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 600
TORONTO, ON M5B 1M4

SEPTEMBER 2023

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
Rev. 2	September 27, 2023	Third Submission Issued for ZBA and SPA

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

LIST OF DRAWINGS

LIST OF FIGURES

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) and Site Plan Application (SPA) 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 July 2010).
    - Public Works Linear Wastewater (published March 2023).
    - Public Works Stormwater Design Criteria and Procedural Manual (dated June 2019).
- 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 Global Architect Inc., dated July 31 2023, consists of one (1) proposed 4-storey building with a total gross-floor area (GFA) of 26,102 m^2. The first floor of the building will be a mixed-use space consisting industrial condos, an interior loading area, office, storage, and commercial space. The second to fourth floors will consist of office and storage spaces. There will be one (1) level of underground parking accessible from the ramp on the east side of the building. Vehicular access to the Site will be accessed via one (1)access point from Ninth Line.

3.1 Population Estimate

A design population of 154 for the proposed building was estimated using population equivalents based on the Region Sanitary Sewer Design Criteria Section 2.1 and in accordance with the proposed GFA per use of each floor. **Table 1** below summarizes the proposed population for the subject property.

Table 1: Estimated Population

Floor	Land Use	GFA (ha)	Population Density (capita/ha)	Population
First	Industrial (Condos)	0.12	70	9
	Loading	0.15	-	0
	Commercial	0.14	50	7
	Storage	0.19	70	13
	Office	0.07	50	4
Second	Storage	0.45	70	31
	Office	0.19	50	9
Third	Storage	0.47	70	33
	Office	0.19	50	9
Fourth	Storage	0.46	70	32
	Office	0.12	50	6
Total	**-**	**2.55**	**-**	**154**

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 development. The calculated design flows are based on the building's floor plate areas 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	Occupancy Type	Unit Type	Number of Units	Flow (L/unit/day)	Flow (L/day)
OBC (Table 8.2.1.3.B)	Industrial (condos)	per Water Closet	11	950	10,450
	Industrial (loading area)	per Loading Bay	2	150	300
	Office	per 9.3 m^2	433.13	75	32,485
	Retail	per 1m^2	980	5	4,899
				Total Site	**48,134**

Based on the design sewage flow demonstrated in **Table 2**, the septic system must accommodate a daily sewage flow of 48,134 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 proposed development. Based on the design sewage flow of 48,135 L/day, a treatment unit complete with an anaerobic digester is required. The anaerobic digester unit will provide pre-treatment for sewage flows.

Two (2) shallowed buried trench (SBT) septic systems with a total footprint of 2440.60 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 the leaching chamber for the SBT design was designed as 972 m in accordance with OBC Table 8.7.3.1 and based on a design percolation time of 50 min. This design percolation time is conservative given the soil conditions (clayey silty till) per the Hydrogeological Investigation report by Fisher Environmental Ltd. dated July 26, 2023. 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. Refer to the Hydrogeological Investigation prepared by Fisher Engineering dated July 26, 2023 for additional details regarding surrounding well capacities.

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	Average Day (L/s)	Max Day (L/s)	Peak Hour (L/s)
Region of Peel[1]	0.53	0.75	1.60

[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 0.53 L/s. The maximum daily and peak hourly water demand for the proposed development were estimated to be 0.76 L/s and 1.62 L/s based on peaking factors of 1.4 and 3.0, respectively. The required domestic water volume for the Site was established based on the average day demand over a one-day period, the required domestic water volume to be provided to the building is 46.20 m^3. 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 proposed building. Flow requirements were calculated based on the footprint and gross floor area of the largest floor plus 25% of each of the two immediately adjoining floors, fire-resistive building construction, combustible building occupancy, and the installation of automated 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	Demand Flow (L/s)	Duration (h)	Required Volume (m^3)
Fire Underwriters Survey	133	2.00	960

The proposed fire suppression service is required to supply a fire flow of approximately 133 L/s for a duration of 2 hours (cistern volume of 960m^3) for the proposed building.

Preliminary design coordination was also completed with the project's sprinkler designer to estimate the building's required fire suppression volume. Based on typical Dymon Storage facilities and considering a 2-hour duration, the estimated fire water supply for the sprinkler demand is 763.14 L (201,600 gallons). As this estimated fire water supply is less than the estimated FUS volume, the design volume required to be provided to the building is 960 m^3. Refer to Appendix B for the preliminary design coordination correspondence with Superior Sprinkler.

Wilkinson cisterns (Precast Fire Fighting Tank) is proposed to meet the required fire supply volume. Nine (9) cisterns are proposed to provide a total fire flow volume of 1,027 m^3. The cistern 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. Refilling of the fire water cisterns will be required to adhere to NFPA 22 chapter 4. Based on the required volume, manually filling of the tank within maximum of 8 hours is required per NFPA 4.2.1.4. The location of the proposed cisterns and dry hydrants surrounding the building is illustrated on **Drawing C102**.

Note that the Fire Underwriters Survey value is a conservative estimate for comparison purposes only. The Mechanical Engineer and Sprinkler Designer 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 is serviced by a domestic well following the precedence set by the neighbouring sports park and tennis facility further north. Based on the Hydrogeological investigation prepared by Fisher Engineering dated July 26, 2023, the report's findings under section 8.0 provide further confirmation that the surrounding well records confirm that the sub-surface conditions has the capacity to provide the required domestic water demands.

The proposed well should be a minimum of 15 m from the proposed septic area. A potable water cistern will provide the necessary volume to meet average daily, maximum daily, and peak hourly water demands. Refer to **Drawing C 102 and Drawing C 104** for further details on the location of the proposed water servicing infrastructure.

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	23,050	0.25	0.25
		Impervious	0.00	-	0.9	0.00
		Sub total	**2.31**	**23,050**	**-**	**0.25**
102	Overland flow to existing 600 mm storm sewer on Dundas Street West	*Pervious*	0.08	819	0.25	0.25
		Impervious	0.00	-	0.9	0.00
		Sub total	**0.08**	**819**	**-**	**0.25**
		Total Site	**2.39**	**23,868**	**-**	**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 the proposed building, 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 concrete storage tank and discharged at a controlled rate to the municipal storm sewer. Refer to **Appendix C** and **Figure 3** for the on-site storm sewer sizing results.

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 (Controlled)	*Pervious*	0.54	5,421	0.25	0.07
	Impervious	1.38	13,800	0.9	0.60
	Permeable Pavers	0.13	1,298	0.5	0.04
	Total	**2.05**	**20,519**	**-**	**0.70**
202 (Uncontrolled)	*Pervious*	0.31	3,060	0.25	0.25
	Impervious	0.00	0	0.9	0.00
	Total	**0.31**	**3,060**	**-**	**0.25**
	Total Site	**2.36**	**23,579**	**-**	**0.64**

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	0.70	0.25
5 yr			
10 yr			
25 yr	1.10	0.77	0.28
50 yr	1.20	0.84	0.30
100 yr	1.25	0.88	0.31

6.3 Groundwater Drainage Conditions

As previously stated, A Hydrogeological Investigation for the subject site was completed by Fisher Engineering Inc. dated July 26, 2023 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 170.01 masl (0.40 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) – 47.8 m^3/day (including a safety factor of 1.5).

- Long-Term (Post-Construction) – 7.2 m^3/day (including a safety factor of 1.5).

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					
		Uncontrolled	Controlled				
	Q_{pre}	$Q_{post-202}$	Q Design target	$Q_{post-201}$	Total Q_{post}		
2 yr	99.35	12.74	86.62	31.58	44.32	229.53	283.32
5 yr	128.98	17.12	82.23	37.09	54.21	325.36	379.36
10 yr	158.86	21.09	78.26	41.88	62.97	414.19	475.39
25 yr	200.70	26.64	72.71	46.18	72.82	550.30	571.43
50 yr	244.40	32.44	66.91	51.96	84.40	692.38	715.49
100 yr	291.73	37.40	61.95	57.32	94.72	817.41	856.34

The post-development peak flow rates satisfy the quantity control criteria by not exceeding the 2-year pre-development peak flow rate for all storm events. A maximum storage volume of 817.4 m^3 for the 100-year event is required. To provide the necessary site storage, an underground concrete storage (Cupolex) tank has been proposed within the parking lot area, west of proposed building. The proposed Cupolex tank will have a maximum storage capacity of 856.34m^3, which is sufficient to control the 100-year post-development storm flow to the 2-year pre-development storm flow. Major overland flow from the site is proposed to discharge overland through the proposed entrance at 9th line. Refer to drawing **C102** and **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. 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 (Controlled)	Impervious	13,800	5	69.0
	Pervious	5,421		27.1
	Permeable Pavers	1,298		6.5
Catchment 202 (Uncontrolled)	Impervious	0		0.0
	Pervious	3,060		15.3
Site Total		**23,791**	**117.9**	**117.9**

Permeable pavers (Ecoraster) are proposed in all parking stalls in order to achieve the volume retention requirement of 117.9 m^3. An area of 1,298 m^2 will be covered with permeable pavers. Accounting for a bedding depth of 250 mm and a void ratio of 0.4 for clear stone, a retention volume of 129.8 m^3 is achieved. Refer to **Drawing C102** with detailed design calculations and permeable paver documentation 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 48,134 L/day. A private sewage system is proposed. This includes a shallow buried trench septic system with a Waterloo Biofilter system or equivalent to for treatment.
2. The peak hour domestic water demand is 1.60 L/s for the proposed development. A volume of 46.2 m^3 is required to supply the average domestic demand. A volume of 50.0 m^3 is provided in an underground cistern (Wilkinson Heavy Precast).
3. The estimated fire flow demand for the proposed building is 133 L/s at a duration for 2.00 hours and total maximum volume of 960 m^3. 9 Wilkinson Heavy Precast Limited cisterns (Model H114FT Precast Fire Fighting Test Tank) are proposed to meet the required volume.
4. Stormwater quantity control criteria is satisfied by a proposed underground concrete stormwater tank (Cupolex). A 125 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.
5. Stormwater quality control criteria is satisfied by use of an Up-Flo Filtration system providing 80% TSS removal.
6. Site water balance is achieved via permeable pavers and permeable landscaped areas providing a volume of 129.8 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 Amendment and Site Plan Application for the development of the subject lands from the perspective of site servicing and stormwater management requirements.

We trust that this functional servicing and 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.

Andrew Farina, P.Eng.
Project Manager

C.F. CROZIER & ASSOCIATES INC.

Vishal Monapara, EIT
Engineering Intern

ADF/nk

N:\1600\1644-Dymon Capital Corp\5477 - 3855 Dundas St. E\Reports\Third Submission\5477_FSRSWM_ThirdSub.docx

APPENDIX A

Sanitary Demand Calculations

ONSITE SEWAGE SYSTEM CALCULATION SHEET

Project Name: 3855 Dundas Street **Date:** 2023-09-10
Project Number: 1644-5477 **Designed By:** DJC
Checked By: ADF/KR

User Input

Occupancy Per Table 8.2.1.3.B of OBC	Unit Flow rate L/day	Office Area
Occupancy Office Building		
Total Usuable Area m2		4028.16
Number of employees or	75	30.00
-	0	
per 9.3m2 Office Space	75	433.13
Sewage Flow L/day		32485

Offica Area	
Floor	Area (m2)
Ground	745
2	1,880
3	1,880
4	1,249
Total (ft^2)	**61,941**
Total (m^2)	**5,755**
70% usage	**4,028**

Occupancy Per Table 8.2.1.3.B of OBC	Unit Flow rate L/day	Warehouse Area
Occupancy Warehouse		
Total Useable Area m2		1231.00
Number of watercloset and	950	11
Number of loading bay	150	2
-	0	0
Sewage Flow L/day		10750

Warehouse Area	
Floor	Area (m2)
Ground	4,614
2	4,703
3	4,703
4	4,292
Total (ft^2)	**197,106**
Total (m^2)	**18,312**
70% usage	**12,818**

Occupancy Per Table 8.2.1.3.B of OBC	Unit Flow rate L/day	Retail Area
Occupancy Store		
Total Usuable Area m2		980
Number of watercloset or	1230	3
-	0	
per 1m2 of Floor Area	5	980
Sewage Flow L/day		4899

Retail Area	
Floor	Area (ft2)
1	1,400
Total (ft^2)	**15,065**
Total (m^2)	**1,400**
70% usage	**980**

Soil Conditions	
T= 50	min/cm

Total Peak sewage Flow (L/day)	**48,134**

Option # 1 - Type A Dispersal Bed			**Minimum Treatment Size**
Stone area required =	963 m^2	(Q/50)	48,500 L
Sand area required =	6017 m^2	(QT/400)	
Option # 2 - Shallow Buried Trench			
Pipe Length =	963 m	(Q/50)	Pump always Required
Number of runs	31		
Length of runs	16.2 m	**Compliance**	**Min Area Required**
Total Length of Pipe	502.2 m	Yes	1128.4 m2

Number of runs	20		
Length of runs	24.3 m	**Compliance**	**Min Area Required**
Total Length of Pipe	486 m	Yes	1052 m2

APPENDIX B

Water Demand Calculations

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

CREATED BY: DJC
CHECKED BY: ADF

DATE: 2023-07-25
UPDATED: 2023-09-15

Proposed Water Demand Calculations - 3855 Dundas Street

Site Statistics:

Floor	Land Use	Area (ha)	Population Density	Units	Population
First	Industrial (Condos)	0.12	70	capita/ha	9
	Loading	0.15	0	capita/ha	0
	Commercial	0.14	50	capita/ha	7
	Storage	0.19	70	capita/ha	13
	Office	0.07	50	capita/ha	4
Second	Storage	0.45	70	capita/ha	31
	Office	0.19	50	capita/ha	9
Third	Storage	0.47	70	capita/ha	33
	Office	0.19	50	capita/ha	9
Fourth	Storage	0.46	70	capita/ha	32
	Office	0.12	50	capita/ha	6
Total	**-**	**2.55**	**-**	**-**	**154**

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)

Design Parameters:

ICI Average Demand (L/capita/day)
300

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

Water Demand:

Average Daily Demand =	46,205	L/day
	0.53	**L/s**
Peaking Factors		
Max Day =	1.4	
Peak Hour =	3.0	
Average Day =	0.53	L/s
Max Day =	**0.75**	**L/s**
Peak Hour =	**1.60**	**L/s**

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

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	Mixed Use Building	0.53	0.75	1.60	46.20	50.00

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

3855 Dundas Street West
Fire Protection Volume Calculation
CFCA File: 1644-6147

5-Aug-2023
Completed By: ADF

Water Supply for Public Fire Protection - 2020
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flows for Public Fire Protection in Canada

1. Required Fire Flows

To determine the estimated amount of water required to confine and control a fire in a building or group of buildings, Fire Underwriter Survey uses the following formula

RFF = 220 * C * sqrt A

where

RFF = the required fire flow in litres per minute (L/min)
C = coefficient related to the type of construction
= 1.5 for Type V Wood Frame Construction
= 0.8 for Type IV-A Mass Timber Construction
= 0.9 for Type IV-B Mass Timber Construction
= 1.0 for Type IV-C Mass Timber Construction
= 1.5 for Type IV-D Mass Timber Construction
= 1.0 for Type III Ordinary Construction
= 0.8 for Type II Noncombustible Construction
= 0.6 for type I Fire Resistive Consturction
A = The total effective floor area (effective building area) in square meters of the building

Scenario 2 - a : 2 largest ajoining floor areas + 50% of all floors above to a max of 8 floors

Proposed Building Statistics — Type I Fire Resistive Construction — 0.6 C

FLOOR	GFA (m^2)	
1	7,394.40	
2	3,291.65	50% of total GFA
3	3,291.65	50% of total GFA
Total Efffective Area	**13,977.70**	**m^2**

Therefore RFF= 16,000 L/min (rounded to nearest 1000 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. Occupency and Contents Ajdustment Factor

The required fire flow may be reduced by as much as -25% for occupancies having contents with very low fire hazard or may be increased by up to 25% for occupancies having contents with high fire hazard. The occupancy and contents adjustment factor should not be made at greater than 25% or less than -25%

Non-Combustible	-25%	Free Burning	15%
Limited Combustible	-15%	Rapid Buring	25%
Combustible	No Charge		

Combustible	0% reduction

0 L/min reduction

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

Water Supply for Public Fire Protection - 2020
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flows for Public Fire Protection in Canada

3. Automatic Sprinkler Protection

The required fire flow maybe reduced by up to 50% for complete Automatic Sprinkler Protection depending upon adequacy of the system. Where only part of a building is protected by Automatic Sprinkler Protection, Credit should be interpolated by determining the percentage of the Total Floor Area being protected by the automatic sprinkler system.

Buildings will have automatic sprinklers designed and installed in accordance with NFPA 13 (typical 30% reduction)
8,000 L/min reduction

4. Exposure Adjustment Charge:

A percentage of water for the exposures should be added to the required fire flow for the subject building to provide adequate flow rates for hose streams used to reduce the spreading of fire from the subject building exposed to exposed risks. The required fire flow of a subject building may be increased depending on the severity of exposed risks to the subject building and the distance between the exposed risks and the subject building. This charge considers the usage of water supplies to prevent exposed risks from igniting or being damaged during a major fire incident in the subject building

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	30.1 to 45 m	5%
10.1 to 20 m	15%		

Exposed buildings

Name		**Distance (m)**		
North	Adjacent Dwelling	0	0%	0
South	Adjacent commercial	0	0%	0
East	Adjacent Dwelling	0.0	0%	0
West	n/a	0.0	0%	0

0 L/min Surcharge

Determine Required Fire Flow

No.1	16,000	
No. 2	0	reduction
No. 3	8,000	reduction
No. 4	0	surcharge
Required Flow:	**8,000 L/min**	
Rounded to nearest 1000l/min:	**8,000 L/min**	or **133.3 L/s**
		2,113 USGPM

Fire suppression storage volume required: **960 m^3** 8,000 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

114 CUBIC METRE PRECAST WASTEWATER HOLDING TANK MODEL H114S

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

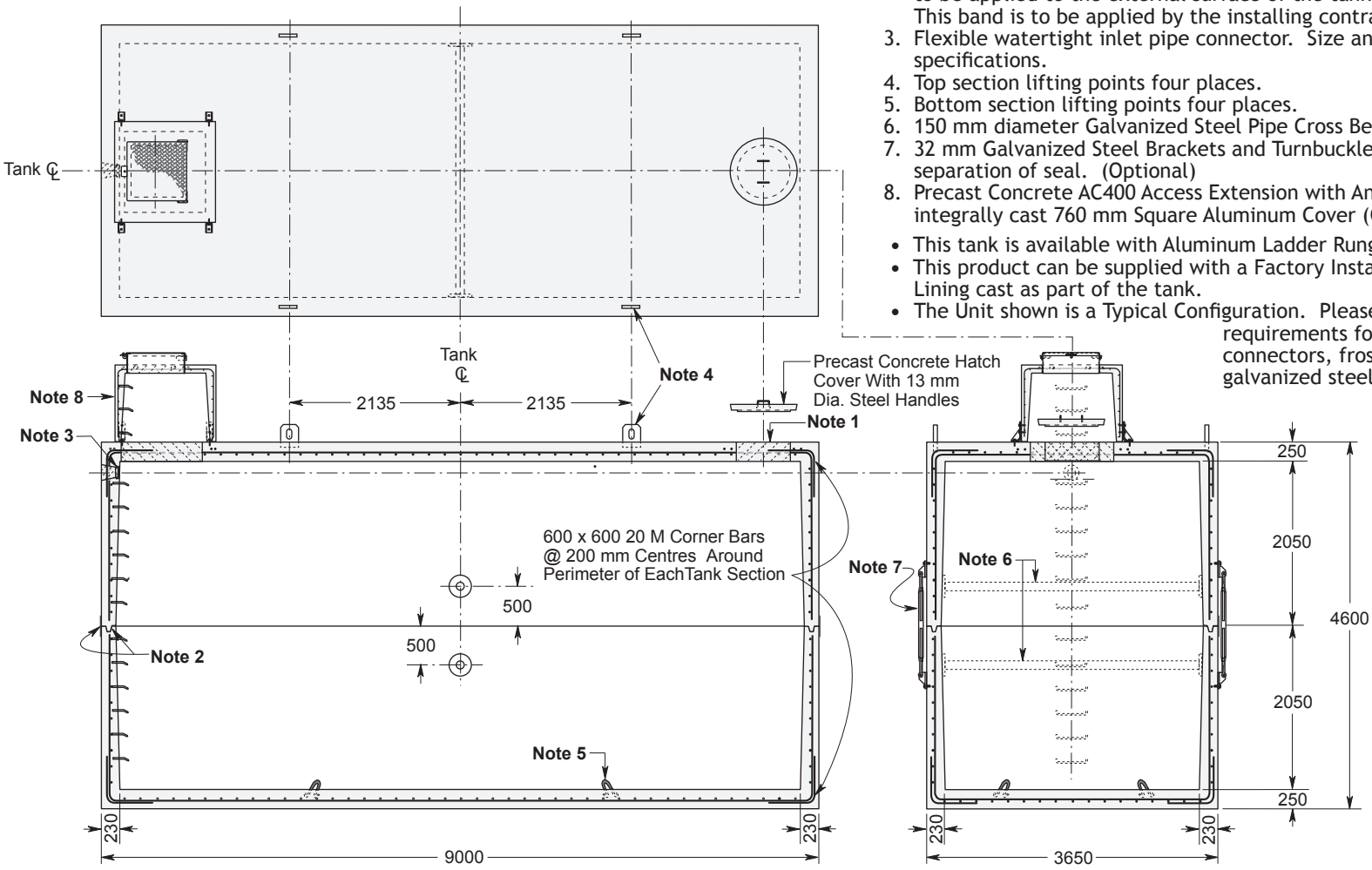
CONSTRUCTION DETAILS *

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

Andrew Farina

From: John Killeen <jkilleen@superiorsprinkler.ca>
Sent: August 29, 2023 9:51 AM
To: Andrew Farina; Pouya Solat; James Byck
Cc: Maire Stea; David Crozier
Subject: RE: 3855 Dundas St, Mississauga - Revised Design (for resubmission)

Follow Up Flag: Follow up
Flag Status: Flagged

Based on the previous Dymon Storage location the expected water supply on site needed for the sprinkler demand will be 180,000 to 200,00 gallons.

- Design area #1 - 1,515 gpm x 120 min = 181,800 gal.

Water curtain duration is dependent on the area being protected and the fire resistance rating.

- If 1 hour, Design area #5 - 1,680 gpm x 60 min = 100,800 gal.
- If 2 hours, Design area #5 - 1,680 gpm x 60 min = 201,600 gal.

For planning purposes, we would recommend adding 5 to10% to these volume to account for variances in hydraulic overflow with area density systems. The final size of the water tank can be determined once a completed sprinkler design is provided for this location.

We have assumed that the water storage tank will be used to supply the sprinkler system, inside hose and outside (hydrant) hose demands, but not to include for domestic demands. If the hydrants for the site can be supplied from the municipal service at a limited capacity the hose demand can be removed from the total fire flow demand to reduce the storage tanks size.

A.12.8.1 Where tanks serve sprinklers only, they can be sized to provide the duration required for the sprinkler system, ignoring any hose stream demands. Where tanks serve some combination of sprinklers, inside hose stations, outside hose stations, or domestic/process use, the tank needs to be capable of providing the duration for the equipment that is fed from the tank, but the demands of equipment not connected to the tank can be ignored. Where a tank is used for both domestic/process water and fire protection, the entire duration demand of the domestic/process water does not need to be included in the tank if provisions are made to segregate the tank so that adequate fire protection water is always present or if provisions are made to automatically cut off the simultaneous use in the event of fire.

SOLID PILE STORAGE OF A CLASS I TO IV COMMODITY AND
EXPANDED , EXPOSED GROUP A PLASTICS IN AN UNSTABLE PILE

REFER TO NFPA #13(2013), TABLE 15.2.6(a) COLUMN C

DESIGN AREA #1

GROUND FLOOR:
MAX. 14'-0" HEIGHT STORAGE WITH A CEILING HEIGHT < 20'-0"
NFPA #13 (2013)
STORAGE OCCUPANCY
DENSITY OF 0.50 gpm/sq.ft. OVER 2000 sq.ft.
WITH 500 USgpm ADDED FOR HOSES
K = 11.2

SPRINKLER DEMAND

TOTAL SPRINKLER CALCULATED:	20
TOTAL SPRINKLER WATER FLOW:	1014.7 USgpm
TOTAL WATER DEMAND INCLUDING HOSES:	1514.7 USgpm
FLOW AND PRESSURE AT BOR:	1014.7 USgpm @ 39.5 psi

DESIGN AREA #2

6th FLOOR
MAX. 9'-0" HEIGHT STORAGE WITH A CEILING HEIGHT < 15'-0"
NFPA #13 (2013)
STORAGE OCCUPANCY
DENSITY OF 0.30 gpm/sq.ft. OVER 2000 sq.ft.
WITH 500 USgpm ADDED FOR HOSES
K = 11.2

SPRINKLER DEMAND

TOTAL SPRINKLER CALCULATED:	23
TOTAL SPRINKLER WATER FLOW:	712.1 USgpm
TOTAL WATER DEMAND INCLUDING HOSES:	1212.1 USgpm
FLOW AND PRESSURE AT BOR:	712.1 USgpm @ 53.4 psi

DESIGN AREA #3

GROUND FLOOR DRY SYSTEM

NFPA #13 (2013)
ORDINARY HAZARD GROUP II
DENSITY OF 0.20 gpm/sq.ft. OVER 1950 sq.ft.
WITH 500 USgpm ADDED FOR HOSES
K = 5.6

SPRINKLER DEMAND

TOTAL SPRINKLER CALCULATED:	20
TOTAL SPRINKLER WATER FLOW:	544.5 USgpm
TOTAL WATER DEMAND INCLUDING HOSES:	1044.5 USgpm
FLOW AND PRESSURE AT BOR:	544.5 USgpm @ 44.9 psi

DESIGN AREA #4 (GROUND FLOOR+ WINDOWS)

ORDINARY HAZARD GROUP II
MINIMUM DENSITY OF 0.20 gpm/sq.ft. OVER AN
AREA OF 1500 sq.ft. WITH WINDOW SPRINKLERS
DISCHARGING 15 gpm
WITH 500 USgpm ADDED FOR HOSE STREAMS

K = 5.6 - OVERHEAD SPRINKLERS
K = 5.6 - WINDOW SPRINKLERS

SPRINKLER DEMAND

TOTAL SPRINKLER CALCULATED:	18
TOTAL SPRINKLER WATER FLOW:	465.4 USgpm
TOTAL WATER DEMAND INCLUDING HOSES:	965.4 USgpm
FLOW AND PRESSURE AT BOR:	465.4 USgpm @ 35.9 psi

DESIGN AREA #5

3

GROUND FLOOR WATER CURTAIN

NFPA #13 (2013)
11.3.3 - WATER CURTAINS
DENSITY OF 18 gpm OVER 6 ft.
WITH 500 USgpm ADDED FOR HOSES
K = 5.6

SPRINKLER DEMAND

TOTAL SPRINKLER CALCULATED:	28
TOTAL SPRINKLER WATER FLOW:	1180 USgpm
TOTAL WATER DEMAND INCLUDING HOSES:	1680 USgpm
FLOW AND PRESSURE AT BOR:	1180 USgpm @ 47 psi
(21 psi SAFETY)	

STANDPIPE SYSTEM DESIGN

MINIMUM FLOW OF 500 USgpm
MEASURED AT THE TWO MOST
HYDRAULICALLY MOST REMOTE 2.1/2"
HOSE CONNECTIONS, WITH NOT LESS
THAN 250 USgpm FLOWING
SIMULTANEOUSLY FROM THE TWO
OUTLETS AT A MINIMUM PRESSURE
OF 65.3 psi

502.0 US gpm @ 148.2 psi TO BE PROVIDED
THROUGH FIRE DEPARTMENT CONNECTION

Table 12.8.6.1 Hose Stream Allowance and Water Supply Duration

Sprinkler Type	Sprinkler Spacing Type	Number of Sprinklers in Design Area*	Size of Design Area	Hose Stream Allowance		W
				gpm	L/min	
Control mode density/area	Standard and extended-coverage	NA	Up to 1200 ft² (111 m²)	250	950	
			Over 1200 ft² (111 m²) up to 1500 ft² (139 m²)	500	1900	
			Over 1500 ft² (139 m²) up to 2600 ft² (240 m²)	500	1900	
			Over 2600 ft² (240 m²)	500	1900	
CMSA	Standard	Up to 12	NA	250	950	
		Over 12 to 15	NA	500	1900	
		Over 15 to 25	NA	500	1900	
		Over 25	NA	500	1900	
	Extended-coverage	Up to 6	NA	250	950	
		Up to 8	144 ft² (13.4 m²) maximum	250	950	
		Over 6 to 8	NA	500	1900	
		Over 8 to 12	NA	500	1900	
		Over 12	NA	500	1900	
ESFR	Standard	Up to 12	NA	250	950	
		Over 12 to 15	NA	500	1900	
		Over 15 to 25	NA	500	1900	
		Over 25	NA	500	1900	

NA: Not applicable.
*For CSMA and ESFR sprinklers the additional sprinklers included in the design area for obstructions do not need to be considered in determining the total number of sprinklers in this column.

- John

From: Andrew Farina <afarina@cfcrozier.ca>
Sent: Tuesday, August 29, 2023 9:47 AM
To: John Killeen <jkilleen@superiorsprinkler.ca>; Pouya Solat <psolat@dymon.ca>; James Byck <jbyck@dymon.ca>
Cc: Maire Stea <mstea@mhbcplan.com>; David Crozier <dcrozier@cfcrozier.ca>
Subject: RE: 3855 Dundas St, Mississauga - Revised Design (for resubmission)

50,000 LITRE PRECAST POTABLE WATER CISTERN

WILKINSON HEAVY PRECAST LIMITED
DUNDAS, ONTARIO 1-800-263-8503
www.wilkinsonheavyprecast.com

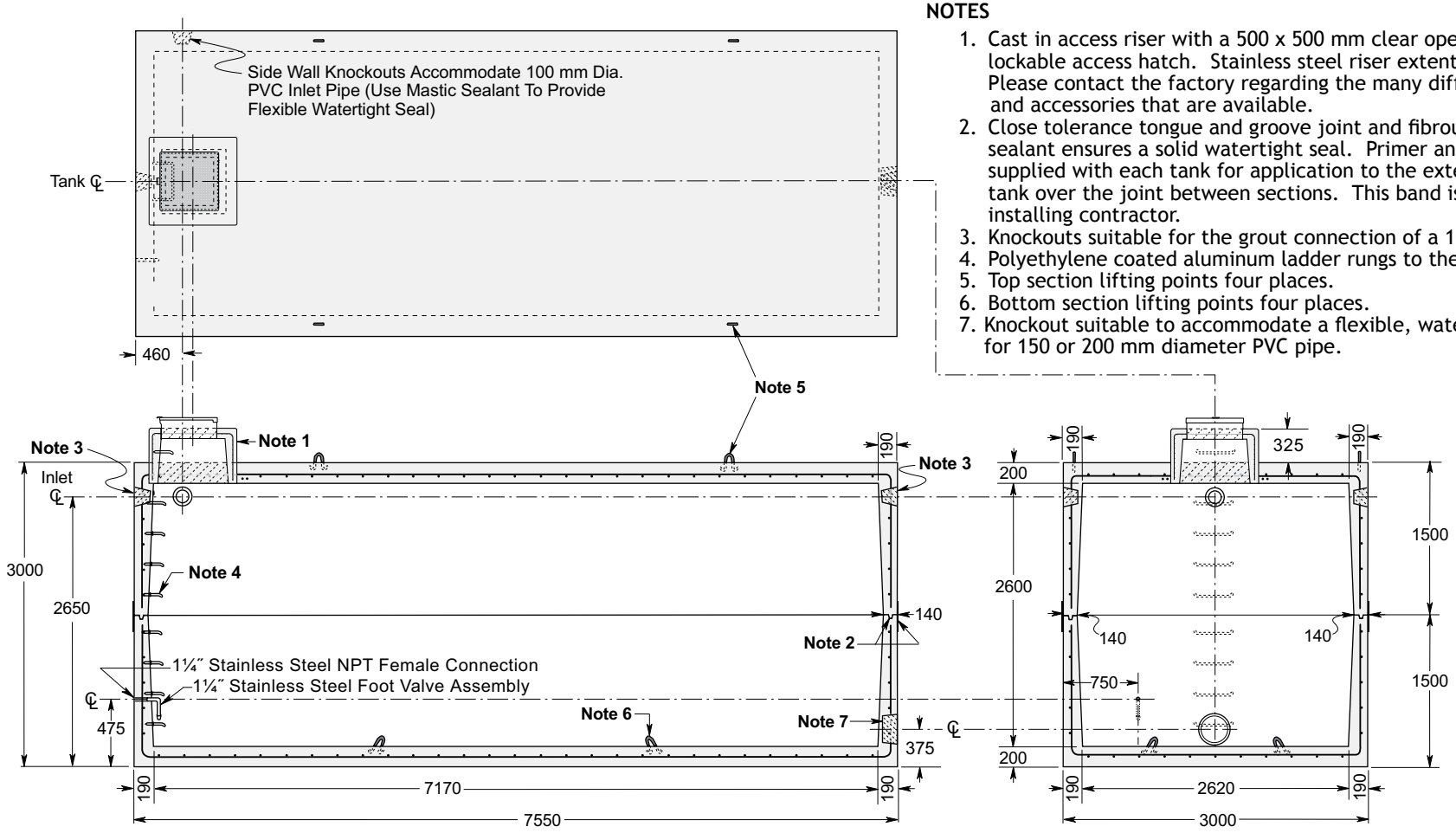
CONSTRUCTION DETAILS *

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

Reinforcing: 15 M bars at 250 mm centres each way in walls, roof and floor.
Eight extra 15 M bars around each roof access opening.
Mininum cover over reinforcing steel - 25mm.

Weight:
Top Section 22,000 kg
Bottom Section 22,000 kg
Total 44,000 kg

Actual Capacity: 19,277 Litres Per Vertical Metre.
50,120 Litres to Underside of Roof.



NOTES

1. Cast in access riser with a 500 x 500 mm clear opening stainless steel lockable access hatch. Stainless steel riser extentions are available. Please contact the factory regarding the many different access risers and accessories that are available.
2. Close tolerance tongue and groove joint and fibrous non-toxic mastic sealant ensures a solid watertight seal. Primer and Mastic Band are supplied with each tank for application to the external surface of the tank over the joint between sections. This band is to be applied by the installing contractor.
3. Knockouts suitable for the grout connection of a 100 mm diameter pipe.
4. Polyethylene coated aluminum ladder rungs to the floor.
5. Top section lifting points four places.
6. Bottom section lifting points four places.
7. Knockout suitable to accommodate a flexible, watertight pipe connector for 150 or 200 mm diameter PVC pipe.

Dimensions in mm
N.T.S.

*Product designed for a **Maximum 1.2 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.

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

APPENDIX C

Stormwater Management Calculations

CROZIER CONSULTING ENGINEERS

Project: 3855 Dundas Street West
Project No.: 1644-5477
Created By: DJC/VM
Checked By: ADF
Created 2023-07-14
Updated: 2023-09-15

Pre-Development Conditions

IDF Values

Tc (Mins) 15

Return Period	A	B	C	I (mm/hr)
2 yr	610	4.6	0.78	59.89
5 yr	820	4.6	0.78	80.51
10 yr	1010	4.6	0.78	99.17
25 yr	1160	4.6	0.78	113.89
50 yr	1300	4.7	0.78	127.13
100 yr	1450	4.9	0.78	140.69

(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*	2.30	23,050	0.25	0.25
		Impervious	0.00	-	0.9	0.00
		Sub total	**2.30**	**23,050**	**-**	**0.25**
102	Overland flow to existing 600 mm storm sewer on Ninth Line	*Pervious*	0.08	819	0.25	0.25
		Impervious	0.00	-	0.9	0.00
		Sub total	**0.08**	**819**	**-**	**0.25**
		Total Site	**2.39**	**23,868**	**-**	**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	2.30	0.096	95.95
5 yr		80.51		0.129	128.98
10 yr		99.17		0.159	158.86
25 yr	0.28	113.89		0.201	200.70
50 yr	0.30	127.13		0.244	244.40
100 yr	0.31	140.69		0.282	281.73

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	3.41
5 yr		80.51		0.005	4.58
10 yr		99.17		0.006	5.64
25 yr	0.28	113.89		0.007	7.13
50 yr	0.30	127.13		0.009	8.68
100 yr	0.31	140.69		0.010	10.00

Equations

Peak Flow

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

Intensity

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

CROZIER CONSULTING ENGINEERS

Project: 3855 Dundas Street West
Project No.: 1644-5477
Created By: DJC/VM
Checked By: ADF
Date: 2023-07-25
Updated: 2023-09-15

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	0.8	59.89
5 yr	820.0	4.6	0.8	80.51
10 yr	1010.0	4.6	0.8	99.17
25 yr	1160.0	4.6	0.8	113.89
50 yr	1300.0	4.7	0.8	127.13
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 (Controlled)	*Pervious*	0.54	5421	0.25	0.07
	Impervious	1.38	13800	0.9	0.61
	Permeable Pavers	0.13	1298	0.5	0.03
	Total	**2.05**	**20519**	**-**	**0.70**
202 (Uncontrolled)	*Pervious*	0.31	3060	0.25	0.25
	Impervious	0.00	0	0.9	0.00
	Total	**0.31**	**3060**	**-**	**0.25**
Total Site		**2.36**	**23579**	**-**	**0.64**

Ajustment Factors

Return Period	Adjustment Factor	Catchment 201	Catchment 202
2 yr	1.00	0.70	0.25
5 yr	1.00	0.70	0.25
10 yr	1.00	0.70	0.25
25 yr	1.10	0.77	0.28
50 yr	1.20	0.84	0.30
100 yr	1.25	0.88	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	0.70	2.05	0.240	240.17
5 yr			0.323	322.85
10 yr			0.398	397.65
25 yr	0.77		0.502	502.38
50 yr	0.84		0.612	611.76
100 yr	0.88		0.705	705.20

Catchment 202 - Uncontrolled				
Storm Event	**C**	**A (ha)**	**Q (m^3/s)**	**Q (L/s)**
2 yr	0.25	0.31	0.013	12.74
5 yr			0.017	17.12
10 yr			0.021	21.09
25 yr	0.28		0.027	26.64
50 yr	0.30		0.032	32.44
100 yr	0.31		0.037	37.40

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}	$Q_{post-202}$	Q_{post} Target	$Q_{post-201}$	Total Q_{post}		
2 yr	**99.35**	12.74	86.62	31.58	44.32	229.53	283.32
5 yr	128.98	17.12	82.23	37.09	54.21	325.36	379.36
10 yr	158.86	21.09	78.26	41.88	62.97	414.19	475.39
25 yr	200.70	26.64	72.71	46.18	72.82	550.30	571.43
50 yr	244.40	32.44	66.91	51.96	84.40	692.38	715.49
100 yr	291.73	37.40	61.95	57.32	94.72	817.41	856.34

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	**Created:**	**2023-07-25**
Project No.:	1644-5477	**Revised:**	**2023-09-15**
		Designed By:	**DJC/VM**
		Checked By:	**ADF**

MODIFIED RATIONAL METHOD CALCULATIONS - 2 YEAR STORM EVENT

Rainfall Intensity Equation:

$$I = \frac{A}{(T+b)^c}$$

City of Missisauga IDF (2-Year)	
a=	610
b=	4.60
c=	0.78

CONTROLLED AREA

Drainage Area ID =	201
Drainage Area =	2.05 ha
Runoff Coefficient =	0.70
Controlled Release Rate at MH1 =	**31.58 L/s**
Peak Long Term Ground Water Flow Rate =	**0.08 L/s**
Max. Storage Volume Required =	229.53 m3
Storage Volume Provided =	283.32 m3

UNCONTROLLED AREA

Drainage Area ID =	202
Drainage Area =	0.31 ha
Runoff Coefficient =	0.25
Target Site Release Rate =	**99.35 L/s**
Controlled Release Rate at MH1 =	31.58 L/s
Uncontrolled Release Rate =	12.74 L/s
Total Site Release Rate =	**44.32 L/s**

Time (minutes)	**Rainfall Intensity** (mm/hr)	**Q_{Runoff}** (L/s)	**$Q_{Release}$** (L/s)	**Storage Volume Required** (m^3)	**Q_{Runoff}** (L/s)
15	59.89	240.25	31.58	187.80	12.74
20	50.16	201.24	31.58	203.59	10.67
25	43.42	174.21	31.58	213.94	9.23
30	38.45	154.25	31.58	220.80	8.18
35	34.60	138.85	31.58	225.25	7.36
40	31.54	126.55	31.58	227.93	6.71
45	29.03	116.50	31.58	229.26	6.17
50	26.94	108.09	31.58	229.53	5.73
55	25.16	100.96	31.58	228.94	5.35
60	23.62	94.81	31.58	227.63	5.02
65	22.29	89.46	31.58	225.73	4.74
70	21.12	84.76	31.58	223.32	4.49
75	20.07	80.58	31.58	220.47	4.27
80	19.14	76.84	31.58	217.24	4.07
85	18.30	73.48	31.58	213.67	3.89
90	17.54	70.44	31.58	209.80	3.73
95	16.85	67.67	31.58	205.67	3.58
100	16.22	65.13	31.58	201.29	3.45
105	15.64	62.81	31.58	196.70	3.33
110	15.11	60.66	31.58	191.91	3.21
115	14.61	58.68	31.58	186.94	3.11
120	14.15	56.83	31.58	181.80	3.01
125	13.72	55.12	31.58	176.52	2.92
130	13.33	53.52	31.58	171.09	2.83
135	12.95	52.02	31.58	165.53	2.75
140	12.60	50.61	31.58	159.85	2.68
145	12.27	49.29	31.58	154.05	2.61
150	11.96	48.04	31.58	148.15	2.54
155	11.67	46.87	31.58	142.15	2.48
160	11.39	45.76	31.58	136.06	2.42
165	11.13	44.70	31.58	129.88	2.37

Project:	3855 Dundas Street West	**Created:**	**2023-07-25**
Project No.:	1644-5477	**Revised:**	**2023-09-15**
		Designed By:	**DJC/VM**
		Checked By:	**ADF**

MODIFIED RATIONAL METHOD CALCULATIONS - 5 YEAR STORM EVENT

Rainfall Intensity Equation:

$$I = \frac{A}{(T+b)^c}$$

City of Mississauga IDF 5-Year)	
a=	820
b=	4.60
c=	0.78

CONTROLLED AREA

Drainage Area ID =	201
Drainage Area =	2.05 ha
Runoff Coefficient =	0.70
Controlled Release Rate at MH1 =	**37.09 L/s**
Peak Permanent Drainage Rate =	**0.08 L/s**
Max. Storage Volume Required =	325.36 m3
Storage Volume Provided =	379.36 m3

UNCONTROLLED AREA

Drainage Area ID =	202
Drainage Area =	0.31 ha
Runoff Coefficient =	0.25
Target Site Release Rate =	**99.35 L/s**
Controlled Release Rate at MH1 =	37.09 L/s
Uncontrolled Release Rate =	17.12 L/s
Total Site Release Rate =	**54.21 L/s**

Time (minutes)	Rainfall Intensity (mm/hr)	Q_{Runoff} + Long Term Dewatering (L/s)	$Q_{Release}$ (L/s)	Storage Volume Required (m^3)	Q_{Runoff} (L/s)
15	80.51	322.93	37.09	257.26	17.12
20	67.43	270.50	37.09	280.09	14.34
25	58.37	234.15	37.09	295.60	12.41
30	51.68	207.32	37.09	306.42	10.99
35	46.52	186.62	37.09	314.00	9.89
40	42.40	170.09	37.09	319.21	9.02
45	39.02	156.57	37.09	322.60	8.30
50	36.21	145.28	37.09	324.56	7.70
55	33.82	135.68	37.09	325.36	7.19
60	31.76	127.43	37.09	325.21	6.75
65	29.96	120.23	37.09	324.25	6.37
70	28.38	113.90	37.09	322.61	6.04
75	26.98	108.29	37.09	320.39	5.74
80	25.73	103.27	37.09	317.64	5.47
85	24.60	98.75	37.09	314.45	5.23
90	23.58	94.66	37.09	310.85	5.02
95	22.66	90.93	37.09	306.89	4.82
100	21.81	87.53	37.09	302.61	4.64
105	21.03	84.40	37.09	298.04	4.47
110	20.31	81.51	37.09	293.20	4.32
115	19.64	78.85	37.09	288.12	4.18
120	19.02	76.37	37.09	282.82	4.05
125	18.45	74.07	37.09	277.31	3.92
130	17.91	71.91	37.09	271.61	3.81
135	17.41	69.90	37.09	265.74	3.70
140	16.94	68.01	37.09	259.70	3.60
145	16.50	66.23	37.09	253.52	3.51
150	16.08	64.56	37.09	247.19	3.42
155	15.68	62.97	37.09	240.72	3.34
160	15.31	61.48	37.09	234.13	3.26
165	14.96	60.06	37.09	227.43	3.18

CROZIER CONSULTING ENGINEERS

Project:	3855 Dundas Street West	**Created:**	**2023-07-25**
Project No.:	1644-5477	**Revised:**	**2023-09-15**
		Designed By:	**DJC/VM**
		Checked By:	**ADF**

MODIFIED RATIONAL METHOD CALCULATIONS - 10 YEAR STORM EVENT

Rainfall Intensity Equation:

$$I = \frac{A}{(T+b)^c}$$

City of Mississauga IDF (10-Year)	
a=	1010
b=	4.60
c=	0.78

CONTROLLED AREA

Drainage Area ID = 201
Drainage Area = 2.05 ha
Runoff Coefficient = 0.70

Controlled Release Rate at MH1 = 41.88 L/s
Peak Permanent Drainage Rate = 0.08 L/s

Max. Storage Volume Required = 414.19 m3
Storage Volume Provided = 475.39 m3

UNCONTROLLED AREA

Drainage Area ID = 202
Drainage Area = 0.31 ha
Runoff Coefficient = 0.25

Target Site Release Rate = 99.35 L/s

Controlled Release Rate at MH1 = 41.88 L/s
Uncontrolled Release Rate = 21.09 L/s
Total Site Release Rate = 62.97 L/s

Time (minutes)	Rainfall Intensity (mm/hr)	Q_{Runoff} + Long Term Dewatering (L/s)	$Q_{Release}$ (L/s)	Storage Volume Required (m^3)	Q_{Runoff} (L/s)
15	99.17	397.74	41.88	320.27	21.09
20	83.06	333.15	41.88	349.53	17.66
25	71.90	288.39	41.88	369.77	15.29
30	63.66	255.34	41.88	384.24	13.54
35	57.30	229.84	41.88	394.71	12.18
40	52.22	209.49	41.88	402.25	11.11
45	48.07	192.83	41.88	407.57	10.22
50	44.60	178.92	41.88	411.12	9.48
55	41.65	167.10	41.88	413.24	8.86
60	39.11	156.93	41.88	414.19	8.32
65	36.91	148.07	41.88	414.15	7.85
70	34.96	140.28	41.88	413.27	7.44
75	33.24	133.36	41.88	411.66	7.07
80	31.69	127.17	41.88	409.41	6.74
85	30.31	121.61	41.88	406.61	6.45
90	29.05	116.57	41.88	403.32	6.18
95	27.90	111.98	41.88	399.58	5.93
100	26.86	107.79	41.88	395.44	5.71
105	25.90	103.93	41.88	390.94	5.51
110	25.01	100.38	41.88	386.12	5.32
115	24.19	97.10	41.88	381.00	5.15
120	23.43	94.05	41.88	375.60	4.98
125	22.72	91.21	41.88	369.95	4.83
130	22.06	88.56	41.88	364.07	4.69
135	21.44	86.07	41.88	357.98	4.56
140	20.86	83.75	41.88	351.68	4.44
145	20.32	81.56	41.88	345.19	4.32
150	19.80	79.49	41.88	338.53	4.21
155	19.32	77.55	41.88	331.71	4.11
160	18.86	75.71	41.88	324.73	4.01
165	18.42	73.96	41.88	317.60	3.92

Project:	3855 Dundas Street West	**Created:**	**2023-07-25**
Project No.:	1644-5477	**Revised:**	**2023-09-15**
		Designed By:	**DJC/VM**
		Checked By:	**ADF**

MODIFIED RATIONAL METHOD CALCULATIONS - 25 YEAR STORM EVENT

Rainfall Intensity Equation:

$$I = \frac{A}{(T+b)^c}$$

City of Mississauga IDF (25-Year)	
a=	1160
b=	4.60
c=	0.78

CONTROLLED AREA		UNCONTROLLED AREA	
Drainage Area ID =	201	Drainage Area ID =	202
Drainage Area =	2.05 ha	Drainage Area =	0.31 ha
Runoff Coefficient =	0.77	Runoff Coefficient =	0.28
Controlled Release Rate at MH1 =	**46.18 L/s**	**Target Site Release Rate =**	**99.35 L/s**
Peak Permanent Drainage Rate =	**0.08 L/s**		
Max. Storage Volume Required =	550.30 m3	Controlled Release Rate at MH1 =	46.18 L/s
Storage Volume Provided =	571.43 m3	Uncontrolled Release Rate =	26.64 L/s
		Total Site Release Rate =	**72.82 L/s**

Time (minutes)	Rainfall Intensity (mm/hr)	Q_{Runoff} + Long Term Dewatering (L/s)	$Q_{Release}$ (L/s)	Storage Volume Required (m^3)	Q_{Runoff} (L/s)
15	113.89	502.46	46.18	410.66	26.64
20	95.40	420.87	46.18	449.64	22.32
25	82.58	364.32	46.18	477.22	19.32
30	73.11	322.57	46.18	497.51	17.10
35	65.80	290.35	46.18	512.76	15.39
40	59.98	264.64	46.18	524.31	14.03
45	55.21	243.59	46.18	533.03	12.91
50	51.22	226.02	46.18	539.53	11.98
55	47.84	211.09	46.18	544.23	11.19
60	44.92	198.24	46.18	547.44	10.51
65	42.39	187.05	46.18	549.40	9.92
70	40.15	177.20	46.18	550.30	9.39
75	38.17	168.46	46.18	550.28	8.93
80	36.40	160.65	46.18	549.46	8.52
85	34.81	153.61	46.18	547.94	8.14
90	33.36	147.25	46.18	545.79	7.80
95	32.05	141.45	46.18	543.08	7.50
100	30.85	136.15	46.18	539.86	7.22
105	29.74	131.29	46.18	536.20	6.96
110	28.73	126.80	46.18	532.12	6.72
115	27.79	122.65	46.18	527.66	6.50
120	26.91	118.79	46.18	522.86	6.30
125	26.10	115.21	46.18	517.74	6.11
130	25.34	111.86	46.18	512.32	5.93
135	24.63	108.72	46.18	506.63	5.76
140	23.96	105.78	46.18	500.69	5.61
145	23.34	103.01	46.18	494.51	5.46
150	22.74	100.41	46.18	488.10	5.32
155	22.19	97.95	46.18	481.50	5.19
160	21.66	95.62	46.18	474.69	5.07
165	21.16	93.42	46.18	467.71	4.95

CROZIER CONSULTING ENGINEERS

Project:	3855 Dundas Street West	**Created:**	**2023-07-25**
Project No.:	1644-5477	**Revised:**	**2023-09-15**
		Designed By:	**DJC/VM**
		Checked By:	**ADF**

MODIFIED RATIONAL METHOD CALCULATIONS - 100 YEAR STORM EVENT

Rainfall Intensity Equation:

$$I = \frac{A}{(T+b)^c}$$

City of Mississauga IDF (50-Year)	
a=	1300
b=	4.70
c=	0.78

CONTROLLED AREA

Drainage Area ID =	201
Drainage Area =	2.05 ha
Runoff Coefficient =	0.84
Controlled Release Rate at MH1 =	**51.96 L/s**
Peak Permanent Drainage Rate =	**0.08 L/s**
Max. Storage Volume Required =	692.38 m3
Storage Volume Provided =	715.49 m3

UNCONTROLLED AREA

Drainage Area ID =	202
Drainage Area =	0.31 ha
Runoff Coefficient =	0.30
Target Site Release Rate =	**99.35 L/s**
Controlled Release Rate at MH1 =	51.96 L/s
Uncontrolled Release Rate =	32.44 L/s
Total Site Release Rate =	**84.40 L/s**

Time (minutes)	Rainfall Intensity (mm/hr)	Q_{Runoff} + Long Term Dewatering (L/s)	$Q_{Release}$ (L/s)	Storage Volume Required (m^3)	Q_{Runoff} (L/s)
15	127.13	611.85	51.96	503.90	32.44
20	106.57	512.90	51.96	553.13	27.20
25	92.30	444.22	51.96	588.40	23.55
30	81.75	393.46	51.96	614.71	20.86
35	73.60	354.25	51.96	634.82	18.78
40	67.10	322.95	51.96	650.39	17.12
45	61.77	297.32	51.96	662.49	15.76
50	57.32	275.91	51.96	671.86	14.63
55	53.54	257.72	51.96	679.02	13.66
60	50.28	242.05	51.96	684.35	12.83
65	47.45	228.40	51.96	688.15	12.11
70	44.95	216.39	51.96	690.64	11.47
75	42.74	205.73	51.96	692.00	10.91
80	40.76	196.20	51.96	692.38	10.40
85	38.97	187.62	51.96	691.89	9.95
90	37.36	179.85	51.96	690.64	9.53
95	35.89	172.78	51.96	688.70	9.16
100	34.54	166.31	51.96	686.14	8.82
105	33.31	160.37	51.96	683.03	8.50
110	32.17	154.90	51.96	679.41	8.21
115	31.12	149.83	51.96	675.32	7.94
120	30.14	145.12	51.96	670.81	7.69
125	29.23	140.74	51.96	665.91	7.46
130	28.38	136.66	51.96	660.65	7.24
135	27.59	132.83	51.96	655.06	7.04
140	26.84	129.24	51.96	649.15	6.85
145	26.14	125.86	51.96	642.95	6.67
150	25.48	122.68	51.96	636.48	6.50
155	24.85	119.67	51.96	629.76	6.34
160	24.26	116.83	51.96	622.80	6.19
165	23.70	114.14	51.96	615.61	6.05

Project:	3855 Dundas Street West	**Created:**	**2023-07-25**
Project No.:	1644-5477	**Revised:**	**2023-09-15**
		Designed By:	**DJC/VM**
		Checked By:	**ADF**

MODIFIED RATIONAL METHOD CALCULATIONS - 100 YEAR STORM EVENT

Rainfall Intensity Equation:

$$I = \frac{A}{(T+b)^c}$$

City of Mississauga IDF (100-Year)	
a=	1450
b=	4.90
c=	0.78

CONTROLLED AREA

Drainage Area ID = 201
Drainage Area = 2.05 ha
Runoff Coefficient = 0.88

Controlled Release Rate at MH1 = 57.32 L/s
Peak Permanent Drainage Rate = 0.08 L/s

Max. Storage Volume Required = 817.41 m3
Storage Volume Provided = 856.34 m3

UNCONTROLLED AREA

Drainage Area ID = 202
Drainage Area = 0.31 ha
Runoff Coefficient = 0.31

Target Site Release Rate = 99.35 L/s

Controlled Release Rate at MH1 = 57.32 m3
Uncontrolled Release Rate = 37.40 m3
Total Site Release Rate = 94.72 L/s

Time (minutes)	Rainfall Intensity (mm/hr)	Q_{Runoff} + Long Term Dewatering (L/s)	$Q_{Release}$ (L/s)	Storage Volume Required (m^3)	Q_{Runoff} (L/s)
15	140.69	705.29	57.32	583.17	37.40
20	118.12	592.17	57.32	641.82	31.40
25	102.41	513.41	57.32	684.14	27.22
30	90.77	455.09	57.32	715.98	24.13
35	81.77	409.97	57.32	740.56	21.74
40	74.58	373.91	57.32	759.81	19.83
45	68.68	344.36	57.32	774.99	18.26
50	63.75	319.64	57.32	786.97	16.95
55	59.56	298.64	57.32	796.36	15.83
60	55.95	280.54	57.32	803.60	14.87
65	52.81	264.77	57.32	809.04	14.04
70	50.03	250.88	57.32	812.96	13.30
75	47.58	238.55	57.32	815.55	12.65
80	45.38	227.53	57.32	816.99	12.06
85	43.39	217.60	57.32	817.41	11.54
90	41.60	208.61	57.32	816.94	11.06
95	39.97	200.42	57.32	815.66	10.62
100	38.47	192.93	57.32	813.67	10.23
105	37.10	186.05	57.32	811.02	9.86
110	35.84	179.71	57.32	807.77	9.53
115	34.66	173.84	57.32	803.98	9.22
120	33.58	168.39	57.32	799.70	8.93
125	32.57	163.32	57.32	794.96	8.66
130	31.62	158.58	57.32	789.80	8.41
135	30.73	154.14	57.32	784.24	8.17
140	29.90	149.98	57.32	778.33	7.95
145	29.12	146.06	57.32	772.07	7.74
150	28.39	142.38	57.32	765.49	7.55
155	27.69	138.89	57.32	758.62	7.36
160	27.04	135.60	57.32	751.47	7.19
165	26.41	132.48	57.32	744.06	7.02

CROZIER & ASSOCIATES Consulting Engineers

Project:	3855 Dundas Street West
Project No.:	1644-5477
Designed By:	DJC/VM
Checked By:	ADF
Created:	2023-07-25
Date Updated:	2023-09-15

Orifice Design

Orifice: $Q=CA(2gH)^{0.5}$	Orifice
Discharge Coef., Cd=	0.80
Orifice Diameter (mm) =	125
Area of Orifice (m^2) =	0.0123
Orifice (Side/Bottom) =	Side
Orifice Invert (m) =	167.71

Underground Detention Tank - Storage Storage Discharge

Water Elev.	Depth	Head	Volume	Orifice 1 Q	Storm Event
(m)	(m)	(m)	(m3)	(L/s)	
167.71	0.09	0.00	0.00	0.00	
167.80	0.09	0.03	43.22	7.21	
167.90	0.19	0.13	91.24	15.53	
168.00	0.29	0.23	139.26	20.74	
168.10	0.39	0.33	187.28	24.89	
168.20	0.49	0.43	235.30	28.43	
168.30	0.59	0.53	283.32	31.58	2-Year
168.40	0.69	0.63	331.34	34.45	
168.50	0.79	0.73	379.36	37.09	5-Year
168.60	0.89	0.83	427.38	39.56	
168.70	0.99	0.93	475.39	41.88	10-Year
168.80	1.09	1.03	523.41	44.08	
168.90	1.19	1.13	571.43	46.18	25-Year
169.00	1.29	1.23	619.45	48.18	
169.10	1.39	1.33	667.47	50.10	
169.20	1.49	1.43	715.49	51.96	50-Year
169.30	1.59	1.53	763.51	53.75	
169.40	1.69	1.63	809.40	55.48	
169.51	1.80	1.74	856.34	57.32	100-Year

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

DESIGN: DJC/VM **DATE:** 2023-07-25
CHECK: ADF **UPDATED:** 2023-09-15

WATER BALANCE CALCULATIONS

Catchment	Land Use	Area (m^2)	Required Abstraction (mm)	Water Balance Requirement (m^3)
Catchment 201	Impervious	13,800	5	69.0
	Pervious	5,421		27.1
	Permeable Pavers	1,298		6.5
Catchment 202	Impervious	0		0.0
	Pervious	3,060		15.3
Site Total		**23,579**	**117.9**	**117.9**

PERMEABLE PAVER CALCULATIONS

Area (Parking Stalls):	1298	m^2
Bedding Depth:	250	mm
Void Ratio:	0.4	(clear stone)
Volume Provided:	**129.8**	m^3

CROZIER CONSULTING ENGINEERS

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

DESIGN: DJC/VM
CHECK: ADF

DATE: 2023-07-14
UPDATED: 2023-09-15

WATER QUALITY CALCULATIONS

Catchment	Land Use	Area (m^2)	Water Quality Target (%)	% of Total Development Area	TSS Removal Credit (%)	Total TSS Removal (%)
Catchment 201	Pervious	5,421	80.0%	23.0%	80.0%	18.4%
	Impervious	13,800		58.5%		46.8%
	Permeable Pavers	1,298		5.5%		4.4%
Catchment 202	Uncontrolled	3,060		13.0%	80.0%	10.4%
TOTAL SITE		**23,579**		**100.0%**	**-**	**80.0%**

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 Street West
PROJECT No.: 1644-5477
FILE: Storm Sewer Design
DATE: 15-Sep-23
Design: DJC/VM
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	CUMMUL 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	CBMH1	MH1	0.42	0.55	0.23	0.23	15.00	99.17	140.69	**0.06**	**0.09**	0.50	**300**	0.07	1.40	42.0	0.50	PVC	**0.10**	64%	**91%**
	MH1	CBMH2				0.23	15.50	97.23	137.99	**0.06**	**0.09**	0.50	**300**	0.07	1.40	47.9	0.57	PVC	**0.10**	64%	**91%**
A2	CBMH2	DCBMH1	0.17	0.75	0.13	0.36	16.07	95.13	135.05	**0.10**	**0.14**	0.50	**375**	0.11	1.62	52.5	0.54	PVC	**0.18**	54%	**77%**
A3	DCBMH1	MH2	0.18	0.69	0.12	0.48	16.61	93.24	132.40	**0.13**	**0.18**	0.50	**450**	0.16	1.27	31.9	0.42	CONC	**0.20**	64%	**91%**
	MH2	TANK				0.48	17.03	91.83	130.42	**0.13**	**0.18**	1.00	**450**	0.16	1.79	9.5	0.09	CONC	**0.29**	45%	**64%**
A6	PLUG	MH1R	0.75	0.90	0.67	0.67	15.00	99.17	140.69	**0.19**	**0.26**	2.00	**375**	0.11	3.24	4.0	0.02	PVC	**0.36**	52%	**74%**
	MH1R	TANK INLET				0.67	15.36	97.77	138.75	**0.03**	**0.03**	2.00	**375**	0.11	3.24	2.2	0.01	PVC	**0.36**	9%	**9%**
A4	CBMH3	MH3	0.32	0.55	0.18	0.18	15.00	99.17	140.69	**0.05**	**0.07**	1.00	**300**	0.07	1.98	86.5	0.73	PVC	**0.14**	35%	**50%**
A5	CB1	MH3	0.21	0.61	0.13	0.30	15.00	99.17	140.69	**0.03**	**0.05**	1.00	**250**	0.05	1.75	10.4	0.10	PVC	**0.09**	41%	**58%**
	MH3	TANK		0.74	0.00	0.30	15.73	96.38	136.79	**0.03**	**0.05**	2.00	**300**	0.07	2.79	3.7	0.02	PVC	**0.20**	18%	**25%**
D/S of Orifice	TANK OUTLET (ORIFICE TUBE)	MH 4 (UP-FLOW)		0.74	0.00	0.98	17.03	91.83	130.42	**0.04**	**0.06**	1.00	**125**	0.01	1.10	2.4	0.04	PVC	**0.01**	310%	**424%**
	MH 4	CTRL MH		0.90	0.00	0.98	17.07	91.71	130.26	**0.04**	**0.06**	1.00	**450**	0.16	1.79	4.0	0.04	CONC	**0.29**	15%	**20%**
	CTRL MH	EX CBMH		0.90	0.00	0.98	17.10	91.59	130.08	**0.04**	**0.06**	1.00	**450**	0.16	1.79	15.0	0.14	CONC	**0.29**	15%	**20%**

Hydro Up-Flo® Filter

Project Name:	3855 Dundas Street W	***Report Date:***	2023.09.01 Paste
Street:	Dundas Street E	***City:***	Mississauga
Province:	Ontario	***Country:***	Canada
Designer:	Andrew Farina	***email:***	afarina@cfcrozier.ca

Treatment Parameters:

Site ID:		
Area:	2.05	ha
Percent Impervious:	79%	
Rational C value:	0.7 Calc. Cn	
Rainfall Station:	Toronto Pearson Intl AP, ONT MAP	
Peak Storm Flow:	57.3	L/s
Peak Storm Flow Return:	100	yrs
Number of Filter Modules	**20**	

Installation Configuration:

Outlet Pipe Size:	450	mm
Inlet Pipe 1 Size:	125	mm
Inlet Pipe 2 Size:		mm
Inlet Pipe 3 Size:		mm

Rim Level:	170.750	m	
Outlet Pipe Invert:	167.560	m	*0*
Invert Pipe 1:	167.690	m	*0*
Invert Pipe 2:	-	m	*0*
Invert Pipe 3:	-	m	*0*

Intensity*	Fraction of Annual Distribution*	Filter Removal Efficiency	Weighted Net Annuall Efficiency
(mm/hr)	(%)	(%)	(%)
0.50	0.2%	92.2%	0.2%
1.00	15.0%	91.3%	13.7%
1.50	17.3%	90.3%	15.6%
2.00	14.5%	89.4%	13.0%
2.50	3.1%	88.4%	2.7%
3.00	2.6%	87.4%	2.2%
3.50	6.2%	86.5%	5.4%
4.00	4.6%	85.5%	4.0%
4.50	1.6%	84.5%	1.4%
5.00	4.9%	83.6%	4.1%
6.00	4.1%	81.7%	3.3%
7.00	4.4%	79.7%	3.5%
8.00	3.2%	77.8%	2.5%
9.00	2.2%	75.9%	1.6%
10.00	2.4%	74.0%	1.7%
20.00	9.4%	54.7%	5.1%
30.00	2.4%	35.5%	0.9%
40.00	0.9%	16.3%	0.2%
50.00	0.5%	0.0%	0.0%
100.00	0.4%	0.0%	0.0%
150.00	0.0%	0.0%	0.0%
		Net Annual Treatment	81.2%
		Total Net Annual Removal Efficiency:	**81.2%**
		Total Runoff Volume Treated:	**90.3%**

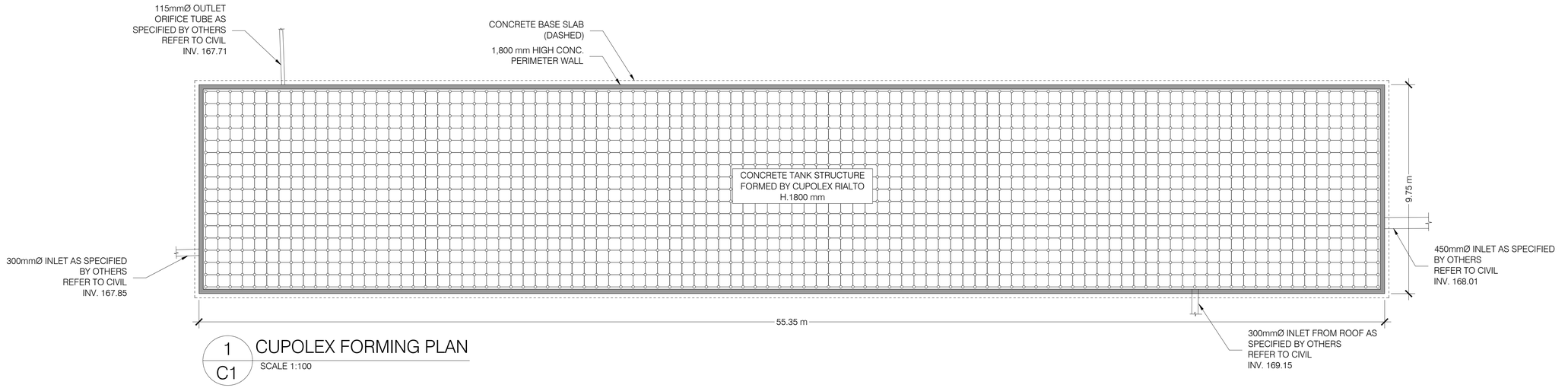
1. Rainfall Data: 1960:2013, HLY03, Toronto Pearson Intl AP , ON, 6158733.

2. Based on NJDEP test protocols post 2015 independently verified.

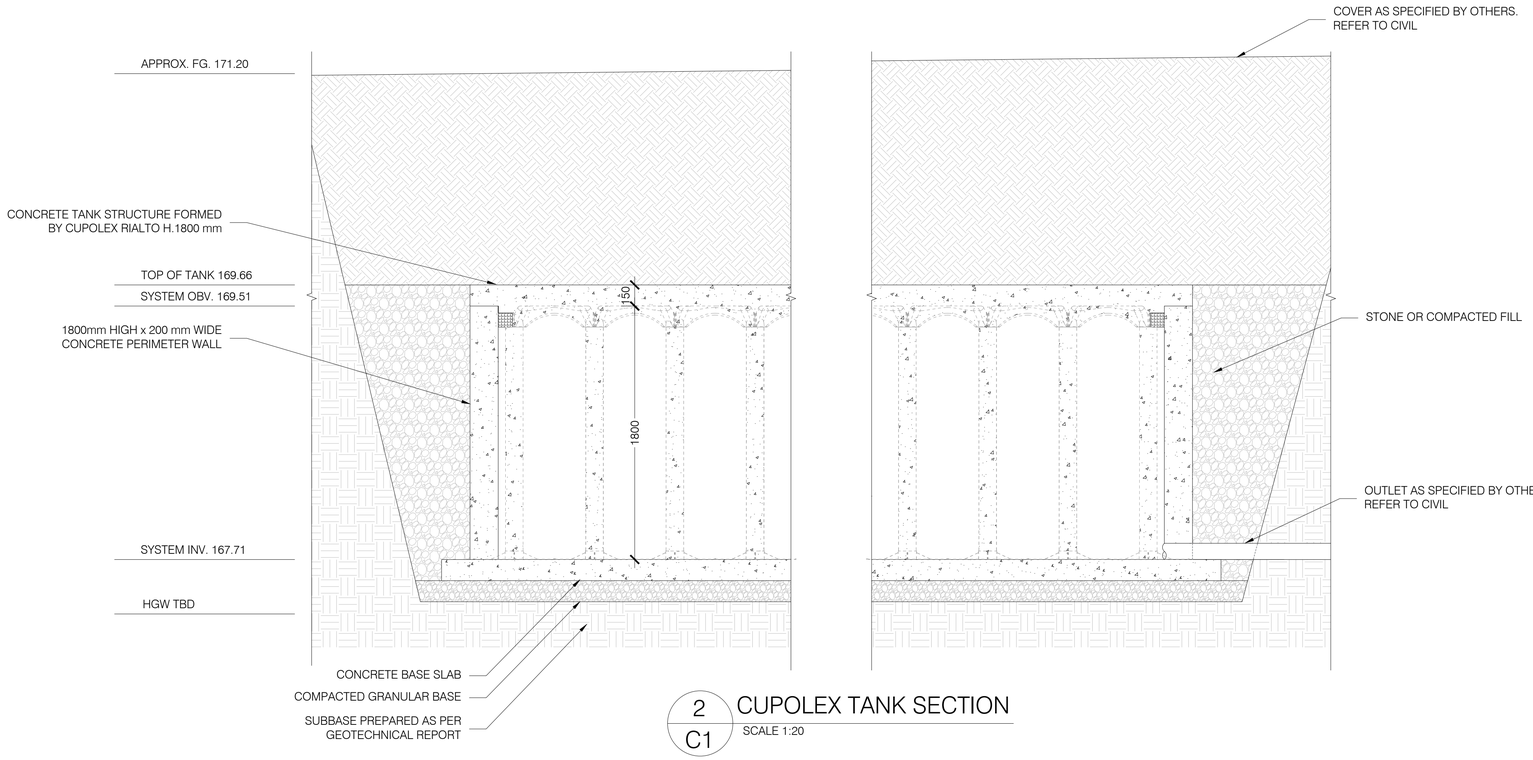
CONTRACTOR TO CONTACT CUPOLEX ENGINEERING SOLUTIONS INC. FOR ENGINEER STAMPED DESIGN DRAWINGS. UNDERGROUND CONCRETE TANK STRUCTURE CAN BE DESIGNED TO SUPPORT ANY LOADING. CIVIL ENGINEER TO SPECIFY LOADING CRITERIA

CONST.

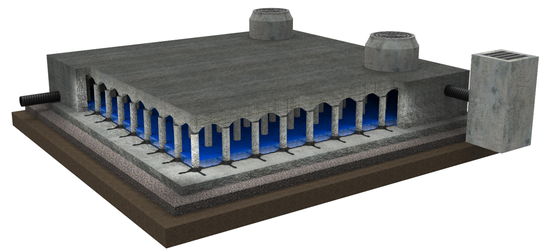
TANK PROPERTIES	
APPROX. MIN. FG.	171.20
TOP OF TANK	169.66
SYSTEM OBVERT	169.51
SYSTEM INVERT	167.71
SYSTEM DEPTH	1,800 mm
INSIDE TANK PERIMETER	129 m
OUTSIDE TANK PERIMETER	130 m
INSIDE TANK AREA	513 m^2
OUTSIDE TANK AREA	539 m^2
STORAGE VOLUME	856.3 m^3



1 / C1 CUPOLEX FORMING PLAN
SCALE 1:100



2 / C1 CUPOLEX TANK SECTION
SCALE 1:20



PRELIMINARY
NOT FOR CONSTRUCTION

CUPOLEX®
ENGINEERING SOLUTIONS INC.
55 Administration Rd, Unit 6
Vaughan, ON, Canada L4K 4G9
1-905-669-8190
info@cupolex.ca
www.cupolex.ca

3855 DUNDAS ST W
MISSISSAUGA, ON

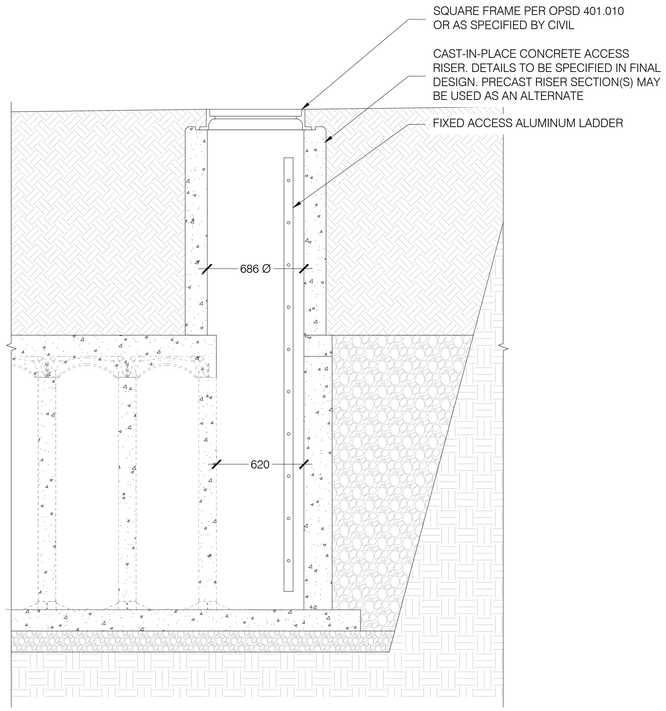
NO.	DATE	DESCRIPTION	DRW.	CHK.
1	24/03/23	CONCEPTUAL DESIGN	IT	AD
2	24/08/23	CONCEPTUAL DESIGN	AD	MK

DATE: 24 March, 2023
DRAWN BY: IT
CHECKED BY: AD
SCALE: As Noted
PROJECT No.: 23-60303

CUPOLEX TANK FORMING PLAN & SECTION

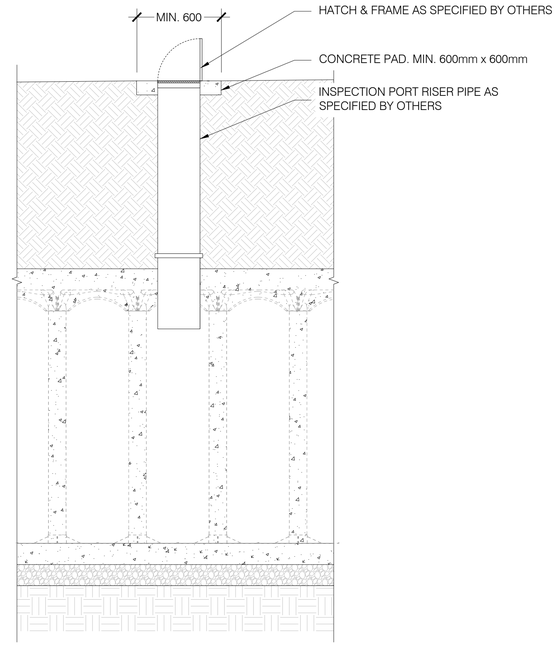
C1

CONTRACTOR TO CONTACT CUPOLEX ENGINEERING SOLUTIONS INC. FOR ENGINEER STAMPED DESIGN DRAWINGS. UNDERGROUND CONCRETE TANK STRUCTURE CAN BE DESIGNED TO SUPPORT ANY LOADING.
CIVIL ENGINEER TO SPECIFY LOADING CRITERIA



1 / C2 TYPICAL ACCESS OPENING
SCALE 1:20

LOCATION(S) TO BE COORDINATED WITH CIVIL



2 / C2 TYPICAL INSPECTION PORT
SCALE 1:20

LOCATION(S) TO BE COORDINATED WITH CIVIL

PRELIMINARY
NOT FOR CONSTRUCTION

CUPOLEX® ENGINEERING SOLUTIONS INC.
55 Administration Rd, Unit 6
Vaughan, ON, Canada L4K 4G9
1-905-669-8190
info@cupolex.ca
www.cupolex.ca

3855 DUNDAS ST W
MISSISSAUGA, ON

NO.	DATE	DESCRIPTION	DRW.	CHK.
1	24/03/23	CONCEPTUAL DESIGN	IT	AD
2	24/08/23	CONCEPTUAL DESIGN	AD	MK

DATE: 24 March, 2023
DRAWN BY: IT
CHECKED BY: AD
SCALE: 1:20
PROJECT No.: 23-60303

CUPOLEX TANK SECTIONS

C2

ECORASTER®

Product Overview

Quality Permeable Ground Reinforcement

X30 | Bloxx | E40 | E50

ECORASTER® E40 | E50

Quality permeable ground reinforcement

High quality permeable ground reinforcement.
E40 Allround and E50 Heavy-Duty.

20 YEAR warranty ECORASTER®

Your Benefits:

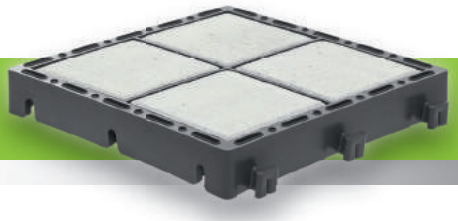
- ✓ easy and quick installation (up to 100 m²| 1,076 ft²/h per person)
- ✓ high resilience (up to 800 t/m²)
- ✓ low maintenance
- ✓ installation without heavy construction equipment
- ✓ no edging needed
- ✓ permeable ground reinforcement
- ✓ low transport and handling costs
- ✓ versatile applicable, accessories available
- ✓ weatherproof and unbreakable
- ✓ Safety interlocking, 36 notches per m²
- ✓ UV-resistant and frostproof
- ✓ driveable green area
- ✓ 20 year warranty
- ✓ German design

Easy to install:

Type:	Dimensions:	Material:	Wall thickness:	Load:	Solubility:	Compressive strength:	Weight per piece:	Weight per m² | 10.76 ft²:
E50 Heavy Duty	330 x 330 x 50 mm • 12.99 x 12.99 x 1.97 "	100% recycled Polyethylene (LDPE)	5 mm • 0.1968 "	up to 800 t/m² (depending on fill type)	resistant to acids, alkalis, alcohol, oil and petrol (de-icing salt, ammonia, acid rain, etc.)	up to 20t point axle load (DIN 1072)	1,06 kg • 2.34 lbs	9,55 kg • 21.05 lbs
E40 Allround	330 x 330 x 40 mm • 12.99 x 12.99 x 1.57 "		3,6 mm • 0.14 "				0,58 kg • 1.27 lbs	5,22 kg • 11.50 lbs

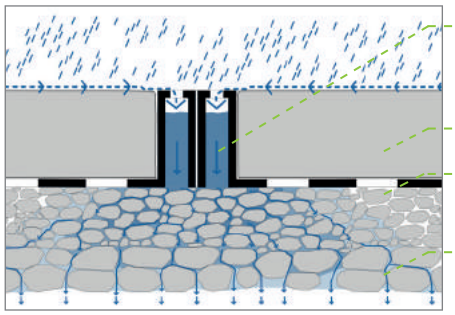
ECORASTER® Bloxx

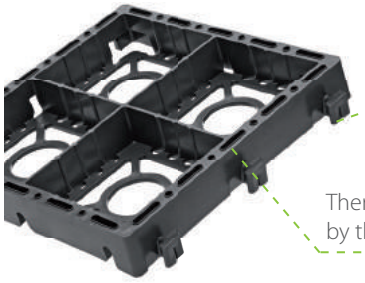
With integrated „no-clogging“ drainage



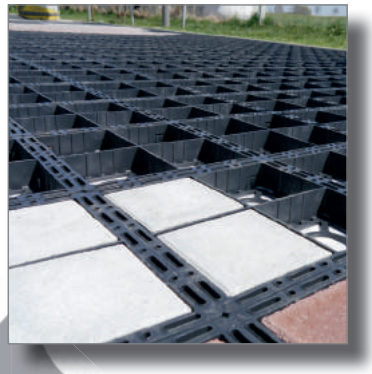
Paved surface with easy installation
Save money, time, and maintenance

How it works:





Easy to install:



ECORASTER® Bloxx, unpack, snap together, and drop the blocks in. No need to tuckpoint the joints!

Bloxx elements connect together in seconds!

Bloxx Paver Elements, replaceable without loosening the cluster (e.g. exchange dirty paver)

Fully accessible!!!

Unique safety interlocking, NO bumps, NO trip hazards!

Colorful: Dark grey, light grey, red, white... combine as u like.

Clogging? Not possible!

- ✓ **Safety Locking System**
- ✓ **High infiltration rate**
- ✓ **Quick Installation**
- ✓ **Low maintenance**

Type:	Dimensions:	Material:	Paver colors:	Solubility:	Compressive strength:	Weight per m^2:
Bloxx	330 x 330 x 50 mm • 12.99 x 12.99 x 1.97“	100% recycled Polyethylene (LDPE)	red, white, dark grey and light grey	resistant to acids, alkalis, alcohol, oil and petrol (de-icing salt, ammonia, acid rain, etc.)	up to 20t point axle load (DIN 1072)	approx. 85 kg • 187.39 lbs (incl. pavers)

QUALITY made in GERMANY

ECORASTER® X30

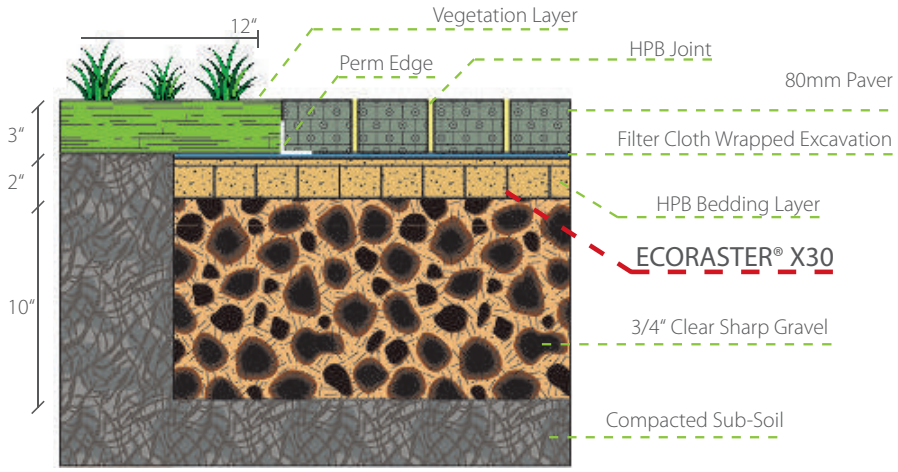
Hardscape Base Stabilizing System

A heavy duty linking grid system that allows you to build stronger hardscapes by stabilizing the base material.

Your Benefits:

- » Up to 50% base reduction in excavation
- » Up to 30% labour cost savings
- » Wider pin-point load dispersal
- » Reduced warrantee call-backs from shifting and sinking
- » Reduced risk of poor sub-base compaction
- » Sustainable, efficient, and profitable!

Easy to install:



Applications:

- » Heavy Duty Base Stabilization
- » Permeable Base Stabilization
- » Interlock Driveway Base Support
- » Permeable Interlock Concrete Paving Installation

Questions? Give us a call:
+1-800-495-5517 (Toll Free)

Type:	Dimensions:	Material:	Wall thickness:	Load up to:	Solubility:	Compressive strength:	Weight per piece:	Weight per m^2 | 10.76 ft^2:
X30 Base Stabilizer	330 x 330 x 30 mm • 12.99 x 12.99 x 1.18"	100% recycled Polyethylene (LDPE)	0.2 in	23 t/ft^2 (unfilled) 75 t/ft^2 (filled)	resistant to acids, alkalis, alcohol, oil and petrol (de-icing salt, ammonia, acid rain, etc.)	up to 20t point axle load (DIN 1072)	0,77 kg • 1.7 lbs	6,93 kg • 15.3 lbs

Specifications

Sustainable and cost-saving

ECORASTER® Application			GREEN / MICROGREEN	MINERAL	Bloxx
			vegetated	gravel filled	paved
Load		Roads and paths used only for pedestrians and bicycles may use this	E40 alternative: S50	E40 alternative: S50	✓
		Paths, walkways and similar applications, as well as car parking	E40 alternative: E50 or S50	E40 alternative: E50	✓
		Roads, road shoulders and parking lots used for all types of vehicles	E50	E50* alternative: ECORASTER® STONE	✓
		Areas used with high point axle loading e.g. warehousing (forklifts and trucks), truck parking lots, bus parking, helicopter landing pads.	---	E50* alternative: ECORASTER® STONE	✓
Installed and unfilled, the **ECORASTER®** system can be driven on with heavy wheeled vehicles (EN 124 / D400 | except Bloxx).					

*with 3/8" - 3/4" inches covering-over

20 YEAR warranty ECORASTER

TÜV NORD Made in Germany

NATO zertifiziert

TÜV NORD

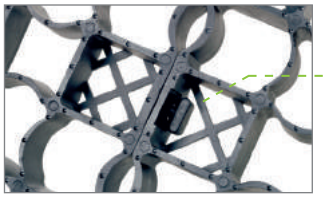
Certificates and Approvals

- ✓ UV-resistant, certified DIN EN 60068-2-5
- ✓ Point axle loading up to 20 t/m², DIN 1072:1985
- ✓ Heavy-duty, tried and tested DIN EN 124:2011
- ✓ Environmentally safe, tested OECD 202:2004
- ✓ Factory warranty: 20 years from purchase date (private use)
- ✓ NATO certified E50 - MOD / 9330-99-858-1406
- ✓ TÜV CERT
- ✓ TÜV Nord „Made in Germany"

Accessories

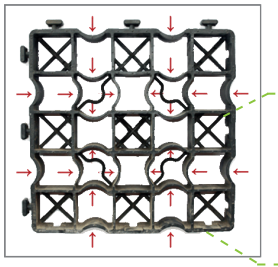
PURUS offer accessories for ECORASTER® ground reinforcement systems, including hinge and curve adaptors as well as parking markers.

Safety interlocking system



Effective safety snap connections are quick and easy to install.

Deploy without expansion joints



Not affected by temperature variations due to the integral expansion elements.

Installed and unfilled, the ECORASTER® system can be driven on with heavy wheeled vehicles (class D 400, excl. Bloxx).

Please note: Please read the manual/ check our website for more information!

$1m^2 = 10.764\ ft^2$

Developing sustainable solutions for a permeable ground reinforcement.

German engineering – installed worldwide.
Questions? Please give us a call:

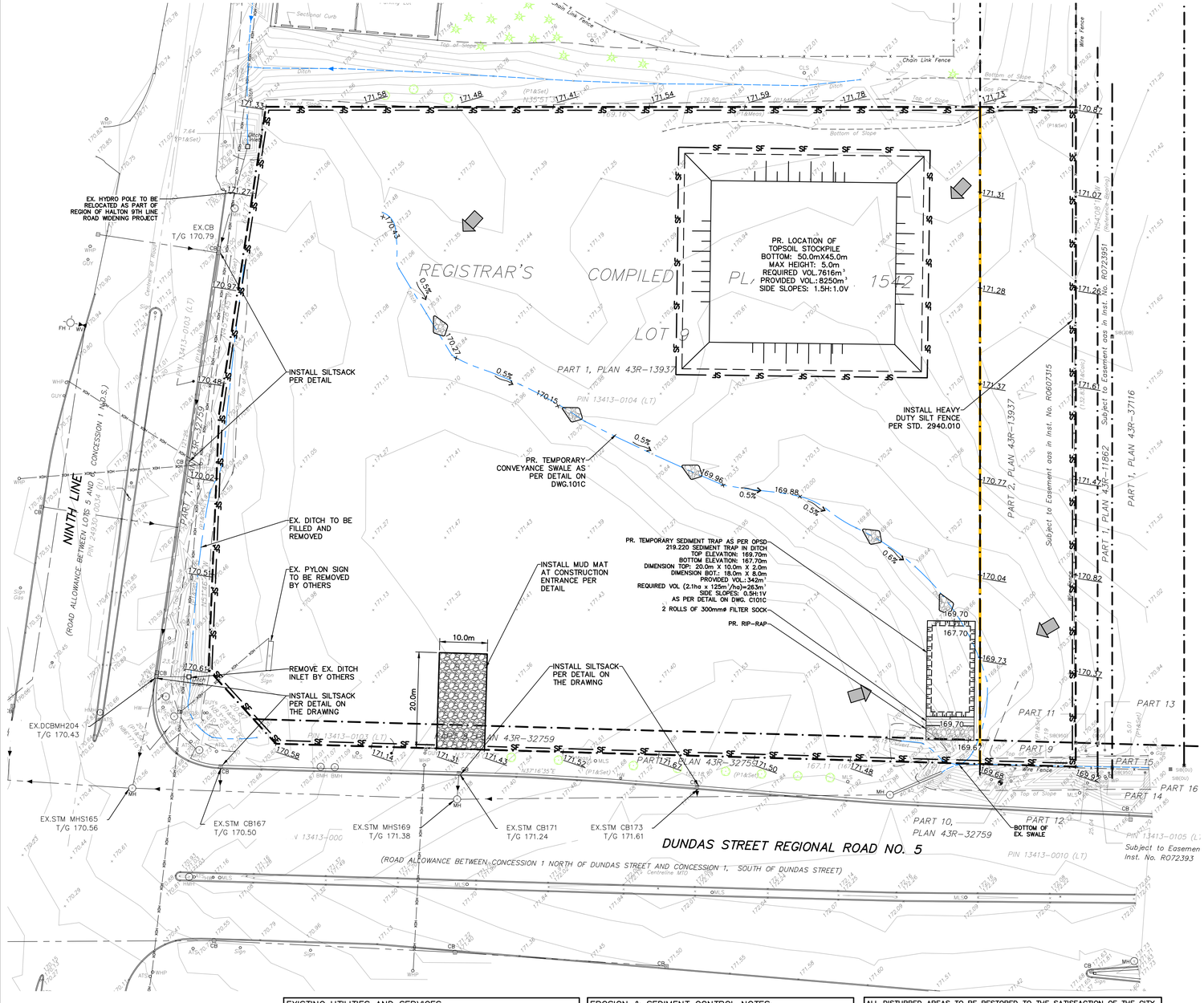
20 YEAR warranty
ECORASTER®

Purus NA Ecoraster Inc.
801 Tremaine Ave. S. PO Box 53
Listowel ON, N4W 3H2
info@purus-northamerica.com
800 495 5517

PURUS PLASTICS NORTH AMERICA

Version Av1_2015

DRAWINGS



10 0m 10 20 30 40
SCALE: 1:500

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.

DESIGN DETAILS OF EROSION AND SEDIMENT CONTROL MEASURES (STAGE 1)

1. INSTALL MUD MAT
2. INSTALL TREE HOARDING AS INDICATED ON LANDSCAPE PLANS.
3. INSTALL SEDIMENT CONTROL FENCE
4. INSTALL TEMPORARY SEDIMENT TRAP
5. INSTALL CONVEYANCE SWALES C/W ROCK CHECK DAMS

SEE DRAWING C101C FOR ALL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS.

NOTES:

1. ALL EXISTING DOMESTIC WELLS AND SANITARY SEPTIC SYSTEMS TO BE DECOMMISSIONED AND DISPOSED OFFSITE.

INSTALLATION & MAINTENANCE CONSIDERATIONS FOR TEMP. SEDIMENT TRAP

1. SEDIMENT TRAP MUST BE CONSTRUCTED PRIOR TO ANY CONSTRUCTION ACTIVITIES EXCEPT FOR TOPSOIL STRIPPING AND GRADING OPERATIONS ASSOCIATED WITH THE CONSTRUCTION OF THE SEDIMENT TRAP
2. PROPER COMPACTION CONTROL MUST BE USED WHEN CONSTRUCTING THE EMBANKMENT TO ENSURE ITS STABILITY
3. THE EMERGENCY SPILLWAY INSTALLATION IS CRITICAL TO PREVENTING FAILURE OF THE STRUCTURE DURING HIGH FLOWS AND ALL SPECIFICATIONS PROVIDED BY THE DESIGNER MUST BE FOLLOWED.
5. SEDIMENT ACCUMULATION IN THE TRAP MUST BE MEASURED A MINIMUM OF ONCE EVERY SIX (6) MONTHS. THE BASIN WILL REQUIRE CLEANING WHEN SEDIMENT ACCUMULATION REACHES 50% OF THE DESIGN CAPACITY.
6. SEDIMENT TRAP EMBANKMENTS, AND SPILLWAY SHOULD BE INSPECTED WEEKLY AND AFTER EACH RAINFALL AND SIGNIFICANT SNOWMELT EVENTS.

NOTES

8. AT-SOURCE AND CONVEYANCE ESC MEASURES MUST BE USED IN ADDITION TO THE SEDIMENT TRAP

INSTALLATION & MAINTENANCE CONSIDERATIONS FOR TEMP. SEDIMENT TRAP

1. SEDIMENT TRAP MUST BE CONSTRUCTED PRIOR TO ANY CONSTRUCTION ACTIVITIES EXCEPT FOR TOPSOIL STRIPPING AND GRADING OPERATIONS ASSOCIATED WITH THE CONSTRUCTION OF THE SEDIMENT TRAP
2. PROPER COMPACTION CONTROL MUST BE USED WHEN CONSTRUCTING THE EMBANKMENT TO ENSURE ITS STABILITY
3. THE EMERGENCY SPILLWAY INSTALLATION IS CRITICAL TO PREVENTING FAILURE OF THE STRUCTURE DURING HIGH FLOWS AND ALL SPECIFICATIONS PROVIDED BY THE DESIGNER MUST BE FOLLOWED.
5. SEDIMENT ACCUMULATION IN THE TRAP MUST BE MEASURED A MINIMUM OF ONCE EVERY SIX (6) MONTHS. THE BASIN WILL REQUIRE CLEANING WHEN SEDIMENT ACCUMULATION REACHES 50% OF THE DESIGN CAPACITY.
6. SEDIMENT TRAP EMBANKMENTS, AND SPILLWAY SHOULD BE INSPECTED WEEKLY AND AFTER EACH RAINFALL AND SIGNIFICANT SNOWMELT EVENTS.

NOTES

8. AT-SOURCE AND CONVEYANCE ESC MEASURES MUST BE USED IN ADDITION TO THE SEDIMENT TRAP

EROSION & SEDIMENT CONTROLS (ESC) MANAGEMENT STRATEGY

THE EROSION AND SEDIMENT CONTROLS SHALL BE A MULTI BARRIER APPROACH TO PREVENT EROSION DURING CONSTRUCTION TO DEAL WITH SEDIMENT TRANSPORT AT SOURCE AND TO MINIMIZE SEDIMENT TRANSPORT FROM LEAVING THE SITE. THE MITIGATION MEASURES OUTLINED BELOW SHALL BE MAINTAINED BY THE CONTRACTOR THROUGH REGULAR INSPECTIONS, MONITORING AND MAINTENANCE UNTIL THE SOIL HAS BEEN STABILIZED. THE CONTRACTOR SHALL KEEP A COPY OF THE ESC PLANS AND THE TORONTO AND REGION CONSERVATION AUTHORITY, EROSION AND SEDIMENT CONTROL GUIDELINE, DECEMBER 2006, ON SITE AT ALL TIMES

GENERAL NOTES

1. EROSION AND SEDIMENT CONTROL (ESC) MEASURES WILL BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING THE CONSTRUCTION PHASES TO PREVENT ENTRY OF SEDIMENT INTO THE WATER. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE REPAIRED AND/OR REPLACED WITHIN 48 HOURS OF THE INSPECTION.
2. THE EROSION AND SEDIMENT CONTROL STRATEGIES OUTLINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED / AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREAS. IF THE PRESCRIBED MEASURES ON THE PLANS ARE NOT EFFECTIVE IN PREVENTING THE RELEASE OF A DELETERIOUS SUBSTANCE, INCLUDING SEDIMENT, THEN ALTERNATIVE MEASURES MUST BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS. TRCA ENFORCEMENT OFFICER SHOULD BE IMMEDIATELY CONTACTED. ADDITIONAL ESC MEASURES ARE TO BE KEPT ON SITE AND USED AS NECESSARY.
3. AN ENVIRONMENTAL MONITOR WILL ATTEND THE SITE TO INSPECT ALL NEW CONTROLS, AS WELL AS ON A WEEKLY BASIS, OR FOLLOWING RAIN/SNOWMELT EVENT, TO MONITOR ALL WORKS, AND IN PARTICULAR WORKS RELATED TO EROSION AND SEDIMENT CONTROLS. SHOULD CONCERNS ARISE ON SITE THE ENVIRONMENTAL MONITOR WILL CONTACT THE TRCA ENFORCEMENT OFFICER AS WELL AS THE CONTRACTOR. WEEKLY INSPECTION REPORTS ARE TO BE PROVIDED TO THE TOWN AND TRCA.
4. ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, WILL BE CONTROLLED TO PREVENT THE ENTRY OF PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE OR OTHER DELETERIOUS SUBSTANCES INTO THE WATER. VEHICULAR REFUELING AND MAINTENANCE WILL BE CONDUCTED A MINIMUM OF 30M FROM THE WATER.
5. AT THE TOWN'S DISCRETION, PRE-GRADE AREAS TO BE STABILIZED BY HYDRO SEEDING C/W APPLICATION OF STRAW MULCH PER OPSS 804 TO A DEPTH OF 25mm TO 50mm TO THE SATISFACTION OF TOWN STAFF.

NOT FOR CONSTRUCTION

LEGEND

- PROPERTY LINE
- EXTENT OF GRADING WORKS
- EXISTING CONTOUR (0.5m)
- EXISTING CONTOUR (1.0m)
- EXISTING DITCH
- HP EXISTING HYDRO POLE
- EXISTING FENCE
- 215.00 EXISTING GRADE
- EXISTING OVERLAND FLOW DIRECTION
- MUD-MAT; SEE DETAIL
- SF SILT FENCE; SEE DETAIL
- PR. ROCK CHECK DAM PER OPSD 219.210
- TEMPORARY CONVEYANCE SWALE (DETAIL 'A')

No.	ISSUE / REVISION	YYYY/MMM/DD
2	ISSUED FOR 3rd SUBMISSION	2023/SEP/27
1	ISSUED FOR 2nd SUBMISSION	2021/DEC/03
0	ISSUED FOR 1st SUBMISSION	2020/NOV/20

ELEVATION NOTE:

ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM THE CITY OF MISSISSAUGA
BENCHMARK No. 07502031
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 GLOBAL ARCHITECTURE INC. DRAWING No.: A101, (2023/JULY/20)
JOB No.: 22-06

DRAWING NOTES:

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

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.

THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.

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

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

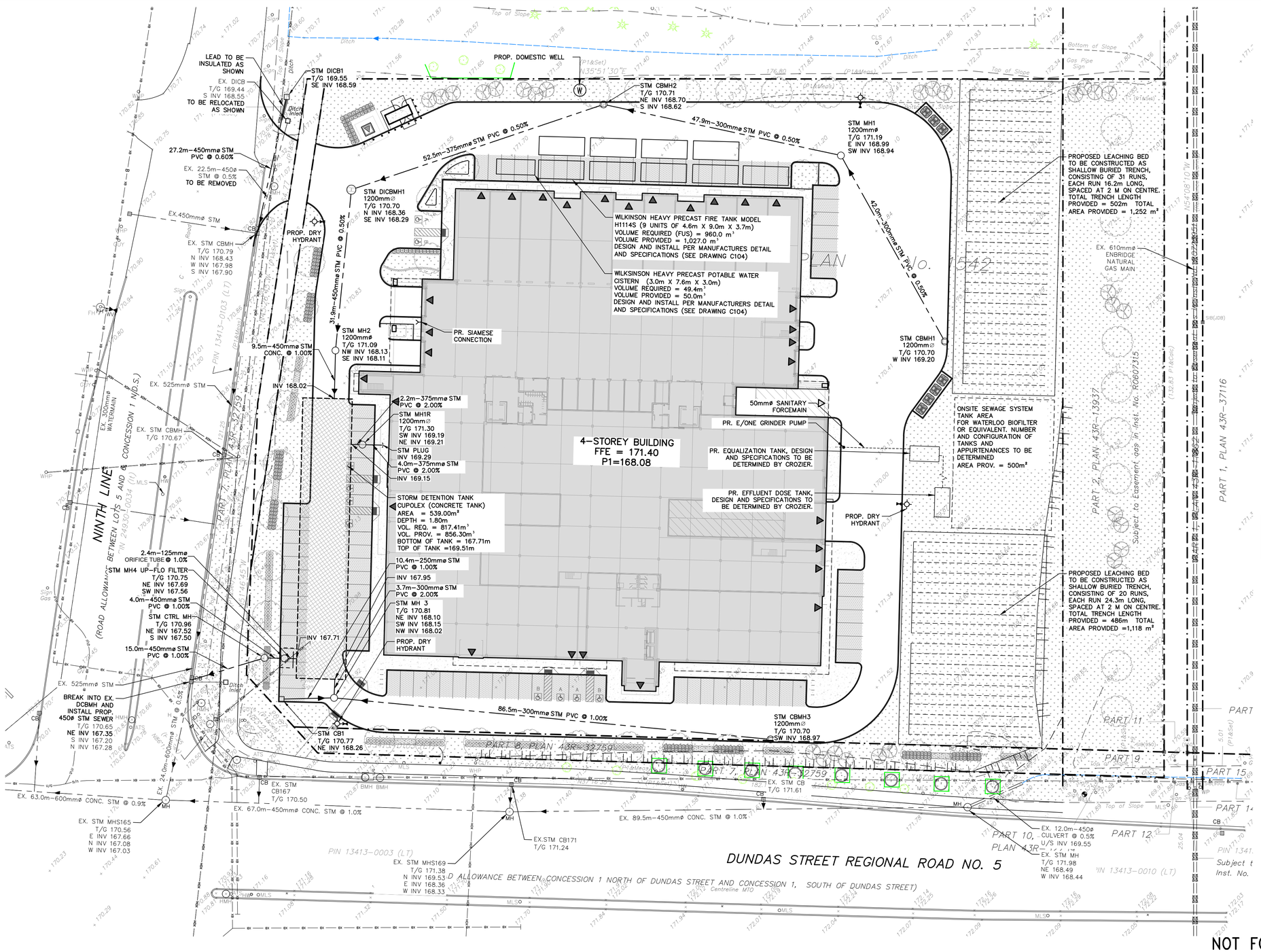
Drawing
REMOVALS PLAN
EROSION & SEDIMENT CONTROL PLAN

Stamp
LICENSED PROFESSIONAL ENGINEER
A. D. FARINA
100523860
2023-09-27
PROVINCE OF ONTARIO

Stamp

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

Drawn	Design	Project No.	
I.M./D.B.	I.M./A.D.F.	1644-5477	
Check	Check	Scale	Dwg.
A.D.F.	A.S.	1:500	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
- PROPOSED TREE PROTECTION

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.

No.	ISSUE / REVISION	YYYY/MMM/DD
2	ISSUED FOR 3rd SUBMISSION	2023/SEP/27
1	ISSUED FOR 2nd SUBMISSION	2021/DEC/03
0	ISSUED FOR 1st SUBMISSION	2020/NOV/20

ELEVATION NOTE:

ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM THE CITY OF MISSISSAUGA
BENCHMARK No. 07502031
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 GLOBAL ARCHITECTURE INC. DRAWING No.: A101, (2023/JULY/20)
JOB No.: 22–06

DRAWING NOTES:

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

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.

THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.

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

NOT FOR CONSTRUCTION

Stamp

LICENSED PROFESSIONAL ENGINEER
A. D. FARINA
100523860
2023-09-27
PROVINCE OF ONTARIO

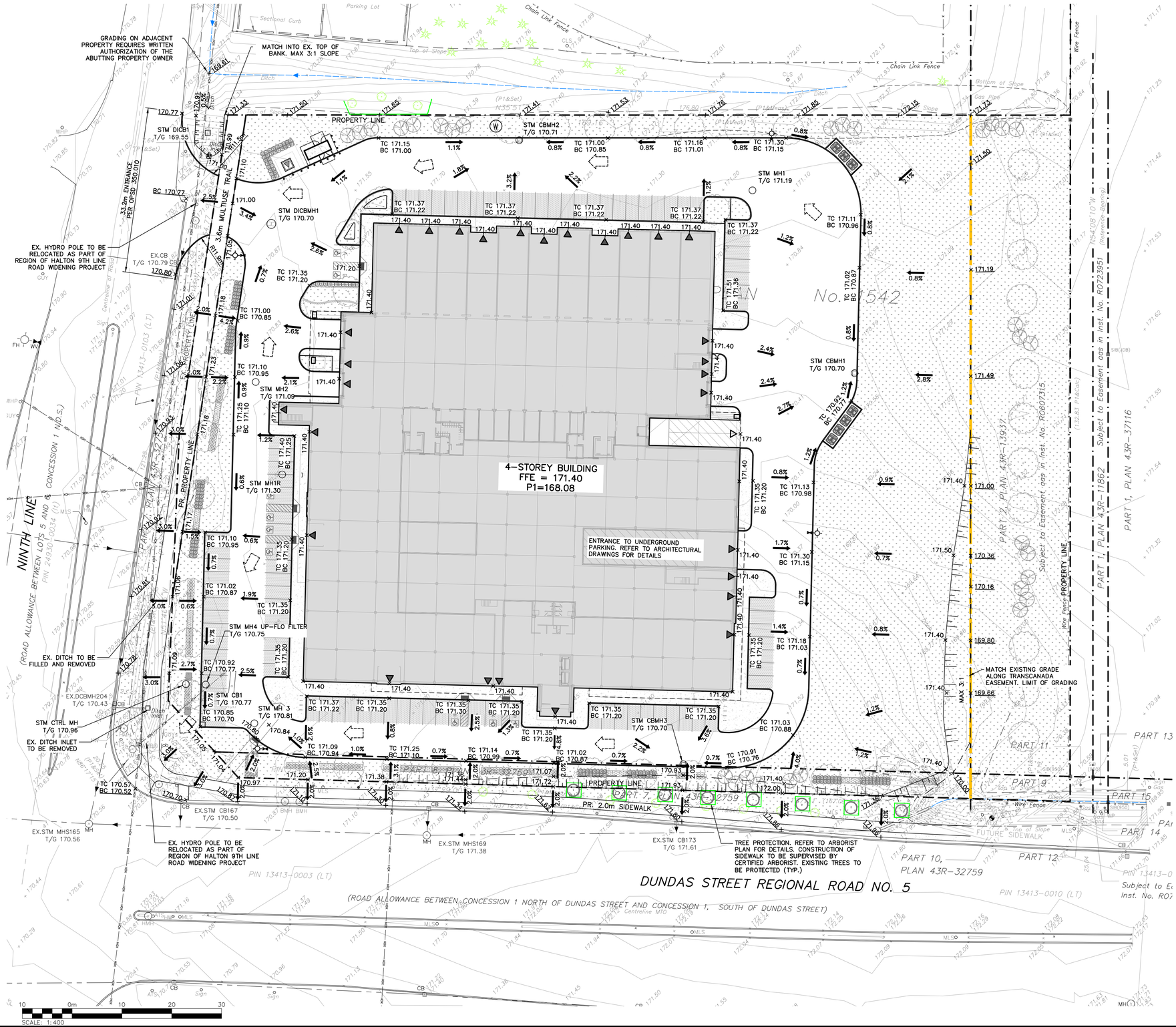
Stamp

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

Drawing
SITE SERVICING PLAN

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

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



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
- PROPOSED TREE PROTECTION

No.	ISSUE / REVISION	YYYY/MMM/DD
2	ISSUED FOR 3rd SUBMISSION	2023/SEP/27
1	ISSUED FOR 2nd SUBMISSION	2021/DEC/03
0	ISSUED FOR 1st SUBMISSION	2020/NOV/20

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

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 GLOBAL ARCHITECTURE INC. DRAWING No.: A101, (2023/JULY/20)
JOB No.: 22-06

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.

NOT FOR CONSTRUCTION

Stamp

LICENSED PROFESSIONAL ENGINEER
A. D. FARINA
100523860
2023-09-27
PROVINCE OF ONTARIO

Stamp

Project

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

Drawing

SITE GRADING PLAN

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

Drawn	I.M./D.B.	Design	I.M./A.D.F.	Project No.	1644–5477
Check	A.D.F.	Check	A.S.	Scale	1: 400
				Dwg.	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

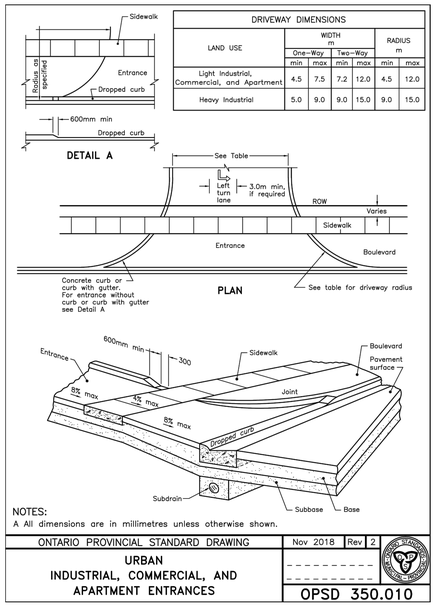
1. EACH OF THE TWO WELLS AND THE DOMESTIC WATER CISTERN SHOULD BE EQUIPPED WITH A 1/2HP 2 WIRE 230V GRUNDFOS 10SQ10-290 COMPLETE WITH FRANKLIN ELECTRIC MOTOR OR APPROVED EQUIVALENT.
2. ALTERNATIVELY, CONTRACTOR CAN REPLACE CISTERN PUMP WITH JET PUMP IN BUILDING.
3. BOTH WELL PUMPS TO BE INSTALLED WITH 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

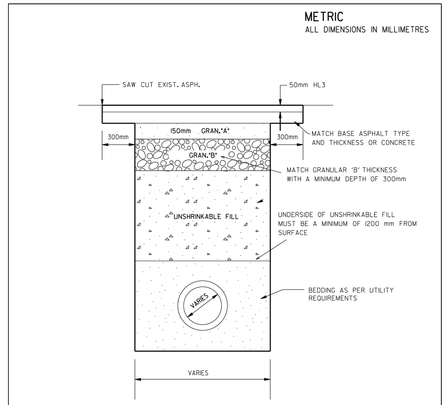
9. WE RECCOMEND USING A UV LIGHT AND PRE-FILTER TO TREAT DOMESTIC WATER. INSTALL PER MANUFACTURERS DESIGN AND SPECIFICATIONS.



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

114,000 LITRE CONCRETE WATER HOLDING TANK MODEL H114S

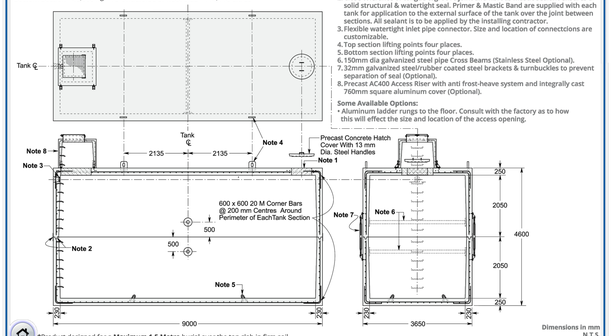
WILKINSON HEAVY PRECAST
WWW.WILKINSONHEAVYPRECAST.COM
DUNDAS, ONTARIO 1-800-263-8503

CONSTRUCTION DETAILS:
Concrete: 35 MPa at 28 Days, 5 to 8% Air Entrainment.
Reinforcing: Designed for a maximum 1.5 metre burial over the top slab in firm soil. Optional reinforcing for CHBDC vehicular loading available upon request.

WEIGHT: Top Section - 48,000 kg, Bottom Section - 48,000 kg
CAPACITY: Per Vertical Metre - 27,832 Litres, To Underside of Roof Slab - 114,110 Litres

NOTES:
1. Large 685 mm diameter roof access openings facilitate tank maintenance. Unless otherwise specified when ordered this tank will be shipped with 840mm diameter concrete roof access cover only. Please see Access Riser section for available riser & hatch options.
2. Close tolerance of tongue & groove joint and fibrous mastic sealant ensures a solid structural & watertight seal. Primer & Mastic Band are supplied with each tank for application to the external surface of the tank over the joint between sections. All sealant is to be applied by the installing contractor.
3. Flexible watertight inlet pipe connector. Size and location of connecticons are customizable.
4. Top section lifting points four places.
5. Bottom section lifting points four places.
6. 150mm dia galvanized steel pipe Cross Beams (Stainless Steel Optional).
7. 32mm galvanized steel/rubber coated steel brackets & turnbuckles to prevent separation of seal (Optional).
8. Precast AC400 Access Riser with anti frost-heave system and integrally cast 760mm square aluminum cover (Optional).

Some Available Options:
• Aluminum ladder rungs to the floor. Consult with the factory as to how this will effect the size and location of the access opening.



*Product designed for a **Maximum 1.5 Metre** burial over the top slab in firm soil away from any area of vehicular traffic.

For recommended installation proceedures refer to Wilkinson Installation Guidelines.

WARNING! IMPROPER INSTALLATION ESPECIALLY IN UNSTABLE SOIL CAN RESULT IN THE STRUCTURAL FAILURE OF THIS PRODUCT — March 27, 2015

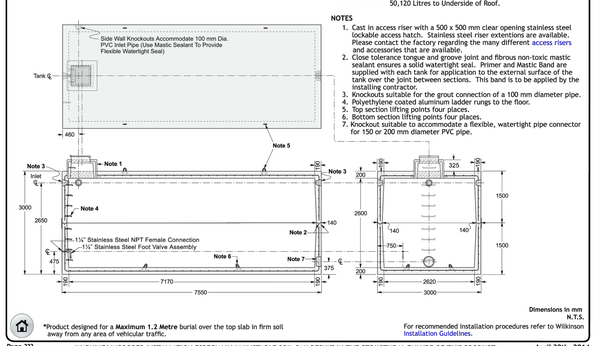
50,000 LITRE PRECAST POTABLE WATER CISTERN

WILKINSON HEAVY PRECAST LIMITED
DUNDAS, ONTARIO 1-800-263-8503
www.wilkinsonheavyprecast.com

CONSTRUCTION DETAILS *
Concrete: 35 MPa at 28 Days, 5 to 8% Air Entrainment.
Reinforcing: 15 M bars at 250 mm centres each way in walls, roof and floor. Eight extra 15 M bars around each roof access opening. Minimum cover over reinforcing steel - 25mm.

Weight: Top Section 22,000 kg, Bottom Section 22,000 kg, Total 44,000 kg
Actual Capacity: 19,277 Litres Per Vertical Metre. 50,120 Litres to Underside of Roof.

NOTES
1. Cast in access riser with a 500 x 500 mm clear opening stainless steel lockable access hatch. Stainless steel riser extentions are available. Please contact the factory regarding the many different access risers and accessories that are available.
2. Close tolerance tongue and groove joint and fibrous non-toxic mastic sealant ensures a solid watertight seal. Primer and Mastic Band are supplied with each tank for application to the external surface of the tank over the joint between sections. This band is to be applied by the installing contractor.
3. Knockouts suitable for the great connection of a 100 mm diameter pipe.
4. Polyethylene coated aluminum ladder rungs to the floor.
5. Top section lifting points four places.
6. Bottom section lifting points four places.
7. Knockout suitable to accommodate a flexible, watertight pipe connector for 150 or 200 mm diameter PVC pipe.



*Product designed for a **Maximum 1.2 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.

Page ???

WARNING! IMPROPER INSTALLATION ESPECIALLY IN UNSTABLE SOIL CAN RESULT IN THE STRUCTURAL FAILURE OF THIS PRODUCT — April 30th, 2014

NOT FOR CONSTRUCTION

Stamp: LICENSED PROFESSIONAL ENGINEER — A. D. FARINA — 100523660 — 2023-09-27 — PROVINCE OF ONTARIO

Stamp

No.	ISSUE / REVISION	YYYY/MMM/DD
2	ISSUED FOR 3rd SUBMISSION	2023/SEP/27
1	ISSUED FOR 2nd SUBMISSION	2021/DEC/03
0	ISSUED FOR 1st SUBMISSION	2020/NOV/20

ELEVATION NOTE:

ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM THE CITY OF MISSISSAUGA BENCHMARK No. 07502J031 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 (CSRS) (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 GLOBAL ARCHITECTURE INC. DRAWING No.: A101, (2023/JULY/20)
JOB No.: 22-06

DRAWING NOTES:

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

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.

THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.

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

Project
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	Design	Project No.	
I.M./D.B.	I.M./A.D.F.	1644-5477	
Check	Check	Scale	Dwg.
J.L.	A.S.	NTS	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

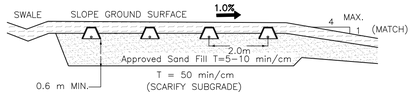
LEACHING BED

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.

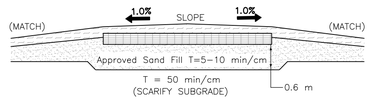
PUMPS AND CONTROLS

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

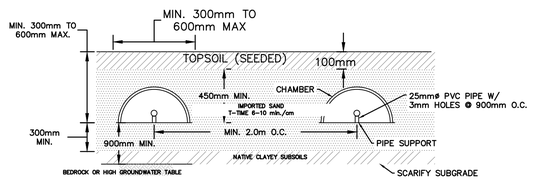
TYPICAL SHALLOW BURIED TRENCH CROSS SECTION
SCALE N.T.S.



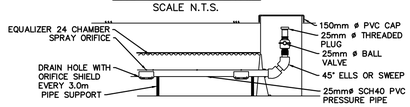
TYPICAL SHALLOW BURIED TRENCH CROSS SECTION
SCALE N.T.S.



SHALLOW BURIED TRENCH DETAIL
SCALE N.T.S.



END OF PORT DETAIL
SCALE N.T.S.



NOT FOR CONSTRUCTION

No.	ISSUE / REVISION	YYYY/MMM/DD
2	ISSUED FOR 3rd SUBMISSION	2023/SEP/27
1	ISSUED FOR 2nd SUBMISSION	2021/DEC/03
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 (CSRS) (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 GLOBAL ARCHITECTURE INC. DRAWING No.: A101, (2023/JULY/20)
JOB No.: 22-06

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.

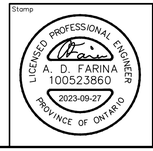
THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.

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
ONSITE SEWAGE SYSTEM NOTES AND STANDARD DETAILS

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.	
I.M./D.B.	I.M./A.D.F.	1644-5477	
Check	Check	Scale	Dwg.
J.L.	A.S.	NTS	C 105

FIGURES

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (1.0m)
- EXISTING DITCH
- EXISTING STORM SEWER & MANHOLE
- EXISTING OVERLAND FLOW DIRECTION
- PRE-DEVELOPMENT STORM DRAINAGE CATCHMENT
- ID — CATCHMENT I.D.
- A | RC — AREA (ha) | RUNOFF COEFFICIENT

No.	ISSUE / REVISION	YYYY/MMM/DD
2	ISSUED FOR 3rd SUBMISSION	2023/SEP/27
1	ISSUED FOR 2nd SUBMISSION	2021/DEC/03
0	ISSUED FOR 1st SUBMISSION	2020/NOV/20

ELEVATION NOTE:

ELEVATIONS SHOWN ON THIS PLAN ARE DERIVED FROM THE CITY OF MISSISSAUGA BENCHMARK No. 07502031
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 GLOBAL ARCHITECTURE INC. DRAWING No.: A101, (2023/JULY/20)
JOB No.: 22-06

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

PRE-DEVELOPMENT DRAINAGE PLAN

NOT FOR CONSTRUCTION

Stamp

LICENSED PROFESSIONAL ENGINEER
A. D. FARINA
100523860
2023-09-27
PROVINCE OF ONTARIO

Stamp

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

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

10 0m 10 20 30
SCALE: 1:400

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (1.0m)
- EXISTING DITCH
- PROPOSED STORM SEWER & MANHOLE
- EXISTING STORM SEWER & MANHOLE
- PROPOSED MAJOR OVERLAND FLOW DIRECTION
- EXISTING OVERLAND FLOW DIRECTION
- POST-DEVELOPMENT STORM DRAINAGE CATCHMENT
- ID: CATCHMENT I.D.
- A | RC: AREA (ha) | RUNOFF COEFFICIENT

No.	ISSUE / REVISION	YYYY/MMM/DD
2	ISSUED FOR 3rd SUBMISSION	2023/SEP/27
1	ISSUED FOR 2nd SUBMISSION	2021/DEC/03
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 GLOBAL ARCHITECTURE INC. DRAWING No.: A101, (2023/JULY/20)
JOB No.: 22-06

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
POST-DEVELOPMENT DRAINAGE PLAN

NOT FOR CONSTRUCTION

Stamp
LICENSED PROFESSIONAL ENGINEER
A. D. FARINA
100523860
2023-09-27
PROVINCE OF ONTARIO

Stamp

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

Drawn	Design	Project No.	
I.M./D.B.	I.M./A.D.F.	1644-5477	
Check	**Check**	**Scale**	**Dwg.**
A.D.F.	A.S.	1:400	FIG 2

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (1.0m)
- EXISTING DITCH
- PROPOSED STORM SEWER & MANHOLE
- EXISTING STORM SEWER & MANHOLE
- STORM DRAINAGE DELINEATION
- EXISTING OVERLAND FLOW DIRECTION
- PROPOSED MAJOR OVERLAND FLOW DIRECTION
- ID / A | RC — CATCHMENT I.D. / AREA (ha) | RUNOFF COEFFICIENT

No.	ISSUE / REVISION	YYYY/MMM/DD
2	ISSUED FOR 3rd SUBMISSION	2023/SEP/27
1	ISSUED FOR 2nd SUBMISSION	2021/DEC/03
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 GLOBAL ARCHITECTURE INC. DRAWING No.: A101, (2023/JULY/20)
JOB No.: 22-06

DRAWING NOTES:

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

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.

THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.

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

Project

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

Drawing

INTERNAL STORM AREA DRAINAGE PLAN

NOT FOR CONSTRUCTION

Stamp: LICENSED PROFESSIONAL ENGINEER — A. D. FARINA — 100523860 — 2023-09-27 — PROVINCE OF ONTARIO

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

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