKS INCLUDE SILT FENCES AND INTERCEPTOR SWALES.
- 1.4 ALL TEMPORARY SOIL OR DIRT STOCKPILES ARE TO BE PROVIDED WITH THE NECESSARY SEDIMENT AND EROSION CONTROL FEATURES IF STOCKPILES ARE TO REMAIN FOR A PERIOD LONGER THAN 180 DAYS, STOCKPILES SHALL BE HYDROSEEDED AND SURROUNDED WITH SILT FENCE.
- 1.6 ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES (I.E. SILT FENCE, STRAW BALES, CLEARSTONE...ETC.) ARE TO BE KEPT ON SITE FOR EMERGENCIES AND REPAIRS.
- 1.7 EROSION AND SEDIMENT CONTROL METHODS ARE TO BE CONTINUOUSLY EVALUATED AND, WHERE NECESSARY, UPGRADES ARE TO BE IMPLEMENTED.
- 1.8 AN AFTER HOURS CONTACT NUMBER IS TO BE VISIBLY POSTED ON-SITE FOR EMERGENCIES.
- 1.9 ALL SEDIMENT CONTROL FENCING IS TO BE ERECTED PRIOR TO THE COMMENCEMENT OF ANY SITE GRADING OPERATIONS, AS PER CITY OF MISSISSAUGA STANDARD 2940.010.
- 1.10 ALL CATCHBASINS WITHIN LANDSCAPED AREAS TO HAVE SEDIMENT BARRIER (CITY OF MISSISSAUGA STANDARD 2930.02 OR 2930.03) ERECTED IMMEDIATELY AFTER CATCHBASIN INSTALLATION. SEDIMENT PROTECTION BARRIER TO BE MAINTAINED ON A REGULAR BASIS OR TO THE SATISFACTION OF THE CITY OF MISSISSAUGA.
- 1.11 ALL ROADSIDE CATCHBASINS TO HAVE SEDIMENT PROTECTION AS PER CITY OF MISSISSAUGA STANDARD 2930.04 INSTALLED IMMEDIATELY AFTER CATCHBASIN INSTALLATION. SEDIMENT PROTECTION BARRIER TO BE MAINTAINED ON A REGULAR BASIS OR TO THE SATISFACTION OF THE CITY OF MISSISSAUGA.

1.12 CONSTRUCTION SEQUENCE:

- INITIAL SEDIMENT CONTROL INSTALLATION (TO BE DETERMINED)
- SITE GRADING OPERATIONS (TO BE DETERMINED)
- UNDERGROUND SERVING OPERATIONS (TO BE DETERMINED)
- BUILDING CONSTRUCTION (TO BE DETERMINED)
- FINAL GRADING OPERATIONS (TO BE DETERMINED)
- 1.13 IF SITE CONSTRUCTION ACTIVITIES ARE INTERRUPTED AND/OR INACTIVITY EXCEEDS 30 DAYS, ALL STRIPPED AND/OR BARE SOIL AREAS ARE TO BE STABILIZED BY SODDING/SEEDING/MULCHING OR OTHER APPROVED METHOD, TO THE SATISFACTION OF THE CITY OF MISSISSAUGA.
- 1.14 ALL EROSION AND SEDIMENT CONTROL MEASURE ARE TO BE REGULARLY INSPECTED AND MAINTAINED, AS REQUIRED, TO THE SATISFACTION OF THE CITY OF MISSISSAUGA.
- 1.15 DURING ALL CONSTRUCTION PHASES, MUD TRACKING CONTROL, CONSISTING OF FLUSHING AND SWEEPING ROADS, IS TO BE PROVIDED FOR ALL ROADS, AS WARRANTED, IN ACCORDANCE WITH THE CITY OF MISSISSAUGA MUD TRACKING CONTROL POLICY.
- A) PRE-CONSTRUCTION
1. CONTRACTOR TO ADVISE CITY WHAT STAFF IS RESPONSIBLE FOR SITE SEDIMENT CONTROL SUPERVISION, INSPECTION AND MAINTENANCE, INCLUDING AFTER HOUR CONTACTS.
2. CONTRACTOR TO PROVIDE WRITTEN INSPECTION AND MAINTENANCE SCHEDULE OF SEDIMENT CONTROL DEVICES.
3. CONTRACTOR TO INSTALL ALL SEDIMENT CONTROL DEVICES AS IDENTIFIED ON THE APPROVED EROSION CONTROL PLAN PRIOR TO IMPLEMENTATION OF TOPSOIL STRIPPING OR EARTHWORKS OPERATIONS.
- B) DURING CONSTRUCTION (SITE AND BUILDING WORKS)
1. CONTRACTOR TO ENSURE TOPSOIL, STRIPPING, GRADING AND UNDERGROUND WORKS CONFORM TO APPROVED GRADING, SERVING AND EROSION CONTROL PLANS.
2. SITE ENGINEER TO CONDUCT REQUIRED WEEKLY INSPECTION, MAINTENANCE AND REPORTING OF SEDIMENT CONTROLS TO THE CITY STAFF.
3. CONTRACTOR TO STABILIZE SITE AS REQUIRED THROUGHOUT SITE CONSTRUCTION SCHEDULE.
- C) POST CONSTRUCTION (INCLUDING BUILDING CONSTRUCTION)
1. CONTRACTOR TO COMPLETE FINAL SITE STABILIZATION AND RE-VEGETATION WORKS.
2. CONTRACTOR TO REMOVE ALL SEDIMENT CONTROL DEVICES AFTER THE SITE IS STABILIZED TO A CONDITION EQUAL TO, OR BETTER THAN, PRE-CONSTRUCTION.
3. FOLLOWING COMPLETION OF CONSTRUCTION AND AS DIRECTED BY SITE ENGINEER, ALL EROSION AND SEDIMENT CONTROL WORKS ARE TO BE REMOVED INCLUDING ANY ACCUMULATED SEDIMENT.
4. ALL WORKS LOCATED ON LANDS OUTSIDE THE PROPOSED DEVELOPMENT AREA ARE TO BE GRADED TO MATCH EXISTING SURROUNDING GROUND AND HYDROSEEDDED.

2.0 EROSION & SEDIMENT CONTROLS (MAINTENANCE)

- 2.1 SILT FENCE MUST BE INSPECTED WEEKLY FOR RIPS OR TEARS, BROKEN STAKES, BLOW-OUTS AND ACCUMULATION OF SEDIMENT.
- 2.2 SILT FENCE MUST BE INSPECTED IMMEDIATELY AFTER EVERY RAIN STORM EVENT OR AS DIRECTED BY SITE ENGINEER.
- 2.3 SEDIMENT MUST BE REMOVED FROM SILT FENCE WHEN ACCUMULATION REACHES 50% OF THE HEIGHT OF THE FENCE.
- 2.4 ALL SILT FENCES MUST BE REMOVED ONLY WHEN THE ENTIRE SITE IS STABILIZED AND AS DIRECTED BY THE SITE ENGINEER.
- 2.5 ALL SILT FENCES INSTALLED AT THE LIMIT OF THE DEVELOPMENT ARE TO BE PLACED DIRECTLY ON THE PROPERTY LINE OR AS DIRECTED BY SITE ENGINEER.

3.0 CONSTRUCTION (GENERAL)

- 3.1 LANDS, TO THE SATISFACTION OF THE COMMUNITY SERVICES DEPARTMENT.
- 3.2 ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH CURRENT ONTARIO BUILDING CODE, CITY OF MISSISSAUGA STANDARDS, REGION OF PEEL STANDARDS, OPSD & OPSS, WHERE CONFLICT OCCURS, CITY OF MISSISSAUGA STANDARDS TO GOVERN FOR STORMWATER, ROADWORKS & INTERNAL GRADING; REGION OF PEEL STANDARDS TO GOVERN FOR SANITARY & WATERMAIN INSTALLATION.
- 3.3 ALL TOPSOIL & EARTH ELEVATION TO BE REMOVED TO AN APPROVED SITE.
- 3.4 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DETAILED LAYOUT OF THE WORK. THE ENGINEER WILL CONFIRM ALL BENCH MARK ELEVATIONS AND HORIZONTAL ALIGNMENT.
- 3.5 ALL PROPERTY BARS TO BE PRESERVED AND REPLACED BY O.L.S. AT CONTRACTOR'S EXPENSE IF REMOVED DURING CONSTRUCTION.
- 3.6 THE CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENTS FOR THE SUPPLY OF TEMPORARY WATER & POWER.
- 3.7 IF REQUIRED, DEWATERING TO BE CARRIED OUT IN ACCORDANCE WITH OPSS-517 & 518 TO MAINTAIN ALL TRENCHES IN A DRY CONDITION. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING MECP PERMITS IF REQUIRED.
- 3.8 ALL ENGINE DRIVEN PUMPS TO BE ADEQUATELY SILENCED, SUITABLE FOR OPERATION IN A RESIDENTIAL DISTRICT.
- 3.9 THE UTILITIES SHOWN ON PLANS ARE APPROXIMATE ONLY & CONTRACTOR TO CONFIRM LOCATIONS IN ADVANCE OF CONSTRUCTION.
- 3.10 THE CONTRACTOR IS RESPONSIBLE TO NOTIFY ALL UTILITY COMPANIES PRIOR TO COMMENCING WORK & CO-ORDINATE CONSTRUCTION ACCORDINGLY.
- 3.11 THE LOCATION AND ELEVATION OF ALL EXISTING SERVICES AND UTILITIES ARE TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESTORATION AND/OR REPAIR OF EXISTING UTILITIES DISTURBED DURING CONSTRUCTION.
- 3.12 ALL AREAS BEYOND THE SITE PLAN WHICH ARE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE EXPENSE OF THE CONTRACTOR.
- 3.13 ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT". THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE CONTRACTOR AS DEFINED IN THE ACT.
- 3.14 ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER.
- 3.15 ROAD AND BOULEVARD RESTORATION AS PER CITY OF MISSISSAUGA ROAD CUT PERMIT.
- 3.16 THE GEOTECHNICAL SUITABILITY OF ALL THE FILL MATERIAL WILL BE ASSESSED BY THE GEOTECHNICAL ENGINEER.
- 3.17 GEOTECHNICAL ENGINEER TO CONFIRM SUITABILITY OF ROAD MATERIAL DEPTHS BASED ON SUB-BASE MATERIAL.
- 3.18 NO GRADING, STRUCTURES, RETAINING WALLS CONSTRUCTION OR SITE/CONSTRUCTION ACCESS ARE PERMITTED ON OR FROM THE MUNICIPAL LANDS.
- 3.19 THE PLACEMENT OF UNAPPROVED MATERIALS OR STRUCTURES WITHIN MUNICIPAL R.O.W. IS NOT PERMITTED BY COMMUNITY SERVICES AT ANY STAGE OF DEVELOPMENT. THIS INCLUDES, BUT IS NOT LIMITED TO, TOPSOIL STOCKPILING, CONSTRUCTION TRAILERS AND VEHICLES, CONSTRUCTION MATERIALS AND DEBRIS, SALES/PROMOTIONAL TRAILERS AND SIGNAGE.
- 3.20 REMOVE CONSTRUCTION RELATED DEBRIS OR LITTER THAT HAS MIGRATED OR HAS THE POTENTIAL TO MIGRATE INTO THE ADJACENT MUNICIPALLY OWNED LANDS. SHOULD THE CONTRACTOR/APPLICANT FAIL TO DO SO, ARRANGEMENTS WILL BE MADE TO DRAW ON THE SUBMITTED SECURITIES TO FUND CLEAN UP ACTIVITIES.
- 3.21 PRIOR TO THE RELEASE OF SECURITIES, THE COMMUNITY SERVICES DEPARTMENT IS TO INSPECT AND APPROVE ANY REQUIRED RESTORATION, REINSTATEMENT AND/OR CLEAN UP WORKS INCLUDING HOARDING REMOVAL AND OFF-SITE DISPOSAL, CONDUCTED AT THE SHARED PROPERTY LINE.
- 3.22 CONTRACTOR SHALL FLUSH AND VIDEO SEWERS UPON INSTALLATION AFTER LANDSCAPE WORKS ARE COMPLETED AND CONTRACTOR TO PROVIDE VIDEO TO ENGINEER.
- 3.23 CONTRACTOR SHALL PROVIDE A DIGITAL AS-BUILT SURVEY OF ALL UNDERGROUND AND ABOVEGROUND WORKS TO THE SATISFACTION OF THE ENGINEER.
- 3.24 CONTRACTOR TO COMPLETE A DEFLECTION TEST FOR PVC SEWERS ONCE INSTALLATION IS COMPLETED.
- 3.25 CONTRACTOR TO OBTAIN ALL NECESSARY PERMITS AT HIS EXPENSE.

4.0 INSTALLATION & RESTORATION (OPEN CUT)

- 4.1 BACKFILL MATERIALS SHALL BE OPSS GRANULAR 'A', GRANULAR 'B' & UNSHRINKABLE FILL PLACED AT THE SPECIFIED DEPTHS AS PER STANDARD 2220.030. ALL GRANULAR MATERIAL SHALL CONFORM WITH OPSS 1010 & THE UNSHRINKABLE FILL SHALL CONFORM TO OPSS 1359. STEEL PLATES SHALL BE SECURED OVER THE EXCAVATION FOR A MINIMUM OF 24 HOURS AFTER WHICH THE GRANULAR MATERIALS CAN BE PLACED. ALL GRANULAR MATERIAL SHALL BE PLACED IN 150mm LIFTS AND COMPACTED TO 100% STANDARD PROCTOR DENSITY.
- 4.2 AFTER BACKFILLING THE UTILITY TRENCH, A MIN. 300mm TOTAL ASPHALT REMOVAL SHALL BE CUT ON ALL SIDES OF THE TRENCH INTO THE EXISTING PAVEMENT STRUCTURE. THE PAVEMENT STRUCTURE MATERIALS SHALL MATCH THE EXISTING PAVEMENT MATERIAL TYPES.
- 4.3 ASPHALT RESTORATION SHALL BE A MINIMUM OF 40mm HL-3 & 50mm HL-8 & SHALL MATCH THE EXISTING PAVEMENT STRUCTURE. ALL ASPHALT RESTORATION SHALL BE IN COMPLIANCE WITH OPSS 310. ALL HOT-MIX MATERIAL SHALL CONFORM TO OPSS 1149, 1150 AND/OR 1154. EXPOSED ASPHALT AND CONCRETE FACES SHALL BE CLEANED AND COATED WITH AN RS-1 (OR EQUIVALENT) ASPHALT EMULSION & ALLOW TO 'BREAK' PRIOR TO COMMENCING ASPHALT PLACEMENT.
- 4.4 WHEN THE REMAINING ASPHALT, FROM THE EDGE OF PAVEMENT TO THE SAWCUT IS 1.3m OR LESS, THE EXISTING ASPHALT WILL BE REMOVED FULL DEPTH & REPAVED AS PER NOTE 4.3. WHEN TWO OR MORE ROAD CUTS ARE REQUIRED AT A GIVEN SITE AND THE CUTS ARE LESS THAN 2.5m APART THE ENTIRE AREA MUST HAVE FULL DEPTH ASPHALT RESTORATION FROM THE OUTER LIMITS OF ALL REPAIRS.
- 4.5 SIDEWALK RESTORATION SHALL BE A MINIMUM OF 1 FULL BAY INCLUDING EXPANSION JOINT MATERIAL. ALL CONCRETE SHALL BE AS PER OPSS 351. ALL SIDEWALKS SHALL BE 130mm THICK.
- 4.6 SUB-DRAINS UNDER THE CURB SHALL BE RESTORED TO ENSURE THEIR OPERATION AND SHALL BE PLACED AS PER CITY OF MISSISSAUGA STANDARD DRAWING NUMBER 2220.040
- 4.7 WHERE THE CURB HAS BEEN UNDERMINED TO FACILITATE SANITARY INSTALLATION THE CURB SHALL BE REMOVED AND REPLACED. CURB RESTORATION SHALL BE MINIMUM OF 2.0m OR SHALL EXTEND 0.5m BEYOND THE OUTER TRENCH EDGES WHICH EVER IS GREATER, ALL CONCRETE SHALL BE AS PER OPSS 353.
- 4.8 ALL GRASSED BOULEVARDS SHALL BE RE-INSTATED WITH NUMBER 1 NURSERY SOD PLACED ON TOP OF 100mm OF TOPSOIL. ALL SOD SHALL BE PLACED WITH STAGGERED JOINTS, BE ROLLED, AND WHERE APPLICABLE, STAKED INTO THE GROUND.

5.0 DRIVEWAY & PARKING

- 5.1 GRANULAR 'A' & 'B' BASE TO BE COMPACTED TO 98% OF THE MATERIAL'S RESPECTIVE SPMD OR AS APPROVED BY GEOTECHNICAL ENGINEER.
- 5.2 THE TOP 1.0m OF THE SUB-BASE SHALL BE COMPACTED TO A MINIMUM OF 98% OF STANDARD PROCTOR DENSITY WITHIN 2% OF OPTIMUM MOISTURE CONTENT.
- 5.3 SUBGRADE TO BE PROOF ROLLED & CERTIFIED PRIOR TO PLACING GRANULAR MATERIAL.
- 5.4 DRIVEWAYS & PARKING LOT TO BE CONSTRUCTED WITH MINIMUM 250mm GRANULAR 'B', 200mm GRANULAR 'A', 65mm HL-8 BASE COURSE ASPHALT & 40mm HL-3 SURFACE COURSE ASPHALT.
- 5.5 ALL GRANULAR AND ASPHALT MATERIAL PLACEMENT TO BE IN ACCORDANCE WITH OPSS 314 & OPSS 310.
- 5.6 ALL GRANULAR CONNECTIONS TO BE CONSTRUCTED IN ACCORDANCE WITH CITY OF MISSISSAUGA STANDARD 2220.050.
- 5.7 ALL CONCRETE SIDEWALKS TO BE CONSTRUCTED IN ACCORDANCE WITH CITY OF MISSISSAUGA STANDARD 2240.010 UNLESS OTHERWISE NOTED.
- 5.8 ALL PEDESTRIAN SIDEWALK ENTRANCES AT INTERSECTIONS TO BE CONSTRUCTED IN ACCORDANCE WITH OPSD 350.010.

6.0 SANITARY SERVICES

- 6.1 BEDDING & EMBEDMENT TO OPSD - 802.010, GRANULAR 'A' BEDDING.
- 6.2 TRENCH BACKFILL TO SELECT NATIVE MATERIAL AS APPROVED BY ENGINEER OR IMPORTED GRANULAR MATERIAL.
- 6.3 BEDDING & EMBEDMENT MATERIAL TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).
- 6.4 CLEAR STONE WRAPPED WITH FILTER FABRIC CAN BE SUBSTITUTED FOR EMBEDMENT MATERIAL IF APPROVED BY THE GEOTECHNICAL ENGINEER.
- 6.5 SANITARY SEWER - SDR 35 PVC WITH MINIMUM PIPE STIFFNESS OF 320kPa - MANUFACTURED TO C.S.A. STANDARD B182.2 (A.S.T.M. SPECIFICATION D 3034) WITH RUBBER GASKETTED BELL AND SPIGOT JOINTS.
- 6.6 SANITARY SEWER BEDDING SHALL BE CLASS 'B' BEDDING AS PER REGION OF PEEL STD. 2-3-1, UNLESS OTHERWISE NOTED.
- 6.7 ALL SEWERS CONSTRUCTED WITH GRADES 0.5% OR LESS, SHALL BE INSTALLED USING A LASER AND CHECKED PRIOR TO BACKFILL AT THE CONTRACTORS EXPENSE.
- 6.8 NO ENCROACHMENT WILL BE ALLOWED ONTO PRIVATE LANDS.

7.0 WATERMAINS

- 7.1 BEDDING & EMBEDMENT TO REGION OF PEEL STANDARD - 1-5-1. WATERMAIN SUPPORT BRIDGING DISTURBED GROUND TO REGION OF PEEL STANDARD - 1-5-2.
- 7.2 TRENCH BACKFILL TO BE SELECT NATIVE MATERIAL AS APPROVED BY ENGINEER OR IMPORTED GRANULAR MATERIAL.
- 7.3 SERVICE CONNECTIONS TO REGION OF PEEL STD. 1-8-3. FIRE LINE AND DOMESTIC CONNECTION TO REGION OF PEEL STD. 1-8-3.
- 7.4 BEDDING & EMBEDMENT MATERIAL TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S SPMDD.
- 7.5 MINIMUM COVER ON WATERMAIN AND SERVICES TO BE 1.7m BELOW FINISHED GRADE.
- 7.6 CLEARANCE BETWEEN WATERMAIN AND SEWERS TO BE A MINIMUM OF 0.5m VERTICAL WHERE WATER MAIN IS ABOVE SEWER OR 2.5m MINIMUM HORIZONTAL SEPARATION.
- 7.7 SERVICES TO BE DIRECT TAP.
- 7.8 FOLLOWING TESTING, CONTRACTOR SHALL OPERATE EACH WATER SERVICE TO VERIFY FULL FLOW AND PRESSURE AT THE CURB STOP TO THE SATISFACTION OF THE ENGINEER.
- 7.9 VALVE & BOX - MUELLER A769 WITH GUIDE PLATE; CLOW-BIBBY VB 1100/RB645.
- 7.10 MECHANICAL JOINT FITTINGS - ANSI A21.53 (A.W.W.A C153) SPECIFICATIONS; HYPROTEC FITTING SHALL BE USED WITH HYPROTEC PIPE INSTALLATION.
- 7.11 BACKFLOW PREVENTORS - WATTS SERIES 900 OR 90; CLAYTON VALVE MODEL 3 OR R.P.; FEBCO 825Y.
- 7.12 ALL PVC WATERMANS SHALL BE EQUAL TO AWWA C-900 CLASS 150, DR 18.
- 7.13 ALL PVC WATERMANS SHALL BE INSTALLED WITH A 12 GAUGE STRANDED COPPER TWJ TRACER WIRE IN ACCORDANCE WITH REGION OF PEEL STANDARDS.
- 7.14 VALVE IN BOXES SHALL BE INSTALLED AS PER REGION OF PEEL STD. 1-3-3-8. MAINLINE VALVES TO BE RESTRAINED AS PER REGION OF PEEL STD. 1-3-3-4.
- 7.15 CATHODIC PROTECTION IS REQUIRED ON ALL METALLIC FITTINGS AS PER REGION OF PEEL STANDARDS.
- 7.16 THE OPERATION OF EXISTING WATERMAIN VALVES SHALL BE CONDUCTED AS REQUIRED BY THE REGION OF PEEL.
- 7.17 THE NEW WATERMAIN TO BE TAPPED FOR WATER SERVICES MUST BE ISOLATED FROM THE EXISTING WATERMAIN TO MAINTAIN PRESSURE IN THE NEW MAIN DURING INSTALLATION OF SERVICES. A 25mm BY-PASS WITH AN APPROVED DIFFERENTIAL BACKFLOW PREVENTORS IS TO BE INSTALLED AROUND THE CLOSED VALVE.

8.0 STORM SEWERS

- 8.1 BEDDING & EMBEDMENT MATERIAL TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S SPMDD.
- 8.2 BEDDING & EMBEDMENT TO OPSD 802.010 (FLEXIBLE PIPE) GRANULAR 'A' EMBEDMENT.
- 8.3 MAIN SEWERS SHALL BE PVC PIPE (OPSS 410), MIN. PIPE STIFFNESS SHALL BE 320kPa. ALL PIPE TO BE JOINED WITH A GASKETTED BELL AND SPIGOT SYSTEM.
- 8.4 WHERE COVER OVER THE SPRING LINE OF THE SEWER IS LESS THAN 1.50m, INSTALL 50mm THICKNESS OF STYROFOAM SM INSULATION MATERIAL FOR EACH 300mm COVER DEFICIT.
- 8.5 CATCHBASINS TO HAVE MIN. 1.0m SUMPS.

9.0 REGION OF PEEL NOTES

- 9.1 ALL MATERIALS AND CONSTRUCTION METHODS MUST CORRESPOND TO THE CURRENT PEEL PUBLIC WORKS STANDARDS AND SPECIFICATIONS.
- 9.2 WATERMAIN AND/OR SERVICE MATERIALS 100mm (4") AND LARGER SHALL BE PVC PIPE, D-18, AWWA C900-16, SIZE 50mm (2") AND SMALLER MUST BE TYPE 'K' SOFT COPPER, ASTM B88-49, STD. DWG 1-7-1.
- 9.3 WATERMANS AND/OR WATER SERVICES ARE TO HAVE A MINIMUM COVER OF 1.7m (5'6") WITH A MINIMUM HORIZONTAL SPACING OF 1.2m (4') FROM THEMSELVES AND ALL UTILITIES.
- 9.4 PROVISIONS FOR FLUSHING WATER LINE PRIOR TO TESTING, ETC. MUST BE PROVIDED WITH AT LEAST A 50mm (2") OUTLET ON 100mm (4") AND LARGER LINES. COPPER LINES ARE TO HAVE FLUSHING POINTS AT THE END, THE SAME SIZE AS THE LINE. THEY MUST ALSO BE HOSED OR PIPED TO ALLOW THE WATER TO DRAIN ONTO A PARKING LOT OR DOWN A DRAIN. ON FIRE LINES, FLUSHING OUT TO BE 100mm (4") DIAMETER MINIMUM ON A HYDRANT.
- 9.5 ALL CURB STOPS TO BE 3.0m (10') OFF FACE OF THE BUILDING UNLESS NOTED OTHERWISE.
- 9.6 HYDRANT AND VALVE SET TO REGION STANDARD STANDARD 1-6-1, DIMENSIONS A=0.7m (2') & B=0.9m (3'), AND TO HAVE PUMPER NOZZLE.
- 9.7 WATERMANS TO BE INSTALLED TO GRADES AS SHOWN ON APPROVED SITE PLAN. COPY OF GRADE SHEET MUST BE SUPPLIED TO INSPECTOR PRIOR TO COMMENCEMENT OF WORK, WHERE REQUESTED BY INSPECTOR.
- 9.8 WATERMANS MUST HAVE A MINIMUM VERTICAL CLEARANCE OF 0.3m (12") OVER & 0.5m (20") UNDER SEWERS AND ALL OTHER UTILITIES WHEN CROSSING.
- 9.9 ALL PROPOSED WATER PIPING MUST BE ISOLATED FROM EXISTING LINES IN ORDER TO ALLOW INDEPENDENT PRESSURE TESTING AND CHLORINATING FROM EXISTING SYSTEMS.
- 9.10 ALL LIVE TAPPING AND OPERATION OF REGION WATER VALVES SHALL BE ARRANGED THROUGH THE REGIONAL INSPECTOR ASSIGNED OR BY CONTACTING THE OPERATIONS AND MAINTENANCE DIVISION.
- 9.11 LOCATIONS OF ALL EXISTING UTILITIES IN THE FIELD TO BE ESTABLISHED BY THE CONTRACTOR.
- 9.12 THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE FOR LOCATES, EXPOSING, SUPPORTING AND PROTECTING ALL UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES EXISTING AT THE TIME OF CONSTRUCTION IN THE AREA OF THEIR WORK WHETHER SHOWN ON THE PLANS OR NOT AND FOR ALL REPAIRS AND CONSEQUENCES RESULTING FROM DAMAGE TO

SAME.

- 9.13 THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE TO GIVE 72 HOURS WRITTEN NOTICE TO THE UTILITIES PRIOR TO CROSSING SUCH UTILITIES, FOR THE PURPOSE OF INSPECTION BY THE CONCERNED UTILITY. THIS INSPECTION WILL BE FOR THE DURATION OF THE CONSTRUCTION, WITH THE CONTRACTOR FOR ALL COSTS ARISING FROM SUCH INSPECTION.
- 9.14 ALL PROPOSED WATER PIPING MUST BE ISOLATED THROUGH A TEMPORARY CONNECTION THAT SHALL INCLUDE AN APPROPRIATE CROSS-CONNECTION CONTROL DEVICE, CONSISTENT WITH THE DEGREE OF HAZARD, FOR BACKFLOW PREVENTION OF THE ACTIVE DISTRIBUTION SYSTEM, CONFORMING TO REGION OF PEEL STANDARDS 1-7-7 OR 1-7-8.

10.0 AS-BUILT SURVEY

- 10.1 CONTRACTOR IS TO SUPPLY ALL AS-BUILT INFORMATION TO THE ENGINEER UPON COMPLETION OF WORKS. AS-BUILT INFORMATION TO INCLUDE A FULL TOPOGRAPHIC SURVEY OF THE SITE. THE AS-BUILT TO ALSO INCLUDE BUT NOT LIMITED TO: LAYOUT OF ALL SEWERS AND WATERMAIN, INVERTS AND TOP OF COVER/GRATES AT STRUCTURES, HEADWALLS AND ANY STORM WATER MANAGEMENT FEATURES.
- 10.2 THE AS-BUILT TO ALSO INCLUDE BUT NOT LIMITED TO CURBS, SIDEWALKS LONGITUDINAL AND CROSSFALL SLOPES, CENTER LINE OF ROADS AND EDGE OF PAVEMENT TO CHECK CROSS FALLS AND ROAD/PARKING LOT GRADES, HANDICAP RAMPS ETC. ANY DEVIATIONS FROM THE ORIGINAL DESIGN ARE TO BE INCLUDED IN THE AS-BUILT DRAWINGS. INFORMATION IS TO BE COMPLETED TO THE CONTRACT ADMINISTRATOR IN BOTH CAD & PDF FORMATS.
- 10.3 THE AS-BUILT INFORMATION WILL BE REQUIRED ONCE AT BASE ASPHALT PLACEMENT COMPLETION AND AGAIN AFTER THE COMPLETION OF TOP ASPHALT & LANDSCAPING.
- 10.4 THE CONTRACTOR TO INCLUDE IN THEIR SCOPE TO CONFIRM CONDITIONS OF ANY WATERMAIN ELEMENTS ( HYDRANTS, VALVE BOXES, WATER CHAMBERS, ETC ) A MINIMUM THREE TIES IN TO EXISTING ABOVE GROUND VISIBLE PERMANENT REPERS (I.E. EXISTING POLES, CATCHBASINS, ETC.).

11.0 PERMITS

- 11.1 THE CONTRACTOR IS RESPONSIBLE FOR APPLYING, RECEIVING AND PAYING FOR ALL PERMITS REQUIRED TO CONSTRUCT THE WORKS INCLUDED IN CONTRACT. THE CONTRACTOR SHALL ALSO COMPLY WITH ALL CONDITIONS DICTATED BY SUCH PERMITS AT NO EXTRA COST TO THE OWNER.
- 11.2 CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND APPROVALS PRIOR TO COMMENCING CONSTRUCTION. ALL PERMITS AND ASSOCIATED DRAWINGS AND CONDITIONS MUST BE ON-SITE AND AVAILABLE UPON REQUEST.

THE CONTRACTOR IS RESPONSIBLE FOR ALL REQUIRED TESTING BY THE MUNICIPALITY AND/OR ENGINEER AS APPLICABLE WHICH INCLUDES BUT NOT LIMITED TO:

STORM AND SANITARY SEWERS:

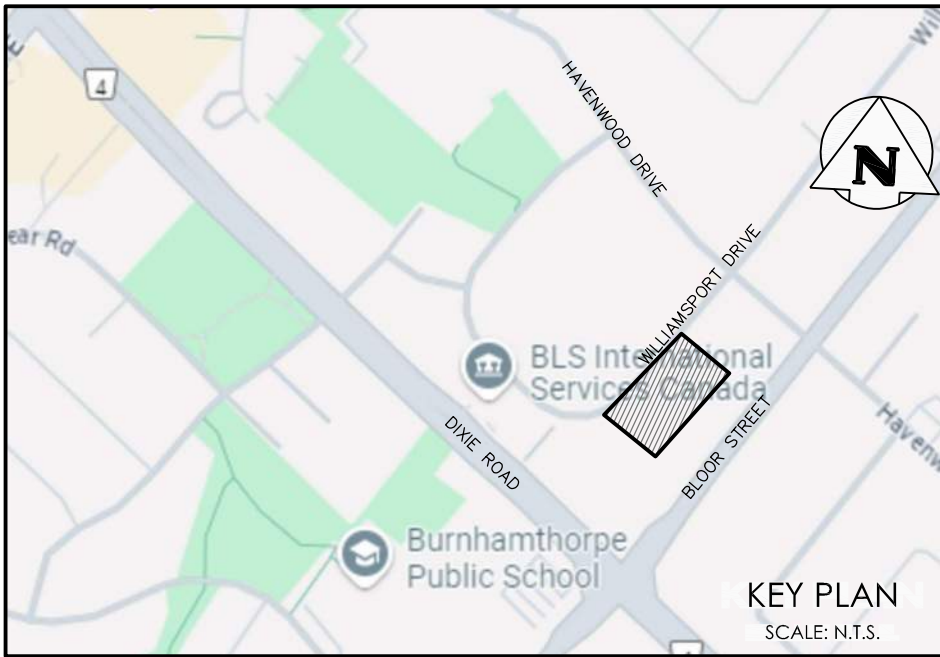
- PRECONSTRUCTION FLUSH & VIDEO OF EXISTING PRIVATE OR MUNICIPAL SEWERS TO CONFIRM CONDITIONS OF ANY SEWER TIES IN, TO THE SATISFACTION OF THE ENGINEER/MUNICIPALITY AS APPLICABLE.
- FLUSH & VIDEO ALL STORM AND SANITARY SEWERS AND PROVIDE THREE PHYSICAL COPIES OF REPORTS AND VIDEOS. THIS INCLUDES MAINLINE SEWERS, LATERALS, LEADS & SERVICES UP TO THE STUB. THE CCTV INSPECTION, INCLUDING FLUSHING AND CLEANING, IS TO BE CARRIED OUT AS DETAILED IN OPSS 409. ONE FLUSH & CCTV VIDEO ROUND IS TO BE COMPLETED AFTER THE PLACEMENT OF BASE ASPHALT. SECOND ROUND OF FLUSH & CCTV TO BE COMPLETED AFTER THE PLACEMENT OF TOP ASPHALT AND COMPLETION OF ALL LANDSCAPING. THIS ITEM TO ALSO INCLUDE THE CLEANING OF ALL STRUCTURES.
- MANDREL TESTING PER THE OPSS FOR ALL FLEXIBLE SANITARY AND STORM PIPES AFTER INSTALLATION, PRIOR BASE ASPHALT PLACEMENT.
- AIR TESTING FOR SANITARY SEWERS & STRUCTURES PRIOR BASE ASPHALT PLACEMENT, IF REQUESTED BY MUNICIPALITY.

WATERMAIN:

- THE CONTRACTOR TO INCLUDE IN THEIR SCOPE, THIRD PARTY TESTING INCLUDING REPORTS FOR ALL APPLICABLE WATERMAIN TESTING INCLUDING BUT NOT LIMITED TO FLUSHING, SWABBING, PRESSURE TESTING, CHLORINATION, BACKFLOW PREVENTOR TESTING, CONTINUITY TESTING & HYDRANT FLOW TESTING.

REGION OF PEEL NOTES:

- PUBLIC AND PRIVATE SERVICES, APPURTENANCES, MATERIALS AND CONSTRUCTION METHODS MUST COMPLY WITH THE MOST CURRENT REGION OF PEEL STANDARDS AND SPECIFICATIONS, THE LOCAL MUNICIPALITY'S REQUIREMENTS FOR THE ONTARIO BUILDING CODE AND ONTARIO PROVINCIAL STANDARDS. ALL WORKS SHALL ADHERE TO ALL APPLICABLE LEGISLATION, INCLUDING REGIONAL BY-LAWS.
- WATERMAIN AND / OR WATER SERVICE MATERIALS 100 MM (4") AND LARGER MUST BE DR18 P.V.C. PIPE MANUFACTURED TO AWWA C900-16, COMPLETE WITH TRACER WIRE. SIZE 50 MM (2") AND SMALLER MUST BE TYPE K SOFT COPPER PIPE PER ASTM B88-49 SPECIFICATION.
- WATERMANS AND / OR WATER SERVICES ARE TO HAVE A MINIMUM COVER OF 1.7 M (5'6") WITH A MINIMUM HORIZONTAL SPACING OF 1.2 M (4') FROM THEMSELVES AND ALL OTHER UTILITIES.
- PROVISIONS FOR FLUSHING WATER LINE PRIOR TO TESTING, ETC. MUST BE PROVIDED WITH AT LEAST A 50 MM (2") OUTLET ON 100 MM (4") AND LARGER LINES. COPPER LINES ARE TO HAVE FLUSHING POINTS AT THE END, THE SAME SIZE AS THE LINE. THEY MUST ALSO BE HOSED OR PIPED TO ALLOW THE WATER TO DRAIN ONTO A PARKING LOT OR DOWN A DRAIN. ON FIRE LINES, FLUSHING OUTLET TO BE 100 MM (4") DIAMETER MINIMUM ON A HYDRANT.
- ALL CURB STOPS TO BE 3.0 M (10') OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED.
- HYDRANT AND VALVE SET TO REGION STANDARD 1-6-1 DIMENSION A AND B, 0.7 M (2') AND 0.9 M (3') AND TO HAVE PUMPER NOZZLE.
- WATERMANS TO BE INSTALLED TO GRADES AS SHOWN ON APPROVED SITE PLAN. COPY OF GRADE SHEET MUST BE SUPPLIED TO INSPECTOR PRIOR TO COMMENCEMENT OF WORK, WHERE REQUESTED BY INSPECTOR.
- WATERMANS MUST HAVE A MINIMUM VERTICAL CLEARANCE OF 0.3 M (12") OVER / 0.5 M (20") UNDER SEWERS AND ALL OTHER UTILITIES WHEN CROSSING.
- ALL PROPOSED WATER PIPING MUST BE ISOLATED FROM EXISTING LINES IN ORDER TO ALLOW INDEPENDENT PRESSURE TESTING AND CHLORINATING FROM EXISTING SYSTEMS.
- ALL LIVE TAPPING AND OPERATION OF REGION WATER VALVES SHALL BE ARRANGED THROUGH THE REGIONAL INSPECTOR ASSIGNED OR BY CONTACTING THE OPERATIONS AND MAINTENANCE DIVISION.
- LOCATION OF ALL EXISTING UTILITIES IN THE FIELD TO BE ESTABLISHED BY THE CONTRACTOR.
- THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE FOR LOCATES, EXPOSING, SUPPORTING AND PROTECTING OF ALL UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES EXISTING AT THE TIME OF CONSTRUCTION IN THE AREA OF THEIR WORK WHETHER SHOWN ON THE PLANS OR NOT AND FOR ALL REPAIRS AND CONSEQUENCES RESULTING FROM DAMAGE TO SAME.
- THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE TO GIVE 72 HOURS WRITTEN NOTICE TO THE UTILITIES PRIOR TO CROSSING SUCH UTILITIES, FOR THE PURPOSE OF INSPECTION BY THE CONCERNED UTILITY. THIS INSPECTION WILL BE FOR THE DURATION OF THE CONSTRUCTION, WITH THE CONTRACTOR RESPONSIBLE FOR ALL COSTS ARISING FROM SUCH INSPECTION.
- ALL PROPOSED WATER PIPING MUST BE ISOLATED THROUGH A TEMPORARY CONNECTION THAT SHALL INCLUDE AN APPROPRIATE CROSS-CONNECTION CONTROL DEVICE, CONSISTENT WITH THE DEGREE OF HAZARD, FOR BACKFLOW PREVENTION OF THE ACTIVE DISTRIBUTION SYSTEM, CONFORMING TO REGION OF PEEL STANDARDS 1-7-7 OR 1-7-8.
- ALL WATER METERS MUST BE INSTALLED IN HEATED AND ACCESSIBLE SPACE.
- PROPOSALS TO CONNECT TO AN EXISTING SERVICE LATERAL REQUIRES APPROVAL FROM THE REGION OF PEEL INSPECTOR AT CONSTRUCTION STAGE.



2	ISSUED FOR REZONING	2025/09/30
1	ISSUED FOR SITE PLAN APPLICATION	2025/02/25
No.	ISSUE / REVISION	YYYY/MM/DD

BEARING NOTE:

BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK OBSERVATION, UTM ZONE 17 (81° WEST LONGITUDE), NAD83(CRS) v6(2010).

BENCHMARK NOTE:

ELEVATIONS ARE GEODETIC AND REFERRED TO CITY OF MISSISSAUGA B.M. No. 690, ELEVATION = 134.702m

SURVEY NOTES:

SURVEY COMPLETED BY IBW SURVEYORS  
SURVEY PREPARED FOR 1470 WILLIAMSPORT HOLDINGS INC.

SITE PLAN NOTES:

DESIGN ELEMENTS ARE BASED ON SITE PLAN BY BPD QUADRANGLE  
DRAWING No.: A201.S PROJECT No.: 23057

DRAWING NOTES:

THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE REPRODUCTION OF ANY PART OF IT WITHOUT PRIOR WRITTEN CONSENT OF THIS OFFICE IS STRICTLY PROHIBITED.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION. THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.




1470 WILLIAMSPORT DRIVE  
CITY OF MISSISSAUGA  
PEEL REGION

Project

Drawing

NOTES

REGION FILE NO.: C601060  
SITE PLAN NO.: SP-25-011M



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Check E.M. Check E.M. Scale 1:200 Dwg. C105