PROPOSED MIXED-USE DEVELOPMENT
2381798 ONTARIO LIMITED
141-153 PLAINS ROAD WEST, BURLINGTON, ONTARIO, L7T 1G1

FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT ADDENDUM

REV 0 – SEPTEMBER 2024



PREPARED BY:

LUBAN LTD.

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INTRODUCE

Luban Limited was retained by the 2381798 Ontario Limited to take over the engineering service in support of an Official Plan and Zoning By-law Amendment (OPA and ZBA) Application for a proposed mixed-use development at 141-153 Plains Road West, Burlington. The development is designated as a mixed-use development consisting of one (1) building with 11 stories and two (2) subgrade parking levels. The development is to take place between 141 Plains Road West and 153 Plains Road West, where three (3) existing lots are to be rezoned in support of the development of the mixed-use structure.

The FSR and SWM reports were previously provided by JSW Associates on January 19, 2024 (Appendix B). This FSR Report Addendum is intended to address the agencies' comments on the previous second submission and to complete the functional report.

We have coordinated with the Region regarding the sanitary and watermain master plan and have retained an SUE company for the underground utility survey. However, due to time constraints, we have not yet received this information. As a result, the sanitary and watermain hydraulic analysis, along with the proposed pipe crossing details, will be submitted at a later date.

Site Location



1. REFERENCE

However, due to time constraints, we have not yet received the master plan and underground utility survey (SUE) from the district government. The relevant authorities have already issued the hydraulic analysis and some pipe crossing details, which will be submitted later.

- Water and Wastewater Linear Design Manual prepared for the Halton Region (dated April 2015)
- Stormwater Management Design Guidelines prepared for the City of Burlington (dated May 21st, 2020)
- Water Supply for Fire Protection, 2020

2. WATER SUPPLY

2.1. Existing Watermains

An existing 300 mm watermain along Plains Road West will serve as the supply line for the development. Currently, the properties at 141, 147, and 153 Plains Road West are connected to this watermain via three 25 mm service connections. These connections will be decommissioned and removed before construction begins.

2.2. Phasing of Development

The mixed-use condo will be developed in a single phase, with construction expected to start in spring 2025 and be completed by summer 2027.

2.3. Water Supply Servicing Design Criteria

The water supply scheme is in accordance with Halton Region Water and Wastewater Linear Design Manual as follows:

- The system shall be designed to provide sufficient flow and pressure to meet the greater of the Maximum Day Demand plus Fire Flow, or the Peak Hourly Demand;
- Average Daily Demand of 275 litres/capita/day;
- Maximum Daily Demand Peaking Factor = 2.25;
- Maximum Hourly Demand Peaking Factor = 4.0 for Residential;
- Maximum Hourly Demand Peaking Factor = 2.25 for Commercial;
- Equivalent Population Density = 285 persons/ha for Apartments (over 6 stories high), and Average Day Service Demands = 78.375 (m^3/ha/day);
- Equivalent Population Density = 90 persons/ha for Light Commercial Areas, and Average Day Service Demands = 24.75 (m^3/ha/day);
- Maximum recommended static pressure is 550 KPa (80 psi);
- Minimum pressure for peak hour demand is 275 KPa (40 psi), and
- Minimum pressure for Maximum Day and Fire Flow demand is 140 KPa (20 psi)

2.4. Proposed Watermains

The proposed water main design has been reviewed and recalculated based on the revised architectural site plan, resulting in minor changes to the water demand.

- The maximum day demand increased from 123 L/min to 161 L/min.
- The peak hour demand increased from 218 L/min to 256 L/min.
- There are no changes to the fire demand, which remains at 11,000 L/min.
- The total demand (design flow) increased from 11,123 L/min to 11,161 L/min.

However, these changes do not affect the dimensions of the proposed water main from the previous JSW design.

> *"The proposed building will contain a fire pump system with an automatic sprinkler system. This system will be supplied by a 150mm watermain that will be drawing from the 300mm watermain within Plains Road West. This service connection will be located at the south side of the proposed building (exiting from the P1 level) and will travel south to the existing municipal watermain. The 11.1m long service connection (PVC DR-18 Class 235) branches to a 100mm domestic line and a 150mm fire line, respectively. Each line will be constructed with a 100mm and a 150mm valve and box as well as the appropriate fixtures."*

Domestic Demand

According to Table 3.3.1 below,

- The maximum day demand = 161 L/min
- Peak Hour Demand = 256 L/min.

Table 3.3.1

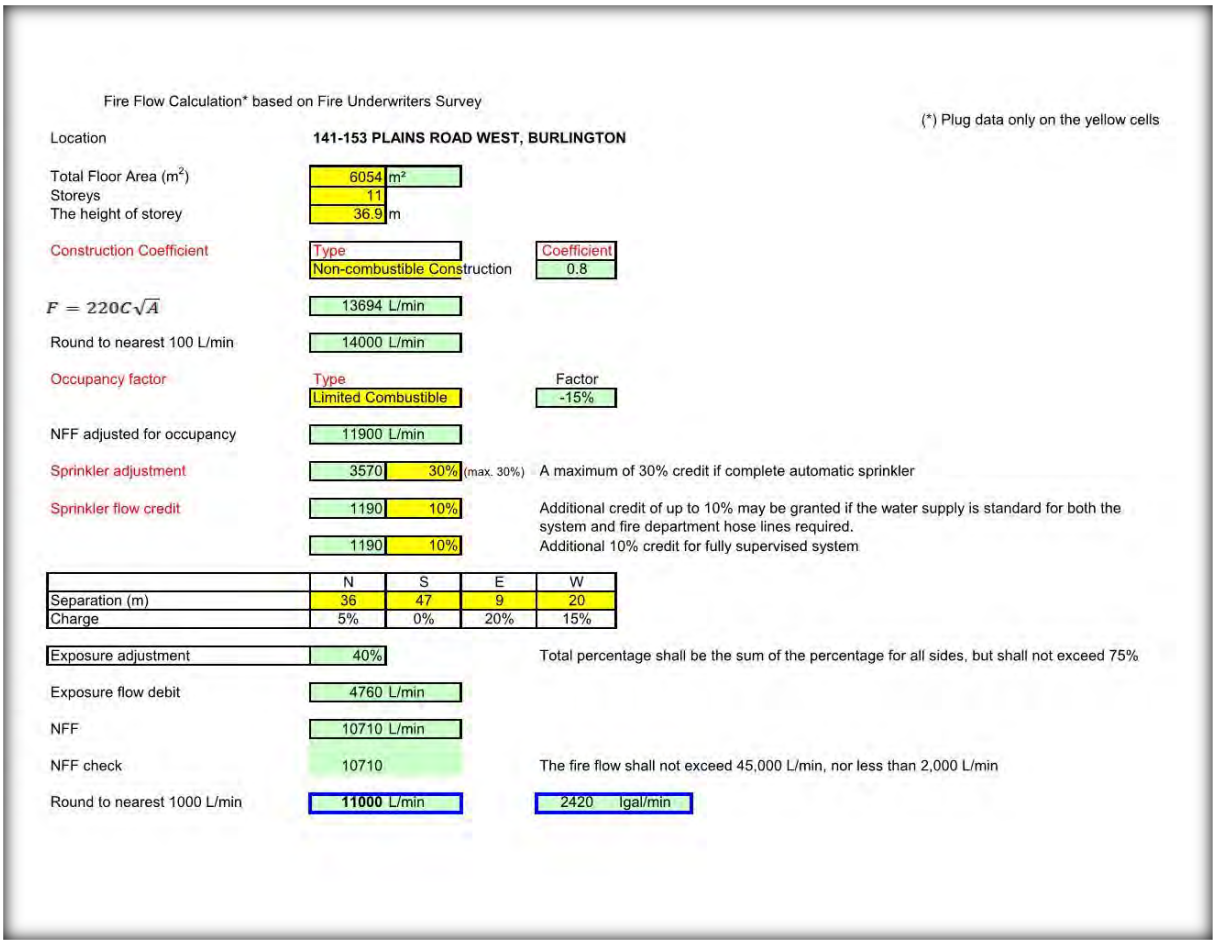
Development type	GFA (ha)	Population Density (persons/ha)	Population	Peaking factor		Water demand (L/cap.d)	Maximum day Demand (L/min)	Peak Hour Demand (L/min)
				Maximum Day	Peak hour Factor			
Apartments (over 6 stories High)	1.050	285	300	2.25	4.00	275	122	218
Light Commercial Areas	0.012	90	2	2.25	2.25	275	39	39
						TOTAL	**161**	**256**

Fire Demand

Based on the Water Supply for Fire Protection, 2020, an estimate of the fire flow required is given by Equation: $\boldsymbol{RFF = 220C\sqrt{A}}$.

The required fire flow was found to be 11,000 L/min (See Fire Demand Calculations in Chart 3.3 below).

Chart 3.3



Fire Flow Calculation* based on Fire Underwriters Survey

(*) Plug data only on the yellow cells

Location	141-153 PLAINS ROAD WEST, BURLINGTON			
Total Floor Area (m^2)	6054	m^2		
Storeys	11			
The height of storey	36.9	m		
Construction Coefficient	Type: Non-combustible Construction		Coefficient: 0.8	
$F = 220C\sqrt{A}$	13694 L/min			
Round to nearest 100 L/min	14000 L/min			
Occupancy factor	Type: Limited Combustible		Factor: -15%	
NFF adjusted for occupancy	11900 L/min			
Sprinkler adjustment	3570	30% (max. 30%)	A maximum of 30% credit if complete automatic sprinkler	
Sprinkler flow credit	1190	10%	Additional credit of up to 10% may be granted if the water supply is standard for both the system and fire department hose lines required.	
	1190	10%	Additional 10% credit for fully supervised system	

	N	S	E	W
Separation (m)	36	47	9	20
Charge	5%	0%	20%	15%

Exposure adjustment	40%	Total percentage shall be the sum of the percentage for all sides, but shall not exceed 75%
Exposure flow debit	4760 L/min	
NFF	10710 L/min	
NFF check	10710	The fire flow shall not exceed 45,000 L/min, nor less than 2,000 L/min
Round to nearest 1000 L/min	**11000** L/min	2420 Igal/min

The Effective GFA Calculation (Table 3.3.2) has been updated in accordance with the revised architectural plan:

Table 3.3.2

Floor	GFA (m^2)	GFA Factored	Effective Floor Area
Ground Floor	720	0%	0
Ground Floor Commercial	120	0%	0
Level 2	1162	100%	1162
Level 3	1162	100%	1162
Level 4	1162	50%	581
Level 5	1103	50%	552
Level 6	1103	50%	552
Level 7	819	50%	410
Level 8	818	50%	409
Level 9	818	50%	409
Level 10	818	50%	409
Level 11	818	50%	409
Amenity & MPH	458	0%	0
	Total Effective GFA		**6054**

Total Demand

The total demand is the greater of the two conditions, the maximum daily demand plus fire flow and the maximum hourly demand. Thus:

- maximum daily demand plus fire flow = 161 + 11,000 = 11,161 L/min
- maximum hourly demand = 256 L/min
- ***Total Demand*** = 11,161 $L/min = 0.186$ m^3/s

Hydrant flow tests were completed by IQ Environmental at the hydrants located along Plains Road West, adjacent to the site (please see Appendix C to see the hydrant flow test results from IQ Environmental). Based on the results of the hydrant flow test, within the existing 300mm watermain within Plains Road West, the available static pressure is 52 psi, and the residual pressure is 47 psi. calculated pressure at building is 332 kPa (see Table 3.3.3). Therefore, the existing watermain within Plains Road West has adequate flow to service the proposed mixed-use development at 141, 147, and 153 Plains Road West.

Table 3.3.3

Hydrant ID	Address	Static Pressure	Residual Pressure	Design Flow	Distance L	Pipe Size	C	Velocity	Pipe Head Lost	Pipe Flow	Fitting Head Lost	Total Head Lost		Pressure at Building
		(psi)	(psi)	m3/s	m	m	(PVC)	m/s	m	m3/s	m	m	kPa	kPa
#1	Plains Rd W	52	47	**0.186**	15	0.15	100	2.45	0.97	0.04	1.76	2.73	26.79	332

2.5. Hydraulic Analysis (Pending)

(RESERVED)

3. SANITARY SERVICING

3.1. Existing Sanitary Infrastructure

There is an existing 375mm diameter sanitary sewer that is located within City of Burlington's right-of-way situated on the north side of Plains Road West, fronting the subject property and slopes from west to east at approximately 0.4%.

3.2. Sanitary Sewer Design Criteria

According to Halton Region Water and Wastewater Linear Design Manual, the criteria applicable to the proposed development are summarized below:

- Average Daily Flow is 275 litres/capita/day;
- Equivalent Population Density = 285 persons/ha for Apartments (over 6 stories high);
- Equivalent Population Density = 90 persons/ha for Light Commercial Areas, and Unit Sewage Flow = 24.75 (m3/ha/day)
- Infiltration allowance is 0.286 L/s/ha.
- Harmon Peaking Factor formula for combined Land Use:

$$M = K_{av} * \left(1 + \frac{14}{4+\sqrt{P_e}}\right)$$

Where,

$$K_{av} = \left(\frac{A_R+(0.8*(A_I+A_C)}{A_R+A_I+A_C}\right)$$

And:

$M = ratio\ of\ peak\ flow\ to\ average\ flow$

$P_e = equivalent\ tributary\ population\ in\ thousands$

- $A_R = residential\ land\ use\ area\ (ha)$

3.3. Proposed Development Flow Rates

The proposed sanitary sewer design has been reviewed based on the revised architectural plans, with the design flow remaining at 3.77 L/s (as shown in Table 4.3.1), consistent with the JSW result. Therefore, the revised architectural plans do not affect the dimensions of the proposed sanitary sewer from JSW's design:

> *"The site will be serviced through a sanitary service connection that ultimately connects from the south face of the proposed underground parking structure to the existing 375mm sanitary sewer main located within the right-of-way along Plains Road West. The proposed development's sanitary sewer system was designed as a 200mm PVC DR-35 sanitary pipe in accordance with the minimum pipe size criteria."*

Design Flow

The post-development sanitary design flow was analyzed based on the Regional Municipality of Halton Water and Wastewater Linear Design Manual criteria (Section 3.2 of the design manual). The design manual states that the sanitary flows can be estimated based on Equation 2.0 below:

Sanitary Design Flow = Average Dry Weather Flow * Average Peak Wastewater Flow Factor + Inflow / Infiltration Allowance

Table 4.3.1

	Land Area (ha)	GFA (ha)	Population Density (persons/ha)	Population	Peak Flow Factor	Unit Sewage Flow	Flow (L/s)	Infiltration Allowance	Infiltration Flow (L/s)	Combined Design Flow (L/s)
Apartments (over 6 stories High)	0.2418	1.050	285	300	4.07	0.275 m3pcd	3.690	0.286 L/s/ha	0.069	3.77
Light Commercial Areas		0.012	90	2		24.75 m3/ha/day	0.014			

3.4. Sanitary Master Drainage Plan, Downstream Hydraulic Analysis (Pending)

(RESERVED)

4. STORM DRAINAGE & STORMWATER MANAGEMENT

4.1. Existing Site Drainage and Storm Sewer System

The subject site currently lacks stormwater collection infrastructure, and all excess runoff is sheet-drained to Plains Road West. At present, no stormwater management techniques have been implemented, and runoff is discharged at an uncontrolled rate. The stormwater flows toward a double catch basin on Plains Road West. The existing sewer in question is an 825mm pipe, approximately 92.9 meters long, with a slope of 0.44%.

4.2. Drainage Parameters

The general requirements for drainage and stormwater management are specified in the Stormwater Management Design Guidelines for the City of Burlington (2020):

- Water Quality:

  Long term average removal of 80% of total suspended solids (T.S.S.).

- Water Balance:

  The City of Burlington's Stormwater Management Design Guidelines specifies that the site is to retain the first 5mm of a storm event by infiltration.

- Allowable Site Discharge Rate Criteria:

  The peak allowable outflow from the site must be limited to the peak runoff rate generated in the pre-development condition by a 5-year design rate using a Time of Concentration of 10 minutes and a maximum runoff coefficient equal to 0.50, or the existing capacity of the receiving storm sewer, whichever is less.

4.3. Site Plan Changes Review

Upon comparing the revised architectural site plan with the previous one used in JSW's report, we observe minor changes in the impervious and landscaped areas. However, the site's combined runoff coefficient remains at 0.78, and the impervious area remains at 83%, as shown in Figures 5.3.1 and 5.3.2. Consequently, the storm sewer and stormwater management designs could remain unchanged, as outlined in JSW's Functional Servicing and Stormwater Management Report, Section 6, dated January 19, 2024.

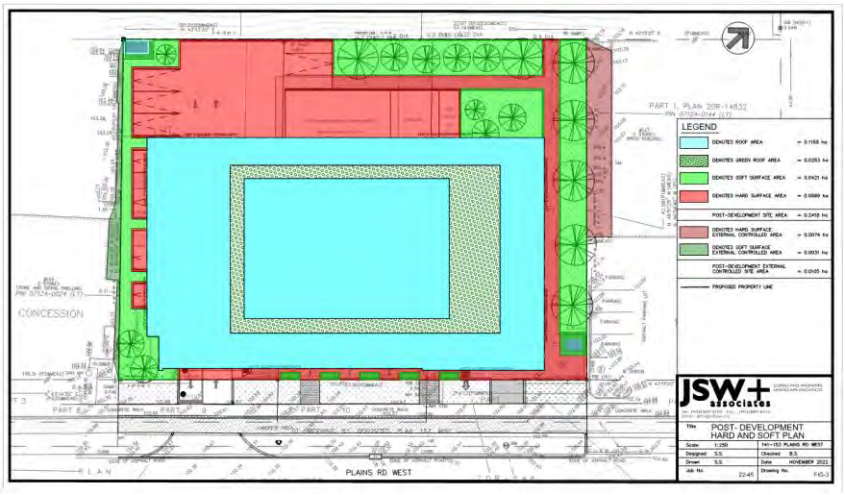
The reduction in the green roof area from 253 m² to 163 m² has resulted in minor changes to the water balance, which are discussed in Section 5.7.

Figure 5.3.1 – Revised Site Plan



	Revised Site Plan
	m^2
Roof	1368
Driveway	643
Lawn	406
Total	2417
Runoff Coefficient	0.78
Imprevious Level	83%

Figure 5.3.2- Previous Site Plan from JSW report



	Previous Site Plan from JSW report
	m^2
Roof	1408
Driveway	588
Lawn	421
Total	2417
Runoff Coefficient	0.78
Imprevious Level	83%

4.4. Proposed Storm Flows

According to the Stormwater Management Design Guidelines for the City of Burlington (2020), the allowable outflow from the site must not exceed the 5-year pre-development Rational Method peak flow. Given a time of concentration of 10 minutes, a pre-development runoff coefficient of 0.5, and a site area of 0.2418 ha, the allowable outflow is calculated to be 34.03 L/sec.

Under post-development conditions, a new service connection will be installed, and stormwater runoff will be directed to the existing storm sewer main. The proposed storm sewer is designed to ensure that during a 100-year storm event, the discharge will not exceed the 5-year pre-development flow rate, capped at a maximum of 33.21 L/s.

4.5. Water Quality Control

The site must achieve 80% removal of Total Suspended Solids (TSS). A Jellyfish Filter Unit (model JF 4-1-1, as detailed in Appendix D) will be installed in an offline configuration. The unit is expected to provide a total TSS treatment efficiency of 92.1% (refer to Table 5 in the JSW report). Detailed discussion refer to JSW's report section 6.3.

4.6. Quantity Control

The site's quantity control aims to manage the 100-year post-development flow rate to match the 5-year pre-development flow rate. According to the Stormwater Management Design Guidelines for the City of Burlington, using a pre-development runoff coefficient of 0.50, the peak 5-year allowable runoff rate for the site is 34.03 L/sec.

The site includes an uncontrolled area of 0.0030 ha with a post-development runoff coefficient of 0.60. Additionally, there is a controlled external area of approximately 0.0105 ha with a post-development runoff coefficient of 0.74. The proposed controlled post-development area is 0.2493 ha, including a controlled external area of 105 m². For this controlled area, the post-development runoff coefficient is 0.76. The allowable controlled flow rate in the post-development condition has been calculated as 33.21 L/sec.

An orifice tube (PVC DR-35 pipe) with a 100 mm diameter has been chosen for stormwater discharge. The flow rate for this 100 mm orifice tube is adjusted to 28.53 L/sec, and it will require a minimum detention volume of 37 m³.

To meet this detention volume requirement, a cast-in-place stormwater detention tank will be installed along the southern property line. This tank will be constructed from cast-in-place concrete with internal dimensions of 14.5 m long, 2.5 m wide, and 1.49 m deep, providing a maximum capacity of 54 m³. The tank will feature an overflow grate with a top elevation of 102.71 m, ensuring that the tank can accommodate up to 54 m³ of stormwater runoff before any overflow occurs. The system will be closed and will not include infiltration features due to site constraints. Detailed discussion refer to JSW's report section 6.5.

4.7. Water Balance

The City of Burlington's Stormwater Management Design Guidelines (2020) require a 'water budget' to account for rainfall that becomes runoff, is infiltrated, or is lost through evapotranspiration at a given site. The City mandates that pre-development infiltration volumes must be maintained under post-development conditions. At a minimum, it is recommended that the first 5 mm of rainfall be retained and infiltrated on-site.

A ZinCo Sedum Green Roof product will be installed on the roof of the 11th storey of the building, covering approximately 163 m² of roof area. This green roof is designed to provide an initial abstraction of 5 mm.

Table 5.7 – Water Balance of Site

Developable Area	Area (m^2)	Fraction of Area	Initial Abstraction (mm)	Initial Abstraction over Area (mm)
Hard Landscape	643	26.6%	1	0.27
Soft Land Scape	407	16.8%	5	0.84
Imperious Roof	1205	49.8%	1	0.50
Green Roof	163	6.7%	5	0.34
TOTAL	**2418**	**100.0%**		**1.94**

According to Table 5.7, the site will abstract 1.94 mm of water through evapotranspiration and infiltration for each rainfall event. This results in a shortfall of 3.06 mm from each storm event, which must be addressed to meet the water balance criteria.

The ZinCo Sedum Green Roof assembly, as previously described, has a retention capacity of 37 L/m². For the proposed green roof, the total retention storage is approximately 6.03 m³, calculated as follows: $37L/m^2 * 163m^2)/1000L/m^3$.

Additionally, a landscaping retention storage basin will be created along the west side of the property within the landscaping area. The basin will have a surface area of 48 m² and a depth of 3 cm, providing a retention storage volume of 1.44 m³, calculated as follows: $48m^2 * 0.03m$.

This results in a total retention storage capacity providing an additional 3.09 mm of abstraction in the water balance, calculated as: $(6.03m^3+1.44m^3)/2{,}418m^2 * 1000mm/m$. This achieves a total abstraction of 5.03 mm = 1.94mm + 3.09mm. Thus, the water balance requirement has been satisfied for this development.

5. EROSION AND SEDIMENT CONTROL

An effective Erosion and Sediment Control (ESC) Plan is crucial for minimizing the potential environmental impacts of a construction site. A multi-barrier approach should be considered to address these effects, including preventing erosion during construction, managing suspended sediment at the source, and minimizing sediment transport off-site. The following measures will be implemented on-site during construction to reduce sediment transport downstream, in accordance with the Greater Golden Horseshoe Area Conservation Authorities Erosion & Sediment Control Guidelines for Urban Construction, as well as Halton Region and City of Burlington requirements:

- Temporary silt fencing will be installed along the site boundary prior to any construction or grading activities, as illustrated on CMESC-1 and in accordance with Halton Region Standard Drawing RH-200.040.
- Construction access mud mats will be installed, as illustrated on CMESC-1 and per Halton Region Standard Drawing RH-200.040.
- All future grassed areas will be seeded as soon as possible.
- All erosion and sediment control measures shall be installed before the commencement of site construction and will remain in place throughout the duration of construction.

- Inspections of all erosion and sediment control measures will be conducted after significant rainfall and snowmelt events..

The contractor must ensure that all on-site personnel are familiar with ESC practices and trained in the ESC Plan, including its implementation, inspections, maintenance, and repairs. During construction, the site inspector will monitor the ESC measures, which will be maintained by the contractor..

6. SUMMARY

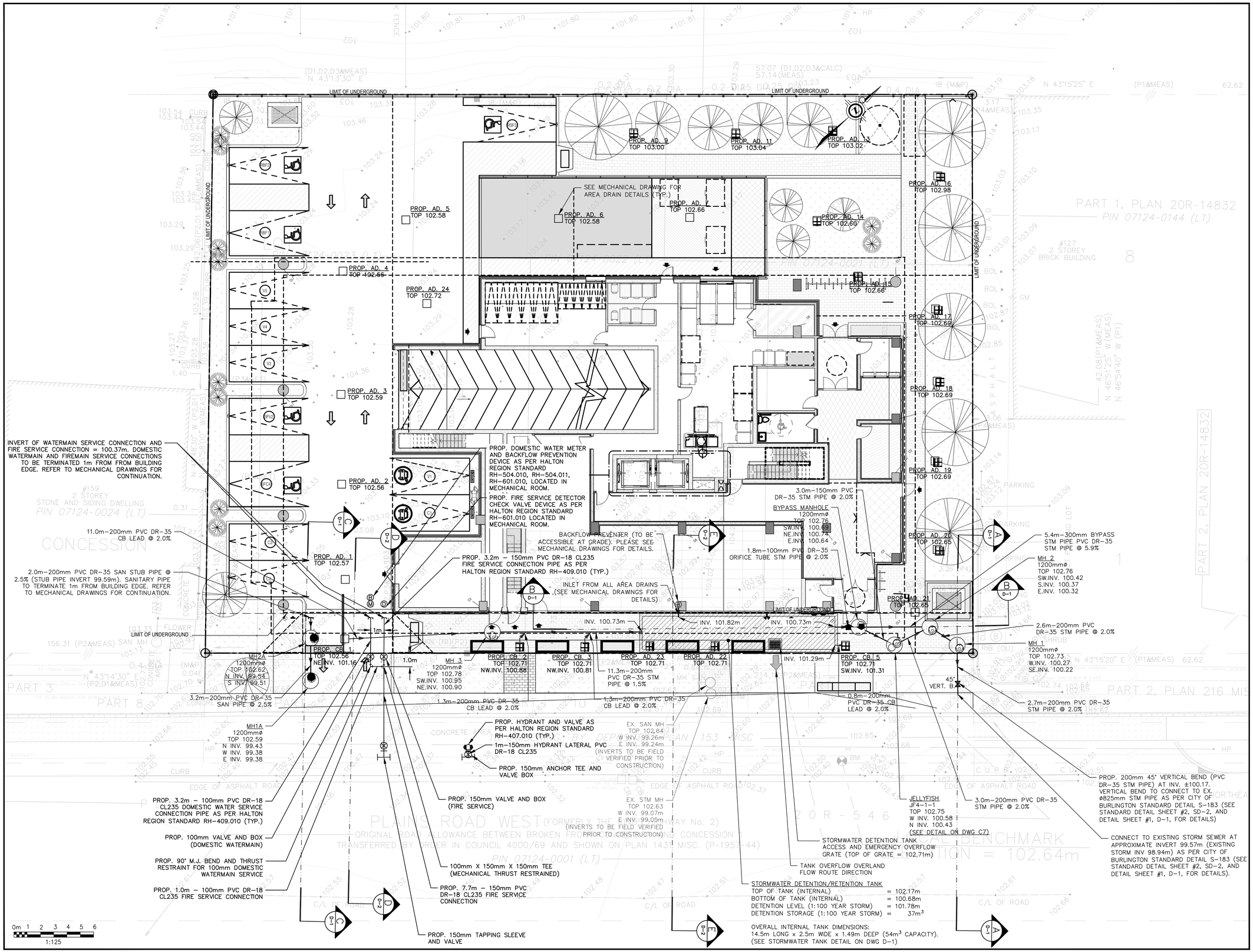
- The peak sanitary flows for the proposed development are anticipated to be 3.77 L/sec.
- Maximum day (domestic) demand: 161 L/min
- Peak Hour (domestic) demand: 256 L/min.
- The required fire flow for the development is 11,000 L/min.
- The total demand required is 11,123 L/min. A hydrant flow test indicated an available flow of 12,108 L/min, confirming that the existing 300 mm watermain can adequately service the proposed mixed-use building.
- Quantity control measures must limit peak site outflows during a 100-year storm event to less than 28.53 L/sec and store a total of 37 m^3 of runoff. This is achieved by using a stormwater management tank with a storage capacity of 54 m^3, equipped with a 100 mm orifice tube.
- The dimensions of the internal stormwater management tank are 14.5 m (length) x 2.5 m (width) x 1.49 m (depth).
- The water quality target of 80% TSS removal will be met with the installation of a Jellyfish JF 4-1-1 unit.
- The water balance for the site has been achieved by providing an abstraction of 6.01 mm, surpassing the 5.00 mm requirement. This was accomplished with the implementation of a ZinCo Sedum Green Roof, which has a retention capacity of 37 L/m^2.

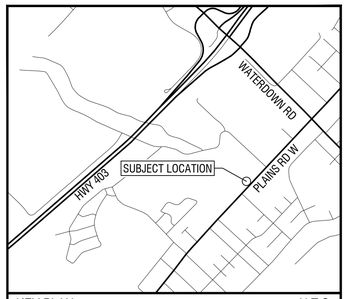
Yours truly,



Feng Shi, P.Eng
Principal Engineer

APPENDIX A Revised Site Servicing Plan, Site Grading Plan, Erosion Control Plan





KEY PLAN N.T.S.

BENCHMARK

A SPIKE SET ON PLAINS ROAD WEST LOCATED APPROXIMATELY 10.2 METERS NORTH FROM THE CENTRELINE OF ROAD, 1.1 METERS NORTH OF THE BACK OF CURB, AS SHOWN ON THE FACE OF PLAN.
ELEVATION=102.64m

ELEVATION

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM THE CITY OF BURLINGTON BENCHMARKS:
No. 463 ELEVATION=90.035m
No. 467 ELEVATION=107.625m

LEGEND

CB	DENOTES EXISTING CATCHBASIN
HJB	DENOTES HYDRO JUNCTION BOX
MH	DENOTES EXISTING MANHOLE
SAN MH	DENOTES EXISTING SANITARY MANHOLE
BOL	DENOTES EXISTING BOLLARD
HP	DENOTES HYDRO POLE
H	DENOTES FIRE HYDRANT
WM	DENOTES WATER METER
WV	DENOTES WATER VALVE
BM	DENOTES LOCAL BENCH MARK
E	DENOTES OVERHEAD HYDRO CABLE
200.00	DENOTES EXISTING CONTOUR ELEVATION
	DENOTES PROPOSED WATERMAIN
	DENOTES PROPOSED STORM SEWER
	DENOTES PROPOSED SANITARY SEWER
	DENOTES PROPOSED CATCHBASIN LEAD
	DENOTES PROPOSED SANITARY (SAN) MANHOLE
	DENOTES PROPOSED STORM (STM) MANHOLE
	DENOTES PROPOSED JELLYFISH FILTER
AD. 1 TOP 100.00	DENOTES PROPOSED AREA DRAIN
CB. 1 TOP 100.00	DENOTES PROPOSED CATCHBASIN
	DENOTES PROPOSED SWM TANK OVERFLOW GRATE
	DENOTES PROPOSED HYDRANT AND VALVE LOCATION
	DENOTES PROPOSED SIAMESE CONNECTION (FIRE DEPARTMENT CONNECTION)
45° VERT. B.	DENOTES STM PIPE 45° VERTICAL BEND
	DENOTES PROPERTY LINE
	DENOTES EASEMENT LINE
	DENOTES LIMIT OF UNDERGROUND PARKING
	DENOTES BUILDING OUTLINE ABOVE
	DENOTES TANK OVERFLOW OVERLAND FLOW ROUTE DIRECTION

No.	Date	Description	By	Ck.
3.	SEP. 13/24	3rd SUBMISSION TO HALTON REGION AND CITY OF BURLINGTON	F.S.	F.S.
2.	JAN. 19/24	2nd SUBMISSION TO HALTON REGION AND CITY OF BURLINGTON	S.S.	M.M.
1.	APR. 28/23	1st SUBMISSION TO HALTON REGION AND CITY OF BURLINGTON	S.S.	B.S.

Revisions

Stamp

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MIXED-USE DEVELOPMENT

141-153 PLAINS RD WEST

BURLINGTON, ONTARIO

Title

SERVICING PLAN

Scale:	1:125		
Designed:	S.S.	Checked:	F.S
Drawn:	M.S.	Date:	SEPTEMBER 2024
Job No.		Drawing No.	
2024-S400		C2	

ROAD CONSTRUCTION

1. RECONSTRUCTION OF DRIVEWAY SHALL BE ACCORDING TO CITY OF BURLINGTON STANDARD DRAWING S-112.
2. LIMITS OF SIDEWALK / CURB RECONSTRUCTION ARE APPROXIMATE, ACTUAL LIMITS ARE TO BE CONFIRMED IN THE FIELD BY THE CONTRACT ADMINISTRATOR.
3. CHAINAGE IS ESTABLISHED FROM THE CENTRELINE OF CONSTRUCTION AND GUTTER GRADES ARE CALCULATED ALONG THE GUTTER LINE.
4. HEIGHT OF CURB FACES MAY VARY ALONG LENGTH OF GUTTER, AS SHOWN ON PROFILE, OR TO BE CONFIRMED IN THE FIELD.
5. ADJUST ALL STRUCTURES (MAINTENANCE HOLES, CATCH BASINS, ETC..) TO SUIT NEW DESIGN ELEVATIONS INCLUDING BREAKING DOWN AND REMOVAL OF PORTION OF TOP STRUCTURES TO ALLOW FOR MINIMUM 150mm ADJUSTMENTS.
6. ALL CURB SHALL BE CONSTRUCTED WITH A LEDGE AT THE BACK OF THE CURB TO FACILITATE FUTURE SIDEWALK CONSTRUCTION.
7. FULL DEPTH SAW-CUTS ARE REQUIRED AT CONSTRUCTION LIMITS OF EXISTING CURB, SIDEWALK AND PAVEMENT UNLESS OTHERWISE SHOWN.
8. SAW CUT EXISTING PAVEMENT, SIDEWALK, CURB, GUTTER DRIVEWAYS, WALKWAYS ETC. AT CONSTRUCTION LIMITS TO PROVIDE A CLEAN JOINT FOR THE PROPOSED WORK.
9. EXPANSION JOINTS, SIDEWALK RAMPS WITH TACTILE WALKING SURFACE INDICATORS ACCORDING TO CITY OF BURLINGTON STANDARD DRAWINGS S-123 & S-123A.
10. EXISTING ENTRANCE RAMPS TO BE DEMOLISHED AND REMOVED AND DISPOSED FROM SITE. VEHICULAR SIDEWALK RAMP SHALL BE ACCORDING TO CITY OF BURLINGTON STANDARD DRAWING S-125A.
11. ADJUSTMENT OF APPROACHES, WALKWAYS AND STEPS MAY BE REQUIRED. LIMITS ARE TO BE DETERMINED IN THE FIELD BY THE CONTRACT ADMINISTRATOR.
12. EXISTING ASPHALT THICKNESS MAY VARY, TAPER TO MATCH EXISTING AT CONSTRUCTION LIMITS (MINIMUM 2.0m)
13. FILTER FABRIC TO BE PLACED UNDER GRATES ON ALL CATCH BASINS TO TRAP SEDIMENT. SILT TRAPS ARE TO BE CLEANED REGULARLY AND ARE NOT TO BE REMOVED UNTIL SUCH TIME AS THE CURBS ARE CONSTRUCTED AND THE BOULEVARDS ARE SODDED OR BACKYARDS GRADED AND SODDED. FILTER FABRIC FOR SILT CONTROL TO BE TERRA FIX 270R OR APPROVED EQUIVALENT.

LANDSCAPING RETENTION STORAGE BASIN
AREA = 48m²; DEPTH = 0.03m

ASPHALT PAVEMENT THICKNESS SHALL BE A MINIMUM OF:
SURFACE COARSE: 40mm HL3
BASE COARSE: 50mm HL8
*SUB-BASE: 150mm GRANULAR 'A'
*BASE: 300mm GRANULAR 'B' TYPE II

*GRANULAR MATERIALS AS PER OPSS 1010

PROPOSED BARRIER CURB AS PER OPSD 600.110

PROPOSED BARRIER CURB AS PER OPSD 600.110

LIMIT OF UNDERGROUND

LIMIT OF BUILDING OVERHANG ABOVE

PROPOSED TACTILE SURFACE INDICATOR AND SIDEWALK RAMP AS PER CITY OF BURLINGTON STANDARD DRAWING S-123A (SEE DETAIL SHEET D-2 FOR DETAILS)

PROPOSED BARRIER CURB AS PER OPSD 600.110

NEW 1.5m WIDE SIDEWALK

NEW 1.8m ASPHALT BIKE PATH

PROPOSED BARRIER CURB AS PER OPSD 600.110

PROPOSED BARRIER CURB AS PER OPSD 600.110

SAW CUT, REMOVE AND REPLACE EX. ASPHALT AS PER LAP JOINT DETAIL (SEE DETAIL SHEET D-2).

PROPOSED DROPPED CONCRETE CURB AND GUTTER AS PER OPSD 600.040

PROPOSED CONCRETE CURB AND GUTTER AS PER OPSD 600.040

NEW ENTRANCE DRIVEWAY, CURB, AND CONCRETE TO BE INSTALLED AS PER CITY OF BURLINGTON STANDARD DRAWING S-112 (SEE DETAIL SHEET D-2 FOR DETAILS).
ASPHALT PAVEMENT THICKNESS SHALL BE A MINIMUM OF:
SURFACE COARSE: 40mm HL3
BASE COARSE: 50mm HL8
*SUB-BASE: 150mm GRANULAR 'A'
*BASE: 300mm GRANULAR 'B' TYPE II

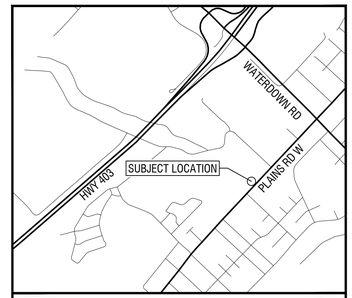
*GRANULAR MATERIALS AS PER OPSS 1010

SAW CUT, REMOVE AND REPLACE EX. ASPHALT AS PER LAP JOINT DETAIL (SEE DETAIL SHEET D-2).

PROPOSED BARRIER CURB AS PER OPSD 600.110

SAW CUT, REMOVE AND REPLACE EX. ASPHALT AS PER LAP JOINT DETAIL (SEE DETAIL SHEET D-2).

0m 1 2 3 4 5 6
1:125



KEY PLAN N.T.S.

BENCHMARK

A SPIKE SET ON PLAINS ROAD WEST LOCATED APPROXIMATELY 10.2 METERS NORTH FROM THE CENTRELINE OF ROAD, 1.1 METERS NORTH OF THE BACK OF CURB, AS SHOWN ON THE FACE OF PLAN.
ELEVATION=102.64m

ELEVATION

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM THE CITY OF BURLINGTON BENCHMARKS:
No. 463 ELEVATION=90.035m
No. 467 ELEVATION=107.525m

LEGEND

EX.100.00	DENOTES EXISTING GRADE ELEVATION TO BE MAINTAINED
EX.SW.100.00	DENOTES EXISTING SIDEWALK GRADE ELEVATION TO BE MAINTAINED
EX.CB TOP 100.00	DENOTES EXISTING TOP OF CATCH BASIN GRADE ELEVATION TO BE MAINTAINED
EX.BC.100.00	DENOTES EXISTING BOTTOM OF CURB GRADE ELEVATION TO BE MAINTAINED
EX.TC.100.00	DENOTES EXISTING TOP OF CURB GRADE ELEVATION TO BE MAINTAINED
100.00	DENOTES PROPOSED GRADE ELEVATION
BC.100.00	DENOTES PROPOSED BOTTOM OF CURB GRADE ELEVATION
TC.100.00	DENOTES PROPOSED TOP OF CURB GRADE ELEVATION
TW.100.00	DENOTES PROPOSED TOP OF WALL GRADE ELEVATION
BW.100.00	DENOTES PROPOSED BOTTOM OF WALL GRADE ELEVATION
SW.100.00	DENOTES PROPOSED CONCRETE SIDEWALK GRADE ELEVATION
HP.100.00	DENOTES PROPOSED HIGH POINT GRADE ELEVATION
TG.100.00	DENOTES PROPOSED TOP OF GRATE GRADE ELEVATION
F.F.E. 100.00	DENOTES PROPOSED FINISHED FLOOR ELEVATION
AD. 4 TOP 100.00	DENOTES PROPOSED TOP OF AREA DRAIN ELEVATION
CB. 4 TOP 100.00	DENOTES PROPOSED TOP OF CATCHBASIN ELEVATION
C&G	DENOTES PROPOSED CURB AND GUTTER
	DENOTES PROPOSED BARRIER CURB
1.6%	DENOTES PROPOSED SLOPE OF GRADE
	DENOTES PROPOSED CURB TRANSITION
	DENOTES PROPOSED LAP JOINT ASPHALT REPAIRS
	DENOTES EXISTING ASPHALT SAW CUT
	DENOTES PROPERTY LINE
	DENOTES EASEMENT LINE
	DENOTES LIMIT OF UNDERGROUND PARKING
	DENOTES LIMIT OF ROOF ABOVE
	DENOTES PROPOSED BUILDING EXIT LOCATIONS
	DENOTES PROPOSED EMERGENCY OVERLAND FLOW ROUTE
	DENOTES PROPOSED SWM TANK OVERFLOW FLOW ROUTE
	DENOTES EXISTING ASPHALT BIKE PATH
	DENOTES PROPOSED ASPHALT BIKE PATH
	DENOTES EXISTING STAMPED CONCRETE
	DENOTES PROPOSED STAMPED CONCRETE

No.	Date	Description	By	Ck.
3.	SEP. 13/24	3rd SUBMISSION TO HALTON REGION AND CITY OF BURLINGTON	F.S.	F.S.
2.	JAN. 19/24	2nd SUBMISSION TO HALTON REGION AND CITY OF BURLINGTON	S.S.	M.M.
1.	APR. 28/23	1st SUBMISSION TO HALTON REGION AND CITY OF BURLINGTON	S.S.	B.S.

Revisions

Stamp

LICENSED PROFESSIONAL ENGINEER F. SHI 100065502 2024/09/13 PROVINCE OF ONTARIO

Engineer

LUBAN
7373 LIONSHEAD AVENUE, NIAGARA FALLS, ONTARIO, L2G7S4
TEL. 226-688-7928, EMAIL: FENG.SHI@LUBAN.CA

MIXED-USE DEVELOPMENT

141-153 PLAINS RD WEST

BURLINGTON, ONTARIO

Title

GRADING PLAN

Scale:	1:125		
Designed:	S.S.	Checked:	F.S.
Drawn:	M.S.	Date:	SEPTEMBER 2024
Job No.		Drawing No.	
2024-S400		C3	

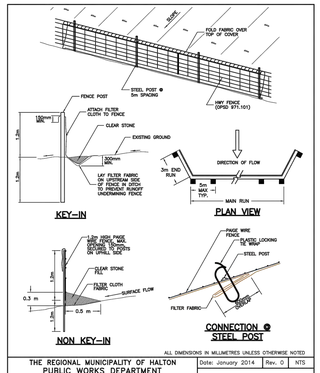
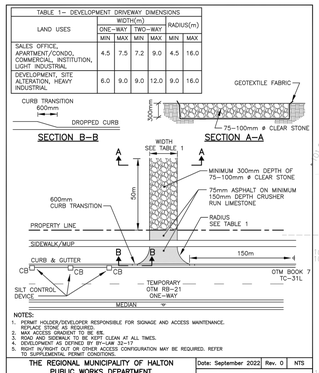
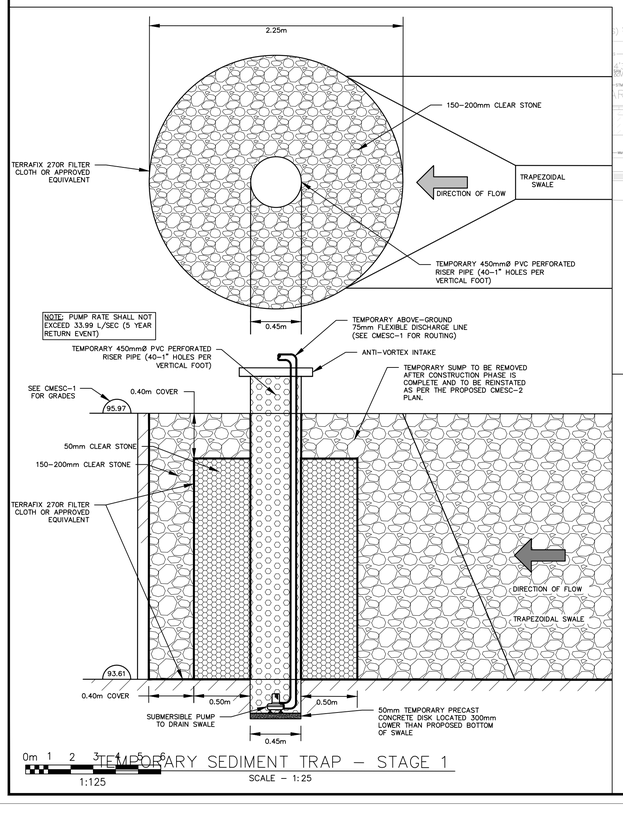


TABLE 1– DEVELOPMENT DRIVEWAY DIMENSIONS						
LAND USES	WIDTH(m) ONE–WAY		WIDTH(m) TWO–WAY		RADIUS(m)	
	MIN	MAX	MIN	MAX	MIN	MAX
SALES OFFICE, APARTMENT/CONDO, COMMERCIAL, INSTITUTION, LIGHT INDUSTRIAL	4.5	7.5	7.2	9.0	4.5	16.0
DEVELOPMENT, SITE ALTERATION, HEAVY INDUSTRIAL	6.0	9.0	9.0	12.0	9.0	16.0

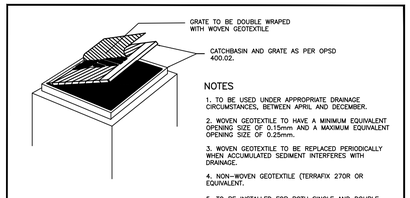


EROSION AND SEDIMENT CONTROL

1. EROSION AND SEDIMENT CONTROL (ESC) MEASURES WILL BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING CONSTRUCTION PHASES, TO PREVENT ENTRY OF SEDIMENT INTO THE WATER. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE REPAIRED OR REPLACED WITHIN 48 HOURS OF INSPECTION OR BOTH.
2. ALL DISTURBED AREAS WILL BE MINIMIZED TO THE EXTENT POSSIBLE, TEMPORARILY STABILIZED OR RESTORED AS THE WORK PROGRESSES.
3. THE EROSION AND SEDIMENT CONTROL STRATEGIES OUTLINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREA. IF THE PRESCRIBED MEASURES ON THE PLANS ARE NOT EFFECTIVE IN PREVENTING THE RELEASE OF A DELETERIOUS SUBSTANCE, THEN ALTERNATIVE MEASURES MUST BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS AND HALTON REGION CONSERVATION AUTHORITY ENFORCEMENT OFFICE SHOULD BE IMMEDIATELY CONTACTED. ADDITIONAL ESC MEASURES TO BE KEPT ON SITE AND USES AS NECESSARY.
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 AND REFUELING WILL BE CONDUCTED A MINIMUM OF 30m FROM THE WATER.
5. ALL GRADES WITHIN THE REGULATORY FLOOD PLAN WILL BE MAINTAINED OR MATCHED.



TEMPORARY SEDIMENT TRAP – STAGE 1



NOTES

1. TO BE USED UNDER APPROPRIATE DRAINAGE CIRCUMSTANCES, BETWEEN APRIL AND DECEMBER.
2. WOVEN GEOTEXTILE TO HAVE A MINIMUM EQUIVALENT OPENING SIZE OF 0.15mm AND A MAXIMUM EQUIVALENT OPENING SIZE OF 0.25mm.
3. WOVEN GEOTEXTILE TO BE REPLACED PERIODICALLY WHEN ACCUMULATED SEDIMENT INTERFERES WITH DRAINAGE.
4. NON–WOVEN GEOTEXTILE (TERRAFIX 270R OR EQUIVALENT.
5. TO BE INSTALLED FOR BOTH SINGLE AND DOUBLE CATCHBASINS.

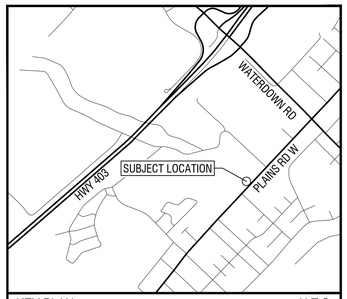
CATCHBASIN SEDIMENT PROTECTION
N.T.S.

GENERAL NOTES

1. EXISTING UNDERGROUND SERVICES SHOWN ON THIS PLAN ARE FOR REFERENCE ONLY. THE EXACT LOCATION OF UNDERGROUND SERVICES MUST BE FIELD VERIFIED BY THE CONTRACTOR WITH THE RESPECTIVE UTILITY COMPANIES.
2. PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL RIGHT OF WAY THE CONTRACTOR, DEVELOPER OR CONSULTANT WILL OBTAIN ALL NECESSARY ROAD OCCUPANCY PERMITS FROM THE CITY'S RIGHT–OF–WAY MANAGEMENT UNIT
3. ALL WORK WITHIN THE CITY RIGHT–OF–WAY SHALL CONFIRM TO THE LATEST CITY OF BURLINGTON/HALTON REGION STANDARD DRAWING AND SPECIFICATIONS OR ONTARIO PROVINCIAL STANDARD DRAWINGS AND SPECIFICATIONS, WHEREVER THERE IS NO CITY OF BURLINGTON/HALTON REGION STANDARD.
4. LOCATION OF THE WATER METER SHALL BE TO THE SATISFACTION OF THE CITY OF BURLINGTON/HALTON REGION.
5. THE BUILDING'S STORM AND SANITARY SYSTEM IS TO BE DESIGNED TO BE ABLE TO OPERATE UNDER MUNICIPAL SEWER SURCHARGE CONDITION
6. THE METHOD OF INSTALLATION FOR THE PROPOSED SERVICE CONNECTIONS WILL BE AT THE DIRECTION OF CITY OF BURLINGTON/HALTON REGION.
7. THE OWNER IS REQUIRED TO INSTALL AND MAINTAIN A PREMISE ISOLATION DEVICE FOR ALL APPLICABLE WATER SERVICES IN ACCORDANCE WITH THE REGIONAL MUNICIPALITY OF HALTON STANDARD DRAWING RH–601.010, THE BUILDING CODE, AND CSA B64.10 SERIES STANDARDS.
8. ALL EXISTING SERVICE CONNECTIONS WITHIN THE MUNICIPAL RIGHT–OF–WAY WILL BE DISCONNECTED/ABANDONED BY THE CITY OF BURLINGTON AT OWNER'S EXPENSE.
9. THE OWNER MUST CONTACT ALL UTILITIES (GAS, BELL, ROGERS, HYDRO, ETC.) TO MAKE ARRANGEMENTS FOR THE RELOCATION OF EXISTING UTILITIES PRIOR TO THE INSTALLATION OF SANITARY, STORM AND WATER SERVICE CONNECTIONS.

CONSTRUCTION NOTES

1. ALL MATERIAL FOR SEWER, FORCE MAIN, WATERMAIN, HYDRANTS AND APPURTENANCES, SHALL BE IN ACCORDANCE TO THE REGIONAL MUNICIPALITY OF HALTON WATER AND WASTEWATER LINEAR DESIGN MANUAL SECTION 2.1.1–2.1.2, APPLICABLE REGION OF HALTON (RH) STANDARD DRAWINGS AND SPECIFICATIONS, REGION OF HALTON DRINKING WATER SYSTEM BY–LAW (71–19), CURRENT OPSS AND OPSD AS AMMENDED BY HALTON REGION, AND MECP DESIGN GUIDELINES FOR DRINKING WATER SYSTEMS.
2. UTILITY SEPARATION SHALL BE IN ACCORDANCE TO SECTION 2.6.6 OF THE THE REGIONAL MUNICIPALITY OF HALTON WATER AND WASTEWATER LINEAR DESIGN MANUAL.
3. ALL AREAS DISTURBED DURING CONSTRUCTION WITHIN THE CITY'S RIGHT–OF–WAY SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION AND TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR. GRASS AREAS SHALL BE TREATED WITH 100MM OF TOPSOIL AND SHALL BE SODDED.
4. ALL EXISTING UTILITIES SHOWN ON DRAWINGS (PLAN & PROFILE) ARE FOR REFERENCE PURPOSES ONLY. THE CONTRACTOR SHALL SATISFY THEMSELVES AS TO THE ACTUAL LOCATION AND DEPTH OF ANY UTILITY AND SHALL BE LIABLE FOR ALL OR ANY DAMAGE.
5. ANY DISCREPANCIES BETWEEN SITE CONDITIONS AND CONSTRUCTION DRAWINGS MUST BE REPORTED TO THE CITY PRIOR TO COMMENCEMENT OF CONSTRUCTION AND APPROPRIATE ACTION TAKEN TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.
6. ALL SURVEYS STAKE LAYOUT POINTS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION. ANY DISCREPANCIES BETWEEN THE DRAWINGS AND THE LAYOUT SHALL BE IMMEDIATELY REPORTED TO THE CITY.
7. ATTENTION IS DIRECTED TO THE POSSIBILITY OF EXISTING PRIVATE SPRINKLERS AND LIGHTING SYSTEMS WITHIN THE RIGHT–OF–WAY, WHICH ARE NOT SHOWN ON THE PLANS, LOCATING, WORKING AROUND AND PROTECTING THESE SYSTEMS SHALL BE COMPLETED AT NO EXTRA COST TO THE CITY.
8. AT ALL LOCATIONS WHERE THE PROPOSED WATERMAIN CROSSES UNDER OR ABOVE THE EXISTING SEWERS, OR UTILITIES, GRANULAR A BEDDING MATERIAL IS TO EXTEND FROM THE LOWER PIPE TO THE TOP OF THE UPPER PIPE. GRANULAR A TO BE COMPACTED TO MINIMUM 98% OF MAXIMUM DRY DENSITY.
9. CONTRACTOR TO PROVIDE ADEQUATE SUPPORT DURING CONSTRUCTION BETWEEN THE NEW WATERMAIN AND EXISTING GAS MAINS. MAINTAIN 300mm MINIMUM VERTICAL CLEARANCE BETWEEN THE NEW WATERMAIN AND EXISTING GASMAIN(S) LESS THAN 300mm IN DIAMETER. MAINTAIN 600mm MINIMUM VERTICAL CLEARANCE BETWEEN THE NEW WATERMAIN AND EXISTING GASMAIN(S) EQUAL TO OR GREATER THAN 300mm IN DIAMETER.
10. ALL DIMENSIONS ARE EXPRESSED IN METERS (m) AND PIPE SIZES ARE EXPRESSED IN MILLIMETERS (mm) UNLESS OTHERWISE NOTED.



KEY PLAN N.T.S.

BENCHMARK

A SPIKE SET ON PLAINS ROAD WEST LOCATED APPROXIMATELY 10.2 METERS NORTH FROM THE CENTRELINE OF ROAD, 1.1 METERS NORTH OF THE BACK OF CURB, AS SHOWN ON THE FACE OF PLAN.
ELEVATION=102.64m

ELEVATION

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM THE CITY OF BURLINGTON BENCHMARKS:
No. 463 ELEVATION=90.035m
No. 467 ELEVATION=107.625m

LEGEND

- EX. STORM MANHOLE
- EX. SANITARY MANHOLE
- EX. CB
- CATCHMENT SEDIMENT PROTECTION (SEE DETAIL THIS DRAWING)
- PROPERTY LINE
- LOT LINE
- EASEMENT LINE
- PROPOSED SILT FENCE LOCATION
- EXISTING EMERGENCY OVERLAND FLOW ROUTE
- DENOTES EXISTING ASPHALT BIKE PATH
- DENOTES PROPOSED ASPHALT BIKE PATH
- DENOTES EXISTING STAMPED CONCRETE
- DENOTES PROPOSED STAMPED CONCRETE

No.	Date	Description	By	Ck.
3.	SEP. 13/24	3rd SUBMISSION TO HALTON REGION AND CITY OF BURLINGTON	F.S.	F.S.
2.	JAN. 19/24	2nd SUBMISSION TO HALTON REGION AND CITY OF BURLINGTON	S.S.	M.M.
1.	APR. 28/23	1st SUBMISSION TO HALTON REGION AND CITY OF BURLINGTON	S.S.	B.S.

Revisions

Stamp

LICENSED PROFESSIONAL ENGINEER F. SHI 100065502 PROVINCE OF ONTARIO

Engineer

LUBAN
7373 LIONSHEAD AVENUE, NIAGARA FALLS, ONTARIO, L2G7S4
TEL. 226-688-7928, EMAIL: FENG.SHI@LUBAN.CA

MIXED-USE DEVELOPMENT

141-153 PLAINS RD WEST

BURLINGTON, ONTARIO

Title: CONSTRUCTION MANAGEMENT AND EROSION SEDIMENTATION PLAN - STAGE 1 (P2 LEVEL)

Scale:	1:125		
Designed:	S.S.	Checked:	F.S.
Drawn:	M.S.	Date:	SEPTEMBER 2024
Job No.		Drawing No.	
2024-S400		C4	

APPENDIX B JSW Functional Servicing and Stormwater Management Report

APPENDIX C Hydrant flow test results from IQ Environmental

IQ ENVIRONMENTAL INC.

524 6th Concession Rd W,
Millgrove, ON L0R 1V0

Information

Date
10/13/2023

Time of Flow Test
09:30

Job Number
80655 - JSW, 153 Plains Rd, W, Burlington - Flow Test, 2381798 Ontario Inc

Watermain Diameter
300

Static Pressure
52

Results

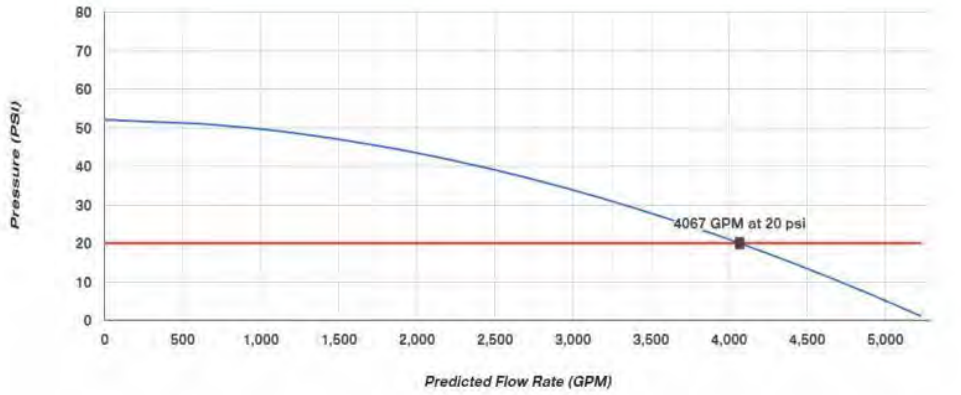
Flow Hydrant Location	Pitot Pressure (2 1/2)	Residual Pressure (2 1/2)	Flow 2 1/2 (USGPM)
153 Plains rd west	38	47	1148
Residual Hydrant Location	**Pitot Pressure (2 x 2 1/2)**	**Residual Pressure (2 x 2 1/2)**	**Flow 2 x 2 1/2 (USGPM)**
127 Plains rd w	26	42	2170

Signatures

Operator Name
Tyler Burns

IQ Operator Signature

GPM at 20 psi: 4067
Class: AA
Marking color: Light Blue
% Pressure Drop: 19%



APPENDIX D Jellyfish Filter Unit (model JF 4-1-1)

GENERAL NOTES:

1. ALL DIMENSIONS INDICATED ARE IN MILLIMETERS (INCHES) UNLESS OTHERWISE SPECIFIED.
2. JELLYFISH STRUCTURE INLET AND OUTLET PIPE SIZE AND ORIENTATION SHOWN FOR INFORMATIONAL PURPOSES ONLY.
3. UNLESS OTHERWISE NOTED, BYPASS INFRASTRUCTURE, SUCH AS ALL UPSTREAM DIVERSION STRUCTURES, CONNECTING STRUCTURES, OR PIPE CONDUITS CONNECTING TO COMPLETE THE JELLYFISH SYSTEM SHALL BE PROVIDED AND ADDRESSED SEPARATELY.
4. DRAWING FOR INFORMATION PURPOSES ONLY. REFER TO ENGINEER'S SITE/UTILITY PLAN FOR STRUCTURE ORIENTATION.
5. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

JELLYFISH STRUCTURE & DESIGN NOTES:

1. 457 MM Ø (18") MAINTENANCE ACCESS WALL TO BE USED FOR CLEANOUT AND ACCESS BELOW CARTRIDGE DECK.
2. CASTINGS OR DOORS OF THE JELLYFISH MANHOLE STRUCTURE TO EXTEND TO DESIGN FINISH GRADE. DEPTHS IN EXCESS OF 3.65 M (12') MAY REQUIRE THE DESIGN AND INSTALLATION OF INTERMEDIATE SAFETY GRATES OR OTHER STRUCTURAL ELEMENTS.
3. CASTINGS AND GRADE RINGS, OR DOORS AND DOOR RISERS, OR BOTH, SHALL BE GROUTED FOR WATERTIGHTNESS.
   STRUCTURE SHALL MEET AASHTO HS-20, ASSUMING EARTH COVER OF 0' - 3', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE IMBRIUM LOGO.
4. ALL STRUCTURAL SECTIONS AND PARTS TO MEET OR EXCEED ASTM C-478, ASTM C-443, AND ASTM D-4097 CORRESPONDING TO AASHTO SPECIFICATIONS, AND ANY OTHER SITE OR LOCAL STANDARDS.
5. CONCRETE RISER SECTIONS FROM BOTTOM TO TOP WILL BE ADDED AS REQUIRED INCLUDING TRANSITION PIECES TO SMALLER DIAMETER RISERS FOR SURFACE ACCESSES WHERE WARRANTED BY SERVICING DEPTH.
6. IF MINIMUM DEPTH FROM TOP OF CARTRIDGE DECK TO BOTTOM OF STRUCTURAL TOP SLAB CANNOT BE ACHIEVED DUE TO PIPING INVERT ELEVATIONS OR OTHER SITE CONSTRAINTS. ALTERNATIVE HATCH CONFIGURATIONS MAY BE AVAILABLE. HATCH DOORS SHOULD BE SIZED TO PROVIDE FULL ACCESS ABOVE THE CARTRIDGES TO ACCOMMODATE MAINTENANCE.
7. STEPS TO BE APPROXIMATELY 330 MM (13") APART AND DIMENSIONS MUST MEET LOCAL STANDARDS. STEPS MUST BE INSTALLED AFTER CARTRIDGE DECK IS IN PLACE.
8. CONFIGURATION OF INLET AND OUTLET PIPE CAN VARY TO MEET SITE'S NEEDS.
9. IT IS THE RESPONSIBILITY OF OTHERS TO PROPERLY PROTECT THE TREATMENT DEVICE, AND KEEP THE DEVICE OFFLINE DURING CONSTRUCTION. FILTER CARTRIDGES SHALL NOT BE INSTALLED UNTIL THE PROJECT SITE IS CLEAN AND FREE OF DEBRIS, BY OTHERS. THE PROJECT SITE INCLUDES ANY SURFACE THAT CONTRIBUTES STORM DRAINAGE TO THE TREATMENT DEVICE. CARTRIDGES SHALL BE FURNISHED NEW, AT THE TIME OF FINAL ACCEPTANCE.
10. THIS DRAWING MUST BE VIEWED IN CONJUNCTION WITH THE STANDARD JELLYFISH SPECIFICATION, AND STORMWATER QUALITY FILTER TREATMENT JELLYFISH DOCUMENTS.

PEAK DIVERSION JELLYFISH DESIGN NOTES:

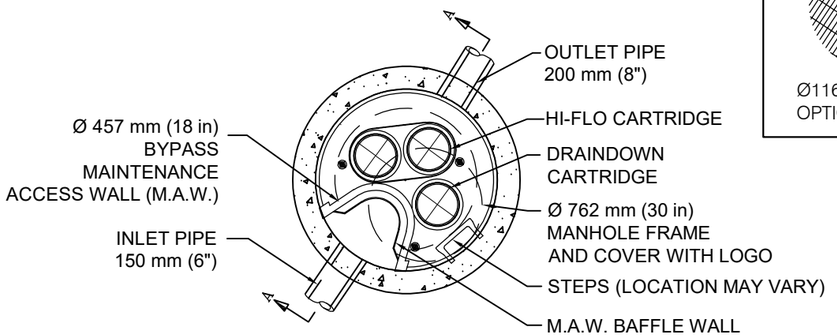
1. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS; WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0' - 3', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE IMBRIUM LOGO.
2. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.
3. INLET HGL NOT TO EXCEED 6" BELOW THE TOP OF THE M.A.W. DURING THE PEAK DESIGN STORM, OR 10-YEAR STORM (WHICHEVER IS GREATER).
4. INLET PIPE INVERT ELEVATION VARIES FROM 1" TO 6" MAXIMUM ABOVE THE OUTLET PIPE INVERT.
5. OUTLET PIPE INVERT IS EQUAL TO THE CARTRIDGE DECK ELEVATION.
6. THE OUTLET PIPE DIAMETER FOR NEW INSTALLATIONS IS TO BE ONE PIPE SIZE LARGER THAN THE INLET PIPE AT EQUAL OR GREATER SLOPE.
7. THE DIFFERENCE IN THE INLET AND OUTLET PIPE ELEVATIONS FOR RETROFIT INSTALLATIONS TO EXISTING STORM DRAIN PIPES SHALL BE EQUAL TO THE SLOPE OVER THE DIAMETER OF THE MANHOLE; NOT THE EXCEED 6" IN VERTICAL DIFFERENTIAL BETWEEN INLET AND OUTLET PIPES.

INSTALLATION NOTES

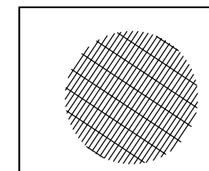
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
E. CARTRIDGE INSTALLATION, BY IMBRIUM, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT IMBRIUM TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION.

PEAK DIVERSION JELLYFISH RECOMMENDED PIPE DIAMETERS			
MODEL DIAMETER (m)	MINIMUM ANGLE INLET/OUTLET PIPES	MINIMUM INLET PIPE DIAMETER (mm)	MAXIMUM INLET PIPE DIAMETER (mm)
1.2	62	150	300
1.8	59	200	300
2.4	52	250	375
3.0	48	300	450
3.6	40	300	450
CONTACT IMBRIUM SYSTEMS FOR ALTERNATE PIPE DIAMETERS			

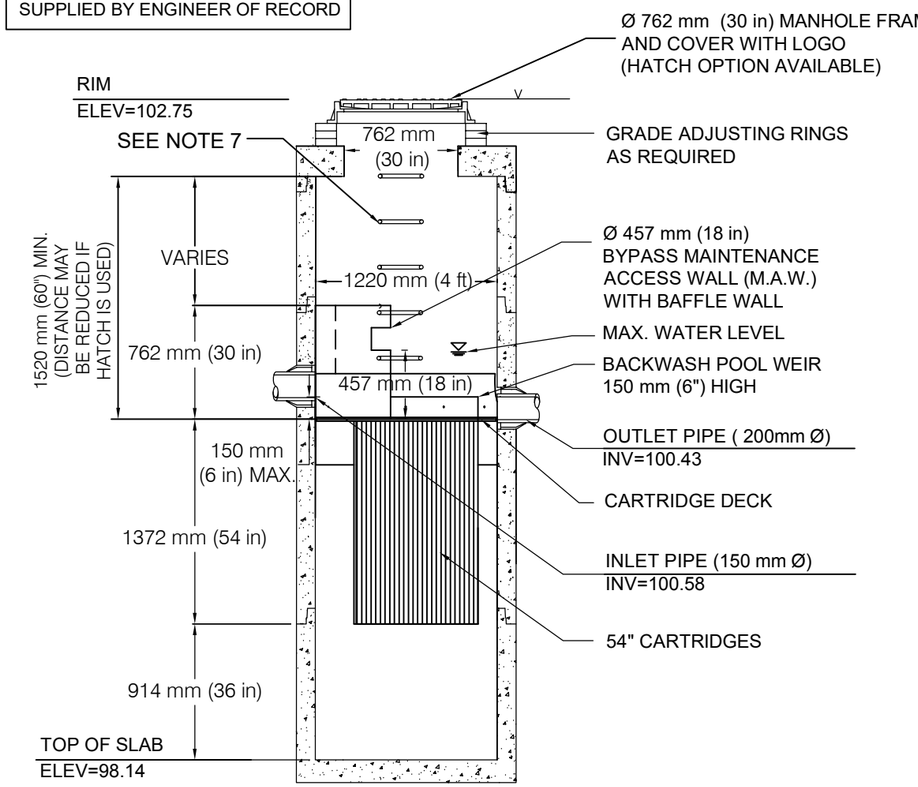
FOR SITE SPECIFIC DRAWINGS PLEASE CONTACT YOUR LOCAL JELLYFISH FILTER REPRESENTATIVE. SITE SPECIFIC DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME. SOME FIELD REVISIONS TO THE SYSTEM LOCATION OR CONNECTION PIPING MAY BE NECESSARY BASED ON AVAILABLE SPACE OR SITE CONFIGURATION REVISIONS. ELEVATIONS SHOULD BE MAINTAINED EXCEPT WHERE NOTED ON BYPASS STRUCTURE.



JF4 (ONLINE) PLAN VIEW



INVERT INFORMATION TO BE SUPPLIED BY ENGINEER OF RECORD



JELLYFISH CROSS SECTION A-A

JELLYFISH DESIGN NOTES

JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD MANHOLE STYLE IS SHOWN. Ø1220 mm (48") MANHOLE JELLYFISH PEAK TREATMENT CAPACITY IS 12.7 L/s (0.54 CFS), AND MAXIMUM BYPASS CAPACITY IS 70.8 L/s (2.50 CFS). IF THE SITE CONDITIONS EXCEED TOTAL CAPACITY, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED. TREATMENT FLOW RATE IS BASED ON 457 mm (18") OF HEAD PRESSURE.

CARTRIDGE SELECTION	54"	40"	27"	15"			
CARTRIDGE DEPTH	90"	76"	63"	51"			
OUTLET INVERT TO STRUCTURE BASE SLAB	5.09 / 2.55	3.68 / 1.84	2.55 / 1.27	1.41 / 0.71			
FLOW RATE HIGH-FLO / DRAINDOWN (L/s) (per cart)	57 / 28	42 / 21	28 / 14	16 / 8			
SEDIMENT CAPACITY HIGH-FLO / DRAINDOWN (kg) (per cart)			2 / 1				
MAX. CARTS HIGH-FLO/DRAINDOWN			70.8				
MAX. BYPASS (L/s)					142	105	70	40
MAX. SEDIMENT CAPACITY (kg)					12.7	9.3	6.2	3.4
MAX. TREATMENT (L/s)					83.5	80.1	77.0	74.2
MAX. TREATMENT AND BYPASS (L/s) (PEAK CAPACITY)								

SITE SPECIFIC DATA REQUIREMENTS

JELLYFISH MODEL	*
STRUCTURE ID	*
WATER QUALITY FLOW RATE (L/s)	*
BYPASS FLOW RATE (L/s)	*
PEAK FLOW RATE (L/s)	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
# OF CARTRIDGES REQUIRED (HF / DD)	*
CARTRIDGE SIZE (inches)	*
MAX ALLOWABLE BYPASS FLOW RATE (L/s)	70.8

PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*

* PER ENGINEER OF RECORD

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0	04/15/2015	INTIAL RELEASE	BSF

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Jellyfish

JF4 ONLINE

Scale = 1:50

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imbrium

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TF 800-565-4801 CA 416-800-6000 INTL +1-416-800-6000

Jellyfish® Filter

THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING: US 6,511,592, US 6,649,048, US 6,991,724, US 7,186,058, US 8,123,938, CA 2,498,462, CA 2,846,242, AU 10-2010-200, NZ 595,431, CA 2,909,990, CA 3,018,010, INTERNATIONAL PATENTS PENDING

DATE: #####

DESIGNED: | DRAWN: BSF

CHECKED: BW | APPROVED: SP

IMBRIUM PROJECT #: #####

SHEET: 1 OF 2

I:\IMBRIUM\PRODUCTS\JELLYFISH FILTER\40 DRAWINGS & DETAILS\STANDARD DETAILS\JELLYFISH FILTER - ONLINE\JELLYFISH FILTER JF4 - PEAK DIVERSION.DWG 7/17/2024 1:09 PM

JELLYFISH® FILTER - SPECIFICATIONS

GENERAL

A. WORK INCLUDED: SPECIFIES REQUIREMENTS FOR CONSTRUCTION AND PERFORMANCE OF AN UNDERGROUND STORMWATER QUALITY, MEMBRANE FILTRATION, AND TREATMENT DEVICE THAT REMOVES POLLUTANTS FROM STORMWATER RUNOFF THROUGH THE UNIT OPERATIONS OF SEDIMENTATION, FLOATATION, AND MEMBRANE FILTRATION.

B. REFERENCE STANDARDS:
ASTM C 891: SPECIFICATION FOR INSTALLATION OF UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES
ASTM C 478: SPECIFICATION FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS
ASTM C 990: SPECIFICATION FOR JOINTS FOR CONCRETE MANHOLES USING PREFORMED FLEXIBLE JOINT SEALANTS
ASTM D 4101: SPECIFICATION FOR COPOLYMER STEPS CONSTRUCTION

C. SHOP DRAWINGS: SHOP DRAWINGS FOR THE STRUCTURE AND PERFORMANCE ARE TO BE SUBMITTED WITH EACH ORDER TO THE CONTRACTOR. CONTRACTOR SHALL FORWARD SHOP DRAWING SUBMITTAL TO THE CONSULTING ENGINEER FOR APPROVAL. SHOP DRAWINGS ARE TO DETAIL THE STRUCTURE PRECAST CONCRETE AND CALL OUT OR NOTE THE FIBERGLASS (FRP) INTERNALS/COMPONENTS.

D. PRODUCT SUBSTITUTIONS: NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD. SUBMISSIONS FOR SUBSTITUTIONS REQUIRE REVIEW AND APPROVAL BY THE ENGINEER OF RECORD, FOR HYDRAULIC PERFORMANCE, IMPACT TO PROJECT DESIGNS, EQUIVALENT TREATMENT PERFORMANCE, AND ANY REQUIRED PROJECT PLAN AND REPORT (HYDROLOGY/HYDRAULIC, WATER QUALITY, STORMWATER POLLUTION) MODIFICATIONS THAT WOULD BE REQUIRED BY THE APPROVING JURISDICTIONS/AGENCIES. CONTRACTOR TO COORDINATE WITH THE ENGINEER OF RECORD ANY APPLICABLE MODIFICATIONS TO THE PROJECT ESTIMATES OF COST, BONDING AMOUNT DETERMINATIONS, PLAN CHECK FEES FOR CHANGES TO APPROVED DOCUMENTS, AND/OR ANY OTHER REGULATORY REQUIREMENTS RESULTING FROM THE PRODUCT SUBSTITUTION.

E. HANDLING AND STORAGE: PREVENT DAMAGE TO MATERIALS DURING STORAGE AND HANDLING.

PRODUCTS

A. THE DEVICE SHALL BE A CYLINDRICAL OR RECTANGULAR, ALL CONCRETE STRUCTURE (INCLUDING RISERS), CONSTRUCTED FROM PRECAST CONCRETE RISER AND SLAB COMPONENTS OR MONOLITHIC PRECAST STRUCTURE(S), INSTALLED TO CONFORM TO ASTM C 891 AND TO ANY REQUIRED STATE HIGHWAY, MUNICIPAL OR LOCAL SPECIFICATIONS; WHICHEVER IS MORE STRINGENT. THE DEVICE SHALL BE WATERTIGHT.

B. THE CYLINDRICAL CONCRETE DEVICE SHALL INCLUDE A FIBERGLASS CARTRIDGE DECK INSERT. THE RECTANGULAR CONCRETE DEVICE SHALL INCLUDE A COATED ALUMINUM INSERT. IN EITHER INSTANCE, THE INSERT SHALL BE BOLTED AND SEALED WATERTIGHT INSIDE THE PRECAST CONCRETE CHAMBER. THE INSERT SHALL SERVE AS: (A) A HORIZONTAL DIVIDER BETWEEN THE LOWER TREATMENT ZONE AND THE UPPER TREATED EFFLUENT ZONE; (B) A DECK FOR ATTACHMENT OF FILTER CARTRIDGES SUCH THAT THE MEMBRANE FILTER ELEMENTS OF EACH CARTRIDGE EXTEND INTO THE LOWER TREATMENT ZONE; (C) A PLATFORM FOR MAINTENANCE WORKERS TO SERVICE THE FILTER CARTRIDGES (MAXIMUM MANNED WEIGHT = 450 POUNDS); (D) A CONDUIT FOR CONVEYANCE OF TREATED WATER TO THE EFFLUENT PIPE.

C. MEMBRANE FILTER CARTRIDGES SHALL BE COMPRISED OF REUSABLE CYLINDRICAL MEMBRANE FILTER ELEMENTS CONNECTED TO A PERFORATED HEAD PLATE. THE NUMBER OF MEMBRANE FILTER ELEMENTS PER CARTRIDGE SHALL BE A MINIMUM OF ELEVEN 2.75-INCH (70-MM) OR GREATER DIAMETER ELEMENTS. THE LENGTH OF EACH FILTER ELEMENT SHALL BE A MINIMUM 15 INCHES (381 MM). EACH CARTRIDGE SHALL BE FITTED INTO THE CARTRIDGE DECK BY INSERTION INTO A CARTRIDGE RECEPTACLE THAT IS PERMANENTLY MOUNTED INTO THE CARTRIDGE DECK. EACH CARTRIDGE SHALL BE SECURED BY A CARTRIDGE LID THAT IS THREADED ONTO THE RECEPTACLE, OR SIMILAR MECHANISM TO SECURE THE CARTRIDGE INTO THE DECK. THE MAXIMUM TREATMENT FLOW RATE OF A FILTER CARTRIDGE SHALL BE CONTROLLED BY AN ORIFICE IN THE CARTRIDGE LID, OR ON THE INDIVIDUAL CARTRIDGE ITSELF, AND BASED ON A DESIGN FLUX RATE (SURFACE LOADING RATE) DETERMINED BY THE MAXIMUM TREATMENT FLOW RATE PER UNIT OF FILTRATION MEMBRANE SURFACE AREA. THE MAXIMUM FLUX RATE SHALL BE 0.21 GPM/FT2 (0.142 LPS/M2). EACH MEMBRANE FILTER CARTRIDGE SHALL ALLOW FOR MANUAL INSTALLATION AND REMOVAL.

D. ALL FILTER CARTRIDGES AND MEMBRANES SHALL BE REUSABLE AND ALLOW FOR THE USE OF FILTRATION MEMBRANE RINSING PROCEDURES TO RESTORE FLOW CAPACITY AND SEDIMENT CAPACITY; EXTENDING CARTRIDGE SERVICE LIFE.

E. ACCESS SHALL HAVE A MINIMUM CLEAR HEIGHT OF 60" OVER ALL OF THE FILTER CARTRIDGES, OR BE ACCESSIBLE BY A HATCH OR OTHER MECHANISM THAT PROVIDES MINIMUM 60" VERTICAL CLEAR SPACE OVER ALL OF THE FILTER CARTRIDGES. FILTER CARTRIDGES SHALL BE ABLE TO BE LIFTED STRAIGHT VERTICALLY OUT OF THE RECEPTACLES AND DECK FOR THE ENTIRE LENGTH OF THE CARTRIDGE.

F. THE DEVICE SHALL INCLUDE A MINIMUM 24 INCHES (610 MM) OF SUMP BELOW THE BOTTOM OF THE CARTRIDGES FOR SEDIMENT ACCUMULATION, UNLESS OTHERWISE SPECIFIED BY THE DESIGN ENGINEER. DEPTHS LESS THAN 24" MAY HAVE AN IMPACT ON THE TOTAL PERFORMANCE AND/OR LONGEVITY BETWEEN CARTRIDGE MAINTENANCE/REPLACEMENT OF THE DEVICE.

G. ALL PRECAST CONCRETE COMPONENTS SHALL BE MANUFACTURED TO A MINIMUM LIVE LOAD OF HS-20 TRUCK LOADING OR GREATER BASED ON LOCAL REGULATORY SPECIFICATIONS, UNLESS OTHERWISE MODIFIED OR SPECIFIED BY THE DESIGN ENGINEER, AND SHALL BE WATERTIGHT.

H. GASKETS AND/OR SEALANTS TO PROVIDE WATER TIGHT SEAL BETWEEN CONCRETE JOINTS. JOINTS SHALL BE SEALED WITH PREFORMED JOINT SEALING COMPOUND CONFORMING TO ASTM C 990.

I. FRAME AND COVERS MUST BE MANUFACTURED FROM CAST-IRON OR OTHER COMPOSITE MATERIAL TESTED TO WITHSTAND H-20 OR GREATER DESIGN LOADS, AND AS APPROVED BY THE LOCAL REGULATORY BODY. FRAMES AND COVERS MUST BE EMBOSSED WITH THE NAME OF THE DEVICE MANUFACTURER OR THE DEVICE BRAND NAME.

J. DOOR AND HATCHES, IF PROVIDED SHALL MEET DESIGNATED LOADING REQUIREMENTS OR AT A MINIMUM FOR INCIDENTAL VEHICULAR TRAFFIC.

K. ALL CONCRETE COMPONENTS SHALL BE MANUFACTURED ACCORDING TO LOCAL SPECIFICATIONS AND SHALL MEET THE REQUIREMENTS OF ASTM C 478.

L. THE FIBERGLASS PORTION OF THE FILTER DEVICE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING STANDARD: ASTM D-4097: CONTACT MOLDED GLASS FIBER REINFORCED CHEMICAL RESISTANT TANKS.

M. STEPS SHALL BE CONSTRUCTED ACCORDING TO ASTM D4101 OF COPOLYMER POLYPROPYLENE, AND BE DRIVEN INTO PREFORMED OR PRE-DRILLED HOLES AFTER THE CONCRETE HAS CURED, INSTALLED TO CONFORM TO APPLICABLE SECTIONS OF STATE, PROVINCIAL AND MUNICIPAL BUILDING CODES, HIGHWAY, MUNICIPAL OR LOCAL SPECIFICATIONS FOR THE CONSTRUCTION OF SUCH DEVICES.

N. ALL PRECAST CONCRETE SECTIONS SHALL BE INSPECTED TO ENSURE THAT DIMENSIONS, APPEARANCE AND QUALITY OF THE PRODUCT MEET LOCAL MUNICIPAL SPECIFICATIONS AND ASTM C 478.

PERFORMANCE

A. THE STORMWATER QUALITY FILTER TREATMENT DEVICE SHALL FUNCTION TO REMOVE POLLUTANTS BY THE FOLLOWING UNIT TREATMENT PROCESSES; SEDIMENTATION, FLOATATION, AND MEMBRANE FILTRATION.

B. THE STORMWATER QUALITY FILTER TREATMENT DEVICE SHALL REMOVE OIL, DEBRIS, TRASH, COARSE AND FINE PARTICULATES, PARTICULATE-BOUND POLLUTANTS, METALS AND NUTRIENTS FROM STORMWATER DURING RUNOFF EVENTS.

C. THE STORMWATER QUALITY FILTER TREATMENT DEVICE SHALL TYPICALLY UTILIZE AN EXTERNAL BYPASS TO DIVERT EXCESSIVE FLOWS. INTERNAL BYPASS SYSTEMS SHALL BE EQUIPPED WITH A FLOATABLES BAFFLE, AND MUST PASS WATER OVER THE CARTRIDGE DECK, AND AVOID PASSAGE THROUGH THE SUMP AND/OR CARTRIDGE FILTRATION ZONE.

D. THE STORMWATER QUALITY FILTER TREATMENT DEVICE SHALL TREAT 100% OF THE REQUIRED WATER QUALITY TREATMENT FLOW BASED ON A MAXIMUM TREATMENT FLUX RATE (SURFACE LOADING RATE) ACROSS THE MEMBRANE FILTER CARTRIDGES NOT TO EXCEED 0.21 GPM/FT2 (0.142 LPS/M2).

E. AT A MINIMUM, THE STORMWATER QUALITY FILTER DEVICE SHALL HAVE BEEN FIELD TESTED AND VERIFIED WITH A MINIMUM 25 QUALIFYING STORM EVENTS AND FIELD MONITORING CONDUCTED ACCORDING TO THE TARP TIER II OR TAPE FIELD TEST PROTOCOL, AND HAVE RECEIVED NJCAT VERIFICATION.

F. THE STORMWATER QUALITY FILTER TREATMENT DEVICE SHALL HAVE DEMONSTRATED A MINIMUM MEDIAN TSS REMOVAL EFFICIENCY OF 85% AND A MINIMUM MEDIAN SSC REMOVAL EFFICIENCY OF 95%.

G. THE STORMWATER QUALITY FILTER TREATMENT DEVICE SHALL HAVE DEMONSTRATED THE ABILITY TO CAPTURE FINE PARTICLES AS INDICATED BY A MINIMUM MEDIAN REMOVAL EFFICIENCY OF 75% FOR THE PARTICLE FRACTION LESS THAN 25 MICRONS, AN EFFLUENT D50 OF 15 MICRONS OR LOWER FOR ALL MONITORED STORM EVENTS, AND AN EFFLUENT TURBIDITY OF 15 NTUS OR LOWER.

H. THE STORMWATER QUALITY FILTER TREATMENT DEVICE SHALL HAVE DEMONSTRATED A MINIMUM MEDIAN TOTAL PHOSPHORUS REMOVAL OF 55%, AND A MINIMUM MEDIAN TOTAL NITROGEN REMOVAL OF 50%.

I. THE STORMWATER QUALITY FILTER TREATMENT DEVICE SHALL HAVE DEMONSTRATED A MINIMUM MEDIAN TOTAL ZINC REMOVAL OF 50%, AND A MINIMUM MEDIAN TOTAL COPPER REMOVAL OF 75%.

INSPECTION AND MAINTENANCE

A. DURABILITY OF MEMBRANES ARE SUBJECT TO GOOD HANDLING PRACTICES DURING INSPECTION AND MAINTENANCE (REMOVAL, RINSING, AND REINSERTION) EVENTS, AND SITE SPECIFIC CONDITIONS THAT MAY HAVE HEAVIER OR LIGHTER LOADING ONTO THE CARTRIDGES, AND POLLUTANT VARIABILITY THAT MAY IMPACT THE MEMBRANE STRUCTURAL INTEGRITY. MEMBRANE MAINTENANCE AND REPLACEMENT SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

B. INSPECTION WHICH INCLUDES TRASH AND FLOATABLES COLLECTION, SEDIMENT DEPTH DETERMINATION, AND VISIBLE DETERMINATION OF BACKWASH POOL DEPTH SHALL BE EASILY CONDUCTED FROM GRADE (OUTSIDE THE STRUCTURE).

C. MANUAL RINSING OF THE REUSABLE FILTER CARTRIDGES SHALL PROMOTE RESTORATION OF THE FLOW CAPACITY AND SEDIMENT CAPACITY OF THE FILTER CARTRIDGES, EXTENDING CARTRIDGE SERVICE LIFE.

D. SEDIMENT REMOVAL FROM THE FILTER TREATMENT DEVICE SHALL BE ABLE TO BE CONDUCTED USING A STANDARD MAINTENANCE TRUCK AND VACUUM APPARATUS, AND A MINIMUM ONE POINT OF ENTRY TO THE SUMP THAT IS UNOBSTRUCTED BY FILTER CARTRIDGES.

E. MAINTENANCE ACCESS SHALL HAVE A MINIMUM CLEAR HEIGHT OF 60" OVER ALL OF THE FILTER CARTRIDGES, OR BE ACCESSIBLE BY A HATCH OR OTHER MECHANISM THAT PROVIDES MINIMUM 60" VERTICAL CLEAR SPACE OVER ALL OF THE FILTER CARTRIDGES. FILTER CARTRIDGES SHALL BE ABLE TO BE LIFTED STRAIGHT VERTICALLY OUT OF THE RECEPTACLES AND DECK FOR THE ENTIRE LENGTH OF THE CARTRIDGE.

F. FILTER CARTRIDGES SHALL BE ABLE TO BE MAINTAINED WITHOUT THE USE OF ADDITIONAL LIFTING EQUIPMENT.

EXECUTION

A. THE INSTALLATION OF A WATERTIGHT PRECAST CONCRETE DEVICE SHOULD CONFORM TO ASTM C 891 AND TO ANY STATE HIGHWAY, MUNICIPAL OR LOCAL SPECIFICATIONS FOR THE CONSTRUCTION OF MANHOLES, WHICHEVER IS MORE STRINGENT. SELECTED SECTIONS OF A GENERAL SPECIFICATION THAT ARE APPLICABLE ARE SUMMARIZED BELOW.

B. THE WATERTIGHT PRECAST CONCRETE DEVICE IS INSTALLED IN SECTIONS IN THE FOLLOWING SEQUENCE:
- AGGREGATE BASE
- BASE SLAB
- TREATMENT CHAMBER AND CARTRIDGE DECK RISER SECTION(S)
- BYPASS SECTION
- CONNECT INLET AND OUTLET PIPES
- CONCRETE RISER SECTION(S) AND/OR TRANSITION SLAB (IF REQUIRED)
- MAINTENANCE RISER SECTION(S) (IF REQUIRED)
- FRAME AND ACCESS COVER

C. INLET AND OUTLET PIPES SHOULD BE SECURELY SET INTO THE DEVICE USING APPROVED PIPE SEALS (FLEXIBLE BOOT CONNECTIONS, WHERE APPLICABLE) SO THAT THE STRUCTURE IS WATERTIGHT, AND SUCH THAT ANY PIPE INTRUSION INTO THE DEVICE DOES NOT IMPACT THE DEVICE FUNCTIONALITY.

D. ADJUSTMENT UNITS (E.G. GRADE RINGS) SHOULD BE INSTALLED TO SET THE FRAME AND COVER AT THE REQUIRED ELEVATION. THE ADJUSTMENT UNITS SHOULD BE LAID IN A FULL BED OF MORTAR WITH SUCCESSIVE UNITS BEING JOINED USING SEALANT RECOMMENDED BY THE MANUFACTURER. FRAMES FOR THE COVER SHOULD BE SET IN A FULL BED OF MORTAR AT THE ELEVATION SPECIFIED.

E. IN SOME INSTANCES THE MAINTENANCE ACCESS WALL, IF PROVIDED, SHALL REQUIRE AN EXTENSION ATTACHMENT AND SEALING TO THE PRECAST WALL AND CARTRIDGE DECK AT THE JOB SITE, RATHER THAN AT THE PRECAST FACILITY. IN THIS INSTANCE, INSTALLATION OF THESE COMPONENTS SHALL BE PERFORMED ACCORDING TO INSTRUCTIONS PROVIDED BY THE MANUFACTURER.

F. FILTER CARTRIDGES SHALL BE INSTALLED IN THE CARTRIDGE DECK AFTER THE CONSTRUCTION SITE IS FULLY STABILIZED AND IN ACCORDANCE WITH THE MANUFACTURERS GUIDELINES AND RECOMMENDATIONS. CONTRACTOR TO CONTACT THE MANUFACTURER TO SCHEDULE CARTRIDGE DELIVERY AND REVIEW PROCEDURES/REQUIREMENTS TO BE COMPLETED TO THE DEVICE PRIOR TO INSTALLATION OF THE CARTRIDGES AND ACTIVATION OF THE SYSTEM.

G. MANUFACTURER SHALL COORDINATE DELIVERY OF FILTER CARTRIDGES AND OTHER INTERNAL COMPONENTS WITH CONTRACTOR. FILTER CARTRIDGES SHALL BE DELIVERED AND INSTALLED COMPLETE AFTER SITE IS STABILIZED AND UNIT IS READY TO ACCEPT CARTRIDGES. UNIT IS READY TO ACCEPT CARTRIDGES AFTER IS HAS BEEN CLEANED OUT AND ANY STANDING WATER, DEBRIS, AND OTHER MATERIALS HAVE BEEN REMOVED. CONTRACTOR SHALL TAKE APPROPRIATE ACTION TO PROTECT THE FILTER CARTRIDGE RECEPTACLES AND FILTER CARTRIDGES FROM DAMAGE DURING CONSTRUCTION, AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND GUIDANCE. FOR SYSTEMS WITH CARTRIDGES INSTALLED PRIOR TO FULL SITE STABILIZATION AND PRIOR TO SYSTEM ACTIVATION, THE CONTRACTOR CAN PLUG INLET AND OUTLET PIPES TO PREVENT STORMWATER AND OTHER INFLUENT FROM ENTERING THE DEVICE. PLUGS MUST BE REMOVED DURING THE ACTIVATION PROCESS.

H. THE MANUFACTURER SHALL PROVIDE AN OWNER'S MANUAL UPON REQUEST.

I. AFTER CONSTRUCTION AND INSTALLATION, AND DURING OPERATION, THE DEVICE SHALL BE INSPECTED AND CLEANED AS NECESSARY BASED ON THE MANUFACTURER'S RECOMMENDED INSPECTION AND MAINTENANCE GUIDELINES AND THE LOCAL REGULATORY AGENCY/BODY.

J. WHEN REPLACEMENT MEMBRANE FILTER ELEMENTS AND/OR OTHER PARTS ARE REQUIRED, ONLY MEMBRANE FILTER ELEMENTS AND PARTS APPROVED BY THE MANUFACTURER FOR USE WITH THE STORMWATER QUALITY FILTER DEVICE SHALL BE INSTALLED.

END OF SECTION

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JELLYFISH FILTER SPECIFICATIONS

Jellyfish®

JF4 ONLINE

Scale = 1:50

www.imbriumsystems.com

imbrium®
407 FAIRVIEW DRIVE, WHITBY, ON L1N 3A9
TF 800-565-4631 CA +1(416)800-3000 INTL +1-416-800-3000
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SHEET: 2 OF 2	

I:\IMBRIUM\PRODUCTS\JELLYFISH FILTER\4D DRAWINGS & DETAILS\STANDARD DETAILS\JELLYFISH FILTER - PEAK DIVERSION MANHOLE\JELLYFISH FILTER JF4 - PEAK DIVERSION MANHOLE.DWG 4/15/2019 9:35 AM