FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

3855-3915 DUNDAS STREET WEST

CITY OF MISSISSAUGA
REGION OF PEEL

PREPARED FOR:

DYMON GROUP OF COMPANIES

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
211 YONGE STREET, SUITE 301
TORONTO, ON M5B 1M4

DECEMBER 2021

CFCA FILE NO. 1644-5477

CROZIER
CONSULTING ENGINEERS

Revision Number	Date	Comments
Rev.0	November 20, 2020	First Submission Issued for ZBA
Rev.1	December 03, 2021	Second Submission Issued for ZBA

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1.0 INTRODUCTION

C.F. Crozier & Associates Inc. (Crozier) was retained by Dymon Group of Companies (Dymon) to prepare a Functional Servicing and a Stormwater Management Report and accompanying drawings in support of the Zoning By-Law Amendment (ZBA) for the proposed mixed industrial, commercial, and self-storage development located at 3855 Dundas Street West (Site) in the City of Mississauga (City), Region of Peel (Region).

This report outlines the proposed functional servicing and stormwater management plan for the Site according to the requirements of the Province, Region, City, and Conservation Halton (CH). It is noteworthy that the Site is uniquely positioned at the border between Region of Peel and Halton Region, and thus Halton Region design standards (and Town of Oakville standards) were also referenced in this report. The following reports, design criteria, and as-constructed drawings were referenced during the preparation of this report:

- Provincial
    - Ontario Building Code (OBC) O. Reg. 322/12 last consolidated on September 20, 2020 under the Building Code Act.
    - Ministry of Transportation (MTO) Highway Corridor Management Controlled Areas under the Public Transportation and Highway Improvement Act.
    - Ministry of the Environment, Conservation and Parks (MECP) Water Well Information System and Well Record Map
- Regional
    - Region of Peel 2020 Water and Wastewater Master Plan for the Lake-based Systems (study completion June 2020).
    - Public Works Design, Specifications, and Procedures Manual. Linear Infrastructure. Watermain Design Criteria revised June 2010.
    - Public Works Design, Specifications, and Procedures Manual. Linear Infrastructure. Sanitary Sewer Design Criteria modified March 2017.
- Conservation Authority
    - Conservation Halton Policies and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning Policy Document dated April 2006 and most recently amended in February 2016.
- Municipal
    - City of Mississauga Development Requirements Manual Section 2 – Subdivision Design Requirements
    - City of Mississauga Development Requirements Manual Section 8 – Storm Drainage Design Requirements
    - Town of Oakville Development Engineering Procedures and Guidelines dated January 2011, including Addendum 1 date January 2017.

- Town of Oakville North Oakville Environmental Implementation Report and Functional Servicing Study – Terms of Reference.
- Town of Oakville North Oakville Creeks Subwatershed Study (NOCSS) – Implementation Report dated August 2006.

- As-constructed drawings:
  - **O-21572** (Ninth Line) dated October 2, 2015.
  - **O-21570** (Dundas Street West) dated October 2, 2015.

2.0 SITE DESCRIPTION

The subject property covers an area of approximately 2.39 ha and currently consists of uncultivated/fallow open green space. The Site is bounded by the Ninth Line Sports Park to the northwest, agricultural lands to the northeast, Ninth Line to the southwest, and Dundas Street West to the southeast.

Other noteworthy establishments near the Site include the Glen Oaks Funeral Home & Cemetery and the Agram Garden Centre to the southwest and southeast, respectively. Per City of Mississauga's Schedule B to By-law No. 0225-2007, current land use is classified as Employment Zone E2-93, whereby lands are only to be used for recreation or as a cemetery.

The Site is mapped within City of Mississauga and Region of Peel jurisdiction, but existing municipal water and stormwater servicing infrastructure is operated and maintained by Halton Region and the Town of Oakville.

3.0 PROPOSED DEVELOPMENT

The Site Plan prepared by Nicholas Caragianis Architect Inc., dated November 8, 2021, consists of three proposed buildings. Building 1 consists of five stories and a GFA of 16,388 m^2. The second to fifth floors are to be used for self-storage purposes. Building 2 consists of two stories with a GFA of 2,201 m^2 to be used for office space. Building 3 consists of one storey for industrial use with a GFA of 1,376 m^2. Two access points are proposed for the Site, which will provide access to Ninth Line and Dundas Street West.

3.1 Population Estimate

A design population of 165 for the proposed development was estimated using population equivalents based on the Region Sanitary Sewer Design Criteria Section 2.1. **Table 1** below summarizes the proposed population for the subject property.

Table 1: Estimated Population

Building	Land Use	Area (ha)	Population Density	Units	Population
Building 1	Industrial	2.14	70	capita/ha	150
Building 2	Commercial	0.13	50	capita/ha	6.6
Building 3	Industrial	0.12	70	capita/ha	8.2
Total	**-**	**2.39**	**-**	**-**	**165**

4.0 SANITARY SERVICING

Region of Peel is responsible for the operation and maintenance of the public sewage collection and treatment systems in the City of Mississauga, and any local sewage system that connects to this public system. However, the Site is vacant and not currently serviced by municipal sanitary connections or a private sewage system. Thus, a new private sewage system is required as part of this application.

4.1 Existing Sanitary Servicing

Review of as-constructed drawings confirmed that the Site does not currently have an existing sanitary connection to the municipal sanitary system. A site visit conducted on October 13, 2020 concludes that the Site is not currently serviced by a private septic system. In the context of sanitary servicing precedence, a building permit for a private sewage system (PSS-7-8066) was approved by the City of Mississauga in 2008 for The Tennis School located 270 m northwest of the Site at 3293 Ninth Line. A review of the Region of Peel 2020 Water and Wastewater Master Plan indicates that the Region does not have intentions in the immediate future to service this area with municipal sanitary infrastructure.

4.2 Design Sanitary Flow

The Ontario Building Code (OBC) was used to estimate the sewage design flows generated by the proposed commercial development. The calculated design flows are based on the development area provided on the concept Site Plan (as noted above). A summary of the calculated design flows is found in **Table 2**, with detailed calculations are provided in **Appendix A**.

Table 2: Estimated Sewage Design Flow

Standard	Building	Occupancy Type	Unit Type	Number of Units	Flow (L/unit/day)	Flow (L/day)	
OBC (Table 8.2.1.3.B)	Building 1	Industrial Warehouse	per Water Closet	6	950	5,700	6,000
			per Loading Bay	2	150	300	
	Building 2	Office	per 9.3 m^2	165.67	75	12,425	
	Building 3	Commercial	per Water Closet	15	1,230	18,450	
Total Sewage Design Flow						**36,875**	

Based on the design sewage flow demonstrated in **Table 2**, the septic system must accommodate a daily sewage flow of 36,875 L/day. Note that as this daily sewage flow is over 10,000 L/day, an Environmental Compliance Approval issued by MOECP will be required.

4.3 Proposed Sanitary Servicing

A private sewage system is proposed to service the commercial development. Based on the design sewage flow of 36,875 L/day, a treatment unit complete with an anaerobic digester is required. The anaerobic digester unit will provide pre-treatment for sewage flows.

A shallowed buried trench septic system with a footprint of 1,880 m^2 and an associated treatment unit is required. A Waterloo Biofilter system or approved equivalent has been proposed as the treatment unit. Detailed design septic system sizing calculations are presented in **Appendix A**. All

components of the septic system must comply with OBC Part 8 and must be certified by CAN/BNQ 3680-600. Refer to the notes on **Drawing C105** for more details.

The length of leaching chamber for the shallow buried trench (SBT) design was calculated using OBC Table 8.7.3.1.A and based on a design percolation time of 50 min. This design percolation time is considered to be conservative given the soil conditions (clayey silty till) per the Hydrogeological Investigation report by Fisher Environmental Ltd. dated November 8, 2021. The report also noted groundwater elevations that ranged between 0.42 and 5.10 m below existing grades though groundwater elevations were typically encountered at depths greater than 3.0 m below existing grades. Thus, Crozier does not anticipate any conflicts during construction or during the operation of the private sewage system. The internal sanitary plumbing system will be designed by the Mechanical Engineer in accordance with OBC standards. Refer to the Site Servicing and Site Grading Plans for the sanitary servicing layout (**Drawing C102** and **Drawing C103**).

5.0 WATER SERVICING

Region of Peel is responsible for the operation and maintenance of the public water system in the City of Mississauga. Likewise, recognizing the Site's proximity to its neighbouring region, Halton Region is responsible for the public water system in the Town of Oakville. The following sections outline the existing and proposed design of water servicing for the proposed development.

5.1 Existing Water Servicing

Review of as-constructed drawings indicate that there are no existing Region of Peel watermains servicing the Site. A site visit conducted on October 13, 2020, suggests that the Site is not currently serviced by a private water supply. The existing Region of Peel watermain network currently terminates near the intersection of Vega Boulevard and Dundas Street West (approximately 800 m west of the Site). However, there is an existing 300 mm watermain on the west side of Ninth Line under the jurisdiction of Halton Region. According to the MOECP's well record, there are existing domestic water wells supplying potable water to the adjacent Ninth Line Sports Park and the nearby "The Tennis School" further north. Water well 4908839 provides a recommended water supply to the sports park at a rate of 0.23 L/s. Water well 7052843 provides a recommended water supply to the tennis facility at a rate of 0.075 L/s. No fire hydrants belonging to the Region of Peel were identified within a 90 m radius from the Site. The nearest Halton Region fire hydrant can be found on approximately 30 m south of the main entrance to the funeral home on the west side of Ninth Line. Refer to **Drawing C 102** for additional details on the location of the existing watermains and hydrants.

5.2 Design Water Demand

The water demands for the Site was calculated with reference to Region of Peel standards. An average consumption rate of 300 L/capita/day according to Section 2.3 of the Public Works Watermain Design Criteria was used to estimate an average commercial and industrial daily water demand based on the proposed development. **Table 3** summarizes the estimated existing and proposed water demand for the Site based on Region of Peel requirements and an equivalent servicing population of 165 people per **Table 1**.

Table 3: Proposed Water Demand

Method	Land Use	Average Day (L/s)	Max Day (L/s)	Peak Hour (L/s)
Region of Peel[1]	Commercial & Industrial	0.57	0.80	1.72

[1]Maximum daily and hourly demand peaking factors based on Section 2.3 of the Public Works Watermain Design Criteria.

As shown in **Table 3**, the estimated average daily water demand for the proposed development is approximately 0.57 L/s. The maximum daily and peak hourly water demand for the proposed development were estimated to be 0.80 L/s and 1.72 L/s based on peaking factors of 1.4 and 3.0, respectively. Refer to **Appendix B** for water demand details.

5.3 Fire Flow Demand

The Fire Underwriters Survey (FUS) method was used to estimate the fire flow requirements for the proposed development. This calculation estimates the preliminary fire tank (cistern) size required to service the self-storage building on the west side of the Site and the commercial/industrial buildings on the east side of the Site separately. Flow requirements were calculated based on the preliminary footprint and gross floor area of the largest floor plus 25% of each of the two immediately adjoining floors, fire-resistive building construction, and the proposed installation of regular sprinklers. **Table 4** summarizes the required fire flow and duration to meet fire protection requirements for the proposed development.

Table 4: Estimated Fire Demand Flows

Method	Building	Demand Flow (L/s)	Duration (h)	Required Volume (m^3)
Fire Underwriters Survey	Building 1	83.3	2.00	600
	Building 2	50.0	1.25	225
	Building 3	33.3	1.25	150

The proposed fire suppression service is required to supply a fire flow of approximately 83.3 L/s for a duration of 2.00 hours (cistern volume of 600 m^3) for Building 1. A separate fire flow of 50.0 L/s for a duration of 1.25 hours (cistern volume of 225 m^3) is required for Building 2. A fire flow of 33.3 L/s for a duration of 1.25 hours (cistern volume of 150 m^3) is required for Building 3. During the detailed design phase of the project, fire suppression volumes will be re-assed and coordained with the project's sprinkler and minicanal consultant to be in accordance

Wilkinson cisterns (Precast Fire Fighting Test Tank) are proposed to meet the required volume demand. The cisterns must have a minimum of 15 m clearance from the distribution piping of the septic system as per OBC Section 8.2.1.6.B. The dry hydrant must be within 3 m of the fire route. Five (5) cisterns will provide 570 m^3 of storage capacity for the self-storage building and a separate system of four (4) cisterns will provide 456.4 m^3 of storage capacity for the other buildings, therefore exceeding the required storage capacity.

A shop drawing, connection specifications, and an installation guideline provided by the manufacturer illustrate the specifications for the cisterns including the dry hydrant connection detail; please refer to **Appendix B** for more details. The proposed cisterns are to be filled prior to occupancy and maintained per the Fire Department's direction. The location of the proposed cisterns and dry hydrant is illustrated on **Drawing C102**.

Note that the Fire Underwriters Survey value is a conservative estimate for comparison purposes only. The Mechanical Engineer for this development will complete the required analyses for fire protection and the Architect will design fire separation methods per the determined fire flow rate, to meet municipally available flows and pressures.

5.4 Proposed Water Servicing

As described in **Section 4.1,** Region of Peel watermains terminate on the west side of Highway 403 and are unable to supply water to subject lands. Thus, it is proposed that the Site be serviced by a domestic well following the precedence set by the neighbouring sports park and tennis facility further north. The well should be a minimum of 15 m from the proposed septic area. Water from the domestic well will be stored in fire tanks and potable water cistern. Fire tanks will provide the necessary fire suppression volume in connection to the proposed on-site fire hydrants. Potable water cisterns will provide the necessary volume to meet average daily, maximum daily, and peak hourly water demands. Refer to **Drawing C 102** for further details on the location of the proposed water servicing infrastructure.

According to the Hydrogeological Investigation report conducted by Fisher Environmental Ltd. dated November 8, 2021, defined aquifers were not encountered within the investigated borehole locations. A domestic well location was not proposed in the hydrogeological investigation report. **Drawing C102** shows an assumed domestic well location until at such time the well location can be confirmed by additional hydrological studies and commissioned by a MOECP licensed well contractor.

6.0 DRAINAGE CONDITIONS

As described in **Section 2.0**, the subject property currently consists of open green space. The following subsections detail the existing and proposed drainage conditions for the Site.

6.1 Existing Drainage Conditions

According to the topographic plan provided by Speight, Van Nostrand, and Gibson Ltd. dated April 25, 2018, the Site generally slopes from the north portion of the Site towards Dundas Street to the south. Please refer to **Figure 1** for the Pre-Development Drainage Plan. **Table 5** below summarizes the existing drainage from Catchment 101 and Catchment 102.

Table 5: Pre-Development Land Areas and Runoff Coefficients

Pre - Development Conditions						
Catchment	**Outlet Location**	**Land Use**	**Area** (ha)	**Area** (m^2)	**C**	**Weighted Average C**
101	Overland flow to existing 600 mm storm sewer on Dundas Street West	*Pervious*	2.31	23,070	0.25	0.25
		Impervious	0.00	-	0.9	0.00
		Sub total	**2.31**	**23,070**	**-**	**0.25**
102	Overland flow to existing 600 mm storm sewer on Dundas Street West	*Pervious*	0.08	830	0.25	0.25
		Impervious	0.00	-	0.9	0.00
		Sub total	**0.08**	**830**	**-**	**0.25**
		Total Site	**2.39**	**23,900**	**-**	**0.25**

The stormwater runoff from the west side of the Site drains via overland flow into a ditch towards a double inlet catchbasin along Ninth Line and ultimately drains into the existing 600 mm storm sewer. Stormwater runoff from the east side of the Site flows via a ditch before being conveyed to a 450 mm culvert at the southeast corner of the Site. The stormwater then enters the existing 450 mm storm sewer on Dundas Street West. Both areas of the site are ultimately conveyed to the existing 600 mm storm sewer on Dundas Street West. There is currently no stormwater infrastructure within the subject property.

6.2 Proposed Drainage Conditions

The post-development drainage is divided into two areas: Catchment 201 and 202. Catchment 201 contains the majority of the Site, including Buildings 1, 2, and 3, paved and landscaped areas. Drainage is proposed to be collected via catchbasins and conveyed through an on-site storm sewer system. The controlled flows will be detained within underground storage chambers and discharged at a controlled rate to the municipal storm sewer. Refer to Appendix C for the on-site storm sewer analysis for the sewers upstream of the orifice tube flow control.

Catchment 202 contains the area along the east property line that is part of the TransCanada Easement and flows uncontrolled. This uncontrolled area is made up of purely landscaped surfaces, which will produce both clean, and slow-flowing discharge.

Table 6 provides a breakdown of post-development site areas and associated runoff coefficients with the proposed drainage conditions shown on the Post-Development Drainage Plan (**Figure 2**).

Table 6: Post-Development Land Areas and Runoff Coefficients

Post - Development Conditions					
Catchment	**Land Use**	**Area** (ha)	**Area** (m^2)	**C**	**Weighted Average C**
201	*Pervious*	0.57	5710	0.25	0.07
	Impervious	1.33	13266	0.9	0.57
	Permeable Pavers	0.18	1824	0.5	0.04
	Total	**2.08**	**20800**	**-**	**0.69**
202	*Pervious*	0.31	3100	0.25	0.25
	Impervious	0.00	0	0.9	0.00
	Total	**0.31**	**3100**	**-**	**0.25**
Total Site		**2.39**	**23900**	**-**	**0.63**

Per the City of Mississauga Engineering Design Standards, runoff coefficient adjustment factors were taken into consideration. Please see **Table 7** below for the factors and adjusted runoff coefficients.

Table 7: Runoff Coefficient Adjustment Factors

Return Period	Adjustment Factor	Catchment 201	Catchment 202
2 yr	1.00	0.69	0.25
100 yr	1.25	0.86	0.31

6.3 Groundwater Drainage Conditions

A Hydrogeological Investigation for the subject site was completed by Fisher Engineering Inc. (Fisher) - File No. File No. FE-P 20-10464H (November 8, 2021), which detailed the Site's subsurface and groundwater conditions. The major conclusions of the hydrogeological assessment are summarized in the bullets below:

- Range of Observed Groundwater Elevations: 165.99 to 169.99 masl (0.42 m to 5.10 m below existing grade). Higher groundwater levels were observed in MW204 towards the eastern boundary of the property.

- Does Groundwater Quality meet Region of Peel Sanitary Sewer Limits per Table 1 of By-law 53-2010? – No, exceedances for TSS and Sulphate were recorded.

- Does Groundwater Quality meet Region of Peel Storm Sewer Limits per Table 2 of By-law 53-2010? – No, exceedances for TSS, Manganese, Zinc were recorded.

- Short-Term (Construction De-Watering) – 5,390 L/day, 4,580 L/day, and 2,070 L/day for Buildings 1, 2 and 3, respectively (including a safety factor of 1.5).

- Long-Term (Post-Construction) – nominal (1,000 L/d for loading bays).

Please refer to the Hydrogeological Investigation prepared by Fisher for more details. As determined by Fisher, it is anticipated that short-term dewatering is required for the Site. Short-term dewatering is to be designed by the dewatering contractor, with dewatering operations taking place prior to any excavation.

Note that the Hydrogeological Investigation report by Fisher considers sewer limits specific to the Region of Peel. However, it is important to consider that discharge of dewatered groundwater may be conveyed to storm sewers that belong to the Town of Oakville (as the Region of Peel does not have any municipal services near the Site). As such, groundwater quality may be evaluated against Town of Oakville storm sewer limits. Any groundwater that is dewatered will require pre-treatment in order to meet the groundwater quality limits as specified in the Town's Sewers By-Law.

The Hydrogeological Investigation report by Fisher anticipates a nominal amount of long-term discharge given the relatively low groundwater levels such that neither permanent under-slab nor perimeter drainage is required. The Mechanical Engineer will confirm the maximum peak flow rate of the nominal long-term discharge to prevent build-up or drainage of stormwater towards the buildings.

7.0 STORMWATER MANAGEMENT

The stormwater management design for the subject property was based on the guidelines provided by the City of Mississauga Development Requirements Manual recognizing that the Site is located within the Joshua Creek Subwatershed. The following criteria are applicable for the subject property:

- **Quantity Control:** Control 100-year post-development flow to the 2-year pre-development flow rate per Table 2 of the City of Mississauga Development Requirements Manual (per commentary from Conservation Halton, Subwatershed Joshua Creek);

- **Quality Control:** MOECP Enhanced Level of Protection (80% TSS Removal); and

- **Water Balance:** Minimum 5 mm on-site retention for site impervious area.

7.1 Existing Stormwater Management Infrastructure

Review of as-constructed drawings (O-21570 and O-21572) confirms that the Site is not serviced by existing municipal infrastructure. However, there are existing storm sewers of various diameters and catchbasins within the right-of-ways of Dundas Street West and Ninth Line.

An existing 450 mm storm sewer conveys roadside and overland runoff southwest on Dundas Street West towards an existing manhole on the northeast corner of the intersection of Dundas Street West and Ninth Line. This manhole also receives roadside and overland runoff stormwater flows through an existing 450 mm, 525 mm, and 600 mm series of storm sewers on the northeastern side of Ninth Line. The 450 mm sewer from Dundas Street West and the 600 mm sewer from Ninth Line merge at the aforementioned manhole and are subsequently conveyed southwest through a single 600 mm

sewer. An existing 375 mm stormwater sewer lead is located at the southern most portion of the subject property and directs overland runoff from the western portion of the Site into the 600 mm sewer on Ninth Line. Refer to **Drawing C102** for details of the existing stormwater infrastructure.

7.2 Stormwater Quantity Control

Using the City of Mississauga Intensity-Duration-Frequency (IDF) data, the Modified Rational Method was used to determine the pre-development and post-development peak flow rates for the site stormwater drainage. A summary of the pre-development and post-development peak flow rates is presented in **Table 8**, with the detailed calculations provided in **Appendix D**.

Table 8: Summary of Pre-Development and Post-Development Peak Flows

Storm Event (years)	Peak Flows (L/s)						Req. Storage (m^3)	Provided Storage (m^3)
	Pre-Development	Post-Development						
	Q_{pre}	Uncontrolled		Controlled				
		$Q_{post-201}$	$Q_{post-202}$	Q_{target}	$Q_{post-201}$	Total Q_{post}		
2 yr	99.48	237.74	12.90	86.58	31.74	**44.64**	279.72	290.02
100 yr	292.12	698.09	37.89	61.59	51.56	**89.45**	767.01	805.39

The post-development peak flow rates satisfy the quantity control criteria by not exceeding the 2-year pre-development peak flow rate. In order to achieve this, a 115 mm orifice tube and underground storage chamber is proposed.

A storage volume of 767.01 m^3 for the 100-year event is required. To provide the necessary site storage, an underground chamber has been proposed within the parking lot area, west of Building 1. The proposed StormTrap system will have a maximum storage capacity of 805.39 m^3, which is sufficient to control the 100-year post-development storm flow to the 2-year pre-development storm flow. Refer to **Appendix D** for details of the proposed storage system.

7.3 Stormwater Quality Control

The Ontario Ministry of the Environment, Conservation and Parks (MOECP) "Enhanced Level of Protection" (Level 1) requires that stormwater runoff be treated for 80% annual average total suspended solids (TSS) removal for 90% of the runoff volume. To meet the criteria, the installation of an Up-Flow filtration system is proposed downstream of the proposed underground chamber. An Up-Flo Filter has been sized to provide stormwater quality control for the proposed development and will provide 80% TSS removal. For more details regarding the Up-Flo system, refer to **Appendix D.**

7.4 Water Balance

Per the City of Mississauga Development Requirements Manual Section 8.3.2., a minimum of 5 mm of on-site runoff retention is required to capture a typical small design rainfall event through infiltration, evapotranspiration, and rainwater reuse. It is generally accepted that grassed and landscaped areas are credited with a minimum initial abstraction of 5 mm. The water balance volume requirements for the site are listed in **Table 9**.

Table 9: Site Water Balance Summary

Catchment	Land Use	Area (m^2)	Water Balance Requirement (mm)	Water Balance Requirement (m^3)
Catchment 201	Impervious	13,266	5	66.3
	Pervious	5,710		28.5
	Permeable Pavers	1,824		9.1
Catchment 202	Impervious	0		0.0
	Pervious	3,100		15.5
Site Total		**23,900**	**-**	**119.5**

Permeable pavers are proposed in all parking stalls in order to achieve the volume retention requirement of 119.5 m^3. An area of 1,824.4 m^2 will be covered with permeable pavers. Accounting for a bedding depth of 200 mm and a void ratio of 0.4 for clear stone, a total retention volume of 145.95 m^3 is achieved. Refer to **Drawing C102** with detailed design calculations provided in **Appendix C**.

8.0 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 Town of Oakville. The Removals and Erosion & Sediment Control Plan (**Drawing C101**) identifies the location of the recommended control features. Controls will be inspected after each significant rainfall event and maintained in proper working condition. The following sediment and erosion controls will be included during construction on the site:

Silt Fencing

Silt fence as per the latest Town of Oakville Standard will be installed surrounding 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 construction entrance 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.

Double Wrapped Catchbasins

The existing storm sewer catchbasins located on Dundas Street West shall be double wrapped in filter cloth during construction.

Temporary Sediment Basin or Sediment Trap

Prior to construction and earthworks activities, a temporary sediment basin or sediment trap could be incorporated at the location of the underground stormwater tank. These temporary sediment basins would accept flows from the site, reduce overall stormwater velocities and promote settlement of suspended solids. The temporary sediment basin or trap is subject to detailed design.

9.0 CONCLUSIONS AND RECOMMENDATIONS

We conclude that the proposed development of the subject property can be readily serviced and meet the objectives of the regulatory agencies with the proposed servicing outlined in this report and accompanying drawings and figures. Based on the information contained in this report, we offer the following conclusions:

1. The estimated sewage design flows were determined to be 36,875 L/day. A private sewage system is proposed to service the commercial development. This includes a shallow buried trench septic system with a footprint of 1,880 m^2 and a Waterloo Biofilter system or equivalent to for treatment.

2. The peak hour domestic water demand is 1.72 L/s for the proposed development. A volume of 49.4 m^3 is required to supply the average domestic demand. A volume of 50.0 m^3 is provided in an underground cistern.

3. The estimated fire flow demand for Building 1 is 83.3 L/s at 2.00 hours, 50.0 L/s for a duration of 1.25 hours for Building 2 and 33.3 L/s for a duration of 1.25 hours for Building 3. Wilkinson cisterns (Model H114FT Precast Fire Fighting Test Tank) are proposed to meet the required volume demand.

    - Six cisterns will provide 685 m^3 of storage capacity for Building 1 and a separate system of four (4) cisterns will provide 456.4 m^3 of storage capacity for Buildings 2 and 3.

4. Stormwater quantity control criteria is satisfied by the proposed StormTrap detention tank. A 115 mm orifice tube is proposed downstream of the detention tank to control the post-development peak flow under the 100-year event to below the pre-development peak flow for the 2-year event as pe

5. Stormwater quality control criteria is satisfied by use of an Up-Flow Filtration system providing 80% TSS removal.

6. Site water balance is achieved via permeable pavers providing a volume of 145.95 m^3.

7. Erosion and sediment control measures during construction will be used to mitigate impacts of construction on the neighbouring infrastructure and the Joshua Creek Watershed.

Therefore, we recommend approval of the Zoning By-Law and Official Plan Amendment for the development of the subject lands from the perspective of site servicing and stormwater management requirements.

10.0 CLOSURE

We trust that this functional servicing report and preliminary stormwater management report meets your immediate needs. Please do not hesitate to contact the undersigned if you have any further questions.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.

Margaret Jasek, EIT
Land Development

/mj

C.F. CROZIER & ASSOCIATES INC.

Andrew Farina, P.Eng.
Land Development

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APPENDIX A

Sanitary Demand Calculations

CROZIER CONSULTING ENGINEERS

ONSITE SEWAGE SYSTEM CALCULATION SHEET

Project Name: 3855 Dundas Street
Project Number: 1644-5477

Date: 2021-11-19
Designed By: AS

BUILDING 1 - Industrial Warehouse	
Floor Area (m^2)	3471
Number of Loading Bays	2
Number of Water closet	6
Per Table 8.2.1.3.B. Ware House (150 L/Day Per Loading Bay + 950 L/Day Per Water Closet)	6,000
Total Peak Flow (L/day)	**6,000**

BUILDING 2 - Office	
Floor Area (m^2)	2,201.0
Office Floor Area (assume 70%)	1,540.70
Number of Water closets	5
Number of Employees	25
Unit of Floor Space per (9.3m^2)	165.67
Per Table 8.2.1.3.B. Office (75 L/Day Per 9.3 m2)	75
Total Peak Flow (L/day)	**12,425**

BUILDING 3 Commercial (Store Fronts)	
Floor Area (m^2)	134.0
Number of Units	10.0
Number of Water closet	15.0
Per Table 8.2.1.3.B. Store (1230 L/Day Per Water Closet)	1,230
Total Peak Flow (L/day)	**18,450**

Sewage Flow Design

Total Peak Flow	**36,875**	L/day
Soil Percolation time, T =	50	min/cm

Leaching Bed (Shallow Buried Trench)

Minimum Length of Pipe	737.5	m	(Q/50)	
Length of Runs	24	Number of Runs	32	
Total Length of Trench	**768**	m		

APPENDIX B

Water Demand Calculations

CROZIER CONSULTING ENGINEERS

PROJECT: 3855 Dundas Street
PROJECT NO.: 1644-5477

CREATED BY: JL/MJ
CHECKED BY: AF

DATE: 2019-12-09
UPDATED: 2021-11-26

Existing Water Demand Calculations - 3855 Dundas Street

Site Statistics:

Land Use	Number of Units	Area (ha)	Population Density	Units	Population
Undeveloped	0	0.00	50	capita/ha	0.0
				Total Population	**0**

Design Parameters:

Average Demand (L/capita/day)
300

Water Demand:

Average Residential Daily Demand =	0	L/day
	0.00	**L/s**
Peaking Factors		
Max Day =	1.4	
Peak Hour =	3.0	
Average Day =	0.00	L/s
Max Day =	**0.00**	**L/s**
Peak Hour =	**0.00**	**L/s**

Summary Table:

Municipality	Phase	Average Daily Water Demand (L/s)	Max Day Demand (L/s)	Peak Hourly Demand (L/s)
Region of Peel	Existing Conditions	0.00	0.00	0.00

Notes & References

Site Stats are as per site plan provided by Nicholas Caragianis Architect Inc. dated November 8, 2021

Region of Peel Public Works Design, Specifications & Procedures Manual - Linear Infrastructure Sanitary Sewer Design Criteria (July, 2009) - 2.1 - Modified March 2017 REV 0.9 (CS)

Region of Peel Public Works Design, Specifications & Procedures Manual - Linear Infrastructure - Watermain Design Criteria (June, 2010) - 2.3 Table #1

Region of Peel Public Works Design, Specifications & Procedures Manual - Linear Infrastructure - Watermain Design Criteria (June, 2010) - 2.3 Table #1

Max Day = Average Day Demand * Max Day

Peak Hour = Average Day Demand * Peak Hour

CROZIER CONSULTING ENGINEERS

PROJECT: 3855 Dundas Street
PROJECT NO.: 1644-5477

CREATED BY: JL/MJ
CHECKED BY: AF/JS

DATE: 2019-12-09
UPDATED: 2021-11-26

Proposed Water Demand Calculations - 3855 Dundas Street

Site Statistics:

Building	Land Use	Area (ha)	Population Density	Units	Population
Building 1	Industrial	2.14	70	capita/ha	150
Building 2	Commercial	0.13	50	capita/ha	6.6
Building 3	Industrial	0.12	70	capita/ha	8.2
Total	**-**	**2.39**	**-**	**-**	**165**

Design Parameters:

ICI Average Demand (L/capita/day)
300

Water Demand:

Average Daily Demand =	49,397	L/day
	0.57	**L/s**
Peaking Factors		
Max Day =	1.4	
Peak Hour =	3.0	
Average Day =	0.57	L/s
Max Day =	**0.80**	**L/s**
Peak Hour =	**1.72**	**L/s**

Summary Table:

Municipality	Phase	Average Daily Water Demand (L/s)	Max Day Demand (L/s)	Peak Hourly Demand (L/s)	Required Water Cistern Volume (m^3)[1]	Proposed Water Cistern Volume (m^3)
Region of Peel	Self-Storage Building 1 Commercial Building 2 Industrial Building 3	0.57	0.80	1.72	49.4	50.0

[1] Required water cistern volume calculated based on the average daily water demand multiplied by 86,400 seconds/day

Notes & References

Site Stats are as per site plan provided by Nicholas Caragianis Architect Inc. dated Novemebr 8, 2021

Region of Peel Public Works Design, Specifications & Procedures Manual - Linear Infrastructure Sanitary Sewer Design Criteria (July, 2009) - 2.1 - Modified March 2017 REV 0.9 (CS)

Region of Peel Public Works Design, Specifications & Procedures Manual - Linear Infrastructure - Watermain Design Criteria (June, 2010) - 2.3 Table #1

Region of Peel Public Works Design, Specifications & Procedures Manual - Linear Infrastructure - Watermain Design Criteria (June, 2010) - 2.3 Table #1

Max Day = Average Day Demand * Max Day

Peak Hour = Average Day Demand * Peak Hour

3855 Dundas Street
Fire Protection Volume Calculation - Building 1 (Five-Storey Self-Storage)
CFCA File: 1644-5477

Date: 2021-12-03
Designed By: MJ
Checked By: AF

Water Supply for Public Fire Protection - 1999
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:

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

where

F = the required fire flow in litres per minute

C = coefficient related to the type of construction:

=	1.5	for wood frame construction (structure essentially all combustible)
=	1.0	for ordinary construction (brick or other masonry walls, combustible floor and interior)
=	0.8	for non-combustible construction (unprotected metal structural components)
=	0.6	for fire-resistive construction (fully protected frame, floors, roof)

A = For fire-resistive buildings, consider the two largest adjoining floors plus 50 percent of each of any floors immediately above them up to eight, when the vertical openings are inadequately protected.
If the vertical openings and exterior vertical communications are properly protected (one hour rating), consider only the area of the largest floor plus 25 percent of each of the two immediately adjoining floors.

Proposed structure:	Building 1	One (1) Five-storey self-storage building	
Largest floor area =	3,471	sq.m.	
25% immediate adjoining floor area above =	868	sq.m.	
25% immediate adjoining floor area below=	868	sq.m.	
Floor Area =	5,207	sq.m.	
C =	0.6		Assume fire-restrictive construction
Therefore, F =	**9,525**	**L/min**	

NOTE: For fire restrictive buildings, if vertical openings and exterior vertical commications are properly protected (one-hour rating), the total floor area was calculated to be the sum of the area of the largest floor plus 25% of each of the two immediately adjoining floors.

Fire flow determined above shall not exceed:

30,000	L/min for wood frame construction
30,000	L/min for ordinary construction
25,000	L/min for non-combustible construction
25,000	L/min for fire-resistive construction

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	-25%	Reduction
Limited Combustible	-15%	Reduction
Combustible	0%	No change
Free Burning	15%	Surcharge
Rapid Burning	25%	Surcharge
Assume Non-Combustible	-25%	No change
Reduction =	**-2,381**	**L/min**
Revised F =	**7,143**	**L/min**

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

3. Sprinklers - The value obtained in No. 2 above maybe reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards.

Assume	30%	Assume regular sprinkler protection
Reduction =	**2,143**	**L/min**
Revised F =	**5,000**	**L/min**

Water Supply for Public Fire Protection - 1999
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 45 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
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	5%

Exposed buildings

Name	Description	Distance (m)	Charge (%)	Surcharge (L/min)
Building 2		8.0	0%	-
Building 3		8.0	0%	-

Total Surcharge **0 L/min**

NOTE:

Separation distances and names of exposed buildings are based on the Site Plan provided by Nicholas Caragianis Architect Inc. dated November 08, 2021 (Issued for ZBA).

Note that all exposure surcharges have been assigned to zero as the other buildings will be serviced by a separate series of fire tanks.

Determine Required Fire Flow

Construction Type & Base Fire Flow	No. 1	9,525	base		
Contents Fire Hazard	No. 2	-2,381	reduction		
Sprinkler System	No. 3	-2,143	reduction		
Exposure	No. 4	0	surcharge		
Required Flow:		**5,000**	**L/min**		
Rounded to nearest 1000 L/min:		**5,000**	**L/min**	or	83.3 L/s
					1,321 USGPM

Fire suppression storage volume required: **600** m^3 6,000 L/min over 2.0 hours

Required Duration of Fire Flow

Flow Required L/min	Duration (hours)
2,000 or less	1.0
3,000	1.25
4,000	1.5
5,000	**1.75**
6,000	2.0
8,000	2.0
10,000	2.0
12,000	2.5
14,000	3.0
16,000	3.5
18,000	4.0
20,000	4.5
22,000	5.0
24,000	5.5
26,000	6.0
28,000	6.5
30,000	7.0
32,000	7.5
34,000	8.0
36,000	8.5
38,000	9.0
40,000 and over	9.5

CROZIER CONSULTING ENGINEERS

3855 Dundas Street
Fire Protection Volume Calculation - Building 2
CFCA File: 1644-5477

Date: 2021-12-03
Designed By: MJ
Checked By: AF

Water Supply for Public Fire Protection - 1999
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:

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

where

F = the required fire flow in litres per minute

C = coefficient related to the type of construction:

=	1.5	for wood frame construction (structure essentially all combustible)
=	1.0	for ordinary construction (brick or other masonry walls, combustible floor and interior)
=	0.8	for non-combustible construction (unprotected metal structural components)
=	0.6	for fire-resistive construction (fully protected frame, floors, roof)

A = For fire-resistive buildings, consider the two largest adjoining floors plus 50 percent of each of any floors immediately above them when the vertical openings are inadequately protected.
If the vertical openings and exterior vertical communications are properly protected (one hour rating), consider only the area of the largest floor plus 25 percent of each of the two immediately adjoining floors.

Proposed structure:	Building 2	One-storey self-storage building	
Largest floor area =	1,231	sq.m.	
25% immediate adjoining floor area below =	243	sq.m.	
Floor Area =	1,474	sq.m.	
C =	0.6		Assume fire-restrictive construction
Therefore, F =	**5,067**	**L/min**	

NOTE: For fire restrictive buildings, if vertical openings and exterior vertical commications are properly protected (one-hour rating), the total floor area was calculated to be the sum of the area of the largest floor plus 25% of each of the two immediately adjoining floors.

Fire flow determined above shall not exceed:

30,000	L/min for wood frame construction
30,000	L/min for ordinary construction
25,000	L/min for non-combustible construction
25,000	L/min for fire-resistive construction

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	-25%	Reduction
Limited Combustible	-15%	Reduction
Combustible	0%	No change
Free Burning	15%	Surcharge
Rapid Burning	25%	Surcharge
Assume Non-Combustible	-25%	No change
Reduction =	**-1,267**	**L/min**
Revised F =	**3,800**	**L/min**

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

3. Sprinklers - The value obtained in No. 2 above maybe reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards.

Assume	30%	Assume complete automatic sprinkler protection
Reduction =	**1,140**	**L/min**
Revised F =	**2,660**	**L/min**

Water Supply for Public Fire Protection - 1999
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 45 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
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	5%

Exposed buildings

Name	Description	Distance (m)	Charge (%)	Surcharge (L/min)
Building 1		8.0	0%	-
Building 3		20.0	0%	-

Total Surcharge **0 L/min**

NOTE:

Separation distances and names of exposed buildings are based on the Site Plan provided by Nicholas Caragianis Architect Inc. dated November 08, 2021 (Issued for ZBA).

Note that all exposure surcharges have been assigned to zero as the other buildings will be serviced by a separate series of fire tanks.

Determine Required Fire Flow

Construction Type & Base Fire Flow	No. 1	5,067	base	
Contents Fire Hazard	No. 2	-1,267	reduction	
Sprinkler System	No. 3	-1,140	reduction	
Exposure	No. 4	0	surcharge	
Required Flow:		**2,660**	**L/min**	
Rounded to nearest 1000 L/min:		**3,000**	**L/min**	or 50.0 L/s, 793 USGPM

Fire suppression storage volume required: **225 m^3** 3,000 L/min over 1.25 hours

Required Duration of Fire Flow

Flow Required L/min	Duration (hours)
2,000 or less	1.0
3,000	**1.25**
4,000	1.5
5,000	1.75
6,000	2.0
8,000	2.0
10,000	2.0
12,000	2.5
14,000	3.0
16,000	3.5
18,000	4.0
20,000	4.5
22,000	5.0
24,000	5.5
26,000	6.0
28,000	6.5
30,000	7.0
32,000	7.5
34,000	8.0
36,000	8.5
38,000	9.0
40,000 and over	9.5

CROZIER CONSULTING ENGINEERS

3855 Dundas Street
Fire Protection Volume Calculation - Building 3
CFCA File: 1644-5477

Date: 2021-12-03
Designed By: MJ
Checked By: AF

Water Supply for Public Fire Protection - 1999
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:

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

where

F = the required fire flow in litres per minute

C = coefficient related to the type of construction:

=	1.5	for wood frame construction (structure essentially all combustible)
=	1.0	for ordinary construction (brick or other masonry walls, combustible floor and interior)
=	0.8	for non-combustible construction (unprotected metal structural components)
=	0.6	for fire-resistive construction (fully protected frame, floors, roof)

A = For fire-resistive buildings, consider the two largest adjoining floors plus 50 percent of each of any floors immediately above them up to eight, when the vertical openings are inadequately protected.
If the vertical openings and exterior vertical communications are properly protected (one hour rating), consider only the area of the largest floor plus 25 percent of each of the two immediately adjoining floors.

Proposed structure:	Building 3	One-storey self-storage building	
Floor Area =	1,171	sq.m.	
C =	0.6		Assume fire-restrictive construction
Therefore, F =	**4,517**	**L/min**	

Fire flow determined above shall not exceed:

30,000	L/min for wood frame construction
30,000	L/min for ordinary construction
25,000	L/min for non-combustible construction
25,000	L/min for fire-resistive construction

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	-25%	Reduction
Limited Combustible	-15%	Reduction
Combustible	0%	No change
Free Burning	15%	Surcharge
Rapid Burning	25%	Surcharge
Assume Non-Combustible	-25%	No change
Reduction =	**-1,129**	**L/min**
Revised F =	**3,388**	**L/min**

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

3. Sprinklers - The value obtained in No. 2 above maybe reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards.

Assume	30%	assume complete automatic sprinkler protection
Reduction =	**1,016**	**L/min**
Revised F =	**2,371**	**L/min**

Water Supply for Public Fire Protection - 1999
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 45 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
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	5%

Exposed buildings

Name	Description	Distance (m)	Charge (%)	Surcharge (L/min)
Building 1		8.0	0%	-
Building 2		20.0	0%	-

Total Surcharge **0 L/min**

NOTE:

Separation distances and names of exposed buildings are based on the Site Plan provided by Nicholas Caragianis Architect Inc. dated November 08, 2021 (Issued for ZBA).

Note that all exposure surcharges have been assigned to zero as the other buildings will be serviced by a separate series of fire tanks.

Determine Required Fire Flow

Construction Type & Base Fire Flow	No. 1	4,517	base	
Contents Fire Hazard	No. 2	-1,129	reduction	
Sprinkler System	No. 3	-1,016	reduction	
Exposure	No. 4	0	surcharge	
Required Flow:		**2,371**	**L/min**	
Rounded to nearest 1000 L/min:		**2,000**	**L/min**	or 33.3 L/s, 528 USGPM

Fire suppression storage volume required: **150 m³** 3,000 L/min over 1.25 hour

Required Duration of Fire Flow

Flow Required L/min	Duration (hours)
2,000 or less	1.0
3,000	**1.25**
4,000	1.5
5,000	1.75
6,000	2.0
8,000	2.0
10,000	2.0
12,000	2.5
14,000	3.0
16,000	3.5
18,000	4.0
20,000	4.5
22,000	5.0
24,000	5.5
26,000	6.0
28,000	6.5
30,000	7.0
32,000	7.5
34,000	8.0
36,000	8.5
38,000	9.0
40,000 and over	9.5

114 CUBIC METRE PRECAST WASTEWATER HOLDING TANK MODEL H114S

WILKINSON HEAVY PRECAST LIMITED
DUNDAS, ONTARIO 905-628-5611
www.wilkinsonheavyprecast.com

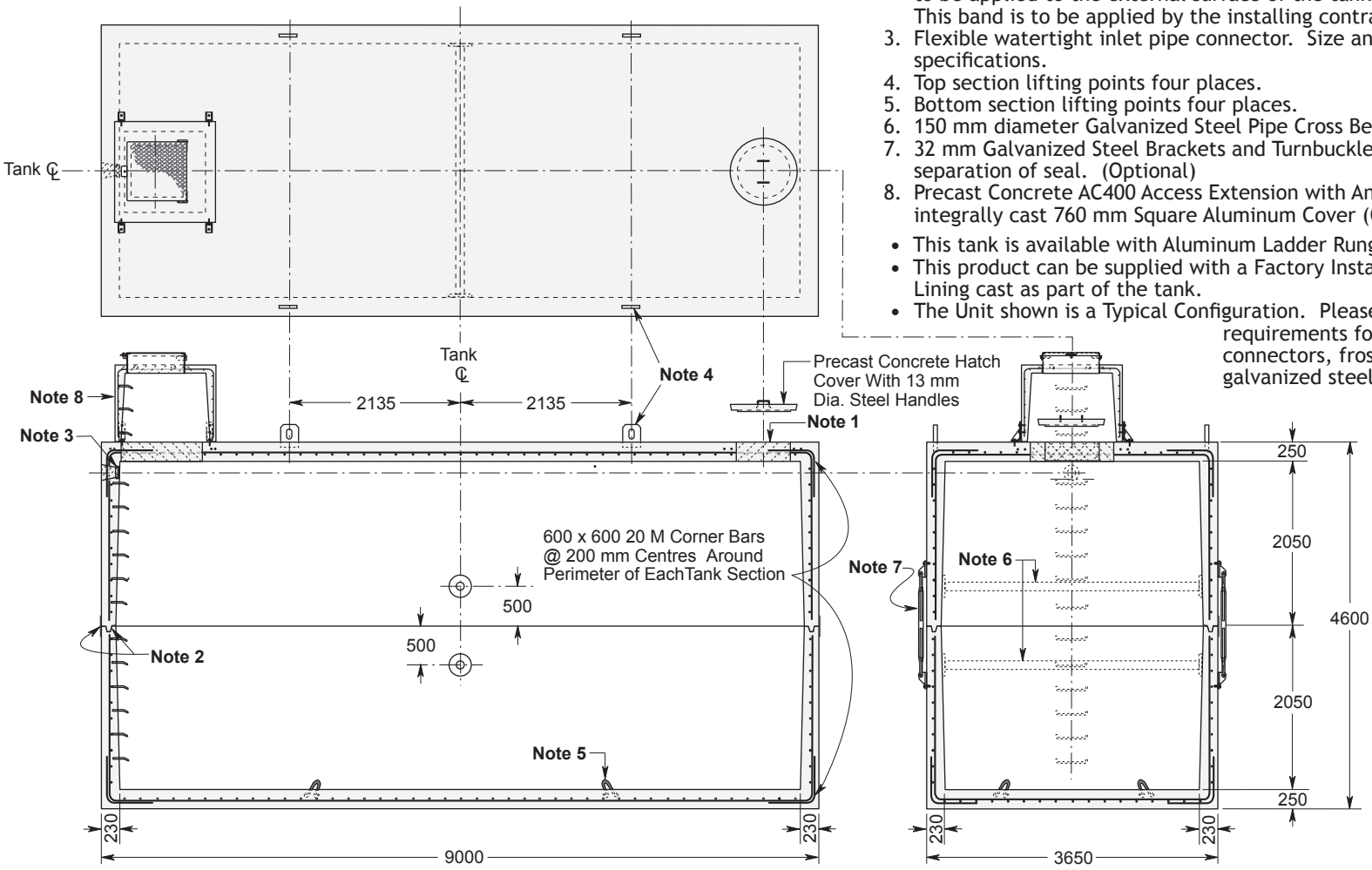
CONSTRUCTION DETAILS *

Concrete: 35 MPa at 28 Days, 5 to 8% Air Entrainment.

Reinforcing: 20 M Bars at 200 mm centres each way in roof, walls and floor. Eight extra 15 M bars around each roof access opening. Minimum cover over reinforcing steel - 25 mm.

Weight: 96,000 kg (48,000 kg Per Half Section)

Actual Capacity: 27,832 Litres Per Vertical Metre. 114,110 Litres to Underside of Roof.



NOTES

1. Large 685 mm diameter roof access openings facilitate tank maintenance. Unless otherwise specified/ordered this tank will be shipped with 840 mm diameter concrete hatch covers. Please note that each cover weighs approximately 125 kg and must be handled only with suitable mechanical lifting equipment. Please see Access Riser section for available options.
2. Close tolerance of Tongue and Groove Joint and a Fibrous Mastic Sealant ensure a solid structural and watertight seal. Primer and Mastic Band will be supplied to be applied to the external surface of the tank over the joint between sections. This band is to be applied by the installing contractor.
3. Flexible watertight inlet pipe connector. Size and position to suit customer's specifications.
4. Top section lifting points four places.
5. Bottom section lifting points four places.
6. 150 mm diameter Galvanized Steel Pipe Cross Beams (Stainless Steel Optional).
7. 32 mm Galvanized Steel Brackets and Turnbuckles in 4 Places to prevent separation of seal. (Optional)
8. Precast Concrete AC400 Access Extension with Anti-Frost Heave System and integrally cast 760 mm Square Aluminum Cover (Optional).

- This tank is available with Aluminum Ladder Rungs to the floor (Optional).
- This product can be supplied with a Factory Installed Polyethylene or P.V.C. Lining cast as part of the tank.
- The Unit shown is a Typical Configuration. Please call the factory to discuss your requirements for flexible watertight pipe/wall connectors, frost resistant watertight extensions, galvanized steel or aluminum hinged covers, flanged roof vents and many other custom appurtenances that can be supplied.

Dimensions in mm
N.T.S.

* Commensurate with a **1.5 Metre** burial over the top slab in firm soil away from any area of vehicular traffic.

For recommended installation procedures refer to Wilkinson Installation Guidelines and Lifting and Assembly Instructions.

WARNING ! IMPROPER INSTALLATION ESPECIALLY IN UNSTABLE SOILS CAN RESULT IN THE STRUCTURAL FAILURE OF THIS PRODUCT

9 May, 2008

APPENDIX C

Stormwater Management Calculations

Project: 3855 Dundas Street West
Project No.: 1644-5477
Created By: MJ
Checked By: AF
Date: 2020-10-01
Updated: 2021-11-26

Pre-Development Conditions

IDF Values

Tc (Mins) 15

Return Period	A	B	C
2 yr	610	4.6	0.78
100 yr	1450	4.9	0.78

(per City of Mississauga standards)

Pre-Development Conditions

Pre - Development Conditions						
Catchment	**Outlet Location**	**Land Use**	**Area** (ha)	**Area** (m^2)	**C**	**Weighted Average C**
101	Overland flow to existing 600 mm storm sewer on Ninth Line	*Pervious*	2.31	23,070	0.25	0.25
		Impervious	0.00	-	0.9	0.00
		Sub total	**2.31**	**23,070**	**-**	**0.25**
102	Overland flow to existing 600 mm storm sewer on Ninth Line	*Pervious*	0.08	830	0.25	0.25
		Impervious	0.00	-	0.9	0.00
		Sub total	**0.08**	**830**	**-**	**0.25**
		Total Site	**2.39**	**23,900**	**-**	**0.25**

Ajustment Factors

Return Period	Adjustment Factor	Catchment 101 & 102 Adjusted RC
2 yr	1.00	0.25
5 yr	1.00	0.25
10 yr	1.00	0.25
25 yr	1.10	0.28
50 yr	1.20	0.30
100 yr	1.25	0.31

(per City of Mississauga standards)

Peak Flows

Catchment 101					
Storm Event	**C**	**i (mm/hr)**	**A (ha)**	**Q (m^3/s)**	**Q (L/s)**
2 yr	0.25	59.89	2.31	0.096	96.03
5 yr		80.51		0.129	129.09
10 yr		99.17		0.159	159.00
25 yr	0.28	113.89		0.201	200.87
50 yr	0.30	127.13		0.245	244.61
100 yr	0.31	140.69		0.282	281.97

Catchment 102					
Storm Event	**C**	**i (mm/hr)**	**A (ha)**	**Q (m^3/s)**	**Q (L/s)**
2 yr	0.25	59.89	0.08	0.003	3.45
5 yr		80.51		0.005	4.64
10 yr		99.17		0.006	5.72
25 yr	0.28	113.89		0.007	7.23
50 yr	0.30	127.13		0.009	8.80
100 yr	0.31	140.69		0.010	10.14

Equations

Peak Flow

$$Q_{post} = 0.0028 \cdot C_{post} \cdot i(T_d) \cdot A$$

Intensity

$$I = \frac{A}{(t_c + B)^C}$$

CROZIER CONSULTING ENGINEERS

Project: 3855 Dundas Street West
Project No.: 1644-5477
Created By: MJ
Checked By: AF
Date: 2020-10-01
Updated: 2021-11-26

Modified Rational Calculations - Input Parameters

Storm Data: Mississauga

Time of Concentration: T_c = 15 min (per City of Mississauga standards)

Return Period	A	B	C	I (mm/hr)
2 yr	610.0	4.6	0.78	59.89
100 yr	1450	4.9	0.78	140.69

Post-Development Conditions

Post - Development Conditions					
Catchment	**Land Use**	**Area** (ha)	**Area** (m^2)	**C**	**Weighted Average C**
201	*Pervious*	0.57	5710	0.25	0.07
	Impervious	1.33	13266	0.9	0.57
	Permeable Pavers	0.18	1824	0.5	0.04
	Total	**2.08**	**20800**	**-**	**0.69**
202	*Pervious*	0.31	3100	0.25	0.25
	Impervious	0.00	0	0.9	0.00
	Total	**0.31**	**3100**	**-**	**0.25**
Total Site		**2.39**	**23900**	**-**	**0.63**

Ajustment Factors

Return Period	Adjustment Factor	Catchment 201	Catchment 202
2 yr	1.00	0.69	0.25
5 yr	1.00	0.69	0.25
10 yr	1.00	0.69	0.25
25 yr	1.10	0.76	0.28
50 yr	1.20	0.82	0.30
100 yr	1.25	0.86	0.31

(per City of Mississauga standards)

Peak Flows

Catchment 201				
Storm Event	**C**	**A (ha)**	**Q (m^3/s)**	**Q (L/s)**
2 yr	0.69	2.08	0.238	237.74
5 yr			0.320	319.59
10 yr			0.394	393.64
25 yr	0.76		0.497	497.31
50 yr	0.82		0.606	605.59
100 yr	0.86		0.698	698.09

Catchment 202 - Uncontrolled				
Storm Event	**C**	**A (ha)**	**Q (m^3/s)**	**Q (L/s)**
2 yr	0.25	0.31	0.013	12.90
5 yr			0.017	17.35
10 yr			0.021	21.37
25 yr	0.28		0.027	26.99
50 yr	0.30		0.033	32.87
100 yr	0.31		0.038	37.89

Peak Flows Summary

Storm Event (years)	Peak Flows (L/s)						Required Underground Storage (m^3)	Total Provided Storage (m^3)
	Pre-Development	Post-Development						
		Uncontrolled		Release Rate				
	Q_{pre}	$Q_{post-201}$	$Q_{post-202}$	Q_{post} Target	$Q_{post-201}$	Total Q_{post}		
2 yr	99.48	237.74	12.90	86.58	31.74	**44.64**	279.72	290.02
100 yr	292.12	698.09	37.89	61.59	51.56	**89.45**	767.01	805.39

Equations

Peak Flow

$$Q_{post} = 0.0028 \cdot C_{post} \cdot i(T_d) \cdot A$$

Intensity

$$I = \frac{A}{(t_c + B)^C}$$

Project: 3855 Dundas Street West
Project No.: 1644-5477
Created By: MJ
Checked By: AF
Date: 2020-10-01
Updated: 2021-11-26

Modified Rational Calculations - 2-Year Storm Event

Control Criteria

2 yr: Control Post-Development Peak Flows to 2-Yr Pre-Development Flows

2 yr: Catchment 201 Uncontrolled Post-Development Flow:

Q_{post} = 0.238 m^3/s

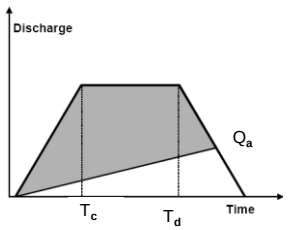
2 yr: Post-Development Site Flow Target:

Q_{target} = 0.087 m^3/s

2 yr: Post-Development Flow Controlled:

$Q_{controlled}$ = 0.032 m^3/s

Underground Storage Volume Determination				
T_d (min)	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
15	59.89	900	0.239	186.9
25	43.42	1500	0.174	222.3
35	34.60	2100	0.138	242.9
45	29.03	2700	0.116	256.3
55	25.16	3300	0.101	265.2
65	22.29	3900	0.089	271.4
75	20.07	4500	0.080	275.5
85	18.30	5100	0.073	278.0
95	16.85	5700	0.067	279.3
105	15.64	6300	0.063	**279.7**
115	14.61	6900	0.058	279.3
125	13.72	7500	0.055	278.2
135	12.95	8100	0.052	276.6
145	12.27	8700	0.049	274.5
155	11.67	9300	0.047	271.9
165	11.13	9900	0.044	269.0
175	10.64	10500	0.043	265.8
185	10.20	11100	0.041	262.3
195	9.80	11700	0.039	258.5
205	9.43	12300	0.038	254.4
215	9.10	12900	0.036	250.1
225	8.79	13500	0.035	245.7
235	8.50	14100	0.034	241.0
245	8.23	14700	0.033	236.2
255	7.98	15300	0.032	231.3
265	7.75	15900	0.031	226.1
275	7.53	16500	0.030	220.9
285	7.33	17100	0.029	215.5
295	7.14	17700	0.029	210.0
305	6.96	18300	0.028	204.4
315	6.79	18900	0.027	198.7
325	6.63	19500	0.026	192.9
335	6.47	20100	0.026	187.0
345	6.33	20700	0.025	181.0
355	6.19	21300	0.025	175.0
365	6.06	21900	0.024	168.8
375	5.94	22500	0.024	162.6
385	5.82	23100	0.023	156.3
395	5.70	23700	0.023	150.0
405	5.59	24300	0.022	143.5
415	5.49	24900	0.022	137.1
425	5.39	25500	0.022	130.5
435	5.29	26100	0.021	123.9
445	5.20	26700	0.021	117.3
455	5.11	27300	0.020	110.6
465	5.03	27900	0.020	103.8
475	4.95	28500	0.020	97.0
485	4.87	29100	0.019	90.2
495	4.79	29700	0.019	83.3
505	4.72	30300	0.019	76.4
Required Storage Volume:				**279.7**



Storage
$S_d = Q_{post} \cdot T_d - Q_{target} (T_d + T_c) / 2$

Peak Flow
$Q_{post} = (0.0028 \cdot C_{post} \cdot i(T_d) \cdot A)$

Modified Rational Calculations - 100-Year Storm Event

Control Criteria

100 yr: Control Post-Development Peak Flows to 2-Yr Pre-Development Flows

100 yr: Catchment 201 Uncontrolled Post-Development Flow:

Q_{post} = 0.698 m^3/s

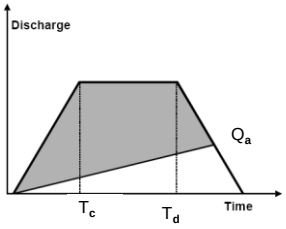
100 yr: Post-Development Site Flow Target:

Q_{target} = 0.062 m^3/s

100 yr: Post-Development Flow Controlled:

$Q_{controlled}$ = 0.052 m^3/s

Underground Storage Volume Determination				
T_d (min)	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
15	140.69	900	0.562	459.8
25	102.41	1500	0.409	552.3
35	81.77	2100	0.327	609.2
45	68.68	2700	0.275	648.6
55	59.56	3300	0.238	677.6
65	52.81	3900	0.211	699.6
75	47.58	4500	0.190	716.7
85	43.39	5100	0.173	730.1
95	39.97	5700	0.160	740.7
105	37.10	6300	0.148	748.9
115	34.66	6900	0.139	755.2
125	32.57	7500	0.130	759.9
135	30.73	8100	0.123	763.3
145	29.12	8700	0.116	765.5
155	27.69	9300	0.111	766.7
165	26.41	9900	0.106	**767.0**
175	25.26	10500	0.101	766.5
185	24.22	11100	0.097	765.3
195	23.27	11700	0.093	763.5
205	22.40	12300	0.090	761.1
215	21.60	12900	0.086	758.2
225	20.86	13500	0.083	754.8
235	20.18	14100	0.081	750.9
245	19.55	14700	0.078	746.7
255	18.96	15300	0.076	742.1
265	18.41	15900	0.074	737.1
275	17.89	16500	0.072	731.8
285	17.41	17100	0.070	726.3
295	16.96	17700	0.068	720.4
305	16.53	18300	0.066	714.3
315	16.12	18900	0.064	707.9
325	15.74	19500	0.063	701.3
335	15.38	20100	0.061	694.4
345	15.03	20700	0.060	687.4
355	14.71	21300	0.059	680.2
365	14.40	21900	0.058	672.7
375	14.10	22500	0.056	665.1
385	13.82	23100	0.055	657.4
395	13.55	23700	0.054	649.4
405	13.29	24300	0.053	641.3
415	13.04	24900	0.052	633.1
425	12.80	25500	0.051	624.7
435	12.58	26100	0.050	616.2
445	12.36	26700	0.049	607.6
455	12.15	27300	0.049	598.9
465	11.95	27900	0.048	590.0
475	11.75	28500	0.047	581.0
485	11.56	29100	0.046	571.9
495	11.38	29700	0.046	562.7
505	11.21	30300	0.045	553.4
Required Storage Volume:				**767.0**



Storage

$S_d = Q_{post} \cdot T_d - Q_{target} (T_d + T_c) / 2$

Peak Flow

$Q_{post} = (0.0028 \cdot C_{post} \cdot i(T_d) \cdot A)$

CROZIER & ASSOCIATES
Consulting Engineers

Project:	3855 Dundas Street West
Project No.:	1644-5477
Designed By:	MJ
Checked By:	AF
Date:	2020-10-01
Date Updated:	2021-11-26

Orifice Design

Orifice: $Q=CA(2gH)^{0.5}$	Orifice
Discharge Coef., Cd=	0.80
Orifice Diameter (mm) =	115
Area of Orifice (m^2) =	0.0104
Orifice (Side/Bottom) =	Side
Orifice Invert (m) =	167.71
Inlet Elevation	167.70

Underground Detention Tank - Storage Storage Discharge					Storm Event
Water Elev.	Depth	Head	Volume	Orifice 1 Q	
(m)	(m)	(m)	(m3)	(L/s)	
167.79	0.08	0.13	32.1	13.45	
167.86	0.15	0.21	64.3	16.85	
167.94	0.23	0.29	96.8	19.70	
168.02	0.31	0.36	128.9	22.16	
168.09	0.38	0.44	161.1	24.37	
168.17	0.46	0.51	193.2	26.40	
168.24	0.53	0.59	225.3	28.28	
168.32	0.61	0.67	257.9	30.07	
168.40	0.69	0.74	290.0	31.74	2-Year
168.47	0.76	0.82	322.2	33.32	
168.55	0.84	0.90	354.3	34.83	
168.62	0.91	0.97	386.4	36.28	
168.70	0.99	1.05	419.0	37.69	
168.78	1.07	1.12	451.1	39.03	
168.85	1.14	1.20	483.2	40.33	
168.93	1.22	1.28	515.4	41.58	
169.01	1.30	1.35	547.5	42.80	
169.08	1.37	1.43	580.0	44.01	
169.16	1.45	1.51	612.2	45.16	
169.23	1.52	1.58	644.3	46.29	
169.31	1.60	1.66	676.4	47.39	
169.39	1.68	1.73	708.6	48.46	
169.44	1.73	1.79	731.8	49.22	
169.46	1.75	1.81	741.1	49.52	
169.54	1.83	1.89	773.3	50.55	
169.62	1.91	1.96	805.4	51.56	100-Year
169.69	1.98	2.04	837.5	52.55	
169.77	2.06	2.11	869.7	53.52	

PROJECT: 3855 Dundas Street West
PROJECT No.: 1644-5477

DESIGN: MJ
CHECK: AF

DATE: 2020-03-18
UPDATED: 2021-11-26

WATER BALANCE CALCULATIONS

Catchment	Land Use	Area (m^2)	Required Abstraction (mm)	Water Balance Requirement (m^3)
Catchment 201	Impervious	13,266	5	66.3
	Pervious	5,710		28.5
	Permeable Pavers	1,824		9.1
Catchment 202	Impervious	0		0.0
	Pervious	3,100		15.5
Site Total		**23,900**	**119.5**	**119.5**

PERMEABLE PAVER CALCULATIONS

Area (Parking Stalls):	1824.4	m^2
Bedding Depth:	200	mm
Void Ratio:	0.4	(clear stone)
Volume Provided:	**146.0**	m^3

CROZIER & ASSOCIATES Consulting Engineers

5 Year Storm $I = \frac{820}{(T.C. + 4.6)^{0.78}}$

100 Year Storm $I = \frac{1450}{(T.C. + 4.9)^{0.78}}$

3855 Dundas Street West Storm System
STORM SEWER DESIGN SHEET

10 YEAR DESIGN STORM - CITY OF MISSISSAUGA

A= 1010 **B= 4.6** **C= 0.78**

100 YEAR DESIGN STORM - CITY OF MISSISSAUGA

A= 1450 **B= 4.9** **C= 0.78**

PROJECT: 3855 Dundas St. West
PROJECT No.: 1644-5477
FILE: Storm Sewer Design
DATE: 2020.10.27
Revised: 2021.10.15
Design: MS
Reviewed By: ADF

INITIAL TIME OF CONCENTRATION (min) 15.00 CONCRETE 'n' 0.013 PVC 'n' 0.009 OR 0.013

Drainage Area ID	Upstream MH	Downstream MH	AREA (A) (HA)	RUNOFF COEFF (C)	A x C	TIME OF CONC. (min)	I (10YR) (mm/hr)	I (100YR) (mm/hr)	Q (10YR) (m^3/sec)	Q (100YR) (m^3/sec)	SLOPE (%)	PIPE DIA. (mm)	PIPE AREA (m^2)	VEL. (m/sec)	LENGTH (m)	TIME OF FLOW (min)	PIPE CLASS	CAPACITY (m^3/sec)	PERCENT CAPACITY - 10YR (%)	PERCENT CAPACITY - 100YR (%)
U/S of Orifice - Pipes Sized for 100YR Event																				
A1	CB1	MH1	0.24	0.45	0.11	15.00	99.17	140.69	**0.030**	**0.042**	1.00	**250**	0.05	1.75	15.3	0.15	PVC	**0.09**	35%	49%
A10	BLD 2	MH 1	0.13	0.90	0.12	15.00	99.17	140.69	**0.032**	**0.045**	2.00	**250**	0.05	2.47	4.3	0.03	PVC	**0.12**	26%	37%
A1+A10	MH 1	CBMH2				15.15	98.59	139.89	**0.061**	**0.087**	0.30	**450**	0.16	0.98	27.9	0.47	CONC	**0.16**	39%	56%
A2	CBMH2	MH2	0.13	0.82	0.11	15.62	96.79	137.37	**0.091**	**0.130**	0.30	**450**	0.16	0.98	37.7	0.64	CONC	**0.16**	58%	83%
A3	MH2	CBMH4	0.15	0.74	0.11	16.26	94.46	134.12	**0.120**	**0.171**	0.50	**450**	0.16	1.27	76.7	1.01	CONC	**0.20**	60%	85%
A11	BLD 3	CBMH4	0.13	0.90	0.12	15.00	99.17	140.69	**0.032**	**0.046**	2.00	**300**	0.07	2.79	10.6	0.06	PVC	**0.20**	16%	23%
A8	CBMH13	CBMH11	0.14	0.61	0.09	15.00	99.17	140.69	**0.024**	**0.033**	0.90	**300**	0.07	1.87	39.7	0.35	PVC	**0.13**	18%	25%
A9	CBMH11	CBMH4	0.10	0.90	0.09	15.35	97.79	138.77	**0.048**	**0.068**	0.60	**375**	0.11	1.78	39.9	0.37	PVC	**0.20**	24%	35%
A4	CBMH4	MH5	0.11	0.79	0.09	15.73	96.39	136.80	**0.224**	**0.401**	1.00	**525**	0.22	1.99	51.8	0.43	CONC	**0.43**	52%	93%
	MH5	CBMH6				16.16	94.81	134.60	**0.224**	**0.401**	0.70	**600**	0.28	1.82	17.4	0.16	CONC	**0.51**	44%	78%
A5	CBMH6	Tank	0.18	0.69	0.12	16.32	94.25	133.81	**0.256**	**0.447**	0.70	**600**	0.28	1.82	3.2	0.03	CONC	**0.51**	50%	87%
A7	DCB1	CBMH10	0.34	0.50	0.17	15.00	99.17	140.69	**0.047**	**0.066**	1.00	**300**	0.07	1.98	26.8	0.23	PVC	**0.14**	33%	47%
A6	CBMH10	Tank	0.11	0.68	0.07	15.23	98.28	139.46	**0.067**	**0.095**	1.00	**300**	0.07	1.98	14.1	0.12	PVC	**0.14**	48%	68%
A12	BLD 1	Tank	0.36	0.90	0.32	15.00	99.17	140.69	**0.089**	**0.127**	2.00	**300**	0.07	2.79	4.9	0.03	PVC	**0.20**	45%	64%

Up-Flo® Filter

The Clever Kind of Clean

Product Profile

The Up-Flo® Filter is a multi-stage stormwater treatment system that combines pretreatment with fluidized bed filtration technology for superior filtration rates and media longevity. The Up-Flo® Filter optimizes the balance between high treatment performance and total cost of ownership.

Applications

- Removal of sediment, nutrients and metals from runoff
- Source control for redevelopment or new construction
- Treatment downstream of Water Quality Volume detention systems
- Sites operating under an industrial or multi-sector general permits
- Protection for groundwater recharge systems
- LEED® construction projects

System Components

1. Inlet grate (pictured) or Inlet Pipe (not shown)
2. Precast Filtration Chamber
3. Filter Module
4. 4mm Screening
5. Bypass Hood/Siphon
6. Outlet Module with Drain Down Filter
7. Pollutant Storage Sump
8. Media bags

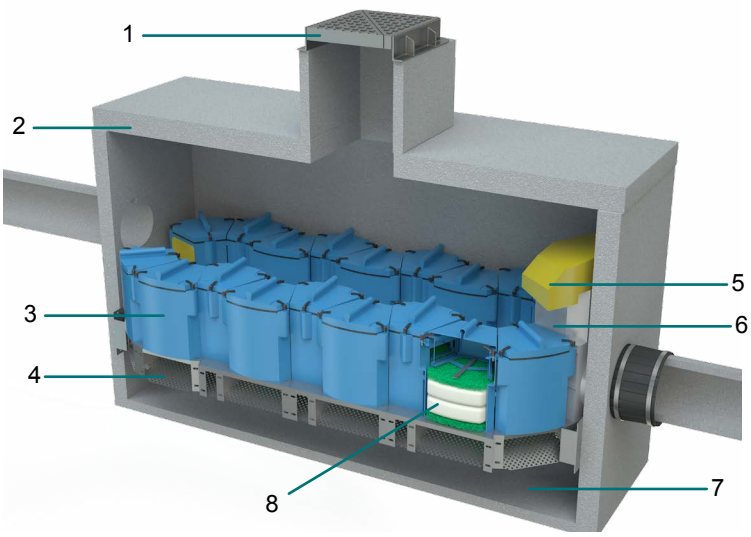


Fig.1 The Up-Flo® Filter includes sedimentation, screening and filtration in a single device.

Advantages

- Sedimentation, screening and filtration in one structure
- Upflow fluidized bed technology prevents clogging of filter media
- Includes an integral high flow bypass and trap for oils and trash
- Economical media bag replacement process requires neither heavy lifting equipment nor purchase of entirely new cartridge
- Independently verified through TARP field monitoring program

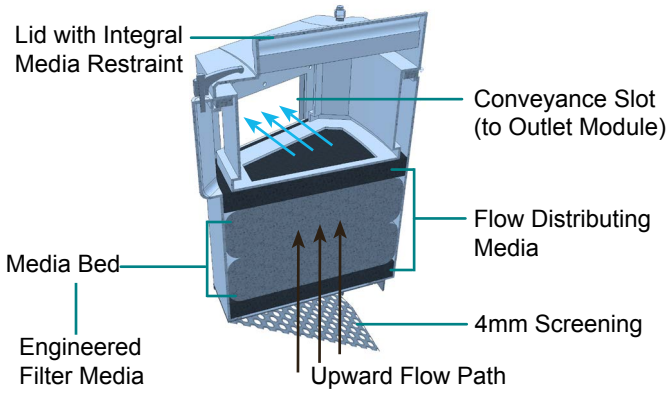
How it Works

1. Pretreatment: Oil and floatables rise to the surface while sediment settles in the sump.
2. Screening: Flow is directed upward through an angled screen to remove debris before entering the filter module.
3. Filtration: Water flows upwards through engineered media bags (see **Fig.2**) before leaving the outlet module to be discharged through the outlet pipe.

During peak flows, excess water is siphoned through the yellow bypass hood which also prevents the escape of oil and trash. As water levels return to normal, captured pollutants are washed off media bags, preventing blinding and prolonging media life.

Filter Module Components

Each Filter Module contains two filter bags containing an engineered media mix designed to optimize pollutant removal by evenly spreading the flow across the entire surface area.



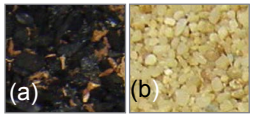


Fig.2 Engineered media mixes, include (a) CPZ™ Mix for TSS, Nutrients, Metals and Organics removal or (b) Hydro Filter Sand for TSS, Particle-bound Nutrients, and Metals removal.

Up-Flo® Filter

Sizing & Design

The modular design of the Up-Flo® Filter ensures that project specific treatment goals are easily met.

Standard and typical dimensions listed below. Use our sizing calculator to determine appropriate site-specific sizing.

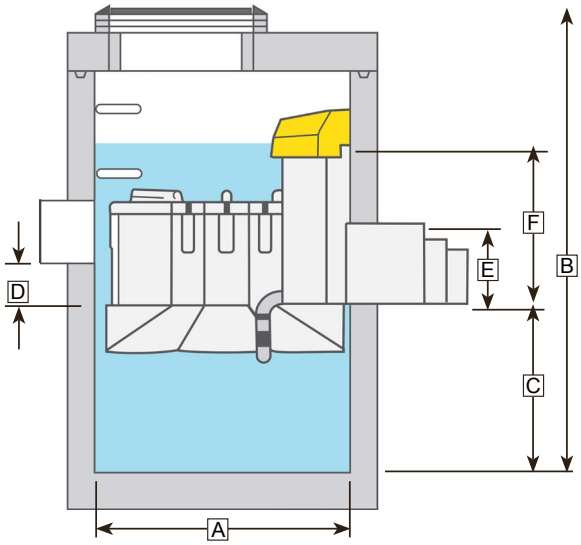


Fig.3 Key dimensions of the Up-Flo® Filter.

FREE *Up-Flo® Filter Sizing Calculator* for Engineers

This simple tool will recommend the best filter size and arrangement based on site-specific data entered by the user.

Go to **hydro-int.com/filtersizing** to access the tool

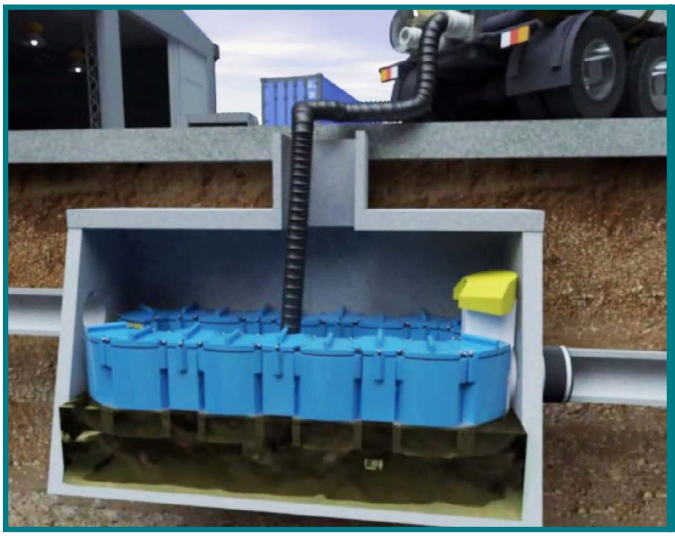
Chamber	A Diameter	Maximum Filter Modules	B Height	C Sump Depth	D Inlet/ Outlet Drop	E Maximum Pipe Diameter	F Operating Head	Maximum Treatment Flow
	(ft/m)	(No.)	(ft/m)	(ft/m)	(ft/m)	(in/mm)	(ft/m)	(cfs/L/s)
Round Manhole	4 / 1.2	6	7.5 / 2.29	3.0 / 0.91	0.8 / 0.24	15 / 375	2.5 / 0.76	0.056 cfs per module
Rectangular Vault	6 x 8 / 1.8 x 2.4	7	6.5 / 1.98	2.0 / 0.60		24 / 609		
	6 x 13 / 1.8 x 3.9	18						
	8.5 x 13 / 2.5 x 3.9	36						
	15 x 13 / 4.5 x 3.9	54						

Inspection & Maintenance

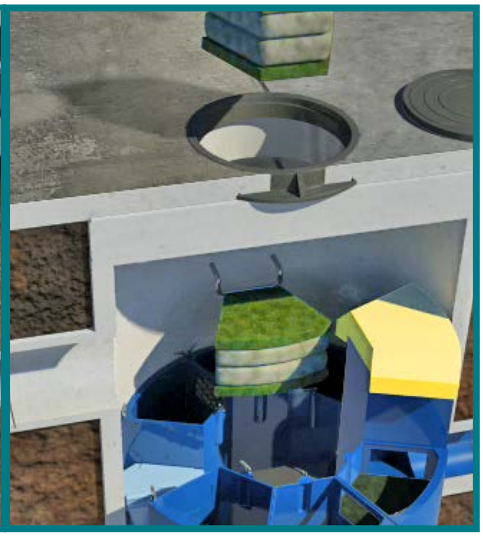
Nobody maintains our systems better than we do. To ensure optimal, ongoing device performance, be sure to recommend Hydro International as a preferred service and maintenance provider to your clients.

Call **1 (800) 848-2706** to schedule an inspection and cleanout or learn more at **hydro-int.com/service**

Filter modules are situated along chamber walls enabling easy sump access for vactor trucks.



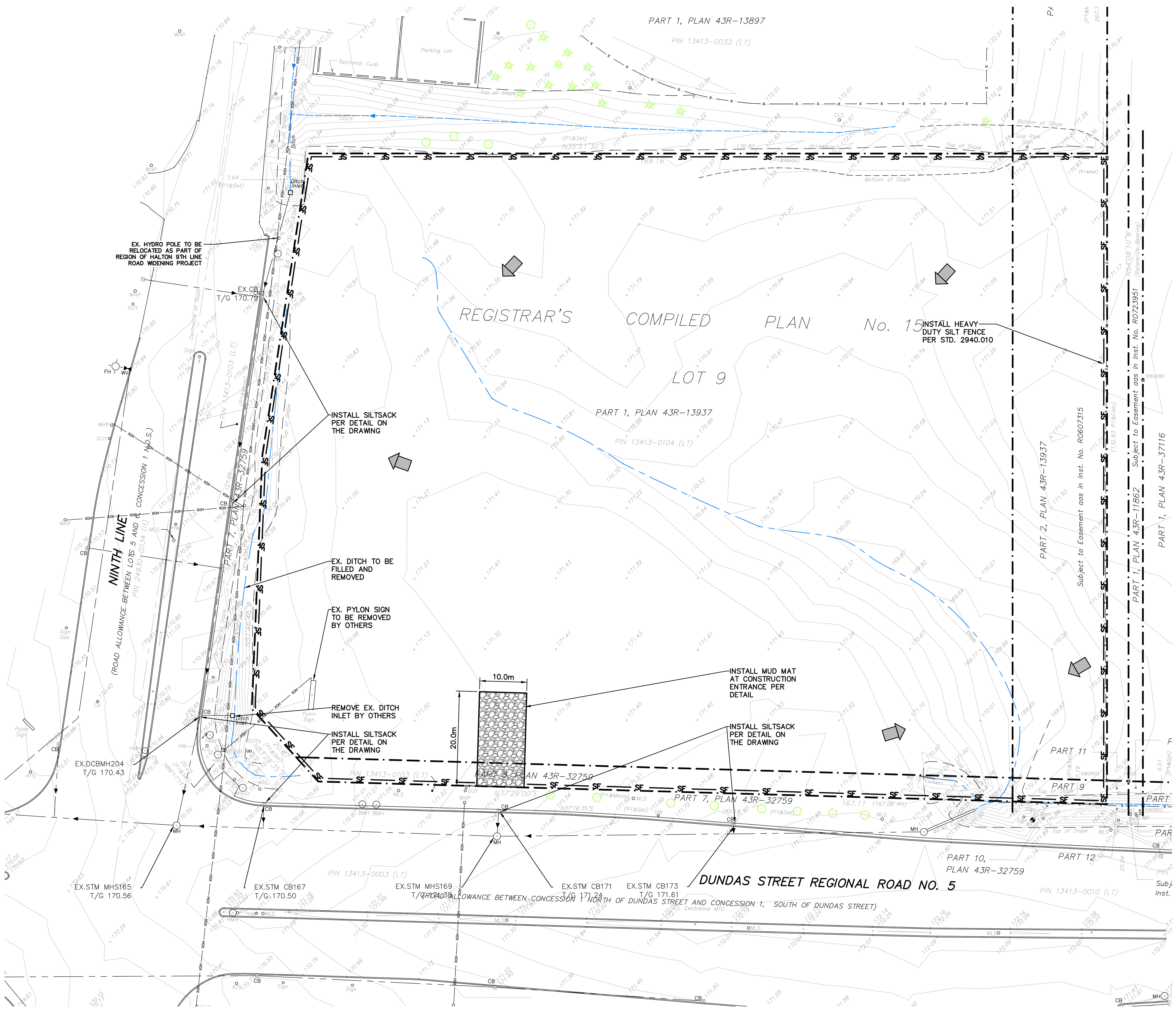
Our light-weight media bags can be manually replaced without removing the entire module

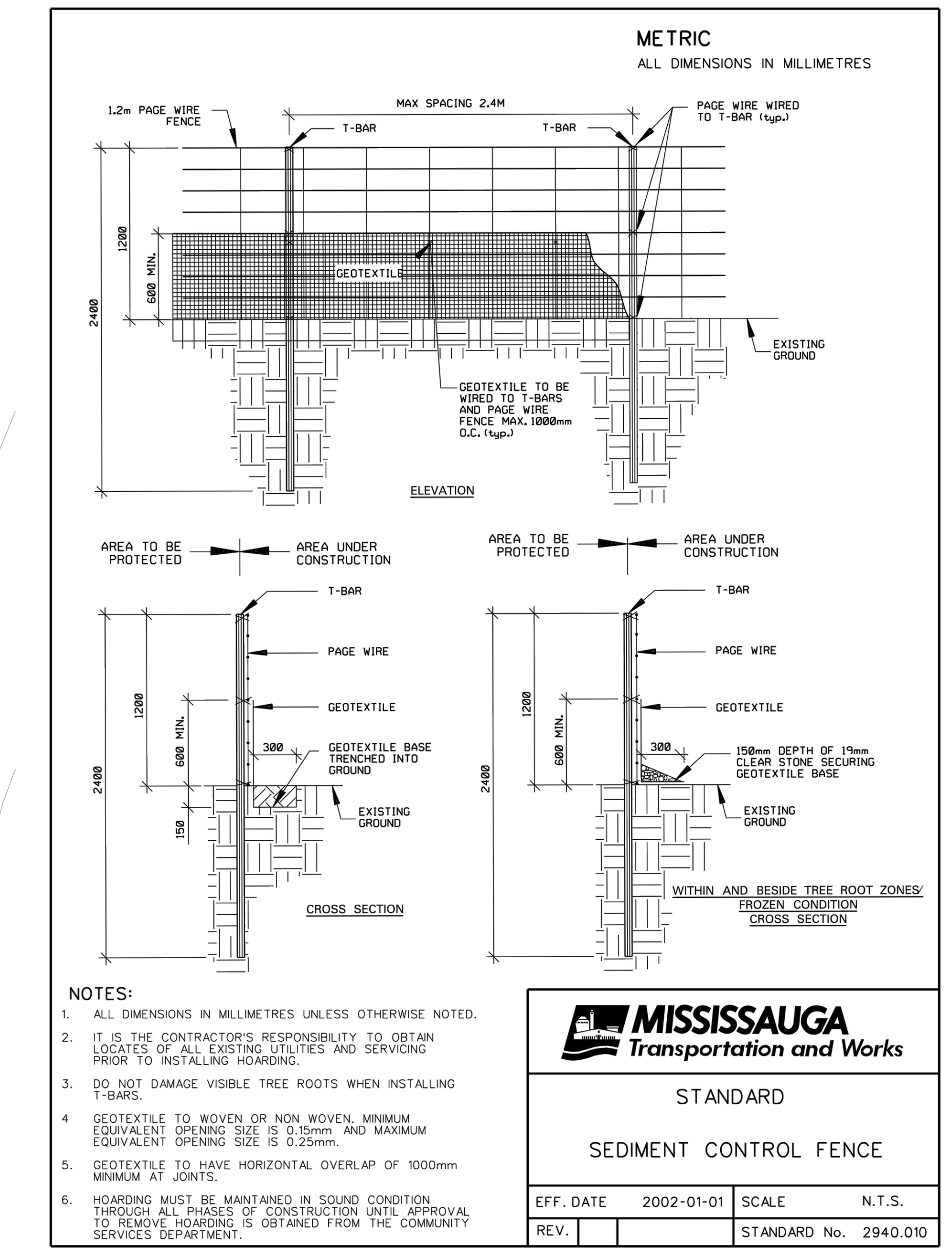


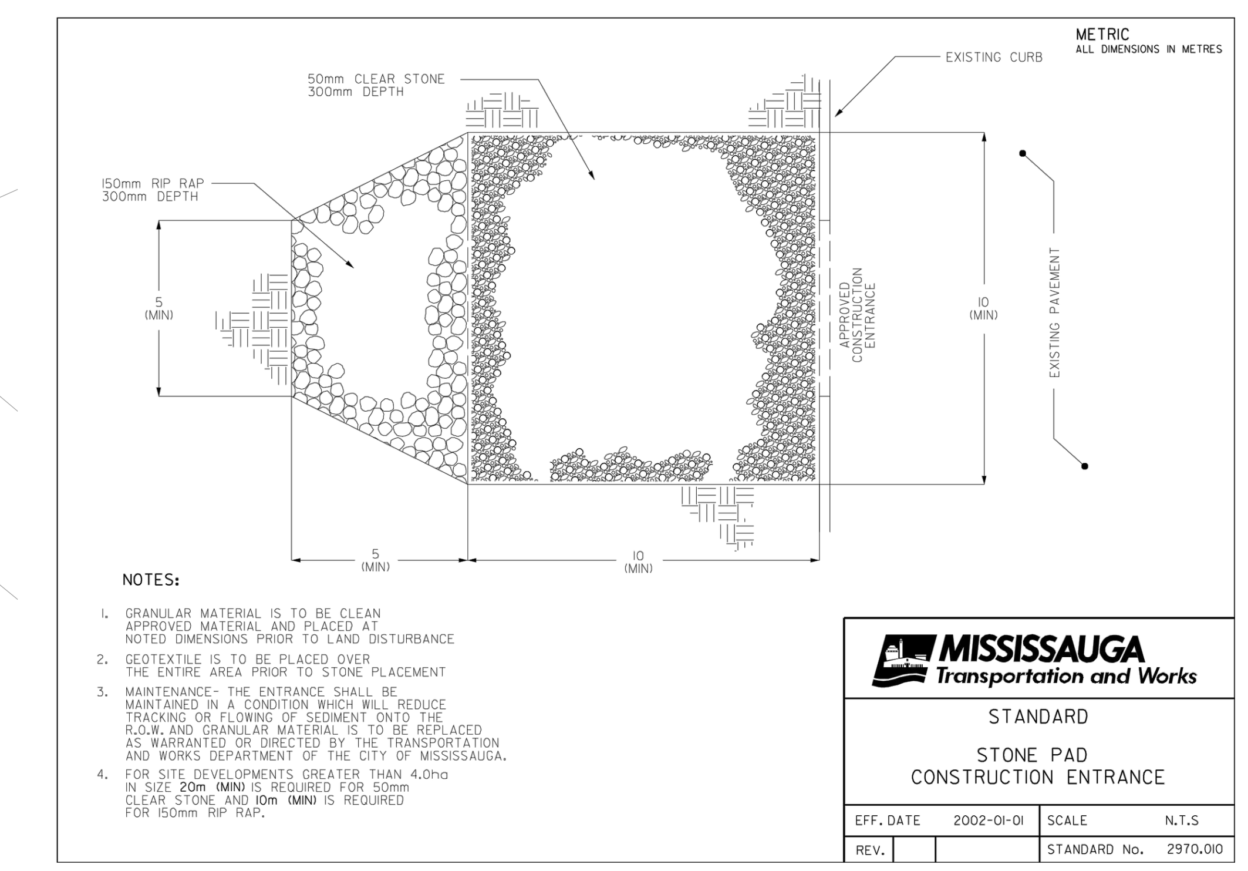
Hydro International, 94 Hutchins Drive, Portland, ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212
Email: stormwaterinquiry@hydro-int.com Web: www.hydro-int.com

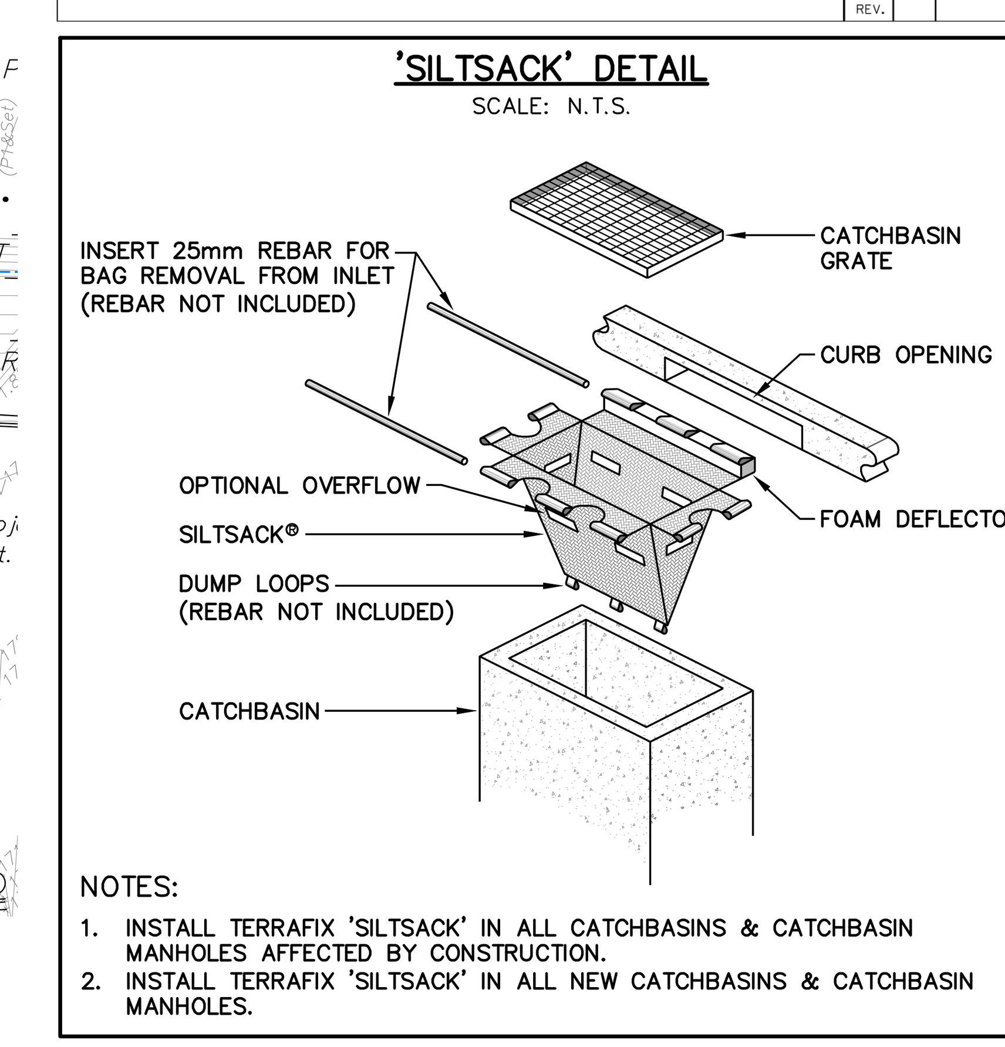
Stormwater Solutions
hydro-int.com/up-flo-filter

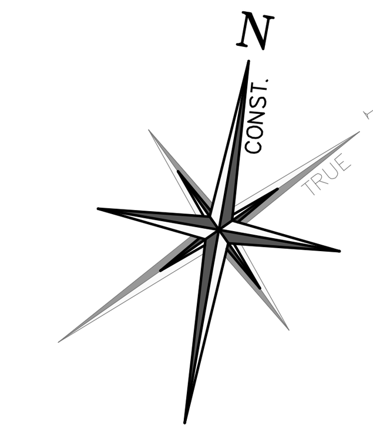
DRAWINGS

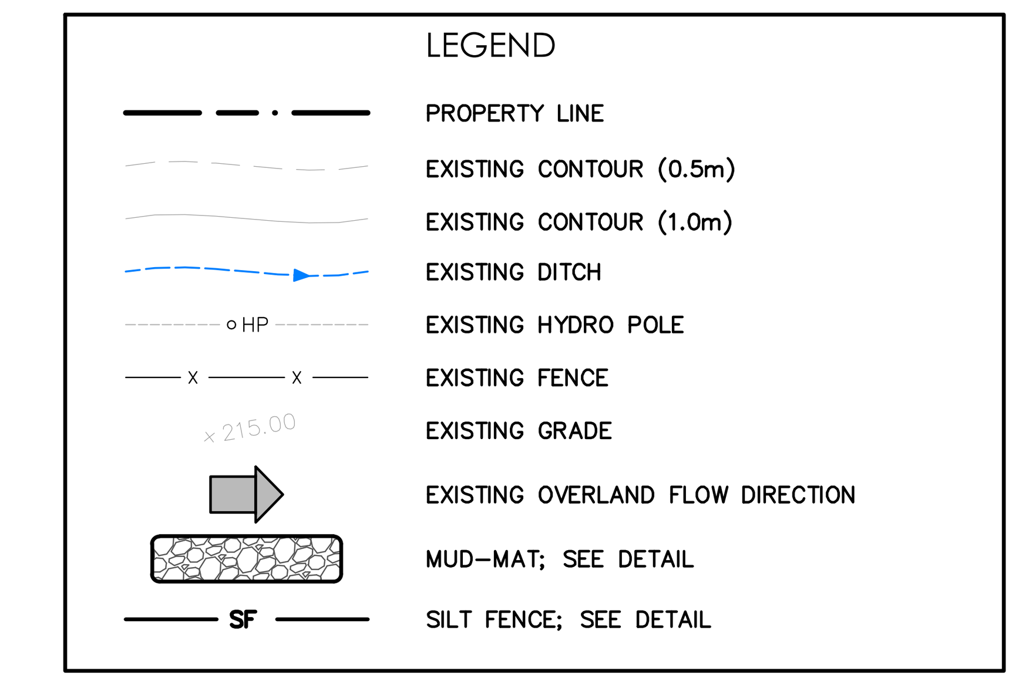












EXISTING UTILITIES AND SERVICES

CONTRACTOR SHALL NOTE THAT THE CONSTRUCTION ZONE HAS NUMEROUS EXISTING UNDERGROUND UTILITIES AND SERVICES, SOME OF WHICH ARE TO BE ABANDONED OR REMOVED, AND OTHERS WHICH ARE TO BE PROTECTED AND MAINTAINED IN SERVICE.

PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL RETAIN THE SERVICES OF A COMPANY, WHICH SPECIALIZES IN SUBSURFACE UTILITY ENGINEERING FOR THE PURPOSES OF LOCATING, MARKING AND SURVEYING ALL UNDERGROUND UTILITIES AND SERVICES. ALL CURRENT METHODS SHALL BE USED FOR THESE LOCATIONS INCLUDING ELECTRONIC METHODS, VACUUM EXCAVATIONS, SURVEYING MANHOLES AND CHAMBERS ETC.

THE UTILITIES AND SERVICES SHALL BE SURVEYED AND TIED INTO THE PROJECT COORDINATE SYSTEM. A COPY OF THE SURVEY SHALL BE PROVIDED TO THE ENGINEER FOR RECORD PURPOSES.

ANY CONFLICT WITH THE PROPOSED WORKS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL LOCATIONS FOR PROTECTION AND TEMPORARY RELOCATION OF UNDERGROUND UTILITIES AND SERVICES AS REQUIRED FOR THE COMPLETE INSTALLATION OF THE PROPOSED WORKS.

EROSION & SEDIMENT CONTROL NOTES:

1. EROSION & SEDIMENT CONTROL MEASURES MUST BE INSTALLED PRIOR TO THE COMMENCEMENT OF SITE WORKS.
2. EROSION & SEDIMENT CONTROLS MUST BE INSPECTED ON A REGULAR BASIS AND AFTER EVERY RAIN FALL EVENT, AND MUST BE MAINTAINED AND REPAIRED IN A TIMELY MANNER TO PREVENT SEDIMENT FROM LEAVING THE SITE.
3. EXISTING AND PROPOSED CATCHBASINS ARE TO BE PROTECTED WITH FILTER CLOTH AND 150mm OF 50mm STONE COVER DURING CONSTRUCTION.
4. IT IS REQUIRED TO STABILIZE ALL AREAS THAT WILL REMAIN DISTURBED FOR MORE THAN 30 DAYS.
5. MUD MAT, SILT FENCE, AND CATCHBASIN PROTECTION ARE NOT TO BE REMOVED UNTIL COMPLETION OF CONSTRUCTION.

NOTE:

ALL DISTURBED AREAS WITHIN MUNICIPAL RIGHT-OF-WAYS ARE TO BE REINSTATED TO EXISTING CONDITIONS OR BETTER

ALL DISTURBED AREAS TO BE RESTORED TO THE SATISFACTION OF THE CITY OF MISSISSAUGA AND REGION OF PEEL.

ALL REMOVED MATERIALS TO BE DISPOSED OF OFF-SITE.

THE REMOVAL/RELOCATION OF OF ELECTRICAL AND COMMUNICATION DUCTS, CABLES, ELECTRICAL POLES, LIGHT STANDARDS, GAS PIPES AND OTHER EX. UTILITIES TO BE COMPLETED PER ELECTRICAL DESIGN AND UTILITIES COMPANIES DESIGN.

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0	ISSUED FOR 1st SUBMISSION	2020/NOV/20

ELEVATION NOTE:

ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM THE CITY OF MISSISSAUGA BENCHMARK No. 075023031
ELEVATION = 169.073m

SURVEY NOTES:

SURVEY COMPLETED BY SPEIGHT, VAN NOSTRAND & GIBSON LMD. (2018/APR/22)
REFERENCE No.: 1-RCP 1542 PEEL
BEARINGS ARE UTM GRID, DERIVED FROM RTN OBSERVATIONS
UTM ZONE 17, NAD83 (GSRS) (2010.0)

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.9996781

SITE PLAN NOTES:

DESIGN ELEMENTS ARE BASED ON SITE PLAN BY COMPANY NICOLAS CARAGIANIS ARCHITECT INC.
DRAWING No.: A-100, REV.29 (2021/NOV/08)
PROJECT No.: 2018.0020

DRAWING NOTES:

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ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

Project

DYMON GROUP OF COMPANIES
3855-3915 DUNDAS STREET WEST
CITY OF MISSISSAUGA

Drawing

REMOVALS PLAN
EROSION & SEDIMENT CONTROL PLAN

NOT FOR CONSTRUCTION

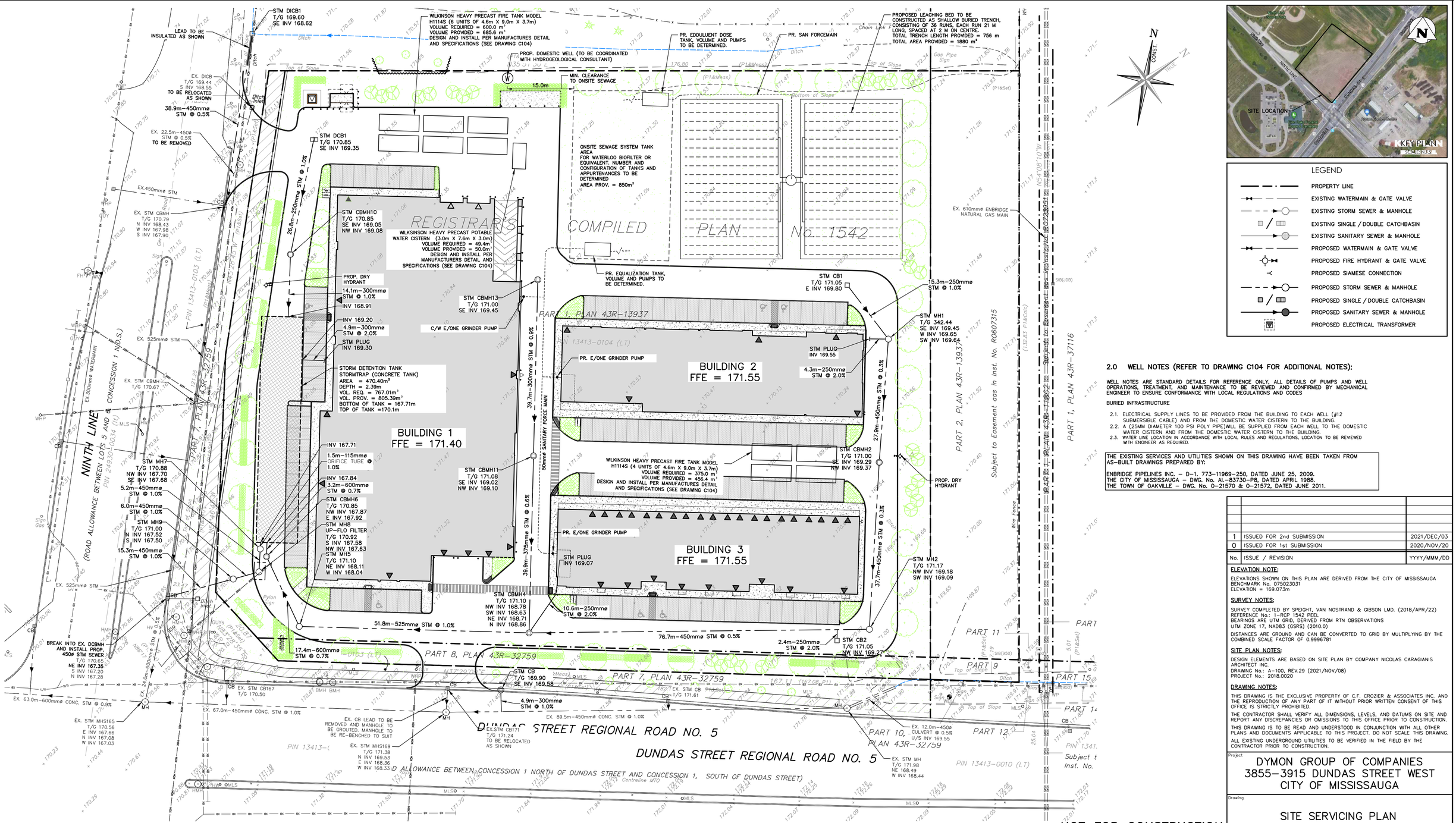
Stamp

LICENSED PROFESSIONAL ENGINEER
A. FARINA
100523860
DEC/03/2021
PROVINCE OF ONTARIO

Stamp

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 301
TORONTO, ON M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA

Drawn	D.B.	Design	A.D.F.	Project No.	1644-5477
Check	A.D.F.	Check	A.S.	Scale 1:500	Dwg. C 101



LEGEND

- PROPERTY LINE
- EXISTING WATERMAIN & GATE VALVE
- EXISTING STORM SEWER & MANHOLE
- EXISTING SINGLE / DOUBLE CATCHBASIN
- EXISTING SANITARY SEWER & MANHOLE
- PROPOSED WATERMAIN & GATE VALVE
- PROPOSED FIRE HYDRANT & GATE VALVE
- PROPOSED SIAMESE CONNECTION
- PROPOSED STORM SEWER & MANHOLE
- PROPOSED SINGLE / DOUBLE CATCHBASIN
- PROPOSED SANITARY SEWER & MANHOLE
- PROPOSED ELECTRICAL TRANSFORMER

2.0 WELL NOTES (REFER TO DRAWING C104 FOR ADDITIONAL NOTES):

WELL NOTES ARE STANDARD DETAILS FOR REFERENCE ONLY, ALL DETAILS OF PUMPS AND WELL OPERATIONS, TREATMENT, AND MAINTENANCE TO BE REVIEWED AND CONFIRMED BY MECHANICAL ENGINEER TO ENSURE CONFORMANCE WITH LOCAL REGULATIONS AND CODES

BURIED INFRASTRUCTURE

2.1. ELECTRICAL SUPPLY LINES TO BE PROVIDED FROM THE BUILDING TO EACH WELL (#12 SUBMERSIBLE CABLE) AND FROM THE DOMESTIC WATER CISTERN TO THE BUILDING.
2.2. A (25MM DIAMETER 100 PSI POLY PIPE)WILL BE SUPPLIED FROM EACH WELL TO THE DOMESTIC WATER CISTERN AND FROM THE DOMESTIC WATER CISTERN TO THE BUILDING.
2.3. WATER LINE LOCATION IN ACCORDANCE WITH LOCAL RULES AND REGULATIONS, LOCATION TO BE REVIEWED WITH ENGINEER AS REQUIRED.

THE EXISTING SERVICES AND UTILITIES SHOWN ON THIS DRAWING HAVE BEEN TAKEN FROM AS-BUILT DRAWINGS PREPARED BY:

ENBRIDGE PIPELINES INC. – D-1, 773-11969-250, DATED JUNE 25, 2009.
THE CITY OF MISSISSAUGA – DWG. No. AI.-83730-P8, DATED APRIL 1988.
THE TOWN OF OAKVILLE – DWG. No. O-21570 & O-21572, DATED JUNE 2011.

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Project
DYMON GROUP OF COMPANIES
3855–3915 DUNDAS STREET WEST
CITY OF MISSISSAUGA

Drawing
SITE SERVICING PLAN

NOT FOR CONSTRUCTION

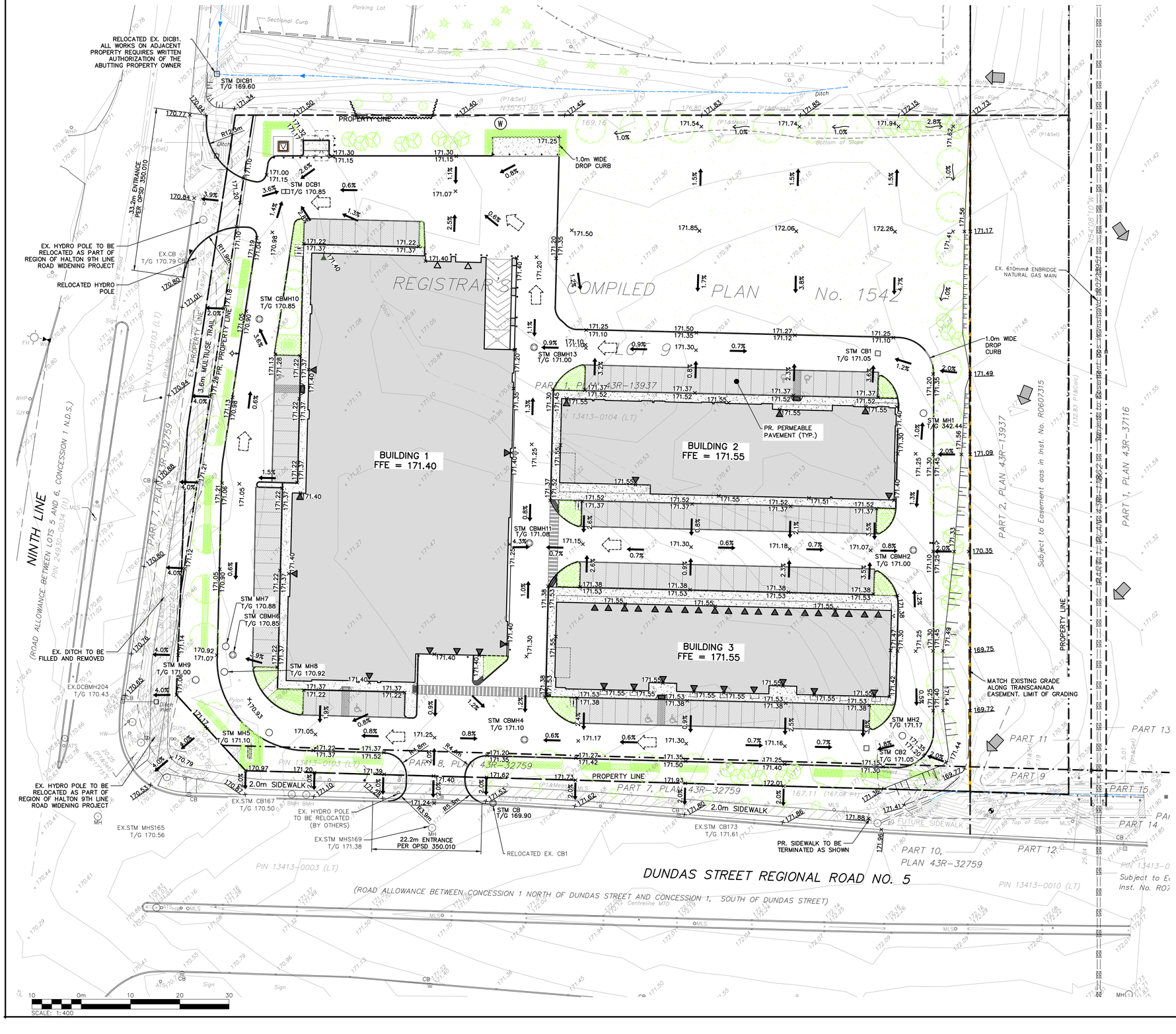
Stamp
LICENSED PROFESSIONAL ENGINEER
A. FARINA
100523860
DEC/03/2021
PROVINCE OF ONTARIO

Stamp

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 301
TORONTO, ON M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA

Drawn	D.B.	Design	A.D.F.	Project No.	1644–5477
Check	A.D.F.	Check	A.S.	Scale	1:400
				Dwg.	C 102

SCALE: 1:400



LEGEND

- PROPERTY LINE
- EXTENT OF GRADING WORKS
- EXISTING DITCH
- EXISTING FENCE
- x215.00 EXISTING GRADE
- x215.00 PROPOSED GRADE
- x215.00 PROPOSED GRADE (TO MATCH EXISTING)
- 2.0% PROPOSED MINOR FLOW DIRECTION
- PROPOSED SLOPE (3:1 MAX.)
- BUILDING ENTRANCE (PERSONNEL DOOR)
- BUILDING ENTRANCE (OVERHEAD DOOR)
- PROPOSED MAJOR OVERLAND FLOW DIRECTION
- EXISTING OVERLAND FLOW DIRECTION
- PROPOSED ELECTRICAL TRANSFORMER
- PROPOSED FIRE HYDRANT & GATE VALVE
- PROPOSED SIAMESE (FIRE DEPT.) CONNECTION
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED STORM MANHOLE
- EXISTING SINGLE / DOUBLE CATCHBASIN
- PROPOSED SINGLE CATCHBASIN
- PROPOSED CATCHBASIN MANHOLE

EASEMENT SUMMARY:

PART 1 & 2 – TRANSCANADA

PART 1–43R–11862 SUBJECT TO EASEMENT AS SET OUT IN INST. NO RO 723951

PART 2–43R–13937 SUBJECT TO EASEMENT AS IN INST. NO. R0607315

PART 7–43R–32759 – NINTH LINE ROAD WIDENING

PART 8–43R–32759 – DUNDAS STREET WEST ROAD WIDENING

NOT FOR CONSTRUCTION

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Project

DYMON GROUP OF COMPANIES
3855–3915 DUNDAS STREET WEST
CITY OF MISSISSAUGA

Drawing

SITE GRADING PLAN

Stamp

LICENSED PROFESSIONAL ENGINEER
A. FARINA
100523860
DEC/03/2021
PROVINCE OF ONTARIO

Stamp

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
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Drawn	Design	Project No.	
D.B.	A.D.F.	1644–5477	
Check	Check	Scale	Dwg.
A.D.F.	A.S.	1: 400	C 103

CONSTRUCTION NOTES:

1.0 GENERAL CONSTRUCTION

1.1 ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH CURRENT 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.
1.2 ALL TOPSOIL & EARTH EXCAVATION TO BE STOCK PILED ON-SITE OR REMOVED TO AN APPROVED SITE AS DIRECTED BY ENGINEER.
1.3 THE DEVELOPER'S CONTRACTOR SHALL BE RESPONSIBLE FOR THE DETAILED LAYOUT OF THE WORK. THE DEVELOPER'S ENGINEER WILL CONFIRM ALL BENCH MARK ELEVATIONS AND HORIZONTAL ALIGNMENT FOR THE DEVELOPER'S CONTRACTOR.
1.4 ALL PROPERTY BARS TO BE PRESERVED AND REPLACED BY O.L.S. AT DEVELOPER'S CONTRACTOR'S EXPENSE IF REMOVED DURING CONSTRUCTION.
1.5 THE DEVELOPER'S CONTRACTOR IS RESPONSIBLE TO NOTIFY ALL UTILITY COMPANIES PRIOR TO COMMENCING WORK & CO-ORDINATE CONSTRUCTION ACCORDINGLY.
1.6 THE LOCATION AND ELEVATION OF ALL EXISTING SERVICES AND UTILITIES ARE TO BE VERIFIED IN THE FIELD BY THE DEVELOPER'S CONTRACTOR. THE DEVELOPER'S CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESTORATION OF EXISTING UTILITIES DISTURBED DURING CONSTRUCTION.
1.7 ALL AREAS BEYOND THE SITE PLAN AND APPROVED DEVELOPMENT & SERVICING LIMITS WHICH ARE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE DEVELOPER'S EXPENSE.
1.8 ALL CONSTRUCTION SIGNING MUST CONFORM TO THE M.T.O. MANUAL OF "UNIFORM TRAFFIC CONTROL DEVICES".
1.9 ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT". THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE CONSTRUCTOR AS DEFINED IN THE ACT.
1.10 ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE DEVELOPER'S CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER.
1.11 ROAD AND BOULEVARD RESTORATION AS PER CITY OF MISSISSAUGA ROAD CUT PERMIT, DETAIL 2220.030.

2.0 OPEN CUT INSTALLATION & RESTORATION PER CITY OF MISSISSAUGA STANDARD NO. 2220.030

2.1 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.
2.2 AFTER BACKFILLING THE UTILITY TRENCH, A MIN. 300mm WIDE 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.
2.3 ASPHALT RESTORATION SHALL BE A MINIMUM OF 40mm HL-3 & 100mm MIN. DEPTH 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.
2.4 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 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.
2.5 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.
2.6 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)
2.7 WHERE THE CURB HAS BEEN UNDERMINED TO FACILITATE SANITARY AND WATER SERVICE & STORM SEWER 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.
2.8 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.

3.0 DRIVEWAYS

3.1 GRANULAR 'A' & 'B' BASE TO BE COMPACTED TO 98% OF THE MATERIAL'S RESPECTIVE SPMDD OR AS APPROVED BY GEOTECHNICAL ENGINEER.
3.2 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.
3.3 SUBGRADE TO BE PROOF ROLLED & CERTIFIED BY GEOTECHNICAL ENGINEER PRIOR TO PLACING GRANULAR MATERIAL.
3.4 DRIVEWAYS & PARKING LOT TO BE CONSTRUCTED AS PER RECOMMENDATIONS OF GEOTECHNICAL ENGINEER.
3.5 ALL GRANULAR AND ASPHALT MATERIAL PLACEMENT TO BE IN ACCORDANCE WITH OPSS 314 & OPSS 310.
3.6 ALL GRANULAR CONNECTIONS TO BE CONSTRUCTED IN ACCORDANCE WITH CITY OF MISSISSAUGA STANDARD 2220.050.
3.7 ALL CONCRETE SIDEWALKS TO BE CONSTRUCTED IN ACCORDANCE WITH CITY OF MISSISSAUGA STANDARD 2240.010.
3.8 ALL PEDESTRIAN SIDEWALK ENTRANCES AT INTERSECTIONS TO BE CONSTRUCTED IN ACCORDANCE WITH OPSD 350.010.

4.0 STORM SERVICES

4.1 BEDDING & EMBEDMENT MATERIAL TO BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MATERIAL'S SPMDD.
4.2 BEDDING & EMBEDMENT TO OPSD 802.010 (FLEXIBLE PIPE) GRANULAR 'A' EMBEDMENT.
4.3 SUMP PUMP SYSTEM TO BE INSTALLED PER OBC PART 7 AND DISCHARGED ABOVE GRADE TO GRASS.

ADDITIONAL NOTES:

1.1. ALL SURFACE DRAINAGE WILL BE SELF-CONTAINED, COLLECTED AND DISCHARGED AT A LOCATION TO BE APPROVED PRIOR TO THE ISSUANCE OF A BUILDING PERMIT.
1.2. THE PORTIONS OF THE DRIVEWAY WITHIN THE MUNICIPAL BOULEVARD WILL BE PAVED BY THE APPLICANT.
1.3. AT THE ENTRANCES TO THE SITE, THE MUNICIPAL CURB AND SIDEWALK WILL BE CONTINUOUS THROUGH THE DRIVEWAY AND A CURB DEPRESSION WILL BE PROVIDED FOR EACH ENTRANCE.
1.4. ALL PROPOSED CURBING WITHIN THE MUNICIPAL BOULEVARD AREA FOR THE SITE IS TO SUIT AS FOLLOWS: A) FOR ALL SINGLE FAMILY RESIDENTIAL PROPERTIES INCLUDING ON STREET TOWNHOUSES, ALL CURBING IS TO STOP AT THE PROPERTY LIMIT OR THE BACK OF THE MUNICIPAL SIDEWALK, WHICHEVER IS APPLICABLE, OR, B) FOR ALL OTHER PROPOSALS INCLUDING INDUSTRIAL, COMMERCIAL AND CONDOMINIUM DEVELOPMENTS, ALL ENTRANCES TO THE SITE ARE TO BE IN ACCORDANCE WITH O.P.S.D. 350.010.
1.5. ALL EXCESS EXCAVATED MATERIAL WILL BE REMOVED FROM THE SITE.
1.6. THE EXISTING DRAINAGE PATTERN WILL BE MAINTAINED EXCEPT WHERE NOTED.
1.7. THE APPLICANT WILL BE REQUIRED TO CONTACT ALL UTILITY COMPANIES TO OBTAIN ALL REQUIRED LOCATED PRIOR TO THE INSTALLATION OF BOARDING WITHIN THE [...CUT OFF...] NECESSITATED BY THE SITE PLAN.
1.8. PRIOR TO CONSTRUCTION TAKING PLACE, ALL REQUIRED HOARDING IN ACCORDANCE WITH THE ONTARIO OCCUPATIONAL HEALTH & SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS MUST BE ERECTED AND THEN MAINTAINED THROUGHOUT ALL PHASES OF CONSTRUCTION.
1.9. SHOULD ANY WORKS BE REQUIRED WITHIN THE MUNICIPAL RIGHT OF WAY, A ROAD OCCUPANCY PERMIT WILL BE REQUIRED. PUCC APPROVAL WILL BE REQUIRED." FOR FURTHER INFORMATION, PLEASE CONTACT THE PUCC/PERMIT TECHNOLOGIST, LOCATED AT 3185 MAVIS ROAD.
1.10. WORKS IN THE MUNICIPAL RIGHT-OF-WAY BEING PERFORMED BY THE CITY'S CONTRACTOR WILL REQUIRE 4 TO 6 WEEKS' NOTICE PRIOR TO COMMENCEMENT OF CONSTRUCTION AFTER ALL DRAWINGS HAVE BEEN APPROVED AND SECURITIES HAVE BEEN RECEIVED. THE APPLICANT IS TO INDICATE IN THEIR SUBMISSION PACKAGE FOR THE RIGHT-OF-WAY WORKS THE IDEAL TIMING FOR THESE WORKS TO BE CONSTRUCTED.
1.11. ALL DAMAGED OR DISTURBED AREAS WITHIN THE MUNICIPAL RIGHT-OF-WAY ARE TO BE REINSTATED AT THE APPLICANT'S EXPENSE. * ALL LANDSCAPING AND GRADING WITHIN CLOSE PROXIMITY TO THE PROPOSED ACCESS POINTS IS TO BE DESIGNED TO ENSURE THAT ADEQUATE SIGHT DISTANCES ARE AVAILABLE FOR ALL APPROACHING AND EXITING MOTORISTS AND PEDESTRIANS. * THE PORTION OF THE DRIVEWAY WITHIN THE MUNICIPAL BOULEVARD IS TO BE PAVED BY THE APPLICANT. * DRIVEWAY ACCESSES SHALL MAINTAIN A 1.5 M SETBACK FROM ABOVEGROUND FEATURES SUCH AS UTILITIES AND TREES. ANY ABOVE GROUND UTILITIES LOCATED WITHIN 1.5 M OF A PROPOSED ACCESS ARE TO BE RELOCATED AT THE APPLICANT'S EXPENSE.

WELL NOTES:

PUMPS

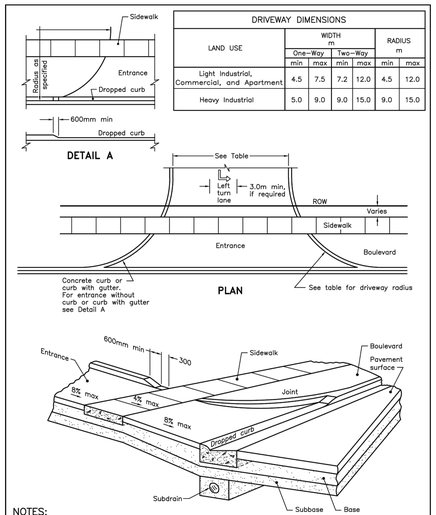
1. EACH OF THE TWO WELLS AND THE DOMESTIC WATER CISTERN SHOULD BE EQUIPPED WITH A 1/2HP 2 WIRE 230V GRUNDFOS 10SQ10-290 COMPLETE WITH FRANKLIN ELECTRIC MOTOR OR APPROVED EQUIVALENT.
2. ALTERNATIVELY, CONTRACTOR CAN REPLACE CISTERN PUMP WITH JET PUMP IN BUILDING.
3. BOTH WELL PUMPS TO BE INSTALLED WITH A BOSHART P100 BRASS PITLESS ADAPTER
4. ALL FITTINGS USED INT HE INSTALLATION OF THE PUMPING SYSTEM TO BE BRASS. NO GALVANIZED OR PLASTIC FITTING.
5. 25mm WATER LINES TO BE BURIED MINIMUM OF 2.0M BELOW FINAL GRADE AND COVERED WITH 25mm OF RIGID STYROFOAM INSULATION PRIOR TO BACKFILLING
6. 25mm WATER LINE FROM THE DRILLED WELL IS NOT TO BE INSTALLED BENEATH THE PAVED PORTION OF THE PARKING LOT, LINE SHOULD BE ROUTED SUCH THAT THE ENTIRETY OF THE WATER LINE IS BENEATH GRASS OR GRAVEL.

OPERATION

7. BORED WELL TO OPERATE ON A CONSTANT BASIS AT A MAXIMUM RATE OF 1.6 L/MIN. THE FLOW SHOULD BE CONTROLLED WITH A DOLE FLOW CONTROL VALVE PLUMBED INTO THE SYSTEM PER MANUFACTURERS DETAILS AND SPECIFICATIONS. THE BORED WELL SHOULD OPERATE 24/7 AND BE EQUIPPED WITH A HIGH WATER LEVEL SHUT OFF.
8. THE DRILLED WELL WOULD BE OPERATED WITH A HIGH/LOW LEVEL SHUTOFF LINKED TO THE DOMESTIC WATER CISTERN. THE SUPPLY PUMP FROM THE CISTERN TO THE BUILDING SHOULD OPERATE AS REQUIRED TO MEET THE DEMAND OF THE BUILDING. THE PRESSURE TANK SHOULD BE SET TO A 40/60 PSI LEVEL AND THE PRESSURE SWITCH WOULD WILL CALL FOR WATER FROM THE CISTERN ONCE THE SYSTEM PRESSURE DROPS BELOW 40PSI AND THEN SHUT OFF ONCE THE SYSTEM PRESSURE REACHES 60PSI.

TREATMENT

9. WE RECCOMEND USING A UV LIGHT AND PRE-FILTER TO TREAT DOMESTIC WATER. INSTALL PER MANUFACTURERS DESIGN AND SPECIFICATIONS.

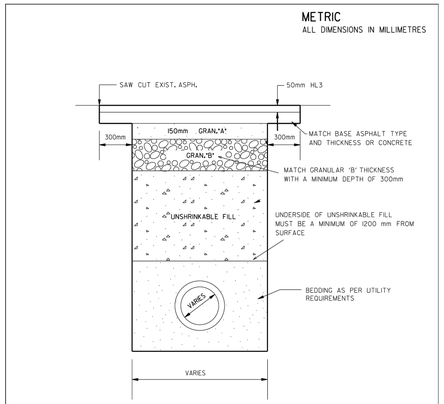


DRIVEWAY DIMENSIONS

LAND USE	WIDTH m				RADIUS m	
	One-Way		Two-Way			
	min	max	min	max	min	max
Light Industrial, Commercial, and Apartment	4.5	7.5	7.2	12.0	4.5	12.0
Heavy Industrial	5.0	9.0	9.0	15.0	9.0	15.0

NOTES:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 2
URBAN INDUSTRIAL, COMMERCIAL, AND APARTMENT ENTRANCES		OPSD 350.010

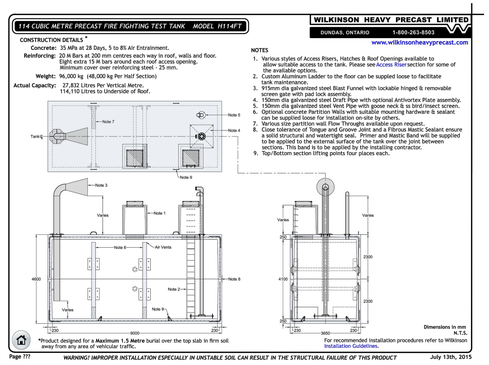


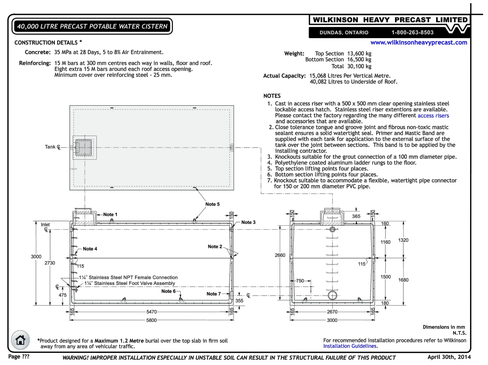
NOTES
1. ALL GRANULAR MATERIALS SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY AT OPTIMUM WATER CONTENT
2. UNSHRINKABLE FILL TO EXTEND FROM TOP OF UTILITY BEDDING TO BOTTOM OF GRANULAR "B"
3. SEE NOTES ON STD. 2220.032 FOR ADDITIONAL DETAILS
4. GRANULAR "A" TO BE OPSS 1010 - 19mm CRUSHER RUN LIMESTONE
5. GRANULAR "B" TO BE OPSS 1010 - TYPE 2 50mm CRUSHER RUN LIMESTONE

MISSISSAUGA

STANDARD
TRENCH RESTORATION FOR OPEN CUT UTILITY INSTALLATION UNDER ROADWAYS

EFF. DATE	2002-01-01	SCALE	N.T.S.
REV. 4	2018-06-27	STANDARD No.	2220.030





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REFERENCE No.: 1-RCP 1542 PEEL
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DRAWING No.: A-100, REV.29 (2021/NOV/08)
PROJECT No.: 2018.0020

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Project
DYMON GROUP OF COMPANIES
3855-3915 DUNDAS STREET WEST
CITY OF MISSISSAUGA

Drawing
NOTES AND STANDARD DETAILS

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 301
TORONTO, ON M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA

Drawn	D.B.	Design	A.D.F.	Project No.	1644-5477
Check	J.L.	Check	A.S.	Scale NTS	Dwg. C 104

ON-SITE SEWAGE CONSTRUCTION NOTES

GENERAL

1. PROPOSED SEWAGE SYSTEM CONSTRUCTION TO BE UNDERTAKEN IN ACCORDANCE WITH THE ONTARIO BUILDING CODE, ONTARIO MINISTRY OF ENVIRONMENT, AND THE MANUFACTURER'S RECOMMENDATIONS.
2. INSTALLATION OF ALL COMPONENTS OF THE SEWAGE SYSTEM TO BE COMPLETED BY A LICENSED AND REGISTERED ONSITE SEWAGE SYSTEM INSTALLER IN THE PROVINCE OF ONTARIO.
3. THE CONTRACTOR SHALL COORDINATE AND PAY FOR ALL NECESSARY INSPECTIONS WITH THE TOWN AND OTHER AUTHORITIES PERTAINING TO THE INSTALLATION OF THEIR WORK.
4. CONTRACTOR TO LOCATE ALL UNDERGROUND UTILITIES AND EXISTING SEWAGE WORKS PRIOR TO CONSTRUCTION.
5. ALL COMPONENT LOCATIONS SHALL BE FIELD VERIFIED WITH THE ENGINEER PRIOR TO INSTALLATION.
6. ALL EARTHWORKS, INCLUDING PLACEMENT OF FILL ARE TO BE UNDERTAKEN WITH TRACK MOUNTED EQUIPMENT TO KEEP COMPACTION TO A MINIMUM. KEEP ALL TRAFFIC IN THE AREA OF THE PROPOSED LEACHING BED TO A MINIMUM.
7. ALL TOPSOIL AND ORGANICS TO BE REMOVED FROM LEACHING BED AREA.
8. IF HIGH GROUNDWATER CONDITIONS ARE EVIDENT AT THE TIME OF CONSTRUCTION, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY. ALL VERTICAL CLEARANCE DISTANCES AS REQUIRED BY THE ONTARIO BUILDING CODE MUST BE MAINTAINED.
9. GRAVITY SEWERS TO HAVE MINIMUM 0.6 M COVER AND SHALL BE INSULATED WHERE LESS THAN 1.0M COVER IS PROVIDED. FORCEMAIN SHALL BE INSULATED WHERE LESS THAN 1.5 M COVER IS PROVIDED. BEDDING, COVER AND BACKFILL TO BE IN ACCORDANCE WITH OPSS.
10. UNLESS OTHERWISE NOTED PE FORCEMAIN TO BE HDPE SERIES 100 OR DR 13.5 PE AND PVC FORCEMAIN TO BE SCHEDULE 40. GRAVITY SEWERS TO BE SDR-35. FORCE MAIN TO BE PROVIDED WITH TRACER WIRE, SECURED TO THE TOP OF THE PIPE WITH WATER PROOF TAPE OR ZIP TIES.
11. ALL PIPES SUBJECT TO VEHICULAR TRAFFIC SHALL BE ADEQUATELY PROTECTED.
12. ALL METAL IN TANKS OR PUMP CHAMBERS TO BE GLAVANIZED OR STAINLESS STEEL
13. ALL JOINTS BELOW THE HIGH WATER LEVEL IN PRECAST TANKS TO BE SEALED WITH MASTIC SEALANT IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS FOR WATERTIGHT SEAL. ALL TANK INLETS AND OUTLETS TO BE EQUIPPED WITH CAST IN RUBBER BOOT FOR WATER TIGHT SEAL. UNLESS OTHERWISE NOTED ALL TANK INLETS AND OUTLETS TO BE EQUIPPED WITH TEES.
14. ALL TANKS TO BE PROVIDED WITH PRECAST CONCRETE OR PVC ACCESS RISERS TO GRADE. HATCHES TO BE BOLTED AND GASKETED AND ACCESSIBLE AT GRADE. ALL CIRCULAR HATCHES TO BE 600 MM DIAMETER POLYLOK RISER WITH CAST IN ADAPTOR. ALL SQUARE ACCESS OPENINGS TO BE EQUIPPED WITH CONCRETE RISERS. VENTED HATCHES TO BE PROVIDED ON TANKS CONTAINING PUMPS.
15. A TANK SHALL NOT BE COVERED BY SOIL OR LEACHING BED FILL HAVING A DEPTH GREATER THAN THE MAXIMUM DEPTH OF BURIAL THAT THE TANK IS DESIGNED TO WITHSTAND.
16. EXISTING SOILS SHALL BE SCARIFIED AT A RIGHT ANGLE TO THE DIRECTION OF LATERAL SEWAGE FLOW IN THE LEACHING BED PRIOR TO IMPORTING FILL OR INSTALLING DISTRIBUTION PIPE STONE LAYER.
17. WHEN THE IMPORTATION OF FILL IS REQUIRED, FILL SHOULD BE END-DUMPED AND GRADED PROGRESSIVELY OVER THE PREPARED SITE AREA WITH TRACK MOUNTED EQUIPMENT.
18. ALL ELEVATIONS TO BE VERIFIED PRIOR TO BACKFILL.
19. ALL FILL MATERIAL PLACED BENEATH TANKS TO BE COMPACTED TO 95%.
20. ALL DISTURBED AREAS TO BE TOPSOILED (100MM MINIMUM) AND SEEDED COMPLETE WITH FERTILIZER AND MULCH IN ACCORDANCE WITH OPSS
21. THE INSTALLING CONTRACTOR SHALL INSTALL THE SEWAGE SYSTEM USING A TRANSIT/LEVEL AND SHALL PROVIDE SAME FOR INSPECTION OF ANY COMPONENT.

TREATMENT UNITS

1. UNLESS OTHERWISE NOTED, ALL LEVEL IV TREATMENT UNITS SHALL BE PROVIDED FROM A MANUFACTURER THAT IS CERTIFIED BY CAN/BNQ 3680-600 TO PROVIDE A LEVEL OF TREATMENT IN ACCORDANCE WITH OBC TABLE 8.6.2.2PROVIDING AN EFFLUENT CRITERIA OF 10mg/L SUSPENDED SOLIDS, AND 10mg/L OF CBOD5.
2. ALL TREATMENT UNITS THAT CONTAIN MECHANICAL COMPONENTS SHALL BE EQUIPPED WITH AN AUDIBLE AND VISUAL WARNING ALARM, LOCATED TO WARN THE OCCUPANTS OF THE BUILDING SERVED OR THE OPERATOR OF THE TREATMENT UNIT OF A MALFUNCTION IN THE OPERATION OF THE TREATMENT UNIT.
3. THE CONTRACTOR WILL ENSURE THAT EVERY OPERATOR OF A TREATMENT UNIT SHALL OBTAIN, FROM THE MANUFACTURER OR DISTRIBUTOR OF THE TREATMENT UNIT, LITERATURE THAT DESCRIBES THE UNIT IN DETAIL AND PROVIDES COMPLETE INSTRUCTIONS REGARDING THE OPERATION, SERVICING, AND MAINTENANCE REQUIREMENTS OF THE UNIT AND ITS RELATED COMPONENTS NECESSARY TO ENSURE THE CONTINUED PROPER OPERATION IN ACCORDANCE WITH THE ORIGINAL DESIGN AND SPECIFICATIONS.
4. MAXIMUM BURIAL DEPTH OF TANKS NOT TO EXCEED TO MANUFACTURERS RECOMMENDATIONS

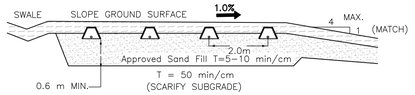
LEACHING BED

1. CLEARANCE DISTANCES FROM PROPERTY LINES, STRUCTURES, WELLS, AND SURFACE WATER WILL ADHERE TO THE REQUIREMENTS OF OBC 8.2.1.6.A
2. A LEACHING BED SHALL NOT BE LOCATED ON AN AREA WITH A SLOPE OF GREATER THAN 4 UNITS HORIZONTALLY TO 1 UNIT VERTICALLY.
3. THE HEADER LINE, DISTRIBUTION PIPES AND LEACHING BED SHALL BE EQUIPPED WITH MEANS OF DETECTION AS REQUIRED BY OBC 8.7.2.2. (2). LIGHT COLOURED PLASTIC COATED 14 GAUGE TRACER WIRE OR EPOXY COATED, 10m REBAR LAID HORIZONTALLY AT EACH CORNER OF THE BED IS ACCEPTABLE.
4. CHAMBERS TO BE INFILTRATOR EQUALIZER 24 OR APPROVED EQUIVALENT. CHAMBER TO INCLUDE END CAPS AS PROVIDED BY INFILTRATOR.
5. CHAMBERS TO BE EQUIPPED WITH MINIMUM 25 MM SCHEDULE 40 PVC PIPE PRE-DRILLED WITH 3 MM SIZE ORIFICE HOLES SPACED AT APPROXIMATELY 1 M ALONG LENGTH OF PIPE ON TOP OF PIPE. EVERY THIRD HOLE TO BE DRILLED THROUGH PIPE TO PROVIDE DRAINAGE.
6. PVC PIPE TO BE SUPPORTED OFF BOTTOM OF TRENCH WITH PIPE SUPPORTS OR PIPE STAKES.
7. END OF EVERY PVC TO BE EQUIPPED WITH A THREADED CAP ACCESSIBLE AT GRADE.
8. ALL IMPORTED SAND FILL TO HAVE A T-TIME OF 6 TO 10 MIN/CM AND SHALL BE VERIFIED IN WRITING BY A SOIL TESTING FIRM AND APPROVED BY THE ENGINEER PRIOR TO PLACEMENT.
9. PUMPS FOR SHALLOW BURIED TRENCH DOSING TO BE TIMED DOSED. DOSING INTERVAL TO BE MINIMUM HOURLY WITH ALL EFFLUENT DOSED TO BED OVER 24 HOUR PERIOD.
10. INSPECTIONS AT LEAST EVERY 36 MONTHS.

PUMPS AND CONTROLS

1. PUMP CHAMBER TO BE VENTED AND EQUIPPED WITH AUDIBLE AND VISUAL HIGH LEVEL ALARM
2. ALL VALVES TO PROVIDE NO OBSTRUCTION TO FLOW WHEN FULLY OPENED. ALL VALVES AND COUPLINGS TO BE ACCESSIBLE AT GRADE.
3. ALL PUMP FLOATS TO BE SECURED TO A REMOVABLE PVC FLOAT TREE
4. ALL PUMP CONTROL PANELS TO BE EQUIPPED WITH SEPARATE CIRCUIT BREAKERS FOR PUMP CIRCUIT
5. NO JUNCTION BOXES IN RISERS
6. ALL BURIED ELECTRICAL WIRING TO BE IN PVC CONDUIT
7. PRIOR TO ACCEPTANCE CONTRACTOR TO PROVIDE DOCUMENTATION THAT ALL ELECTRICAL WORK HAS BEEN INPSECTED AND APPROVED BY THE ELECTRICAL AUTHORITY HAVING JURISDICTION

TYPICAL SHALLOW BURIED TRENCH CROSS SECTION
SCALE N.T.S.



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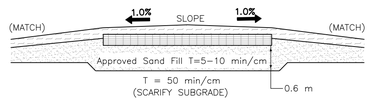
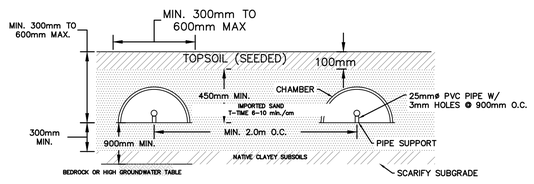
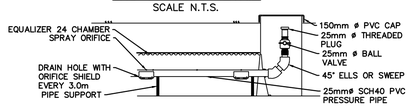


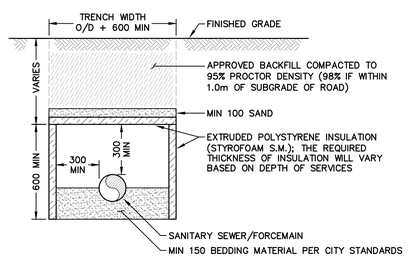
SHALLOW BURIED TRENCH DETAIL
SCALE N.T.S.



END OF PORT DETAIL
SCALE N.T.S.



INSULATION FOR SHALLOW SANITARY SERVICES
SCALE: N.T.S.



NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. 50mm OF INSULATION IS REQUIRED FOR EVERY 600mm OF COVER DEFICIENCY.
3. MINIMUM COVER REQUIREMENTS;
   - SANITARY SEWER 1.0m

No.	ISSUE / REVISION	YYYY/MMM/DD
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BENCHMARK No. 07502031
ELEVATION = 169.073m

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PROJECT No.: 2018.0020

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Project
DYMON GROUP OF COMPANIES
3855-3915 DUNDAS STREET WEST
CITY OF MISSISSAUGA

Drawing
ONSITE SEWAGE SYSTEM NOTES AND STANDARD DETAILS

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Stamp

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CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 301
TORONTO, ON M5B 1M4
416-477-3392 T
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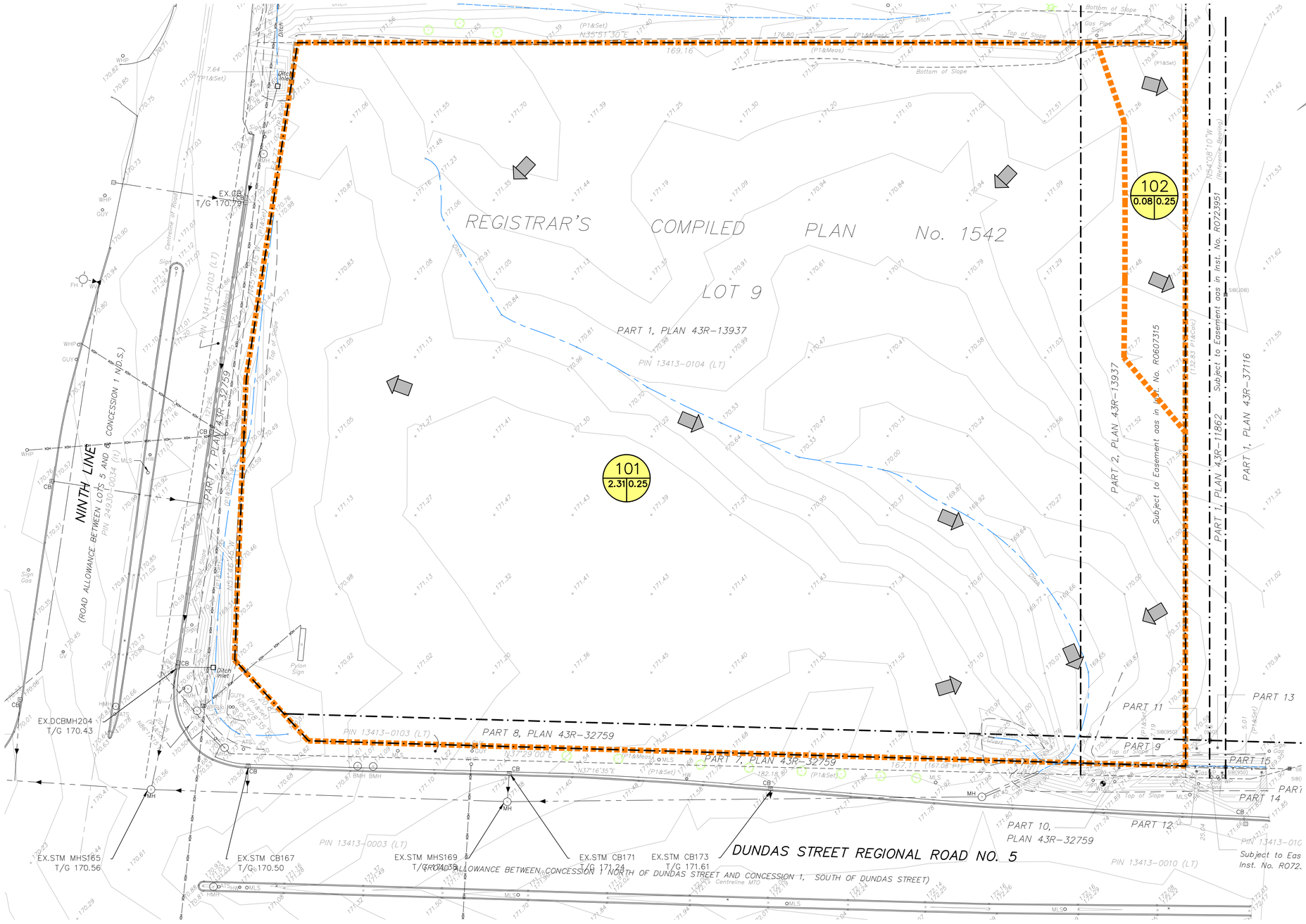
Drawn	D.B.	Design	A.D.F.	Project No.	1644-5477
Check	J.L.	Check	A.S.	Scale NTS	Dwg. C 105

FIGURES



LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (0.5m)
- EXISTING CONTOUR (1.0m)
- EXISTING DITCH
- EXISTING GRADE
- EXISTING OVERLAND FLOW DIRECTION
- PRE-DEVELOPMENT STORM DRAINAGE CATCHMENT
- CATCHMENT I.D.
- AREA (ha) | RUNOFF COEFFICIENT

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3855–3915 DUNDAS STREET WEST
CITY OF MISSISSAUGA

Drawing

PRE-DEVELOPMENT DRAINAGE PLAN

NOT FOR CONSTRUCTION

Stamp

Stamp

10 0m 10 20 30
SCALE: 1:400

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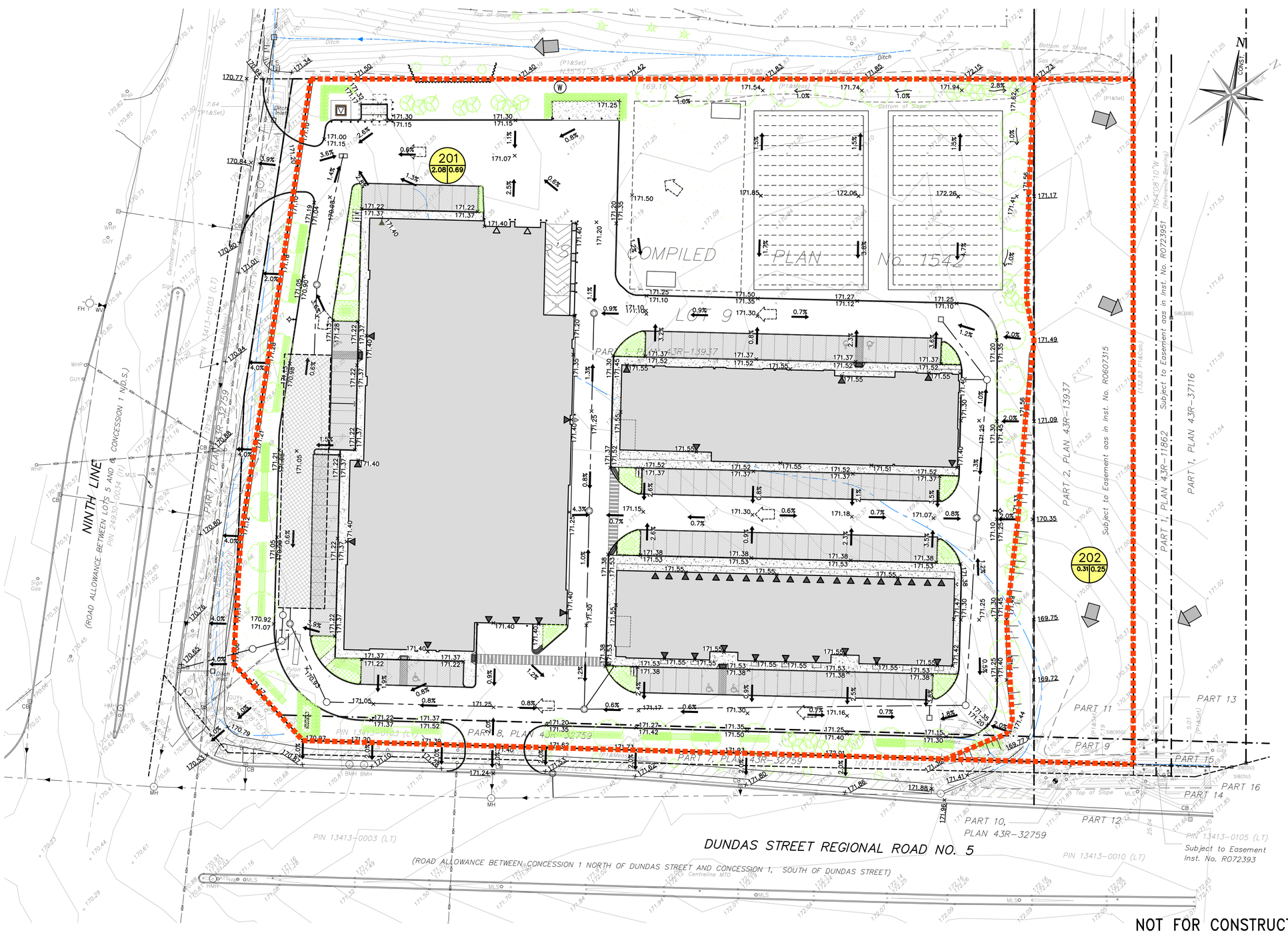
Drawn	Design	Project No.	
D.B.	A.D.F.	1644-5477	
Check	Check	Scale	Dwg.
A.D.F.	A.S.	1:400	FIG 1



LEGEND

- PROPERTY LINE
- EXISTING STORM SEWER & MANHOLE
- EXISTING SINGLE / DOUBLE CATCHBASIN
- PROPOSED STORM SEWER & MANHOLE
- PROPOSED SINGLE / DOUBLE CATCHBASIN
- PROPOSED MAJOR OVERLAND FLOW DIRECTION
- EXISTING OVERLAND FLOW DIRECTION
- POST-DEVELOPMENT STORM DRAINAGE CATCHMENT
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DYMON GROUP OF COMPANIES
3855-3915 DUNDAS STREET WEST
CITY OF MISSISSAUGA

Drawing

POST-DEVELOPMENT DRAINAGE PLAN

NOT FOR CONSTRUCTION

Stamp

Stamp

SCALE: 1:400

CROZIER CONSULTING ENGINEERS
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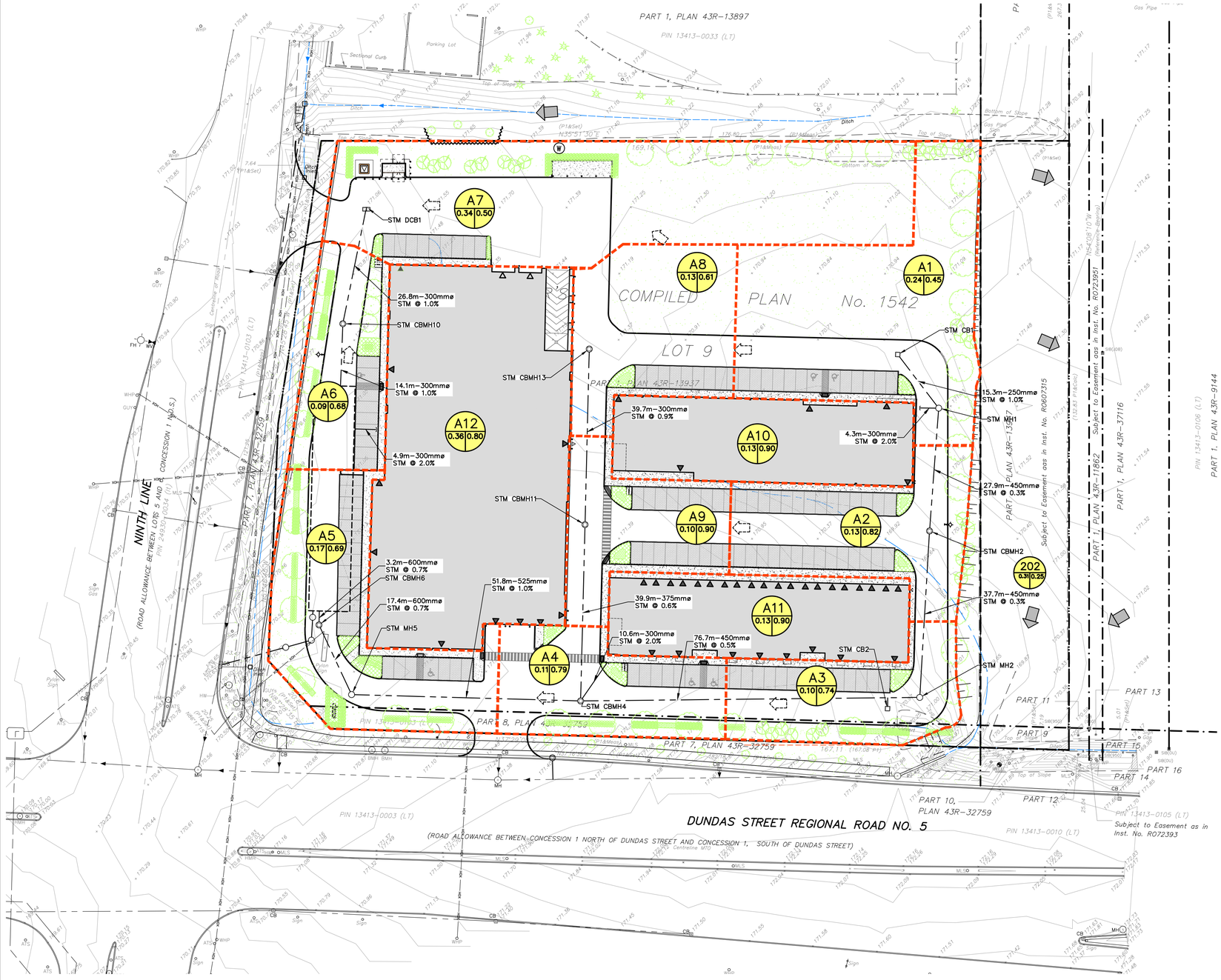
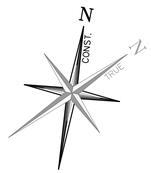
Drawn	Design	Project No.	
D.B.	A.D.F.		1644-5477
Check	Check	Scale	Dwg.
A.D.F.	A.S.	1:400	FIG 2





LEGEND

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- EXISTING DITCH
- EXISTING GRADE (x 215.00)
- EXISTING OVERLAND FLOW DIRECTION
- INTERNAL STORM AREA DRAINAGE
- CATCHMENT I.D. (ID / A | RC)
- AREA (ha) | RUNOFF COEFFICIENT

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0	ISSUED FOR 1st SUBMISSION	2020/NOV/20

ELEVATION NOTE:

ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM THE CITY OF MISSISSAUGA BENCHMARK No. 07502303I
ELEVATION = 169.073m

SURVEY NOTES:

SURVEY COMPLETED BY SPEIGHT, VAN NOSTRAND & GIBSON LMD. (2018/APR/22)
REFERENCE No.: 1-RCP 1542 PEEL
BEARINGS ARE UTM GRID, DERIVED FROM RTN OBSERVATIONS
UTM ZONE 17, NAD83 (GSRS) (2010.0)

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.9996781

SITE PLAN NOTES:

DESIGN ELEMENTS ARE BASED ON SITE PLAN BY COMPANY NICOLAS CARAGIANIS ARCHITECT INC.
DRAWING No.: A-100, REV.29 (2021/NOV/08)
PROJECT No.: 2018.0020

DRAWING NOTES:

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

DYMON GROUP OF COMPANIES
3855-3915 DUNDAS STREET WEST
CITY OF MISSISSAUGA

Drawing

INTERNAL STORM AREA DRAINAGE PLAN

NOT FOR CONSTRUCTION

Stamp

Stamp

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 301
TORONTO, ON M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA

Drawn	Design	Project No.	
D.B.	A.D.F.	1644-5477	
Check	Check	Scale	Dwg.
A.D.F.	A.S.	1: 400	FIG 3