Site Servicing & Stormwater Management Report

The Ottawa Hospital – Riverside Campus

Parking Lots C & D

1967 Riverside Drive

Ottawa, Ontario

Table of Contents

List of Tables

List of Figures

List of Appendices

Parking Lot C Drawings

Parking Lot D Drawings

1.0 INTRODUCTION

Parsons Inc. was retained by The Ottawa Hospital (TOH) to provide engineering services for the construction of two new surface parking lots for their Riverside Campus, located at 1967 Riverside Drive, Ottawa, Ontario.

The entire Riverside Campus property encompasses a total area of approximately 8.5 ha, however the proposed parking lots will be constructed on a small portions of the property estimated at 0.2 ha (Lot C) and 0.5 ha (Lot D). The proposed site for the new parking Lot C is located on the south side of the Hospital property between the Transitway, the CN Railway and the main Hospital access road. The new parking Lot D will be located on the west side of the property between Riverside Drive, the Transitway and south of the Smyth Road access ramp.

The proposed parking lots will include new storm sewers with stormwater management for quality and volume control. The figure below shows the location of the proposed parking lots.

Figure 1 – Site Context

2.0 PURPOSE

This report summarizes the proposed grading and drainage design, documents the proposed method of attenuating stormwater runoff from the subject site, and deals with erosion and sediment control measures to be undertaken during construction.

Stormwater management items addressed include the following:

- establishing the allowable post-development release rate from the site;
- calculating the post-development runoff from the site;
- determining the required on-site stormwater storage volume and storage areas.

3.0 EXISTING CONDITIONS

3.1 Lot C

The subject site was originally composed or a mix of grassed and dense vegetated areas. However, the site was recently disturbed due to the construction of a new watermain and was restored into a temporary gravel parking lot for construction workers of the Schlegel Villages currently on-going on the site. Overall, the site generally drains toward the hospital main access road up to the existing fence along the Transitway. From that fence, the grade drops significantly towards the Transitway with slopes estimated at more than 33% (3H:1V). The site elevations where the parking lot is proposed vary between 68.32m and 71.52m. An existing 300mm dia. watermain constructed in 2023 is located within the site along with multiple valve chambers and vertical 6.0m dia. receiving shaft used during construction to allow the watermain grade drop for the Transitway crossing. Existing storm (1200mm dia.) and sanitary (450mm dia.) sewers are also crossing within the site. Both existing sewer networks are estimated at a depth of around 9.0m. Inverts for the storm sewer were taken from GeoOttawa, however these values were visually confirmed during site inspection. The existing 1200mm dia. storm sewer collects stormwater from portions of the Alta Vista neighborhood and the Transitway before discharging into the Rideau River.

According to the geotechnical investigation report for this lot, by Gemtec dated March 13th, 2025, soil condition on this part of the site consists of a layer of loose sandy fill (1-2m deep) over a compact layer of native sand. The bedrock is estimated at a depth between 10 to 15m. The groundwater table is estimated to be deeper than 5.0m as it was not encountered at the time of drilling, however the groundwater is subject to seasonal fluctuation.

3.2 Lot D

The subject site is currently vacant and is composed of a mix of grassed and dense vegetated areas. A significant earth berm is located on the east side of the lot. Overall, the majority of the site drains towards Riverside Drive (west of the berm) while the other portion drains towards the Transitway. Site slopes range between 5 and 10% and surface elevations are comprised between 60.25m and 63.90m. An existing 200mm dia. watermain is located on the east side of the site, adjacent to the Hospital building. A storm sewer is also located within the site, crossing the property on the southern portion. This existing storm sewer collects stormwater from the Transitway and crosses under Riverside Drive to discharge in the Rideau River. The diameter of the pipe crossing the site is unknown according to GeoOttawa, however a site inspection was conducted and the conduit appeared to be a 825mm dia. concrete pipe. A 375mm dia. and 450mm dia. storm sewers are also located near the site on Riverside Drive and on the Smyth Road access ramp respectively. These two sewers are interconnected at the intersection of Riverside Drive and the Smyth Road access ramp. This storm sewer continues north on Riverside Drive to eventually discharge in the Rideau River.

Many monitoring wells are present on the site to monitor the level of methane gas trapped in the soil due to the site being a former landfill. These monitoring wells were installed in 2005 and annual reports are prepared to report the data collected.

According to the geotechnical investigation report for this lot, by Gemtec dated March 13th, 2025, soil condition on this site consists of generally sand, gravel and glacial till over a shale bedrock, The bedrock is estimated at a depth between 5 to 10m. The groundwater table is estimated to be deeper than 6.0m as it was not encountered at the time of drilling, however the groundwater is subject to seasonal fluctuation.

4.0 PROPOSED DEVELOPMENT

As shown on the Site Plans for both lots, the proposed parking lots will yield a total of 44 and 126 new parking stalls for Lot C and D respectively. Both parking lots will include new pedestrian connections (sidewalks, multi-use pathway) to existing facilities (Hospital, Transitway, etc).

The site grading will match the existing conditions where feasible. Significant cut & fill will be required for both sites due to the existing topography and presence of large earth berms. Small retaining walls (≤ 1.0m in height), might be required in Lot D along Riverside Drive and the Smyth Road access ramp to facilitate the pavement grading of the lot. The existing monitoring wells on Lot D will be cut down to pavement level. The site plan is designed in a way that monitoring wells with attached equipment will remain to existing conditions. Refer to **Drawings C103** for both parking Lot C and D for more detail on the proposed site grading.

5.0 STORMWATER MANAGEMENT PLAN

Drawings C105 and **C106**, appended to this report, depict the boundaries of the pre- and post-development drainage areas and should be read in conjunction with this report. The design approach for the stormwater management is to ensure that the post-development peak flows do not exceed the allowable release rate to mitigate the risk of flooding and against erosion. The stormwater management for both sites will ensure that the peak flows directed to the existing storm network do not exceed the 5-year pre-development release rate. Flows in excess of the established allowable rate up to and including the post-development 100-year storm will be detained onsite.

The Rational Method formula has been used to calculate the allowable release rate for both sites. The rainfall data is based on the IDF curve equations from the *Ottawa Sewer Design Guidelines, Second Edition, October 2012.*

$$Q = 2.78\ CIA$$

Where,

Q = Flow rate (L/s)

C = Runoff coefficient

I = Rainfall intensity (mm/hr)

A = Area (ha)

Rainfall intensity: $I_5 = 998.071 / (Tc + 6.053)^{0.814}$

The parameters used to calculate the allowable release rate are shown in the following table.

Table 1 – Allowable Release Rate

Parking Lot	Composite Runoff Coefficient	Time of Concentration (min)	Rainfall Intensity (mm/hr)	Drainage Area (ha)	Allowable Release Rate (L/s)
Parking Lot C	0.25	10	104.19	0.21	15.4
Parking Lot D	0.21	10	104.19	0.49	30.2

The allowable 100-year post-development release rates are **15.4 L/s** and **30.2 L/s** for Lot C and Lot D respectively.

5.1 Pre-Development Conditions

5.1.1 Lot C

The current site is currently used as a temporary gravel parking lot. The majority of the site drainage is captured by the existing catch basins located along main hospital access road. It is unclear where these existing catch basins are connected, but it is assumed that the stormwater eventually flows through the existing 1200mm dia. storm sewer along the Transitway, that discharges in the Rideau River.

5.1.2 Lot D

Existing drainage for this site in separated in two sections by a large earth berm. Majority of the site is located west of the berm and drains towards Riverside Drive, where water is captured by the roadside catch basins. These catch basins are connected to a main sewer along Riverside Drive that discharges to the Rideau River north of the Smyth Road Bridge. The other part of the site, east of the berm, drains towards the Transitway catch basins that are connected to a 450mm dia. storm sewer. This sewer crosses the subject site further downstream to reach the Rideau River. The information for the pipe crossing the site is unknown according to GeoOttawa, however the conduit appeared to be a 825mm dia. concrete pipe during the site investigation.

5.2 Post-Development Conditions

5.2.1 Lot C

New catch basins will be installed for this lot to retain water on-site. However, some existing areas will be disturbed by this project and will drain uncontrolled to the existing access road catch basins or down towards the Transitway.

The following is a description of each controlled drainage areas through the site, refer to **Appendix A** and Lot C **Drawing C106** attached to this report for more details.

- Area WS-01 is the western part of the proposed lot and will be captured by CB-1;
- Area WS-02 is the eastern portion of the lot including the new multi-use pathway. Drainage from this area will mostly be captured by CB-2, however some runoff will also be collected from CBMH-4.

For the purpose of calculating the average runoff coefficients for the post-development areas, the following guidelines were used:

- Landscaped surfaces (grass, trees, shrubs, etc.) C = 0.20
- Impervious surfaces (asphalt, concrete, pavers, rooftops, etc.) C = 0.90
- The runoff coefficient for 100-year event is increased by 25% based on the Ottawa Sewer Design Guidelines.

Appendix A "Stormwater Management Calculations – Lot C" provides a summary of the post-development areas and average runoff coefficients.

An inlet-control-device (ICD) is required to control the flows from the site to the allowable release rate of **15.4 L/s** for a 100-year storm event. However, due to some areas being uncontrolled, the adjusted allowable release rate is only **6.6 L/s** for the 100-year storm event. Also, to calculate the required amount of storage and to design the proper ICD, 50% of this value was taken to simulate average discharge instead of peak flow. The adjusted allowable discharge for the 100-year storm for this lot is only **3.3 L/s**.

Storage requirements to attenuate the 100-year post-development flow rate are given below:

5.2.1.1 100-year Site Storage Requirements

The 100-year post-development flow will be captured by the proposed catch basins and will be directed to the subsurface storage system. This system will consist of underground storm chambers. To control the total discharge within the piped system to the identified adjusted flow rate of **3.3 L/s**, an ICD will be placed on the outlet pipe of the proposed MHST-5. The 100-year storage requirement to meet the established allowable flow rate is calculated at **84.7 m³**.

The design head for the orifice ICD sizing was calculated as the delta in height between the centre of the orifice and the hydraulic grade line (HGL) for the 100-year event within the underground storage chambers which is equivalent to the top of the perimeter stone of the system.

The orifice outlet flow has been calculated based on the MTO Drainage Management Manuel, Part 3, Chapter 8, p.127:

- $Q_{orifice}\ (m^3/s) = C_d A(2gH)^{0.5}$

  where:
  C_d = coefficient of discharge (0.62)
  A = Area of orifice opening in m^2
  g = acceleration due to gravity (9.81 m/s^2)
  H = difference in height between 100-year HGL and centre of the orifice in metres.

Based on the proposed underground storm chamber model and the depth of the system, the 100-year HGL is estimated at an elevation of **68.26 m**, which is equivalent to a head of **2.04 m** upstream of the orifice. Considering the HGL level and the allowable flow rate, the equivalent required orifice diameter is 33 mm. Due to clogging risk and maintenance difficulty, it is generally not recommended to use orifice ICDs that are under 75 mm in diameter. For this reason, the proposed ICD for this lot consists of a vortex type ICD, **Hydrovex® 50VHV-1 by John Meunier** or approved equivalent.

Detailed stormwater management calculations are shown in **Appendix A** and the vortex ICD flow chart is provided in **Appendix C**.

5.2.2 Lot D

New catch basins will be installed to retain water on-site. Most of the landscaping buffer around the site will drain uncontrolled to either Riverside Drive or the Transitway, as it does today, due to the required grade raise along the property line.

The following is a description of each controlled drainage areas through the site, refer to **Appendix A** and Lot D **Drawing C106** attached to this report for more details.

- Area WS-01 is the northern part of the proposed lot and runoff will be captured by CB-10;
- Area WS-02 is the north-west portion of the lot including part of the middle-grassed island. Drainage from this area will be captured by CBMH-11;
- Area WS-03 is the north-east part of the proposed lot and runoff will be captured by CB-12;
- Area WS-04 is the south-west portion of the lot and drainage will be capture by CBMH-13;
- Area WS-05 is the south-east part of the lot and runoff will be captured by CBMH-14;
- Area WS-06 is the entrance of the lot and drainage will be assured by CB-15 and also CBMH-16.

For the purpose of calculating the average runoff coefficients for the post-development areas, the following guidelines were used:

- Landscaped surfaces (grass, trees, shrubs, etc.) C = 0.20
- Impervious surfaces (asphalt, concrete, pavers, rooftops, etc.) C = 0.90
- The runoff coefficient for 100-year event is increased by 25% based on the Ottawa Sewer Design Guidelines.

Appendix A "Stormwater Management Calculations – Lot D" provides a summary of the post-development areas and average runoff coefficients.

An inlet-control-device (ICD) is required to control the flows from the site to the allowable release rate of **30.2 L/s** for a 100-year storm event. However, due to the uncontrolled runoff, the adjusted allowable release rate is only **14.7 L/s** for the 100-year storm event. Also, to calculate the required amount of storage and to design the proper ICD, 50% of this value was taken to simulate average discharge instead of peak flow. The adjusted allowable discharge for the 100-year storm for this lot is only **7.4 L/s**.

Storage requirements to attenuate the 100-year post-development flow rate are given below:

5.2.2.1 100-year Site Storage Requirements

The 100-year post-development flow will be captured by the proposed catch basins and will be directed to the subsurface storm system. Most of the site will drain through the underground storm chamber system before reaching the outlet point. To control the total discharge within the piped system to the identified adjusted flow rate of **7.4 L/s**, an ICD will be placed on the outlet pipe of the proposed CBMH-16. This ICD will force stormwater to backup within the proposed underground storage system. The 100-year storage requirement to meet the established allowable flow rate is calculated at **198.6 m³**.

The design head for the orifice ICD sizing was calculated as the delta in height between the centre of the orifice and the hydraulic grade line (HGL) for the 100-year event within the underground storage chambers which is equivalent to the top of the perimeter stone of the system.

The orifice outlet flow has been calculated based on the MTO Drainage Management Manuel, Part 3, Chapter 8, p.127:

- $Q_{orifice}\ (m^3/s) = C_d A(2gH)^{0.5}$

  where:
  C_d = coefficient of discharge (0.62)
  A = Area of orifice opening in m^2
  g = acceleration due to gravity (9.81 m/s^2)
  H = difference in height between 100-year HGL and centre of the orifice in metres.

Based on the proposed underground storm chamber model and the depth of the system, the 100-year HGL is estimated at an elevation of **61.28 m**, which is equivalent to a head of **1.85 m** upstream of the orifice. Considering the HGL level and the allowable flow rate, the equivalent required orifice diameter is 50 mm. Due to clogging risk and maintenance difficulty, it is generally not recommended to use orifice ICDs that are under 75 mm in diameter. For this reason, the proposed ICD for this lot consists of a vortex type ICD, **Hydrovex® 75VHV-1 by John Meunier** or approved equivalent.

Detailed stormwater management calculations are shown in **Appendix A** and the vortex ICD flow chart is provided in **Appendix C.**

6.0 STORM SEWERS AND STORMWATER MANAGEMENT SYSTEM

6.1 Storm Sewers

Calculations showing the storm sewer capacities are appended to this report under **Appendix B** "Storm Sewer Computation Forms". The storm sewer design spreadsheet is based on the Rational Method and Manning formula and was used to calculate the design flow and required pipe sizes. Capacity required for proposed storm sewers is based on the 5-year rainfall intensity obtained from the Ottawa Sewer Design Guidelines, where T_c is the time of concentration:

- $I_5\ (mm/hr) = 998.071/(T_c+6.053)^{0.814}$

Drawings C106 shows the proposed drainage areas. Details including pipe lengths, sizes, materials, inverts elevations and structure types are shown on **Drawings C102**.

6.2 Emergency Major Overland Flow Route

6.2.1 Lot C

As mentioned above, the maximum HGL elevation during the 100-year storm event is estimated at **68.26 m**. Considering that the lowest point in the parking lot is CB-1 with a grate elevation of **68.40 m**, no surface ponding is anticipated for the major storm event. However, in case of blockage, the maximum spill point elevation is **68.70 m**, which limits the ponding height over the catch basin at 0.30m, at that elevation, water would spill either on the main hospital access road or would flow along the slope towards the Transitway. The emergency overland flow routes are shown on **Drawing C106** for each drainage area.

6.2.2 Lot D

The estimated 100-year HGL elevation is **61.28 m** for this lot. Considering that the lowest point in the parking lot is CB-15 with a grate elevation of **61.77m**, no surface ponding is anticipated for the major storm event. However, in case of blockage, the proposed grading limits the ponding height over every proposed catch basin to a maximum of 0.30m. The emergency overland flow route for this site consists of either Riverside Drive or the Transitway. The emergency overland flow routes are shown on **Drawing C106** for each drainage area.

6.3 Stormwater Management System

6.3.1 Lot C

The stormwater management system for this lot includes a vortex ICD on the outlet pipe of MHST-5 that will control the site discharge to a maximum of **3.3 L/s** assuming a free flow outlet condition.

The **Table 2** lists all the requirements for the manufacturer to provide the appropriate ICD.

Table 2 - ICD Schedule (Lot C)

ICD ID	Location	Outlet Diameter (mm)	Outlet Flow 5y/100y (L/s)	Head 5y/100y (m)	Equivalent Diameter (mm)	Model	100y Storage Required (m^3)
1	MHST-5	250	1.9/3.3	0.68/2.04	33	Vortex*	84.7

**The proposed vortex ICD is the Hydrovex® 50VHV-1 by John Meunier or approved equivalent*

For the purpose of the ICD design, only below grade storage provided by the underground storm chambers was considered, however minimal additional storage is also provided by the structures and pipes upstream of the control device. A total of **103.9 m^3** of storage volume is provided within the underground storage chambers for the 100-year storm event which is more than the required amount. The proposed system consists of the StormTech MC-7200 or equivalent, see **Appendix E** for specifications. Considering that the average surface elevation for Lot C is around 70.0m and that the estimated groundwater table is assumed to be deeper than 5.0m per the geotechnical investigation, the bottom of the proposed system (66.20m) is set above the estimated groundwater table elevation (≤65.0m) by more than 1.0m, which meets the *Ontario Ministry of Environment (MOE) Stormwater Management Planning and Design Manual, 2003* requirements. A perforated subdrain will be placed on the perimeter of the storm chambers, to collect infiltration from the chambers and redirect it to the storm outlet.

The required level of stormwater quality control for this site is established at 80% Total Suspended Solids (TSS) removal. The required treatment will be provided by an oil and grit separator (OGS) placed near the outlet to the existing City sewer. The proposed treatment unit consists of the Stormceptor EF04 from Imbrium Systems or approved equivalent. A copy of the Stormceptor Sizing Detailed Report is provided in **Appendix D.**

Additional stormwater treatment and infiltration will be provided by the underground storm chamber system. The system is designed that all water captured by the catch basins is directly connected in the first row of the chamber system (Isolator Row Plus) and for stormwater to reach the outlet structure, it needs to either flow through the underneath granular stone or to generate a surcharge and to flow in the elevated manifold connected at CBMH-4. This technology is ETV certified and claims an 80% TSS removal by filtration through the filter fabric placed at the bottom of the Isolator Row Plus and the granular stone. The proposed system consists of three MC-7200 chambers Isolator Row Plus that provide a total treatment rate of **38.22 L/s**. The peak flow during the quality storm event (25mm 4-hr Chicago Storm) can be estimated using the rational method with the following rainfall intensity:

$$I_{(25mm)} = 405/ (t + 3)^{0.76}$$

Considering a total area of 0.18 ha, a time of concentration of 10min and a runoff coefficient of 0.74 for the parking Lot C controlled areas, the estimated peak flow during the quality storm event is **21.35 L/s**. The provided treatment train between the oil and grit separator and the Isolator Row Plus is deemed to be acceptable to meet the required 80% TSS removal. Please refer to **Appendix F** for Isolator Row Plus certification and specifications.

6.3.2 Lot D

The stormwater management system for this lot includes a vortex ICD on the outlet pipe of CBMH-16 that will control the site discharge to a maximum of **7.4 L/s** assuming a free flow outlet condition.

The **Table 3** lists all the requirements for the manufacturer to provide the appropriate ICD.

Table 3 - ICD Schedule (Lot D)

ICD ID	Location	Outlet Diameter (mm)	Outlet Flow 5y/100y (L/s)	Head 5y/100y (m)	Equivalent Diameter (mm)	Model	100y Storage Required (m^3)
1	CBMH-16	375	4.8/7.4	0.80/1.85	50	Vortex*	198.6

**The proposed vortex ICD is the Hydrovex® 75VHV-1 by John Meunier or approved equivalent*

For the purpose of the ICD design, only below grade storage provided by the underground storm chambers was considered, however minimal additional storage is also provided by the structures and pipes upstream of the control device. A total of **205.9 m^3** of storage volume is provided within the underground storage chambers for the 100-year storm event which is more than the required amount. The proposed system consists of the StormTech MC-3500 or equivalent, see **Appendix E** for specifications. Considering that the average surface elevation around the proposed chambers is 62.30m and that the estimated groundwater table is assumed to be deeper than 6.0m per the geotechnical investigation, the bottom of the proposed system (59.80m) is set above the estimated groundwater table elevation (≤56.30m) by more than 1.0m, which meets the *Ontario Ministry of Environment (MOE) Stormwater Management Planning and Design Manual, 2003* requirements. A perforated subdrain will be placed on the perimeter of the storm chambers, to collect infiltration from the chambers and redirect it to the storm outlet.

The required level of stormwater quality control for this site is established at 80% Total Suspended Solids (TSS) removal. The required treatment will be provided by an oil and grit separator (OGS) placed near the outlet to the existing City sewer. The proposed treatment unit consists of the Stormceptor EF04 from Imbrium Systems or approved equivalent. A copy of the Stormceptor Sizing Detailed Report is provided in **Appendix D.**

Similar to Lot C, additional stormwater treatment and infiltration will be provided by the underground storm chamber system Isolator Row Plus. The grading of this lot is intended to channel the majority of the site drainage into the underground storage system before it reaches the outlet point. Drainage from the site entrance could not be directed towards the underground chambers due to site geometry constraints. Overall, 82% of the total controlled areas and 85% of the total impervious areas will be captured through the underground filtration system (WS-01 to WS-05). For the stormwater to reach the outlet structure of the system, it needs to either flow through the underneath granular stone or to generate a surcharge and to flow in the elevated manifold connected at CBMH-13. This technology is ETV certified and claims an 80% TSS removal by filtration through the filter fabric placed at the bottom of the Isolator Row Plus and the granular stone.

The proposed system consists of seven MC-3500 chambers Isolator Row Plus that provide a total treatment rate of **79.24 L/s**. The peak flow during the quality storm event (25mm 4-hr Chicago Storm) can be estimated using the rational method with the following rainfall intensity:

$$I_{(25mm)} = 405/ (t + 3)^{0.76}$$

Considering a total area of 0.33 ha, a time of concentration of 10min and a runoff coefficient of 0.80 for the parking Lot D controlled areas reaching the underground system, the estimated peak flow during the quality storm event is **41.43 L/s**. The provided treatment train between the oil and grit separator and the Isolator Row Plus is deemed to be acceptable to meet the required 80% TSS removal. Please refer to **Appendix F** for Isolator Row Plus certification and specifications.

7.0 EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION

To mitigate the impacts due to erosion and sedimentation during construction, erosion and sediment control measures shall be installed and maintained throughout the duration of construction.

Measures shall only be removed once the construction activities are complete, and the site has stabilized.

The measures will include but are not limited to:

- Siltsack® shall be installed between the frame and cover of existing and new catchbasins and maintenance holes, to minimize sediments entering the storm drainage system.
- All grassed areas must be completed prior to the removal of the Siltsack® in catch basins and maintenance holes.
- Light Duty Silt Fence Barriers placed around the perimeter of the site where necessary, installed and maintained according to OPSS 577 and OPSD 219.110.
- Construction mud mat at site entrance along Riverside Drive (Lot D) and the hospital access road (Lot C) to minimize the amount of mud carried out of the site.

Refer to **Drawings C101** notes for more details.

8.0 CONCLUSION

The proposed development of parking Lot C and D at The Ottawa Hospital's Riverside Campus aims to provide a total of 170 new parking stalls, with 44 in Lot C and 126 in Lot D. The development includes new pedestrian connections to existing facilities and requires significant site grading due to the existing topography and large earth berms.

The stormwater management plan ensures that post-development peak flows do not exceed the allowable release rates to mitigate flooding and erosion risks. The 100-year post-development allowable discharge rate for both sites is based on the pre-development 5-year flow adjusted with uncontrolled flow and reduced by 50% to simulate for average discharge instead of peak flow. For Lot C, the adjusted allowable release rate is set at **3.3 L/s**, while for Lot D, it is **7.4 L/s**. The minimum required on-site storage to meet these allowable rates is estimated at **84.7 m³** and **198.6 m³** for Lot C and D respectively. The on-site storage will be provided by underground storm chambers. Inlet control-devices (ICD) are required in the downstream structure of each parking lot to control the discharge rates. Considering the lower allowable discharge, vortex ICDs are required to avoid maintenance issues with orifices. Both lots will utilize Hydrovex® ICDs by John Meunier. The proposed models are the 50VHV-1 and 75VHV-1 for Lot C and D respectively.

The required 80% Total Suspended Solids (TSS) removal will be achieved using a treatment train approach that consists of an oil and grit separator and the storm chamber system Isolator Row Plus for both lots. The storm chambers will also provide infiltration.

We look forward to receiving approval of this report and the appended plans from the City of Ottawa in order to proceed with the construction of the site.

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Appendix A:
Stormwater Management Calculations

PARKING LOT C

TABLE I - ALLOWABLE RUNOFF CALCULATIONS BASED ON EXISTING CONDITIONS

Area Description	Area (ha)	Time of Conc, Tc (min)	Minor Storm			
				I_5 (mm/hr)	C_{AVG}	Q_{ALLOW} (L/s)
EWS-01	0.19	10	Storm = 5 yr	104.19	0.26	**14.7**
EWS-02	0.01	10	Storm = 5 yr	104.19	0.20	**0.7**
TOTAL	0.21					**15.4**

5-year Storm $C_{ASPH/ROOF/CONC}$ = 0.90 C_{GRASS} = 0.20
100-year Storm $C_{ASPH/ROOF/CONC}$ = 1.00 C_{GRASS} = 0.25

TABLE II - POST-DEVELOPMENT AVERAGE RUNOFF COEFFICIENTS

Watershed Area No.	Impervious Areas (m^2)	A * C_{ASPH}	Pervious Areas (m^2)	A * C_{GRASS}	Sum AC	Total Area (m^2)	$C_{AVG\ (5yr)}$	$C_{AVG(100yr)}$	% Impervious
WS-01	658.00	592	170.00	34	626	828	0.76	0.95	79%
WS-02	715.00	644	237.00	47	691	952	0.73	0.91	75%
WS-Unc**	122.00	110	166.00	33	143	288	0.50	0.62	42%
Total	1495		573		1460	2068			

**Uncontrolled Areas

TABLE III - TOTAL RUNOFF COEFFICIENT FOR CONTROLLED AREAS

$C_{AVG(5yr)}$ = Sum AC / Total Area = **1 317 / 1 780** = **0.74** $C_{AVG(100yr)}$ = **0.92**

TABLE IV - SUMMARY OF POST-DEVELOPMENT RUNOFF

Area No	Area (ha)	Storm = 5 yr				Storm = 100 yr			
		I_5 (mm/hr)	$C_{AVG(5yr)}$	Q_{GEN} (L/s)	Q_{CONT} (L/s)	I_{100} (mm/hr)	$C_{AVG(100yr)}$	Q_{GEN} (L/s)	Q_{CONT} (L/s)
WS-01	0.083	104.19	0.76	18.1	**1.9**	178.56	0.95	38.9	**6.6**
WS-02	0.095	104.19	0.73	20.0		178.56	0.91	42.9	
WS-Unc**	0.029	104.19	0.50	4.1	**4.1**	178.56	0.62	8.9	**8.9**
Total	0.207			42.3	**6.0**			90.598	**15.4**

$I_5 = 998.071 / (Tc+6.053)^{0.814}$

$I_{100} = 1735.688 / (Tc+6.014)^{0.820}$

Time of concentration (min), Tc = 10 mins

Table V - Storage Volumes (5-Year and 100-Year Storm Events)

Parking Lot C Site Storage Requirement

C_{AVG} = 0.74 (5-year)
C_{AVG} = 0.92 (100-year)
Time Interval = 5 (mins)
Drainage Area = 0.178 (hectares)

**Release rate reduced by 50% to estimate average release rate

	Release Rate = 1.9 (L/sec)						Release Rate = 3.3 (L/sec)**					
	Return Period = 5 (years)						Return Period = 100 (years)					
	IDF Parameters, A = 998.071 , B = 0.814						IDF Parameters, A = 1735.688 , B = 0.820					
	$I = A/(T_c+6.053)^B$						$I = A/(T_c+6.014)^B$					
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Peak Flow from Roof (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Peak Flow from Roof (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	-	-	-	-	-	-	-	-	-	-	-	-
5	141.2	51.7	-	1.9	49.8	14.9	242.7	111.1	-	3.3	107.8	32.3
10	104.2	38.2	-	1.9	36.3	21.8	178.6	81.7	-	3.3	78.4	47.1
15	83.6	30.6	-	1.9	28.7	25.8	142.9	65.4	-	3.3	62.1	55.9
20	70.3	25.7	-	1.9	23.8	28.6	120.0	54.9	-	3.3	51.6	61.9
25	60.9	22.3	-	1.9	20.4	30.6	103.8	47.5	-	3.3	44.2	66.4
30	53.9	19.7	-	1.9	17.8	32.1	91.9	42.0	-	3.3	38.8	69.8
35	48.5	17.8	-	1.9	15.9	33.3	82.6	37.8	-	3.3	34.5	72.5
40	44.2	16.2	-	1.9	14.3	34.3	75.1	34.4	-	3.3	31.1	74.7
45	40.6	14.9	-	1.9	13.0	35.0	69.1	31.6	-	3.3	28.3	76.5
50	37.7	13.8	-	1.9	11.9	35.7	64.0	29.3	-	3.3	26.0	78.0
55	35.1	12.9	-	1.9	11.0	36.2	59.6	27.3	-	3.3	24.0	79.2
60	32.9	12.1	-	1.9	10.2	36.6	55.9	25.6	-	3.3	22.3	80.3
65	31.0	11.4	-	1.9	9.5	36.9	52.6	24.1	-	3.3	20.8	81.2
70	29.4	10.8	-	1.9	8.9	37.2	49.8	22.8	-	3.3	19.5	81.9
75	27.9	10.2	-	1.9	8.3	37.4	47.3	21.6	-	3.3	18.3	82.5
80	26.6	9.7	-	1.9	7.8	37.6	45.0	20.6	-	3.3	17.3	83.1
85	25.4	9.3	-	1.9	7.4	37.7	43.0	19.7	-	3.3	16.4	83.5
90	24.3	8.9	-	1.9	7.0	37.8	41.1	18.8	-	3.3	15.5	83.9
95	23.3	8.5	-	1.9	6.6	37.8	39.4	18.0	-	3.3	14.8	84.2
100	22.4	8.2	-	1.9	6.3	37.8	37.9	17.3	-	3.3	14.1	84.4
105	21.6	7.9	-	1.9	6.0	37.8	36.5	16.7	-	3.3	13.4	84.5
110	20.8	7.6	-	1.9	5.7	37.8	35.2	16.1	-	3.3	12.8	84.7
115	20.1	7.4	-	1.9	5.5	37.7	34.0	15.6	-	3.3	12.3	84.7
120	19.5	7.1	-	1.9	5.2	37.6	32.9	15.1	-	3.3	11.8	84.7
125	18.9	6.9	-	1.9	5.0	37.5	31.9	14.6	-	3.3	11.3	84.7
Max =						**37.8**						**84.7**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A

2) Rainfall Intensity, $I_5 = A/(Tc+6.053)^B$ & $I_{100} = A/(Tc+6.014)^B$

3) Release Rate = LESSER of Min (Release Rate, Peak Flow) - Minus 100 Year Flow Of Uncontroled Areas OR Pipe Outlet Capacity

4) Storage Rate = Peak Flow - Release Rate

5) Storage = Duration x Storage Rate

6) Maximium Storage = Max Storage Over Duration

ICD Design Table - VI

Parking Lot C

$Q = 0.62 \times A \times [2gh]^{0.5}$ where: g= 9.81

Location	Pipe Outlet Diameter (mm)	Pipe Outlet Invert (m)	HGL (m)		Outlet flow (L/s)		Trial orifice size (mm)	Orifice size (mm)	Orifice Area (sqm)	Head (m)	
			100-year event	5-year event	100-year event	5-year event				100-year event	5-year event
MHST-5	250	66.20	68.26	66.90	3.3	1.9	**33**	32.64	0.00084	2.04	0.68

PARKING LOT D

TABLE I - ALLOWABLE RUNOFF CALCULATIONS BASED ON EXISTING CONDITIONS

Area Description	Area (ha)	Time of Conc, Tc (min)	Minor Storm			
				I_5 (mm/hr)	C_{AVG}	Q_{ALLOW} (L/s)
EWS-01	0.36	10	Storm = 5 yr	104.19	0.21	**21.8**
EWS-02	0.13	10	Storm = 5 yr	104.19	0.22	**8.4**
TOTAL	0.49				0.21	**30.2**

5-year Storm $C_{ASPH/ROOF/CONC}$ = 0.90 C_{GRASS} = 0.20
100-year Storm $C_{ASPH/ROOF/CONC}$ = 1.00 C_{GRASS} = 0.25

TABLE II - POST-DEVELOPMENT AVERAGE RUNOFF COEFFICIENTS

Watershed Area No.	Impervious Areas (m^2)	A * C_{ASPH}	Pervious Areas (m^2)	A * C_{GRASS}	Sum AC	Total Area (m^2)	$C_{AVG\ (5yr)}$	$C_{AVG(100yr)}$	% Impervious
WS-01	530.00	477	42.00	8	485	572	0.85	1.00	93%
WS-02	626.00	563	300.00	60	623	926	0.67	0.84	68%
WS-03	492.00	443	0.00	0	443	492	0.90	1.00	100%
WS-04	653.00	588	115.00	23	611	768	0.80	0.99	85%
WS-05	463.00	417	30.00	6	423	493	0.86	1.00	94%
WS-06	471.00	424	243.00	49	473	714	0.66	0.83	66%
WS-Unc**	80.00	72	887.00	177	249	967	0.26	0.32	8%
Total	3315		1617		3307	4932			

**Uncontrolled Areas

TABLE III - TOTAL RUNOFF COEFFICIENT FOR CONTROLLED AREAS

$C_{AVG(5yr)}$ = Sum AC / Total Area = **3 058 / 3 965** = **0.77** $C_{AVG(100yr)}$ = **0.96**

TABLE IV - SUMMARY OF POST-DEVELOPMENT RUNOFF

Area No	Area (ha)	Storm = 5 yr				Storm = 100 yr			
		I_5 (mm/hr)	$C_{AVG(5yr)}$	Q_{GEN} (L/s)	Q_{CONT} (L/s)	I_{100} (mm/hr)	$C_{AVG(100yr)}$	Q_{GEN} (L/s)	Q_{CONT} (L/s)
WS-01	0.057	104.19	0.85	14.1		178.56	1.00	28.4	
WS-02	0.093	104.19	0.67	18.1		178.56	0.84	38.7	
WS-03	0.049	104.19	0.90	12.8	**4.8**	178.56	1.00	24.4	**14.7**
WS-04	0.077	104.19	0.80	17.7		178.56	0.99	37.9	
WS-05	0.049	104.19	0.86	12.2		178.56	1.00	24.5	
WS-06	0.071	104.19	0.66	13.7		178.56	0.83	29.3	
WS-Unc**	0.097	104.19	0.26	7.2	**7.2**	178.56	0.32	15.5	**15.5**
Total	0.493			95.8	**12.1**			198.657	**30.2**

$I_5 = 998.071 / (Tc+6.053)^{0.814}$

$I_{100} = 1735.688 / (Tc+6.014)^{0.820}$

Time of concentration (min), Tc = 10 mins

Table V - Storage Volumes (5-Year and 100-Year Storm Events)

Parking Lot D Site Storage Requirement

C_{AVG} = 0.77 (5-year)
C_{AVG} = 0.96 (100-year)
Time Interval = 5 (mins)
Drainage Area = 0.397 (hectares)

**Release rate reduced by 50% to estimate average release rate

	Release Rate = 4.8 (L/sec)						Release Rate = 7.4 (L/sec)**					
	Return Period = 5 (years)						Return Period = 100 (years)					
	IDF Parameters, A = 998.071, B = 0.814						IDF Parameters, A = 1735.688, B = 0.820					
	$I = A/(T_c+6.053)^B$						$I = A/(T_c+6.014)^B$					
Duration (min)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Peak Flow from Roof (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Peak Flow from Roof (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
0	-	-	-	-	-	-	-	-	-	-	-	-
5	141.2	120.0	-	4.8	115.2	34.5	242.7	257.9	-	7.4	250.5	75.1
10	104.2	88.6	-	4.8	83.7	50.2	178.6	189.7	-	7.4	182.3	109.4
15	83.6	71.0	-	4.8	66.2	59.6	142.9	151.8	-	7.4	144.5	130.0
20	70.3	59.7	-	4.8	54.9	65.8	120.0	127.4	-	7.4	120.1	144.1
25	60.9	51.8	-	4.8	46.9	70.4	103.8	110.3	-	7.4	103.0	154.4
30	53.9	45.8	-	4.8	41.0	73.8	91.9	97.6	-	7.4	90.2	162.4
35	48.5	41.2	-	4.8	36.4	76.4	82.6	87.7	-	7.4	80.4	168.8
40	44.2	37.6	-	4.8	32.7	78.5	75.1	79.8	-	7.4	72.5	173.9
45	40.6	34.5	-	4.8	29.7	80.2	69.1	73.4	-	7.4	66.0	178.2
50	37.7	32.0	-	4.8	27.2	81.5	64.0	68.0	-	7.4	60.6	181.7
55	35.1	29.9	-	4.8	25.0	82.6	59.6	63.3	-	7.4	56.0	184.7
60	32.9	28.0	-	4.8	23.2	83.4	55.9	59.4	-	7.4	52.0	187.3
65	31.0	26.4	-	4.8	21.5	84.0	52.6	55.9	-	7.4	48.6	189.4
70	29.4	25.0	-	4.8	20.1	84.5	49.8	52.9	-	7.4	45.5	191.2
75	27.9	23.7	-	4.8	18.9	84.9	47.3	50.2	-	7.4	42.8	192.8
80	26.6	22.6	-	4.8	17.7	85.2	45.0	47.8	-	7.4	40.4	194.1
85	25.4	21.6	-	4.8	16.7	85.3	43.0	45.6	-	7.4	38.3	195.2
90	24.3	20.6	-	4.8	15.8	85.4	41.1	43.7	-	7.4	36.3	196.1
95	23.3	19.8	-	4.8	15.0	85.3	39.4	41.9	-	7.4	34.5	196.8
100	22.4	19.0	-	4.8	14.2	85.2	37.9	40.3	-	7.4	32.9	197.4
105	21.6	18.3	-	4.8	13.5	85.1	36.5	38.8	-	7.4	31.4	197.9
110	20.8	17.7	-	4.8	12.9	84.9	35.2	37.4	-	7.4	30.0	198.2
115	20.1	17.1	-	4.8	12.3	84.6	34.0	36.1	-	7.4	28.8	198.4
120	19.5	16.5	-	4.8	11.7	84.3	32.9	35.0	-	7.4	27.6	198.6
125	18.9	16.0	-	4.8	11.2	84.0	31.9	33.9	-	7.4	26.5	198.6
130	18.3	15.6	-	4.8	10.7	83.6	30.9	32.8	-	7.4	25.5	198.6
Max =						**85.4**						**198.6**

Notes

1) Peak flow is equal to the product of 2.78 x C x I x A

2) Rainfall Intensity, $I_5 = A/(Tc+6.053)^B$ & $I_{100} = A/(Tc+6.014)^B$

3) Release Rate = LESSER of Min (Release Rate, Peak Flow) - Minus 100 Year Flow Of Uncontroled Areas OR Pipe Outlet Capacity

4) Storage Rate = Peak Flow - Release Rate

5) Storage = Duration x Storage Rate

6) Maximium Storage = Max Storage Over Duration

ICD Design Table - VI

Parking Lot D

$Q = 0.62 \times A \times [2gh]^{0.5}$ where: g= 9.81

Location	Pipe Outlet Diameter (mm)	Pipe Outlet Invert (m)	HGL (m)		Outlet flow (L/s)		Trial orifice size (mm)	Orifice size (mm)	Orifice Area (sqm)	Head (m)	
			100-year event	5-year event	100-year event	5-year event				100-year event	5-year event
CBMH-16	375	59.41	61.28	60.23	7.4	4.8	**50**	50.15	0.00198	1.85	0.80

Appendix B:
Storm Sewer Computation Forms

STORM SEWER COMPUTATION FORM

Rational Method

Q = 2.78*A*I*R

Q = Flow (L/sec)
A = Area (ha)
I = Rainfall Intensity (mm/h)
R = Ave. Runoff Coefficient

City of Ottawa IDF Curve - 5-y

I_5 = 998.071/(Tc+6.053) ^ 0.814

Minimum Time of Conc. Tc = **10 min**

Manning's n = **0.013**

Drainage Area	From	To	Area	Runoff Parameters					Roof Flow Q	Peak Flow Q	Pipe Dia.		Slope	Length	Capacity	Velocity		Time of Flow	Q(d) / Q(f)	REMARKS
				Runoff Coeff. R	Indiv. 2.78AR	Accum. 2.78AR	Time of Conc.	Rainfall Intensity			nom.	actual			full	full	actual			
			(ha)				(min)	(mm/hr)	(L/sec)	(L/sec)	(mm)	(mm)	(%)	(m)	(L/sec)	(m/sec)	(m/sec)	(min)		
WS-01	CB-1	MHST-3	0.083	0.76	0.17	0.17	10.00	104.19		18.14	200	203	1.41	13.5	40.63	1.25	1.03	0.18	0.45	
WS-02	CB-2	MHST-3	0.095	0.73	0.19	0.19	10.00	104.19		20.01	200	203	1.20	17.5	37.48	1.16	0.99	0.25	0.53	
	MHST-3	CBMH-4				0.37	10.25	102.89		37.67	250	254	1.00	26.2	62.04	1.22	1.10	0.36	0.61	
	CBMH-4	MHST-5				0.37	10.61	101.08		37.01	600	610	0.10	1.0	202.56	0.69	0.43	0.02	0.18	**STM Chambers System
	MHST-5	OGS				0.37	10.63	100.98		36.97	250	254	1.25	2.4	69.36	1.37	1.18	0.03	0.53	
	OGS	EX. MHST				0.37	10.66	100.83		36.92	250	254	1.26	2.4	69.64	1.37	1.18	0.03	0.53	

Note:

Design: B. Villeneuve
Check: M. Theiner

Date: 2025-03-05

Project: TOH Riverside Campus - Parking Lot C

Client: The Ottawa Hospital

STORM SEWER COMPUTATION FORM

Rational Method

Q = 2.78*A*I*R

Q = Flow (L/sec)
A = Area (ha)
I = Rainfall Intensity (mm/h)
R = Ave. Runoff Coefficient

City of Ottawa IDF Curve - 100-y

I_{100} = 1735.688/(Tc+6.014) ^ 0.820

Minimum Time of Conc. Tc = **10 min**

Manning's n = **0.013**

Drainage Area	From	To	Area (ha)	Runoff Parameters: Runoff Coeff. R	Indiv. 2.78AR	Accum. 2.78AR	Time of Conc. (min)	Rainfall Intensity (mm/hr)	Roof Flow Q (L/sec)	Peak Flow Q (L/sec)	Pipe Dia. nom. (mm)	Pipe Dia. actual (mm)	Slope (%)	Length (m)	Capacity full (L/sec)	Velocity full (m/sec)	Velocity actual (m/sec)	Time of Flow (min)	Q(d) / Q(f)	REMARKS
WS-01	CB-1	MHST-3	0.083	0.95	0.22	0.22	10.00	178.56		38.86	200	203	1.41	13.5	40.63	1.25	1.29	0.18	0.96	
WS-02	CB-2	MHST-3	0.095	0.91	0.24	0.24	10.00	178.56		42.87	200	203	1.20	17.5	37.48	1.16	1.20	0.25	1.14	
	MHST-3	CBMH-4				0.46	10.25	176.31		80.69	250	254	1.00	26.2	62.04	1.22	1.27	0.36	1.30	
	CBMH-4	MHST-5				0.46	10.61	173.17		79.26	600	610	0.10	1.0	202.56	0.69	0.54	0.02	0.39	**STM Chambers System
	MHST-5	OGS				0.46	10.63	173.00		79.18	250	254	1.25	2.4	69.36	1.37	1.42	0.03	1.14	
	OGS	EX. MHST				0.46	10.66	172.74		79.06	250	254	1.26	2.4	69.64	1.37	1.43	0.03	1.14	

Note:

Design: B. Villeneuve
Check: M. Theiner

Date: 2025-03-05

Project: TOH Riverside Campus - Parking Lot C

Client: The Ottawa Hospital

STORM SEWER COMPUTATION FORM

Rational Method

Q = 2.78*A*I*R

Q = Flow (L/sec)
A = Area (ha)
I = Rainfall Intensity (mm/h)
R = Ave. Runoff Coefficient

City of Ottawa IDF Curve - 5-y

I_5 = 998.071/(Tc+6.053) ^ 0.814

Minimum Time of Conc. Tc = **10 min**

Manning's n = **0.013**

Drainage Area	From	To	Area	Runoff Parameters					Roof Flow Q	Peak Flow Q	Pipe Dia.		Slope	Length	Capacity	Velocity		Time of Flow	Q(d) / Q(f)	REMARKS
				Runoff Coeff. R	Indiv. 2.78AR	Accum. 2.78AR	Time of Conc.	Rainfall Intensity			nom.	actual			full	full	actual			
			(ha)				(min)	(mm/hr)	(L/sec)	(L/sec)	(mm)	(mm)	(%)	(m)	(L/sec)	(m/sec)	(m/sec)	(min)		
WS-01	CB-10	CBMH-11	0.057	0.85	0.13	0.13	10.00	104.19		14.06	200	203	1.00	7.5	34.22	1.06	0.84	0.12	0.41	
WS-02	CBMH-11	CBMH-13	0.093	0.67	0.17	0.31	10.12	103.56		31.92	250	254	0.52	59.7	44.74	0.88	0.84	1.13	0.71	
WS-03	CB-12	CBMH-14	0.049	0.90	0.12	0.12	10.00	104.19		12.83	200	203	2.00	38.2	48.39	1.49	1.04	0.43	0.27	
WS-05	CBMH-14	CBMH-13	0.049	0.86	0.12	0.24	10.43	101.98		24.54	250	254	1.00	11.9	62.04	1.22	0.97	0.16	0.40	
WS-04	CBMH-13	MHST-18	0.077	0.80	0.17	0.72	11.25	98.02		70.44	375	381	1.10	20.0	191.84	1.68	1.30	0.20	0.37	**Storm Chambers, matching inlet manifold capacity (192 L/s)
WS-06	MSHT-18	CBMH-16	0.071	0.66	0.13	0.85	11.45	97.11		82.54	375	381	0.50	23.7	129.34	1.13	1.04	0.35	0.64	
	CBMH-16	OGS	-	-	-	0.85	11.80	95.56		81.22	375	381	0.50	7.9	129.34	1.13	1.03	0.12	0.63	
	OGS	MHST17	-	-	-	0.85	11.92	95.04		80.78	375	381	0.50	18.4	129.34	1.13	1.03	0.27	0.62	

Note:

Design: B. Villeneuve
Check: M. Theiner

Date: 2025-01-20

Project: TOH Riverside Campus - Parking Lot D

Client: The Ottawa Hospital

STORM SEWER COMPUTATION FORM

Rational Method

Q = 2.78*A*I*R

Q = Flow (L/sec)
A = Area (ha)
I = Rainfall Intensity (mm/h)
R = Ave. Runoff Coefficient

City of Ottawa IDF Curve - 100-y

I_{100} = 1735.688/(Tc+6.014) ^ 0.820

Minimum Time of Conc. Tc = **10 min**

Manning's n = **0.013**

Drainage Area	From	To	Area (ha)	Runoff Parameters: Runoff Coeff. R	Indiv. 2.78AR	Accum. 2.78AR	Time of Conc. (min)	Rainfall Intensity (mm/hr)	Roof Flow Q (L/sec)	Peak Flow Q (L/sec)	Pipe Dia. nom. (mm)	Pipe Dia. actual (mm)	Slope (%)	Length (m)	Capacity full (L/sec)	Velocity full (m/sec)	Velocity actual (m/sec)	Time of Flow (min)	Q(d) / Q(f)	REMARKS
WS-01	CB-10	CBMH-11	0.057	1.00	0.16	0.16	10.00	178.56		28.39	200	203	1.00	7.5	34.22	1.06	1.04	0.12	0.83	
WS-02	CBMH-11	CBMH-13	0.093	0.84	0.22	0.38	10.12	177.47		66.67	250	254	0.52	59.7	44.74	0.88	0.92	1.13	1.49	
WS-03	CB-12	CBMH-14	0.049	1.00	0.14	0.14	10.00	178.56		24.42	200	203	2.00	38.2	48.39	1.49	1.27	0.43	0.50	
WS-05	CBMH-14	CBMH-13	0.049	0.99	0.14	0.27	10.43	174.72		47.70	250	254	1.00	11.9	62.04	1.22	1.19	0.16	0.77	
WS-04	CBMH-13	MHST-18	0.077	0.99	0.21	0.86	11.25	167.89		144.53	375	381	1.10	20.0	191.84	1.68	1.63	0.20	0.75	**Storm Chambers, matching inlet manifold capacity (192 L/s)
WS-06	MSHT-18	CBMH-16	0.071	0.83	0.16	1.03	11.45	166.31		170.48	375	381	0.50	23.7	129.34	1.13	1.18	0.35	1.32	
	CBMH-16	OGS	-	-	-	1.03	11.80	163.62		167.73	375	381	0.50	7.9	129.34	1.13	1.18	0.12	1.30	
	OGS	MHST17	-	-	-	1.03	11.92	162.73		166.80	375	381	0.50	18.4	129.34	1.13	1.18	0.27	1.29	

Note:

Design: B. Villeneuve
Check: M. Theiner

Date: 2025-01-20

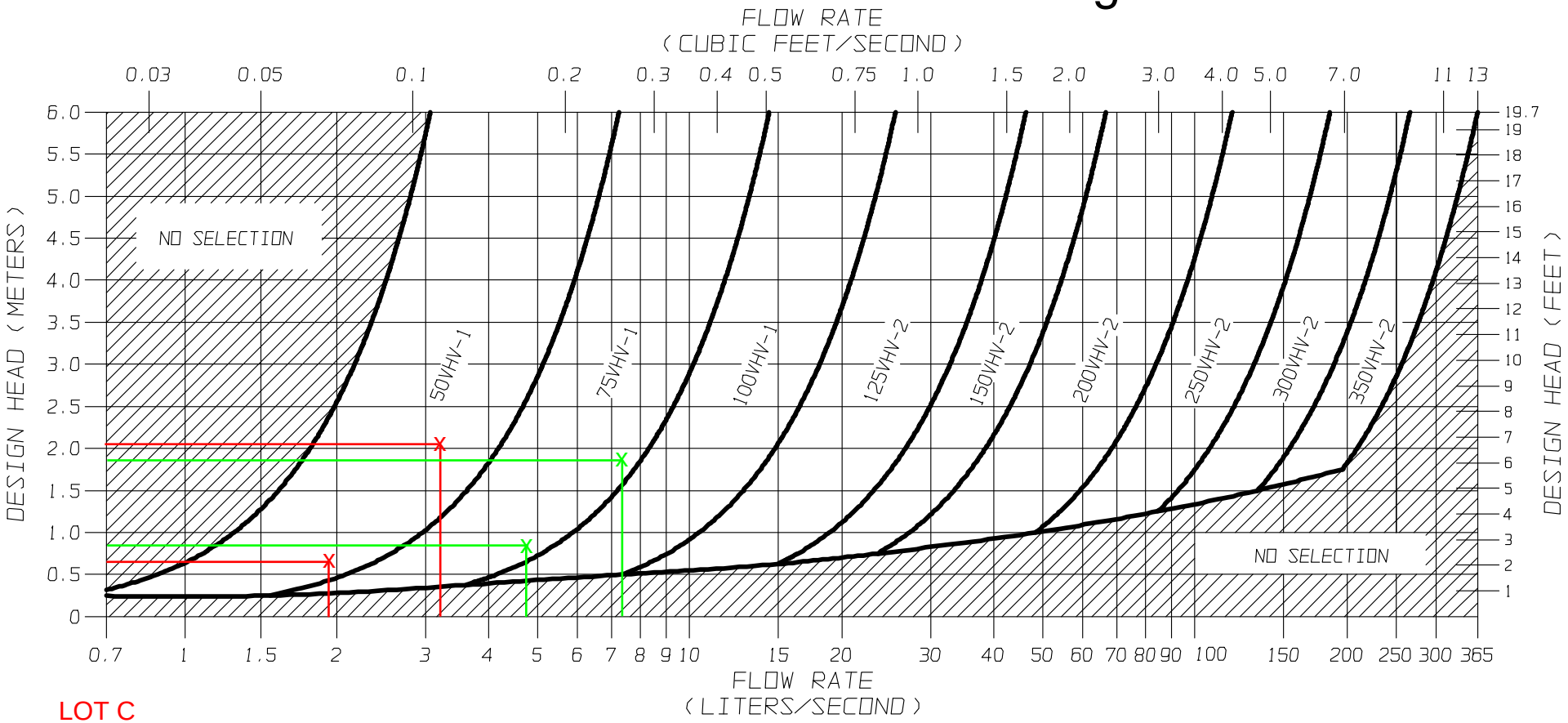
Project: TOH Riverside Campus - Parking Lot D

Client: The Ottawa Hospital

Appendix C:
Vortex ICD Flow Chart

HYDROVEX®

VHV Vertical Vortex Flow Regulator



LOT C

5y flow = 1.9 L/s @ 0.68m head
100y flow = 3.3 L/s @ 2.04m head

50 VHV-1

FIGURE 3 - VHV

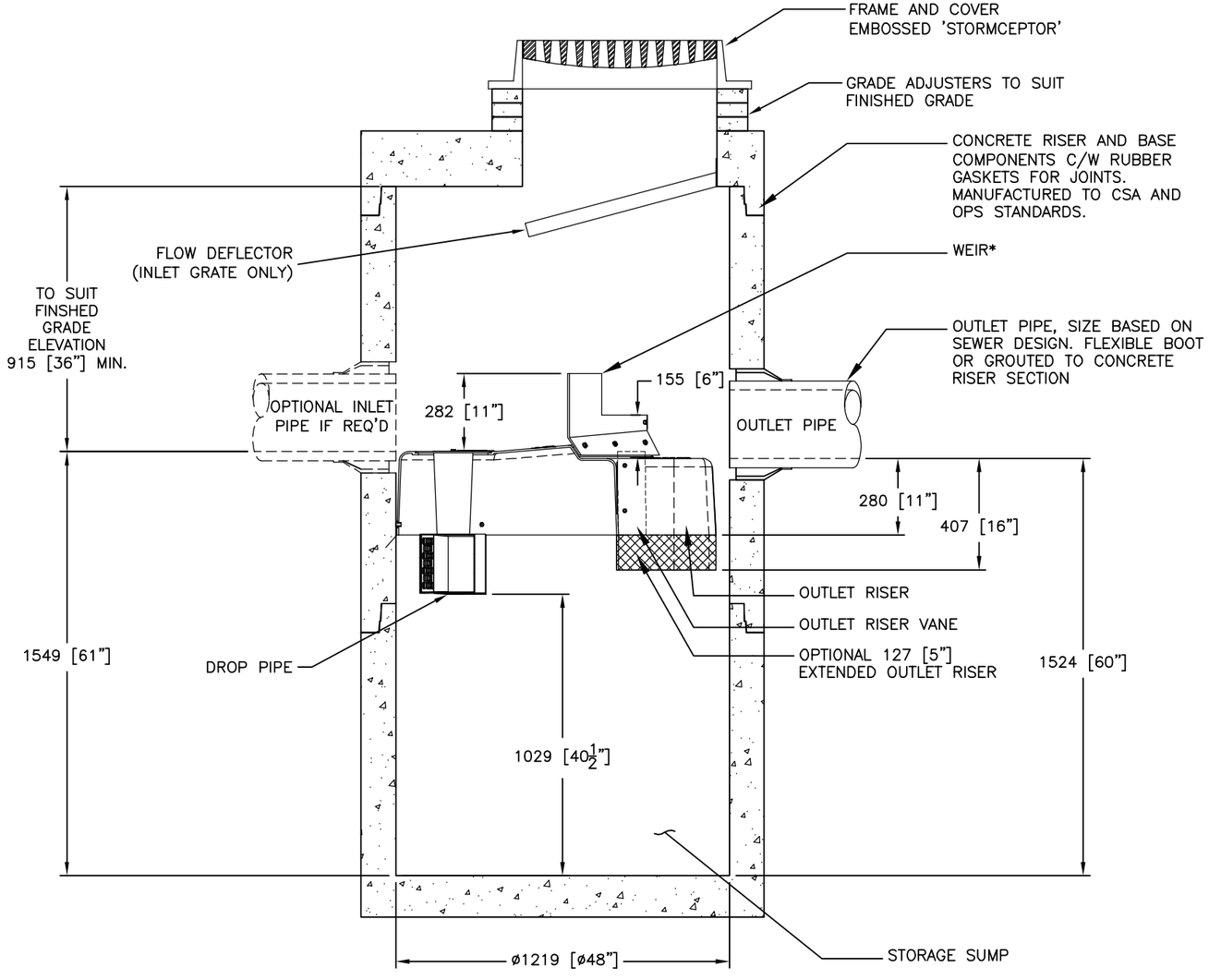
JOHN MEUNIER

LOT D

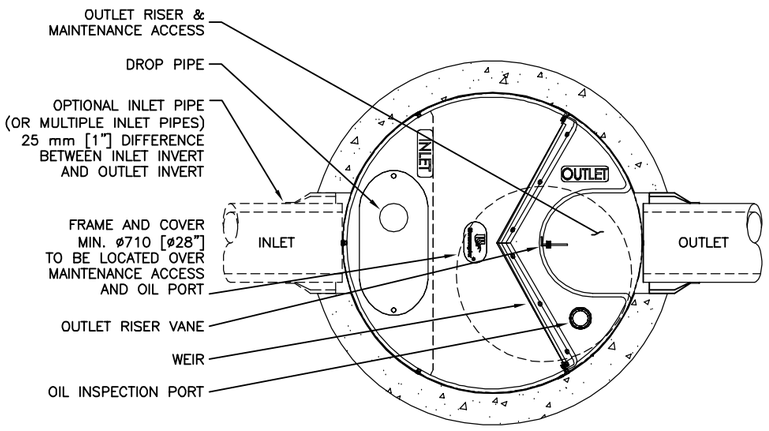
5y flow = 4.8 L/s @ 0.80m head
100y flow = 7.4 L/s @ 1.85m head

75 VHV-1

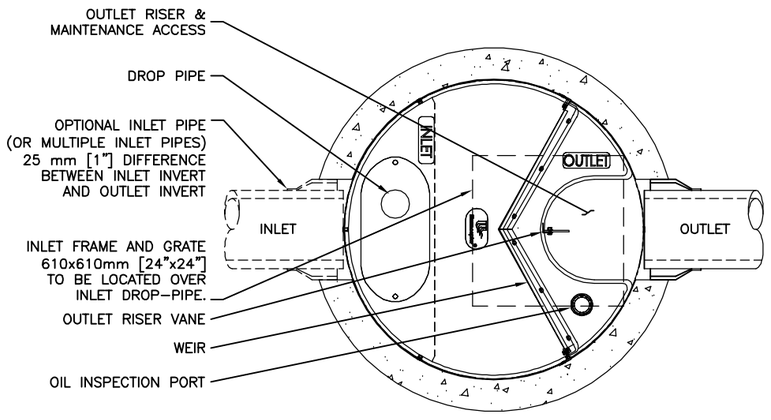
Appendix D:
EFO Stormceptor Sizing



SECTION VIEW



PLAN VIEW (STANDARD)



PLAN VIEW (INLET TOP)

FOR SITE SPECIFIC DRAWINGS PLEASE CONTACT YOUR LOCAL STORMCEPTOR 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 (IF REQUIRED).

GENERAL NOTES:

* MAXIMUM SURFACE LOADING RATE (SLR) INTO LOWER CHAMBER THROUGH DROP PIPE IS 1135 L/min/m^2 (27.9 gpm/ft^2) FOR STORMCEPTOR EF4 AND 535 L/min/m^2 (13.1 gpm/ft^2) FOR STORMCEPTOR EFO4 (OIL CAPTURE CONFIGURATION). WEIR HEIGHT IS 150 mm (6 INCH) FOR EF04.

1. ALL DIMENSIONS INDICATED ARE IN MILLIMETERS (INCHES) UNLESS OTHERWISE SPECIFIED.
2. STORMCEPTOR 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 STORMCEPTOR 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.

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 THE DEVICE FROM CONSTRUCTION-RELATED EROSION RUNOFF.
E. DEVICE ACTIVATION, BY CONTRACTOR, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE STORMCEPTOR UNIT IS CLEAN AND FREE OF DEBRIS.

STANDARD DETAIL
NOT FOR CONSTRUCTION

SITE SPECIFIC DATA REQUIREMENTS

STORMCEPTOR MODEL	EFO4
STRUCTURE ID	*
HYDROCARBON STORAGE REQ'D (L)	*
WATER QUALITY FLOW RATE (L/s)	*
PEAK FLOW RATE (L/s)	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
DRAINAGE AREA (HA)	*
DRAINAGE AREA IMPERVIOUSNESS (%)	*

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

* PER ENGINEER OF RECORD

MARK	DATE	REVISION DESCRIPTION	BY
####	####	####	####
####	####	####	####
1	6/8/18	UPDATES	JSK
0	5/26/17	INITIAL RELEASE	JSK

Stormceptor® EF

SCALE = NTS

imbrium®
407 FAIRVIEW DRIVE, WHITBY, ON, L1N 9A9
TF 800-565-4501 CA 416-800-8600 INTL +1-416-800-8600

DATE: 10/13/2017

DESIGNED:	DRAWN:
JSK	JSK
CHECKED:	APPROVED:
BSF	SP
PROJECT No.:	SEQUENCE No.:
EFO4	*

SHEET: 1 OF 1

Stormceptor® EF Sizing Report

Imbrium® Systems
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

10/23/2024

Province:	Ontario
City:	Ottawa
Nearest Rainfall Station:	OTTAWA CDA RCS
Climate Station Id:	6105978
Years of Rainfall Data:	20

Site Name:	

Drainage Area (ha):	0.40
% Imperviousness:	84.00

Runoff Coefficient 'c': 0.80

Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	10.38
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	Yes
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	14.70
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	370
Estimated Average Annual Sediment Volume (L/yr):	301

Project Name:	TOH Riverside Campus Lot D
Project Number:	65659
Designer Name:	Benoit Villeneuve
Designer Company:	Parsons Inc.
Designer Email:	benoit.villeneuve@parsons.com
Designer Phone:	367-990-5884
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	88
EFO6	95
EFO8	98
EFO10	100
EFO12	100

Recommended Stormceptor EFO Model: EFO4

Estimated Net Annual Sediment (TSS) Load Reduction (%): 88

Water Quality Runoff Volume Capture (%): > 90

THIRD-PARTY TESTING AND VERIFICATION

►**Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

►**Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterwavs.

PARTICLE SIZE DISTRIBUTION (PSD)

►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

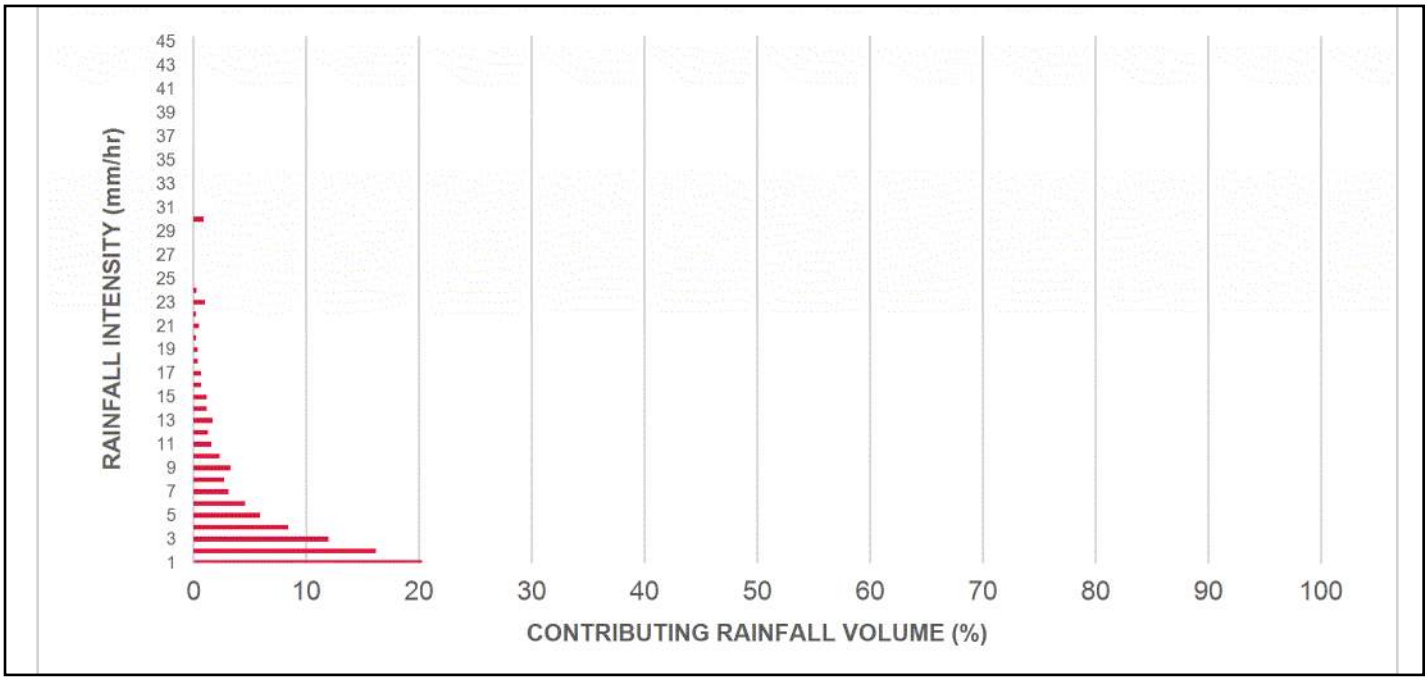
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Upstream Flow Controlled Results

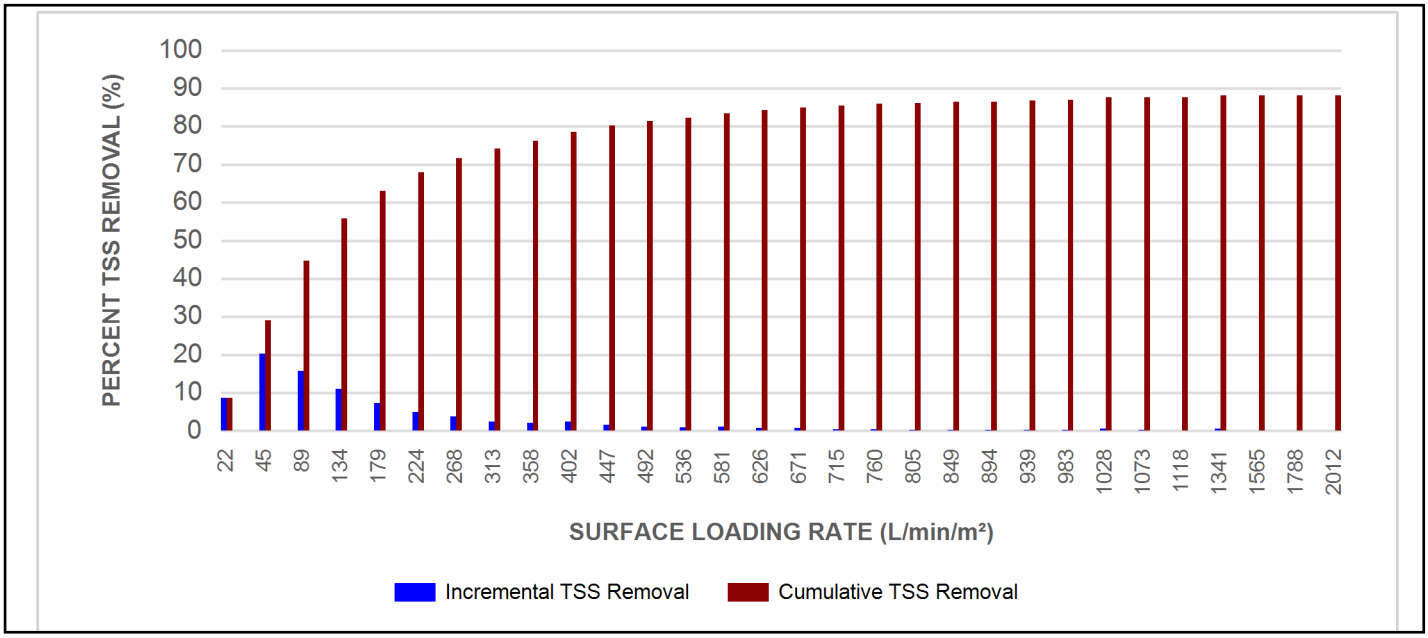
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.6	8.6	0.45	27.0	22.0	100	8.6	8.6
1.00	20.3	29.0	0.89	54.0	45.0	100	20.3	29.0
2.00	16.2	45.2	1.79	107.0	89.0	97	15.8	44.7
3.00	12.0	57.2	2.68	161.0	134.0	92	11.0	55.8
4.00	8.4	65.6	3.58	215.0	179.0	87	7.3	63.1
5.00	5.9	71.6	4.47	268.0	224.0	82	4.9	68.0
6.00	4.6	76.2	5.36	322.0	268.0	80	3.7	71.7
7.00	3.1	79.3	6.26	376.0	313.0	78	2.4	74.1
8.00	2.7	82.0	7.15	429.0	358.0	76	2.1	76.2
9.00	3.3	85.3	8.05	483.0	402.0	74	2.5	78.6
10.00	2.3	87.6	8.94	536.0	447.0	72	1.7	80.3
11.00	1.6	89.2	9.83	590.0	492.0	70	1.1	81.4
12.00	1.3	90.5	10.73	644.0	536.0	68	0.9	82.3
13.00	1.7	92.2	11.62	697.0	581.0	66	1.1	83.4
14.00	1.2	93.5	12.52	751.0	626.0	64	0.8	84.2
15.00	1.2	94.6	13.41	805.0	671.0	64	0.7	84.9
16.00	5.4	100.0	14.30	858.0	715.0	64	3.4	88.4
17.00	0.0	100.0	15.00	900.0	750.0	63	0.0	88.4
18.00	0.0	100.0	15.00	900.0	750.0	63	0.0	88.4
19.00	0.0	100.0	15.00	900.0	750.0	63	0.0	88.4
20.00	0.0	100.0	15.00	900.0	750.0	63	0.0	88.4
21.00	0.0	100.0	15.00	900.0	750.0	63	0.0	88.4
22.00	0.0	100.0	15.00	900.0	750.0	63	0.0	88.4
23.00	0.0	100.0	15.00	900.0	750.0	63	0.0	88.4
24.00	0.0	100.0	15.00	900.0	750.0	63	0.0	88.4
25.00	0.0	100.0	15.00	900.0	750.0	63	0.0	88.4
30.00	0.0	100.0	15.00	900.0	750.0	63	0.0	88.4
35.00	0.0	100.0	15.00	900.0	750.0	63	0.0	88.4
40.00	0.0	100.0	15.00	900.0	750.0	63	0.0	88.4
45.00	0.0	100.0	15.00	900.0	750.0	63	0.0	88.4
Estimated Net Annual Sediment (TSS) Load Reduction =								**88 %**

Climate Station ID: 6105978 *Years of Rainfall Data*: 20

RAINFALL DATA FROM OTTAWA CDA RCS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

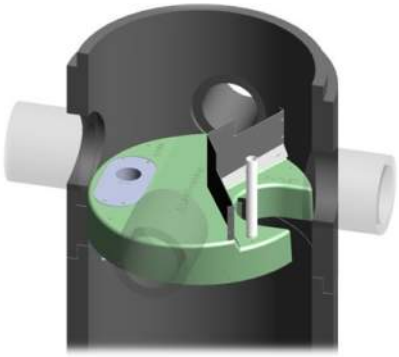
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

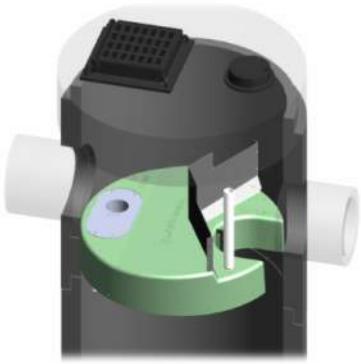
DESIGN FLEXIBILITY

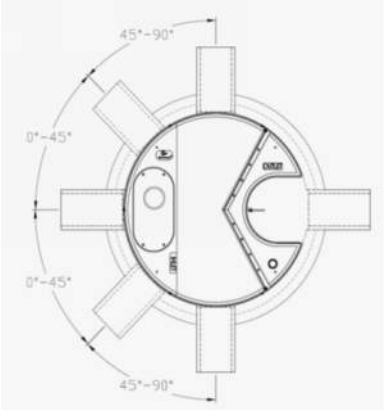
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.







INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.
0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.
45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft^3)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity
** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit** S**eparators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators,** with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to

assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m^2 to 2600 L/min/m^2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.** However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

Stormceptor® EF Sizing Report

Imbrium® Systems
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

03/05/2025

Province:	Ontario
City:	Ottawa
Nearest Rainfall Station:	OTTAWA CDA RCS
Climate Station Id:	6105978
Years of Rainfall Data:	20

Site Name:	

Drainage Area (ha):	0.18
Runoff Coefficient 'c':	0.74

Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0

Project Name:	TOH Riverside Campus Lot C
Project Number:	479008
Designer Name:	Benoit Villeneuve
Designer Company:	Parsons Inc.
Designer Email:	benoit.villeneuve@parsons.com
Designer Phone:	367-990-5884
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	4.30
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	Yes
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	3.30
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	174
Estimated Average Annual Sediment Volume (L/yr):	142

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	97
EFO5	99
EFO6	100
EFO8	100
EFO10	100
EFO12	100

Recommended Stormceptor EFO Model: EFO4

Estimated Net Annual Sediment (TSS) Load Reduction (%): 97

Water Quality Runoff Volume Capture (%): > 90

THIRD-PARTY TESTING AND VERIFICATION

►**Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

►**Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterwavs.

PARTICLE SIZE DISTRIBUTION (PSD)

►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

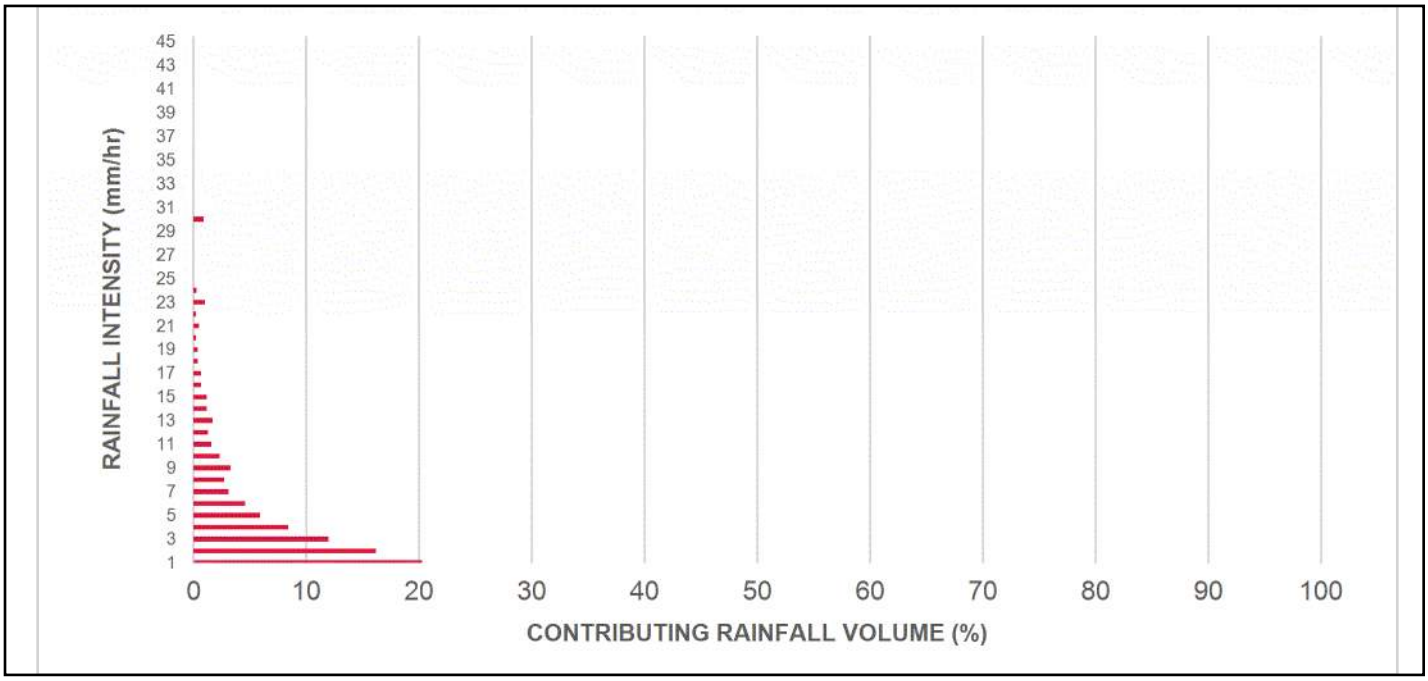
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Upstream Flow Controlled Results

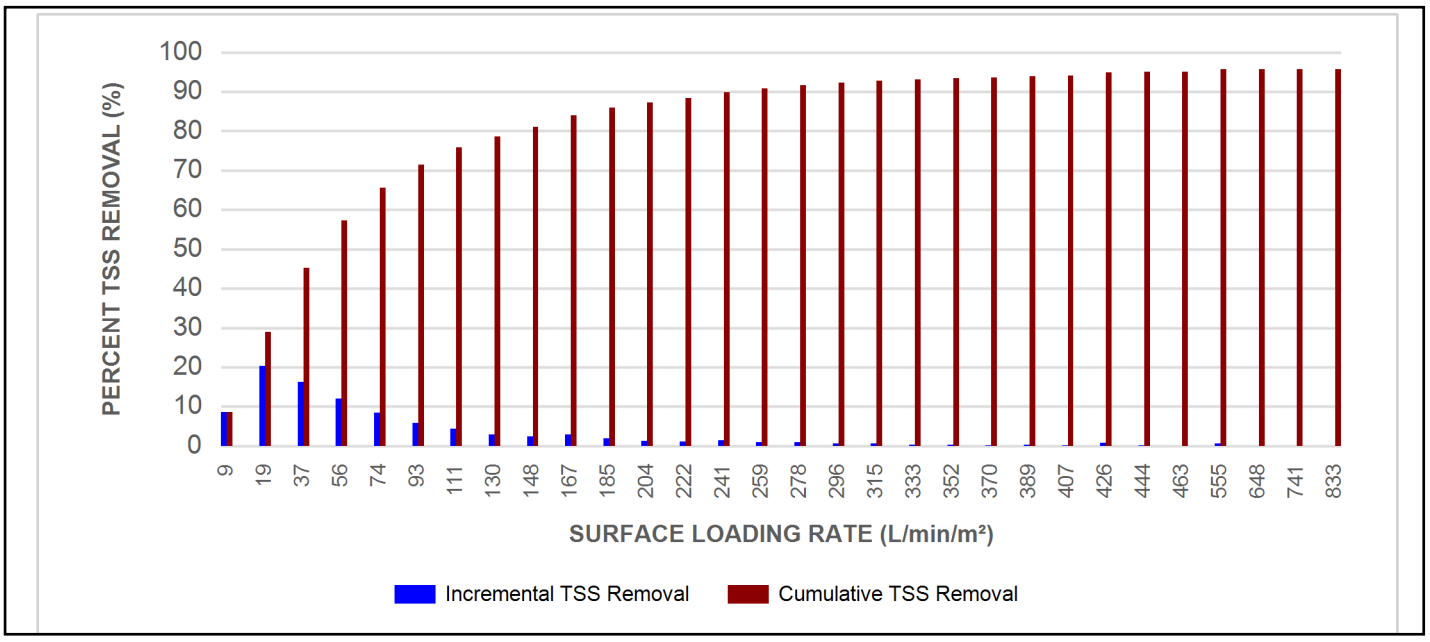
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.6	8.6	0.19	11.0	9.0	100	8.6	8.6
1.00	20.3	29.0	0.37	22.0	19.0	100	20.3	29.0
2.00	16.2	45.2	0.74	44.0	37.0	100	16.2	45.2
3.00	12.0	57.2	1.11	67.0	56.0	100	12.0	57.2
4.00	8.4	65.6	1.48	89.0	74.0	100	8.4	65.6
5.00	5.9	71.6	1.85	111.0	93.0	97	5.8	71.4
6.00	4.6	76.2	2.22	133.0	111.0	95	4.4	75.8
7.00	3.1	79.3	2.59	156.0	130.0	92	2.8	78.6
8.00	20.7	100.0	2.96	178.0	148.0	91	18.8	97.4
9.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
10.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
11.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
12.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
13.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
14.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
15.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
16.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
17.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
18.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
19.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
20.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
21.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
22.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
23.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
24.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
25.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
30.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
35.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
40.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
45.00	0.0	100.0	3.00	180.0	150.0	89	0.0	97.4
Estimated Net Annual Sediment (TSS) Load Reduction =								**97 %**

Climate Station ID: 6105978 *Years of Rainfall Data*: 20

RAINFALL DATA FROM OTTAWA CDA RCS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF5 / EFO5	1.5	5	90	762	30	762	30	710	25
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

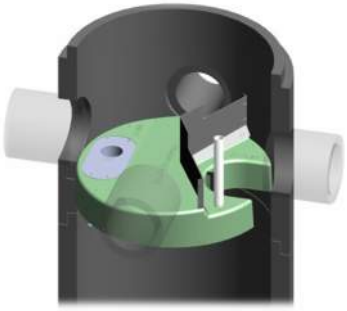
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

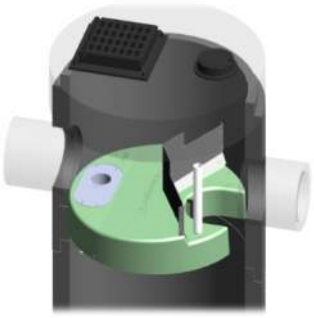
DESIGN FLEXIBILITY

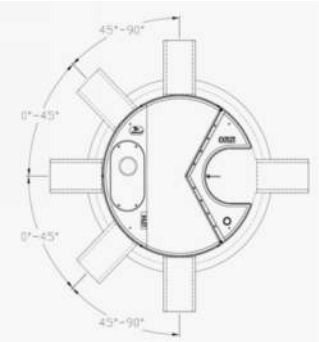
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.







INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft^3)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF5 / EFO5	1.5	5	1.62	5.3	420	111	305	10	2124	75	2612	5758
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREAMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit** S**eparators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	5 ft (1524 mm) Diameter OGS Units:	1.95 m^3 sediment / 420 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid

Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators,** with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m^2 to 2600 L/min/m^2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.** However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

Appendix E:
Stormwater Storage Chambers Specifications

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

Advanced Drainage Systems, Inc.

ADS SiteAssist™
FOR STORMTECH
INSTALLATION INSTRUCTIONS
VISIT OUR APP

TOH RIVERSIDE CAMPUS LOT C R1

OTTAWA, ON, CANADA

MC-7200 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-7200.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL BE CERTIFIED TO CSA B184, "POLYMERIC SUB-SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE CSA S6 CL-625 TRUCK AND THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 75 mm (3").
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 23° C / 73° F), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.
10. MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE. DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
11. ADS DOES NOT DESIGN OR PROVIDE MEMBRANE LINER SYSTEMS. TO MINIMIZE THE LEAKAGE POTENTIAL OF LINER SYSTEMS, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTEXTILE PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-7200 CHAMBER SYSTEM

1. STORMTECH MC-7200 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 230 mm (9") SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 300 mm (12") INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE; AASHTO M43 #3, 357, 4, 467, 5, 56, OR 57.
9. STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 300 mm (12") BETWEEN ADJACENT CHAMBER ROWS.
10. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
11. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
12. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-7200 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
3. FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

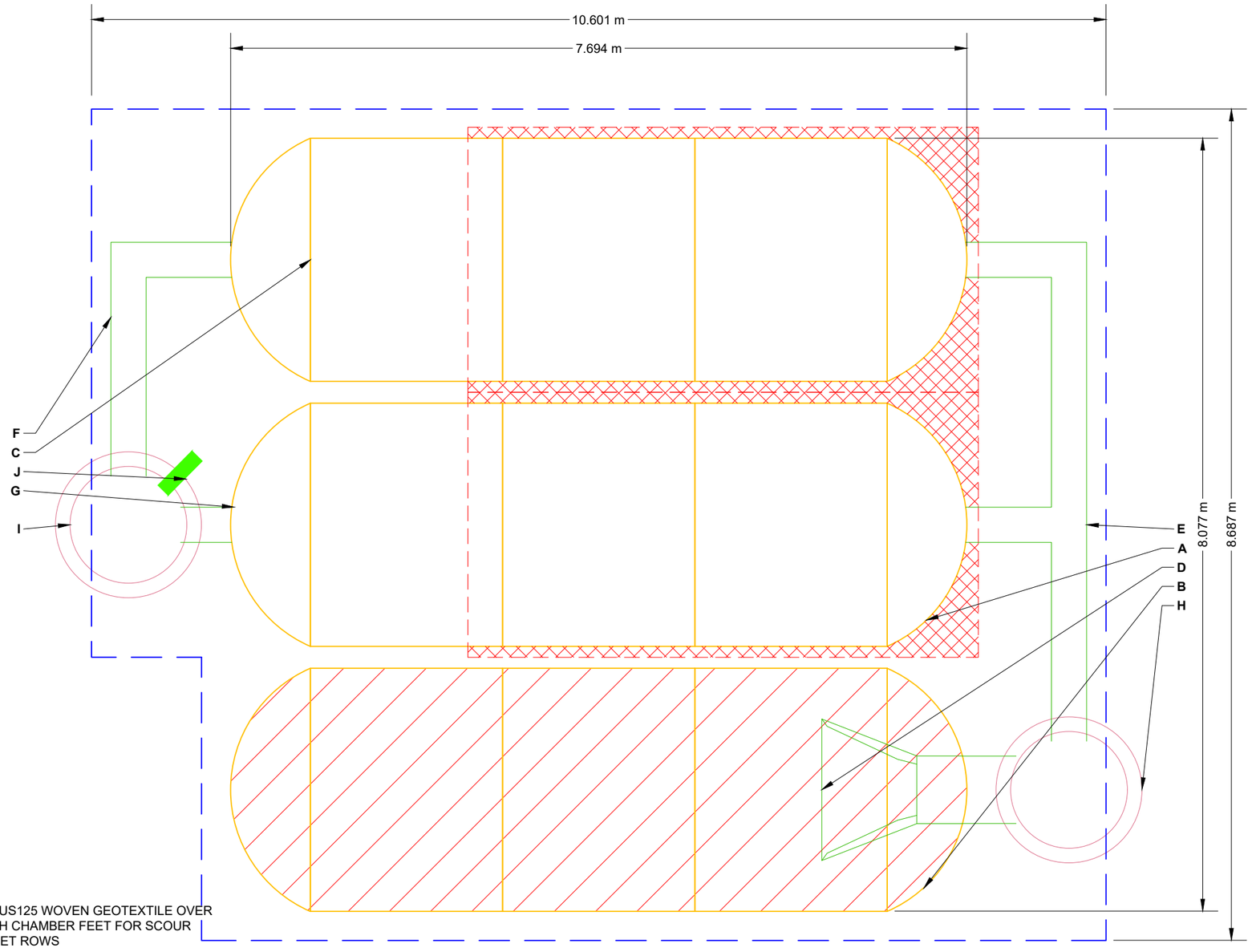
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-800-821-6710 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT		PROPOSED ELEVATIONS:	
9	STORMTECH MC-7200 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	70.086
6	STORMTECH MC-7200 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	68.715
305	STONE ABOVE (mm)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	68.562
229	STONE BELOW (mm)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	68.562
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	68.562
103.9	INSTALLED SYSTEM VOLUME (m^3) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	68.258
		TOP OF MC-7200 CHAMBER:	67.953
		300 mm x 300 mm TOP MANIFOLD INVERT:	67.335
		600 mm ISOLATOR ROW PLUS INVERT:	66.486
88.7	SYSTEM AREA (m^2)	300 mm x 300 mm BOTTOM MANIFOLD INVERT:	66.468
38.6	SYSTEM PERIMETER (m)	300 mm BOTTOM CONNECTION INVERT:	66.468
		BOTTOM OF MC-7200 CHAMBER:	66.429
		UNDERDRAIN INVERT:	66.200
		BOTTOM OF STONE:	66.200

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	300 mm TOP PARTIAL CUT END CAP, PART#: MC7200IEPP12T / TYP OF ALL 300 mm TOP CONNECTIONS	907 mm	
PREFABRICATED END CAP	B	600 mm BOTTOM PARTIAL CUT END CAP, PART#: MC7200IEPP24B / TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	57 mm	
PREFABRICATED END CAP	C	300 mm BOTTOM PARTIAL CUT END CAP, PART#: MC7200IEPP12B / TYP OF ALL 300 mm BOTTOM CONNECTIONS	39 mm	
FLAMP	D	INSTALL FLAMP ON 600 mm ACCESS PIPE / PART#: MCFLAMP		
MANIFOLD	E	300 mm x 300 mm TOP MANIFOLD, ADS N-12	907 mm	
MANIFOLD	F	300 mm x 300 mm BOTTOM MANIFOLD, ADS N-12	39 mm	
PIPE CONNECTION	G	300 mm BOTTOM CONNECTION	39 mm	
CONCRETE STRUCTURE	H	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		70 L/s IN
CONCRETE STRUCTURE	I	OCS (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		113 L/s OUT
UNDERDRAIN	J	150 mm ADS N-12 DUAL WALL PERFORATED HDPE UNDERDRAIN		



ISOLATOR ROW PLUS
(SEE DETAIL)

PLACE MINIMUM 5.334 m OF ADSPLUS125 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES

- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- **NOT FOR CONSTRUCTION**: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

TOH RIVERSIDE CAMPUS LOT C
R1
OTTAWA, ON, CANADA

DATE: 01/15/2025 | DRAWN: BV | CHECKED: N/A | PROJECT #:

DATE	DRW	CHK	DESCRIPTION

StormTech®
Chamber System
1-800-821-6710 | WWW.STORMTECH.COM

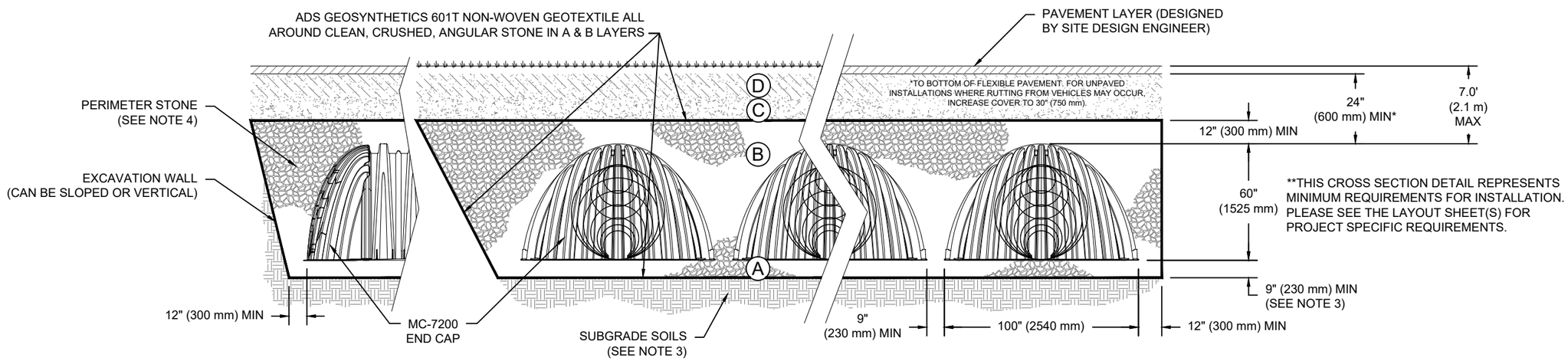
ADS
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

SCALE = 1 : 50

ACCEPTABLE FILL MATERIALS: STORMTECH MC-7200 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



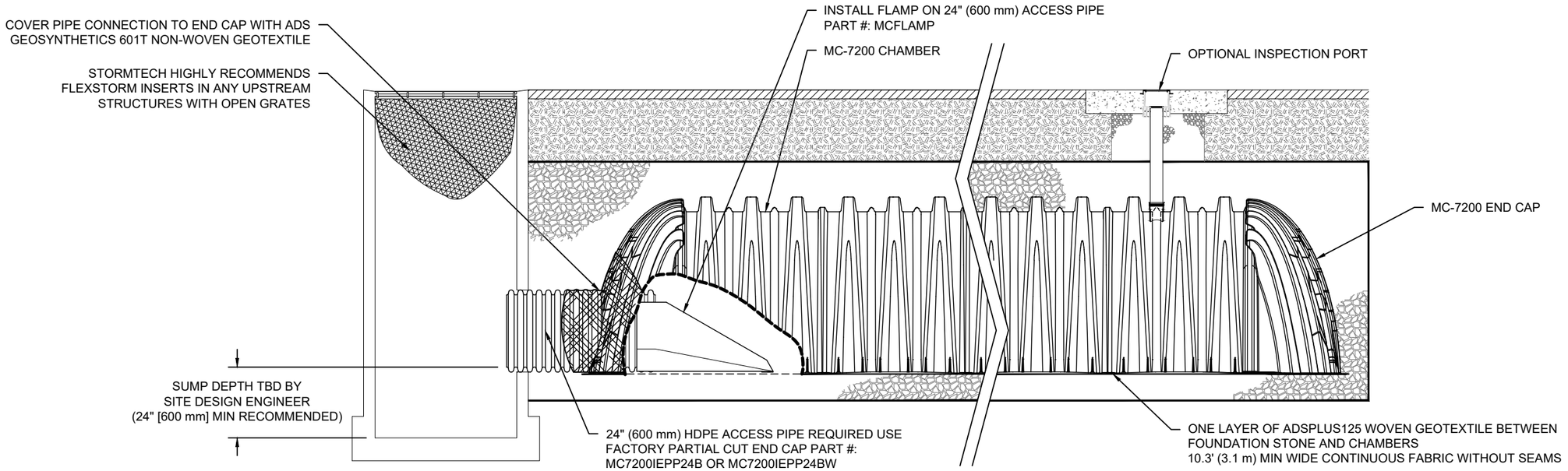
NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101
2. MC-7200 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

TOH RIVERSIDE CAMPUS LOT C R1
OTTAWA, ON, CANADA
DATE: 01/15/2025 | DRAWN: BV | CHECKED: N/A
PROJECT #:

DATE	DRW	CHK	DESCRIPTION

StormTech®
Chamber System
1-800-821-6710 | WWW.STORMTECH.COM
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473



MC-7200 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

TOH RIVERSIDE CAMPUS LOT C
R1
OTTAWA, ON, CANADA

DATE: 01/15/2025 | DRAWN: BV | CHECKED: N/A
PROJECT #:

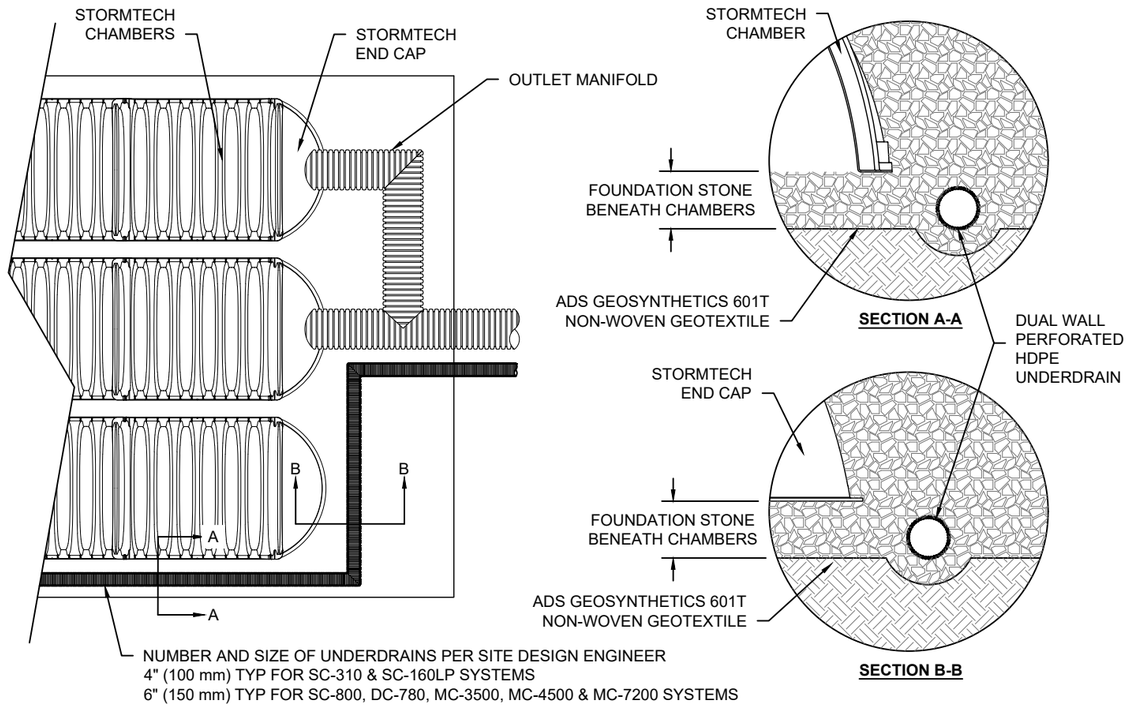
DATE	DRW	CHK	DESCRIPTION

StormTech®
Chamber System
1-800-821-6710 | WWW.STORMTECH.COM

ADS
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

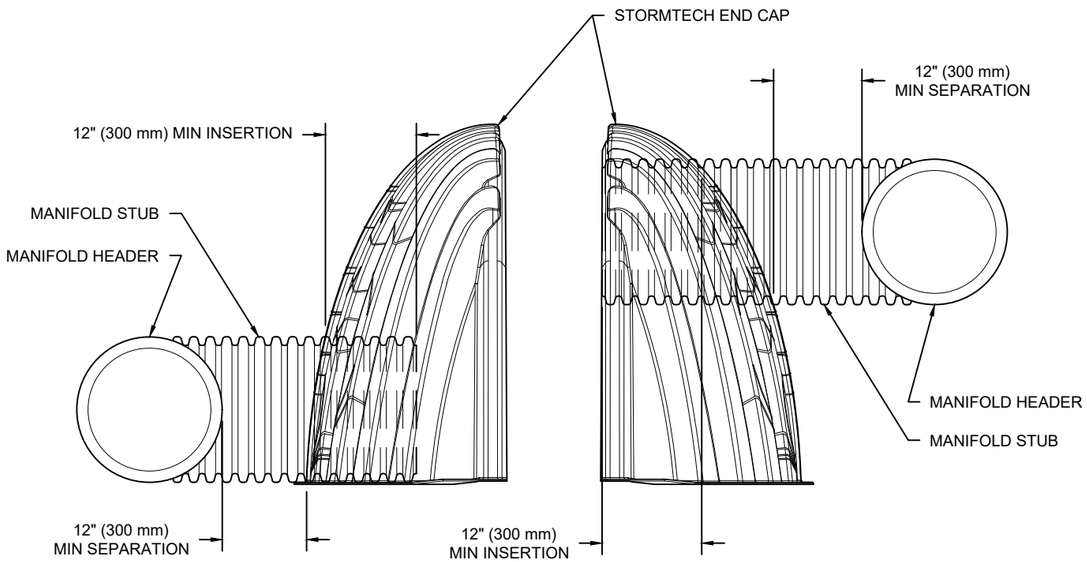
UNDERDRAIN DETAIL

NTS



MC-SERIES END CAP INSERTION DETAIL

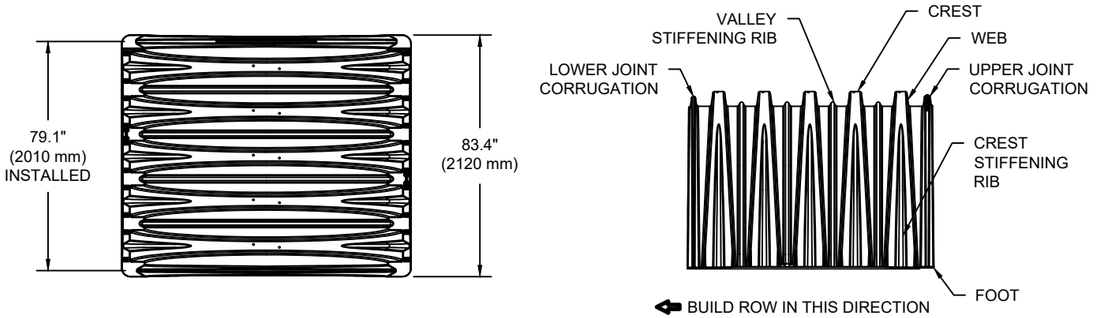
NTS



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

MC-7200 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 79.1"	(2540 mm X 1524 mm X 2010 mm)
CHAMBER STORAGE	175.9 CUBIC FEET	(4.98 m³)
MINIMUM INSTALLED STORAGE*	267.3 CUBIC FEET	(7.56 m³)
WEIGHT (NOMINAL)	205 lbs.	(92.9 kg)

NOMINAL END CAP SPECIFICATIONS

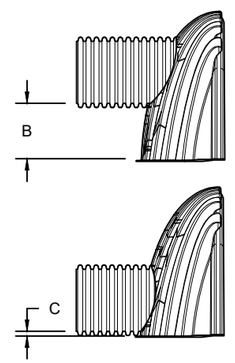
SIZE (W X H X INSTALLED LENGTH)	90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
END CAP STORAGE	39.5 CUBIC FEET	(1.12 m³)
MINIMUM INSTALLED STORAGE*	115.3 CUBIC FEET	(3.26 m³)
WEIGHT (NOMINAL)	90 lbs.	(40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC7200IEPP06T	6" (150 mm)	42.54" (1081 mm)	---
MC7200IEPP06B		---	0.86" (22 mm)
MC7200IEPP08T	8" (200 mm)	40.50" (1029 mm)	---
MC7200IEPP08B		---	1.01" (26 mm)
MC7200IEPP10T	10" (250 mm)	38.37" (975 mm)	---
MC7200IEPP10B		---	1.33" (34 mm)
MC7200IEPP12T	12" (300 mm)	35.69" (907 mm)	---
MC7200IEPP12B		---	1.55" (39 mm)
MC7200IEPP15T	15" (375 mm)	32.72" (831 mm)	---
MC7200IEPP15B		---	1.70" (43 mm)
MC7200IEPP18T	18" (450 mm)	29.36" (746 mm)	---
MC7200IEPP18TW			
MC7200IEPP18B		---	1.97" (50 mm)
MC7200IEPP18BW			
MC7200IEPP24T	24" (600 mm)	23.05" (585 mm)	---
MC7200IEPP24TW			
MC7200IEPP24B		---	2.26" (57 mm)
MC7200IEPP24BW			
MC7200IEPP30BW	30" (750 mm)	---	2.95" (75 mm)
MC7200IEPP36BW	36" (900 mm)	---	3.25" (83 mm)
MC7200IEPP42BW	42" (1050 mm)	---	3.55" (90 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL

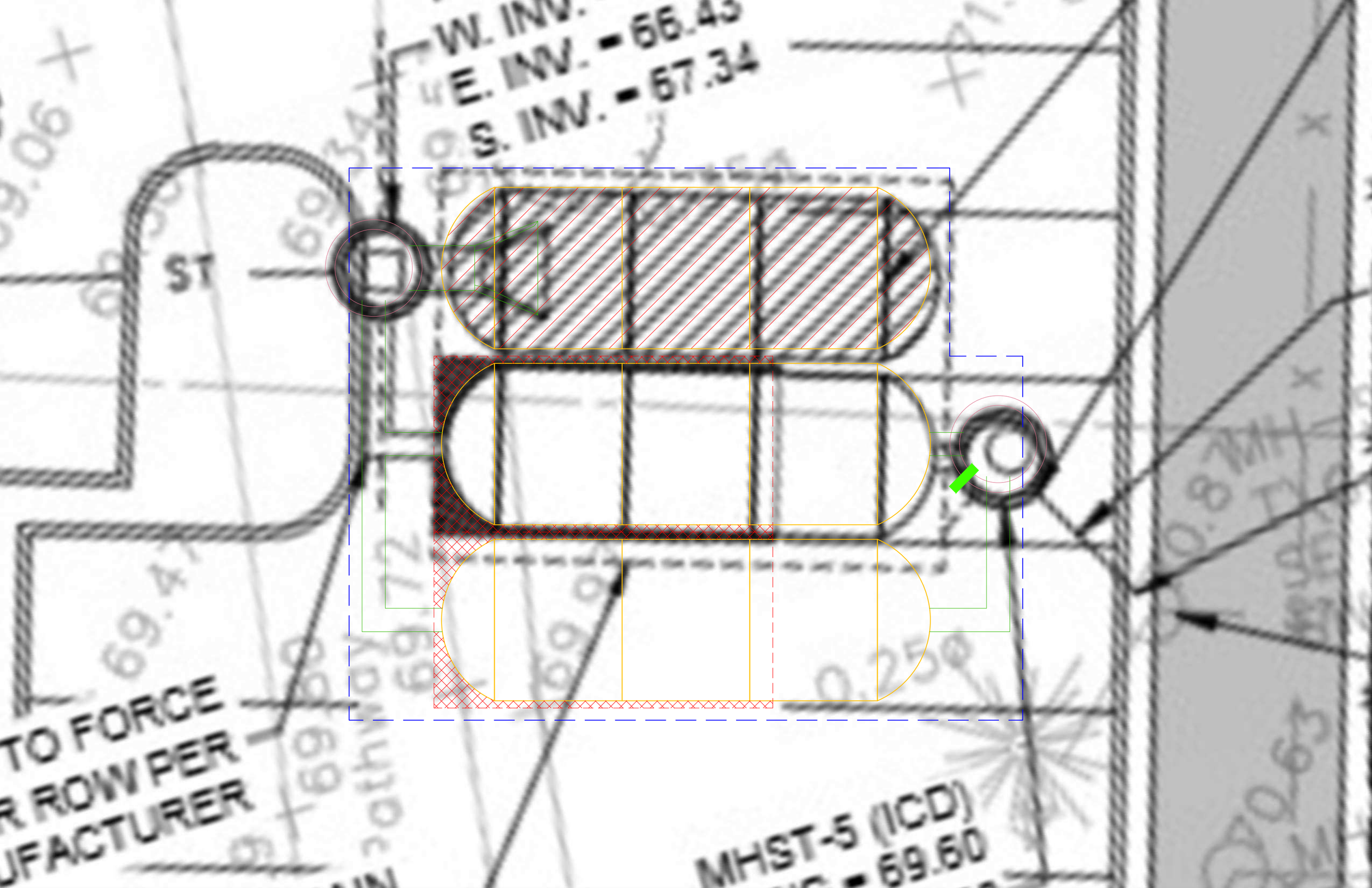


CUSTOM PREFABRICATED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-7200 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

TOH RIVERSIDE CAMPUS LOT C R1
OTTAWA, ON, CANADA
DATE: 01/15/2025 | DRAWN: BV | CHECKED: N/A
PROJECT #:

DATE	DRW	CHK	DESCRIPTION

StormTech® Chamber System
1-800-821-6710 | WWW.STORMTECH.COM
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473


W. INV. =
E. INV. = 66.43
S. INV. = 67.34
ST
TO FORCE
R ROW PER
UFACTURER
MHST-5 (ICD)
69.60

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

Advanced Drainage Systems, Inc.

SiteAssist™
FOR STORMTECH
INSTALLATION INSTRUCTIONS
VISIT OUR APP

TOH RIVERSIDE CAMPUS LOT D R1

OTTAWA, ON, CANADA

MC-3500 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL BE CERTIFIED TO CSA B184, "POLYMERIC SUB-SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE CSA S6 CL-625 TRUCK AND THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 75 mm (3").
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 23° C / 73° F), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.
10. MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE. DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
11. ADS DOES NOT DESIGN OR PROVIDE MEMBRANE LINER SYSTEMS. TO MINIMIZE THE LEAKAGE POTENTIAL OF LINER SYSTEMS, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTEXTILE PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 150 mm (6") SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 300 mm (12") INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE; AASHTO M43 #3, 357, 4, 467, 5, 56, OR 57.
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
10. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
11. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

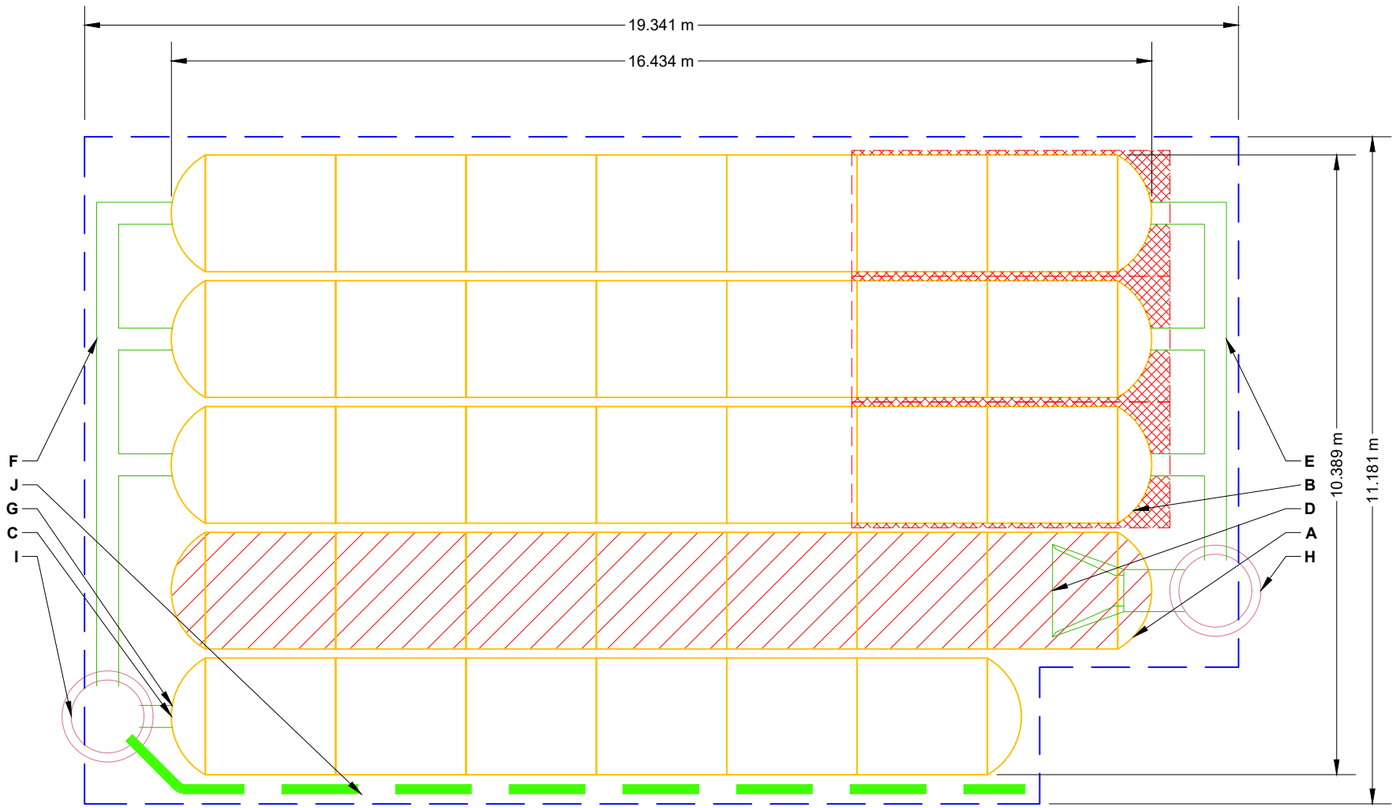
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-800-821-6710 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT		PROPOSED ELEVATIONS:	
34	STORMTECH MC-3500 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	63.410
10	STORMTECH MC-3500 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	61.581
305	STONE ABOVE (mm)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	61.429
229	STONE BELOW (mm)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	61.429
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	61.429
205.9	INSTALLED SYSTEM VOLUME (m^3) BELOW ELEVATION 61.276 (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	61.276
		TOP OF MC-3500 CHAMBER:	60.972
		300 mm x 300 mm TOP MANIFOLD INVERT:	60.498
		600 mm ISOLATOR ROW PLUS INVERT:	59.881
		300 mm x 300 mm BOTTOM MANIFOLD INVERT:	59.863
208.6	SYSTEM AREA (m^2)	300 mm BOTTOM CONNECTION INVERT:	59.863
61.0	SYSTEM PERIMETER (m)	BOTTOM OF MC-3500 CHAMBER:	59.829
		UNDERDRAIN INVERT:	59.600
		BOTTOM OF STONE:	59.600

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	600 mm BOTTOM PRE-CORED END CAP, PART#: MC3500IEPP24BC / TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	52 mm	
PREFABRICATED END CAP	B	300 mm TOP PRE-CORED END CAP, PART#: MC3500IEPP12T / TYP OF ALL 300 mm TOP CONNECTIONS	670 mm	
PREFABRICATED END CAP	C	300 mm BOTTOM PRE-CORED END CAP, PART#: MC3500IEPP12B / TYP OF ALL 300 mm BOTTOM CONNECTIONS	34 mm	
FLAMP	D	INSTALL FLAMP ON 600 mm ACCESS PIPE / PART#: MCFLAMP		
MANIFOLD	E	300 mm x 300 mm TOP MANIFOLD, ADS N-12	670 mm	
MANIFOLD	F	300 mm x 300 mm BOTTOM MANIFOLD, ADS N-12	34 mm	
PIPE CONNECTION	G	300 mm BOTTOM CONNECTION	34 mm	
CONCRETE STRUCTURE	H	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		192 L/s IN
CONCRETE STRUCTURE	I	OCS (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		113 L/s OUT
UNDERDRAIN	J	150 mm ADS N-12 DUAL WALL PERFORATED HDPE UNDERDRAIN		



ISOLATOR ROW PLUS
(SEE DETAIL)

PLACE MINIMUM 5.334 m OF ADSPLUS125 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES

- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- **NOT FOR CONSTRUCTION**: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

TOH RIVERSIDE CAMPUS LOT D R1
OTTAWA, ON, CANADA
DATE: 01/15/2025 | DRAWN: UU | CHECKED: N/A
PROJECT #:

DATE	DRW	CHK	DESCRIPTION

4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

SCALE = 1 : 100

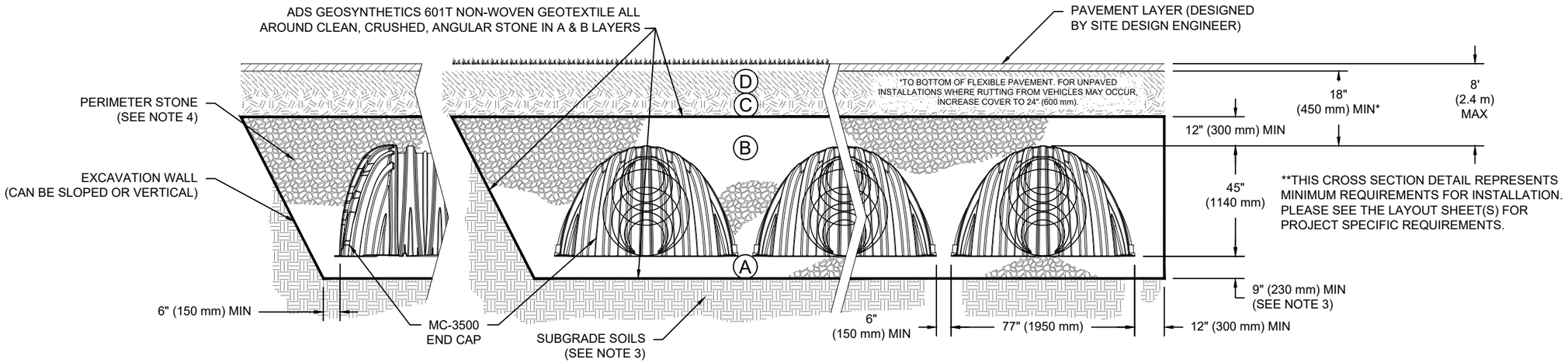
StormTech®
Chamber System

1-800-821-6710 | WWW.STORMTECH.COM

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



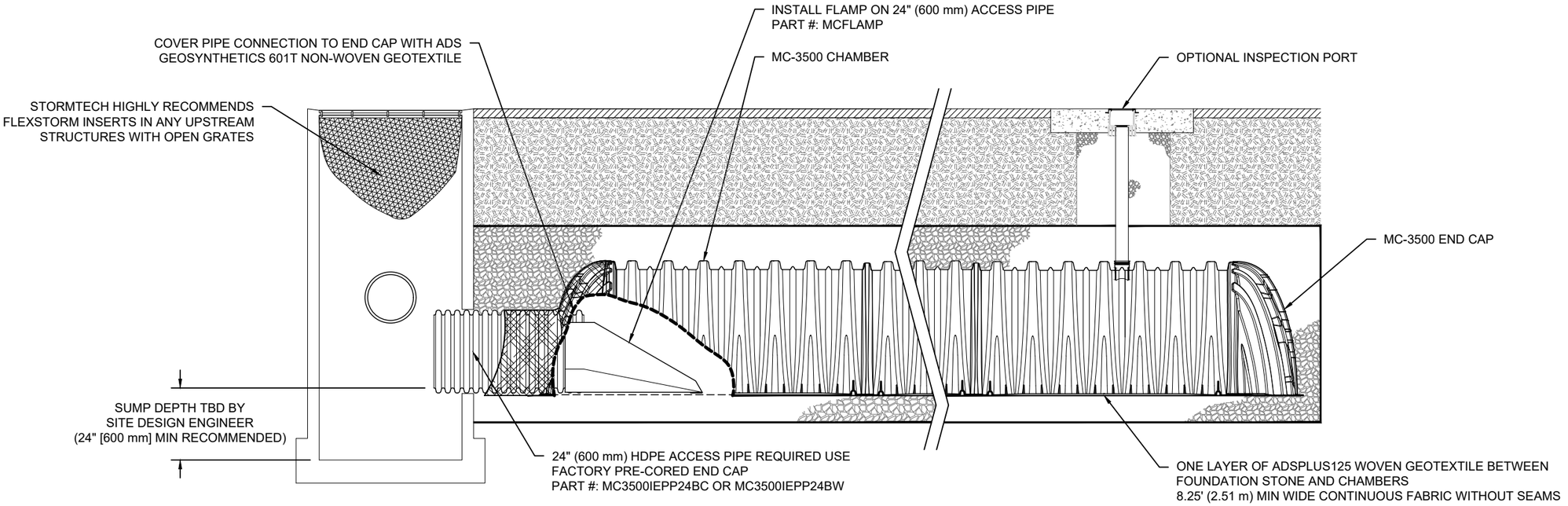
NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
2. MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

TOH RIVERSIDE CAMPUS LOT D R1
OTTAWA, ON, CANADA
DATE: 01/15/2025 | DRAWN: UU | CHECKED: N/A
PROJECT #:

DATE	DESCRIPTION	CHK	DRW

StormTech®
Chamber System
1-800-821-6710 | WWW.STORMTECH.COM
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473



MC-3500 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

TOH RIVERSIDE CAMPUS LOT D
R1
OTTAWA, ON, CANADA

DATE: 01/15/2025 | DRAWN: UU | CHECKED: N/A
PROJECT #:

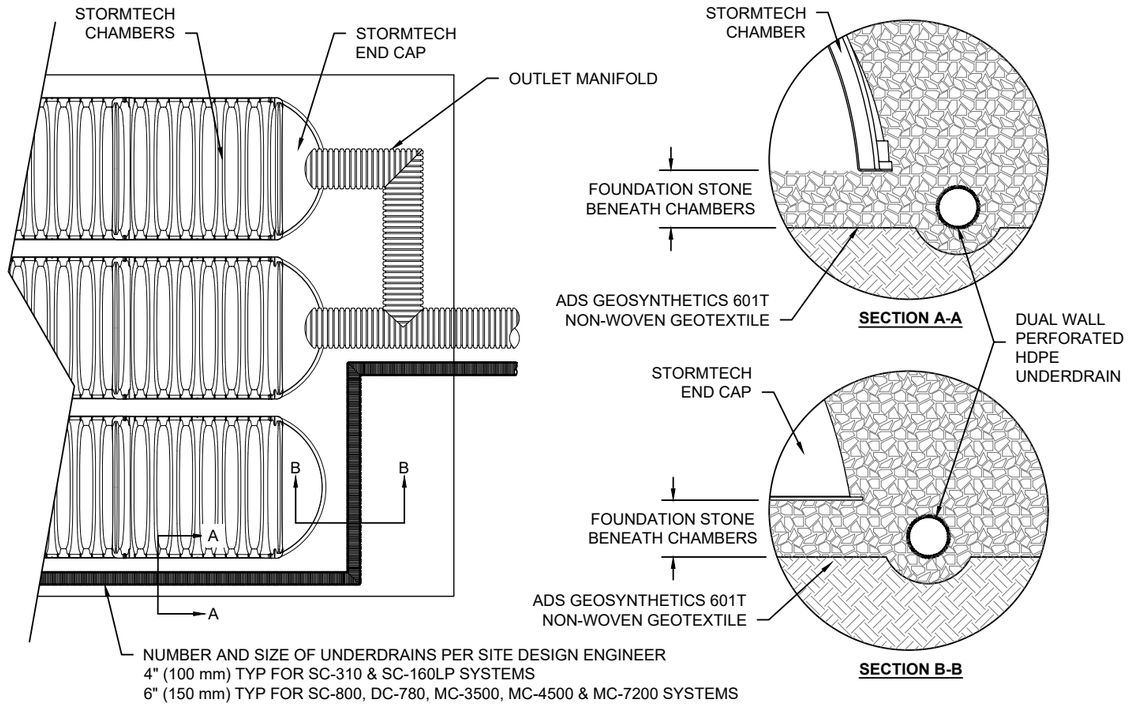
DATE	DRW	CHK	DESCRIPTION

StormTech®
Chamber System
1-800-821-6710 | WWW.STORMTECH.COM

4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

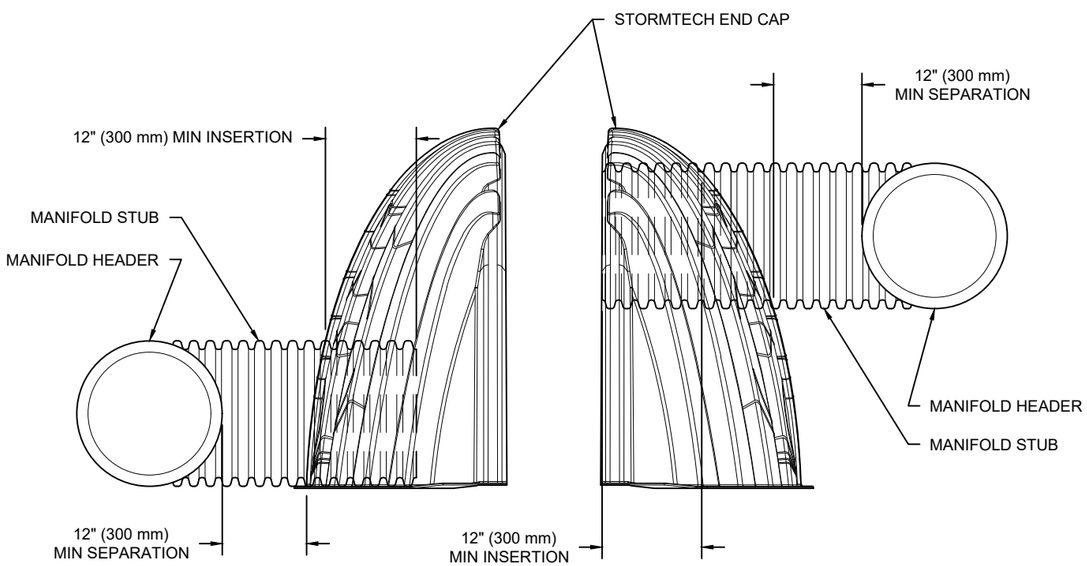
UNDERDRAIN DETAIL

NTS



MC-SERIES END CAP INSERTION DETAIL

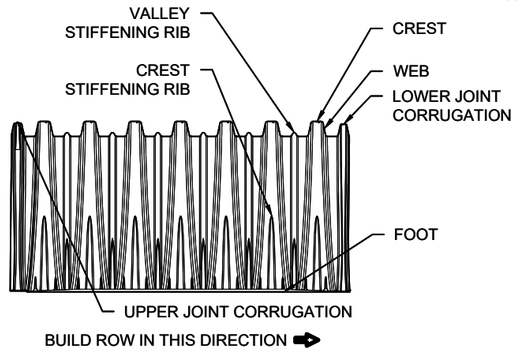
NTS

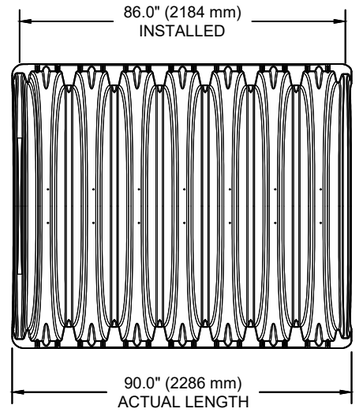


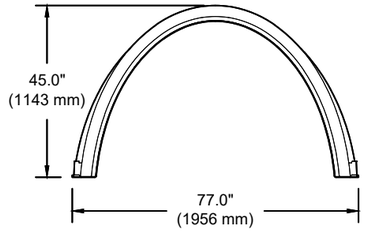
NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

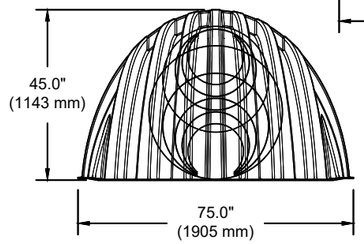
MC-3500 TECHNICAL SPECIFICATION

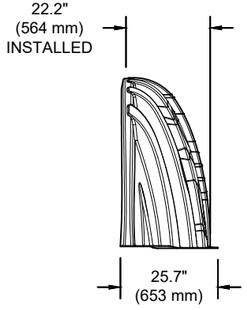
NTS











NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 86.0"	(1956 mm X 1143 mm X 2184 mm)
CHAMBER STORAGE	109.9 CUBIC FEET	(3.11 m³)
MINIMUM INSTALLED STORAGE*	175.0 CUBIC FEET	(4.96 m³)
WEIGHT	134 lbs.	(60.8 kg)

NOMINAL END CAP SPECIFICATIONS

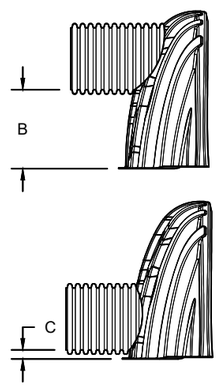
SIZE (W X H X INSTALLED LENGTH)	75.0" X 45.0" X 22.2"	(1905 mm X 1143 mm X 564 mm)
END CAP STORAGE	14.9 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	45.1 CUBIC FEET	(1.28 m³)
WEIGHT	49 lbs.	(22.2 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION, 6" SPACING BETWEEN CHAMBERS, 6" (152 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY

STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A WELDED CROWN PLATE END WITH "C"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC3500IEPP06T	6" (150 mm)	33.21" (844 mm)	---
MC3500IEPP06B		---	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	---
MC3500IEPP08B		---	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	---
MC3500IEPP10B		---	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	---
MC3500IEPP12B		---	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	---
MC3500IEPP15B		---	1.50" (38 mm)
MC3500IEPP18TC	18" (450 mm)	20.03" (509 mm)	---
MC3500IEPP18TW			
MC3500IEPP18BC		---	1.77" (45 mm)
MC3500IEPP18BW			
MC3500IEPP24TC	24" (600 mm)	14.48" (368 mm)	---
MC3500IEPP24TW			
MC3500IEPP24BC		---	2.06" (52 mm)
MC3500IEPP24BW			
MC3500IEPP30BC	30" (750 mm)	---	2.75" (70 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PRECORED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-3500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

TOH RIVERSIDE CAMPUS LOT D
R1
OTTAWA, ON, CANADA

DATE: 01/15/2025 | DRAWN: UU | CHECKED: N/A
PROJECT #:

DATE	DRW	CHK	DESCRIPTION

StormTech®
Chamber System
1-800-821-6710 | WWW.STORMTECH.COM
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

CB-15
IG = 61.77
E. INV. = 60.39

200mmØ @ 1.89%

MH-STM 43.9m - 375mmØ @ 0.46%

DC

CBMH-13
TIG = 62.30
N. INV. = 59.70
E. INV. = 59.67
NE. INV. = 59.73

300mmØ @ 0.55%

MH-SC
TIG = 62.41
SW. INV. = 59.75
N. INV. = 60.06
E. INV. = 60.02

Appendix F:
Isolator Row Plus Specifications

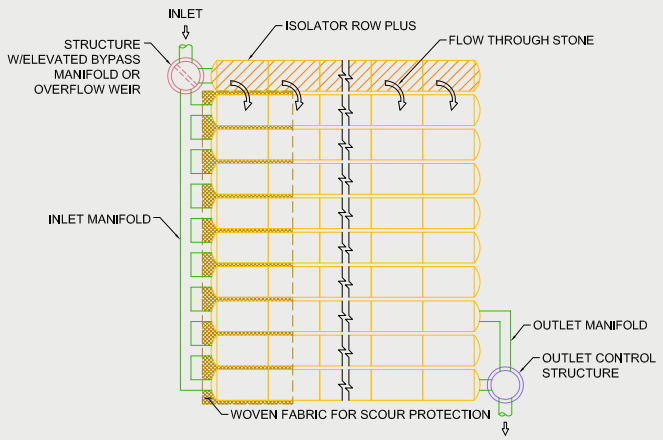
Isolator® Row Plus

The StormTech Isolator Row Plus is an enhancement to our proven water quality treatment system. This updated system is an NJCAT verified water quality treatment device that can be incorporated into any system layout.

Features

- Isolator Row Plus is now NJCAT verified. As a Manufactured Treatment Device it achieves over 80% TSS removal by filtration NJDEP Laboratory Protocol Assessment NJCAT Technology Verification.
- A patented Flamp™ (Flared End Ramp) provides a smooth transition from pipe invert to fabric bottom. The Flamp is attached to the inlet pipe inside the chamber end cap and improves chamber function over time by distributing sediment and debris that would otherwise collect at the inlet. It also serves to improve the fluid and solid flow back into the inlet pipe during maintenance and cleaning.
- Proprietary ADS Plus fabric maintains durability and sediment removal while allowing for higher water quality flow rates. A single layer of ADS Plus fabric is placed between the angular base stone and the Isolator Row Plus chambers.

Schematic of the StormTech Isolator Row Plus System



Technology Descriptions

The Isolator Row Plus is designed to capture the “first flush” runoff and offers the versatility to be sized on a volume or a flow basis. An upstream manhole not only provides access to the Isolator Row Plus but includes a high/low concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row Plus bypass through a manifold to the other chambers. This is achieved with either an elevated bypass manifold or a high-flow weir. This creates a differential between the Isolator Row Plus row of chambers and the manifold to the rest of the system, thus allowing for settlement time in the Isolator Row Plus. After Stormwater flows through the Isolator Row Plus and into the rest of the StormTech chamber system it is either infiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

Summary of Verified Claims[1]

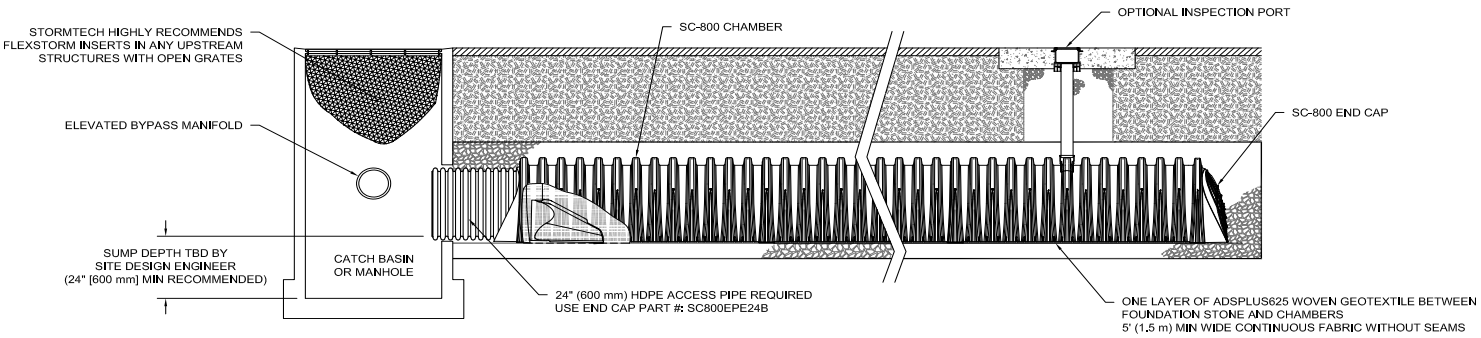
Treatment Rate (gpm/ft²)	4.1
Underlying Geotextile Layers	1
NJDEP Test Sediment	D50=75um
Mean Particle Concentration (mg/L)	200
TSS Removal Efficiency	>80%

[1] Verification testing of the StormTech SC-740 Isolator Row PLUS in accordance with NJDEP Laboratory protocol to access total suspended solids removal by filtration manufactured treatment device, 2013

ADS StormTech™

adspipe.com
800-821-6710

StormTech Isolator Row Plus (not to scale)



Maintenance

The Isolator Row Plus was designed to reduce the cost of periodic maintenance. By "isolating" sediment to just one row of the StormTech system, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout.

Maintenance is accomplished with the JetVac® process. The JetVac process utilizes a high-pressure water nozzle to propel itself down the Isolator Row Plus while scouring and suspending sediment. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency.

StormTech Isolator Row Plus

Chamber Model	Chamber Storage	Chamber Footprint	Treatment Rate
SC-160LP	15.0 cf (0.42 m^3)	11.45 sf (1.06 m^2)	0.11 cfs (3.11 L/s)
SC-310	31.0 cf (0.88 m^3)	17.7 sf (1.64 m^2)	0.16 cfs (4.53 L/s)
SC-740	74.9 cf (2.12 m^3)	27.8 sf (2.58 m^2)	0.26 cfs (7.36 L/s)
DC-780	78.4 cf (2.22 m^3)	27.8 sf (2.58 m^2)	0.26 cfs (7.36 L/s)
SC-800	81.0 cf (2.29 m^3)	27.3 sf (2.54 m^2)	0.25 cfs (7.1 L/s)
MC-3500	175.0 cf (4.96 m^3)	42.9 sf (3.99 m^2)	0.40 cfs (11.32 L/s)
MC-4500	162.6 cf (4.60 m^3)	30.1 sf (2.80 m^2)	0.28 cfs (7.93 L/s)
MC-7200	267.3 cf (7.57 m^3)	50.0 sf (4.65 m^2)	0.45 cfs (12.74 L/s)

Installation

Installation of the stormwater treatment unit(s) shall be preformed per manufacture's installation instructions. Such instructions can be obtained by calling Advanced Drainage Systems Inc. at (800) 821-6710 or by logging on to adspipe.com.

ADS StormTech™

adspipe.com

800-821-6710

Verification Statement

StormTech Isolator® Row PLUS
Registration number: (V-2020-10-01)
Date of issue: (2020-October-27)

Technology type	Stormwater Filtration Device
Application	Stormwater filtration technology to remove sediments, nutrients, heavy metals, and organic contaminants from stormwater runoff
Company	StormTech, LLC.
Address	520 Cromwell Avenue, Rocky Hill, CT 06067 USA **Phone** +1-888-892-2694
Website	www.stormtech.com
E-mail	info@stormtech.com

Verified Performance Claims

The StormTech Isolator® Row PLUS technology was tested at the Mid-Atlantic Storm Water Research Center (MASWRC), under the supervision of Boggs Environmental Consultants, Inc. The performance test results for two overlapping StormTech Isolator® Row PLUS chambers (commercial unit model SC-740) were verified by Good Harbour Laboratories Inc. (GHL), following the requirements of ISO 14034:2016 and the VerifiGlobal Performance Verification Protocol. Based on the laboratory testing conducted, the verified performance claims are as follows:

Total Suspended Solids (TSS) Removal Efficiency - The StormTech Isolator® Row PLUS achieved 82% ± 1% removal efficiency of suspended sediment concentration (SCC) at a 95% confidence level.

Average Loading Rate - Based on the reported flow rate data and the effective sedimentation and filtration treatment area of the test unit, the average loading rate of the test unit was 4.15 ± 0.03 GPM/ft^2 at a 95% confidence level.

Maximum Treatment Flow Rate (MTFR) - Although the MTFR varies among the StormTech Isolator® Row PLUS model sizes and the number of chambers, the design surface loading rate remains the same (4.13 gpm/ ft^2 of treatment surface area). The test unit consisted of two overlapping StormTech SC-740 chambers with a nominal MTFR of 225 GPM (0.501 CFS) and an effective filtration treatment area (EFTA) of approximately 54.5 ft^2.

Detention Time and Volume - The StormTech Isolator Row PLUS detention time and wet volume varies with model size. The unit tested had a wet volume of approximately 65.1 ft^3 and a detention time of 2.2 minutes.

Maximum Sediment Storage Depth and Volume - The sediment storage volume and depth vary according to the StormTech Isolator® Row PLUS model sizes and system configuration. For the two overlapping StormTech SC-740 chambers tested, the maximum sediment storage volume is 2.3 ft^3 at a sediment depth of 0.5 inches.

Effective Sedimentation/Filtration Treatment Areas - The Effective Sedimentation Area (ESA) and the Effective Filtration Treatment Area (EFTA) increase as the size of the system increases. For the two overlapping StormTech SC-740 chambers tested, the ESA and the ratio of ESA/EFTA were 54.5 ft^2 and 1.0, respectively.

Sediment Mass Load Capacity - The sediment mass load capacity varies according to the StormTech Isolator® Row PLUS model sizes and system configuration. For the two overlapping StormTech SC-740 chambers tested, the mass loading capture was 158.4 lbs ± 0.8 lbs (2.91 ±0.01 lbs/ ft^2) following a total sediment loading of 195.2 lbs.

Technology Application

The StormTech "Isolator® Row PLUS" is a stormwater treatment technology designed for use under parking lots, roadways and heavy earth loads while providing a superior and durable structural system. The technology comprises a row of chambers covered in a non-woven geotextile fabric with a single layer of proprietary woven fabric at the bottom that serves as a filter strip, providing surface area for infiltration and runoff reduction with enhanced suspended solids and pollutant removal. The following features make the Isolator® Row PLUS effective as a water quality solution:

- Enhanced infiltration Surface Area
- Runoff Volume Reduction
- Peak Flow Reduction
- Sediment/Pollutant Removal
- Internal Water Storage (IWS)
- Water Temperature Cooling (Thermal Buffer).

Technology Description

The Isolator® Row PLUS (shown in Figures 1 and 2) is the first row of StormTech chambers that is surrounded with filter fabric and connected to a closely located manhole for easy access. The Isolator® Row PLUS provides for settling and filtration of sediment as stormwater rises in the chamber and ultimately passes through the filter fabric. The open-bottom chambers allow stormwater to flow out of the chambers, while sediment is captured in the Isolator® Row PLUS.

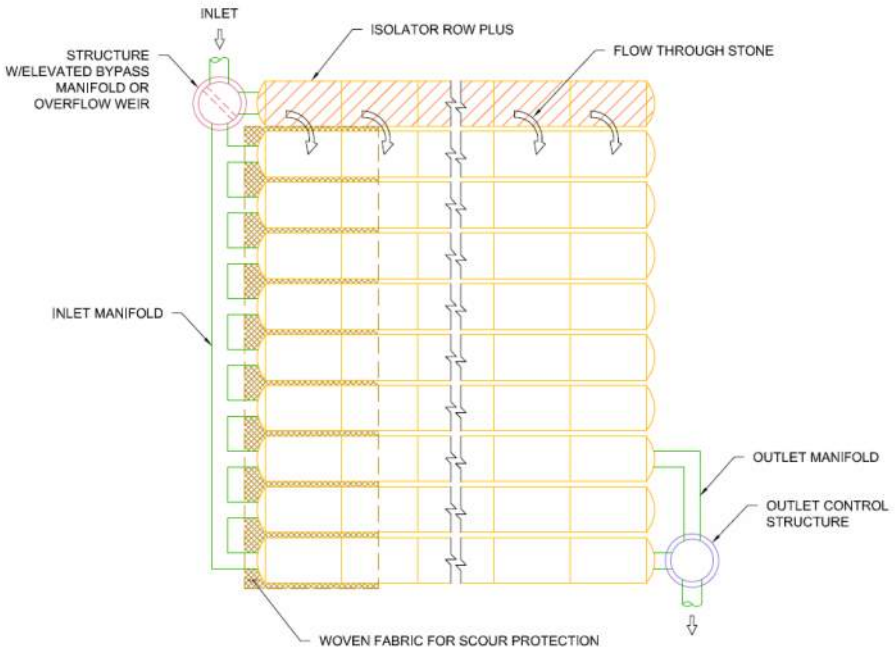


Figure 1: Schematic of the StormTech Isolator® Row PLUS System

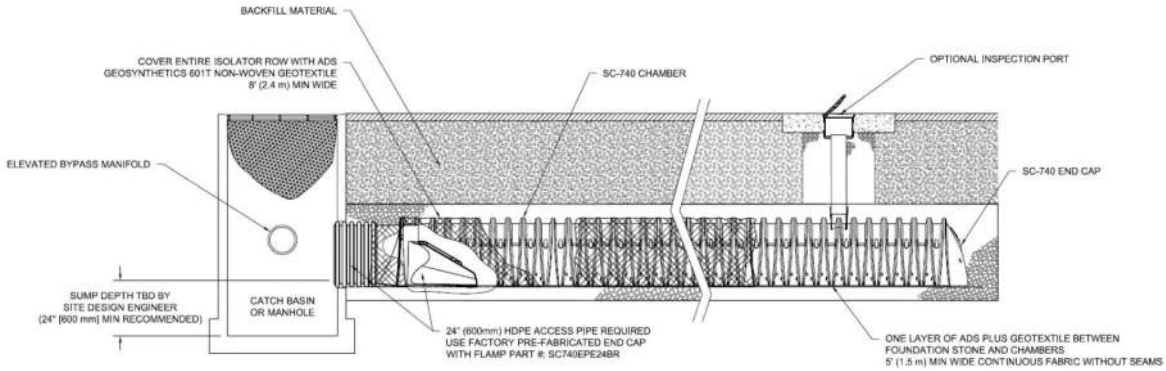


Figure 2: Isolator® Row PLUS Detail

A single layer of proprietary Advanced Drainage Systems (ADS) PLUS fabric is placed between the angular base stone and the Isolator Row PLUS chamber. The geotextile provides the means for stormwater filtration and provides a durable surface for maintenance operations. A 6 oz. non-woven fabric is placed over the chambers.

The Isolator® Row PLUS is designed to capture the “first flush” and offers the versatility to be sized on a volume basis or a flow-rate basis. An upstream manhole not only provides access to the Isolator® Row PLUS but includes a high low/concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator® Row PLUS bypass through a manifold to the other chambers. This is achieved with either a high-flow weir or an elevated manifold. This creates a differential between the Isolator® Row PLUS and the manifold, thus allowing for settlement time in the Isolator® Row PLUS. After Stormwater flows through the Isolator® Row PLUS and into the rest of the StormTech chamber system it is either infiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

StormTech developed and owns the Isolator® Row PLUS technology and has filed a number of patent applications relating to the Isolator® Row PLUS system.[1]

Description of Test Procedure for the StormTech Isolator® Row PLUS

In January 2020, two overlapping StormTech SC-740 Isolator® Row PLUS commercial size chambers were installed at the Mid-Atlantic Storm Water Research Center (MASWRC, a subsidiary of BaySaver), in Mount Airy, Maryland, to evaluate the performance of the Isolator® Row PLUS system for Total Suspended Solid (TSS) removal (Figure 3) All testing and data collection procedures were supervised by Boggs Environmental Consultants, Inc. (BEC), who was hired by ADS for third party oversight, and were in accordance with the *New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device (January 2013)*.

Prior to the start of testing, a Quality Assurance Project Plan (QAPP), revision dated January 09, 2020, was submitted and approved by the New Jersey Corporation for Advanced Technology (NJCAT), c/o Center for Environmental Systems, Stevens Institute of Technology, Castle Point on Hudson, Hoboken, NJ 07030.

[1] (U.S. Provisional Application No. 62/753,050, filed October 30, 2018; U.S. Non-Provisional Application No. 16/670,628, filed October 31, 2019; International Application No. PCT/US2019/059283, filed October 31, 2019; U.S. Application No. 16/938,482, filed July 24, 2020; U.S. Application No. 16/938,657, filed July 24, 2020; PCT International Application No. PCT/US2020/043543, filed July 24, 2020; PCT International Application No. PCT/US2020/043557, filed July 24, 2020.

Figure 3: StormTech "Isolator® Row PLUS" Test Set-up at MASWRC

Verification Results

The verification process for the StormTech Isolator® Row PLUS technology was conducted by GHL in accordance with the VerifiGlobal Verification Plan for the StormTech "Isolator® Row PLUS" Technology – 2020-09-09. The technology performance claims verified by GHL are summarized at the front of this Verification Statement and in Table 6 on Page 8 under the heading "Verification Summary".

Particle size distribution analysis was performed by ECS Mid-Atlantic, LLC of Frederick, MD in accordance with ASTM D422-63(2007). ECS is accredited by the American Association of State Highways and Transportation Officials (AASHTO).

ASTM D422-63(2007) is a sieve and hydrometer method where the larger particles, > 75 microns, are measured using a standard sieve stack while the smaller particles are measured based on their settling time using a hydrometer.

The PSD meets the requirements of NJDEP, which is generally accepted as representative of the type of particle sizes an OGS would be designed to treat. Actual PSD is site and rainfall event specific, so it was necessary to choose a standard PSD to make testing and comparison manageable.

Table 1 shows the NJDEP PSD specification. Table 2 and Figure 4 show the incoming material PSD as determined by ECS Mid-Atlantic and confirmed by the verifier.

Table 1: NJDEP PSD Specification

Particle Size (µm)	NJDEP Minimum Specification
1000	98
500	93
250	88
150	73
100	58
75	48
50	43
20	33
8	18
5	8
2	3
d_{50}	< 75 µm

Table 2 – Particle Size Distribution (PSD) of Test Sediment

Mesh (mm)	US Sieve Size	Sample ID		
		PSD A	PSD B	PSD C
		Percent Finer		
9.525	0.375	100.0	100.0	100.0
4.750	#4	100.0	100.0	100.0
4.000	#5	100.0	100.0	100.0
2.360	#8	100.0	100.0	100.0
2.000	#10	100.0	100.0	100.0
1.180	#16	100.0	100.0	100.0
1.000	#18	100.0	100.0	100.0
0.500	#35	100.0	100.0	100.0
0.425	#40	93.3	93.0	93.6
0.250	#60	90.3	89.8	90.2
0.150	#100	79.3	78.1	78.1
0.125	#120	73.6	71.7	71.7
0.106	#140	68.4	65.2	64.8
0.090	#170	60.2	58.3	57.5
0.075	#200	52.0	50.9	50.3
0.053	#270	48.0	48.3	47.8
0.045	Hydrometer	46.6	46.7	46.7
0.032		42.8	42.9	41.0
0.021		37.1	37.2	35.3
0.0125		25.7	25.7	25.8
0.0090		20.1	20.1	19.2
0.0064		16.3	16.4	14.5
0.0032		8.8	8.7	7.8
0.0014		3.8	3.7	3.8

The suspended sediment concentration analysis was completed by Fredericktowne Labs Inc., Meyersville, MD. Fredericktown Labs is accredited by the Maryland Department of Environment as Maryland Certified Water Quality Laboratory. The analysis procedure was ASTM D3977-97, Suspended Sediment Concentration. The sampling procedure and submission of samples to the test lab were overseen by the independent observer, Boggs Environmental Consultants, Inc.

All test data and calculations were detailed in the report “NJCAT TECHNOLOGY VERIFICATION Isolator® Row PLUS StormTech, LLC”, July 2020, which was submitted to and verified by the New Jersey Corporation for Advanced Technology (NJCAT).

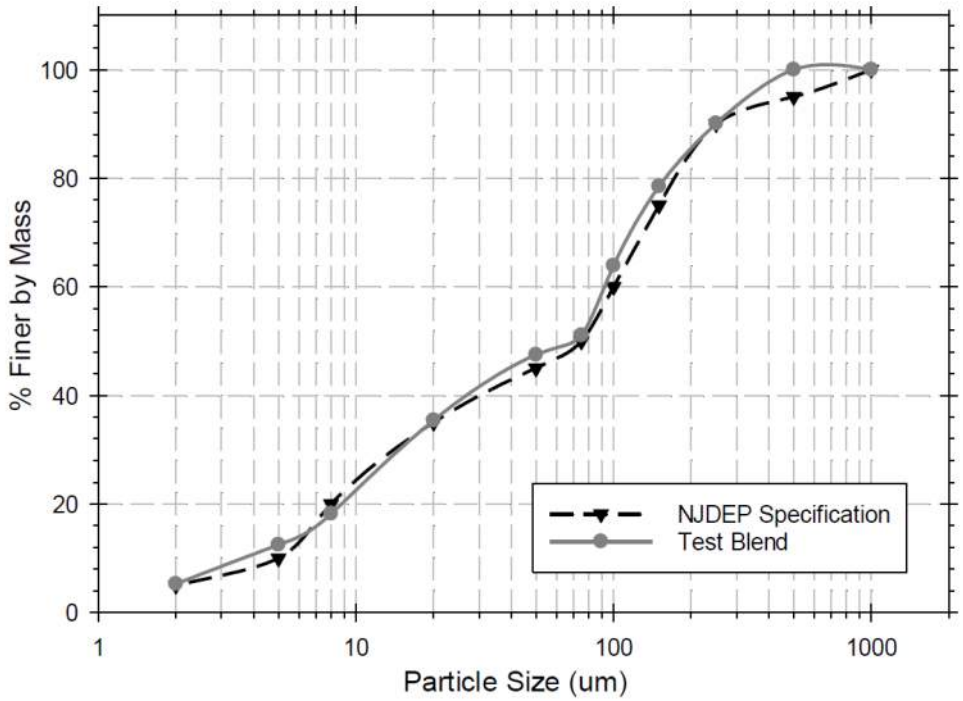


Figure 4– Particle Size Distribution (PSD)

The data in Table 3 (Flow Rate and Temperature) and Table 4 (Removal Efficiency) form the basis for the verified technology performance claim, specifically, flow rate, sediment captured and removal efficiency.

Table 3: Flow Rate and Temperature Summary

Run	Max Flow (gpm)	Min Flow (gpm)	Average Flow (gpm)	Flow COV	Flow Compliance (COV< 0.1)	Maximum Temperature (Fahrenheit)	NJDEP Temperature Compliance (< 80 F)
1	232.8	223.9	226.3	0.0078	Y	48.2	Y
2	228.9	218.6	220.8	0.0104	Y	51.5	Y
3	229.4	220.0	227.2	0.0094	Y	44.7	Y
4	230.2	218.7	223.2	0.0138	Y	40.5	Y
5	228.7	216.9	222.2	0.0103	Y	44.7	Y
6	227.6	217.0	224.2	0.0115	Y	46.7	Y
7	229.7	221.9	226.4	0.0092	Y	44.6	Y
8	230.3	222.2	226.8	0.0089	Y	43.5	Y
9	233.2	218.4	225.6	0.0136	Y	45.5	Y
10	232.2	219.7	228.4	0.0126	Y	44.7	Y
11	226.9	219.2	224.1	0.0088	Y	52.4	Y
12	232.2	222.1	226.9	0.0107	Y	48.5	Y
13	234.7	221.2	226.1	0.0109	Y	48.5	Y
14	231.9	223.4	228.7	0.0103	Y	45.6	Y
15	236.8	224.1	231.4	0.0131	Y	52.2	Y
16	232.5	221.3	229.0	0.0137	Y	47.8	Y

Table 4: Removal Efficiency Results

Run	Average Influent TSS (mg/L)	Influent Water Volume (gal)	Adjusted Average Effluent TSS (mg/L)	Effluent Water Volume (gal)	Adjusted Average Drain Down TSS (mg/L)	Drain Down Water Volume (gal)	Single Run Removal Efficiency (%)	Mass of Captured Sediment (g)	Cumulative Removal Efficiency (%)
1	203	7166	46	6881	34	285	77.8	4282	77.8
2	199	6993	32	6639	27	354	84.0	4415	80.8
3	207	7197	37	6793	27	403	82.6	4654	81.4
4	217	7068	33	6635	29	433	84.9	4923	82.3
5	215	7037	39	6593	29	444	82.2	4705	82.3
6	207	7097	40	6643	31	454	81.2	4504	82.1
7	198	7169	37	6693	30	476	81.6	4386	82.0
8	201	7184	37	6716	32	468	81.6	4473	82.0
9	205	7147	38	6675	30	472	81.8	4539	82.0
10	203	7235	38	6759	31	476	81.4	4523	81.9
11	208	7096	38	6624	30	472	81.8	4567	81.9
12	209	7185	41	6709	30	476	80.7	4584	81.8
13	198	7162	41	6680	32	482	79.7	4277	81.6
14	200	7242	43	6757	34	485	78.8	4318	81.4
15	196	7329	41	6842	32	487	79.5	4320	81.3
16	202	7254	44	6769	31	485	78.9	4384	81.2
Avg.	**204.2**	**7160**	**39**	**6713**	**31**	**447**	**81.2**	**4491**	**N/A**
Cumulative Mass Removed (g)							**71854**		
Cumulative Mass Removed (lb)							**158.4**		
Total Mass Loaded (lb)							**195.2**		
Cumulative Removal Efficiency (%)							**81.2**		

Quality Assurance

Performance verification of the StormTech Isolator® Row PLUS technology was performed in accordance with the requirements of ISO 14034:2016 and the VerifiGlobal Performance Verification Protocol. This included reviewing all data sheets and calculated values, as well as overall management of the test system, quality control and data integrity.

Additional information on quality control measures taken can be found in section 5 of the QAPP for StormTech Isolator Row New Jersey Department of Environmental Protection Testing, Rev. 1/9/2020.

Specific QA/QC measures reviewed by the verifier are summarized in Table 5 below.

Table 5. Validation of QA/QC Procedures

QC Parameter	Acceptance Criteria
Independence of observer	Confirmed in letter from Boggs Environmental Consultants, Inc. to NJCAT
Consistency of procedure	Daily logs confirm proper procedure
Existence of QAPP	Confirmed. “QAPP For StormTech Isolator Row New Jersey Department of Environmental Protection Testing”, Rev. 1/9/2020*)*
Use of appropriate sample analysis method – ASTM D3799	Confirmed by method reference on lab reports from Fredericktowne Labs Inc.
Test method appropriate for the technology	Used industry stakeholder approved protocol: *New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids*

	Removal by a Filtration Manufactured Treatment Device (January 2013)
Test parameters stayed within required limits	Confirmed in report "NJCAT TECHNOLOGY VERIFICATION Isolator® Row PLUS StormTech, LLC", July 2020
Third party verified data	All testing was observed and reviewed by Boggs Environmental Consultants, Inc.

Variance

Performance claims regarding structural load limitations were not verified as they are outside the scope of the performance testing that was conducted in accordance with the 'Quality Assurance Project Plan (QAPP) for StormTech Isolator Row, New Jersey Department of Environmental Protection Testing', revision dated January 09, 2020.

Verification Summary

The StormTech "Isolator® Row PLUS" is a stormwater treatment technology designed for use under parking lots, roadways and heavy earth loads while providing a superior and durable structural system. The technology comprises a row of chambers wrapped in woven geotextile fabric with two layers at the bottom that serve as a filter strip, providing surface area for infiltration and runoff reduction with enhanced suspended solids and pollutant removal.

The StormTech Isolator® Row PLUS technology was tested at the Mid-Atlantic Storm Water Research Center (MASWRC), under the supervision of Boggs Environmental Consultants, Inc. The performance test results for two overlapping StormTech Isolator® Row PLUS chambers (commercial unit model SC-740) were verified by Good Harbour Laboratories Inc. (GHL), following the requirements of ISO 14034:2016 and the VerifiGlobal Performance Verification Protocol. Table 6 summarizes the verification results in relation to the technology performance parameters that were identified in the Verification Plan to determine the efficacy of the StormTech Isolator® Row PLUS technology.

Table 6 - Summary of Verification Results Against Performance Parameters

Parameters	Verified Claims	Accuracy
Total Suspended Solids (TSS) Removal Efficiency	Based on the laboratory testing conducted, the StormTech Isolator® Row PLUS achieved an average 82% removal efficiency of SSC	± 1% (95% confidence level)
Average Loading Rate	Based on the laboratory testing parameters, the StormTech Isolator® Row PLUS maintained a loading rate of 4.15 GPM/sf	±0.03 GPM/sf (95% confidence level)
Maximum Treatment Flow Rate (MTFR)	Although the MTFR varies among the StormTech Isolator® Row PLUS model sizes and the number of chambers, the design surface loading rate remains the same (4.13 GPM/ft^2 of treatment surface area). The test unit consisted of two overlapping StormTech SC-740 chambers with a nominal MTFR of 225 GPM (0.501 CFS) and an effective filtration treatment area (EFTA) of approximately 54.5 ft^2.	± 1.4 GPM (95% confidence level)
Detention Time and Volume	Detention time and wet volume varies with model size. The unit tested had a wet volume of approximately 65.1 ft^3 (based on	N/A

	physical measurement) and a detention time of 2.2 minutes.	
Maximum Sediment Storage Depth and Volume	The sediment storage volume and depth vary according to the StormTech Isolator® Row PLUS model sizes and system configuration. For the two overlapping StormTech SC-740 chambers tested, the maximum sediment storage volume is 2.3 ft^3 at a sediment depth of 0.5 inches.	N/A
Effective Sedimentation/ Filtration Treatment Area	The effective sedimentation and filtration treatment area increases as the size of the chamber increases. Under the tested conditions using 2 overlapping chambers, the treatment area was 54.5 ft^2	The sedimentation /filtration area was determined from the actual physical dimensions of the test unit*
Sediment Mass Load Capacity	The sediment mass load capacity varies according to the StormTech Isolator® Row PLUS model sizes and system configuration. For the two overlapping StormTech SC-740 chambers tested, the mass loading capture was 158.4 lbs (2.91 lbs/ ft^2) following a total sediment loading of 195.2 lbs	± 0.8 lbs (±0.01 lbs/ft^2) (95% confidence level)

*Note: These numbers are determined based on physical measurement or a dimensional drawing, which is standard practice. Highly accurate measurements are not practical.

In conclusion, the StormTech Isolator® Row PLUS is a viable technology that can be used to remove contaminants from stormwater runoff via filtration. This technology has proven effective at removing suspended sediment from stormwater through in-lab testing using an industry recognized laboratory protocol.

By extension of sediment removal, this technology should also remove particle bound nutrients, heavy metals, and a wide variety of organic contaminants. Performance is a function of pollutant properties, hydraulic retention time, filter media, pre-treatment, and flow rate, such that proper design of the system is critical to achieving the desired results.

What is ISO 14034?

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

Benefits of ETV

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

For more information on the StormTech "Isolator® Row PLUS" technology, contact:	For more information on VerifiGlobal, contact:
StormTech, LLC. 520 Cromwell Avenue, Rocky Hill, CT 06067 USA t: +1-888-892-2694 e: info@stormtech.com w: www.stormtech.com	VerifiGlobal c/o ETA-Danmark A/S Göteborg Plads 1, DK-2150 Nordhaven t +45 7224 5900 e: info@verifiglobal.com w: www. verifiglobal.com
Signed for StormTech: *Original signed by:* *Greg Spires* Greg Spires, P.E. General Manager	Signed for VerifiGlobal: *Original signed by:* *Thomas Bruun* Thomas Bruun, Managing Director *Original signed by:* *John Neate* John Neate, Managing Director

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

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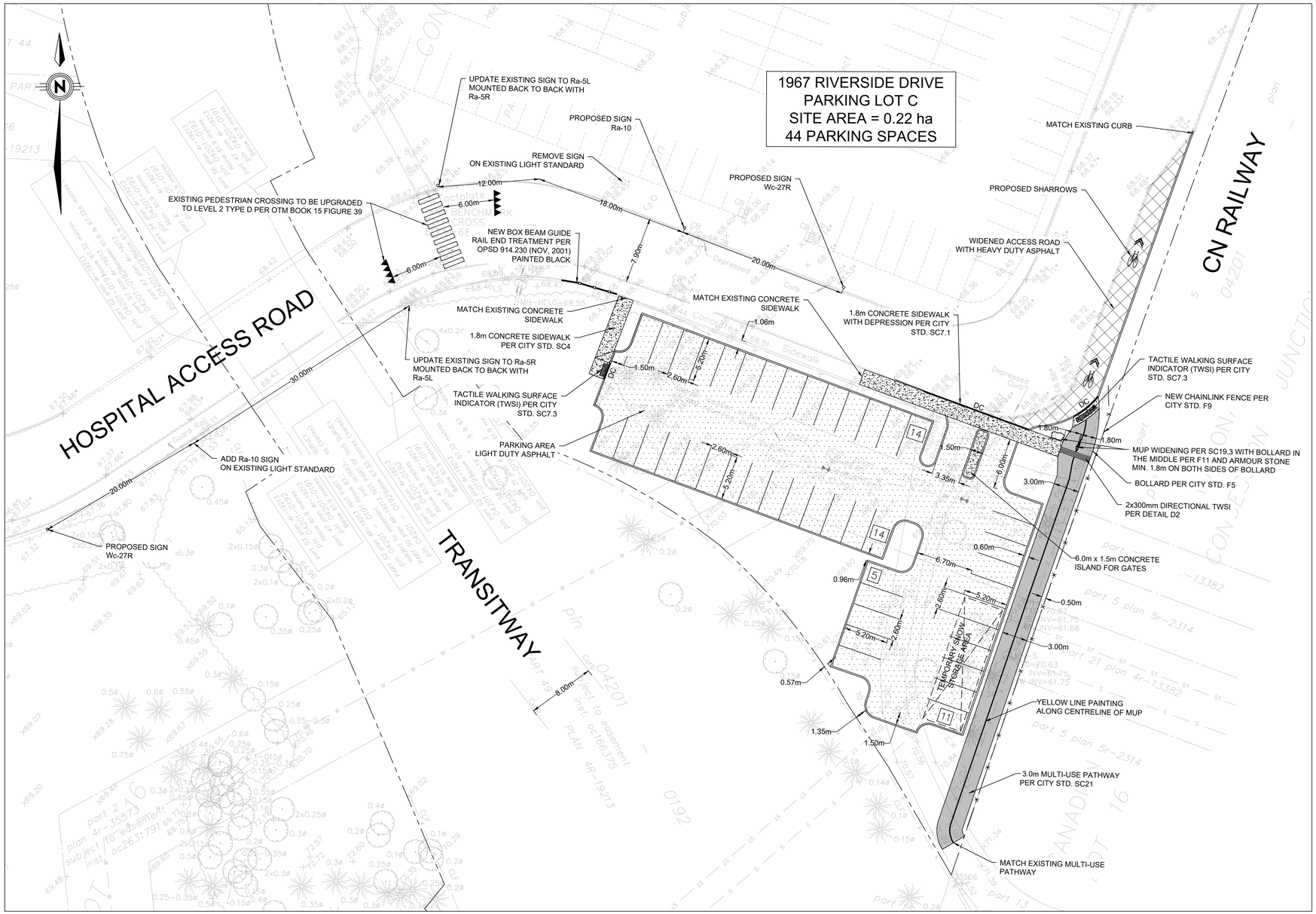
Parking Lot C Drawings



LEGEND:

- EXISTING PROPERTY LINE
- EXISTING GRADE
- PROPOSED LIGHT DUTY PAVEMENT
- PROPOSED HEAVY DUTY PAVEMENT
- PROPOSED CONCRETE
- PROPOSED MULTI-USE PATHWAY
- PROPOSED CONCRETE CURB PER CITY STD. SC1.1
- PROPOSED DEPRESSED CONCRETE CURB WITH TWSI PER CITY STD. SC7.3 (DC)
- EXISTING CHAINLINK FENCE
- PROPOSED CHAINLINK FENCE PER CITY STD. F9

KEY PLAN

NOT TO SCALE

Surveyor

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 CONCOURSE GATE, SUITE 500
NEPEAN, ONTARIO, K2E 7S6

TOPOGRAPHIC INFORMATION & BENCHMARK

SURVEY COMPLETED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. ON MARCH 21, 2024. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM, DERIVED FROM CONTROL MONUMENT NO. 019680274 HAVING AN ELEVATION OF 66.322m.

BOUNDARY INFORMATION WAS COMPILED FROM PLANS 4R-19213, 4R-35573 AND 4R-36051

JOB BENCHMARK

CUT CROSS ON SIDEWALK NEAR OVERPASS
ELEVATION = 68.53m

PROPERTY LEGAL DESCRIPTION

THE SOUTHERLY PART OF PIN 04201-0191
BEING PART OF LOT 16
CONCESSION JUNCTION GORE
GEOGRAPHIC TOWNSHIP OF GLOUCESTER
CITY OF OTTAWA

Client

THE OTTAWA HOSPITAL
1053 CARLING AVENUE
OTTAWA, ONTARIO, K1Y 4E9
(613) 722-7000

PARSONS
1223 MICHAEL STREET, SUITE 100
GLOUCESTER, ONTARIO, K1J 7T2

LICENCED PROFESSIONAL ENGINEER
B. VILLENEUVE
100553987
2025-03-14
PROVINCE OF ONTARIO

No.	Revision	By	Date (yy/mm/dd)
3	RE-ISSUED FOR SPA	BV	2025/03/13
2	RE-ISSUED FOR SPA	BV	2025/01/17
1	ISSUED FOR SPA	BV	2024/11/08

Scale

5m 0 5 10m
SCALE: 1:250

Project Title

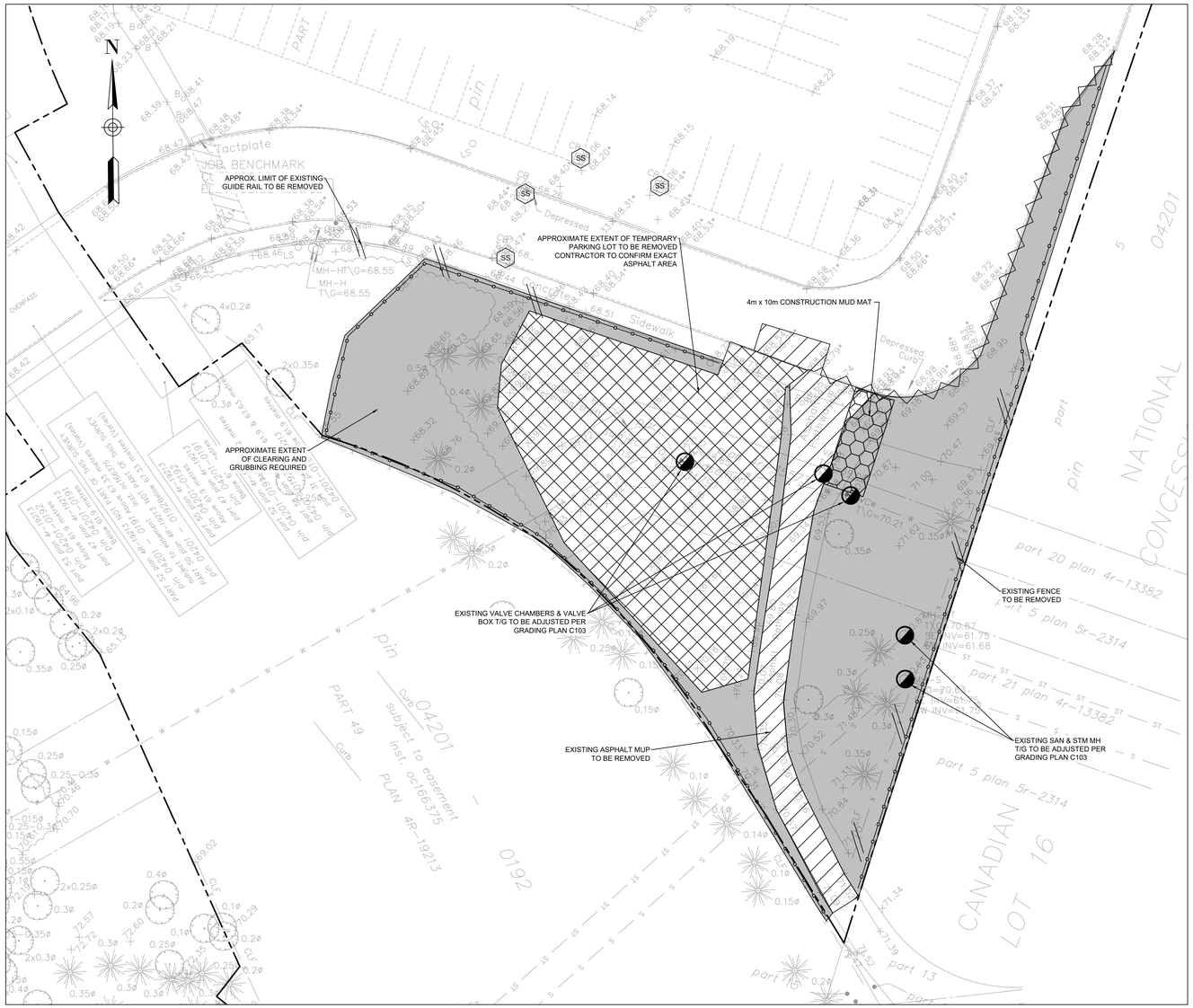
1967 RIVERSIDE DRIVE
RIVERSIDE CAMPUS
PARKING LOTS

Drawing Title

PARKING LOT C - SITE PLAN

Designed by:	BV	Datum	
Drawn by:	BV		
Approved by:	MT		
Project No.	479008	Drawing No.	SP

#19228 D07-12-25-0006



LEGEND:

- EXISTING PROPERTY LINE
- STRUCTURE TO BE ADJUSTED
- SILT SACK PER DETAIL D1
- TEMPORARY PARKING LOT ASPHALT REMOVAL
- CLEARING & GRUBBING AREA/ LANDSCAPE REMOVAL
- EXISTING ASPHALT REMOVAL
- EXISTING CURB REMOVAL
- EXISTING CHAINLINK FENCE
- EXISTING GUARD RAIL
- PROPOSED SILT FENCE AS PER OPSD 219.110

NOTES: REMOVALS AND DEMOLITION

1. PRE-REMOVAL, THE CONTRACTOR MUST VISIT THE PREMISES IN ORDER TO BE FULLY AWARE OF EXISTING CONDITIONS ON SITE, INCLUDING ALL ELEMENTS TO BE REMOVED AND DEMOLISHED. NO CLAIM WILL BE ACCEPTED DUE TO A POOR EVALUATION OF THE WORK TO BE COMPLETED.
2. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND THE REQUEST FOR INTERRUPTION OF PUBLIC UTILITY SERVICES, SUCH AS GAS, TELEPHONE, POWER, CABLE, SEWERS, WATERMAIN, ETC. BEFORE PROCEEDING WITH WORK, COORDINATE WITH ALL APPLICABLE UTILITY COMPANIES.
3. FIRE HYDRANTS TO BE TAGGED AND BAGGED AND/OR PROTECTED AS INDICATED ON DRAWING.
4. CURB, ASPHALT, SIDEWALK, AND GRANULAR BASE TO BE EXCAVATED WITHIN LIMITS OF DEMOLITION REMOVAL. THE CONTRACTOR MUST CARRY OUT NECESSARY SAW CUTS.
5. SEWER / WATERMAIN PIPES TO BE ABANDONED MUST BE CUT, FILL WITH UNSHRINKABLE CONCRETE CONFORMING TO OPSS 1359, AND CAPPED.
6. REMOVE AND DISPOSE SEWERS AS INDICATED. PLUG ANY SERVICE LATERALS TO BE ABANDONED.
7. THE CONTRACTOR MUST ENTIRELY REMOVE THE DEMOLITION WRECKAGE FROM THE CONSTRUCTION SITE OFFSITE IN ACCORDANCE WITH THE REQUIREMENTS OF THE MINISTRY OF ENVIRONMENT AND CLIMATE CHANGE (MOECC).
   a. THE CONTRACTOR MUST DISCARD RECYCLABLE DEMOLITION MATERIALS IN COLLABORATION WITH A REGIONAL RECYCLING COMPANY.
   b. ALL OTHER DEMOLITION MATERIALS MUST BE DISPOSED OFF-SITE AT AUTHORIZED LICENSED LANDFILLS AND IN CONFORMITY WITH THE APPLICABLE LAWS AND REGULATIONS. THE CONTRACTOR MUST BE ABLE TO PROVIDE, UPON REQUEST, COPIES OF THE DISPOSAL TICKETS TO THE OWNER'S REPRESENTATIVE.
8. SURFACES AND WORKS LOCATED OUTSIDE OF THE CONSTRUCTION WORK LIMIT MUST BE REINSTATED AS THEY WERE BEFORE BEGINNING OF WORK. CONTRACTOR IS RESPONSIBLE TO MAKE GOOD ON ANY DAMAGES TO EXISTING CURB AND ASPHALT NOT SCHEDULED FOR REMOVAL.
9. ALL MATERIALS, PRODUCTS AND OTHERS COMING FROM THE DEMOLITION BELONG TO THE CONTRACTOR, UNLESS SPECIFIED OTHERWISE.
10. THE CONTRACTOR MUST COMPLETE ALL REMOVALS AS SHOWN ON THE DRAWINGS AND AS REQUIRED TO MAKE THE WORK COMPLETE.
11. THE CONTRACTOR MUST PROTECT AND MAINTAIN IN SERVICE THE EXISTING WORKS WHICH MUST REMAIN IN PLACE. IF THEY ARE DAMAGED, THE CONTRACTOR MUST IMMEDIATELY MAKE THE REPLACEMENTS AND NECESSARY REPAIRS TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE AND WITHOUT ADDITIONAL EXPENSE TO THE OWNER.
12. THE CONTRACTOR MUST NOT PERFORM ANY TREE CUTTING DURING THE CORE MIGRATORY BIRDS NESTING PERIOD, WHICH IS APRIL 15 TO AUGUST 15.

EROSION AND SEDIMENT CONTROL MEASURES:

- CONTRACTOR IS RESPONSIBLE FOR ALL INSTALLATION, MONITORING, REPAIR AND REMOVAL OF ALL EROSION AND SEDIMENT CONTROL FEATURES. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURE MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
- SEDIMENT AND EROSION CONTROL PLAN OBJECTIVES:
- PREVENT SOIL EROSION. THIS CAN RESULT FROM STREAMING RAIN WATER OR WIND EROSION DURING CONSTRUCTION,
- PREVENT SEDIMENT DEPOSITS IN THE SEWER PIPES AND NEARBY COLLECTING STREAMS (AS APPLICABLE),
- PREVENT AIR POLLUTION FROM PARTICULATE MATTER AND DUST.

1. PRIOR TO START OF CONSTRUCTION:

PRIOR TO THE REMOVAL OF ANY VEGETATIVE COVER, MOVING OF SOIL AND CONSTRUCTION:

- INSTALL SILT FENCE (AS PER OPSD 219.110) ALONG DITCHES IMMEDIATELY DOWNSTREAM FROM AREAS TO BE DISTURBED (SEE PLAN FOR LOCATION).
- INSTALL FILTER CLOTH ON DOWNSTREAM MANHOLE COVERS.
- INSTALL SILTSACK FILTERS IN ALL CONCRETE CATCH BASINS STRUCTURES.
- INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION.
- THE CONTRACTOR MUST SET UP THE MEASURES INDICATED ON THE PLAN, INSPECT THEM FREQUENTLY AND CLEAN AND REPAIR OR REPLACE THE DETERIORATED STRUCTURES. AT THE END OF THE CONSTRUCTION PERIOD, THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF THE TEMPORARY STRUCTURES AND RECONDITIONING THE AFFECTED AREAS

2. DURING CONSTRUCTION:

- SEDIMENT AND EROSION CONTROL MEASURES TO BE CONSTRUCTED AS PER OPSS 805.
- WHEN SEDIMENT AND EROSION CONTROL MEASURES MUST BE REMOVED TO COMPLETE A PORTION OF THE WORK, THE SAME MEASURES MUST BE REINSTATED UPON THE WORK'S COMPLETION.
- WORK TO BE DONE IN THE VICINITY OF MAJOR WATERWAYS TO BE CARRIED OUT FROM JULY AND SEPTEMBER ONLY.
- MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE.
- PROTECT DISTURBED AREAS FROM RUNOFF.
- PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILITATED SHORTLY.
- INSPECT STRAW BALE FLOW CHECK DAMS, SILT FENCES, SILT SACKS, AND CATCH BASIN SUMPS REGULARLY AND AFTER EVERY MAJOR STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY.
- PLAN TO BE REVIEWED AND REVISED AS REQUIRED DURING CONSTRUCTION.
- EROSION CONTROL FENCING TO BE ALSO INSTALLED AROUND THE BASE OF ALL STOCKPILES.
- DO NOT LOCATE TOPSOIL PILES AND EXCAVATION MATERIAL CLOSER THAN 2.5m FROM ANY PAVED SURFACE, OR ONE WHICH IS TO BE PAVED BEFORE THE PILE IS REMOVED. ALL TOPSOIL PILES ARE TO BE SEEDED IF THEY ARE TO REMAIN ON SITE LONG ENOUGH FOR SEEDS TO GROW (LONGER THAN 30 DAYS). WHEN STORING SOIL ON SITE IN PILES THE CONTRACTOR MUST COVER EACH PILE WITH TARPS, STRAW OR A GEOTEXTILE FABRIC TO AVOID FINE PARTICLE TRANSPORT BY WIND AND/OR STREAMING RAIN WATER.
- CONTROL WIND-BLOWN DUST OFF SITE TO ACCEPTABLE LEVELS BY SEEDING TOPSOIL PILES AND OTHER AREAS TEMPORARILY (PROVIDE WATERING AS REQUIRED). FOR DUST CONTROL, CONTRACTOR TO APPLY CALCIUM CHLORIDE (TYPE I – OPSS 2501 AND CAN/CGSB-15-1) AND WATER WITH EQUIPMENT APPROVED BY THE OWNER'S REPRESENTATIVE AT RATE IN ACCORDANCE TO OPSS 506 WHEN DIRECTED BY OWNER'S REPRESENTATIVE.
- ALL EROSION CONTROL STRUCTURE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN STABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE GROUND COVER. SEDIMENT CAPTURE SILT SACKS MUST BE MAINTAINED AND CANNOT BE REMOVED UNTIL ALL LANDSCAPING AREAS ARE COMPLETED.
- NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVES BY THIS CONSULTING ENGINEER AND THE TOWN DEPARTMENT OF PUBLIC WORKS.
- CONTRACTOR RESPONSIBLE FOR MUNICIPAL ROADWAY AND SIDEWALK TO BE CLEANED OF ALL SEDIMENT FROM VEHICULAR TRACKING ETC. AT THE END OF EACH WORK DAY.
- DURING WET CONDITIONS, TIRES OF ALL VEHICLES/EQUIPMENT LEAVING THE SITE ARE TO BE SCRAPED.
- ANY MUD/MATERIAL TRACKED ONTO THE ROAD SHALL BE REMOVED IMMEDIATELY BY HAND OR RUBBER TIRE LOADER.
- TAKE ALL NECESSARY STEPS TO PREVENT BUILDING MATERIAL, CONSTRUCTION DEBRIS OR WASTE BEING SPILLED OR TRACKED ONTO ABUTTING PROPERTIES OR PUBLIC STREETS DURING CONSTRUCTION AND PROCEED IMMEDIATELY TO CLEAN UP ANY AREAS SO AFFECTED.
- PROVIDE GRAVEL ENTRANCE WHEREVER EQUIPMENT LEAVES THE SITE TO PROVIDE MUD TRACKING ONTO PAVED SURFACES. GRAVEL BED SHALL BE A MINIMUM OF 10m LONG, 4m WIDE, AND 0.15m DEEP AND SHALL CONSIST OF COARSE MATERIAL. MAINTAIN GRAVEL ENTRANCE IN CLEAN CONDITION.

3. AFTER CONSTRUCTION:

- PROVIDE PERMANENT COVER CONSISTING OF TOPSOIL AND SEED TO DISTURBED AREAS.
- ALL SEDIMENT AND EROSION CONTROL MEASURES TO BE REMOVED BY THE CONTRACTOR FOLLOWING THE COMPLETION OF WORK AND AFTER DISTURBED AREAS HAVE BEEN REHABILITATED AND STABILIZED. THIS INCLUDES REMOVE STRAW BALE FLOW CHECK DAMS, SILT FENCES AND FILTER CLOTHS ON CATCH BASINS AND MANHOLE COVERS.
- INSPECT AND CLEAN CATCH BASIN SUMPS AND STORM SEWERS.

KEY PLAN

NOT TO SCALE

Surveyor

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 CONCOURSE GATE, SUITE 500
NEPEAN, ONTARIO, K2E 7S6

TOPOGRAPHIC INFORMATION & BENCHMARK

SURVEY COMPLETED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. ON MARCH 21, 2024. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM, DERIVED FROM CONTROL MONUMENT NO. 019680274 HAVING AN ELEVATION OF 66.322m.

BOUNDARY INFORMATION WAS COMPILED FROM PLANS 4R-19213, 4R-35573 AND 4R-36051

JOB BENCHMARK

CUT CROSS ON SIDEWALK NEAR OVERPASS
ELEVATION = 68.53m

Client

THE OTTAWA HOSPITAL
1053 CARLING AVENUE,
OTTAWA, ONTARIO, K1Y 4E9
(613) 722-7000

PARSONS
1223 MICHAEL STREET, SUITE 100
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LICENCED PROFESSIONAL ENGINEER
B. VILLENEUVE
100553987
2025-03-14
PROVINCE OF ONTARIO

No.	Revision	By	Date (yy/mm/dd)
3	RE-ISSUED FOR SPA	BV	2025/03/13
2	RE-ISSUED FOR SPA	BV	2025/01/17
1	ISSUED FOR SPA	BV	2024/11/08

Scale

5m 0 5 10m

SCALE: 1:250

Project Title

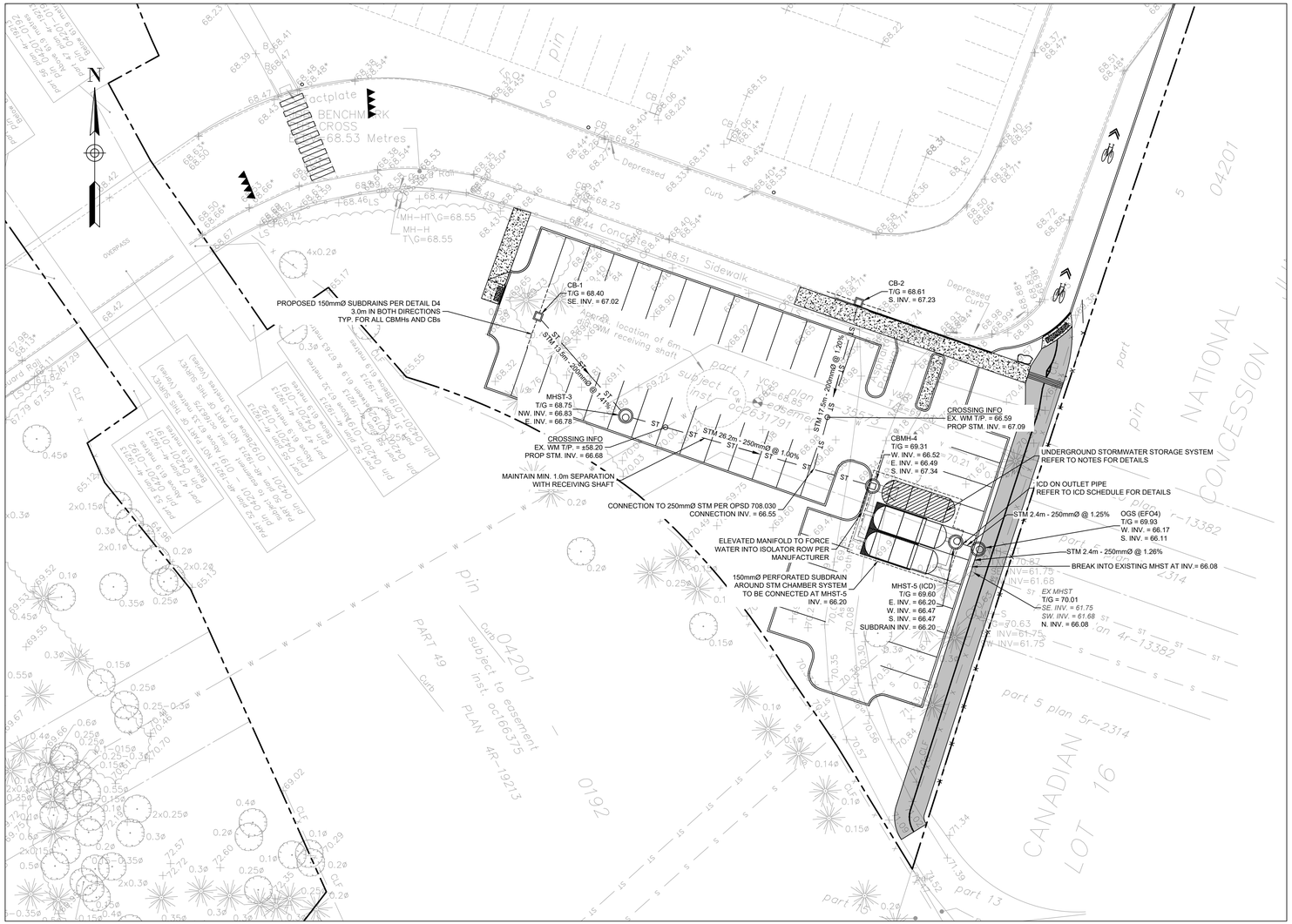
1967 RIVERSIDE DRIVE RIVERSIDE CAMPUS PARKING LOTS

Drawing Title

PARKING LOT C REMOVALS PLAN

Designed by:	BV	Datum	MEAN SEA LEVEL, CGVD28
Drawn by:	BV		
Approved by:	MT		
Project No.	479008	Drawing No.	C101

#19228 D07-12-25-0006



LEGEND:

- EXISTING PROPERTY LINE
- EXISTING WATERMAIN
- EXISTING VALVE BOX
- EXISTING VALVE CHAMBER
- EXISTING SANITARY SEWER AND MAINTENANCE HOLE
- EXISTING STORM SEWER AND MAINTENANCE HOLE
- PROPOSED STORM SEWER AND MAINTENANCE HOLE
- PROPOSED CATCH BASIN MAINTENANCE HOLE WITH 3.0m SUBDRAINS IN BOTH DIRECTIONS
- PROPOSED CATCH BASIN WITH 3.0m SUBDRAINS IN BOTH DIRECTIONS

NOTES: SEWER

1. CONTRACTOR TO CONFIRM ELEVATION OF EXISTING STORM AND SANITARY SEWERS AT PROPOSED CONNECTION POINTS AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE COMMENCING ANY WORK.
2. ALL WORK SHALL BE PERFORMED, AS APPLICABLE IN ACCORDANCE WITH OPSS 407, 408 AND 410.
3. ALL STORM AND SANITARY SEWERS INSTALLED BELOW THE GROUNDWATER TABLE ELEVATION SHALL BE WATERTIGHT AND INFILTRATION TESTS SHALL BE CARRIED OUT ACCORDING TO OPSS.MUNI 410.
4. PIPE MATERIAL TO BE PVC SDR-35 AND CONFORMING TO OPSS 1841, UNLESS INDICATED OTHERWISE. PVC SEWERS TO BE INSTALLED PER OPSD 802.010 (MODIFIED). BEDDING AND COVER MATERIALS TO BE OPSS 1010 GRANULAR 'A' CRUSHER-RUN LIMESTONE BEDDING COMPACTED TO 95% SPMDD.
5. ALL SEWERS WITH LESS THAN 1.5 METERS OF COVER ARE SUBJECTED TO INSULATION PER CITY OF OTTAWA STD DETAIL S35
6. PIPE BACKFILL MATERIAL TO BE APPROVED NATIVE MATERIAL OR SELECT SUBGRADE MATERIAL IN CONFORMANCE WITH OPSS 212.
7. ALL MAINTENANCE HOLES AND CATCH BASIN MAINTENANCE HOLES TO BE 1200mmØ AS PER OPSD 701.010, UNLESS INDICATED OTHERWISE. MAINTENANCE HOLES AND CATCH BASIN MAINTENANCE HOLES TO BE INSTALLED PER OPSS 407.
8. ALL CATCH BASINS TO BE 600x600mm AS PER OPSD 705.010, UNLESS INDICATED OTHERWISE. CATCH BASINS TO BE INSTALLED PER OPSS 407.
9. EXCAVATING, BACKFILLING, AND COMPACTING REQUIRED FOR MAINTENANCE HOLES, CATCH BASIN MAINTENANCE HOLES, AND CATCH BASINS TO BE COMPLETED AS PER OPSS 402. THEY ARE TO BE BACKFILLED WITH OPSS GRANULAR 'B' COMPACTED TO 98% SPMDD. JOINTS BETWEEN SECTIONS TO BE WRAPPED WITH NON-WOVEN GEOTEXTILE.
10. FOR SANITARY STRUCTURES: CAST IRON MAINTENANCE HOLE COVER AS PER OPSD 401.010 TYPE 'A'.
11. FOR STORM STRUCTURES: CAST IRON CATCH BASIN MAINTENANCE HOLE COVER AS PER OPSD 401.010 TYPE 'B' AND CAST IRON CATCH BASIN COVER AS PER OPSD 400.020.
12. SANITARY MAINTENANCE HOLES REQUIRE BENCHING AS PER OPSD 701.021.
13. THE CONTRACTOR IS RESPONSIBLE FOR MAKING OR ARRANGING ALL CONNECTIONS TO THE EXISTING SEWERS AS PER MUNICIPAL REQUIREMENTS. PRIOR TO CONNECTION, THE CONTRACTOR MUST PROVIDE, TO THE CONSULTANT / ENGINEER AND THE CITY FOR APPROVAL, ALL TEST RESULTS PERFORMED ON THE INTERNAL SERVICES.
14. ADVISE THE CITY PUBLIC WORKS AT LEAST 72 HOURS IN ADVANCE BEFORE ANY CONNECTION TO THE CITY SERVICES. CO-ORDINATE WITH CITY AS REQUIRED.
15. TERMINATE AND PLUG ALL SERVICE CONNECTIONS AT 1.0 m FROM EDGE OF THE BUILDING.
16. ALL SEWERS TO BE C.C.T.V. INSPECTED BY THE CONTRACTOR AS PER OPSS 409. TWO COPIES OF THE INSPECTION REPORT MUST BE PROVIDED TO THE CONSULTANT AND THE C.C.T.V. INSPECTION IN DVD FORMAT ONLY.

NOTES: UNDERGROUND STORMWATER STORAGE

1. UNDERGROUND STORMWATER STORAGE SYSTEM CHAMBER TYPE OR EQUIVALENT
2. CHAMBER TYPE: STORMTECH MC-7200 OR APPROVED EQUIVALENT
3. STORAGE PROVIDED: 103.9m³. (INCLUDING PERIMETER STONE)
4. BOTTOM OF FOUNDATION PAD ELEVATION & PERFORATED SUBDRAIN INVERT: 66.20m.
5. BOTTOM OF CHAMBER ELEVATION: 66.43m.
6. TOP OF CHAMBER ELEVATION: 67.96m.
7. TOP OF SYSTEM (PERIMETER STONE) = 68.26m.
8. TOP OF CHAMBER TO BE A MINIMUM OF 600mm BELOW PARKING LOT PAVEMENT AND MAXIMUM 2.1m.
9. SYSTEM TO BE COMPLETELY WRAPPED WITH GEOTEXTILE.
10. SHOP DRAWINGS FOR UNDERGROUND STORAGE SYSTEM SHALL BE PROVIDED.
11. INLET AND OUTLET STRUCTURES (CBMH-4 & MHST-5) TO BE OPSD 701.010 CONCRETE MAINTENANCE HOLES

ICD SCHEDULE						
ICD ID	LOCATION	ORIFICE INVERT (m)	FLOW 5y/100y (L/s)	HEAD 5y/100y (m)	EQUIVALENT DIAMETER (mm)	MODEL*
1	MHST-5	66.20	1.9/3.3	0.68/2.04	33	JOHN MEUNIER HYDROVEX 50VHV-1

* ICD SHOP DRAWINGS SHALL BE SUBMITTED TO PARSONS BEFORE COMMENCING ANY WORK

KEY PLAN

NOT TO SCALE

Surveyor

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 CONCOURSE GATE, SUITE 500
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TOPOGRAPHIC INFORMATION & BENCHMARK

SURVEY COMPLETED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. ON MARCH 21, 2024. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM, DERIVED FROM CONTROL MONUMENT NO. 019680274 HAVING AN ELEVATION OF 66.322m.

BOUNDARY INFORMATION WAS COMPILED FROM PLANS 4R-19213, 4R-35573 AND 4R-36051

JOB BENCHMARK

CUT CROSS ON SIDEWALK NEAR OVERPASS
ELEVATION = 68.53m

Client

The Ottawa Hospital | L'Hôpital d'Ottawa

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PARSONS

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LICENSED PROFESSIONAL ENGINEER
B. VILLENEUVE
100533987
2025-03-14
PROVINCE OF ONTARIO

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Scale

5m 0 5 10m

SCALE: 1:250

Project Title

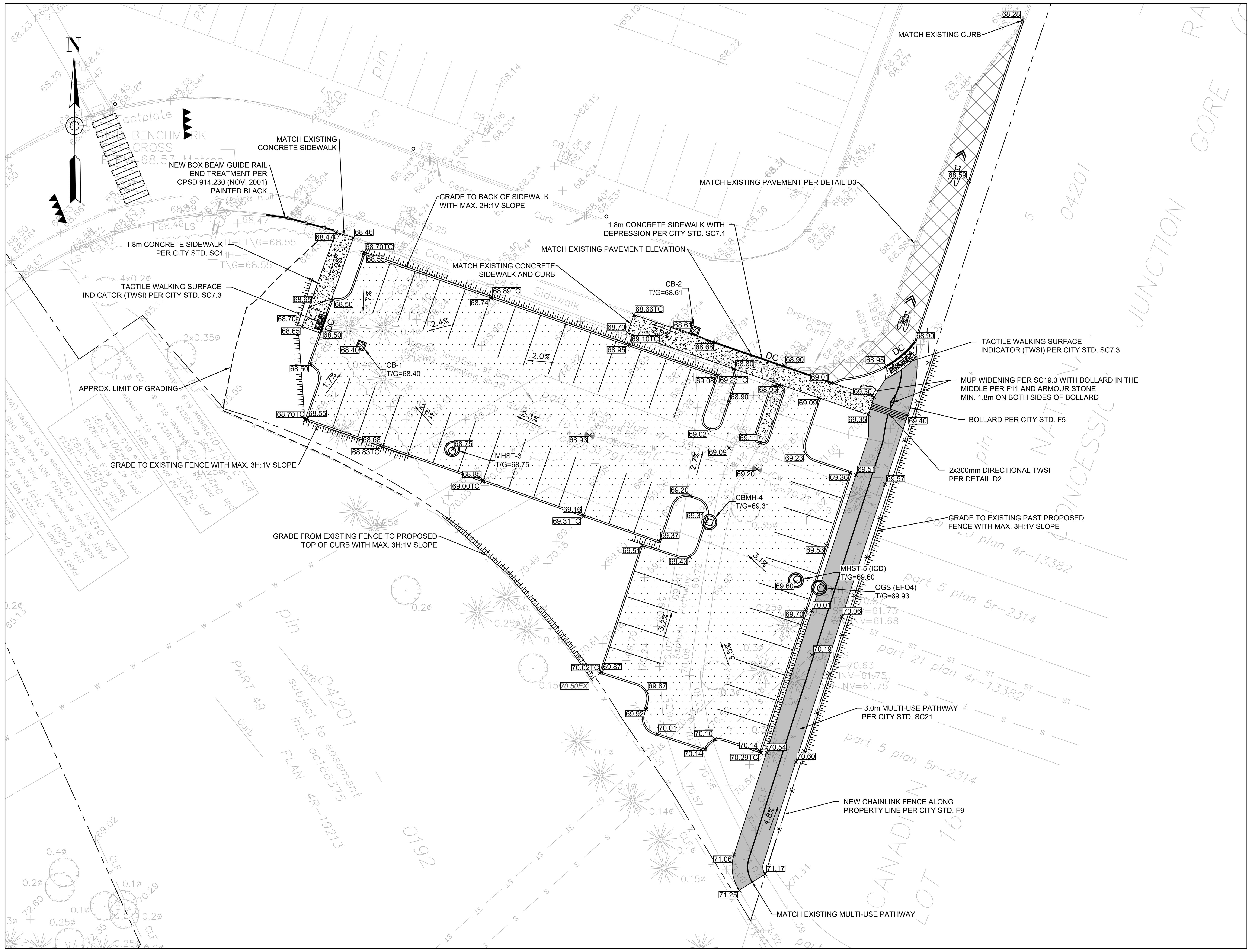
1967 RIVERSIDE DRIVE RIVERSIDE CAMPUS PARKING LOTS

Drawing Title

PARKING LOT C SITE SERVICING PLAN

Designed by: BV	Datum: NAD83 ORIGINAL CGVD28
Drawn by: BV	
Approved by: MT	
Project No. 479008	Drawing No. C102

#19228 D07-12-25-0006



LEGEND:

- EXISTING PROPERTY LINE
- TERRACE (2:1 MAX)
- 99.99 EXISTING GRADE
- 99.99 PROPOSED GRADE
- 99.99TC PROPOSED TOP OF CURB ELEVATION
- 2.0% PROPOSED SLOPE DIRECTION AND PERCENTAGE
- PROPOSED STORM MAINTENANCE HOLE
- PROPOSED CATCH BASIN MAINTENANCE HOLE
- PROPOSED CATCH BASIN
- PROPOSED LIGHT DUTY PAVEMENT
- PROPOSED HEAVY DUTY PAVEMENT
- PROPOSED CONCRETE
- PROPOSED MULTI-USE PATHWAY
- PROPOSED CONCRETE CURB PER CITY STD. SC1.1
- DC PROPOSED DEPRESSED CONCRETE CURB WITH TWSI PER CITY STD. SC7.3
- — x — x — EXISTING CHAINLINK FENCE
- — x — x — PROPOSED CHAINLINK FENCE

KEY PLAN

NOT TO SCALE

Surveyor

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JOB BENCHMARK

CUT CROSS ON SIDEWALK NEAR OVERPASS
ELEVATION = 68.53m

NOTES: GENERAL

1. THE CONTRACTOR MUST CONFORM TO ALL LAWS, CODES, ORDINANCES, AND REGULATIONS ADOPTED BY FEDERAL, PROVINCIAL OR MUNICIPAL GOVERNMENT COUNCILS AND GOVERNMENT AGENCIES, APPLYING TO WORK TO BE CARRIED OUT. WHEREVER STANDARDS, LAWS AND/OR REGULATIONS ARE MENTIONED THEY REFER TO THEIR CURRENT VERSIONS, MODIFICATIONS INCLUDED.
2. ALL MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE ONTARIO PROVINCIAL STANDARD SPECIFICATIONS AND DRAWINGS (OPSS AND OPSD), THE ONTARIO MINISTRY OF ENVIRONMENT AND CLIMATE CHANGE, THE ONTARIO MINISTRY OF NATURAL RESOURCES, APPLICABLE CONSERVATION AUTHORITIES, THE MUNICIPAL STANDARD SPECIFICATIONS AND DRAWINGS, AND ALL OTHER GOVERNING AUTHORITIES AS THEY APPLY, UNLESS OTHERWISE INDICATED.
3. ALL MATERIAL SUPPLIED AND PLACED FOR PARKING LOT AND ACCESS ROAD CONSTRUCTION SHALL BE TO OPSS STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED. CONSTRUCTION TO OPSS 206, 310 & 314. MATERIALS TO OPSS 1001, 1003 & 1010.
4. THE LOCATION OF EXISTING UNDERGROUND MUNICIPAL SERVICES AND PUBLIC UTILITIES AS SHOWN ON THE PLANS ARE APPROXIMATE. THE CONTRACTOR MUST DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES (ON-SITE AND OFF-SITE) PRIOR TO ANY EXCAVATION WORK. DAMAGE TO ANY EXISTING SERVICES AND/OR EXISTING UTILITIES DURING CONSTRUCTION, WHETHER OR NOT SHOWN ON THE DRAWINGS MUST BE REPAIRED BY THE CONTRACTOR AT HIS OWN EXPENSE.
5. THE CONTRACTOR SHALL DETERMINE THE EXACT INVERT (GEODETIC ELEVATION), DIAMETER AND CONSTRUCTION MATERIAL OF THE EXISTING CONDUITS AT THE PROPOSED CONNECTIONS. THEY SHALL ALSO CARRY OUT, IF NECESSARY, EXPLORATORY DIGS IN ORDER TO DETERMINE THE EXACT LOCATION AND INVERTS OF EXISTING DUCK BANKS. THIS INFORMATION SHALL IMMEDIATELY BE PROVIDED TO THE CONSULTANT PRIOR TO START UNDERTAKING ANY MUNICIPAL SERVICES WORK AND A 48 HOUR PERIOD MUST BE ALLOCATED TO THE CONSULTANT FOR DESIGN REVIEW.
6. AT PROPOSED UTILITY CONNECTION POINTS AND CROSSINGS (I.E. STORM SEWER, SANITARY SEWER, WATER, ETC.) THE CONTRACTOR SHALL DETERMINE THE PRECISE LOCATION AND DEPTH OF EXISTING UTILITIES AND REPORT ANY DISCREPANCIES OR CONFLICTS TO THE ENGINEER BEFORE COMMENCING WORK.
7. CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT FOR CONSTRUCTION PURPOSES.
8. THE CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF ALL WORK AND ACTIVITIES WITH OTHERS TRADES AND CONTRACTORS.
9. THE CONTRACTOR IS THE ONLY PERSON IN CHARGE OF SAFETY ON THE BUILDING SITE. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADEQUATE PROTECTION OF THE WORKERS, OTHER PERSONNEL AND THE GENERAL PUBLIC, PROTECTION OF MATERIALS, AS WELL AS MAINTAINING IN GOOD CONDITION THE COMPLETED WORKS AND WORKS TO BE COMPLETED. THE CONTRACTOR MUST PROVIDE AT ANY TIME:
   a. A SUFFICIENT NUMBER OF FENCES, BARRIERS, POSTERS, GUARDS AND OTHERS TO ENSURE SAFETY;
   b. NECESSARY CONVENIENCES FOR THE COMPLETION OF WORK SUCH AS HEATING, LIGHTING, VENTILATION ETC.
10. CONTRACTOR IS RESPONSIBLE TO OBTAIN THE VARIOUS PERMITS/APPROVALS REQUIRED TO COMPLETE ALL THE WORKS AND ACTIVITIES AND BEAR COST OF THE SAME, SUCH AS BUT NOT LIMITED TO; ROAD CUT PERMITS, SEWER PERMITS, WATER PERMIT, ETC. AND THEIR ASSOCIATED COSTS.
11. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS.
12. JOB BENCH MARK - CONFIRM WITH PARSONS PRIOR TO UTILIZATION. THE CONTRACTOR MUST MAINTAIN BENCHMARKS AND LANDMARK REFERENCES AS IS. OTHERWISE THESE REFERENCES WILL BE REPOSITIONED BY A CERTIFIED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.
13. ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND LOW POINTS EXCEPT WHERE APPROVED SWALE OR CATCH BASIN OUTLETS ARE PROVIDED.
14. IF GROUNDWATER IS ENCOUNTERED DURING CONSTRUCTION, DEWATERING OF EXCAVATIONS COULD BE REQUIRED. IT IS ASSUMED THAT GROUNDWATER MAY BE CONTROLLED BY SUMP AND PUMPING METHODS. THE CONTRACTOR SHALL OBTAIN A PERMIT TO TAKE WATER IF SITE CONDITIONS REQUIRE TAKING MORE THAN A TOTAL OF 400 000 L/DAY.
15. STRIP AND REMOVE ALL TOPSOIL FROM IMPROVED AREAS. SITE PREPARATION INCLUDES CLEARING, GRUBBING, STRIPPING OF TOPSOIL, DEMOLITION, REMOVAL OF UNSUITABLE MATERIALS, CUT, FILL AND ROUGH GRADING OF ALL AREAS TO RECEIVE FINISHED SURFACES.
16. ABUTTING PROPERTY GRADE TO BE MATCHED.
17. ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW CUT TO FORM A NEAT AND STRAIGHT LINE PRIOR TO PLACING NEW PAVEMENT. PAVEMENT REINSTATEMENT SHALL BE WITH STEP JOINTS OF 300mm WIDTH MINIMUM.
18. CURBS TO BE BARRIER, CONSTRUCTED AS PER OPSD 600.110, EXCEPT WHERE INDICATED OTHERWISE. ELEVATION AT TOP OF CONCRETE CURBS TO BE 150 mm ABOVE THE ASPHALT, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
19. DEPRESSED CURBS TO BE MOUNTABLE, CONSTRUCTED AS PER OPSD 600.100.
20. LIGHT DUTY AND HEAVY DUTY ASPHALT PAVEMENTS TO BE CONSTRUCTED AS PER TABLE ON DRAWING C103.
21. TRANSITION BETWEEN EXISTING AND PROPOSED PAVEMENT SHALL BE CONSTRUCTED AS PER DETAIL D3 ON DRAWING C104.
22. RESTORE PAVEMENT STRUCTURE AND SURFACES ON EXISTING ROADS TO A CONDITION AT LEAST EQUAL TO ORIGINAL AND TO THE SATISFACTION OF THE MUNICIPAL AUTHORITIES.
23. CLEANLINESS ON THE SITE, INCLUDES THE CONTRACTOR SHALL CLEAN ROADWAYS AT HIS OWN COST AS DIRECTED BY THE OWNER'S REPRESENTATIVE, MATERIALS AND EQUIPMENT MUST BE LAID OUT IN AN ORGANIZED AND SAFE MANNER, AND ALL MATERIAL, EQUIPMENT AND TEMPORARY STRUCTURES WHICH ARE NO LONGER NECESSARY FOR THE EXECUTION OF THE CONTRACT MUST BE REMOVED FROM THE SITE.
24. CONTRACTOR TO ENSURE MITIGATION MEASURES ARE IMPLEMENTED TO REDUCED THE RISK OF GROUND CONTAMINATION FROM PETROLEUM PRODUCTS.
25. THE CONTRACTOR MUST ENSURE THE FOLLOWING MEASURES ARE IMPLEMENTED REGARDING THE HANDLING OF CONCRETE:
   a. CONCRETE SHOULD EITHER BE MIXED AWAY FROM THE SITE OR SHOULD BE PREPARED ON PAVED SURFACES IF ONLY SMALL QUANTITIES ARE REQUIRED (I.E. MINOR REPAIRS);
   b. EXCESS CONCRETE MUST BE DISPOSED OFF-SITE AT A LOCATION THAT MEETS ALL REGULATORY REQUIREMENTS;
   c. THE WASHING OF CONCRETE TRUCKS AND OTHER EQUIPMENT USED FOR MIXING CONCRETE SHOULD NOT BE CARRIED OUT WITHIN 30 METERS OF A WATERCOURSE OR WETLAND AND SHOULD TAKE PLACE OUTSIDE OF THE WORK SITE;
   d. ALL CONCRETE TRUCKS SHOULD COLLECT THEIR WASH WATER AND RECYCLE IT BACK INTO THEIR TRUCKS FOR DISPOSAL OFF-SITE AT A LOCATION MEETING ALL REGULATORY REQUIREMENTS.
26. THE CONTRACTOR SHALL ENSURE THAT ALL EXCAVATED SURPLUS MATERIALS THAT WILL BE REQUIRED TO BE DISPOSED OFFSITE BE STOCKPILED TEMPORALLY FOR SAMPLING PRIOR BEING LOADED OFFSITE.
27. MINIMIZE DISTURBANCE TO EXISTING VEGETATION DURING THE EXECUTION OF ALL WORKS.
28. TRENCHING, BACKFILLING AND COMPACTING MUST CONFORM TO OPSS 401.
29. DEWATERING OF PIPELINE, UTILITY AND ASSOCIATED STRUCTURE EXCAVATIONS TO BE COMPLETED AS PER OPSS 517.
30. THE CONTRACTOR MUST CONTROL SURFACE RUNOFF FROM PRECIPITATION DURING CONSTRUCTION.
31. FOR ALL GEOTECHNICAL WORK, CONTRACTOR TO REFER TO "GEOTECHNICAL INVESTIGATION, PROPOSED NEW EMPLOYEE PARKING LOTS "C" AND "C1", THE OTTAWA HOSPITAL, RIVERSIDE CAMPUS, OTTAWA, ONTARIO, BY GEMTEC. DATED MARCH 13, 2025."
32. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL UNLESS OTHERWISE DIRECTED FROM THE ENGINEER. EXCAVATE AND REMOVE ALL ORGANIC MATERIAL AND DEBRIS LOCATED WITHIN THE PROPOSED BUILDING, PARKING AND ROADWAY LOCATIONS.
33. THE CONTRACTOR IS RESPONSIBLE FOR ALL EXCAVATION, BACKFILL AND REINSTATEMENT OFF ALL AREAS DISTURBED DURING CONSTRUCTION TO EXISTING CONDITIONS OR BETTER AND ALL ASSOCIATED WORKS TO THE SATISFACTION OF THE CONSULTANT AND MUNICIPAL AUTHORITIES. ASPHALT REINSTATEMENT MUST BE IN ACCORDANCE WITH OPSS 310. LANDSCAPE AREAS TO BE REINSTATED WITH 150 mm OF TOPSOIL AND SOD IN ACCORDANCE WITH OPSS 802 AND OPSS 803.
34. DURING THE CONSTRUCTION PERIOD THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING TEMPORARY TRAFFIC SIGNAGE, INCLUDING TRAFFIC SIGNS, TRAFFIC MARKINGS AND TEMPORARY TRAFFIC LIGHTS, AND FLAGMEN, AS REQUIRED BY THE OWNER, THE CONSULTANT, THE MUNICIPALITY, THE MTO, AND OTHER GOVERNING AUTHORITIES.
35. CONSTRUCT SIDEWALK EXPANSION JOINTS & CONTROL JOINTS AS PER OPSD 310.020.
36. CONSTRUCT CONCRETE SIDEWALK AS PER OPSD 310.020 AND OPSS 351. TACTILE WALKING SURFACE INDICATORS PER OPSS 351.
37. DISPOSE OF CONTAMINATED MATERIALS AT APPROPRIATE OFF-SITE FACILITY THAT MEETS ALL REGULATORY REQUIREMENTS.
38. BE PREPARED TO INTERCEPT, CLEAN UP, AND DISPOSE OF SPILLS OR RELEASES THAT MAY OCCUR WHETHER ON LAND OR WATER. MAINTAIN MATERIALS AND EQUIPMENT REQUIRED FOR CLEANUP OF SPILLS OR RELEASES READILY ACCESSIBLE ON SITE.
39. PROMPTLY REPORT SPILLS AND RELEASES POTENTIALLY CAUSING DAMAGE TO ENVIRONMENT TO: AUTHORITY HAVING JURISDICTION OR INTEREST IN SPILL OR RELEASE INCLUDING CONSERVATION AUTHORITY, WATER SUPPLY AUTHORITIES, DRAINAGE AUTHORITY, ROAD AUTHORITY, AND FIRE DEPARTMENT.
40. DECONTAMINATE EQUIPMENT AFTER WORKING IN POTENTIALLY CONTAMINATED WORK AREAS AND PRIOR TO SUBSEQUENT WORK OR TRAVEL ON CLEAN AREAS.
41. DO NOT DISCHARGE DECONTAMINATED WATER, OR SURFACE WATER RUNOFF, OR GROUNDWATER WHICH MAY HAVE COME IN CONTACT WITH POTENTIALLY CONTAMINATED MATERIAL, OFF SITE OR TO MUNICIPAL SEWERS.
42. CONTRACTOR IS TO SUBMIT A TRAFFIC MANAGEMENT PLAN FOR APPROVAL ONE (1) WEEK PRIOR TO ANY WORK WITHIN THE ROW LIMITS TO MEET THE REQUIREMENTS OF MTO BOOK 7. THE CONTRACTOR WILL BE REQUIRED TO IMPLEMENT ALL REQUIREMENTS OF THE MTO BOOK 7.
43. CITY PUBLIC WORKS DEPARTMENT TO BE CONTACTED MINIMUM 7 DAYS PRIOR TO PLANNED DATE FOR CONNECTION TO EXISTING STORM SEWERS, SANITARY SEWERS, AND WATERMAIN. CONNECTION TO EXISTING TO TAKE PLACE IN THE PRESENCE OF APPROPRIATE CITY OF OTTAWA STAFF.

PAVEMENT STRUCTURES

MATERIAL	LIGHT DUTY	HEAVY DUTY	COMPACTION
SURFACE LAYER : SP 12.5 (PG 58-28 LEVEL B)	60 mm	MATCH EXISTING	≥ 92%*
BASE LAYER : SP 19 (PG 58-28 LEVEL B)	-	MATCH EXISTING	≥ 92%*
GRANULAR BASE : OPSS GRANULAR A	150 mm	MATCH EXISTING	98%**
GRANULAR SUB-BASE : OPSS GRANULAR B TYPE II	300 mm	MATCH EXISTING	98%**

*MINIMUM PAVEMENT COMPACTION BASED ON MAXIMUM RELATIVE DENSITY, PER OPSS.MUNI 310
**OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY
SOURCE: GEOTECHNICAL INVESTIGATION, PROPOSED NEW EMPLOYEE PARKING LOTS "C" AND "C1", THE OTTAWA HOSPITAL, RIVERSIDE CAMPUS, OTTAWA, ONTARIO, BY GEMTEC, DATED MARCH 13, 2025

Client

The Ottawa Hospital | L'Hôpital d'Ottawa

THE OTTAWA HOSPITAL
1053 CARLING AVENUE,
OTTAWA, ONTARIO, K1Y 4E9
(613) 722-7000

PARSONS
1223 MICHAEL STREET, SUITE 100
GLOUCESTER, ONTARIO, K1J 7T2

LICENSED PROFESSIONAL ENGINEER
B. VILLENEUVE
100553987
2025-03-14
PROVINCE OF ONTARIO

No.	Revision	By	Date (yy/mm/dd)
3	RE-ISSUED FOR SPA	BV	2025/03/13
2	RE-ISSUED FOR SPA	BV	2025/01/17
1	ISSUED FOR SPA	BV	2024/11/08

Scale

5m 0 5 10m
SCALE: 1:250

Project Title

1967 RIVERSIDE DRIVE
RIVERSIDE CAMPUS
PARKING LOTS

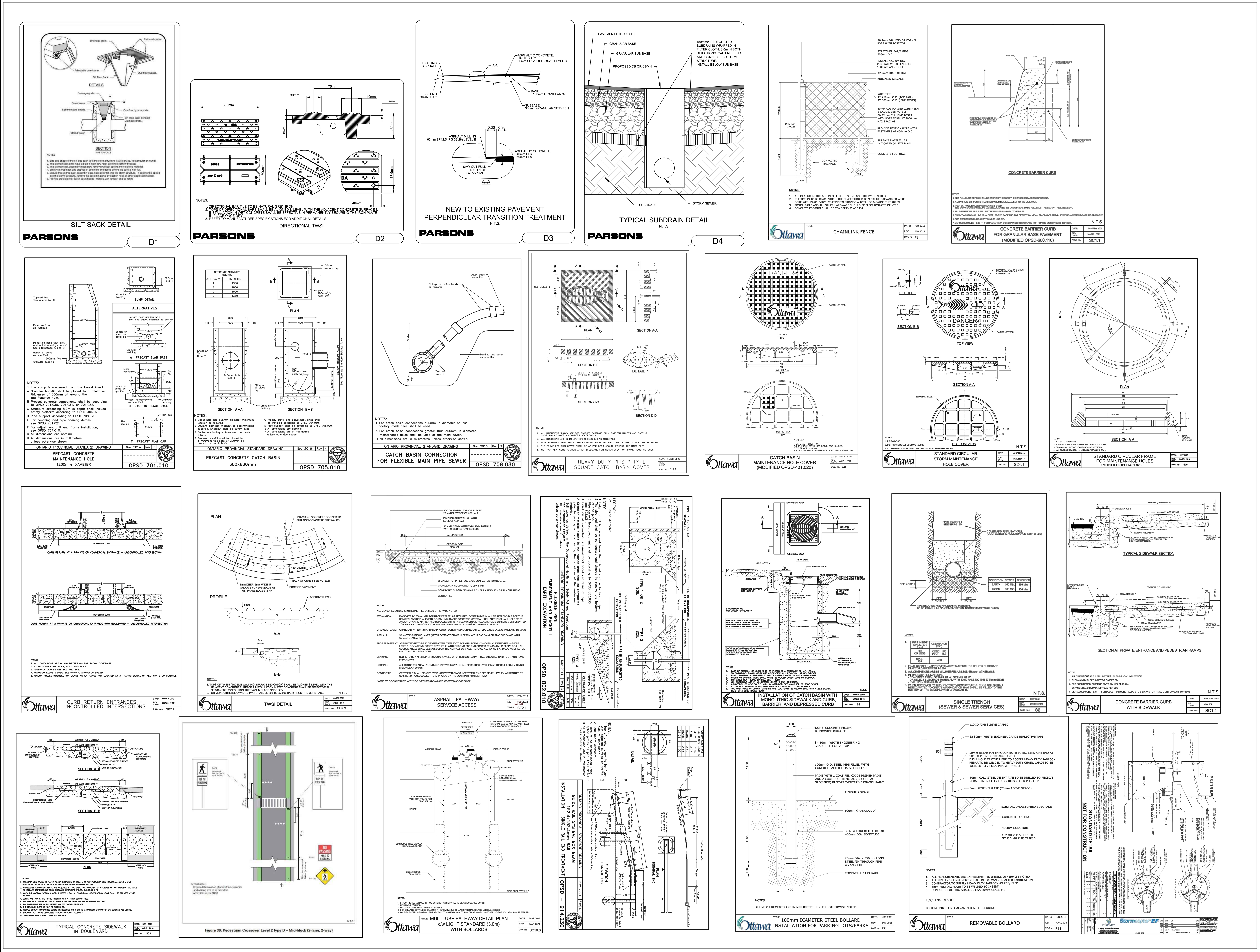
Drawing Title

PARKING LOT C
GRADING PLAN

Designed by: BV
Drawn by: BV
Approved by: MT
Datum: CGVD28

Project No. 479008
Drawing No. C103

D07-12-25-0006
#19228



KEY PLAN

NOT TO SCALE

Surveyor

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 CONCOURSE GATE, SUITE 500
NEPEAN, ONTARIO, K2E 7S6

TOPOGRAPHIC INFORMATION & BENCHMARK

SURVEY COMPLETED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. ON MARCH 21, 2024. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM, DERIVED FROM CONTROL MONUMENT NO. 019680274 HAVING AN ELEVATION OF 66.322m.

BOUNDARY INFORMATION WAS COMPILED FROM PLANS 4R-19213, 4R-35573 AND 4R-36051

JOB BENCHMARK

CUT CROSS ON SIDEWALK NEAR OVERPASS
ELEVATION = 68.53m

Client

The Ottawa Hospital | L'Hôpital d'Ottawa

THE OTTAWA HOSPITAL
1053 CARLING AVENUE,
OTTAWA, ONTARIO, K1Y 4E9
(613) 722-7000

PARSONS
1223 MICHAEL STREET, SUITE 100
GLOUCESTER, ONTARIO, K1J 7T2

LICENSED PROFESSIONAL ENGINEER
B. VILLENEUVE
100553987
2025-03-14
PROVINCE OF ONTARIO

No.	Revision	By	Date (yy/mm/dd)
3	RE-ISSUED FOR SPA	BV	2025/03/13
2	RE-ISSUED FOR SPA	BV	2025/01/17
1	ISSUED FOR SPA	BV	2024/11/08

Scale
5m 0 5 10m
SCALE: 1:250

Project Title

1967 RIVERSIDE DRIVE
RIVERSIDE CAMPUS
PARKING LOTS

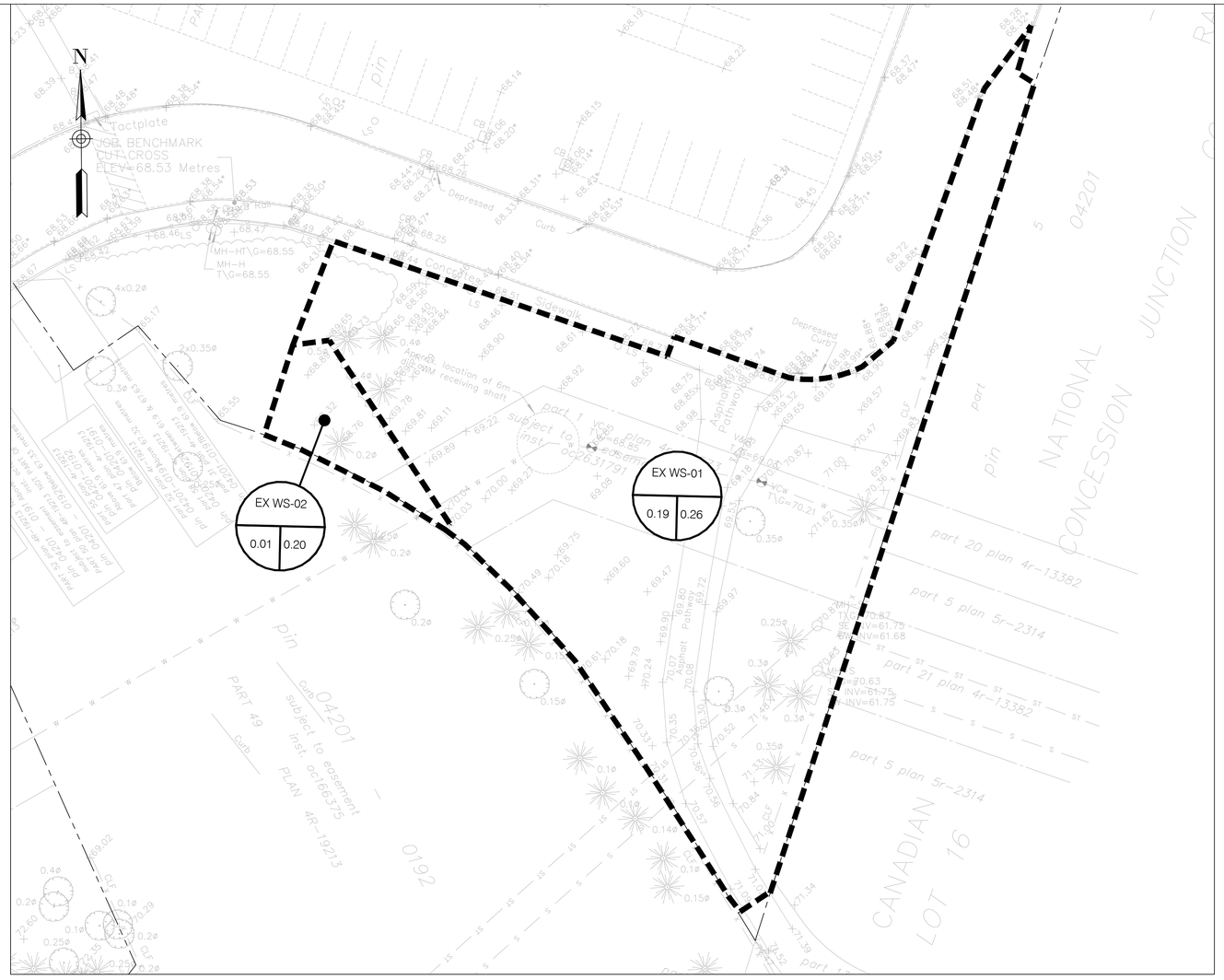
Drawing Title

PARKING LOT C
DETAILS

Designed by:	BV	Datum	NAD83 ORIGINAL CGVD28
Drawn by:	BV		
Approved by:	MT		
Project No.	479008	Drawing No.	C104

D07-12-25-0006

#19228



LEGEND:

EXISTING PROPERTY LINE

EXISTING WATERSHED BOUNDARY

WS-XX — WATERSHED NAME

0.61 | 0.90 — RUNOFF COEFFICIENT

AREA IN HECTARES

KEY PLAN

NOT TO SCALE

Surveyor

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 CONCOURSE GATE, SUITE 500
NEPEAN, ONTARIO, K2E 7S6

TOPOGRAPHIC INFORMATION & BENCHMARK

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BOUNDARY INFORMATION WAS COMPILED FROM PLANS 4R-19213, 4R-35573 AND 4R-36051

JOB BENCHMARK

CUT CROSS ON SIDEWALK NEAR OVERPASS
ELEVATION = 68.53m

Client

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1053 CARLING AVENUE,
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B. VILLENEUVE
100553987
2025-03-14
PROVINCE OF ONTARIO

No.	Revision	By	Date (yy/mm/dd)
3	RE-ISSUED FOR SPA	BV	2025/03/13
2	RE-ISSUED FOR SPA	BV	2025/01/17
1	ISSUED FOR SPA	BV	2024/11/08

Scale

5m 0 5 10m

SCALE: 1:250

Project Title

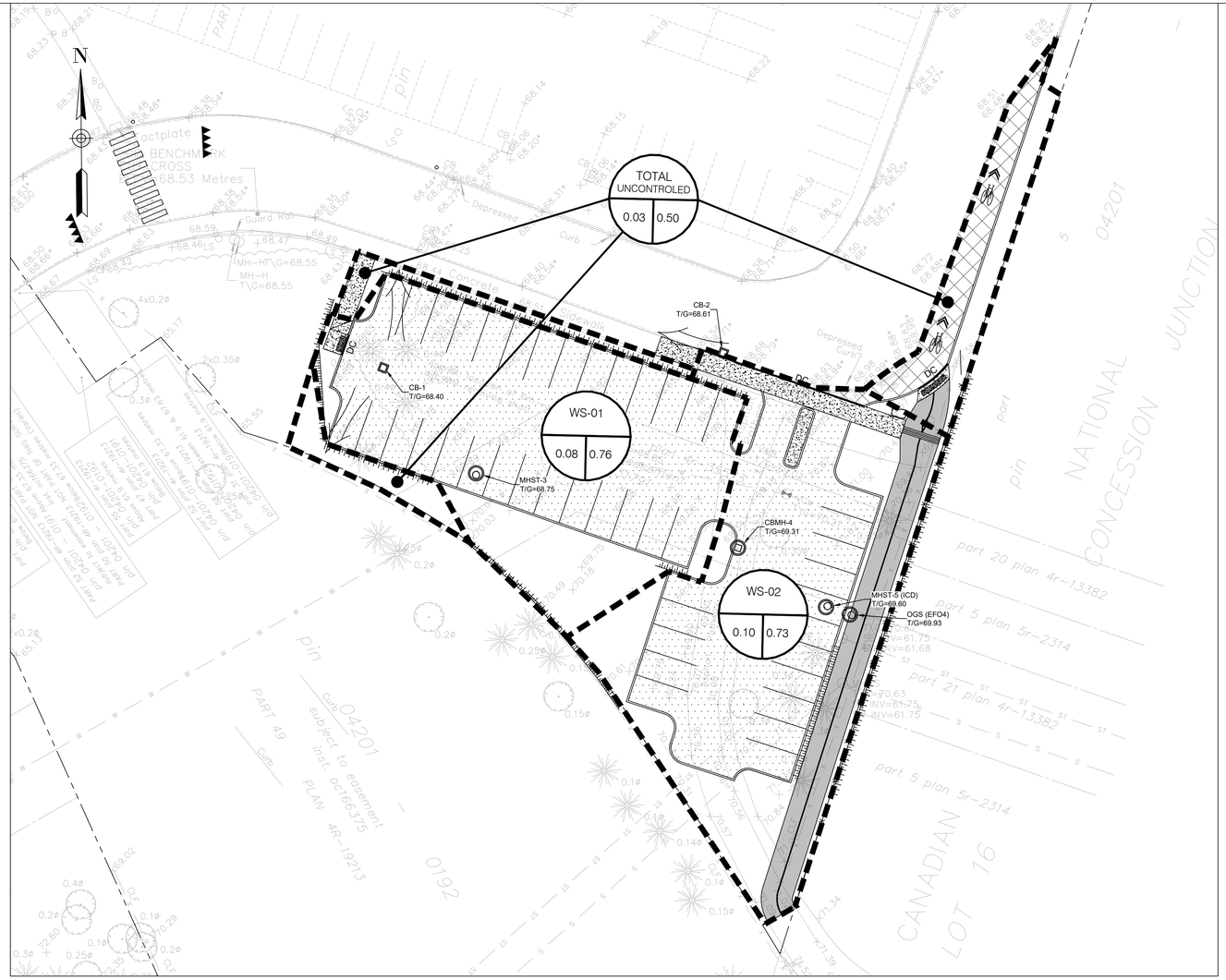
1967 RIVERSIDE DRIVE
RIVERSIDE CAMPUS
PARKING LOTS

Drawing Title

PARKING LOT C
PRE DEVELOPMENT
DRAINAGE AREAS

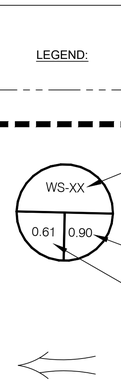
Designed by: BV	Datum: MVCA ORIGINAL CGVD28
Drawn by: BV	
Approved by: MT	
Project No. 479008	Drawing No. C105

#19228 D07-12-25-0006



LEGEND:

- EXISTING PROPERTY LINE
- WATERSHED BOUNDARY
- WATERSHED NAME
- RUNOFF COEFFICIENT
- AREA IN HECTARES
- EMERGENCY OVERLAND FLOW ROUTE



KEY PLAN

NOT TO SCALE

Surveyor

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 CONCOURSE GATE, SUITE 500
NEPEAN, ONTARIO, K2E 7S6

TOPOGRAPHIC INFORMATION & BENCHMARK

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BOUNDARY INFORMATION WAS COMPILED FROM PLANS 4R-19213, 4R-35573 AND 4R-36051

JOB BENCHMARK

CUT CROSS ON SIDEWALK NEAR OVERPASS
ELEVATION = 68.53m

Client

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1053 CARLING AVENUE,
OTTAWA, ONTARIO, K1Y 4E9
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PARSONS
1223 MICHAEL STREET, SUITE 100
GLOUCESTER, ONTARIO, K1J 7T2

LICENSED PROFESSIONAL ENGINEER
B. VILLENEUVE
100553987
2025-03-14
PROVINCE OF ONTARIO

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2	RE-ISSUED FOR SPA	BV	2025/01/17
1	ISSUED FOR SPA	BV	2024/11/08

Scale

5m 0 5 10m

SCALE: 1:250

Project Title

1967 RIVERSIDE DRIVE
RIVERSIDE CAMPUS
PARKING LOTS

Drawing Title

PARKING LOT C
POST DEVELOPMENT
DRAINAGE AREAS

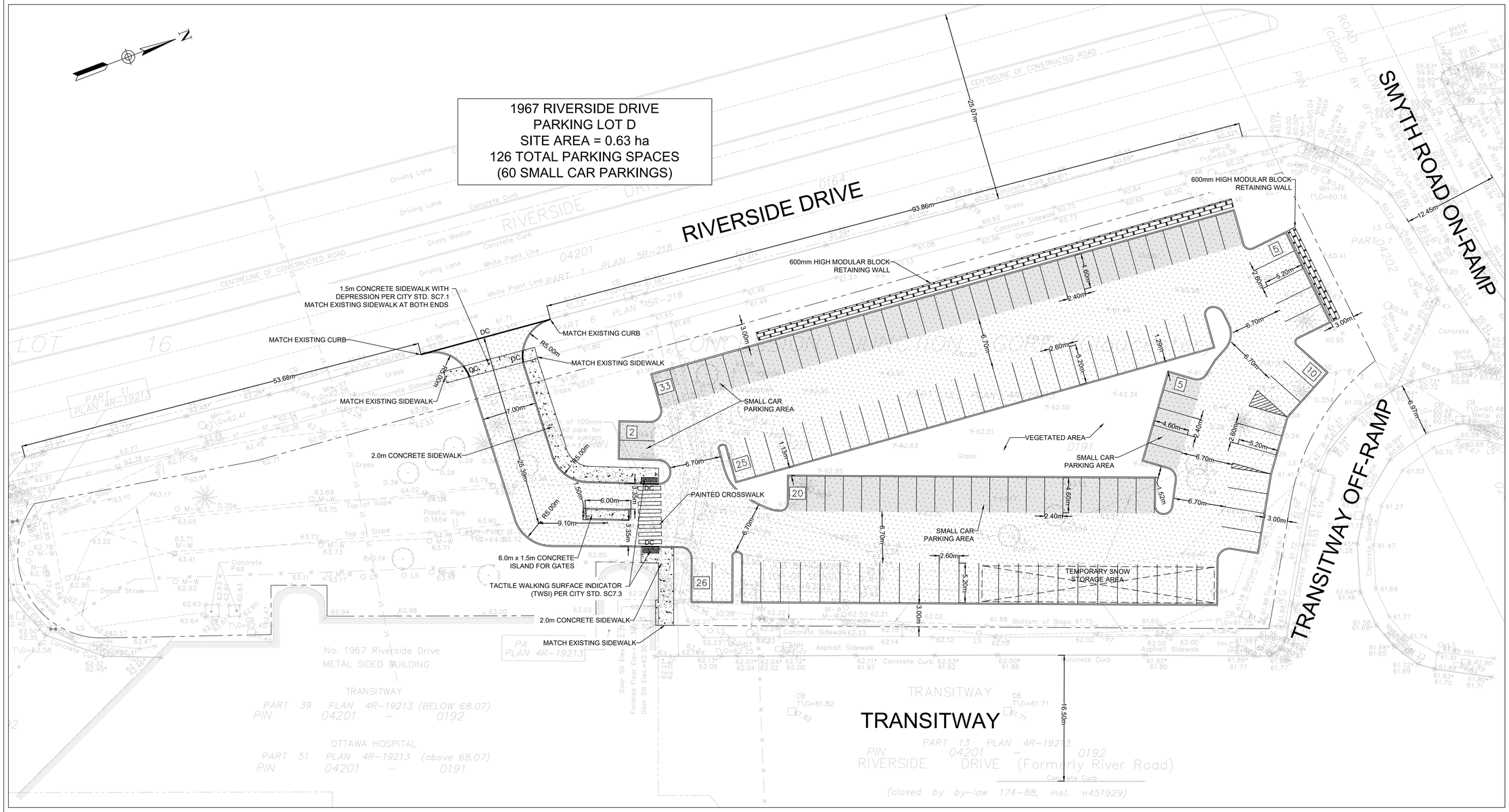
Designed by:	BV
Drawn by:	BV
Approved by:	MT
Project No.	479008
Drawing No.	C106

Datum

D07-12-25-0006

#19228

Parking Lot D Drawings



LEGEND:

- EXISTING PROPERTY LINE
- EXISTING GRADE
- PROPOSED LIGHT DUTY PAVEMENT
- PROPOSED CONCRETE
- PROPOSED CONCRETE CURB PER CITY STD. SC1.1
- PROPOSED DEPRESSED CONCRETE CURB WITH TWSI PER CITY STD. SC7.3 (DC)

KEY PLAN

NOT TO SCALE

Surveyor

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 CONCOURSE GATE, SUITE 500
NEPEAN, ONTARIO, K2E 7S6

TOPOGRAPHIC INFORMATION & BENCHMARK

SURVEY COMPLETED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. ON MAY 28, 2024. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM, DERIVED FROM CONTROL MONUMENT NO. 011968274 HAVING AN ELEVATION OF 66.322m.

BOUNDARY INFORMATION WAS COMPILED FROM PLANS 4R-19213, 4R-35573 AND 4R-36051

JOB BENCHMARK

FIRE HYDRANT TOP OF SPINDLE ALONG TRANSITWAY
ELEVATION = 63.52m

PROPERTY LEGAL DESCRIPTION

THE NORTHERLY PART OF PIN 04201-0191
BEING PART OF LOT 16
CONCESSION JUNCTION GORE
GEOGRAPHIC TOWNSHIP OF GLOUCESTER
CITY OF OTTAWA

Client

The Ottawa Hospital | L'Hôpital d'Ottawa

THE OTTAWA HOSPITAL
1053 CARLING AVENUE,
OTTAWA, ONTARIO, K1Y 4E9
(613) 722-7000

PARSONS

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GLOUCESTER, ONTARIO, K1J 7T2

LICENSED PROFESSIONAL ENGINEER
B. VILLENEUVE
100553987
2025-03-14
PROVINCE OF ONTARIO

No.	Revision	By	Date (yy/mm/dd)
3	RE-ISSUED FOR SPA	BV	2025/03/13
2	RE-ISSUED FOR SPA	BV	2025/01/17
1	ISSUED FOR SPA	BV	2024/11/08

Scale

5m 0 5 10m

SCALE: 1:250

Project Title

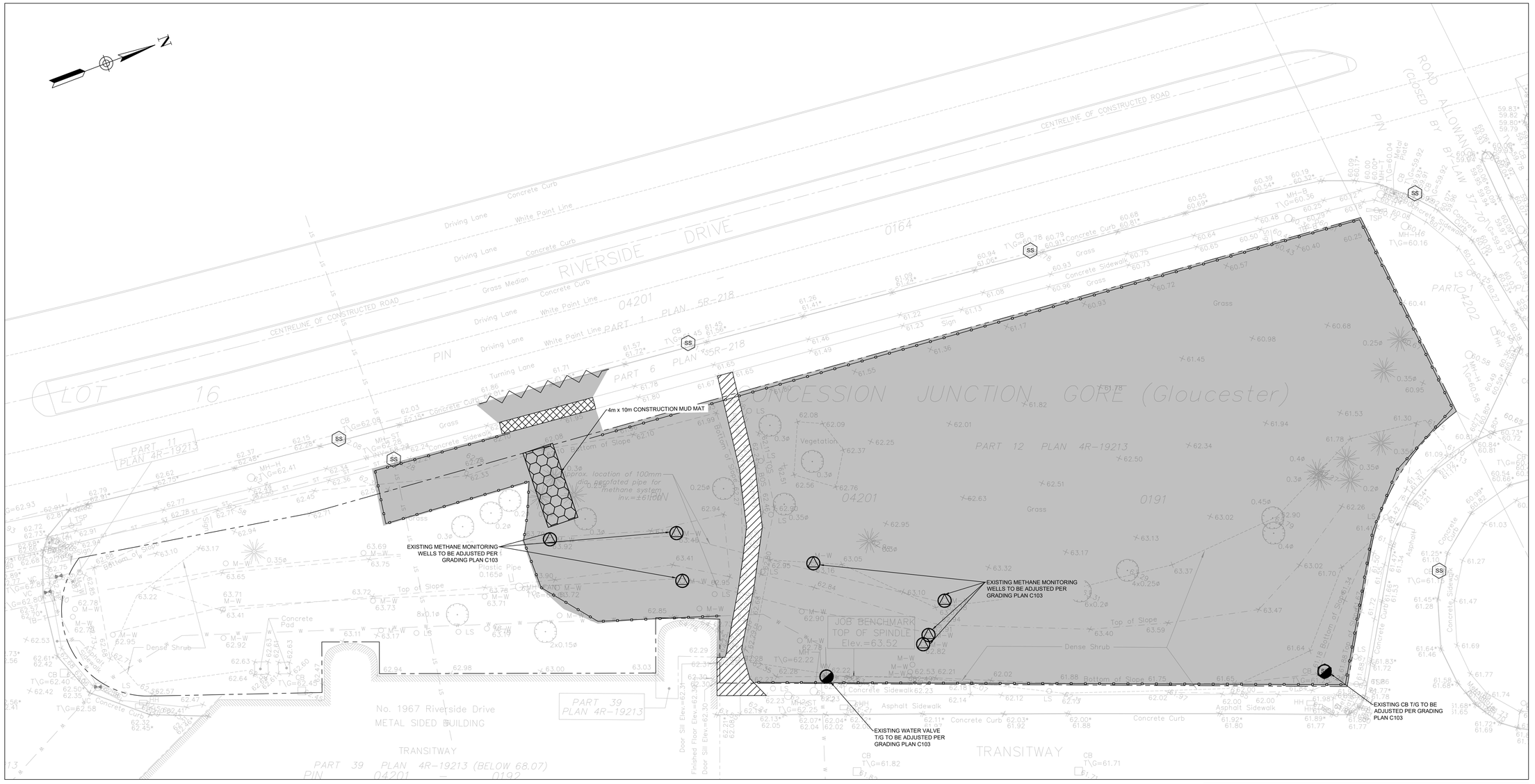
1967 RIVERSIDE DRIVE
RIVERSIDE CAMPUS
PARKING LOTS

Drawing Title

PARKING LOT D
SITE PLAN

Designed by:	BV
Drawn by:	BV
Approved by:	MT
Datum	NAD83 ORIGINAL COORDS
Project No.	479008
Drawing No.	SP

D07-12-25-0006
#19228



KEY PLAN

NOT TO SCALE

Surveyor

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 CONCOURSE GATE, SUITE 500
NEPEAN, ONTARIO, K2E 7S6

TOPOGRAPHIC INFORMATION & BENCHMARK

SURVEY COMPLETED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. ON MAY 28, 2024. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM, DERIVED FROM CONTROL MONUMENT NO. 019680274 HAVING AN ELEVATION OF 66.322m.

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JOB BENCHMARK

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ELEVATION = 63.52m

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100553987
2025-03-14
PROVINCE OF ONTARIO

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1	ISSUED FOR SPA	BV	2024/11/08

Scale

5m 0 5 10m
SCALE: 1:250

Project Title

THE OTTAWA HOSPITAL RIVERSIDE CAMPUS PARKING LOT

Drawing Title

PARKING LOT D REMOVALS PLAN

Designed by:	BV
Drawn by:	BV
Approved by:	MT
Datum	MAMSL OR LOCAL COVOS
Project No.	479008
Drawing No.	C101

#19228 D07-12-25-0006

NOTES: REMOVALS AND DEMOLITION

1. PRE-REMOVAL, THE CONTRACTOR MUST VISIT THE PREMISES IN ORDER TO BE FULLY AWARE OF EXISTING CONDITIONS ON SITE, INCLUDING ALL ELEMENTS TO BE REMOVED AND DEMOLISHED. NO CLAIM WILL BE ACCEPTED DUE TO A POOR EVALUATION OF THE WORK TO BE COMPLETED.
2. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND THE REQUEST FOR INTERRUPTION OF PUBLIC UTILITY SERVICES, SUCH AS GAS, TELEPHONE, POWER, CABLE, SEWERS, WATERMAIN, ETC. BEFORE PROCEEDING WITH WORK, COORDINATE WITH ALL APPLICABLE UTILITY COMPANIES.
3. FIRE HYDRANTS TO BE TAGGED AND BAGGED AND/OR PROTECTED AS INDICATED ON DRAWING.
4. CURB, ASPHALT, SIDEWALK, AND GRANULAR BASE TO BE EXCAVATED WITHIN LIMITS OF DEMOLITION REMOVAL. THE CONTRACTOR MUST CARRY OUT NECESSARY SAW CUTS.
5. SEWER / WATERMAIN PIPES TO BE ABANDONED MUST BE CUT, FILL WITH UNSHRINKABLE CONCRETE CONFORMING TO OPSS 1359, AND CAPPED.
6. REMOVE AND DISPOSE SEWERS AS INDICATED. PLUG ANY SERVICE LATERALS TO BE ABANDONED.
7. THE CONTRACTOR MUST ENTIRELY REMOVE THE DEMOLITION WRECKAGE FROM THE CONSTRUCTION SITE OFFSITE IN ACCORDANCE WITH THE REQUIREMENTS OF THE MINISTRY OF ENVIRONMENT AND CLIMATE CHANGE (MOECC).
   a. THE CONTRACTOR MUST DISCARD RECYCLABLE DEMOLITION MATERIALS IN COLLABORATION WITH A REGIONAL RECYCLING COMPANY.
   b. ALL OTHER DEMOLITION MATERIALS MUST BE DISPOSED OFF-SITE AT AUTHORIZED LICENSED LANDFILLS AND IN CONFORMITY WITH THE APPLICABLE LAWS AND REGULATIONS. THE CONTRACTOR MUST BE ABLE TO PROVIDE, UPON REQUEST, COPIES OF THE DISPOSAL TICKETS TO THE OWNER'S REPRESENTATIVE.
8. SURFACES AND WORKS LOCATED OUTSIDE OF THE CONSTRUCTION WORK LIMIT MUST BE REINSTATED AS THEY WERE BEFORE BEGINNING OF WORK. CONTRACTOR IS RESPONSIBLE TO MAKE GOOD ON ANY DAMAGES TO EXISTING CURB AND ASPHALT NOT SCHEDULED FOR REMOVAL.
9. ALL MATERIALS, PRODUCTS AND OTHERS COMING FROM THE DEMOLITION BELONG TO THE CONTRACTOR, UNLESS SPECIFIED OTHERWISE.
10. THE CONTRACTOR MUST COMPLETE ALL REMOVALS AS SHOWN ON THE DRAWINGS AND AS REQUIRED TO MAKE THE WORK COMPLETE.
11. THE CONTRACTOR MUST PROTECT AND MAINTAIN IN SERVICE THE EXISTING WORKS WHICH MUST REMAIN IN PLACE. IF THEY ARE DAMAGED, THE CONTRACTOR MUST IMMEDIATELY MAKE THE REPLACEMENTS AND NECESSARY REPAIRS TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE AND WITHOUT ADDITIONAL EXPENSE TO THE OWNER.
12. THE CONTRACTOR MUST NOT PERFORM ANY TREE CUTTING DURING THE CORE MIGRATORY BIRDS NESTING PERIOD, WHICH IS APRIL 15 TO AUGUST 15.

EROSION AND SEDIMENT CONTROL MEASURES:

- CONTRACTOR IS RESPONSIBLE FOR ALL INSTALLATION, MONITORING, REPAIR AND REMOVAL OF ALL EROSION AND SEDIMENT CONTROL FEATURES. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURE MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
- SEDIMENT AND EROSION CONTROL PLAN OBJECTIVES:
- PREVENT SOIL EROSION. THIS CAN RESULT FROM STREAMING RAIN WATER OR WIND EROSION DURING CONSTRUCTION,
- PREVENT SEDIMENT DEPOSITS IN THE SEWER PIPES AND NEARBY COLLECTING STREAMS (AS APPLICABLE),
- PREVENT AIR POLLUTION FROM PARTICULATE MATTER AND DUST.

1. PRIOR TO START OF CONSTRUCTION:

PRIOR TO THE REMOVAL OF ANY VEGETATIVE COVER, MOVING OF SOIL AND CONSTRUCTION.

- INSTALL SILT FENCE (AS PER OPSD 219.110) ALONG DITCHES IMMEDIATELY DOWNSTREAM FROM AREAS TO BE DISTURBED (SEE PLAN FOR LOCATION).
- INSTALL FILTER CLOTH ON DOWNSTREAM MANHOLE COVERS.
- INSTALL SILTSACK FILTERS IN ALL CONCRETE CATCH BASINS STRUCTURES.
- INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION.
- THE CONTRACTOR MUST SET UP THE MEASURES INDICATED ON THE PLAN, INSPECT THEM FREQUENTLY AND CLEAN AND REPAIR OR REPLACE THE DETERIORATED STRUCTURES. AT THE END OF THE CONSTRUCTION PERIOD, THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF THE TEMPORARY STRUCTURES AND RECONDITIONING THE AFFECTED AREAS

2. DURING CONSTRUCTION:

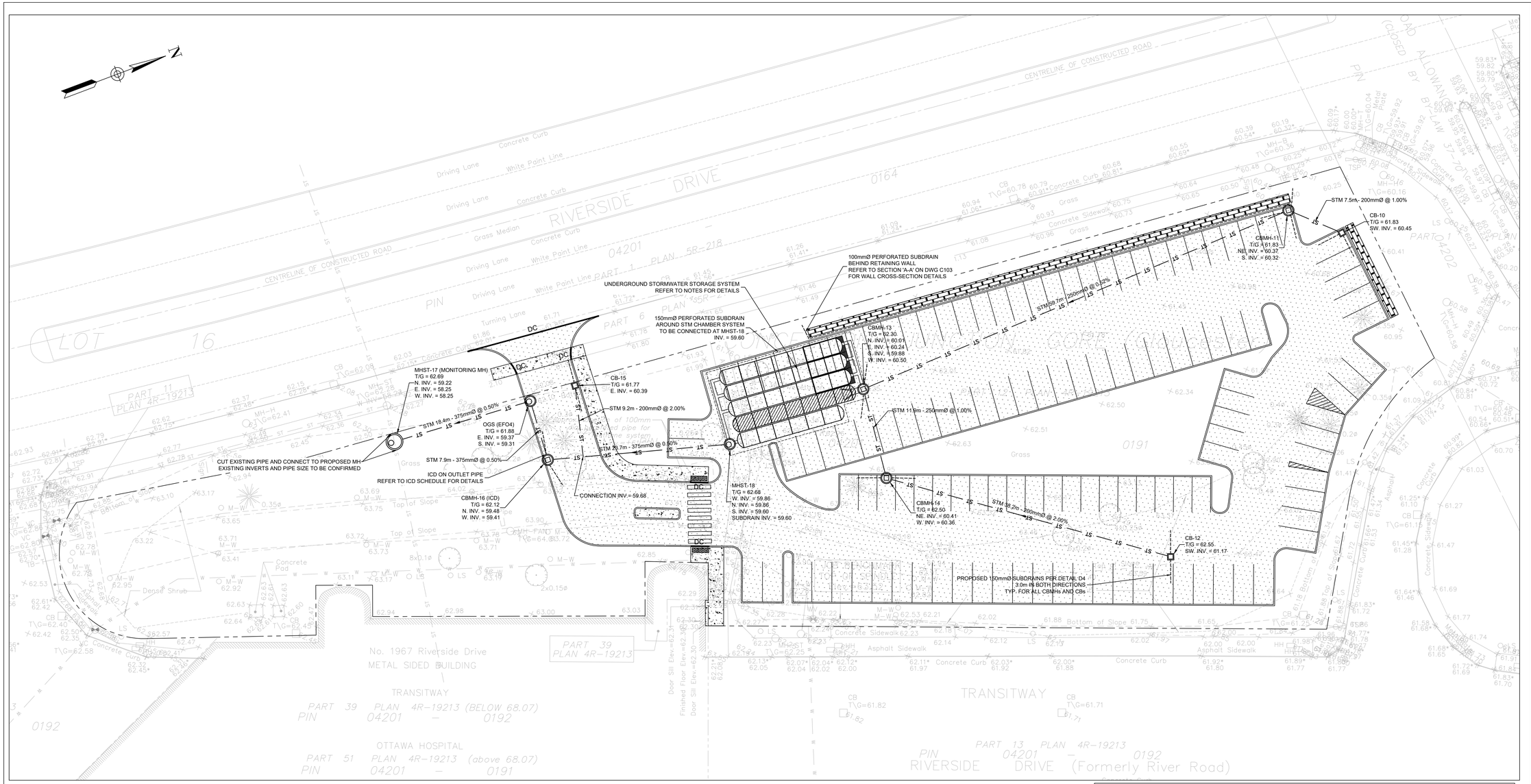
- SEDIMENT AND EROSION CONTROL MEASURES TO BE CONSTRUCTED AS PER OPSS 805.
- WHEN SEDIMENT AND EROSION CONTROL MEASURES MUST BE REMOVED TO COMPLETE A PORTION OF THE WORK, THE SAME MEASURES MUST BE REINSTATED UPON THE WORK'S COMPLETION.
- WORK TO BE DONE IN THE VICINITY OF MAJOR WATERWAYS TO BE CARRIED OUT FROM JULY AND SEPTEMBER ONLY.
- MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE.
- PROTECT DISTURBED AREAS FROM RUNOFF.
- PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILITATED SHORTLY.
- INSPECT STRAW BALE FLOW CHECK DAMS, SILT FENCES, SILT SACKS, AND CATCH BASIN SUMPS REGULARLY AND AFTER EVERY MAJOR STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY.
- PLAN TO BE REVIEWED AND REVISED AS REQUIRED DURING CONSTRUCTION.
- EROSION CONTROL FENCING TO BE ALSO INSTALLED AROUND THE BASE OF ALL STOCKPILES.
- DO NOT LOCATE TOPSOIL PILES AND EXCAVATION MATERIAL CLOSER THAN 2.5m FROM ANY PAVED SURFACE, OR ONE WHICH IS TO BE PAVED BEFORE THE PILE IS REMOVED. ALL TOPSOIL PILES ARE TO BE SEEDED IF THEY ARE TO REMAIN ON SITE LONG ENOUGH FOR SEEDS TO GROW (LONGER THAN 30 DAYS). WHEN STORING SOIL ON SITE IN PILES THE CONTRACTOR MUST COVER EACH PILE WITH TARPS, STRAW OR A GEOTEXTILE FABRIC TO AVOID FINE PARTICLE TRANSPORT BY WIND AND/OR STREAMING RAIN WATER.
- CONTROL WIND-BLOWN DUST OFF SITE TO ACCEPTABLE LEVELS BY SEEDING TOPSOIL PILES AND OTHER AREAS TEMPORARILY (PROVIDE WATERING AS REQUIRED). FOR DUST COMTROL, CONTRACTOR TO APPLY CALCIUM CHLORIDE (TYPE I – OPSS 2501 AND CAN/CGSB-15-1) AND WATER WITH EQUIPMENT APPROVED BY THE OWNER'S REPRESENTATIVE AT RATE IN ACCORDANCE TO OPSS 506 WHEN DIRECTED BY OWNER'S REPRESENTATIVE.
- ALL EROSION CONTROL STRUCTURE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN STABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE GROUND COVER. SEDIMENT CAPTURE SILT SACKS MUST BE MAINTAINED AND CANNOT BE REMOVED UNTIL ALL LANDSCAPING AREAS ARE COMPLETED.
- NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVES BY THIS CONSULTING ENGINEER AND THE TOWN DEPARTMENT OF PUBLIC WORKS.
- CONTRACTOR RESPONSIBLE FOR MUNICIPAL ROADWAY AND SIDEWALK TO BE CLEANED OF ALL SEDIMENT FROM VEHICULAR TRACKING ETC. AT THE END OF EACH WORK DAY.
- DURING WET CONDITIONS, TIRES OF ALL VEHICLES/EQUIPMENT LEAVING THE SITE ARE TO BE SCRAPED.
- ANY MUD/MATERIAL TRACKED ONTO THE ROAD SHALL BE REMOVED IMMEDIATELY BY HAND OR RUBBER TIRE LOADER.
- TAKE ALL NECESSARY STEPS TO PREVENT BUILDING MATERIAL, CONSTRUCTION DEBRIS OR WASTE BEING SPILLED OR TRACKED ONTO ABUTTING PROPERTIES OR PUBIC STREETS DURING CONSTRUCTION AND PROCEED IMMEDIATELY TO CLEAN UP ANY AREAS SO AFFECTED.
- PROVIDE GRAVEL ENTRANCE WHEREVER EQUIPMENT LEAVES THE SITE TO PROVIDE MUD TRACKING ONTO PAVED SURFACES. GRAVEL BED SHALL BE A MINIMUM OF 10m LONG, 4m WIDE, AND 0.15m DEEP AND SHALL CONSIST OF COARSE MATERIAL. MAINTAIN GRAVEL ENTRANCE IN CLEAN CONDITION.

3. AFTER CONSTRUCTION:

- PROVIDE PERMANENT COVER CONSISTING OF TOPSOIL AND SEED TO DISTURBED AREAS.
- ALL SEDIMENT AND EROSION CONTROL MEASURES TO BE REMOVED BY THE CONTRACTOR FOLLOWING THE COMPLETION OF WORK AND AFTER DISTURBED AREAS HAVE BEEN REHABILITATED AND STABILIZED, THIS INCLUDES REMOVE STRAW BALE FLOW CHECK DAMS, SILT FENCES AND FILTER CLOTHS ON CATCH BASINS AND MANHOLE COVERS.
- INSPECT AND CLEAN CATCH BASIN SUMPS AND STORM SEWERS.

LEGEND:

- EXISTING PROPERTY LINE
- STRUCTURE TO BE ADJUSTED
- STRUCTURE TO BE REMOVED
- METHANE MONITORING WELL TO BE ADJUSTED
- SS — SILT SACK PER DETAIL D1
- EXISTING ASPHALT REMOVAL
- EXISTING CONCRETE SIDEWALK REMOVAL
- CLEARING & GRUBBING AREA/ LANDSCAPE REMOVAL
- EXISTING CURB REMOVAL
- PROPOSED SILT FENCE PER OPSD 219.110



KEY PLAN

NOT TO SCALE

Surveyor

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 CONCOURSE GATE, SUITE 500
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TOPOGRAPHIC INFORMATION & BENCHMARK

SURVEY COMPLETED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. ON MAY 28, 2024. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM, DERIVED FROM CONTROL MONUMENT NO. 019680274 HAVING AN ELEVATION OF 66.322m.

BOUNDARY INFORMATION WAS COMPILED FROM PLANS 4R-19213, 4R-35573 AND 4R-36051

JOB BENCHMARK

FIRE HYDRANT TOP OF SPINDLE ALONG TRANSITWAY
ELEVATION = 63.52m

Client

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PARSONS
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LICENSED PROFESSIONAL ENGINEER
B. VILLENEUVE
100553987
2025-03-14
PROVINCE OF ONTARIO

No.	Revision	By	Date (yy/mm/dd)
3	RE-ISSUED FOR SPA	BV	2025/03/13
2	RE-ISSUED FOR SPA	BV	2025/01/17
1	ISSUED FOR SPA	BV	2024/11/08

Scale

5m 0 5 10m
SCALE: 1:250

Project Title

THE OTTAWA HOSPITAL RIVERSIDE CAMPUS PARKING LOT

Drawing Title

PARKING LOT D SITE SERVICING PLAN

Designed by:	BV	Datum	MOST RECENT CGVD28
Drawn by:	BV		
Approved by:	MT		
Project No.	479008	Drawing No.	C102

#19228 D07-12-25-0006

NOTES: SEWER

1. CONTRACTOR TO CONFIRM ELEVATION OF EXISTING STORM AND SANITARY SEWERS AT PROPOSED CONNECTION POINTS AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE COMMENCING ANY WORK.
2. ALL WORK SHALL BE PERFORMED, AS APPLICABLE IN ACCORDANCE WITH OPSS 407, 408 AND 410.
3. ALL STORM AND SANITARY SEWERS INSTALLED BELOW THE GROUNDWATER TABLE ELEVATION SHALL BE WATERTIGHT AND INFILTRATION TESTS SHALL BE CARRIED OUT ACCORDING TO OPSS.MUNI 410.
4. PIPE MATERIAL TO BE PVC SDR-35 AND CONFORMING TO OPSS 1841, UNLESS INDICATED OTHERWISE. PVC SEWERS TO BE INSTALLED PER OPSD 802.010 (MODIFIED). BEDDING AND COVER MATERIALS TO BE OPSS 1010 GRANULAR 'A' CRUSHER-RUN LIMESTONE BEDDING COMPACTED TO 95% SPMDD.
5. ALL SEWERS WITH LESS THAN 1.5 METERS OF COVER ARE SUBJECTED TO INSULATION PER CITY OF OTTAWA STD DETAIL S35
6. PIPE BACKFILL MATERIAL TO BE APPROVED NATIVE MATERIAL OR SELECT SUBGRADE MATERIAL IN CONFORMANCE WITH OPSS 212.
7. ALL MAINTENANCE HOLES AND CATCH BASIN MAINTENANCE HOLES TO BE 1200mmØ AS PER OPSD 701.010, UNLESS INDICATED OTHERWISE. MAINTENANCE HOLES AND CATCH BASIN MAINTENANCE HOLES TO BE INSTALLED PER OPSS 407.
8. ALL CATCH BASINS TO BE 600x600mm AS PER OPSD 705.010, UNLESS INDICATED OTHERWISE. CATCH BASINS TO BE INSTALLED PER OPSS 407.
9. EXCAVATING, BACKFILLING, AND COMPACTING REQUIRED FOR MAINTENANCE HOLES, CATCH BASIN MAINTENANCE HOLES, AND CATCH BASINS TO BE COMPLETED AS PER OPSS 402. THEY ARE TO BE BACKFILLED WITH OPSS GRANULAR 'B' COMPACTED TO 98% SPMDD. JOINTS BETWEEN SECTIONS TO BE WRAPPED WITH NON-WOVEN GEOTEXTILE.
10. FOR SANITARY STRUCTURES: CAST IRON MAINTENANCE HOLE COVER AS PER OPSD 401.010 TYPE 'A'.
11. FOR STORM STRUCTURES: CAST IRON CATCH BASIN MAINTENANCE HOLE COVER AS PER OPSD 401.010 TYPE 'B' AND CAST IRON CATCH BASIN COVER AS PER OPSD 400.020.
12. SANITARY MAINTENANCE HOLES REQUIRE BENCHING AS PER OPSD 701.021.
13. THE CONTRACTOR IS RESPONSIBLE FOR MAKING OR ARRANGING ALL CONNECTIONS TO THE EXISTING SEWERS AS PER MUNICIPAL REQUIREMENTS. PRIOR TO CONNECTION, THE CONTRACTOR MUST PROVIDE, TO THE CONSULTANT / ENGINEER AND THE CITY FOR APPROVAL, ALL TEST RESULTS PERFORMED ON THE INTERNAL SERVICES.
14. ADVISE THE CITY PUBLIC WORKS AT LEAST 72 HOURS IN ADVANCE BEFORE ANY CONNECTION TO THE CITY SERVICES. CO-ORDINATE WITH CITY AS REQUIRED.
15. TERMINATE AND PLUG ALL SERVICE CONNECTIONS AT 1.0 m FROM EDGE OF THE BUILDING.
16. ALL SEWERS TO BE C.C.T.V. INSPECTED BY THE CONTRACTOR AS PER OPSS 409. TWO COPIES OF THE INSPECTION REPORT MUST BE PROVIDED TO THE CONSULTANT AND THE C.C.T.V. INSPECTION IN DVD FORMAT ONLY.
17. SUBDRAIN KNOCKOUT (KO) WILL BE PRE-MANUFACTURED WITH CATCH BASINS AND MAINTENANCE HOLES.
18. THE OGS UNIT SHALL BE STORMCEPTOR EFO4 OR APPROVED EQUIVALENT. OGS WILL REQUIRE PERIODIC MAINTENANCE AND CLEANING AS PER MANUFACTURERS SPECIFICATIONS - TYPICAL CLEANING INTERNAL IS ONCE A YEAR.

NOTES: UNDERGROUND STORMWATER STORAGE

1. UNDERGROUND STORMWATER STORAGE SYSTEM CHAMBER TYPE OR EQUIVALENT
2. CHAMBER TYPE: STORMTECH MC-3500 OR APPROVED EQUIVALENT
3. STORAGE PROVIDED: 205.9m³. (INCLUDING PERIMETER STONE)
4. BOTTOM OF FOUNDATION PAD ELEVATION & PERFORATED SUBDRAIN INVERT: 59.60m.
5. BOTTOM OF CHAMBER ELEVATION: 59.83m.
6. TOP OF CHAMBER ELEVATION: 60.97m.
7. TOP OF SYSTEM (PERIMETER STONE) = 61.28m.
8. TOP OF CHAMBER TO BE A MINIMUM OF 450mm BELOW PARKING LOT PAVEMENT AND MAXIMUM 2.4m.
9. SYSTEM TO BE COMPLETELY WRAPPED WITH GEOTEXTILE.
10. SHOP DRAWINGS FOR UNDERGROUND STORAGE SYSTEM SHALL BE PROVIDED.
11. INLET STRUCTURE (CBMH-13) & OUTLET STRUCTURE (MHST-18) TO BE OPSD 701.010 CONCRETE MAINTENANCE HOLE

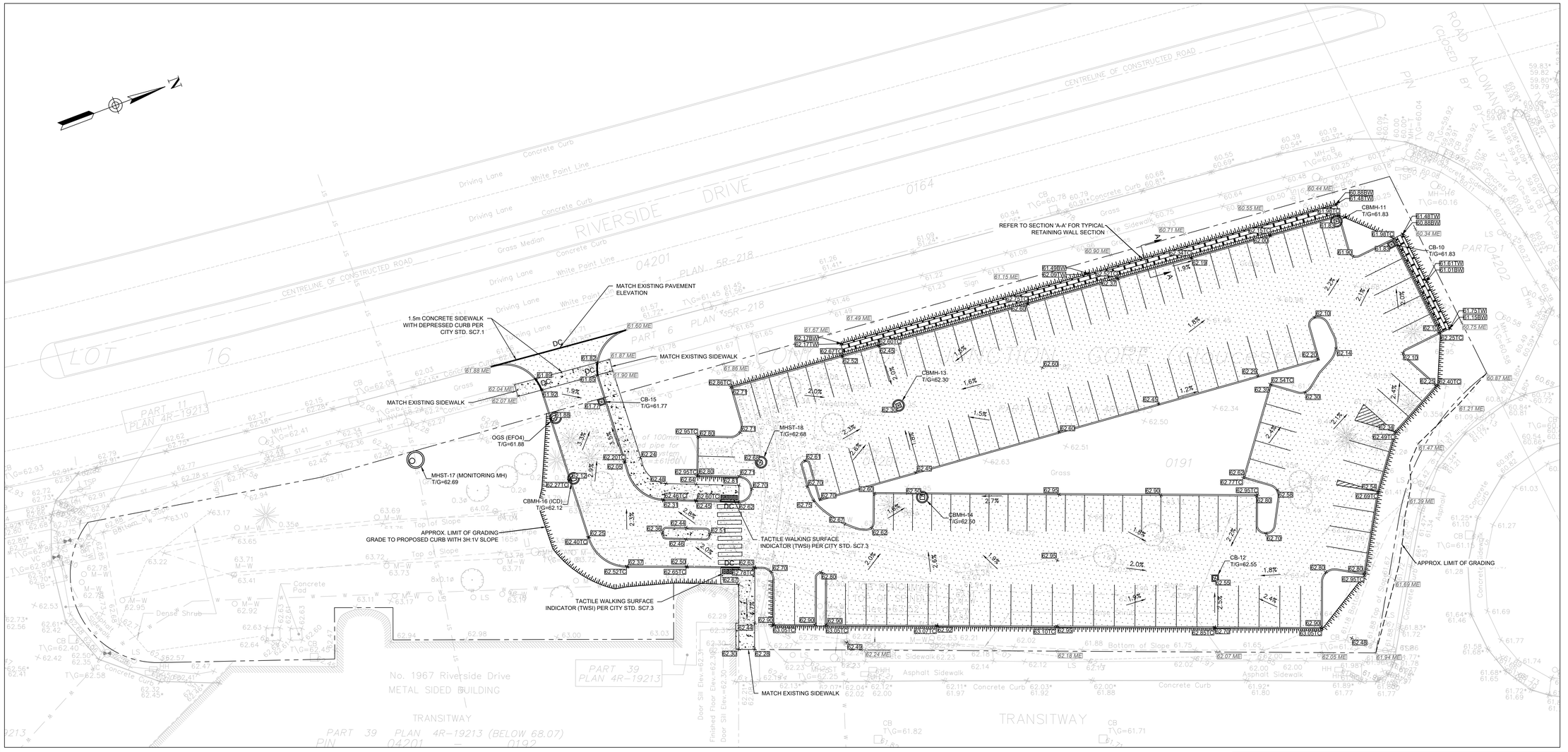
ICD SCHEDULE

ICD ID	LOCATION	ORIFICE INVERT (m)	FLOW 5y/100y (L/s)	HEAD 5y/100y (m)	EQUIVALENT DIAMETER (mm)	MODEL*
1	CBMH-16	59.41	4.8/7.4	0.80/1.85	50	JOHN MEUNIER HYDROVEX 75VHV-1

* ICD SHOP DRAWINGS SHALL BE SUBMITTED TO PARSONS BEFORE COMMENCING ANY WORK

LEGEND:

- EXISTING PROPERTY LINE
- EXISTING WATERMAIN
- EXISTING WATER VALVE
- EXISTING SANITARY SEWER AND MAINTENANCE HOLE
- EXISTING STORM SEWER AND MAINTENANCE HOLE
- EXISTING CATCH BASIN
- EXISTING METHANE MONITORING WELL
- PROPOSED STORM SEWER AND MAINTENANCE HOLE
- PROPOSED CATCH BASIN MAINTENANCE HOLE WITH 3.0m SUBDRAINS IN BOTH DIRECTIONS
- PROPOSED CATCH BASIN WITH 3.0m SUBDRAINS IN BOTH DIRECTIONS



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Scale
5m 0 5 10m
SCALE: 1:250

Project Title

THE OTTAWA HOSPITAL RIVERSIDE CAMPUS PARKING LOT

Drawing Title

PARKING LOT D GRADING PLAN

Designed by:	BV
Drawn by:	BV
Approved by:	MT
Datum	NORTH AMERICAN DATUM 1983 CGVD28
Project No.	479008
Drawing No.	C103

#19228 D07-12-25-0006

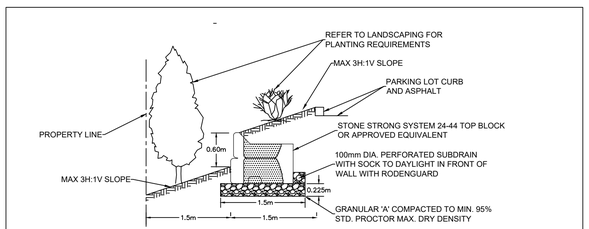
NOTES: GENERAL

1. THE CONTRACTOR MUST CONFORM TO ALL LAWS, CODES, ORDINANCES, AND REGULATIONS ADOPTED BY FEDERAL, PROVINCIAL OR MUNICIPAL GOVERNMENT COUNCILS AND GOVERNMENT AGENCIES, APPLYING TO WORK TO BE CARRIED OUT. WHEREVER STANDARDS, LAWS AND/OR REGULATIONS ARE MENTIONED THEY REFER TO THEIR CURRENT VERSIONS, MODIFICATIONS INCLUDED.
2. ALL MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE ONTARIO PROVINCIAL STANDARD SPECIFICATIONS AND DRAWINGS (OPSS AND OPSD), THE ONTARIO MINISTRY OF ENVIRONMENT AND CLIMATE CHANGE, THE ONTARIO MINISTRY OF NATURAL RESOURCES, APPLICABLE CONSERVATION AUTHORITIES, THE MUNICIPAL STANDARD SPECIFICATIONS AND DRAWINGS, AND ALL OTHER GOVERNING AUTHORITIES AS THEY APPLY, UNLESS OTHERWISE INDICATED.
3. ALL MATERIAL SUPPLIED AND PLACED FOR PARKING LOT AND ACCESS ROAD CONSTRUCTION SHALL BE TO OPSS STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED. CONSTRUCTION TO OPSS 206, 310 & 314. MATERIALS TO OPSS 1001, 1003 & 1010.
4. THE LOCATION OF EXISTING UNDERGROUND MUNICIPAL SERVICES AND PUBLIC UTILITIES AS SHOWN ON THE PLANS ARE APPROXIMATE. THE CONTRACTOR MUST DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES (ON-SITE AND OFF-SITE) PRIOR TO ANY EXCAVATION WORK. DAMAGE TO ANY EXISTING SERVICES AND/OR EXISTING UTILITIES DURING CONSTRUCTION, WHETHER OR NOT SHOWN ON THE DRAWINGS MUST BE REPAIRED BY THE CONTRACTOR AT HIS OWN EXPENSE.
5. THE CONTRACTOR SHALL DETERMINE THE EXACT INVERT (GEODETIC ELEVATION), DIAMETER AND CONSTRUCTION MATERIAL OF THE EXISTING CONDUITS AT THE PROPOSED CONNECTIONS. THEY SHALL ALSO CARRY OUT, IF NECESSARY, EXPLORATORY DIGS IN ORDER TO DETERMINE THE EXACT LOCATION AND INVERTS OF EXISTING DUCK BANKS. THIS INFORMATION SHALL IMMEDIATELY BE PROVIDED TO THE CONSULTANT PRIOR TO START UNDERTAKING ANY MUNICIPAL SERVICES WORK AND A 48 HOUR PERIOD MUST BE ALLOCATED TO THE CONSULTANT FOR DESIGN REVIEW.
6. AT PROPOSED UTILITY CONNECTION POINTS AND CROSSINGS (I.E. STORM SEWER, SANITARY SEWER, WATER, ETC.) THE CONTRACTOR SHALL DETERMINE THE PRECISE LOCATION AND DEPTH OF EXISTING UTILITIES AND REPORT ANY DISCREPANCIES OR CONFLICTS TO THE ENGINEER BEFORE COMMENCING WORK.
7. CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT FOR CONSTRUCTION PURPOSES.
8. THE CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF ALL WORK AND ACTIVITIES WITH OTHERS TRADES AND CONTRACTORS.
9. THE CONTRACTOR IS THE ONLY PERSON IN CHARGE OF SAFETY ON THE BUILDING SITE. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADEQUATE PROTECTION OF THE WORKERS, OTHER PERSONNEL AND THE GENERAL PUBLIC, PROTECTION OF MATERIALS, AS WELL AS MAINTAINING IN GOOD CONDITION THE COMPLETED WORKS AND WORKS TO BE COMPLETED. THE CONTRACTOR MUST PROVIDE AT ANY TIME:
   a. A SUFFICIENT NUMBER OF FENCES, BARRIERS, POSTERS, GUARDS AND OTHERS TO ENSURE SAFETY;
   b. NECESSARY CONVENIENCES FOR THE COMPLETION OF WORK SUCH AS HEATING, LIGHTING, VENTILATION ETC.
10. CONTRACTOR IS RESPONSIBLE TO OBTAIN THE VARIOUS PERMITS/APPROVALS REQUIRED TO COMPLETE ALL THE WORKS AND ACTIVITIES AND BEAR COST OF THE SAME, SUCH AS BUT NOT LIMITED TO; ROAD CUT PERMITS, SEWER PERMITS, WATER PERMIT, ETC. AND THEIR ASSOCIATED COSTS.
11. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS.
12. JOB BENCH MARK - CONFIRM WITH PARSONS PRIOR TO UTILIZATION. THE CONTRACTOR MUST MAINTAIN BENCHMARKS AND LANDMARK REFERENCES AS IS. OTHERWISE THESE REFERENCES WILL BE REPOSITIONED BY A CERTIFIED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.
13. ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND LOW POINTS EXCEPT WHERE APPROVED SWALE OR CATCH BASIN OUTLETS ARE PROVIDED.
14. IF GROUNDWATER IS ENCOUNTERED DURING CONSTRUCTION, DEWATERING OF EXCAVATIONS COULD BE REQUIRED. IT IS ASSUMED THAT GROUNDWATER MAY BE CONTROLLED BY SUMP AND PUMPING METHODS. THE CONTRACTOR SHALL OBTAIN A PERMIT TO TAKE WATER IF SITE CONDITIONS REQUIRE TAKING MORE THAN A TOTAL OF 400 000 L/DAY.
15. STRIP AND REMOVE ALL TOPSOIL FROM IMPROVED AREAS. SITE PREPARATION INCLUDES CLEARING, GRUBBING, STRIPPING OF TOPSOIL, DEMOLITION, REMOVAL OF UNSUITABLE MATERIALS, CUT, FILL AND ROUGH GRADING OF ALL AREAS TO RECEIVE FINISHED SURFACES.
16. ABUTTING PROPERTY GRADE TO BE MATCHED.
17. ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW CUT TO FORM A NEAT AND STRAIGHT LINE PRIOR TO PLACING NEW PAVEMENT. PAVEMENT REINSTATEMENT SHALL BE WITH STEP JOINTS OF 300mm WIDTH MINIMUM.
18. CURBS TO BE BARRIER, CONSTRUCTED AS PER OPSD 600.110, EXCEPT WHERE INDICATED OTHERWISE. ELEVATION AT TOP OF CONCRETE CURBS TO BE 150 mm ABOVE THE ASPHALT, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
19. DEPRESSED CURBS TO BE MOUNTABLE, CONSTRUCTED AS PER OPSD 600.100.
20. LIGHT DUTY AND HEAVY DUTY ASPHALT PAVEMENTS TO BE CONSTRUCTED AS PER TABLE ON DRAWING C103.
21. TRANSITION BETWEEN EXISTING AND PROPOSED PAVEMENT SHALL BE CONSTRUCTED AS PER DETAIL D3 ON DRAWING C104.
22. RESTORE PAVEMENT STRUCTURE AND SURFACES ON EXISTING ROADS TO A CONDITION AT LEAST EQUAL TO ORIGINAL AND TO THE SATISFACTION OF THE MUNICIPAL AUTHORITIES.
23. CLEANLINESS ON THE SITE, INCLUDES THE CONTRACTOR SHALL CLEAN ROADWAYS AT HIS OWN COST AS DIRECTED BY THE OWNER'S REPRESENTATIVE. MATERIALS AND EQUIPMENT MUST BE LAID OUT IN AN ORGANIZED AND SAFE MANNER, AND ALL MATERIAL, EQUIPMENT AND TEMPORARY STRUCTURES WHICH ARE NO LONGER NECESSARY FOR THE EXECUTION OF THE CONTRACT MUST BE REMOVED FROM THE SITE.
24. CONTRACTOR TO ENSURE MITIGATION MEASURES ARE IMPLEMENTED TO REDUCED THE RISK OF GROUND CONTAMINATION FROM PETROLEUM PRODUCTS.
25. THE CONTRACTOR MUST ENSURE THE FOLLOWING MEASURES ARE IMPLEMENTED REGARDING THE HANDLING OF CONCRETE:
   a. CONCRETE SHOULD EITHER BE MIXED AWAY FROM THE SITE OR SHOULD BE PREPARED ON PAVED SURFACES IF ONLY SMALL QUANTITIES ARE REQUIRED (I.E. MINOR REPAIRS);
   b. EXCESS CONCRETE MUST BE DISPOSED OFF-SITE AT A LOCATION THAT MEETS ALL REGULATORY REQUIREMENTS;
   c. THE WASHING OF CONCRETE TRUCKS AND OTHER EQUIPMENT USED FOR MIXING CONCRETE SHOULD NOT BE CARRIED OUT WITHIN 30 METERS OF A WATERCOURSE OR WETLAND AND SHOULD TAKE PLACE OUTSIDE OF THE WORK SITE;
   d. ALL CONCRETE TRUCKS SHOULD COLLECT THEIR WASH WATER AND RECYCLE IT BACK INTO THEIR TRUCKS FOR DISPOSAL OFF-SITE AT A LOCATION MEETING ALL REGULATORY REQUIREMENTS.
26. THE CONTRACTOR SHALL ENSURE THAT ALL EXCAVATED SURPLUS MATERIALS THAT WILL BE REQUIRED TO BE DISPOSED OFFSITE BE STOCKPILED TEMPORALLY FOR SAMPLING PRIOR BEING LOADED OFFSITE.
27. MINIMIZE DISTURBANCE TO EXISTING VEGETATION DURING THE EXECUTION OF ALL WORKS.
28. TRENCHING, BACKFILLING AND COMPACTING MUST CONFORM TO OPSS 401.
29. DEWATERING OF PIPELINE, UTILITY AND ASSOCIATED STRUCTURE EXCAVATIONS TO BE COMPLETED AS PER OPSS 517.
30. THE CONTRACTOR MUST CONTROL SURFACE RUNOFF FROM PRECIPITATION DURING CONSTRUCTION.
31. FOR ALL GEOTECHNICAL WORK, CONTRACTOR TO REFER TO "GEOTECHNICAL INVESTIGATION, PROPOSED ALTERNATE PARKING LOT D, THE OTTAWA HOSPITAL - RIVERSIDE CAMPUS, 1967 RIVERSIDE DRIVE, OTTAWA, ONTARIO, BY GEMTEC, DATED MARCH 13, 2025."
32. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL UNLESS OTHERWISE DIRECTED FROM THE ENGINEER. EXCAVATE AND REMOVE ALL ORGANIC MATERIAL AND DEBRIS LOCATED WITHIN THE PROPOSED BUILDING, PARKING AND ROADWAY LOCATIONS.
33. THE CONTRACTOR IS RESPONSIBLE FOR ALL EXCAVATION, BACKFILL AND REINSTATEMENT OFF ALL AREAS DISTURBED DURING CONSTRUCTION TO EXISTING CONDITIONS OR BETTER AND ALL ASSOCIATED WORKS TO THE SATISFACTION OF THE CONSULTANT AND MUNICIPAL AUTHORITIES. ASPHALT REINSTATEMENT MUST BE IN ACCORDANCE WITH OPSS 310. LANDSCAPE AREAS TO BE REINSTATED WITH 150 mm OF TOPSOIL AND SOD IN ACCORDANCE WITH OPSS 802 AND OPSS 803.
34. DURING THE CONSTRUCTION PERIOD THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING TEMPORARY TRAFFIC SIGNAGE, INCLUDING TRAFFIC SIGNS, TRAFFIC MARKINGS AND TEMPORARY TRAFFIC LIGHTS, AND FLAGMEN, AS REQUIRED BY THE OWNER, THE CONSULTANT, THE MUNICIPALITY, THE MTO, AND OTHER GOVERNING AUTHORITIES.
35. CONSTRUCT SIDEWALK EXPANSION JOINTS & CONTROL JOINTS AS PER OPSD 310.020.
36. CONSTRUCT CONCRETE SIDEWALK AS PER OPSD 310.020 AND OPSS 351. TACTILE WALKING SURFACE INDICATORS PER OPSS 351.
37. DISPOSE OF CONTAMINATED MATERIALS AT APPROPRIATE OFF-SITE FACILITY THAT MEETS ALL REGULATORY REQUIREMENTS.
38. BE PREPARED TO INTERCEPT, CLEAN UP, AND DISPOSE OF SPILLS OR RELEASES THAT MAY OCCUR WHETHER ON LAND OR WATER. MAINTAIN MATERIALS AND EQUIPMENT REQUIRED FOR CLEANUP OF SPILLS OR RELEASES READILY ACCESSIBLE ON SITE.
39. PROMPTLY REPORT SPILLS AND RELEASES POTENTIALLY CAUSING DAMAGE TO ENVIRONMENT TO: AUTHORITY HAVING JURISDICTION OR INTEREST IN SPILL OR RELEASE INCLUDING CONSERVATION AUTHORITY, WATER SUPPLY AUTHORITIES, DRAINAGE AUTHORITY, ROAD AUTHORITY, AND FIRE DEPARTMENT.
40. DECONTAMINATE EQUIPMENT AFTER WORKING IN POTENTIALLY CONTAMINATED WORK AREAS AND PRIOR TO SUBSEQUENT WORK OR TRAVEL ON CLEAN AREAS.
41. DO NOT DISCHARGE DECONTAMINATED WATER, OR SURFACE WATER RUNOFF, OR GROUNDWATER WHICH MAY HAVE COME IN CONTACT WITH POTENTIALLY CONTAMINATED MATERIAL, OFF SITE OR TO MUNICIPAL SEWERS.
42. CONTRACTOR IS TO SUBMIT A TRAFFIC MANAGEMENT PLAN FOR APPROVAL ONE (1) WEEK PRIOR TO ANY WORK WITHIN THE ROW LIMITS TO MEET THE REQUIREMENTS OF MTO BOOK 7. THE CONTRACTOR WILL BE REQUIRED TO IMPLEMENT ALL REQUIREMENTS OF THE MTO BOOK 7.
43. CITY PUBLIC WORKS DEPARTMENT TO BE CONTACTED MINIMUM 7 DAYS PRIOR TO PLANNED DATE FOR CONNECTION TO EXISTING STORM SEWERS, SANITARY SEWERS, AND WATERMAIN. CONNECTION TO EXISTING TO TAKE PLACE IN THE PRESENCE OF APPROPRIATE CITY OF OTTAWA STAFF.

PAVEMENT STRUCTURES			
MATERIAL	LIGHT DUTY	HEAVY DUTY	COMPACTION
SURFACE LAYER : SP 12.5 (PG 58-34 LEVEL B)	60 mm	N/A	≥ 92%*
BASE LAYER : SP 19 (PG 58-34 LEVEL B)	-	N/A	≥ 92%*
GRANULAR BASE : OPSS GRANULAR A	150 mm	N/A	98%**
GRANULAR SUB-BASE : OPSS GRANULAR B TYPE II	300 mm	N/A	98%**

*MINIMUM PAVEMENT COMPACTION BASED ON MAXIMUM RELATIVE DENSITY, PER OPSS.MUNI 310
**OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY

SOURCE: GEOTECHNICAL INVESTIGATION, PROPOSED ALTERNATE PARKING LOT D, THE OTTAWA HOSPITAL - RIVERSIDE CAMPUS, 1967 RIVERSIDE DRIVE, OTTAWA, ONTARIO, BY GEMTEC, DATED MARCH 13, 2025



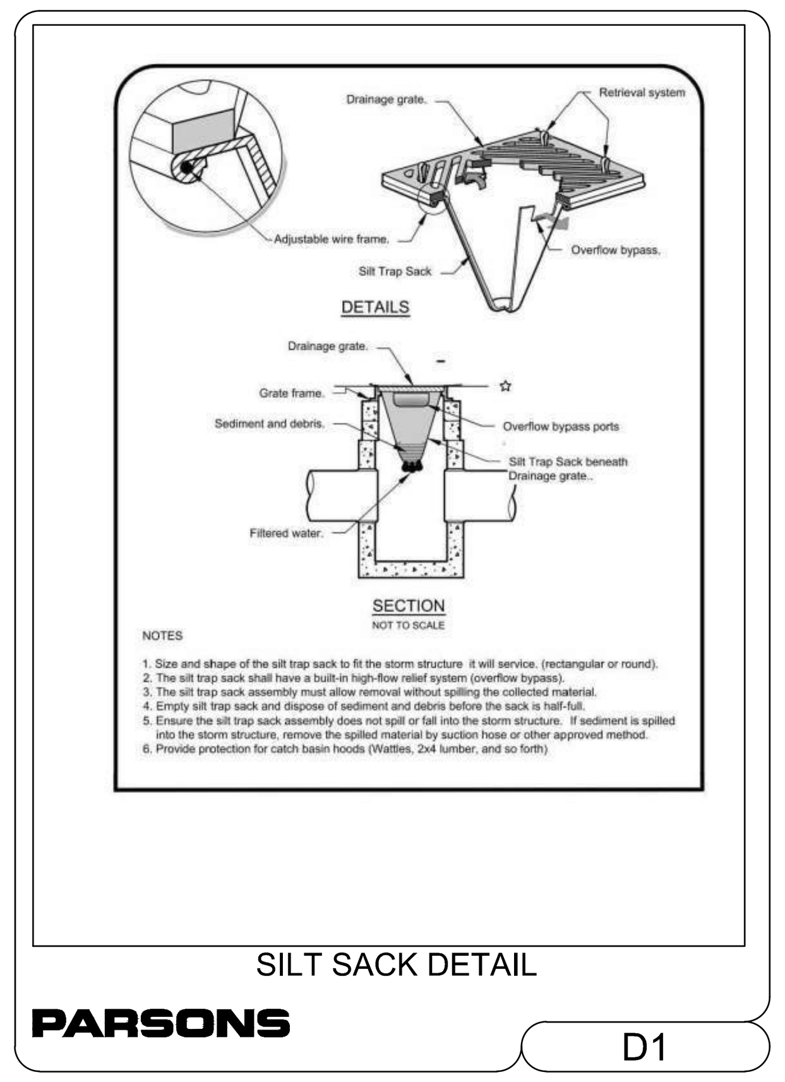
NOTE: BEARING CONDITIONS SHALL BE OBSERVED BY THE SITE GEOTECHNICAL ENGINEER. "BASE DIMENSIONS MAY BE INCREASED TO ADDRESS DEFICIENT SOIL BEARING CONDITIONS."

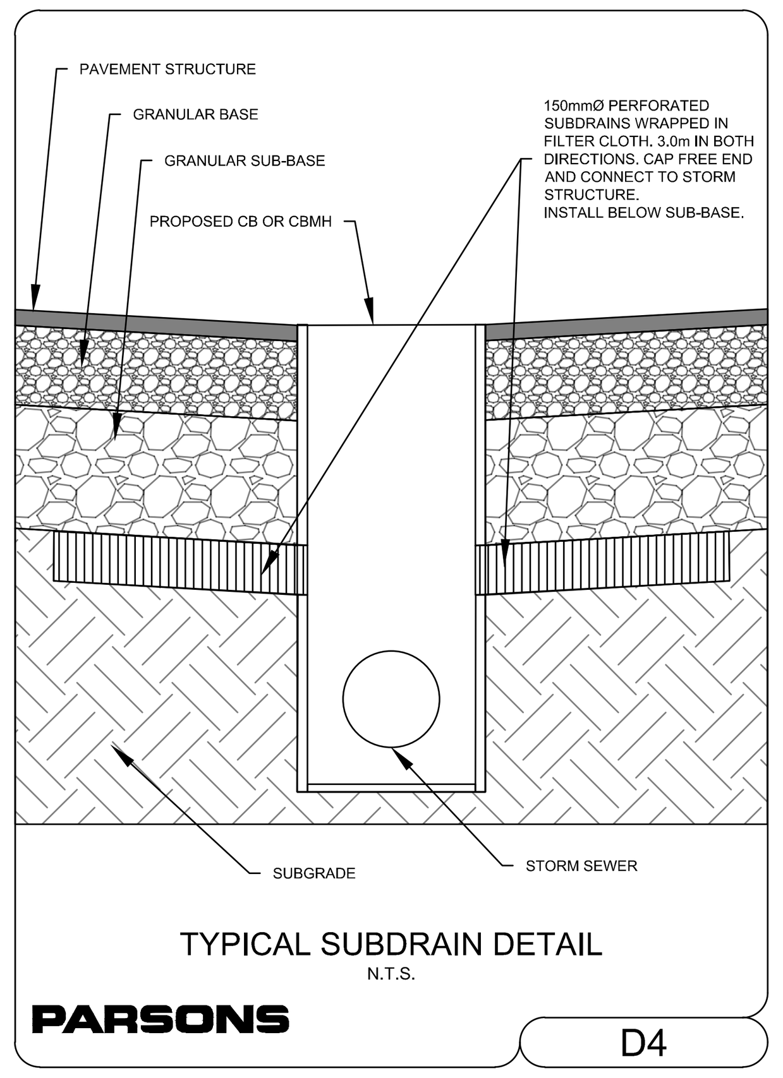
REFER TO STONE STRONG SYSTEM FIELD CONSTRUCTION MANUAL FOR INSTALLATION DETAILS

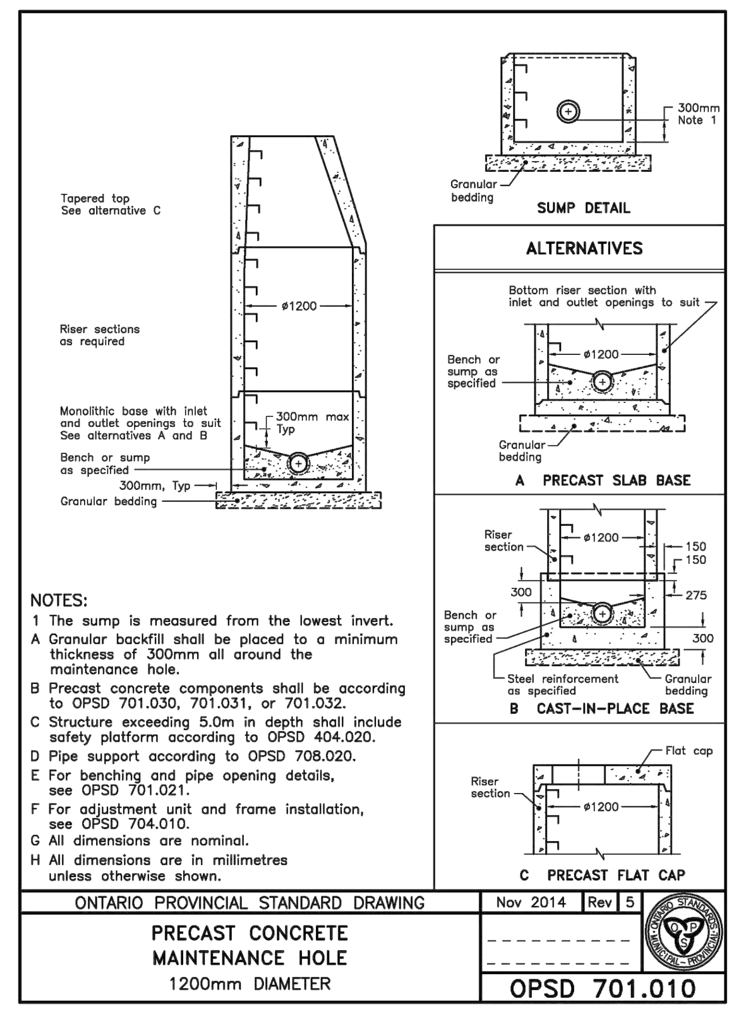
1 FIG.1 SECTION A-A
SCALE: 1:50

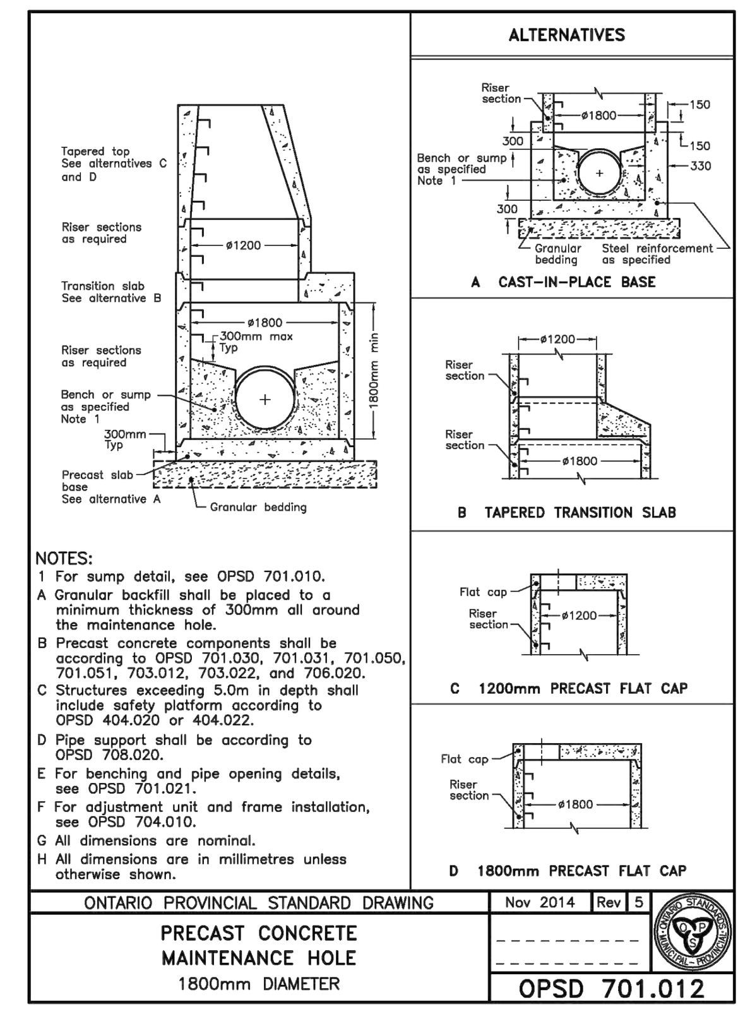
LEGEND:

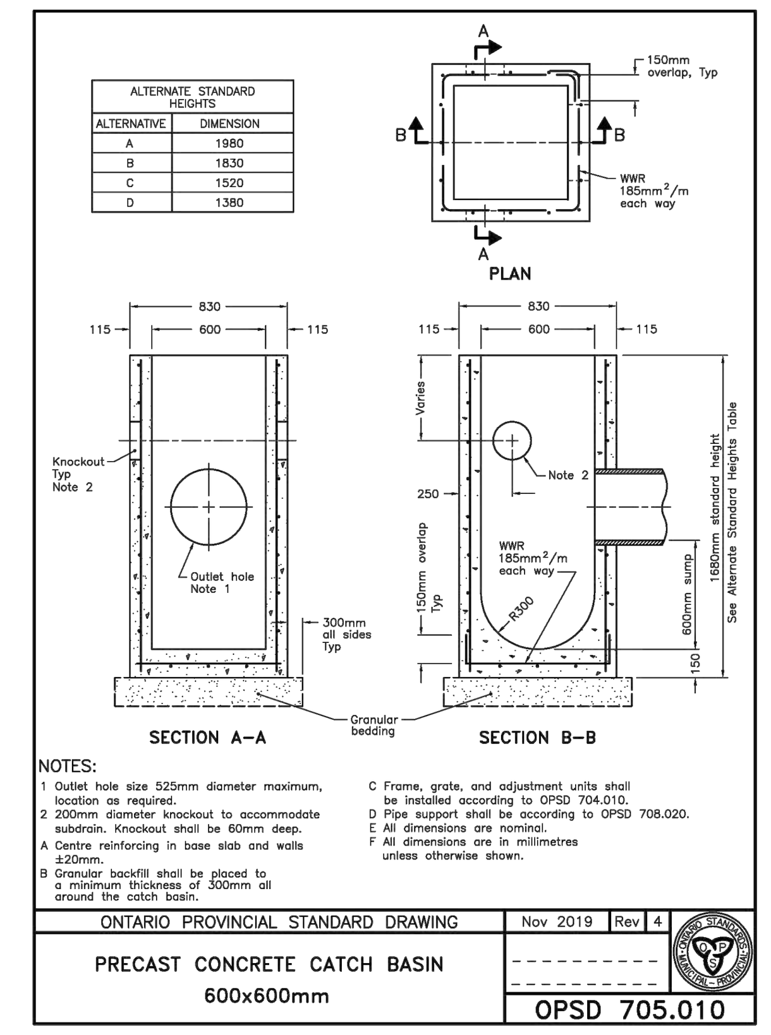
- EXISTING PROPERTY LINE
- TERRACE (3:1 MAX)
- 99.99 EXISTING GRADE
- 99.99 PROPOSED GRADE
- 99.99TC PROPOSED TOP OF CURB ELEVATION
- 99.99 ME MATCH EXISTING SURFACE ELEVATION
- 99.99BW PROPOSED BOTTOM OF WALL ELEVATION
- 99.99TW PROPOSED TOP OF WALL ELEVATION
- 2.0% PROPOSED SLOPE DIRECTION AND PERCENTAGE
- PROPOSED STORM MAINTENANCE HOLE
- PROPOSED CATCH BASIN MAINTENANCE HOLE
- PROPOSED CATCH BASIN
- PROPOSED LIGHT DUTY PAVEMENT
- PROPOSED CONCRETE
- PROPOSED CONCRETE CURB PER CITY STD. SC1.1
- DEPRESSED DC PROPOSED DEPRESSED CONCRETE CURB WITH TWSI PER CITY STD. SC7.3

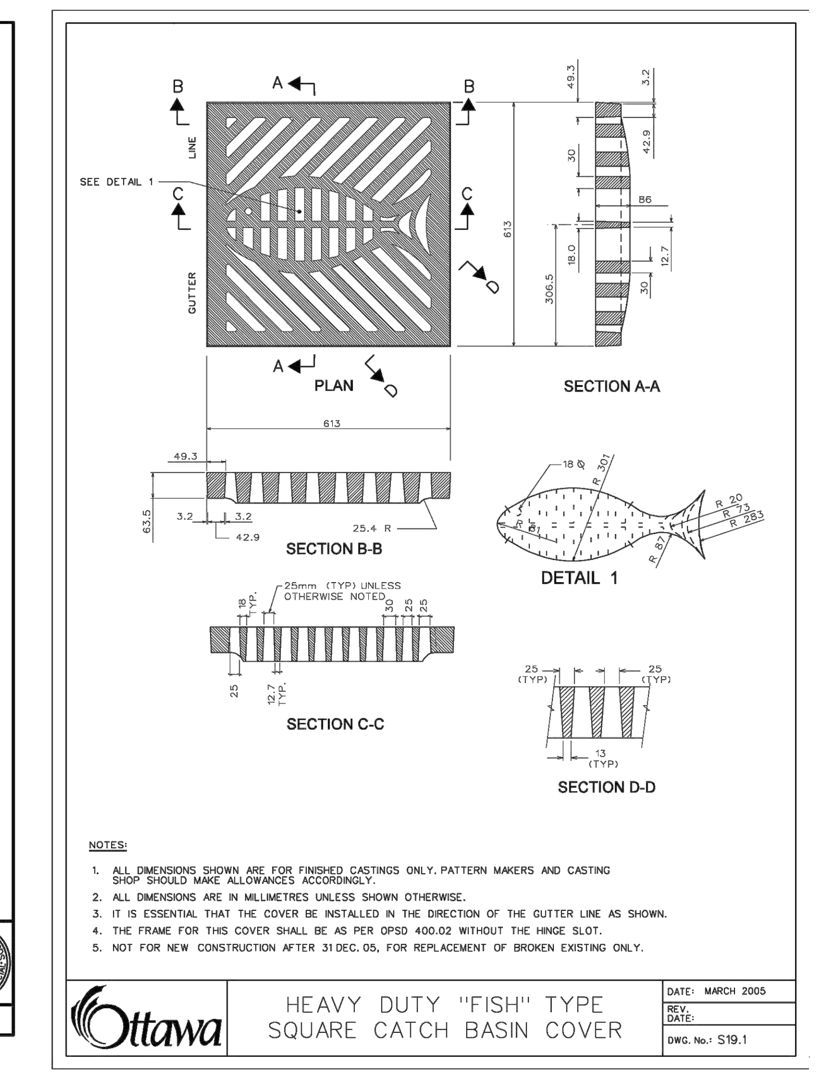


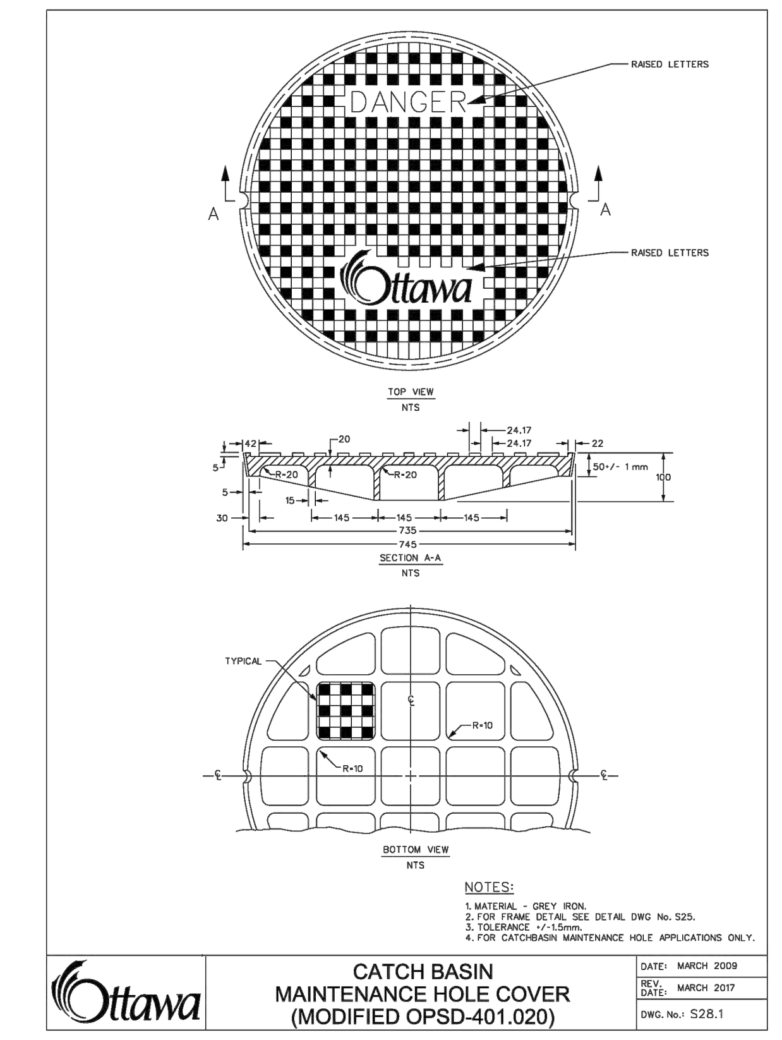


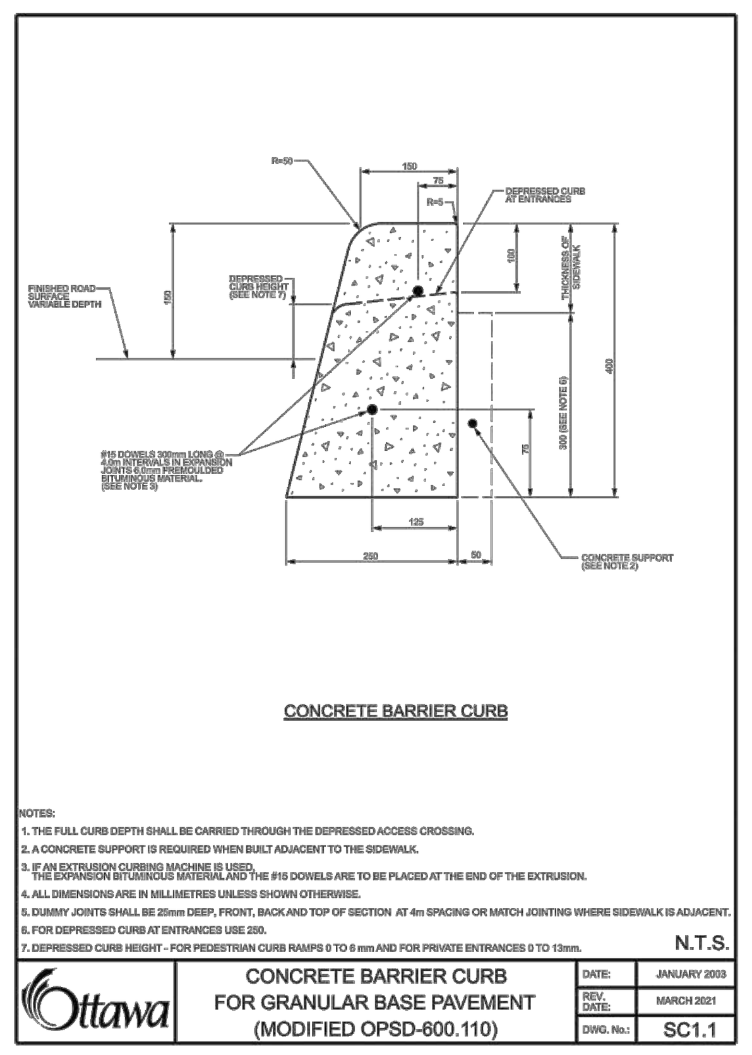


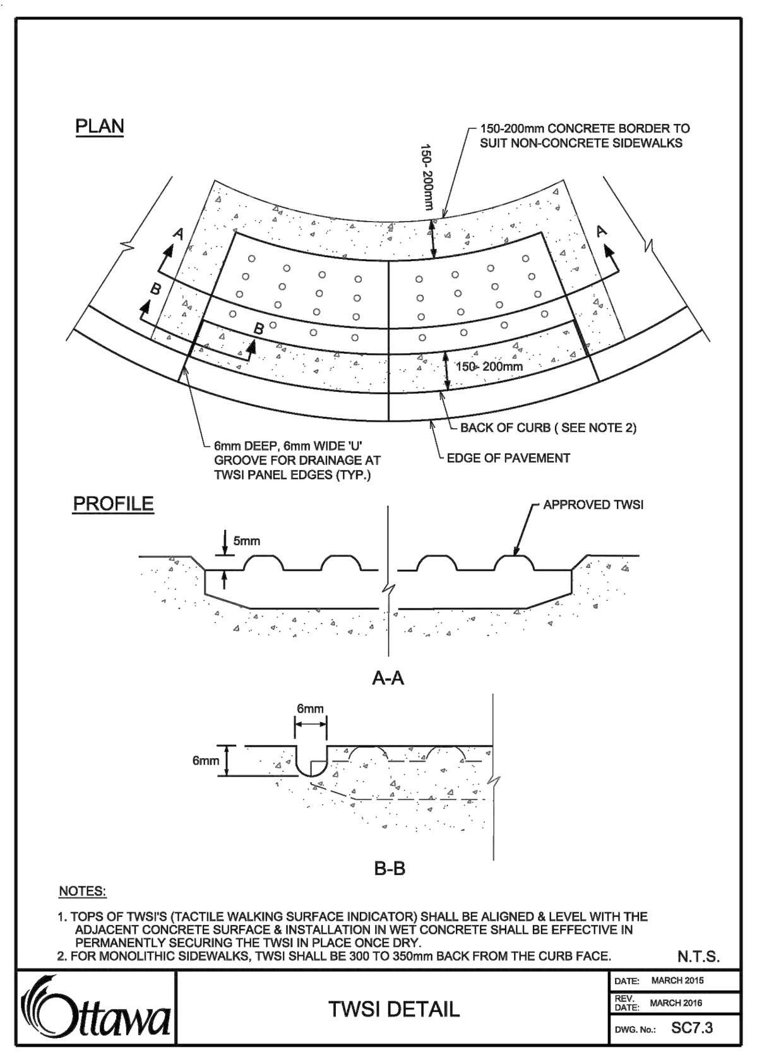


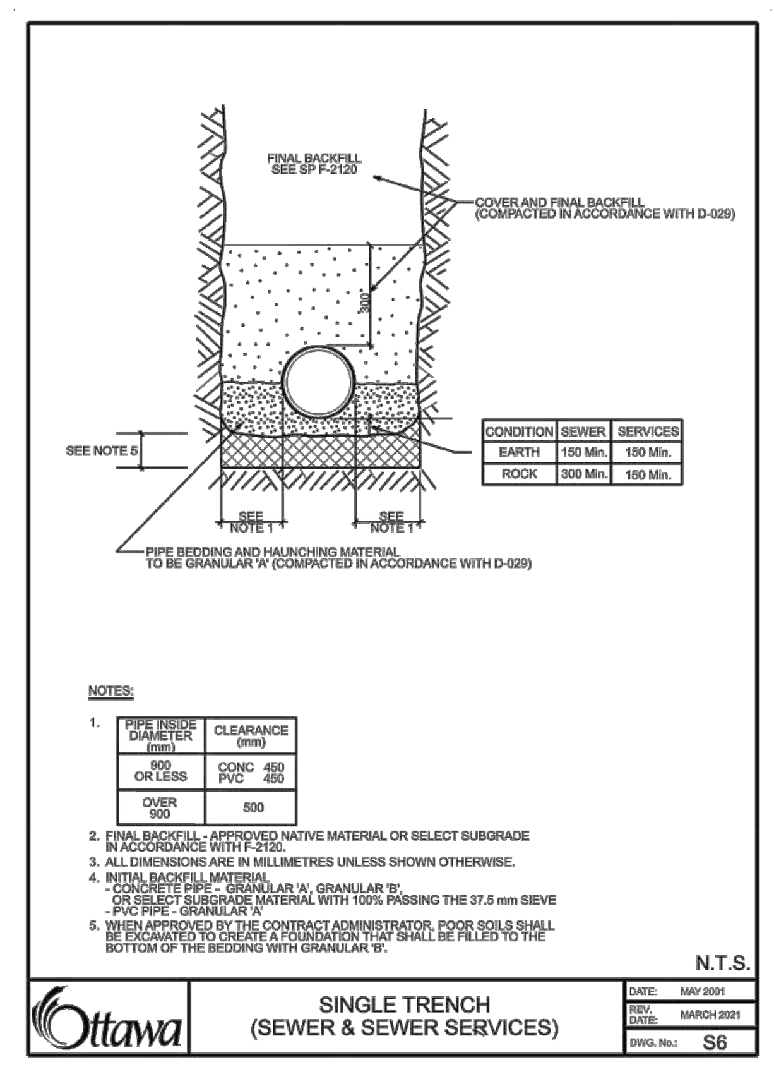


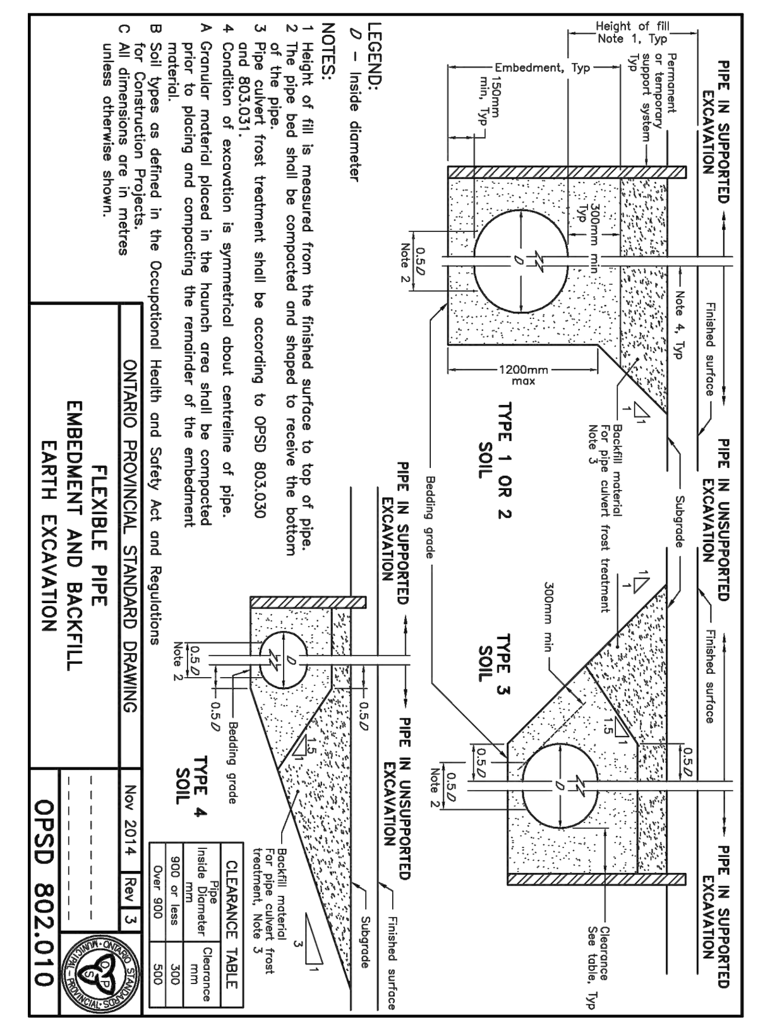


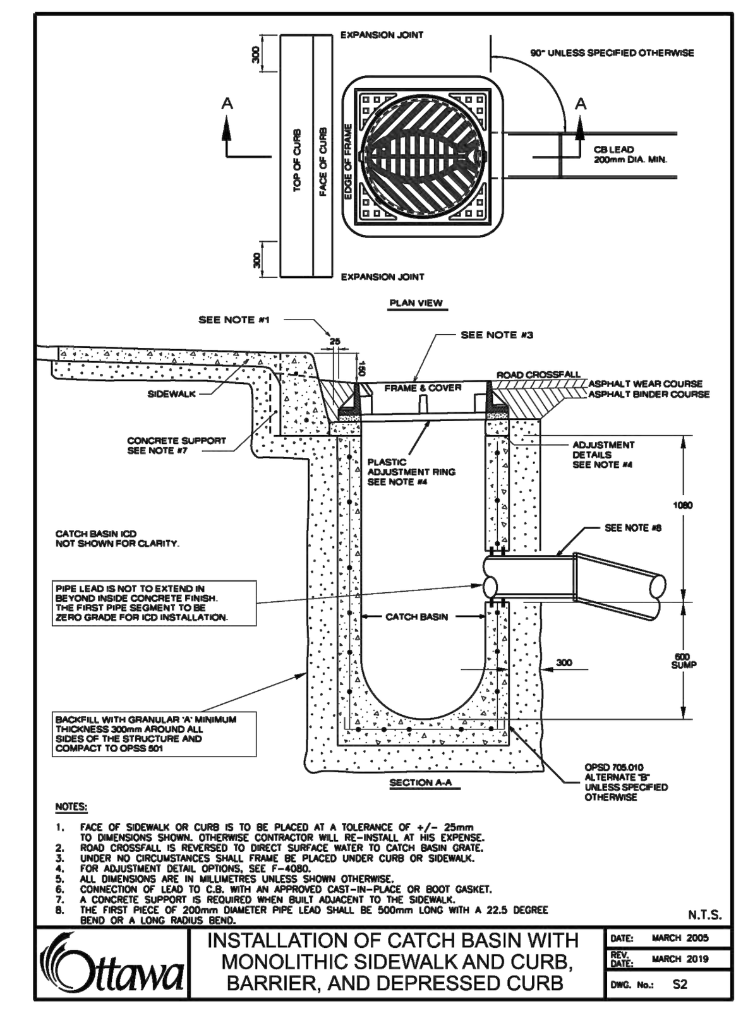


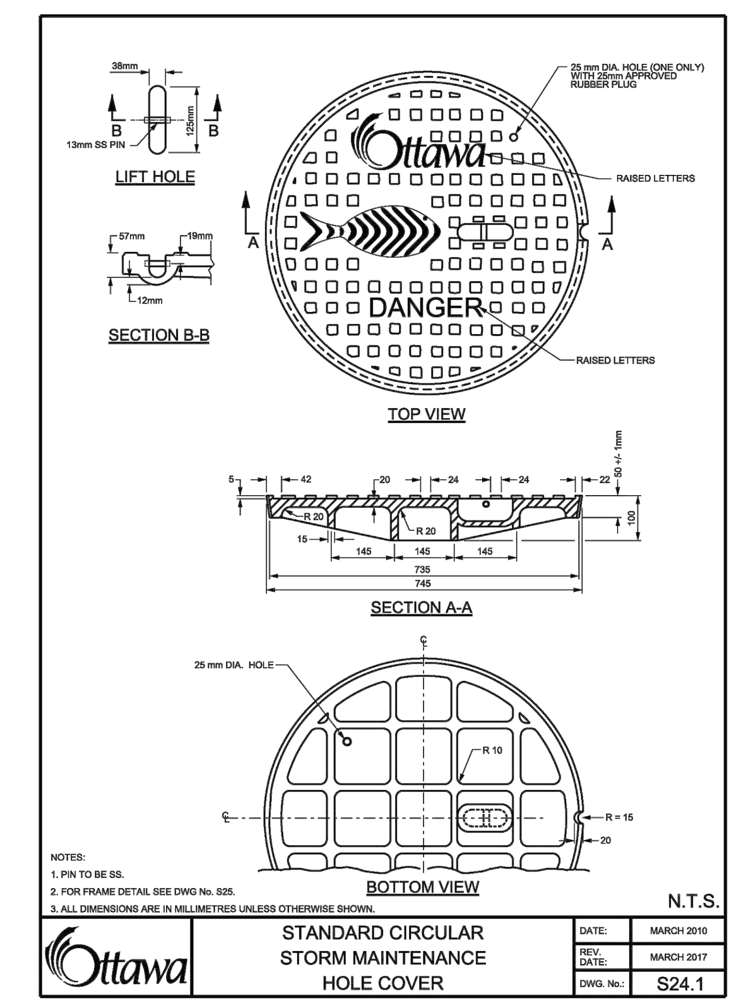


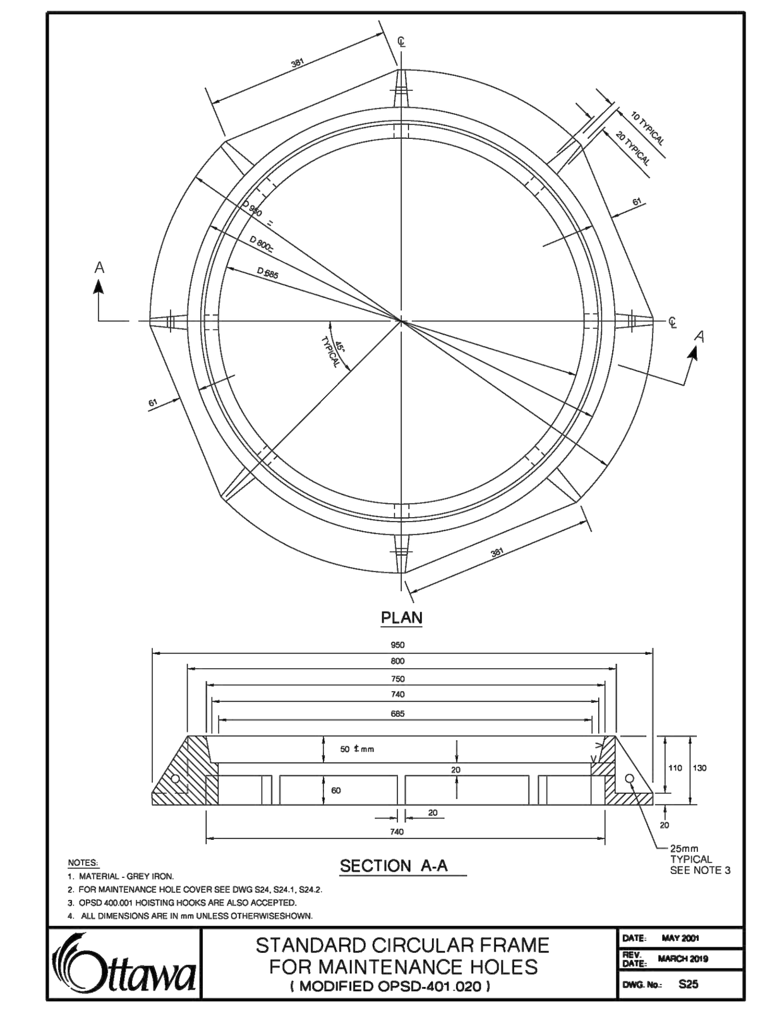


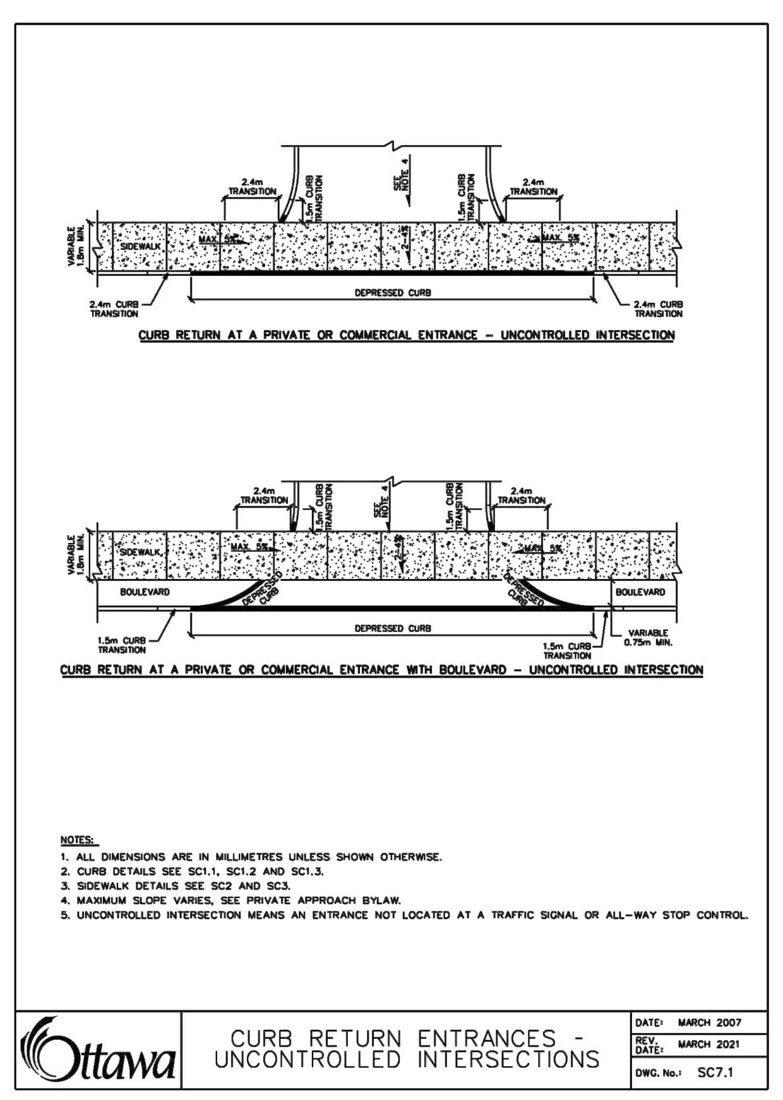


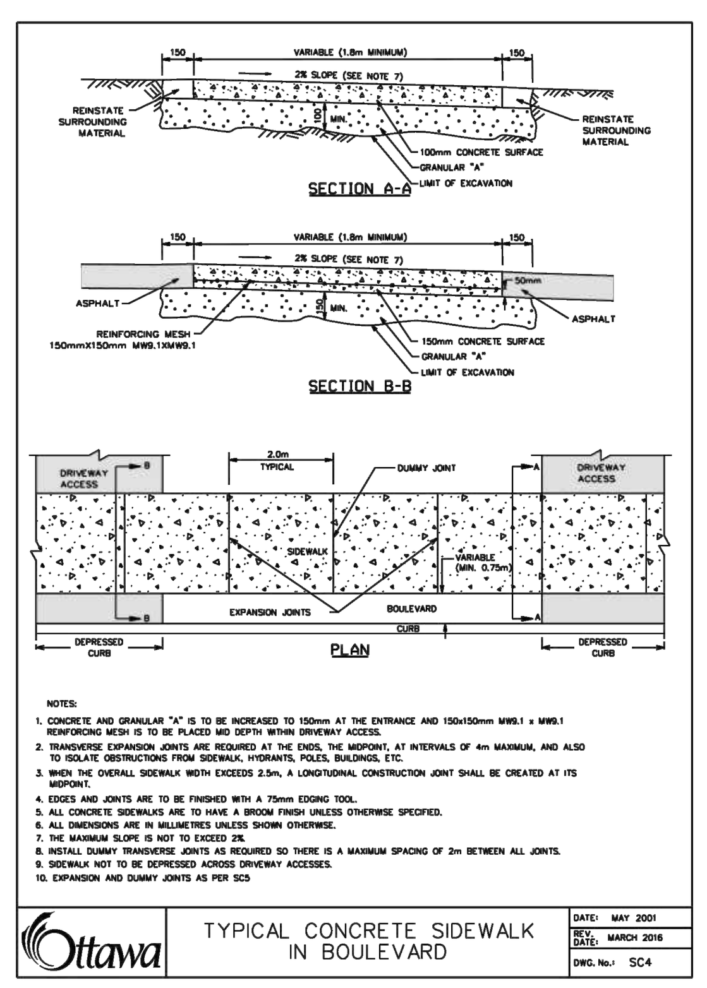


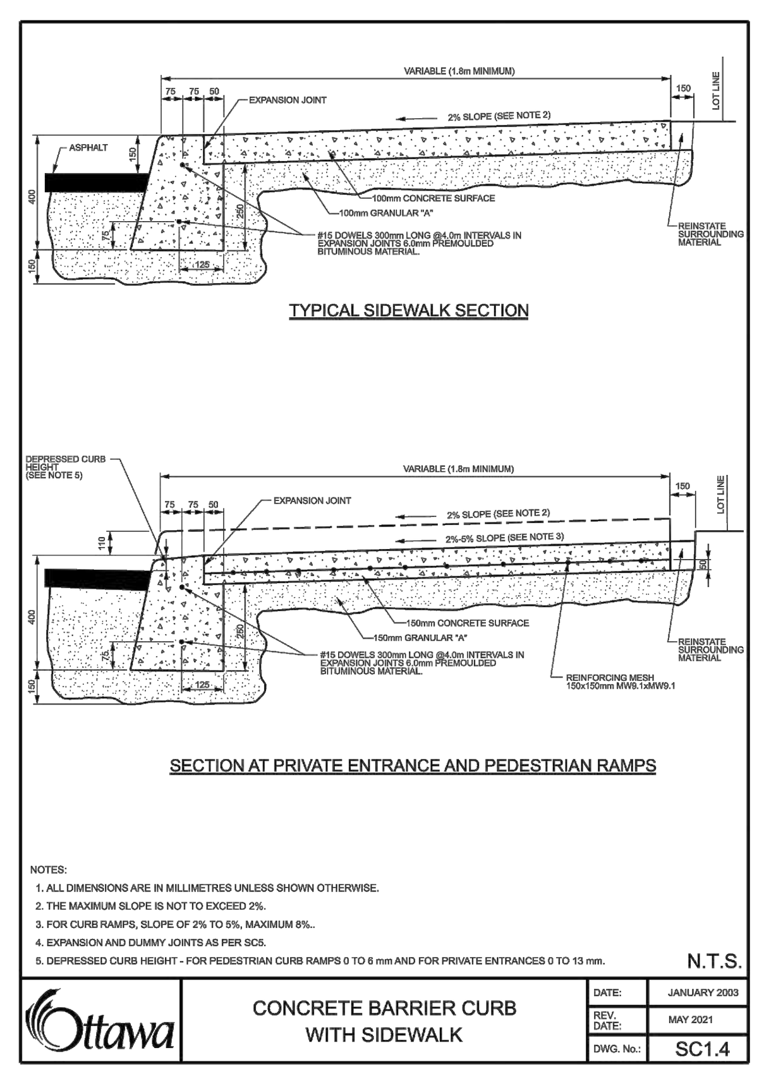


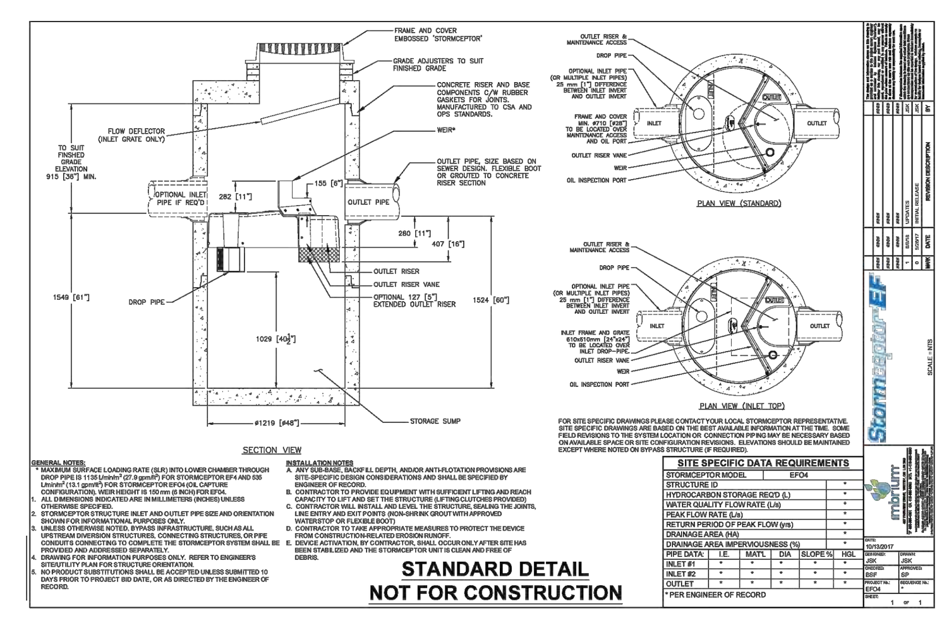












KEY PLAN

NOT TO SCALE

Surveyor

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 CONCOURSE GATE, SUITE 500
NEPEAN, ONTARIO, K2E 7S6

TOPOGRAPHIC INFORMATION & BENCHMARK

SURVEY COMPLETED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. ON MAY 28, 2024. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM, DERIVED FROM CONTROL MONUMENT NO. 019680274 HAVING AN ELEVATION OF 66.322m.

BOUNDARY INFORMATION WAS COMPILED FROM PLANS 4R-19213, 4R-35573 AND 4R-36051

JOB BENCHMARK

FIRE HYDRANT TOP OF SPINDLE ALONG TRANSITWAY ELEVATION = 63.52m

Client

The Ottawa Hospital | L'Hôpital d'Ottawa

THE OTTAWA HOSPITAL
1053 CARLING AVENUE,
OTTAWA, ONTARIO, K1Y 4E9
(613) 722-7000

PARSONS
1223 MICHAEL STREET, SUITE 100
GLOUCESTER, ONTARIO, K1J 7T2

LICENSED PROFESSIONAL ENGINEER
B. VILLENEUVE
100553987
2025-03-14
PROVINCE OF ONTARIO

No.	Revision	By	Date (yy/mm/dd)
3	RE-ISSUED FOR SPA	BV	2025/03/13
2	RE-ISSUED FOR SPA	BV	2025/01/17
1	ISSUED FOR SPA	BV	2024/11/08

Scale

5m 0 5 10m
SCALE: 1:250

Project Title

THE OTTAWA HOSPITAL RIVERSIDE CAMPUS PARKING LOT

Drawing Title

PARKING LOT D DETAILS

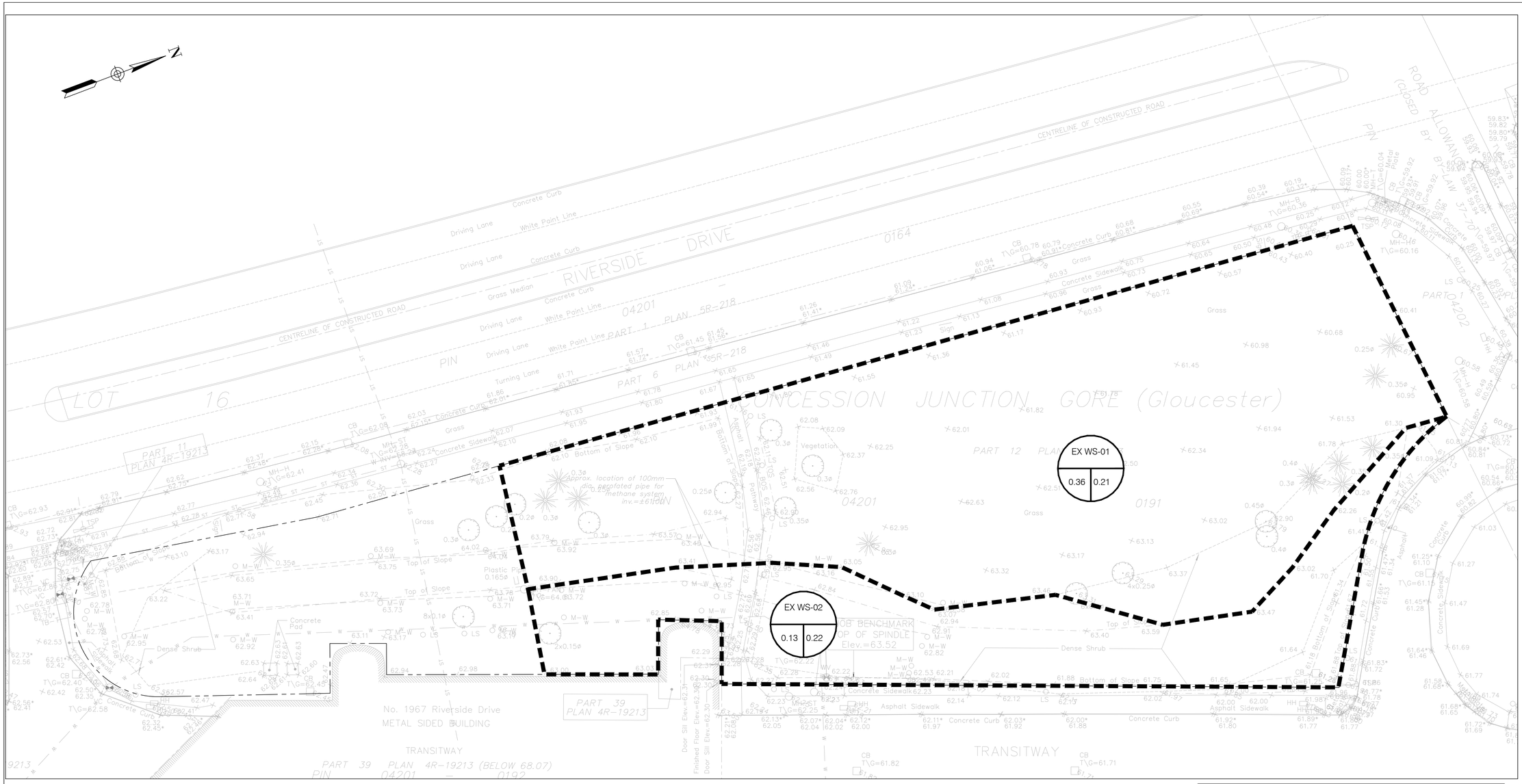
Designed by:	BV
Drawn by:	BV
Approved by:	MT

Datum: NAD83 ORIGINAL CGVD28

Project No. 479008

Drawing No. C104

D07-12-25-0006
#19228



LEGEND:

EXISTING PROPERTY LINE

EXISTING WATERSHED BOUNDARY

WS-XX — WATERSHED NAME

0.61 | 0.90 — RUNOFF COEFFICIENT

AREA IN HECTARES

KEY PLAN

NOT TO SCALE

Surveyor

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 CONCOURSE GATE, SUITE 500
NEPEAN, ONTARIO, K2E 7S6

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2025-03-14
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No.	Revision	By	Date (yy/mm/dd)
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1	ISSUED FOR SPA	BV	2024/11/08

Scale

5m 0 5 10m

SCALE: 1:250

Project Title

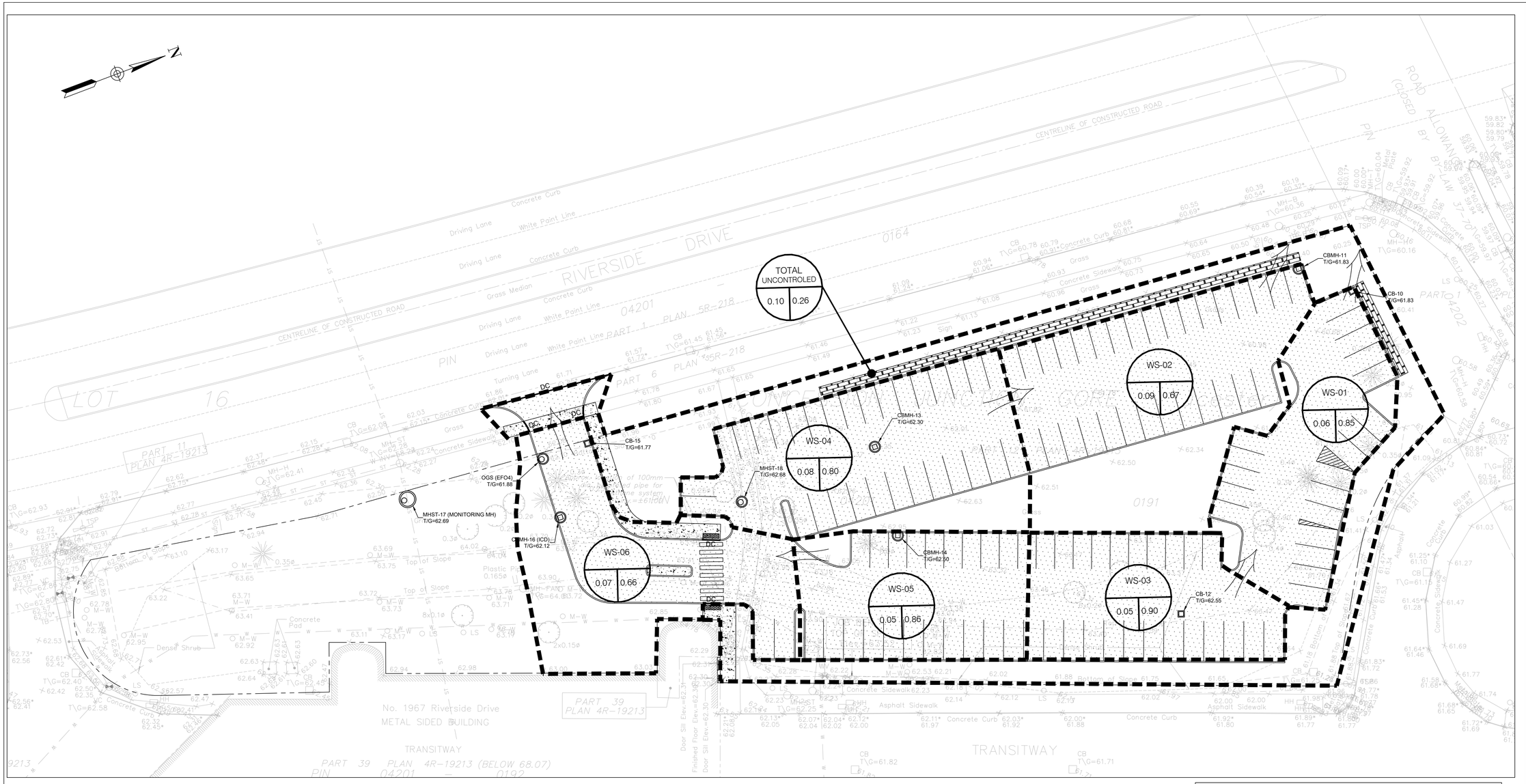
THE OTTAWA HOSPITAL
RIVERSIDE CAMPUS
PARKING LOT

Drawing Title

PARKING LOT D
PRE DEVELOPMENT
DRAINAGE AREAS

Designed by:	BV	Datum	
Drawn by:	BV		
Approved by:	MT		
Project No.	479008	Drawing No.	C105

#19228 D07-12-25-0006



LEGEND:

- EXISTING PROPERTY LINE
- WATERSHED BOUNDARY
- WATERSHED NAME (WS-XX)
- RUNOFF COEFFICIENT (0.61)
- AREA IN HECTARES (0.90)
- EMERGENCY OVERLAND FLOW ROUTE

KEY PLAN

NOT TO SCALE

Surveyor

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 CONCOURSE GATE, SUITE 500
NEPEAN, ONTARIO, K2E 7S6

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Scale

5m 0 5 10m
SCALE: 1:250

Project Title

THE OTTAWA HOSPITAL RIVERSIDE CAMPUS PARKING LOT

Drawing Title

PARKING LOT D POST DEVELOPMENT DRAINAGE AREAS

Designed by:	BV	Datum	NAD83 CSRS (3) MTM ZONE 9
Drawn by:	BV		
Approved by:	MT		
Project No.	479008	Drawing No.	C106

#19228 D07-12-25-0006