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FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

MILTON AMJ COMMUNITY CENTRE
MILTON, ONTARIO

PREPARED FOR:
AHMADIYYA MUSLIM JAMA'AT CANADA INC.
1456 BRONTE STREET
MILTON, ON L9T 7K4

DATE: JULY 2023

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DATE: JULY 2023

PROJECT NO. 16834

PREPARED BY HUSSON
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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF DRAWINGS

1.0 INTRODUCTION

The purpose of this report is to provide functional design information related to the stormwater management (SWM) plan and servicing design for the proposed AMJ Community Centre development on Milton, Ontario. This report will demonstrate the measures that will be undertaken to deal with storm and sanitary drainage, and water servicing for the site.

The site is located on the west side of Bronte Street South, north of Britannia Road. It is in the Milton Phase III West residential development. The 0.38ha site is located within Block 1 of the Boyne Survey Secondary Plan Area. The site is bordered by a proposed school to the north and west and future residential lands to the south. There is an existing house and separate garage on the site. **Figure 1** shows the site location.

Site Plan A0, prepared by Paradigm Architecture + Design, shows the proposed development. It is proposed to construct a one storey community centre with basement with a gross floor area of 1,516m^2 and associated landscape and parking areas.

The storm drainage plan has been designed to meet the requirements of the Town of Milton. The following materials were referenced in the preparation of this report.

- Boyne Survey Block 1, Subwatershed Impact Study, prepared by The Municipal Infrastructure Group, and others, dated April 2018. This document outlines the overall grading, servicing and stormwater management plan for the secondary plan area.
- The Stormwater Management Planning and Design Manual (MECP Guidelines), prepared by the Ministry of the Environment, Conservation and Parks, March 2003.
- The Erosion & Sediment Control Guideline for Urban Construction, prepared by the Greater Golden Horseshoe Area Conservation Authorities (GGHA CA), December 2006.

2.0 STORMWATER DESIGN

2.1 Design Criteria

As requested by the Town, this report is to address the stormwater management, grading and erosion and sediment controls to be implemented during construction. It is to provide sufficient information to demonstrate that the site can be adequately serviced and graded under the interim and ultimate conditions, considering that the Site development will precede the surrounding development. The Town has provided the following criteria which is applicable to the site development:

a) The grading should be designed in a manner that incorporates conveyance of existing offsite drainage that currently traverses through the site (if applicable). Flooding impacts on adjacent properties is to be avoided.

b) Preliminary Stormwater Management criteria is as follows:

   i. Quantity Control – 100-year post-development flows to 5-year pre-development flows;

   ii. Quality Control – Level 1 TSS removal (as per MECP Guildelines).

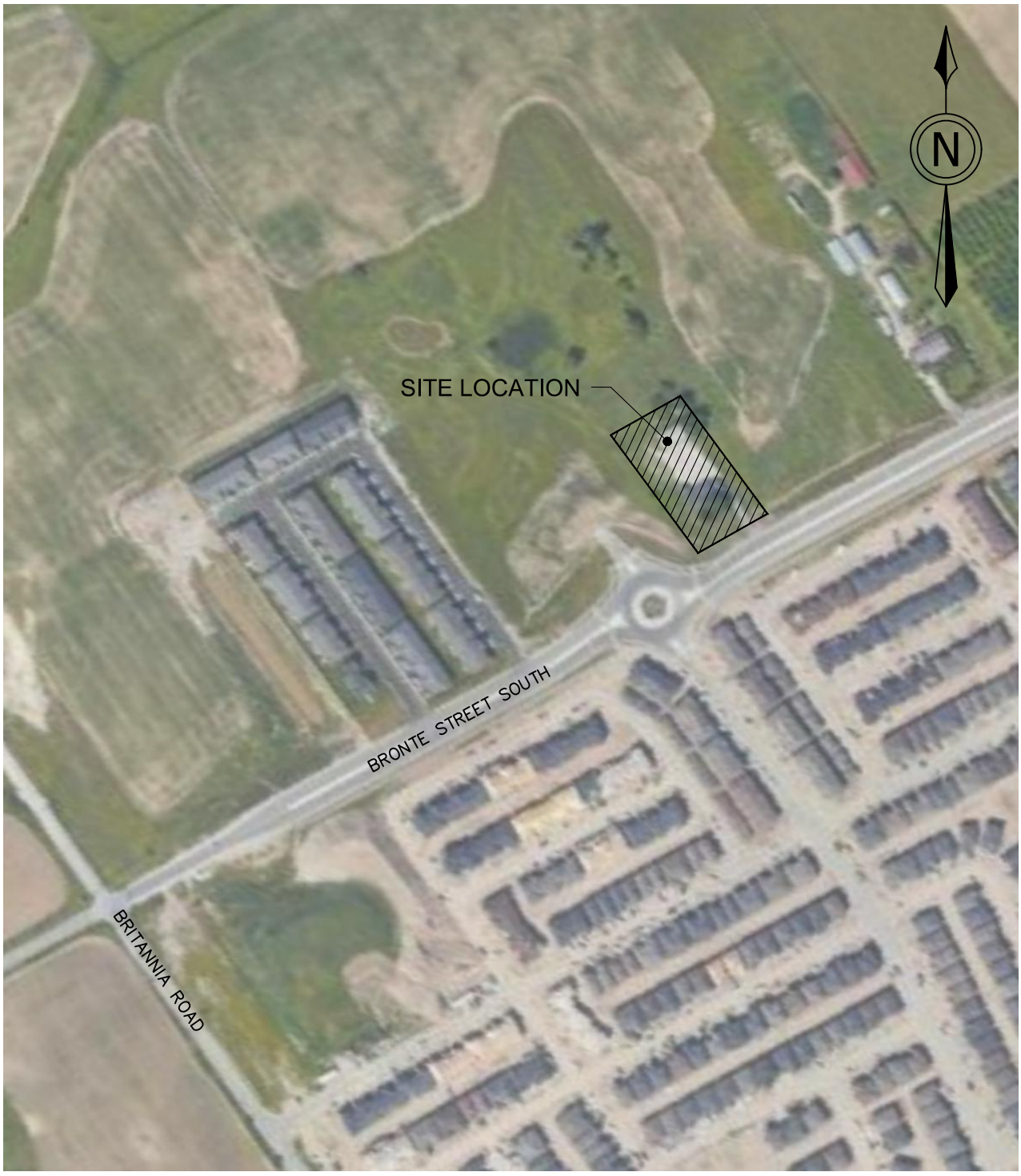

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FIGURE 1

MILTON AMJ COMMUNITY CENTRE
SITE LOCATION

DATE: JULY 2023 SCALE: N.T.S PROJECT: 16834

c) 100-year ponding limits will be required on the Grading Plan, if proposed.

2.2 Major and Minor System Drainage

2.2.1 Existing Drainage

Existing drainage on the property is generally directed from west to east toward Bronte Street. There is an existing 450mm diameter storm sewer on Bronte Street, as well as a roadside ditch on the west side of the road. The site currently drains to the roadside ditch.

There is a culvert under the existing driveway, which conveys drainage from the Bronte Street ditch to the north; however, the majority of this drainage will be blocked by the retaining wall, which is currently being constructed for the school site development. The retaining wall will extend along the north and west sides of the site, within the school site property. Therefore, there will be no external drainage conveyed through the site.

2.2.2 Storm Sewer Design

It is proposed to outlet to the existing ditch on Bronte Street. Storm sewer systems have been designed to convey the 5-year runoff from the site. The proposed grading design consists of saw-toothed grading through the parking lot with water ponding above the catchbasins. With this type of design, the majority of the 100-year storm runoff will be captured in the minor (storm sewer) system. Details of the on-site ponding are provided in **Section 2.3**. **Drawing SW2** shows the proposed storm sewer system design and the storm sewer design sheet for the site can be referenced in **Appendix A**.

The discharge from the minor system to the ditch will be controlled to the 5-year pre-development peak flow. Details of the on-site stormwater management design are provided in **Section 2.3**.

2.2.3 Overland Flow

In the event of a blockage, or a storm greater than the 100-year event, an emergency overland flow route has been incorporated into the design so that ponding above the catchbasins does not exceed 0.3m. The emergency overland flow will be directed toward Bronte Street. Refer to **Drawing SW1** for the site grading.

2.2.4 Ultimate Drainage

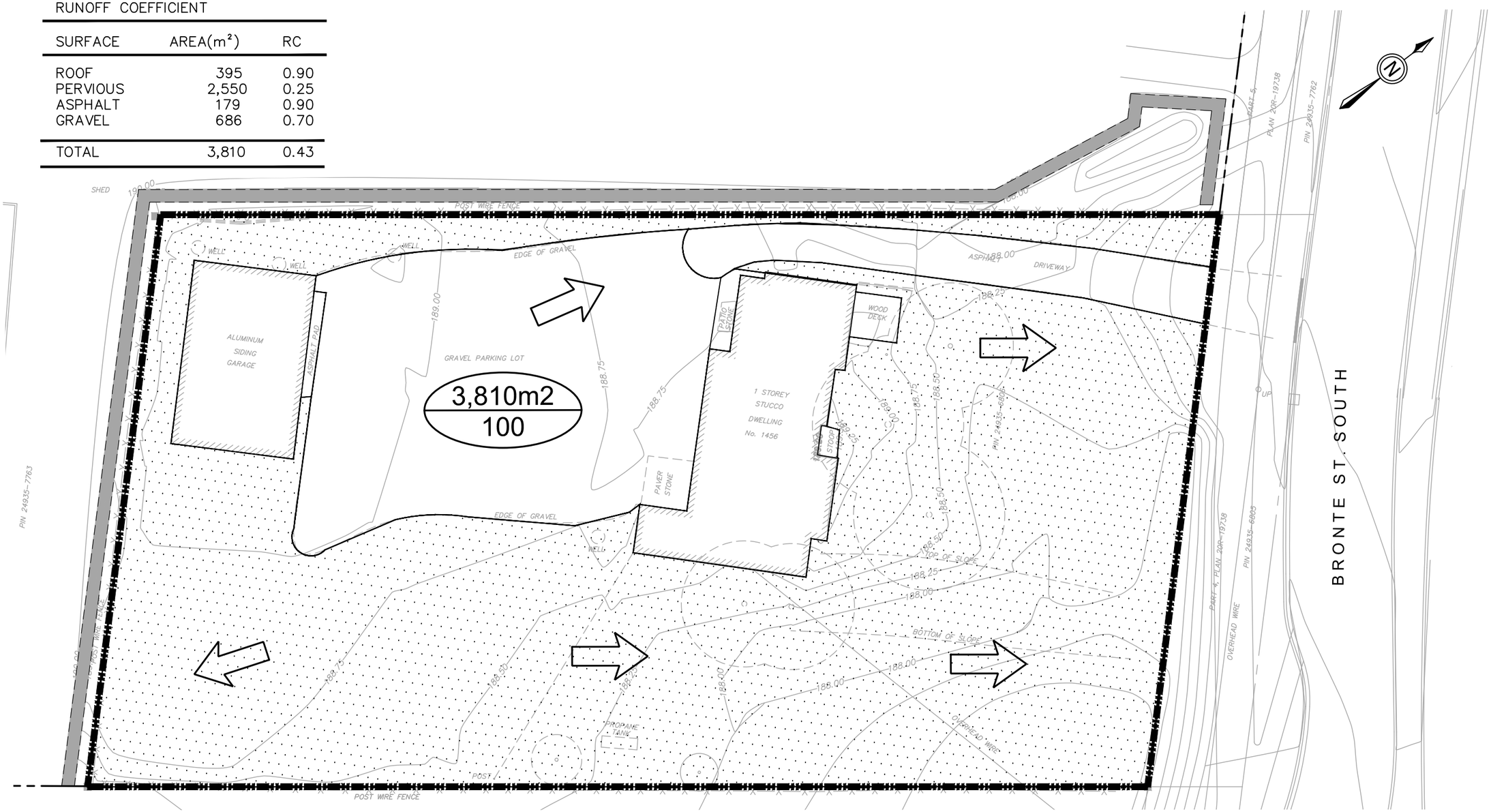
When the future residential development to the south proceeds it is anticipated that the existing ditch south of the property will remain and be directed to new storm sewer ultimately discharging into the future stormwater management pond to be located on the north side of Britannia Road, east of Bronte Street, as per the approved SIS.

2.3 Peak Flow Controls

As per the Town requirements, the allowable release rate from the site is the 5-year pre-development peak flow. The pre-development catchment area draining to the Bronte Street ditch is shown on **Figure 2**. The site includes rooftop, asphalt and gravel parking and landscape areas. The existing site has an area of 0.381ha, with a runoff coefficient of 0.43. **Table 1** provides the allowable release rate from the site, based on the 5-year pre-development peak flow. Refer to **Appendix B** for calculations.

CATCHMENT 100–FULL SITE
RUNOFF COEFFICIENT

SURFACE	AREA(m²)	RC
ROOF	395	0.90
PERVIOUS	2,550	0.25
ASPHALT	179	0.90
GRAVEL	686	0.70
TOTAL	3,810	0.43



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LEGEND

DIRECTION OF OVERLAND FLOW

CATCHMENT DRAINAGE BOUNDARY

3,810m2 / 100 — DRAINAGE AREA / CATCHMENT ID

PERVIOUS AREA

FIGURE 2
MILTON AMJ COMMUNITY CENTRE
EXISTING SWM PLAN

DATE: JULY 2023 SCALE: 1:300 PROJECT: 16834

Table 1. Target Release Rates

Catchment	Catchment Area (ha)	Runoff Coefficient	5-Year Pre-Development Flow (L/s)
Total	0.381	0.43	48

To meet the target release rates, it is proposed to use parking lot surface detention. Refer to **Figure 3** for the proposed stormwater management plan and catchment areas.

Runoff can be stored in the depressions above the catchbasins in parking areas. Surface storage will be limited to a maximum depth of 0.3m as described in **Section 2.2.3**. Runoff from the parking lot will be controlled by a 100mm diameter orifice tube located on the outlet of MH2. The controlled flow rate from the orifice is summarized in **Table 3**.

Table 2 provides a summary of the storage provided on site.

Table 2. Peak Flow Controls

Catchment	HWL (m)	Invert (m)	Orifice Plate Dia. (mm)	Maximum Flow (L/s)
101	189.45	187.43	100	39

A modified rational method calculation was used to estimate the required on-site storage volume to control the peak flow from Catchment 101 to 39.1L/s. The storage volume provided in the parking lot was estimated using the end-area method for 0.05m contours within the parking area. Storage is provided between the lowest CB elevation of 189.15m and the high-water level of 189.45. In addition, 13.6m^3 of storage is provided in the storm pipes and structures below the elevation of 189.45m. Refer to **Table 3** for a comparison of the required and provided storage volumes. There is adequate storage provided between the storm sewers and surface storage to provide the required controls.

Table 3. Storage Volume Comparison

Catchment	Storage Provided (m^3)	Storage Required (m^3) 100 Year
101	203	24

The 100-year storage elevation in the parking lot will be at an elevation of 187.25; which is 0.1m of ponding above the catchbasins.

Table 4 provides a comparison of the pre- and post-development peak flows. **Appendix B** for calculations.

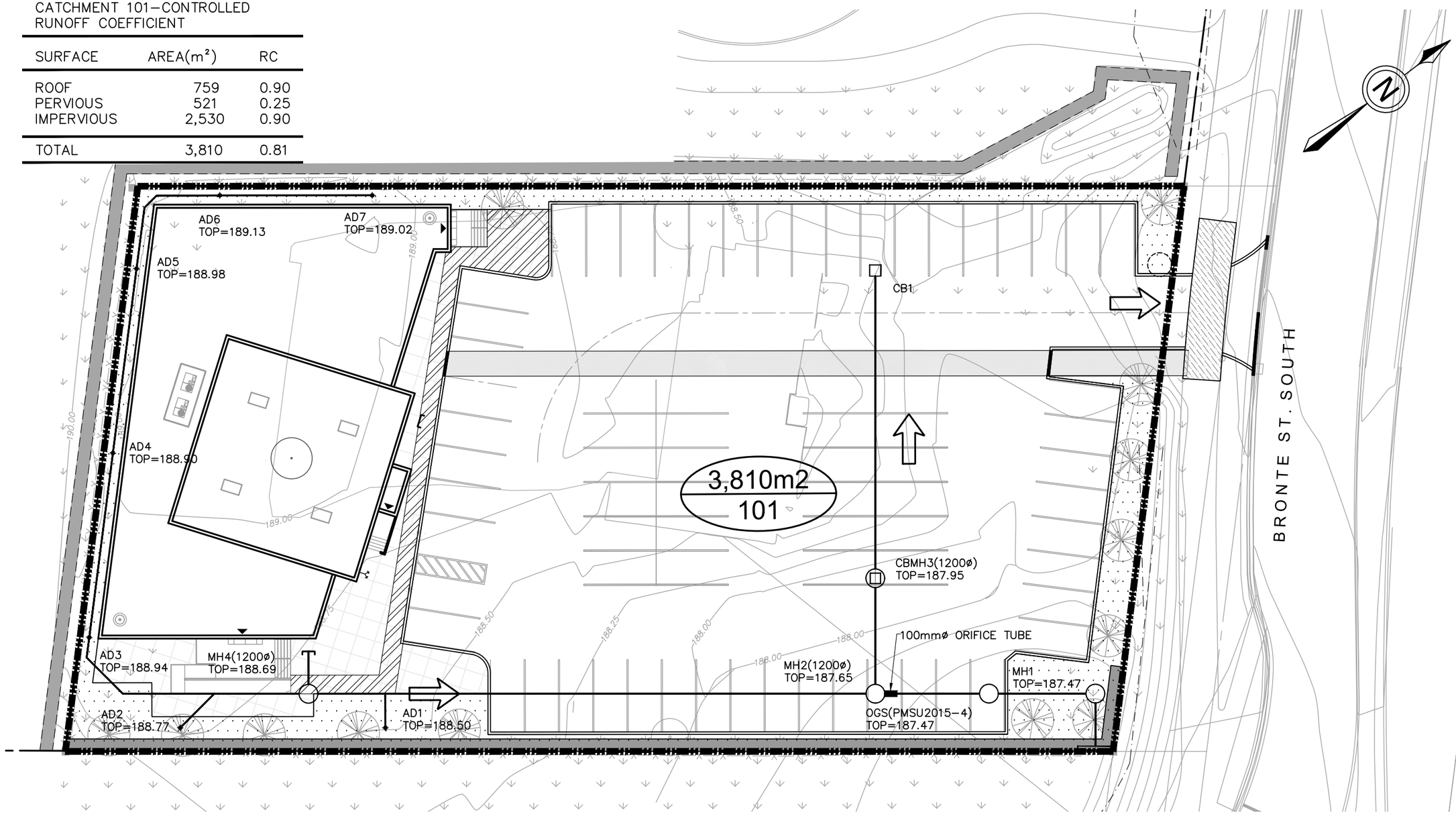
Table 4. Peak Flow Comparison

Catchment	Post-Development 100 Year Peak Flow (L/s)	Target Flow (L/s)
101 (Controlled)	**39**	**48**

Table 4 shows that the post development peak flows are less than the target flows. Therefore, quantity controls for the pond downstream are satisfied.

CATCHMENT 101–CONTROLLED
RUNOFF COEFFICIENT

SURFACE	AREA(m²)	RC
ROOF	759	0.90
PERVIOUS	521	0.25
IMPERVIOUS	2,530	0.90
TOTAL	3,810	0.81



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LEGEND

DIRECTION OF OVERLAND FLOW

CATCHMENT DRAINAGE BOUNDARY

3,659m2 / 101 — DRAINAGE AREA / CATCHMENT ID

PERVIOUS AREA

FIGURE 3
MILTON AMJ COMMUNITY CENTRE
PROPOSED SWM PLAN

DATE: JULY 2023 SCALE: 1:300 PROJECT: 16834

2.4 Quality Control

The Town requires that the development provide a Level 1 (*enhanced)* level of water quality control based on the MECP Guidelines. An oil/grit separator (OGS) will be provided to meet the quality control requirement. The OGS will be installed downstream of the orifice control and will treat the runoff from the rooftop, driveway and parking area.

The proposed OGS will be a PMSU20_15_4m (or approved equivalent). The unit has been sized to provide 84.7 percent TSS removal, based on a catchment area of 0.381ha and a runoff coefficient of 0.85. Refer to **Appendix C** for details and sizing of the CDS unit.

2.5 Erosion and Sediment Control

An erosion and sediment control plan, will be prepared with the detailed design at the site plan approval stage. The plan will be prepared following the Erosion and Sediment Control Guidelines for Urban Construction (ESC Guidelines), prepared by The Greater Golden Horseshoe Area Conservation Authorities, December 2006. The plan has been designed to limit sediment and debris from leaving the site during all stages of construction.

2.5.1 Existing Site Condition

The existing site is gently sloping from west to east. The majority of the site drains to the existing ditch on Bronte Street. The existing soils consist of a layer of fill, clayey silt till and sandy silt till. Overland flow is generally directed towards the southeast at an average grade of 2 percent. Based on the soils and gentle slopes across the site, there is a moderate potential for erosion from the site.

2.5.2 Erosion and Sediment Control Plan

The sediment control plan for this site consists of the following:

- A sediment control fence will be installed along the perimeter of the site where the grade will direct flows off-site.
- Site access will be limited to one entrance per phase of construction. A gravel access pad will be installed for staging of construction material and vehicles.
- Any mud tracked from the site should be swept immediately and a sweeper truck should be used as necessary to remove any additional debris.
- Trucks leaving the site should be covered with tarpaulin.
- During dry weather, above freezing construction periods, dust control measures including wetting the site and egress points should be implemented on an as needed basis.
- Once the storm sewer system has been constructed, catchbasin sediment control and protection devices will be installed and maintained until the site is ready to be paved.

Erosion measures will be in place prior stripping topsoil from the site. A program will be in place to monitor and maintain the erosion and sediment controls. The sediment controls will be inspected by the Site Engineer and contractor:

- Once every 7 days and/or
- Within 24 hours following any significant rainfall event or snowmelt.

The inspection frequency can be extended to monthly inspections if there is no construction activity on-site.

Proper construction sequencing will also help with erosion and sediment control. The following schedule is recommended:

1. Install sediment control fence and access road.
2. Install sediment control devices on existing catchbasins receiving runoff from areas to be disturbed during construction.
3. Install perimeter swales.
4. Rough grade site to subgrade elevations.
5. Install services and sediment control devices on new catchbasins.
6. Re-vegetate disturbed areas including lands left untouched for more than 30 days.
7. Remove sediment controls once the site has been 95 percent stabilized.

3.0 SANITARY SERVICING

There is an existing 200mm diameter sanitary sewer on Holbrook Court to the east of the Bronte Street South, flowing south. The sanitary service to the site will be provided by connecting to an existing manhole on Holbrook Court with a 200mm diameter sanitary service which crosses Bronte Street South, refer to Drawing **SW2**. The existing septic bed and well on the site will be removed/decommissioned as per MOE requirements.

The sanitary sewer for the site has been sized based on Region of Halton Standards for Community Services. The following parameters from the Region of Halton's Water Wastewater Linear Design Manual were used:

- Average daily flow per capita = 275 L
- Population Density (Table 3-1 and 3-2): Single Family Residential = 55 persons/ha; Institutional = 90 persons/ha
- Peaking Factors were calculated using the Modified Harmon Formula for Institutional Land Use.
- An infiltration allowance of 0.286 L/s/ha was carried for all areas.

The estimated populations are summarized in **Table 5** below.

Table 5. Sanitary Flow Comparison

Land Use	Equivalent Population[1]	Peaking Factor[2]	Equivalent Peak Flow (L/s)[2]
Pre-Development:			
• Single Family: 0.381ha	21	3.50	0.23
Post Development:			
• Institutional: 0.381ha	34	3.48	0.38

[1] Equivalent population as per the latest *Region of Halton's Water and Wastewater Linear Design Manual*
Light Commercial Areas: 90person/hectare; Single Family: 55person/hectare

[2] Equivalent Flow as per the latest *Region of Halton's Water and Wastewater Linear Design Manual*
(Average daily wastewater flow = 275litres/capita/day, maximum peaking factor: Harmon's Peaking Factor)

The sanitary flows are summarized in **Table 6** below.

Table 6. Sanitary Flow Summary

Scenario	Sanitary Flow (L/s)	Infiltration Flow (L/s)*	Total (L/s)
Pre-Development	0.23	0.11	**0.34**
Post Development	0.38	0.11	**0.49**

*Infiltration flows are based off a site area of 0.381ha and a design flow rate of 0.286L/s/ha.

The sanitary drainage from the site of approximately 0.49L/s is not expected to have an adverse impact on the capacity of the receiving system. No further analysis was carried out downstream of the site.

For detailed site servicing information please refer to the Site Servicing Plan (**Drawing SW2**).

4.0 WATER SERVICING

There are existing 300mm diameter PVC watermain and 400mm diameter CPP watermain located along the west and east side of Bronte Street South across the frontage of the site, respectively. There is a hydrant located at the south corner of the property, within the west boulevard of the Bronte Street South. The watermain for the site has been designed to meet the requirements of the Region of Halton and the Town of Milton.

The site is serviced by a proposed 100mm diameter PVC domestic water service and a 150mm diameter PVC fireline off of the existing 300mm diameter watermain on Bronte Road, refer to **Drawing SW2** for details. A private site hydrant is proposed close to the proposed building to ensure that there is a hydrant within 45m of the fire department connection.

4.1 Water Demand Analysis

Following the Halton Region Water and Wastewater Linear Design Manual (2019), the watermains are to be designed to meet the greater of the maximum day plus fire flow or the maximum hour demand.

Criteria for Watermains:

Equivalent population density:	Institutional	90person/hectare
Average demand		275L/cap/day
Peaking Factor (pf):	Peak Hour	2.25
	Maximum Day	2.25
Minimum Pressure (under non-fire demand scenario)		350kPa
Minimum Pressure (under max day + fire flow conditions)		140kPa

Average Daily Demand:

Community Centre = 90(person/hectare) x 0.381hectare x 275L/cap/day

=9,430L/day (6.55L/min)

Peak Hour Demand:

Community Centre = 6.55L/min x 2.25(pf)

= 14.74L/min (3.2gal/min)

Maximum Day Demand:

Community Centre = 6.55L/day x 2.25(pf)

= 14.74L/min (3.2gal/min)

A hydrant flow test will need to be completed prior to the next submission to confirm that under peak hour and maximum day flow conditions the pressure in the watermain will meet the Region minimum pressure of 350kPa (50psi).

6.0 CONCLUSIONS

The storm drainage design for the site has been designed to meet the criteria outlined by the Town. The plan will consist of the following:

- The majority of drainage will be blocked by extended retaining wall along the north and west sides of the site. Therefore, there will be no external drainage conveyed through the site.
- Quality control is provided by an oil/grit separator at the site outlet to provide a minimum of 80 percent TSS removal.
- Underground and surface storage, in conjunction with orifice controls will be used to limit peak runoff from the site for up to the 100-year storm event to 39L/s.
- Sanitary service can be provided off of the sanitary sewer on Holbrook Court on the east side of Bronte Street South. The proposed flows are not expected to adversely affect the downstream system.
- Water service will be connected to the existing 300mm diameter watermain on the west side of Bronte Street South. A hydrant flow test will need to be completed prior to the next submission to confirm that the existing infrastructure can service the proposed development.

Charles Groen, P.Eng.

APPENDIX A

STORM SEWER DESIGN SHEET

Storm Design Sheet
Milton AMJ Commmunity Centre

Rainfall Intensity = $\frac{A}{(Tc+B)^{c}}$

	5-Year	100-Year
A =	959	1435
B =	5.7	5.2
c =	0.8024	0.7751

Starting Tc = 10 min

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Project: 1456 Bronte Street South
Project #: 16834
Date: 23/07/19
Designed by: SM

STREET	FROM MH	TO MH	5-YR AREA (ha)	5-YR RUNOFF COEFFICIENT "R"	5-YR "AR"	5-YR ACCUM. "AR"	5-YR RAINFALL INTENSITY (mm/hr)	5-YR ACCUM. FLOW (m3/s)	EXT or BLDG Area (ha)	EXT/BLDG FLOW RATE (l/s/ha)	EXT or BLDG FLOW (m3/s)	ACCUM. EXT/BLDG FLOW (m3/s)	Control Flow	Total Flow (m3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONC. (min)
Site	CB1	CBMH3	0.11	0.90	0.10	0.10	105.25	0.029					5-yr	0.029	24.7	0.70	250	0.050	1.014	0.406	10.406
Site	CBMH3	MH2US	0.17	0.90	0.15	0.25	103.12	0.073					5-yr	0.073	9.3	0.30	375	0.096	0.869	0.178	10.584
Site	BLDG	MH4	0.08	0.90	0.07	0.07	105.25	0.021					5-yr	0.021	3.4	2.00	200	0.046	1.476	0.038	10.038
Site	MH4	MH2US	0.02	0.25	0.01	0.08	105.05	0.022					5-yr	0.022	45.5	0.30	300	0.053	0.749	1.012	11.050
Site	MH2DS	OGS					105.25		1.000	39.100	0.039	0.039	External	0.039	9.1	0.30	375	0.096	0.869	0.174	10.174
Site	OGS	MH1					104.32					0.039	External	0.039	8.5	0.30	375	0.096	0.869	0.163	10.337
	MH1	HW1					103.47					0.039	External	0.039	4.4	0.50	450	0.201	1.268	0.058	10.395

APPENDIX B

STORMWATER MANAGEMENT CALCULATIONS

Modified Rational Method

Project:	Milton Mosque
Project No.:	16834
Municipality:	Milton

Pre-Development

	Area (m2)	C	CxA
Pervious	2550	0.25	637.5
Building	395	0.9	355.5
Gravel	686	0.70	480.2
Asphalt	179	0.90	161.1
	3810	0.43	1634.3

Post Development (Controlled)

	Area (m2)	C	CxA
Pervious	521	0.25	130.2025
Building	759	0.9	683.469
Impervious	2530	0.90	2276.586
	3810	0.81	3090.258

Rational Method Calc.

Project:	Milton Mosque
Project No.:	16834
Municipality:	Milton
Catchment:	Pre-Full Site

	5-Year Storm
A:	959.00
B:	5.70
C:	-0.80

Pre Development Peak Flows

Catchment	100
Runoff Coefficient (C) =	0.43
Area (A) =	0.381
Tc:	10.0
Intensity (I) mm/hr =	105.3
Peak Flow (Q) L/s =	47.78

Modified Rational Method

Project:	Milton Mosque
Project No.:	16834
Municipality:	Milton
Catchment:	101

Area:	0.3810	ha	Rainfall $I=A*(T+B)^C$
Runoff Coefficient:	0.43		A: 1435.0
			B: 5.2
Orifice Flow:	0.0391	m^3/s	C: -0.8
Storage Required	24.0	m^3	

Initial Time 5 min Increment 1 min

Time (min)	Intensity (mm/hr)	Peak Flow (m^3/s)	Controlled Roof Flow (m^3/s)	Total Peak Flow (m^3/s)	Runoff Volume (m^3)	Discharge Volume (m^3)	Storage Volume (m^3)
5	237.2	0.108	0.000	0.108	32.30	11.72	20.6
6	220.6	0.100	0.000	0.100	36.05	14.06	22.0
7	206.4	0.094	0.000	0.094	39.36	16.41	23.0
8	194.2	0.088	0.000	0.088	42.32	18.75	23.6
9	183.5	0.083	0.000	0.083	44.99	21.09	23.9
10	174.1	0.079	0.000	0.079	47.42	23.44	24.0
11	165.7	0.075	0.000	0.075	49.65	25.78	23.9
12	158.2	0.072	0.000	0.072	51.71	28.13	23.6
13	151.4	0.069	0.000	0.069	53.62	30.47	23.1
14	145.3	0.066	0.000	0.066	55.40	32.81	22.6
15	139.7	0.063	0.000	0.063	57.06	35.16	21.9
16	134.5	0.061	0.000	0.061	58.63	37.50	21.1
17	129.8	0.059	0.000	0.059	60.11	39.84	20.3
18	125.4	0.057	0.000	0.057	61.51	42.19	19.3
19	121.4	0.055	0.000	0.055	62.83	44.53	18.3
20	117.7	0.053	0.000	0.053	64.10	46.88	17.2
21	114.2	0.052	0.000	0.052	65.30	49.22	16.1
22	110.9	0.050	0.000	0.050	66.45	51.56	14.9
23	107.8	0.049	0.000	0.049	67.56	53.91	13.7
24	105.0	0.048	0.000	0.048	68.62	56.25	12.4
25	102.3	0.046	0.000	0.046	69.63	58.59	11.0
26	99.7	0.045	0.000	0.045	70.61	60.94	9.7
27	97.3	0.044	0.000	0.044	71.56	63.28	8.3
28	95.0	0.043	0.000	0.043	72.47	65.63	6.8

Orifice Flow Calculation

Pipe Diameter	100	mm
Area	0.008	m^2
Maximum WL	189.45	m
Invert	187.43	m
Head (h)	1.97	m
Co-efficient	0.80	
Flow (Q)	$Q=CA(2gh)^{0.5}$	
	0.0391	m^3/s
Max depth:	2.02	

Flow Summary

Project:	Milton Mosque
Project No.:	16834
Municipality:	Milton

Pre Development

Catchment	Area (ha)	C	Target Flow (L/s)
100	0.381	0.43	48

Post Development

Catchment	Proposed Flow (L/s)	Target Flow (L/s)
101	39	48

OSD Storage-Discharge

Project:	Milton Mosque
Project No.:	16834
Municipality:	Milton
Catchment:	101

Orifice Tube

Invert	187.43	m	@ MH2
Size	100	mm	
Co-efficient	0.80		
Area	0.0079	m^2	

STAGE-STORAGE	Elevation	Area (m^2)	Incremental Storage (m^3)	Total Storage (m^3)	Head on Orifice (m)	Orifice Flow (m^3/s)
	187.43	0.00	0.00	0.0	0.00	0.000
	189.15	0.00	13.60	13.6	1.67	0.036
	189.2	70.74	1.77	15.4	1.72	0.037
	189.25	282.95	8.84	24.2	1.77	0.037
	189.3	612.68	22.39	46.6	1.82	0.038
	189.35	939.73	38.81	85.4	1.87	0.038
	189.4	1181.72	53.04	138.4	1.92	0.039
	189.45	1395.16	64.42	202.9	1.97	0.039

Pipe/Structure Storage Volumes

Project: Milton Mosque
Project No.: 16834
Municipality: Milton

Pipe Storage

Diameter	Length	Storage Volume
150	83.6	1.5
200	3.4	0.1
250	24.7	1.2
300	45.5	3.2
375	9.3	1.0
450	0	0.0
525	0	0.0
600	0	0.0
675	0	0.0
750	0	0.0
825	0	0.0

Total 7.0 m^3

Manhole Storage

Description	MH Inside Diam. (mm)	Invert (m)	Top Elev. (m)	Storage Depth (m)	Storage Volume (m^3)
MH2	1200	187.43	189.36	1.93	2.2
CBMH3	1200	187.55	189.15	1.60	1.8
MH4	1200	187.6	189.45	1.85	2.1

Total 6.1 m^3

Catchbasin Storage

Description	CB Inside Dim. (mm)	Invert (m)	Top Elev. (m)	Storage Depth (m)	Storage Volume (m^3)
CB1	600x600	187.75	189.15	1.40	0.5

Total 0.5 m^3

Total Storage 13.6 m^3

APPENDIX C

OIL/GRIT SEPARATOR SIZING AND DETAILS

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD
BASED ON A FINE PARTICLE SIZE DISTRIBUTION

Project Name:	Milton AMJ Community Centre	**Engineer:**	**Husson**
Location:	Milton, ON	**Contact:**	G. Rapp, P.Eng.
OGS #:	OGS	**Report Date:**	11-Feb-21

Area	0.381	ha	**Rainfall Station #**	204	
Weighted C	0.85		**Particle Size Distribution**	FINE	
CDS Model	2015		**CDS Treatment Capacity**	20	l/s

Rainfall Intensity[1] (mm/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (l/s)	Treated Flowrate (l/s)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
0.5	9.4%	9.4%	0.5	0.5	2.3	98.2	9.2
1.0	11.0%	20.4%	0.9	0.9	4.5	97.6	10.7
1.5	10.1%	30.5%	1.4	1.4	6.8	96.9	9.8
2.0	9.6%	40.1%	1.8	1.8	9.1	96.3	9.3
2.5	7.9%	48.0%	2.3	2.3	11.4	95.6	7.6
3.0	6.4%	54.4%	2.7	2.7	13.6	95.0	6.1
3.5	4.4%	58.8%	3.2	3.2	15.9	94.3	4.1
4.0	4.2%	63.0%	3.6	3.6	18.2	93.6	4.0
4.5	3.7%	66.7%	4.1	4.1	20.4	93.0	3.5
5.0	3.3%	70.0%	4.5	4.5	22.7	92.3	3.1
6.0	5.6%	75.6%	5.4	5.4	27.2	91.0	5.1
7.0	4.0%	79.6%	6.3	6.3	31.8	89.7	3.6
8.0	3.5%	83.1%	7.2	7.2	36.3	88.4	3.1
9.0	2.2%	85.3%	8.1	8.1	40.9	87.1	1.9
10.0	1.7%	87.0%	9.0	9.0	45.4	85.8	1.4
15.0	6.3%	93.3%	13.5	13.5	68.1	79.3	5.0
20.0	2.3%	95.6%	18.0	18.0	90.8	72.8	1.7
25.0	1.8%	97.3%	22.5	19.8	100.0	61.8	1.1
30.0	0.8%	98.2%	27.0	19.8	100.0	51.5	0.4
35.0	0.9%	99.0%	31.5	19.8	100.0	44.2	0.4
40.0	0.3%	99.3%	36.0	19.8	100.0	38.6	0.1
45.0	0.5%	99.8%	40.5	19.8	100.0	34.3	0.2
50.0	0.2%	100.0%	45.0	19.8	100.0	30.9	0.1
							91.2

Removal Efficiency Adjustment[2] = 6.5%

Predicted Net Annual Load Removal Efficiency = 84.7%

Predicted % Annual Rainfall Treated = 98.8%

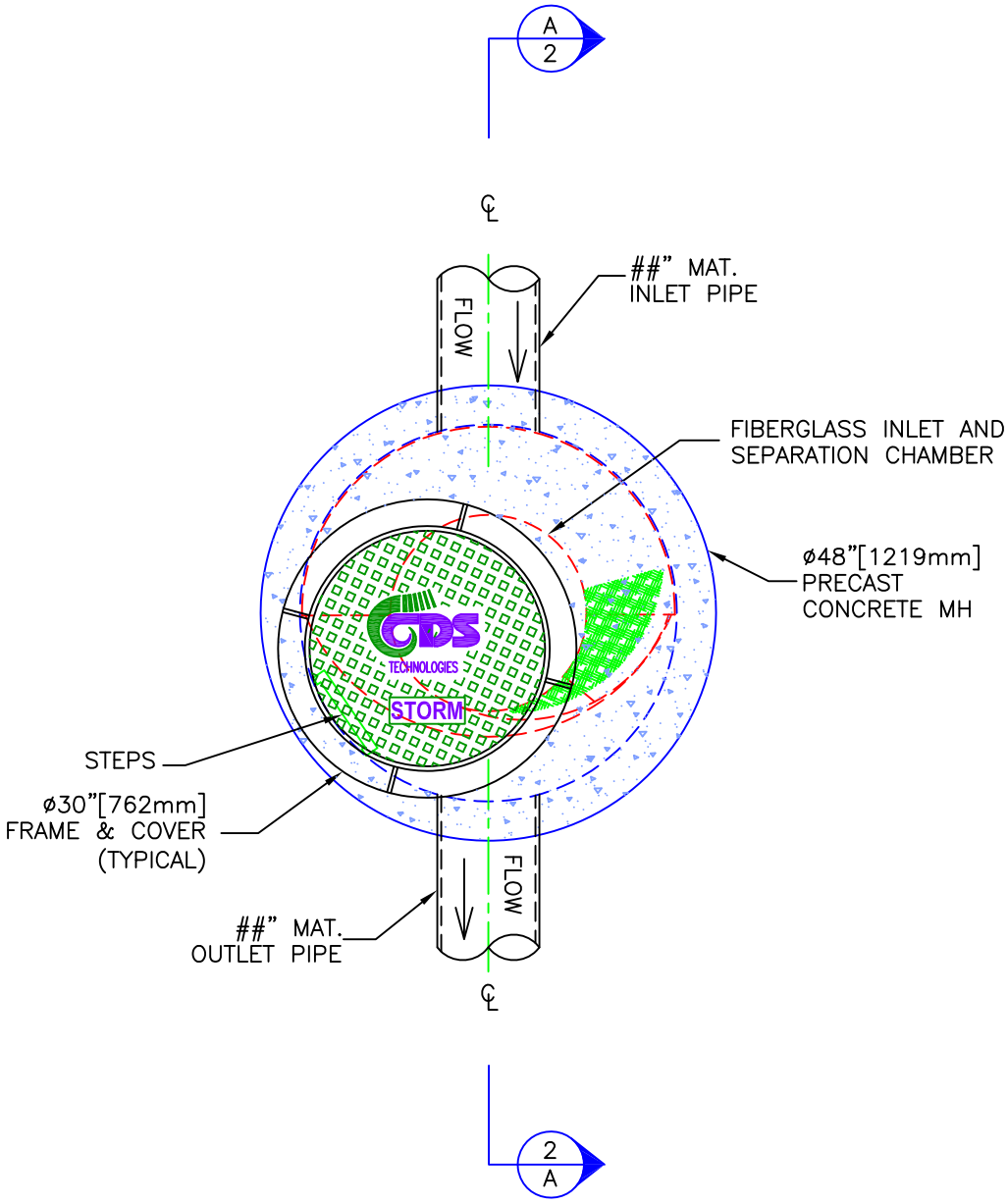
1 - Based on 44 years of hourly rainfall data from Canadian Station 6158733, Toronto ON (Airport)

2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

3 - CDS Efficiency based on testing conducted at the University of Central Florida

4 - CDS design flowrate and scaling based on standard manufacturer model & product specifications

PLAN VIEW

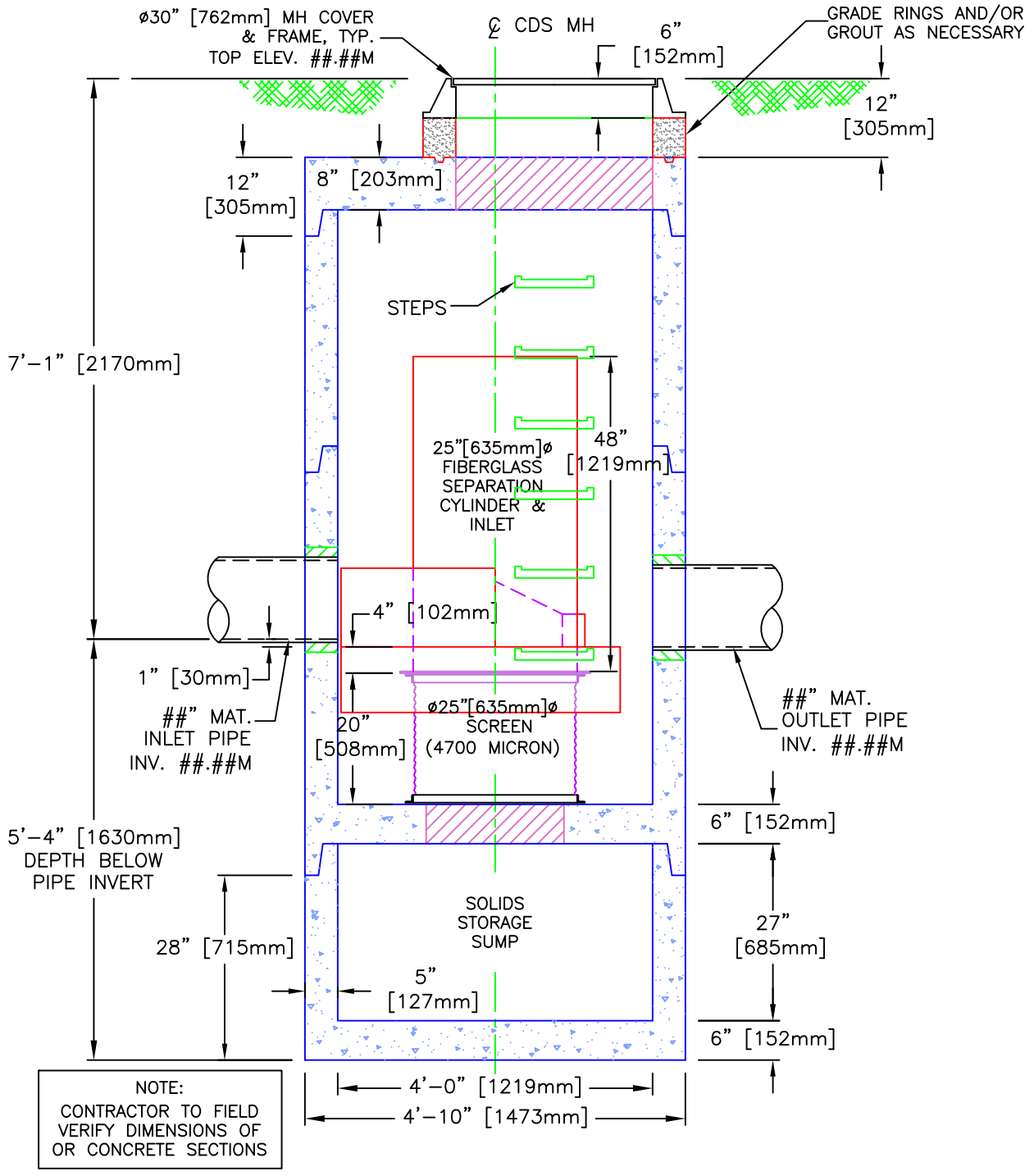


CDS MODEL PMSU20_15_4m
STORMWATER TREATMENT UNIT

CONTECH STORMWATER SOLUTIONS	PROJECT NAME CITY, STATE	JOB# XX-##-###	SCALE 1" = 2'
		DATE ##/##/##	SHEET 1
		DRAWN INITIALS	
		APPROV.	

Echelon Environmental 505 Hood Road, Unit 26, Markham, Ontario L3R 5V6 Tel: (905) 948-0000 Fax: (905) 948-0577
CONTECH Stormwater Solutions Inc. 930 Woodcock Road, Suite 101, Orlando, Florida 32803 Tel: (800) 848-9955

SECTION A–A
ELEVATION VIEW



CDS MODEL PMSU20_15_4m
STORMWATER TREATMENT UNIT

CONTECH STORMWATER SOLUTIONS	PROJECT NAME CITY, STATE	JOB# XX–##–###	SCALE 1" = 2'
		DATE ##/##/##	SHEET 2
		DRAWN INITIALS	
		APPROV.	

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