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SITE SERVICING AND STORMWATER MANAGEMENT REPORT

FOR

LE GROUPE MOURICE
211 CENTRUM BLVD.

CITY OF OTTAWA

PROJECT NO.: 19-1159
CITY APPLICATION NO.: D07-12-XX-XXXX

NOVEMBER 2020 – REV 1
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SITE SERVICING AND STORMWATER MANAGEMENT REPORT
FOR
211 CENTRUM BLVD.

LE GROUPE MOURICE

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1.0 INTRODUCTION

David Schaeffer Engineering Limited (DSEL) has been retained by Le Groupe Maurice to prepare a Site Servicing and Stormwater Management report in support of a Zoning By-Law Amendment (ZBLA) and Site Plan Control (SPC) application for the proposed development at 211 Centrum Blvd.

The subject property is located within the City of Ottawa urban boundary, in the Orleans ward. As illustrated in ***Figure 1***, the subject property is located at the intersection of Place d'Orleans Drive and Centrum Boulevard. Comprised of a single parcel of land the subject property measures approximately ***1.53 ha*** and is zoned Mixed-Use Centre Zone (MC).

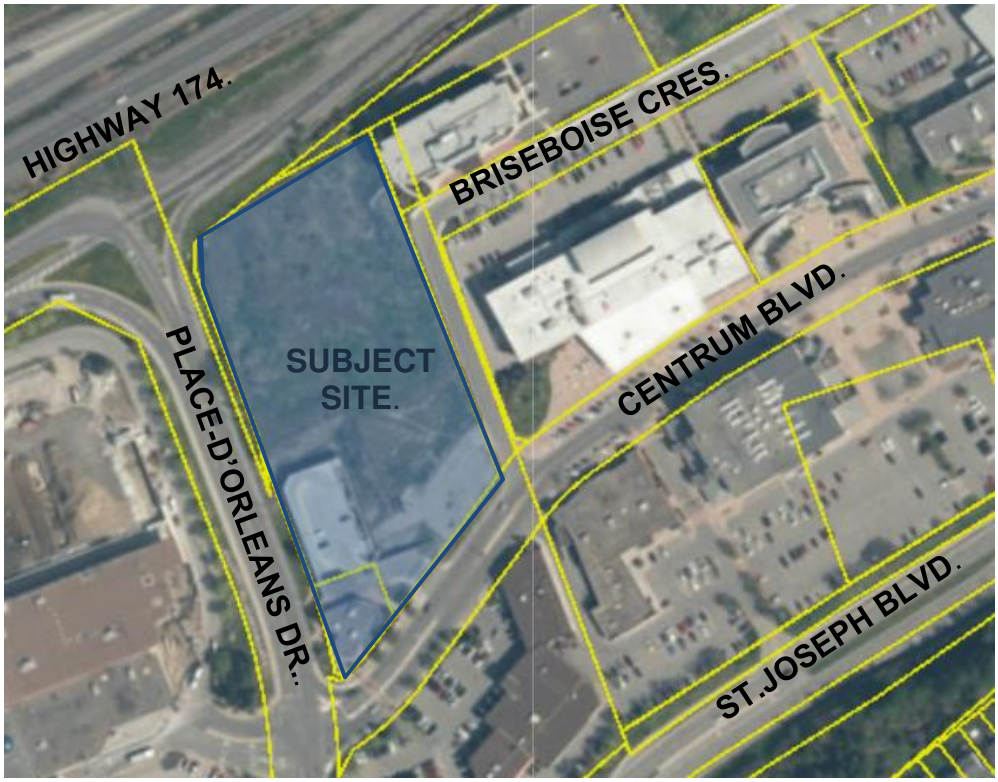


Figure 1: Site Location

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The proposed ZBLA and SPC would allow for the development of a 17-storey retirement residence fronting onto Brisebois Crescent. The proposed condominium would include ***377*** residential apartments and **20** assisted living boarding rooms, approximately ***7,812 m^2*** of amenity space, and underground parking with access from Brisebois Crescent. A copy of the Site Plan is included in ***Drawings/Figures***. The rear hall portion of the existing commercial building will be removed to accommodate the development.

The objective of this report is to provide sufficient detail to demonstrate that the proposed development is supported by existing municipal services.

1.1 Existing Conditions

The site contains an existing commercial building and an attached 2-storey parking lot and landscaped areas. The elevations range between 62.10 m and 69.82 m with grade change of approximately 1.9% from the Southwest to the Northeast corner of the property, sloped towards the drainage swale located along Highway 174.

Sewer and watermain mapping collected from the City of Ottawa indicate that the following services exist across the property frontages within the adjacent municipal right-of-ways:

Place-d'Orleans Drive

- 1200 mm diameter CONC storm sewer tributary to the Greens Creek.

Centrum Boulevard

- 305 mm diameter DI watermain;
- 450 mm diameter CONC storm sewer tributary to the Greens Creek; and
- 250 mm diameter PVC sanitary sewer tributary to the Cumberland Collector.

Brisebois Crescent

- 203 mm diameter PVC watermain;
- 250 mm diameter CONC storm sewer tributary to the Greens Creek; and
- 300 mm diameter PVC sanitary sewer tributary to the Cumberland Collector.

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1.2 Required Permits / Approvals

The proposed development is subject to the site plan control approval process. The City of Ottawa must approve the engineering design drawings and reports prior to the issuance of site plan control.

The proposed development is a single parcel of land that is not industrial and would outlet to a storm sewer. As a result, the stormwater management system is exempt from sections 53(1) and (3) of the Ontario Water Resources Act under Ontario Regulation 525/98.

1.3 Pre-consultation

Pre-consultation correspondence, along with the servicing guidelines checklist, is located in ***Appendix A***.

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2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

2.1 Existing Studies, Guidelines, and Reports

The following studies were utilized in the preparation of this report:

- **Ottawa Sewer Design Guidelines**,
  City of Ottawa, *SDG002,* October 2012.
  (City Standards)

  - **Technical Bulletin ISDTB-2014-01**
    City of Ottawa, February 5, 2014.
    (*ISDTB-2014-01*)

  - **Technical Bulletin PIEDTB-2016-01**
    City of Ottawa, September 6, 2016.
    (*PIEDTB-2016-01*)

  - **Technical Bulletin ISTB-2018-01**
    City of Ottawa, March 21, 2018.
    (*ISTB-2018-01*)

  - **Technical Bulletin ISTB-2018-03**
    City of Ottawa, March 21, 2018.
    (*ISTB-2018-03*)

  - **Technical Bulletin ISTB-2019-01**
    City of Ottawa, January, 2019.
    (*ISTB-2019-01*)

  - **Technical Bulletin ISTB-2019-02**
    City of Ottawa, July 8, 2019.
    (*ISTB-2019-02*)

- **Ottawa Design Guidelines – Water Distribution**
  City of Ottawa, July 2010.
  (Water Supply Guidelines)

  - **Technical Bulletin ISD-2010-2**
    City of Ottawa, December 15, 2010.
    (*ISD-2010-2*)

  - **Technical Bulletin ISDTB-2014-02**
    City of Ottawa, May 27, 2014.
    (*ISDTB-2014-02*)

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- **Technical Bulletin ISDTB-2018-02**
  City of Ottawa, March 21, 2018.
  (*ISDTB-2018-02*)

- **Design Guidelines for Sewage Works,**
  Ministry of the Environment, 2008.
  (MOE* Design Guidelines*)

- **Stormwater Planning and Design Manual,**
  Ministry of the Environment, March 2003.
  (SWMP Design Manual)

- **Ontario Building Code Compendium**
  Ministry of Municipal Affairs and Housing Building Development Branch,
  January 1, 2010 Update.
  (OBC)

- **Geotechnical Investigation (11206675 – Rev1)**
  GHD,
  August, 2020.
  (Geotech Report)

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3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The subject property lies within the City of Ottawa 1E pressure zone, as shown by the Pressure Zone map in ***Appendix B***. A local 203 mm diameter watermain exists within the Brisebois Cres. right-of-way and a local 305 mm diameter watermain exists within the Centrum Blvd. right-of-way.

3.2 Water Supply Servicing Design

It is proposed to service the development by connecting to the existing 203 mm diameter watermain within Brisebois Cres. via 150 mm diameter service connection and a second connection to the existing 300 mm diameter watermain within Centrum Blvd. via a 150 mm service connection.

In accordance with City of Ottawa technical bulletin ISDTB-2014-02, redundant service connections will be required due to an estimated design flow of greater than 50 m^3/day.

Based on available City mapping, there are two fire hydrants fronting the property along Brisebois Cres.

Table 1, below, summarizes the ***Water Supply Guidelines*** employed in the preparation of the water demand estimate.

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Table 1
Water Supply Design Criteria

Design Parameter	Value
Residential Bachelor Apartment	1.4 P/unit
Residential 1 Bedroom Apartment	1.4 P/unit
Residential 2 Bedroom Apartment	2.1 P/unit
Residential 3 Bedroom Apartment	3.1 P/unit
Boarding Room	1.0 P/unit
Residential Average Daily Demand	280 L/d/P***
Residential Maximum Daily Demand	2.5 x Average Daily **
Residential Maximum Hourly Demand	5.5 x Average Daily **
Amenity Space	2.5 L/m^2/d
Commercial Maximum Daily Demand	1.5 x avg. day
Commercial Maximum Hour Demand	1.8 x max. day
Minimum Watermain Size	150 mm diameter
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
During normal operating conditions desired operating pressure is within	350 kPa and 480 kPa
During normal operating conditions pressure must not drop below	275 kPa
During normal operating conditions pressure must not exceed	552 kPa
During fire flow operating pressure must not drop below	140 kPa

Daily average based on Appendix 4-A from **Water Supply Guidelines*
*** Residential Max. Daily and Max. Hourly peaking factors per MOE Guidelines for Drinking-Water Systems Table 3-3 for 0 to 500 persons.*
-Table updated to reflect ISD-2010-2
****Daily consumption rate of 280 L/person/day to align with the revised wastewater rates identified by City of Ottawa Technical Bulletin ISTB-2018-03. As a result, DSEL is submitting for a deviation from the **Water Supply Guidelines**.*

Table 2, below, summarizes the estimated water supply demand and boundary conditions for the proposed development based on the ***Water Supply Guidelines***.

Table 2
Water Demand and Boundary Conditions
Proposed Conditions

Design Parameter	Estimated Demand[1] (L/min)	Boundary Condition[2] (m H_2O / kPa) Connection 1	Boundary Condition[2] (m H_2O / kPa) Connection 2
Average Daily Demand	142.1	47.4 / 465.0	47.4 / 449.3
Max Day + Fire Flow	341.7 + 16,000= 16,341.7	16.0 / 157.0	32.8 / 306.1
Peak Hour	743.5	41.3 / 405.2	41.4 / 306.1

1) Water demand calculation per ***Water Supply Guidelines***. See ***Appendix B*** for detailed calculations.
2) Boundary conditions supplied by the City of Ottawa for the demands indicated in the correspondence; assumed ground elevation 66.5m at Connection 1 (Brisebois Cres.) and 68,1m at Connection 2 (Centrum Blvd). See ***Appendix B.***

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Fire flow requirements are to be determined in accordance with City of Ottawa ***Water Supply Guidelines*** and the Ontario Building Code.

Fire flow requirements were estimated per City of Ottawa Technical Bulletin ***ISTB-2018-02***. The following parameters were coordinated with the architect:

- Type of construction – Non-combustible Construction;
- Occupancy type – Limited Combustibility; and
- Sprinkler Protection –Fully supervised.

The above assumptions result in an estimated fire flow of approximately ***16,000 L/min.*** A certified fire protection system specialist would need to be employed to design the building fire suppression system of the building.

The City of Ottawa was contacted to obtain boundary conditions associated with the estimated water demand as indicated in the boundary request correspondence included in ***Appendix B***.

The City provided both the estimated minimum and maximum water pressures, as well as the estimated water pressure during fire flow demand for the demands indicated by the correspondence in ***Appendix B***. As shown by ***Table 2,*** above, the minimum and maximum pressures fall within the recommended range identified in ***Table 1***.

The Site Plan has been revised since the original boundary conditions request, which resulted in an increase of approximately 5.5% to the estimated water demand for the site. It is not anticipated to have a significant impact on the previously provided boundary conditions.

3.3 Water Supply Conclusion

The City provided both the estimated minimum and maximum water pressures, as well as, the estimated water pressure during fire flow. The minimum and maximum pressures fall within the recommended range identified in ***Table 1.***

DSEL employed a daily consumption rate of 280 L/person/day to align with the revised wastewater rates identified by City of Ottawa Technical Bulletin ISTB-2018-03. As a result, DSEL is submitting for a deviation from the ***Water Supply Guidelines***.

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4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

The subject site lies within the Cumberland Collector catchment area, as shown by the City sewer mapping included in ***Appendix C***. An existing 250 mm diameter sanitary sewer within Brisebois Cres. is available to service the proposed development as well as a 250mm diameter sanitary sewer within Centrum Blvd.

The existing site consists of an existing commercial building is estimated to be contributing wastewater to the local 250 mm diameter sewer system within Centrum Blvd.

4.2 Wastewater Design

It is proposed that the development will be serviced via the existing 250 mm sanitary sewer within Brisebois via a 250 mm diameter service lateral.

Table 4, below***,*** summarizes the ***City Standards*** employed in the design of the proposed wastewater sewer system.

Table 3
Wastewater Design Criteria

Design Parameter	Value
Residential 1 Bedroom Apartment	1.4 P/unit
Residential 2 Bedroom Apartment	2.1 P/unit
Residential 3 Bedroom Apartment	3.1 P/unit
Residential Townhouse	2.7 P/unit
Average Daily Demand	280 L/d/per
Peaking Factor	Harmon's Peaking Factor. Max 4.0, Min 2.0 Harmon's Corrector Factor 0.8
Amenity Space	5 L/m^2/d
Infiltration and Inflow Allowance	0.05 L/s/ha (Dry Weather) 0.28 L/s/ha (Wet Weather) 0.33 L/s/ha (Total)
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} AR^{2/3} S^{1/2}$
Minimum Sewer Size	200 mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5 m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6 m/s
Maximum Full Flowing Velocity	3.0 m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012.	

Table 5, below, demonstrates the estimated peak flow from the proposed development. See ***Appendix C*** for associated calculations.

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Table 4
Summary of Estimated Peak Wastewater Flow

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	**3.12**
Estimated Peak Dry Weather Flow	**8.11**
Estimated Peak Wet Weather Flow	**8.53**

The estimated sanitary flow based on the ***Site Plan,*** included in ***Drawings/Figures,*** results in a peak wet weather flow of ***8.53 L/s***.

In order to assess the available capacity, a sanitary analysis was conducted for the local municipal sanitary sewers located across the frontage of the subject property. The catchment area serviced by the Brisebois Cres. sewer was identified and evaluated by reviewing existing development and zoning within the area. The analysis was conducted from the site to the upstream extents of the drainage area located near the crossing of sanitary sewer under Highway 174 as shown by the sanitary drainage plan ***SAN-1,*** included along with this report.

The City of Ottawa's Technical Bulletin ***ISTB-2018-01*** was employed to generate a conservative estimate of the existing wastewater flow conditions within the local sewers.

Based on the sanitary analysis, the controlling section of the local sewer system is located at the bend in Brisebois Cres. As the sanitary sewer leaves the City right-of-way. This sewer was estimated to have an available capacity of ***29.1 L/s*** (section EX.MH5-EX.MH6) with an available residual capacity of ***24.2 L/s***; detailed calculations are included in ***Appendix C***.

The analysis above indicates that sufficient capacity is available in the local sewers to accommodate the proposed development.

4.3 Wastewater Servicing Conclusions

The site is tributary to the Cumberland Collector. It is proposed to discharge wastewater to the existing 250 mm diameter sanitary sewer within Brisebois Cres. via a 250 mm diameter service lateral

Based on the above sanitary analysis, sufficient capacity is available to accommodate the estimated ***8.53 L/s*** peak wet weather flow from the proposed development.

The proposed wastewater design conforms to all relevant ***City Standards***.

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5.0 STORMWATER MANAGEMENT

5.1 Existing Stormwater Services

Stormwater runoff from the subject property is tributary to the City of Ottawa sewer system located within the Greens Creek sub-watershed. As such, approvals for proposed development within this area are under the approval authority of the City of Ottawa.

Flows that influence the watershed in which the subject property is located are further reviewed by the principal authority. The subject property is located within the Ottawa River watershed, and is therefore subject to review by the Rideau Valley Conservation Authority (RVCA). Consultation with the RVCA is located in ***Appendix A***.

It was assumed that the existing development contained no stormwater management controls for flow attenuation. Refer to ***SWM-1*** for further information. The estimated pre-development peak flows for the 2, 5, and 100-year events are summarized in ***Table 5,*** below:

Table 5
Summary of Existing Peak Storm Flow Rates

City of Ottawa Design Storm	Estimated Peak Flow Rate (L/s)
2-year	99.2
5-year	134.0
100-year	286.0

5.2 Post-development Stormwater Management Target

Stormwater management requirements for the proposed development were reviewed with the City of Ottawa, where the proposed development is required to:

- Meet an allowable release rate based on a Rational Method Coefficient of 0.50, employing the City of Ottawa IDF parameters for a 5-year storm with a time of concentration equal to or greater than 20 minutes;
- Attenuate all storms up to and including the City of Ottawa 100-year design event on site; and
- Quality controls are recommended onsite due to the ultimate outlet within the Greens Creek. Per the pre-consultation email with the RVCA, it was recommended to provide 80% TSS Removal

Based on the above the allowable release rate for the proposed development is ***148.9 L/s***.

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5.3 Proposed Stormwater Management System

It is proposed that the stormwater outlet from the development will be to the 525 mm diameter storm sewer within Brisebois Cres. via a 450 mm diameter sewer connection to the existing manhole.

To meet the stormwater objectives the proposed development will contain underground storage within the parking area and surface storage through ponding.

Stormwater runoff collected from the building (***A202***) will be directed to a ***250 m³*** Stormtech MC-4500 or an approved equivalent. Flow from this area will be controlled via a ***155 mm*** dia. ICD located at the outlet of ***STM202***.

The parking and landscaped amenity area (***A103***, ***A107A***, ***A107B, A105*** and ***A106***) will be collected via catch basins into a ***131 m³*** and ***61 m³*** Stormtech SC-740 storm chamber or an approved equivalent. Flow from this area will be controlled via a ***130 mm*** dia. ICD located at the outlet of ***CBMH102***. Refer to ***Appendix D*** for storm chamber specifications.

The parking and landscaped amenity area (***A101***) will be collected by a catch basin and stormwater storage will be provided via surface ponding. Flow from this area will be controlled via a ***100 mm*** dia. ICD located at the outlet of ***CB101A***. Stormwater will then enter the municipal storm sewer within Brisebois Cres., as shown by drawing ***SSP-1***. Foundation drains are to be connected downstream of flow controls.

Stormwater quality controls will be provided through an Oil-Grit Separator (OGS) unit Stormceptor EFO8 or an approved equivalent in order to provide 80% TSS removal. Refer to ***Appendix D*** for sizing reports and specifications.

Table 6, below, summarizes post-development flow rates. These areas will be compensated for in areas with flow attenuation controls.

Table 6
Stormwater Flow Rate Summary

Control Area	5-Year Release Rate	5-Year Required Storage	100-Year Release Rate	100-Year Required Storage	100-Year Available Storage
	(L/s)	(m^3)	(L/s)	(m^3)	(m^3)
Unattenuated Areas	5.5	0.0	11.6	0.0	0.0
A202 (BLDG)	34.3	84.6	63.4	246.9	250.0
Attenuated Areas A1	40.0	43.3	47.6	172.9	192.0
Attenuated Areas A2	13.7	0.1	26.1	1.2	1.9
Total	**93.4**	**128.0**	**148.7**	**421.0**	**443.9**

It is estimated that approximately ***421.0 m³*** of storage will be required on site to attenuate flow to the established release rate of ***148.9 L/s***; storage calculations are contained within ***Appendix D***.

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Runoff from unattenuated areas outlined on figure ***SWM-1***, is proposed to flow overland: Area ID ***U1*** is proposed to direct flow towards the Centrum Boulevard, City of Ottawa Sewers. The unattenuated flow from the proposed development results in a net reduction of runoff to all receiving sewers improving pre-development conditions.

5.4 Stormwater Servicing Conclusions

Post development stormwater runoff will be required to be restricted to the allowable target release rate for storm events up to and including the 100-year storm in accordance with City of Ottawa ***City Standards***. The post-development allowable release rate was calculated as ***148.9 L/s*** based on based on pre-consultation with the City of Ottawa***.*** It is estimated that ***421.0 m^3*** will be required to meet this release rate.

Stormwater quality controls are provided through an OGS unit Stormceptor EFO8 or approved equivalent to achieve 80% TSS removal per consultation with the RVCA.

The proposed stormwater design conforms to all relevant ***City Standards*** and Policies for approval.

6.0 UTILITIES

Gas and Hydro services currently exist within the Centrum Blvd and Brisebois right-of-way. Utility servicing will be coordinated with the individual utility companies prior to site development.

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7.0 EROSION AND SEDIMENT CONTROL

Soil erosion occurs naturally and is a function of soil type, climate and topography. During construction the extent of erosion losses is exaggerated due to the removal of vegetation and the top layer of soil becoming agitated.

Prior to topsoil stripping, earthworks or underground construction, erosion and sediment controls will be implemented and will be maintained throughout construction.

Silt fence will be installed around the perimeter of the site and will be cleaned and maintained throughout construction. Silt fence will remain in place until the working areas have been stabilized and re-vegetated.

Catch basins will have SILTSACKs or an approved equivalent installed under the grate during construction to protect from silt entering the storm sewer system.

A mud mat will be installed at the construction access in order to prevent mud tracking onto adjacent roads.

Erosion and sediment controls must be in place during construction. The following recommendations to the contractor will be included in contract documents:

- Limit extent of exposed soils at any given time;
- Re-vegetate exposed areas as soon as possible;
- Minimize the area to be cleared and grubbed;
- Protect exposed slopes with plastic or synthetic mulches;
- Install silt fence to prevent sediment from entering existing ditches;
- No refueling or cleaning of equipment near existing watercourses;
- Provide sediment traps and basins during dewatering;
- Install filter cloth between catch basins and frames;
- Plan construction at proper time to avoid flooding; and
- Establish material stockpiles away from watercourses, so that barriers and filters may be installed.

The contractor will, at every rainfall, complete inspections and guarantee proper performance. The inspection is to include:

- Verification that water is not flowing under silt barriers; and
- Clean and change filter cloth at catch basins.

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8.0 CONCLUSION AND RECOMMENDATIONS

David Schaeffer Engineering Ltd. (DSEL) has been retained by Le Groupe Mourice to prepare a Site Servicing and Stormwater Management report in support of the Site Plan Control (SPC) at 211 Centrum Blvd. The preceding report outlines the following:

- Based on boundary conditions provided by the City the existing municipal water infrastructure is capable of providing the proposed development with water within the City's required pressure range;
- The FUS method for estimating fire flow indicated ***16,000 L/min*** is required for the proposed development,
- The proposed development is estimated to have a peak wet weather flow of ***8.53 L/s***; Based on the sanitary analysis conducted the existing municipal sewer infrastructure has sufficient capacity to support the development;
- Based on consultation with the ***City of Ottawa*** the proposed development will be required to attenuate post development flows to an equivalent release rate of ***148.9 L/s*** for all storms up to and including the 100-year storm event based on criteria provided by the City of Ottawa.
- It is proposed that stormwater objectives be met through stormwater retention via an internal cistern. It is estimated that ***421.0 m^3*** of onsite storage will be required to attenuate flow to the established release rate above;
- Stormwater quality controls are recommended per consultation with the RVCA

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Prepared by,
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Per: Brandon N Chow

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Per: Adam D. Fobert, P.Eng

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APPENDIX A

Pre-Consultation

DEVELOPMENT SERVICING STUDY CHECKLIST

19-1159 26/06/2020

4.1 General Content

☐	Executive Summary (for larger reports only).	N/A
☒	Date and revision number of the report.	Report Cover Sheet
☒	Location map and plan showing municipal address, boundary, and layout of proposed development.	Drawings/Figures, EX-1
☒	Plan showing the site and location of all existing services.	Figure 1, EX-1
☒	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 1.0, Section 5.0
☒	Summary of Pre-consultation Meetings with City and other approval agencies.	Section 1.3, Appendix A
☒	Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	Section 2.1
☒	Statement of objectives and servicing criteria.	Section 1.0
☒	Identification of existing and proposed infrastructure available in the immediate area.	Sections 3.1, 4.1, 5.1, EX-1
☐	Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	N/A
☒	Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	GP-1
☐	Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐	Proposed phasing of the development, if applicable.	N/A
☒	Reference to geotechnical studies and recommendations concerning servicing.	Section 2.1
☐	All preliminary and formal site plan submissions should have the following information: -Metric scale -North arrow (including construction North) -Key plan -Name and contact information of applicant and property owner -Property limits including bearings and dimensions -Existing and proposed structures and parking areas -Easements, road widening and rights-of-way -Adjacent street names	Drawings/Figures

4.2 Development Servicing Report: Water

☐	Confirm consistency with Master Servicing Study, if available	N/A
☒	Availability of public infrastructure to service proposed development	Section 3.1
☒	Identification of system constraints	Section 3.1
☒	Identify boundary conditions	Section 3.1, 3.2, Appendix B
☒	Confirmation of adequate domestic supply and pressure	Section 3.2, 3.2.1, 3.3

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Section 3.2, Appendix B
☐	Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	N/A
☐	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
☐	Address reliability requirements such as appropriate location of shut-off valves	N/A
☐	Check on the necessity of a pressure zone boundary modification	N/A
☒	Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	Section 3.2, 3.2.1, 3.3
☒	Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Section 3.2, SSP-1
☐	Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
☒	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 3.2, Appendix B
☒	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	Section 3.2.1, Appendix B

4.3 Development Servicing Report: Wastewater

☒	Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Section 4.2
☐	Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
☐	Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N/A
☒	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 4.1, EX-1
☒	Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Section 4.2, Appendix C
☒	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Section 4.2, Appendix C
☒	Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 4.2, SSP-1
☐	Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☐	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
☐	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
☐	Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
☐	Special considerations such as contamination, corrosive environment etc.	N/A

4.4 Development Servicing Report: Stormwater Checklist

☒	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 5.1
☒	Analysis of available capacity in existing public infrastructure.	Section 5.1, Appendix D
☒	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Drawings/Figures
☒	Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Section 5.2
☒	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 5.2
☒	Description of the stormwater management concept with facility locations and descriptions with references and supporting information	Section 5.3
☐	Set-back from private sewage disposal systems.	N/A
☐	Watercourse and hazard lands setbacks.	N/A
☒	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Appendix A
☐	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
☒	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 5.3
☐	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A
☒	Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Section 5.1, 5.3, Appendix D
☐	Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
☒	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Section 5.3
☐	If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A
☐	Identification of potential impacts to receiving watercourses	N/A
☐	Identification of municipal drains and related approval requirements.	N/A

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 5.3
☐	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	N/A
☐	Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A
☒	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 7.0
☐	Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
☐	Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5 Approval and Permit Requirements: Checklist

☒	Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement ct. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	Section 1.2
☐	Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N/A
☐	Changes to Municipal Drains.	N/A
☐	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A

4.6 Conclusion Checklist

☒	Clearly stated conclusions and recommendations	Section 8.0
☐	Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	
☐	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

Subject: FW: Pre-con Follow-up - [address]
From: Matt McElligott <mcelligott@fotenn.com>
Date: 12/20/2019 4:14 PM
To: Éric Burns <eburns@legroupemaurice.com>
CC: Wendy Brawley <wbrawley.bjh@gmail.com>, Rheal Labelle <rlabelle@hobinarc.com>, Robert Freel <RFreel@dsel.ca>, Andrew Harte <andrew.harte@cghtransportation.com>, Jacob Bolduc <bolduc@fotenn.com>

Good afternoon Eric and all,

We received the City's comments from the pre-application consultation. See the below email for the comments and attached for a list of the required studies report and plans.

For the Official Plan Amendment and Zoning By-law Amendment Applications the following submission materials will be required:

- Site Servicing Study (DSEL)
- Transportation Impact Assessment (CGA)
- Topo Survey Plan (Stantec)
- Concept Plan, including Landscaping (BHA)
- Architectural Building Elevations (BHA)
- Planning Rationale (Fotenn)
- Design Brief (Fotenn & BHA)
- Public Consultation Strategy (Fotenn)

For the Site Plan Control Application, the following studies, reports and plans are required:

- Site Servicing Study and Plan (DSEL)
- Grade Control and Drainage Plan (DSEL)
- Stormwater Management Report (DSEL)
- Erosion and Sediment Control Plan (DSEL)
- Noise Vibration Study (to address road noise and stationary noise, mechanical equipment in proximity to neighbours)
- Transportation Impact Assessment (CGA)
- Geotechnical Study
- Planning Rationale and Design Brief (Fotenn)
- Public Consultation Strategy (Fotenn)
- Phase 1 ESA (if required Phase 2)
- Record of Site Condition (if required – DSEL to advise)
- Landscape Plan
- Tree Conservation Report
- Topographic Survey (Stantec)
- Wind Analysis
- Architectural Site Plan, Floor Plans and Building Elevations (BHA)

Given we will be submitting all three applications at one time, we would not need to duplicate the above materials. I have indicated the sub-consultant responsible for each study, report and plan, however there are a few reports/plans to confirm the sub-consultant (wind, Geotech. Landscaping/tcr, ESA, noise). Have these sub-consultants been retained? Who are the contacts?

Based on the comments and list of studies/plans, I have a few follow up questions for the file planner, namely:

- Please clarify Planning bullet #3 below

- Please provide more information on Planning Bullet #5 re: sewer on neighbouring property
- Please clarify the site specific DC applicable to this site

Before I prepare a response to the file planner, can everyone please review the email and requirements and let me know whether there are any additional questions for clarification? I was hoping to send an email either Monday (23rd) or Tuesday (24th) morning.

Thanks everyone for your attention to this. Hopefully I receive your comments/questions prior to the break so Staff are preparing responses after Christmas, etc.

Regards,
Matt

Matthew McElligott, MCIP RPP
Principal, Planning + Policy
T 613.730.5709 ext. 232

From: Belan, Steve <Steve.Belan@ottawa.ca>
Sent: December 20, 2019 2:54 PM
To: Matt McElligott <mcelligott@fotenn.com>; Jacob Bolduc <bolduc@fotenn.com>
Subject: Pre-con Follow-up - [address]

Hello Matt,

Please refer to the below [and/or attached notes] regarding the Pre-Application Consultation (pre-con) Meeting held on December 3, 2019 for the property at 211 Centrum Blvd for a zoning, site plan and OPA applications in order to allow the development of 399 unit retirement complex by Le Groupe Maurice. I have also attached the required Plans & Study List for application submission.

Below are staff's preliminary comments based on the information available at the time of pre-con meeting:

Planning

- The area is addressed by the former Cumberland plan for the town centre (which is now a site specific policy area under the plan).

- The proposed use is not consistent with the schedule under that plan and would require an official plan amendment for that reason.

- I would hope that the planning justification would address what the appropriate designation under the secondary plan is appropriate. The study should also address the other provisions under the plan dealing with the recommended structure of the town centre (such as a concentration of commercial elements, a mainstreet and downtown feel).

- Note that the entire plan will be scrapped within a year to two. Policy would much prefer not to have an application while that study progresses so that they could work out the appropriate uses, heights and density.

- I was told by the real estate section that the sewer for this property runs across the holiday inn

property. Development will therefore require coordination with the owner of that facility.

- Finally, please be reminded that the city will be using an area specific DC for the area to address necessary connectivity improvements the LRT station (to support the additional density).

- Please provide a massing exercise to illustrate that Section 37 requirement is required or not. If it is please contact the Councillor to see if there are any Community benefits this could be applied to.

- For Zoning By-law Amendment, Official Plan Amendment the Applicant must now provide a proposed strategy for public consultation as directed by Bill 73

Urban Design Comments

1. **Former City of Cumberland Secondary Plan –**
   a. The Town Centre Objectives of the Former City of Cumberland Secondary Plan envision Centrum Blvd. as having a "main street" focus that fosters a sense of place along the street. Key principles from the plan that are still relevant include achieving continuous street facades, discouraging parking lots adjacent to the public realm, ensuring high quality streetscapes, and encouraging new developments to build upon the theme of the Town Centre.

2. **Contribute to the theme of the Street –**
   a. Ensure that this development continues to build upon the established theme of the streetscape and Town Centre by:
      i. Extending the special sidewalk and paving treatment currently present along Centrum on this site and especially in the space between the building facades and the roadway.
      ii. Soften the visual impact of the parking areas by means of tree planting, terracing and planting areas.
      iii. Ensuring extensive tree planting and landscaping along Centrum Boulevard.

3. **Establish a stronger Mainstreet feel –**
   a. **Streetwall Condition -** Explore the possibility of extending podium of the building across the Centrum edge of the site to achieve a more continuous street façade and achieve a stronger Mainstreet feel. The streetwall could also be potentially achieved by a pavilion building at the south-east corner of the site.

   b. **Animate and Activate -** Look for additional opportunities to animate and activate Centrum frontage of the development. The terraces are a positive addition, but are private space and will not be publicly accessible. Activate the mainstreet frontage with retail units, front doors, or publicly accessible open space.

   c. **Shift Parking –** Shift the visitor parking lot further away from Centrum Blvd and eliminate the vehicular access on Centrum. Explore opportunities to relocate the parking to the rear of the buildings, but if this is not possible, it should be shifted further north. All vehicular access should be located on Brisebois Crescent.

   d. **Open Space -** If establishing a consistent streetwall condition across the Centrum frontage is not possible, it is strongly recommended that an open space should be located at the corner of Brisebois and Centrum rather than a berm. Such a space would be inviting, read as publicly accessible space (ie, few barriers, use similar paving treatment to public realm), and would contain amenities such as benches and trees.

   e. **Main Entrance -** The covered walkway offers a strong approach to the main entrance, however, it is quite far from Centrum. Look for opportunities to strengthen its presence on the public street and the development's connection to the public realm. This could potentially be achieved by relocating main entrance, extending the vestibule south towards street edge and/or opening stronger views towards the main entrance through open space along the Centrum edge of the site.

4. **Urban Design Review Panel –**
    a. A Formal Review with the Urban Design Review Panel is required for this file and an informal pre-consultation, while not mandatory, is recommended. Contact panel coordinator David Maloney (David.Maloney@ottawa.ca) to schedule the meeting(s). More information including submission materials and upcoming panel dates can be found on the UDRP website.

5. **Design Brief -**
    a. The Design Brief accompanying the development application should focus in particular on demonstrating:
        i. How this development will contribute to the “mainstreet feel” of Centrum Blvd, how it will be tied to and not detached from the public realm, and how the building frontage will activate and animate the street edge.
        ii. The underlying logic of the site organization including courtyards, loading and servicing and circulation.
        iii. The drivers of the shape and orientation of the towers (ie, maximizing views? Program restrictions?).

Engineering

Submission Requirements
Water Boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide the following information:
Location of service connections (MAP)
Type of development and the amount of fire flow required (as per FUS).
Average daily demand: ___ l/s.
Maximum daily demand: ___l/s.
Maximum hourly daily demand: ___ l/s.

Submission Requirements

Required Plans and Reports:

Site Plan
3 colour elevations
Topographical Plan of Survey with a published Bench Mark
Grading & Drainage Plan
General Plan of Services
Erosion & Sediment Control Plan
Design Brief and Stormwater Management Report
Geotechnical Report
Noise and Stationary Noise Study
TIA
Landscape Plan & TCR

Subsurface Storage
To deal with the large change in flow through a Storage Tank ICD over the duration of the storm, the City asks that the average flow rate be used when there is a large change in head in the system, in most designs this results in a flow rate 50% of the maximum allowable flow. This is a conservative assumption that will ensure that the amount of required storage is not underestimated. It should be stated again that it is the City’s preference is that these systems be hydraulically modeled to allow for a more accurate design.

Minimum Drawing and File Requirements- All Plans

Plans are to be submitted on standard A1 size (594mm x 841mm) sheets, utilizing an appropriate Metric scale (1:200, 1:250, 1:300, 1:400, or 1:500).
With all submitted plans provide an individual PDF of the plans

Feel free to contact Infrastructure Project Manager, Will Curry, at ext. 16214, for follow-up questions.]

Transportation

- Follow Traffic Impact Assessment Guidelines:
  - A TIA is required for this application.
  - Start this process asap. The application will not be deemed complete until the submission of the draft step 1-4, including the functional draft RMA package (if applicable), draft functional plans (if applicable) and/or monitoring report (if applicable).
  - Request base mapping asap if RMA is required. Contact Engineering Services (https://ottawa.ca/en/city-hall/planning-and-development/engineering-services)
- ROW protection on Place d'Orleans Dr between St Joseph and St Joseph is 37.5m even. (No ROW protection identified for Centrum Blvd.)
- Reserves along property line both along Place d'Orleans Dr and Centrum Blvd.
- Corner triangles as per OP Annex 1 - Road Classification and Rights-of-Way at the following locations on the final plan will be required (measure on the property line/ROW protected line; no structure above or below this triangle):
  - Local Road to Collector Road: 5 m x 5 m
  - Collector Road to Arterial Road: 5 m x 5 m
- Sight triangle as per Zoning by-law is 6 m x 6 m measure on the curb line.
- Minimum corner clearances to the accesses is 55m from a signalized intersection along a collector road. The access in its proposed location meets this minimum distance.
- Clear throat requirements for apartments that are >200 units on a collector is 25m.
- Undertake sight line analysis for access on Centrum Blvd.
- If the Centrum access is desired to be all-way, the existing median and streetlighting needs to be considered.
- On site plan:
  - Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
  - Turning templates will be required for all accesses showing the largest vehicle to access the site; required for internal movements and at all access (entering and exiting and going in both directions).
  - Show all curb radii measurements; ensure that all curb radii are reduced as much as possible
  - Show lane/aisle widths.
  - Sidewalk is to be continuous across access as per City Specification 7.1.
  - Grey out any area that will not be impacted by this application.
- AODA legislation is in effect for all organizations, please ensure that the design conforms to these standards.

- Noise Impact Study required for the following:
  - Road
  - Stationary due to the proximity to neighboring exposed mechanical equipment and/or if there will be any exposed mechanical equipment due to the proximity to neighboring

noise sensitive land uses.

Feel free to contact Transportation Project Manager, Josiane Gervais, at ext. 21765, for follow-up questions.

Environmental

- No Comment

Parkland

- Cash-in-lieu of parkland as required by the Parkland Dedication By-law

Conservation Authority

Stormwater quality and quantity must met RVCA criteria

Other

- A Waste Reduction Workplan Summary is required for the construction project as required by O.Reg. 102/94, being "Waste Audits and Waste Reduction Work Plans" made under the Environmental Protection Act, RSO 1990, c E.19, as amended.
- [Optional] You are encouraged to contact the Ward Councillor, Councillor Matt Luloff, at Matt.Luloff@ottawa.ca about the proposal. You may also consider contacting the following registered Community Association (contacts) for this area.

ORG	NAME	TITLE	ADDRESS	CITY	PROV	POSTAL
Bilberry Creek Neighbourhood Association	Roger Perreault	rpperreault@icloud.com	1565 Bonneville Crescent	Ottawa	Ontario	K1C 7N2
Federation of Community Associations (FCA)		info@fca-fac.ca	146, 207 Bank Street	Ottawa	Ontario	K2P 2N2
Heart of Orléans BIA	Jasmine Brown, Executive Director	jasmine@heartoforleans.ca	301, 245 Centrum Blvd	Orléans	ON	K1E 0A1
Metroland East - Editorial		Theresa.Fritz@metroland.com	4, 80 Colonnade Road	Nepean	Ontario	K2E 7L2
Queenswood Heights Community Association	Emilie Anne Duval, President	emilieanneduval@yahoo.ca	285 Tompkins Avenue	Orleans	Ontario	K1E 3M8

-

Please refer to the links to "Guide to preparing studies and plans" and fees for further information. Additional information is available related to building permits, development charges, and the Accessibility Design

Standards. Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting informationcentre@ottawa.ca.

These pre-con comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

Please do not hesitate to contact me if you have any questions.

Regards,

Steve Belan

Steve Belan, MCIP, RPP

Planner Planning Services, Development Review Services
Planning, Infrastructure and Economic Development
City of Ottawa / Ville d'Ottawa
110 Laurier Avenue West, 4th Floor / 110, avenue Laurier Ouest, 4e étage
Ottawa, ON K1P 1J1
Telephone / tél.: 613-580-2424 ext./poste 27591
E-mail / courriel: Steve.Belan@ottawa.ca

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Attachments:

Pre-con Applicant's Study and Plan Identification List Site Plan.docx	55.5 KB
Pre-con Applicant's Study and Plan Identification List Zoning.docx	55.4 KB

Brandon Chow

From: Curry, William <William.Curry@ottawa.ca>
Sent: April 21, 2020 2:46 PM
To: Brandon Chow
Subject: Re: 211 Centrum - SWM criteria

Brandon,
Pre to post 5-year pipe onsite. Pre TC is 20 and Post is 10. use .5 C

Runoff entering the minor system is controlled via inlet control devices.

The maximum 100-year depth is 350 mm. Any building openings or garage ramp (top) elevations must be 300 mm above the 100-year ponding elevation for protection.

Major overland flow has be routed by grading, to spill once the 100-year elevation occurs towards the ROW.
Will

From: Brandon Chow <BChow@dsel.ca>
Sent: Tuesday, April 21, 2020 2:19 PM
To: Curry, William <William.Curry@ottawa.ca>
Subject: 211 Centrum - SWM criteria

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Hi Will,

We are working on servicing for a site a located at 211 Centrum Blvd.

Stormwater Management Criteria was not outlined in the pre-consult notes. Can you please confirm the SWM criteria to be used for the proposed development?

Thank you,

Brandon Chow
Project Coordinator / Intermediate Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.532

fax: (613) 836-7183
email: bchow@DSEL.ca

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Charlotte Kelly

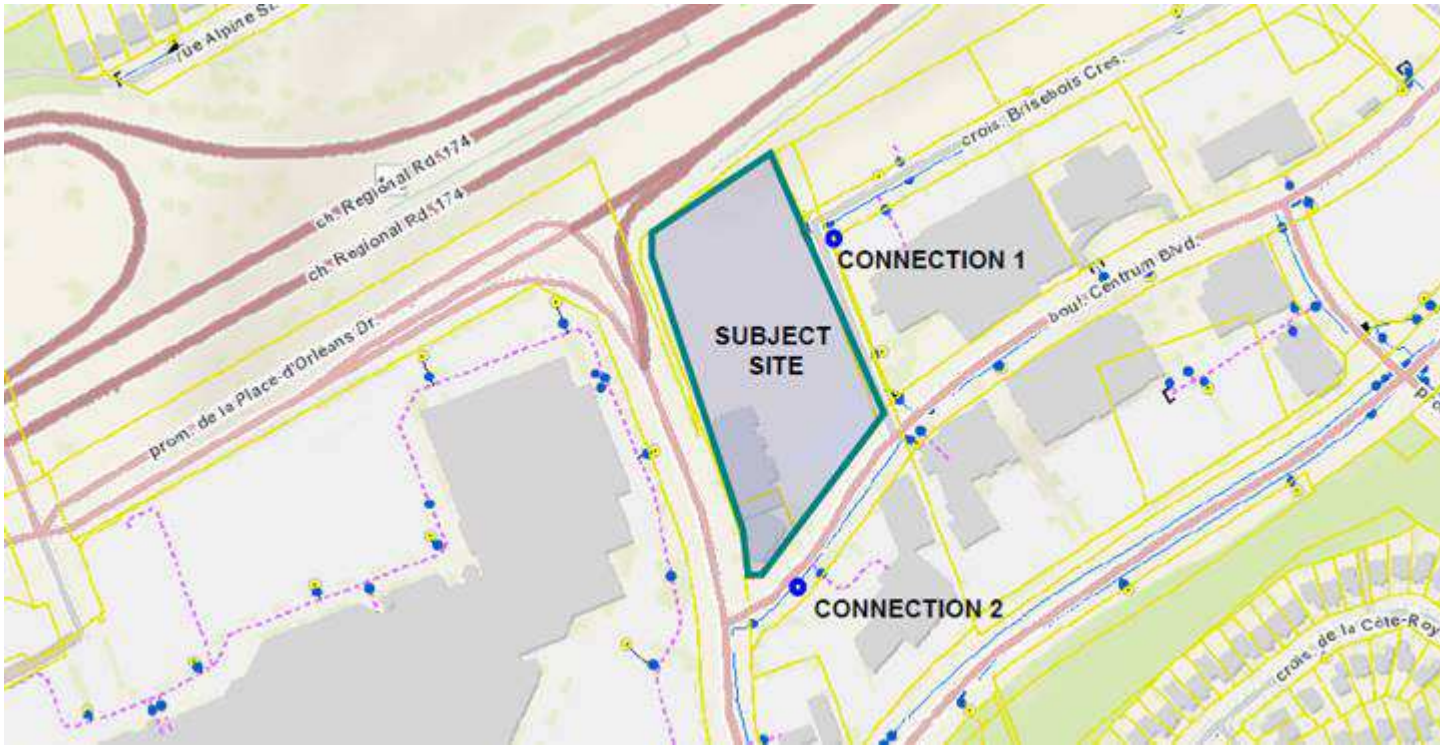
From: Charlotte Kelly
Sent: June 5, 2020 3:28 PM
To: 'Curry, William'
Cc: Brandon Chow
Subject: 211 Centrum Blvd - Updated Boundary Condition Request
Attachments: wtr-2020-05-28_1159.pdf

Good Afternoon Will,

We would like to kindly request updated boundary conditions for the proposed development at 211 Centrum Boulevard using the following anticipated development demands:

1. Location of Service / Street Number: 211 Centrum
2. Type of development and the amount of fire flow required for the contemplated development:
   - Type of development: The contemplated development includes long-term care / retirement residence based on the concept plan. The development is contemplated to consist ***345*** apartments and ***20*** boarding rooms. It is contemplated to have ***8,684 m2*** of amenity space.
   - Contemplated Connections:
     - Connection to the 203 mm diameter watermain within Brisebois Cres.
     - Connection to the 305mm diameter watermain within Centrum Blvd.
   - Fire demand based on Technical Bulletin ISTB-2018-02 has been used to estimate a max fire demand of ***17,000 L/min***. Refer to the attached for detailed calculations.

Demand	L/min	L/s
Avg. Daily	132.7	2.21
Max Day	316.7	5.28
Peak Hour	687.7	11.46



Please let me know if you have any questions.

Thank-you,

Charlotte Kelly, E.I.T.
Junior Engineering Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.511
email: ckelly@dsel.ca

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Charlotte Kelly

From: Jamie Batchelor <jamie.batchelor@rvca.ca>
Sent: May 8, 2020 3:56 PM
To: Charlotte Kelly
Cc: Brandon Chow
Subject: RE: Quality Control Requirements - 211 Centrum Blvd

Good Afternoon Charlotte,

In our opinion, given the proximity of the site to the Ottawa River, the quality objective should be for enhanced (80% removal rate of TSS). It has always been our approach to achieve improvements wherever and whenever they can be achieved. Having said that however, we also acknowledge that the receiver is a municipally owned SWM facility which we understand has been designed for normal (70% TSS Removal).

Back in 2009, the development pressures within this area were already indicating that in order to accommodate the proposed development, the water quality objective in the pond may be degraded below 70% TSS removal. Although we have recommended 80% TSS removal, it is our recommendation and not our requirement. However, if the pond is demonstrated not to meet the minimum design target of 70% TSS removal as it currently stands or that the proposed development would degrade the water quality objective below the design target, then onsite water quality treatment would be required. The RVCA would not be able to accept any degradation in the water quality objective target below 70% TSS removal.

If you have any further questions do not hesitate to contact me.

Jamie Batchelor, MCIP, RPP
Planner, ext. 1191
Jamie.batchelor@rvca.ca

Rideau Valley Conservation Authority
3889 Rideau Valley Drive
PO Box 599, Manotick ON K4M 1A5
T 613-692-3571 | 1-800-267-3504 F 613-692-0831 | www.rvca.ca

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and any copy of the e-mail and any printout thereof, immediately. Your cooperation is appreciated.

From: Charlotte Kelly <CKelly@dsel.ca>
Sent: Friday, May 8, 2020 3:25 PM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Cc: Brandon Chow <BChow@dsel.ca>
Subject: Quality Control Requirements - 211 Centrum Blvd

Good Afternoon Jamie,

We wanted to touch base with you regarding a development at 211 Centrum Blvd.

The existing site conditions consists of paved surface parking lots, a large landscaped area and a church with a parking structure as demonstrated in ***Figure 1,*** below.

The development involves the construction of a 15-storey retirement / long-term care building with landscaped recreation areas and an above ground parking area. Based on the information available, the development contemplates discharging stormwater to the 525 mm diameter Brisebois Crescent storm sewer. The Brisebois Crescent sewer travels approx.336m before it outlets to the stormwater management pond located at 315 Brisebois Cres., as shown by ***Figure 2*** below. The pond then outlets to the Ottawa river located approx. 1 km downstream from the pond.

We anticipate that quality controls will not be required as the development proposes to outlet to a stormwater management pond as well as the distance to the outlet in the Ottawa River. Can you please review and provide recommendations?

Please feel free to contact me to discuss.



Figure 1: Existing Site Limits



Figure 2: Distance to Outlet

Thank-you,

Charlotte Kelly, E.I.T.
Project Coordinator / Junior Designer

DSEL
david schaeffer engineering ltd.

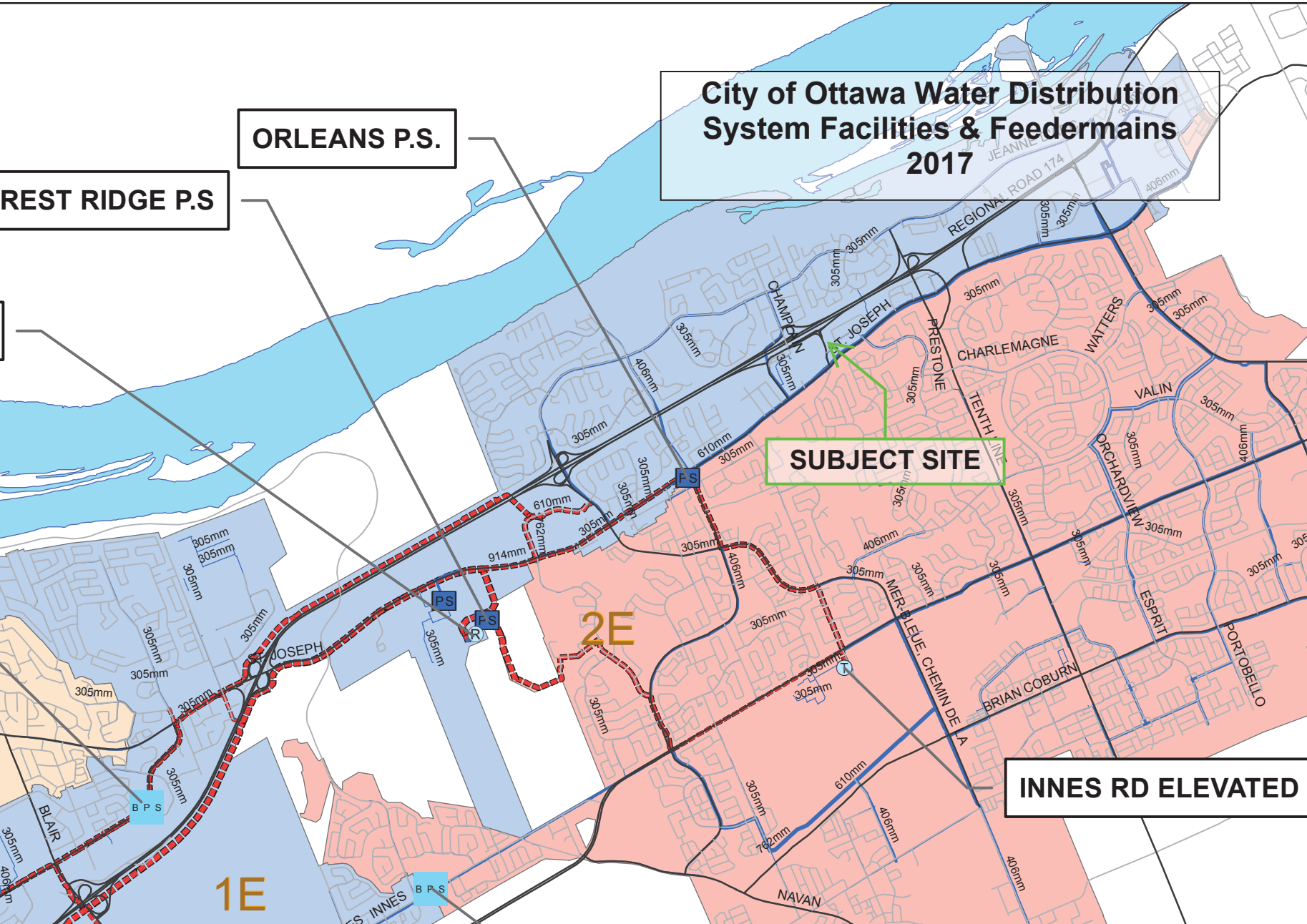
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

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email: ckelly@dsel.ca

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APPENDIX B

Water Supply


City of Ottawa Water Distribution System Facilities & Feedermains 2017
ORLEANS P.S.
REST RIDGE P.S
SUBJECT SITE
INNES RD ELEVATED
2E
1E
REGIONAL ROAD 174
ST JOSEPH
CHAMPLAIN
PRESTONE
CHARLEMAGNE
WATTERS
VALIN
TENTH LINE
ORCHARDVIEW
ESPRIT
PORTOBELLO
BRIAN COBURN
MER BLEUE, CHEMIN DE LA
BLAIR
INNES
NAVAN
JEANNE
305mm
406mm
610mm
762mm
914mm
PS
BPS

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010

Domestic Demand

Type of Housing	Per / Unit	Units	Pop					
Single Family	3.4	-	0					
Semi-detached	2.7	-	0					
Townhouse	2.7	-	0					
Apartment			0					
Bachelor	1.4	20	28			10.0	10.0	
1 Bedroom	1.4	207	290		12.0	17.0	58.0	55.0	65.0
2 Bedroom	2.1	143	301		5.0	10.0	20.0	30.0	78.0
3 Bedroom	3.1	7	22			1.0	6.0		
Average	1.8	-	0					
Type of Housing	**Per/Bed**	**Beds**	**Pop**					
Boarding †	1	20	20			20.0		
								397.0

	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Domestic Demand	661	185.1	128.5	462.7	321.3	1017.9	706.9

Institutional / Commercial / Industrial Demand

			Avg. Daily		Max Day		Peak Hour	
Property Type	**Unit Rate**	**Units**	m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Amenity Space	2.5 $L/m^2/d$	7,812	19.53	13.6	29.3	20.3	52.7	36.6
Total I/CI Demand			19.5	13.6	29.3	20.3	52.7	36.6
Total Demand			**204.6**	**142.1**	**492.0**	**341.7**	**1070.7**	**743.5**

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

$$F = 220C\sqrt{A}$$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor are*

Type of Construction: Non-Combustible Construction

C	0.8		*Type of Construction Coefficient per FUS Part II, Section 1*
A	30270.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	30621.0	L/min	
	31000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%	
Fire Flow	**26350.0**	**L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%	
Reduction	**-13175**	**L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	**S.D**	**Lw**	**Ha**	**LH**	**EC**	
N	Non-Combustible	>45m	0	0	0	0%	
S	Non-Combustible	>45m	0	0	0	0%	
E	Non-Combustible	20.1m-30m	15	5	75	9%	
W	Non-Combustible	>45m	0	0	0	0%	
		% Increase				**9%**	*value not to exceed 75%*

Increase	**2371.5**	**L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	15546.5	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	16000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by Hobin Architecture.
-Calculations based on Fire Underwriters Survey - Part II

Boundary Conditions Unit Conversion

Connection 1:

Grnd Elev	66.50

	height (m)	m H2O	PSI	kPa
Avg. Day	**113.9**	**47.4**	67.4	465.0
Peak Hour	**107.8**	**41.3**	58.8	405.2
Max Day + FF	**82.5**	**16.0**	22.8	157.0

Connection 2:

Grnd Elev	68.10

	height (m)	m H2O	PSI	kPa
Avg. Day	**113.9**	**47.4**	65.2	449.3
Peak Hour	**107.9**	**41.4**	56.6	390.4
Max Day + FF	**99.3**	**32.8**	44.4	306.1

0

Boundary Conditions
211 Centrum Blvd

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	200	3.33
Maximum Daily Demand	486	8.10
Peak Hour	1,060	17.67
Fire Flow Demand #1	16,000	266.67

Location



Results

Connection 1 – Brisebois Cres.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	113.9	67.3
Peak Hour	107.8	58.6
Max Day plus Fire 1	82.5	22.7

[1] Ground Elevation = 66.5 m

Connection 2 – Centrum Blvd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	113.9	65.2
Peak Hour	107.9	56.5
Max Day plus Fire 1	99.3	44.4

[1] Ground Elevation = 68.1 m

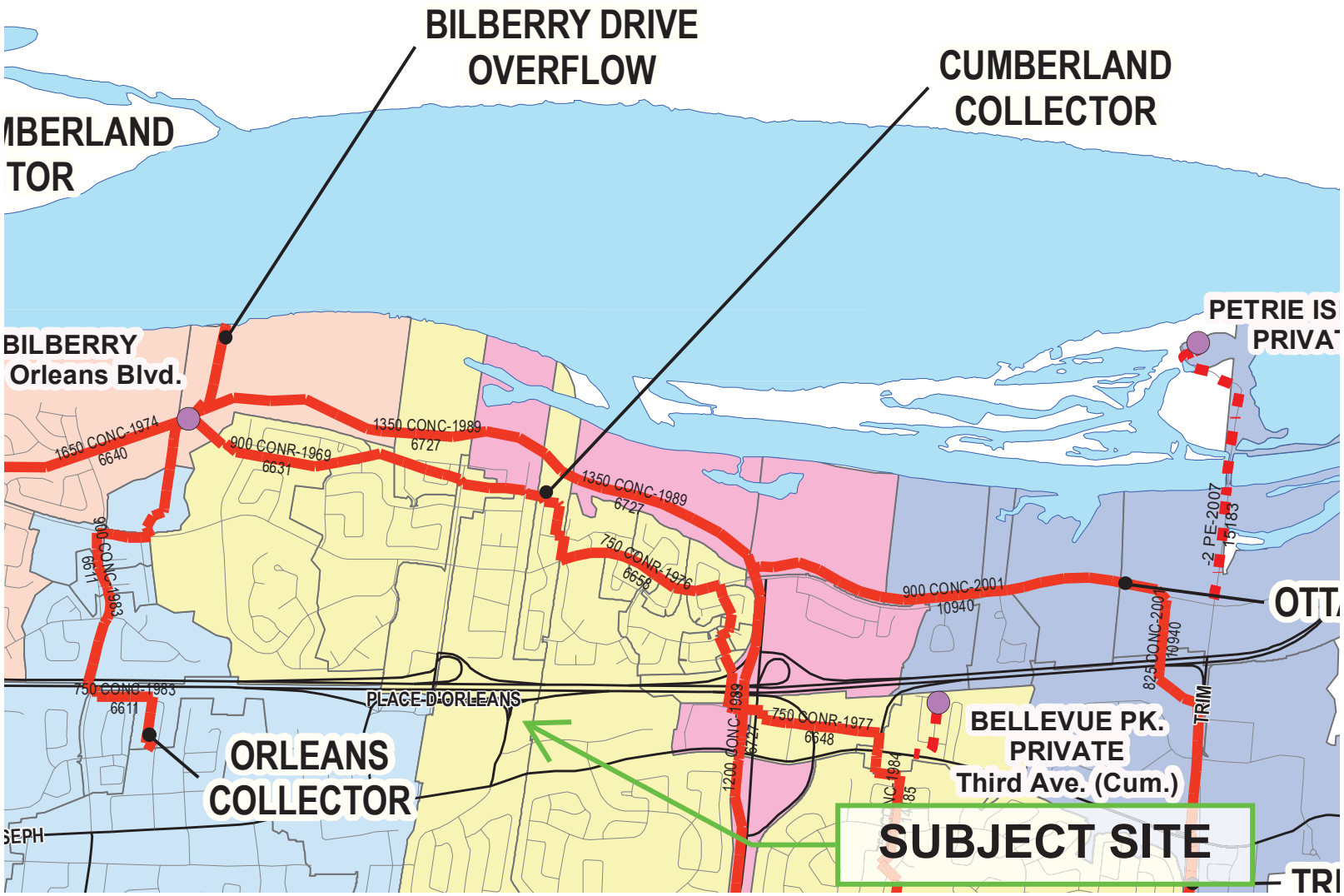
Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

APPENDIX C

Wastewater Collection

CITY OF OTTAWA
SANITARY TRUNKS AND PUMPING STATION MAP EXCERPT



Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2004

Site Area 1.526 **ha**

Extraneous Flow Allowances

Infiltration / Inflow (Dry)	**0.08 L/s**
Infiltration / Inflow (Wet)	**0.43 L/s**
Infiltration / Inflow (Total)	**0.50 L/s**

Domestic Contributions

Unit Type	**Unit Rate**	**Units**	**Pop**
Single Family	3.4		0
Semi-detached and duplex	2.7		0
Townhouse	2.7		0
Stacked Townhouse	2.3		0
Apartment			
Bachelor	1.4	20	28
1 Bedroom	1.4	207	290
2 Bedroom	2.1	143	301
3 Bedroom	3.1	7	22
Boarding	1	20	20

Total Pop	**661**
Average Domestic Flow	**2.14 L/s**
Peaking Factor	**3.33**
Peak Domestic Flow	**7.13 L/s**

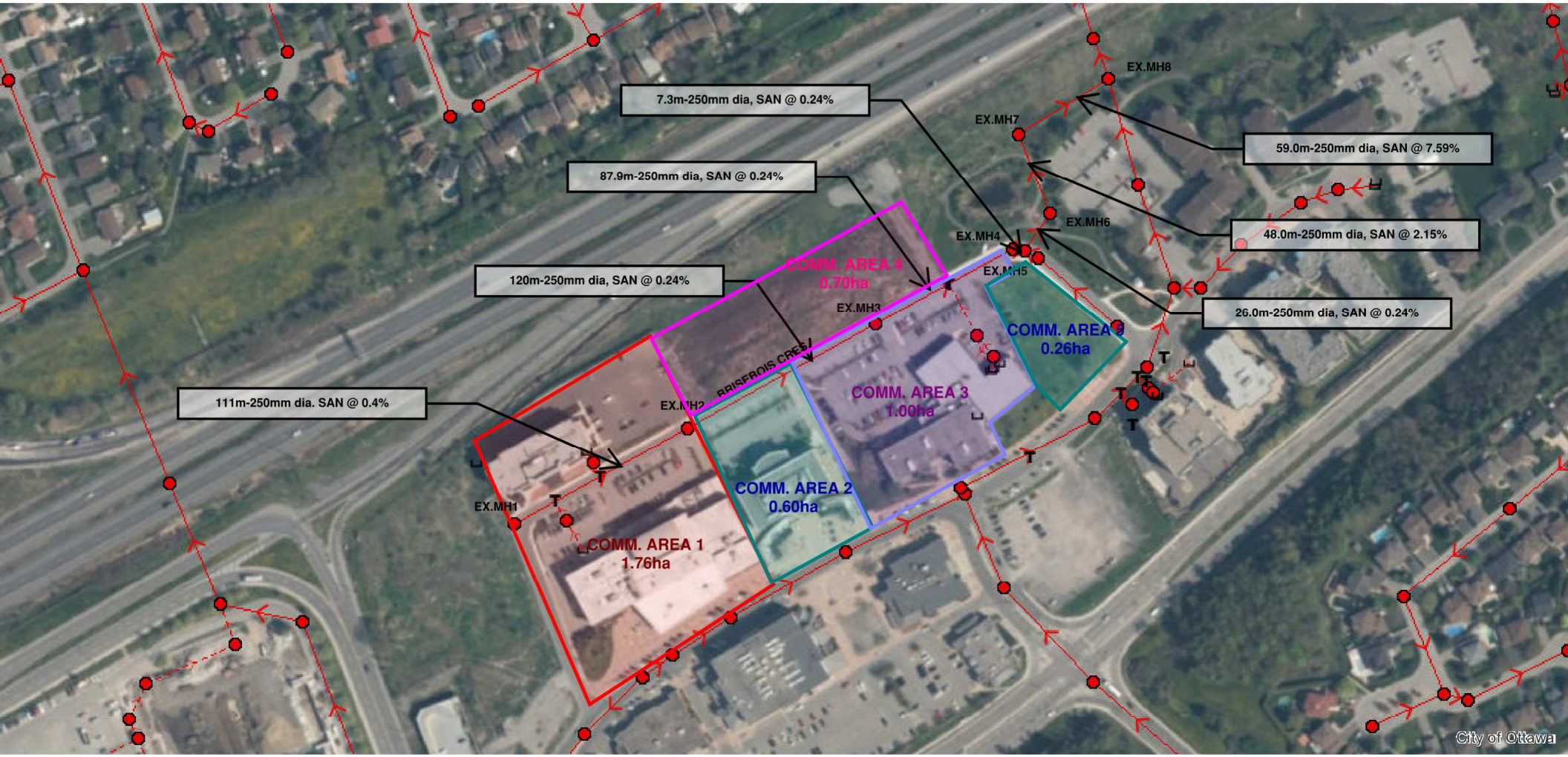
Institutional / Commercial / Industrial Contributions

Property Type	**Unit Rate**	**No. of Units**	**Avg Wastewater (L/s)**
Amenity Space	5 $L/m^2/d$	7,812	0.90

Average I/C/I Flow	**0.90**
Peak Institutional / Commercial Flow	0.90
Peak Industrial Flow**	0.00
Peak I/C/I Flow	**0.90**

Total Estimated Average Dry Weather Flow Rate	**3.12 L/s**
Total Estimated Peak Dry Weather Flow Rate	**8.11 L/s**
Total Estimated Peak Wet Weather Flow Rate	**8.53 L/s**

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EXISTING SANITARY DRAINAGE PLAN
211 CENTRUM BLVD.

FIG. SAN-1
2020-05-27
19-1159

APPENDIX D

Stormwater Management

Estimated Peak Stormwater Flow Rate
City of Ottawa Sewer Design Guidelines, 2012

Existing Drainage Charateristics From Internal Site

Area	1.5260	ha	
C	0.45	Rational Method runoff coefficient	
L	75	m	
Up Elev	67.5	m	
Dn Elev	62.15	m	
Slope	7.1	%	
Tc	20.0	min	*per City of Ottawa Preconsult

1) Time of Concentration per Federal Aviation Administration

$$t_c = \frac{1.8(1.1-C)L^{0.5}}{S^{0.333}}$$

tc, in minutes
C, rational method coefficient, (-)
L, length in ft
S, average watershed slope in %

Estimated Peak Flow

	2-year	**5-year**	**100-year**	
i	52.0	70.3	120.0	mm/hr
Q	99.2	134.0	286.0	L/s

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Stormwater - Proposed Development
City of Ottawa Sewer Design Guidelines, 2012

Target Flow Rate

Area	1.526	ha
C	0.50	Rational Method runoff coefficient
t_c	20.0	min

	5-year	
i	70.3	mm/hr
Q	148.9	L/s

Estimated Post Development Peak Flow from Unattenuated Areas

Total Area	0.19	ha
C	0.25	Rational Method runoff coefficient

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual}* (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
45.0	40.6	5.5	5.5	0.0	0.0	69.1	11.6	11.6	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Estimated Post Development Peak Flow from Attenuated Areas

Area ID **A202**
Available Cistern Storage
Total Subsurface Storage (m^3) 250.0

Stage Attenuated Areas Storage Summary

		Surface Storage			Surface and Subsurface Storage			
	Stage	**Ponding**	**h_o**	**delta d**	**V***	**V_{acc}****	**$Q_{release}$†**	**$V_{drawdown}$**
	(m)	**(m^2)**	**(m)**	**(m)**	**(m^3)**	**(m^3)**	**(L/s)**	**(hr)**
Orifice INV	63.55		0.00			0.0	0.0	0.00
Cistern INV	63.59		0.04	0.04	0.0	0.0	10.2	0.00
Cistern Storage SL	64.36		0.81	0.77	125.0	125.0	45.7	0.76
Cistern Storage OBV	65.12		1.57	0.77	125.0	250.0	63.9	1.09

* V=Incremental storage volume
**V_{acc}=Total surface and sub-surface
† $Q_{release}$ = Release rate calculated from orifice equation

Orifice Location **STM202** **Dia** **155**

Total Area	0.643	ha
C	0.85	Rational Method runoff coefficient

Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual}‡ (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual}‡ (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	158.2	36.1	122.0	73.2	178.6	318.9	31.9	287.0	172.2
15	83.6	126.9	36.1	90.7	81.6	142.9	255.2	31.9	223.3	201.0
20	70.3	106.7	36.1	70.5	84.6	120.0	214.2	31.9	182.3	218.8
25	60.9	92.5	36.1	56.3	84.5	103.8	185.5	31.9	153.5	230.3
30	53.9	81.9	36.1	45.7	82.3	91.9	164.1	31.9	132.1	237.9
35	48.5	73.7	36.1	37.5	78.8	82.6	147.5	31.9	115.6	242.7
40	44.2	67.1	36.1	30.9	74.2	75.1	134.2	31.9	102.3	245.5
45	40.6	61.7	36.1	25.5	68.9	69.1	123.3	31.9	91.4	246.8
50	37.7	57.2	36.1	21.0	63.1	64.0	114.2	31.9	82.3	246.9
55	35.1	53.3	36.1	17.2	56.7	59.6	106.5	31.9	74.6	246.0
60	32.9	50.0	36.1	13.9	49.9	55.9	99.8	31.9	67.9	244.4
65	31.0	47.1	36.1	11.0	42.8	52.6	94.0	31.9	62.1	242.2
70	29.4	44.6	36.1	8.4	35.5	49.8	88.9	31.9	57.0	239.4
75	27.9	42.3	36.1	6.2	27.9	47.3	84.4	31.9	52.5	236.1
80	26.6	40.3	36.1	4.2	20.1	45.0	80.4	31.9	48.4	232.4
85	25.4	38.5	36.1	2.4	12.1	43.0	76.7	31.9	44.8	228.4
90	24.3	36.9	36.1	0.7	3.9	41.1	73.4	31.9	41.5	224.0
95	23.3	35.4	35.4	0.0	0.0	39.4	70.4	31.9	38.5	219.4
100	22.4	34.0	34.0	0.0	0.0	37.9	67.7	31.9	35.8	214.5
105	21.6	32.8	32.8	0.0	0.0	36.5	65.2	31.9	33.2	209.5
110	20.8	31.6	31.6	0.0	0.0	35.2	62.9	31.9	30.9	204.2

5-year $Q_{attenuated}$	**34.26**	**L/s**	**100-year $Q_{attenuated}$**	**63.43**	**L/s**
5-year Max. Storage Required	**84.6**	**m^3**	**100-year Max. Storage Required**	**246.9**	**m^3**
Est. 5-year Storage Elevation	**64.11**	**m**	**Est. 100-year Storage Elevation**	**65.10**	**m**

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Area ID **A1** (A103, A105, A106, A107A, A107B)

Available Cistern Storage

Total Subsurface Storage (m^3) 192.0

Stage Attenuated Areas Storage Summary

		Surface Storage			Surface and Subsurface Storage			
	Stage	Ponding	h_o	delta d	V*	V_{acc}**	$Q_{release}$†	$V_{drawdown}$
	(m)	(m^2)	(m)	(m)	(m^3)	(m^3)	(L/s)	(hr)
Orifice INV	63.55		0.00			0.0	0.0	0.00
Cistern INV	64.63		1.08	1.08	0.0	0.0	37.3	0.00
Cistern Storage SL	65.01		1.46	0.38	96.0	96.0	43.3	0.62
Cistern Storage OBV	65.39		1.84	0.38	96.0	192.0	48.6	1.10
T/L	65.70	0.4	2.15	0.31	0.0	192.0	52.6	1.01
MAX.Ponding	65.85	48.0	2.30	0.15	2.6	194.7	54.4	0.99

* V=Incremental storage volume

**V_{acc}=Total surface and sub-surface

† $Q_{release}$ = Release rate calculated from orifice equation

Orifice Location **CBMH102** **Dia** **130**

Total Area 0.634 ha

C 0.60 Rational Method runoff coefficient *Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations*

	5-year					100-year				
t_c	i	Q_{actual}‡	$Q_{release}$	Q_{stored}	V_{stored}	i	Q_{actual}‡	$Q_{release}$	Q_{stored}	V_{stored}
(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(m^3)	(mm/hr)	(L/s)	(L/s)	(L/s)	(m^3)
10	104.2	110.1	40.1	70.0	42.0	178.6	235.8	27.2	208.7	125.2
15	83.6	88.3	40.1	48.1	43.3	142.9	188.7	27.2	161.5	145.4
20	70.3	74.2	40.1	34.1	40.9	120.0	158.4	27.2	131.2	157.5
25	60.9	64.3	40.1	24.2	36.3	103.8	137.2	27.2	110.0	165.0
30	53.9	57.0	40.1	16.8	30.3	91.9	121.3	27.2	94.1	169.5
35	48.5	51.3	40.1	11.1	23.4	82.6	109.1	27.2	81.9	171.9
40	44.2	46.7	40.1	6.5	15.7	75.1	99.3	27.2	72.1	172.9
45	40.6	42.9	40.1	2.8	7.5	69.1	91.2	27.2	64.0	172.8
50	37.7	39.8	39.8	0.0	0.0	64.0	84.5	27.2	57.3	171.8
55	35.1	37.1	37.1	0.0	0.0	59.6	78.8	27.2	51.6	170.1
60	32.9	34.8	34.8	0.0	0.0	55.9	73.8	27.2	46.6	167.9
65	31.0	32.8	32.8	0.0	0.0	52.6	69.5	27.2	42.3	165.1
70	29.4	31.0	31.0	0.0	0.0	49.8	65.8	27.2	38.6	162.0
75	27.9	29.5	29.5	0.0	0.0	47.3	62.4	27.2	35.2	158.5
80	26.6	28.1	28.1	0.0	0.0	45.0	59.4	27.2	32.2	154.7
85	25.4	26.8	26.8	0.0	0.0	43.0	56.7	27.2	29.5	150.7
90	24.3	25.7	25.7	0.0	0.0	41.1	54.3	27.2	27.1	146.4
95	23.3	24.6	24.6	0.0	0.0	39.4	52.1	27.2	24.9	141.9
100	22.4	23.7	23.7	0.0	0.0	37.9	50.1	27.2	22.9	137.2
105	21.6	22.8	22.8	0.0	0.0	36.5	48.2	27.2	21.0	132.4
110	20.8	22.0	22.0	0.0	0.0	35.2	46.5	27.2	19.3	127.4

5-year $Q_{attenuated}$	**40.01 L/s**	**100-year $Q_{attenuated}$**	**47.59 L/s**
5-year Max. Storage Required	**43.3 m^3**	**100-year Max. Storage Required**	**172.9 m^3**
Est. 5-year Storage Elevation	**64.80 m**	**Est. 100-year Storage Elevation**	**65.31 m**

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Estimated Post Development Peak Flow from Attenuated Areas

Area ID **A2** (A101)
Available Sub-surface Storage

Total Subsurface Storage (m^3) 0.2

Stage Attenuated Areas Storage Summary

		Surface Storage			Surface and Subsurface Storage			
	Stage	**Ponding**	**h_o**	**delta d**	**V***	**V_{acc}****	**$Q_{release}$†**	**$V_{drawdown}$**
	(m)	**(m^2)**	**(m)**	**(m)**	**(m^3)**	**(m^3)**	**(L/s)**	**(hr)**
Orifice INV	63.65		0.00			0.0	0.0	0.00
T/L	65.10	0.4	1.45	1.45	0.2	0.2	25.6	0.00
MAX.Ponding	65.20	46.0	1.55	0.10	1.7	1.9	26.4	0.02

* V=Incremental storage volume
**V_{acc}=Total surface and sub-surface
† $Q_{release}$ = Release rate calculated from orifice equation

Orifice Location **CB101A** **Dia** **100**
Total Area 0.065 ha
C 0.55 Rational Method runoff coefficient *Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations*

	5-year					100-year				
t_c	**i**	**Q_{actual}‡**	**$Q_{release}$**	**Q_{stored}**	**V_{stored}**	**i**	**Q_{actual}‡**	**$Q_{release}$**	**Q_{stored}**	**V_{stored}**
(min)	**(mm/hr)**	**(L/s)**	**(L/s)**	**(L/s)**	**(m^3)**	**(mm/hr)**	**(L/s)**	**(L/s)**	**(L/s)**	**(m^3)**
5	141.2	14.0	13.7	0.3	0.1	242.7	30.1	26.1	4.0	1.2
10	104.2	10.3	10.3	0.0	0.0	178.6	22.2	22.2	0.0	0.0
15	83.6	8.3	8.3	0.0	0.0	142.9	17.7	22.2	0.0	0.0
20	70.3	7.0	7.0	0.0	0.0	120.0	14.9	22.2	0.0	0.0
25	60.9	6.0	6.0	0.0	0.0	103.8	12.9	22.2	0.0	0.0
30	53.9	5.4	5.4	0.0	0.0	91.9	11.4	22.2	0.0	0.0
35	48.5	4.8	4.8	0.0	0.0	82.6	10.3	22.2	0.0	0.0
40	44.2	4.4	4.4	0.0	0.0	75.1	9.3	22.2	0.0	0.0
45	40.6	4.0	4.0	0.0	0.0	69.1	8.6	22.2	0.0	0.0
50	37.7	3.7	3.7	0.0	0.0	64.0	7.9	22.2	0.0	0.0
55	35.1	3.5	3.5	0.0	0.0	59.6	7.4	22.2	0.0	0.0
60	32.9	3.3	3.3	0.0	0.0	55.9	6.9	22.2	0.0	0.0
65	31.0	3.1	3.1	0.0	0.0	52.6	6.5	22.2	0.0	0.0
70	29.4	2.9	2.9	0.0	0.0	49.8	6.2	22.2	0.0	0.0
75	27.9	2.8	2.8	0.0	0.0	47.3	5.9	22.2	0.0	0.0
80	26.6	2.6	2.6	0.0	0.0	45.0	5.6	22.2	0.0	0.0
85	25.4	2.5	2.5	0.0	0.0	43.0	5.3	22.2	0.0	0.0
90	24.3	2.4	2.4	0.0	0.0	41.1	5.1	22.2	0.0	0.0
95	23.3	2.3	2.3	0.0	0.0	39.4	4.9	22.2	0.0	0.0
100	22.4	2.2	2.2	0.0	0.0	37.9	4.7	22.2	0.0	0.0
105	21.6	2.1	2.1	0.0	0.0	36.5	4.5	22.2	0.0	0.0

5-year $Q_{attenuated}$ **13.67 L/s**
5-year Max. Storage Required **0.1 m^3**
Est. 5-year Storage Elevation **64.43 m**

100-year $Q_{attenuated}$ **26.08 L/s**
100-year Max. Storage Required **1.2 m^3**
Est. 100-year Storage Elevation **65.16 m**

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Summary of Release Rates and Storage Volumes

Control Area	5-Year Release Rate (L/s)	5-Year Required Storage (m^3)	100-Year Release Rate (L/s)	100-Year Required Storage (m^3)	100-Year Available Storage (m^3)
Unattenuated Areas	5.5	0.0	11.6	0.0	0.0
A202 (BLDG)	34.3	84.6	63.4	246.9	250.0
Attenuated Areas A1	40.0	43.3	47.6	172.9	192.0
Attenuated Areas A2	13.7	0.1	26.1	1.2	1.9
Total	**93.4**	**128.0**	**148.7**	**421.0**	**443.9**

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Storm Sewer Calculation Sheet

										Sewer Data								
Area ID	Up	Down	Area	C	Indiv AxC	Acc AxC	T_C	I	Q	DIA	Slope	Length	$A_{hydraulic}$	R	Velocity	Qcap	Time Flow	Q / Q full
			(ha)	(-)			(min)	(mm/hr)	(L/s)	(mm)	(%)	(m)	(m^2)	(m)	(m/s)	(L/s)	(min)	(-)
A107A, A107B	STM107	STM106	0.194	0.40	0.08	0.08	10.0	104.2	22.3	250	0.50	43.9	0.049	0.063	0.86	42.0	0.9	0.53
A106	STM106	STM105	0.240	0.70	0.17	0.24	10.9	99.9	67.7	375	0.50	26.2	0.110	0.094	1.12	124.0	0.4	0.55
A105	STM105	STM104	0.100	0.80	0.08	0.32	11.2	98.1	88.4	375	1.00	36.8	0.110	0.094	1.59	175.3	0.4	0.50
	STM104	STM103			0.00	0.32	11.6	96.3	86.8	375	1.00	16	0.110	0.094	1.59	175.3	0.2	0.50
	STM103	CBMH102			0.00	0.32	11.8	95.6	86.1	375	1.00	23.9	0.110	0.094	1.59	175.3	0.3	0.49
A103	CBMH102	STM201	0.100	0.50	0.05	0.37	12.0	94.5	99.3	450	0.50	3.5	0.159	0.113	1.27	201.6	0.0	0.49
						0.37	12.1											
A202	BLDG1	STM202	0.643	0.85	0.55	0.55	10.0	104.2	158.2	375	2.00	11.7	0.110	0.094	2.25	248.0	0.1	0.64
	STM202	STM201			0.00	0.55	10.1	103.7	158.2	450	0.50	2.8	0.159	0.113	1.27	201.6	0.0	0.78
						0.55	10.1											
	STM201	STM101			0.00	0.92	12.1	94.3	257.5	450	1.00	8	0.159	0.113	1.79	285.1	0.1	0.90
						0.92	12.2											
A101	STM301	STM101	0.057	0.55	0.03	0.03	10.0	104.2	26.1	250	0.50	8.2	0.049	0.063	0.86	42.0	0.2	0.62
						0.03	10.2											
	STM101	OGS			0.00	0.95	12.2	94.0	184.3	450	0.50	2.7	0.159	0.113	1.27	201.6	0.0	0.91
	OGS	EX. STM SEWER			0.00	0.95	12.2	93.8	184.3	450	0.50	5.2	0.159	0.113	1.27	201.6	0.1	0.91
							12.3											

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PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

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211 CENTRUM (A103A)
OTTAWA, ONTARIO

SC-740 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-740.
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 F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
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 50 mm (2").
   - 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 550 LBS/IN/IN. 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.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-740 SYSTEM

1. STORMTECH SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 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. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 20-50 mm (3/4-2").
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. 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 SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 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 THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

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PROPOSED LAYOUT

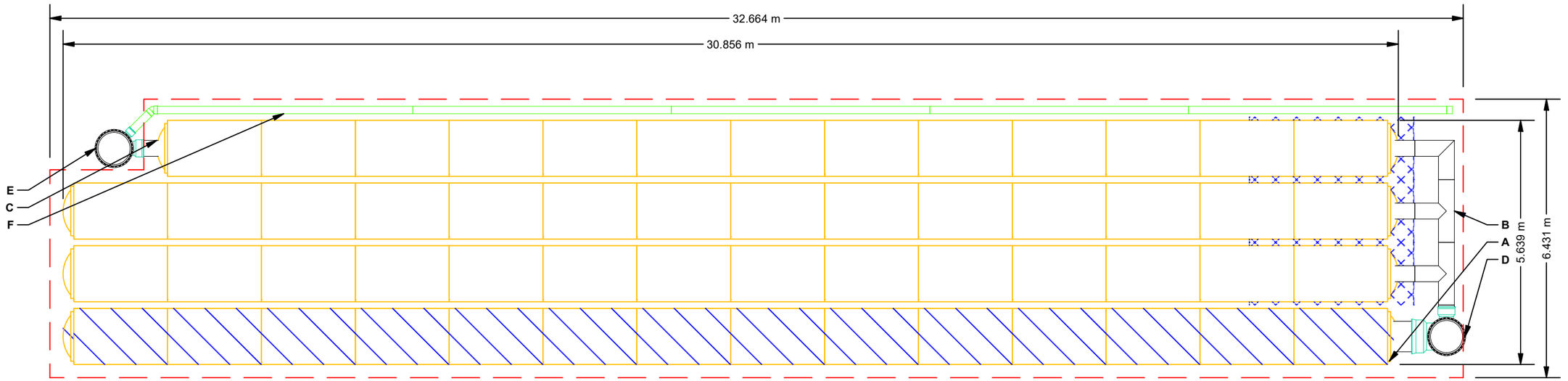
55	STORMTECH SC-740 CHAMBERS
8	STORMTECH SC-740 END CAPS
152	STONE ABOVE (mm)
152	STONE BELOW (mm)
40	STONE VOID
131.1	INSTALLED SYSTEM VOLUME (m^3) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)
206.5	SYSTEM AREA (m^2)
78.2	SYSTEM PERIMETER (m)

CONCEPTUAL ELEVATIONS

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	3.353
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	1.524
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	1.372
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	1.372
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	1.372
TOP OF STONE:	1.067
TOP OF SC-740 CHAMBER:	0.914
300 mm x 300 mm TOP MANIFOLD INVERT:	0.470
300 mm BOTTOM CONNECTION INVERT:	0.183
600 mm ISOLATOR ROW INVERT:	0.155
BOTTOM OF SC-740 CHAMBER:	0.152
UNDERDRAIN INVERT:	0.000
BOTTOM OF STONE:	0.000

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	600 mm BOTTOM PREFABRICATED END CAP/TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR ROWS	3 mm	
MANIFOLD	B	300 mm x 300 mm TOP MANIFOLD, ADS N-12	318 mm	
PIPE CONNECTION	C	300 mm BOTTOM CONNECTION	30 mm	
NYLOPLAST (INLET W/ ISO ROW)	D	750 mm DIAMETER (610 mm SUMP MIN)		161 L/s IN
NYLOPLAST (OUTLET)	E	750 mm DIAMETER (DESIGN BY ENGINEER)		57 L/s OUT
UNDERDRAIN	F	150 mm ADS N-12 DUAL WALL PERFORATED HDPE UNDERDRAIN		



ISOLATOR ROW
(SEE DETAIL)

PLACE MINIMUM 3.810 m OF ADS GEOSYNTHETICS 315WTK WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES

- 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.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- **NOT FOR CONSTRUCTION:** THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

211 CENTRUM (A103A)
OTTAWA, ONTARIO

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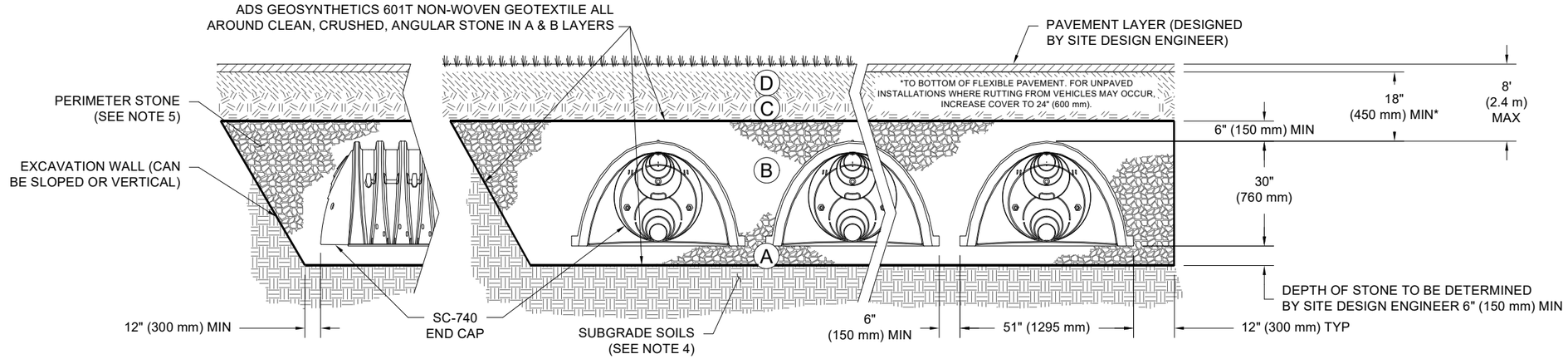
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ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

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 18" (450 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 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	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	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 6" (150 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.



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 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.
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 2".
   - 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 550 LBS/IN/IN. 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.

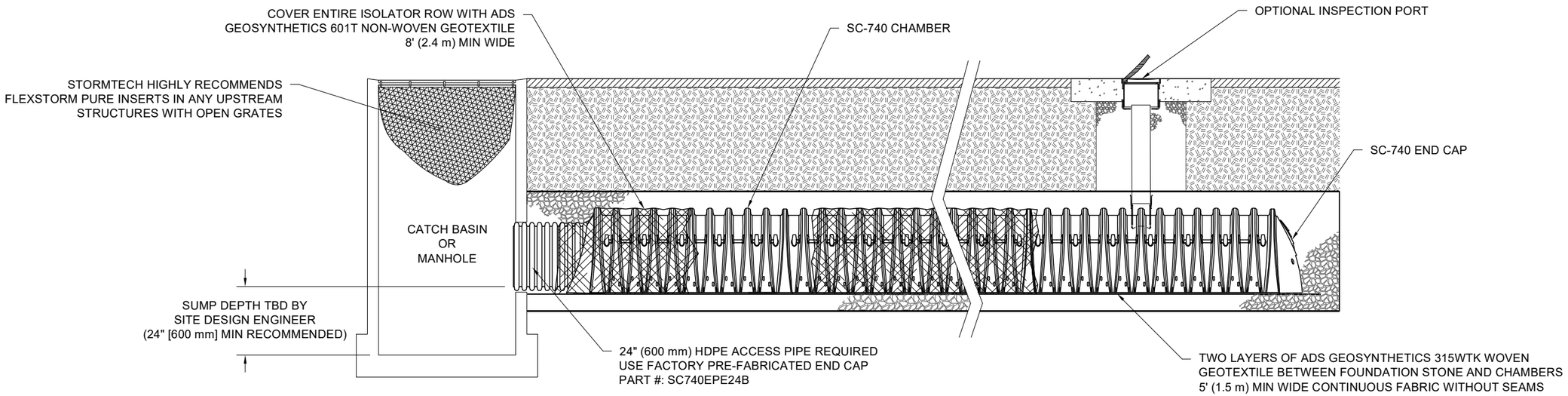
211 CENTRUM (A103A)
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SC-740 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW 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 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 ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW 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 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.

211 CENTRUM (A103A)
OTTAWA, ONTARIO

DATE:
DRAWN: BC
PROJECT #:
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REV	DRW	CHK	DESCRIPTION

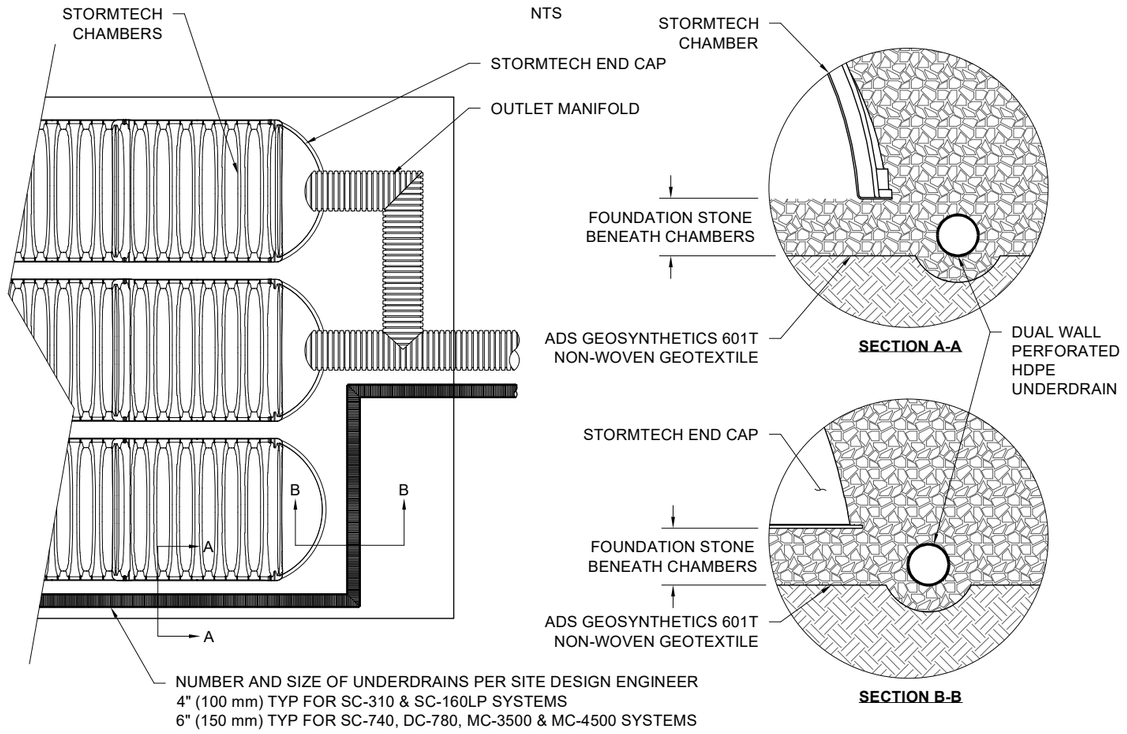
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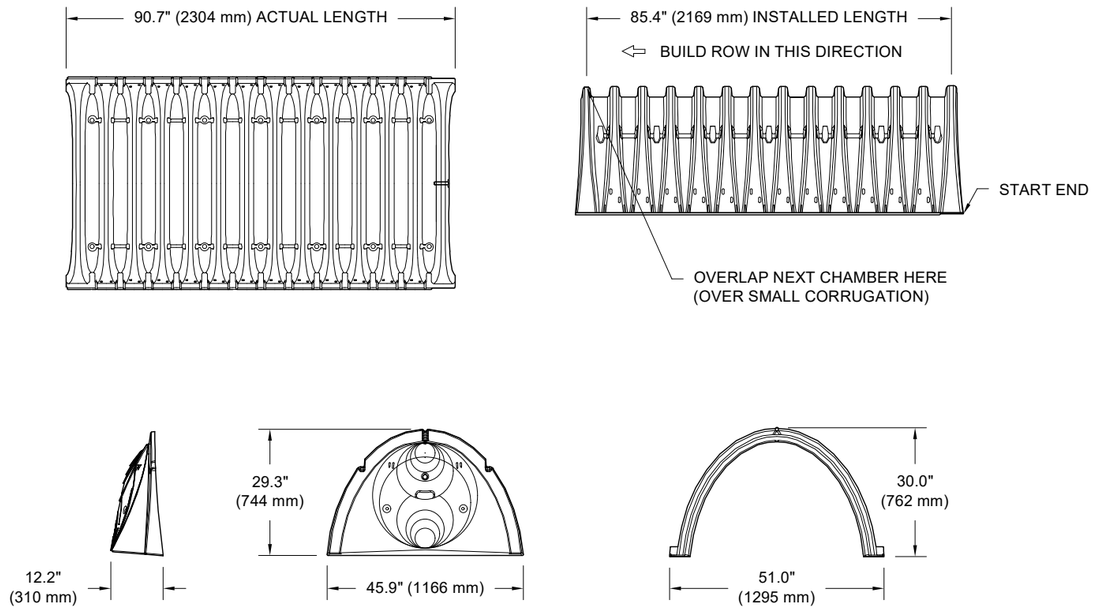
UNDERDRAIN DETAIL

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SC-740 TECHNICAL SPECIFICATION

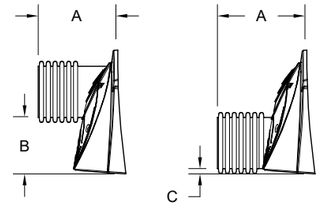
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NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET	(1.30 m³)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET	(2.12 m³)
WEIGHT	75.0 lbs.	(33.6 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS



PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPE06B / SC740EPE06BPC			---	0.5" (13 mm)
SC740EPE08T /SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	---
SC740EPE08B / SC740EPE08BPC			---	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	---
SC740EPE10B / SC740EPE10BPC			---	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	---
SC740EPE12B / SC740EPE12BPC			---	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	---
SC740EPE15B / SC740EPE15BPC			---	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	---
SC740EPE18B / SC740EPE18BPC			---	1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)

ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC740EPE24B THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

211 CENTRUM (A103A)
OTTAWA, ONTARIO

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DRAWN: BC
PROJECT #:
CHECKED: N/A

REV	DRW	CHK	DESCRIPTION

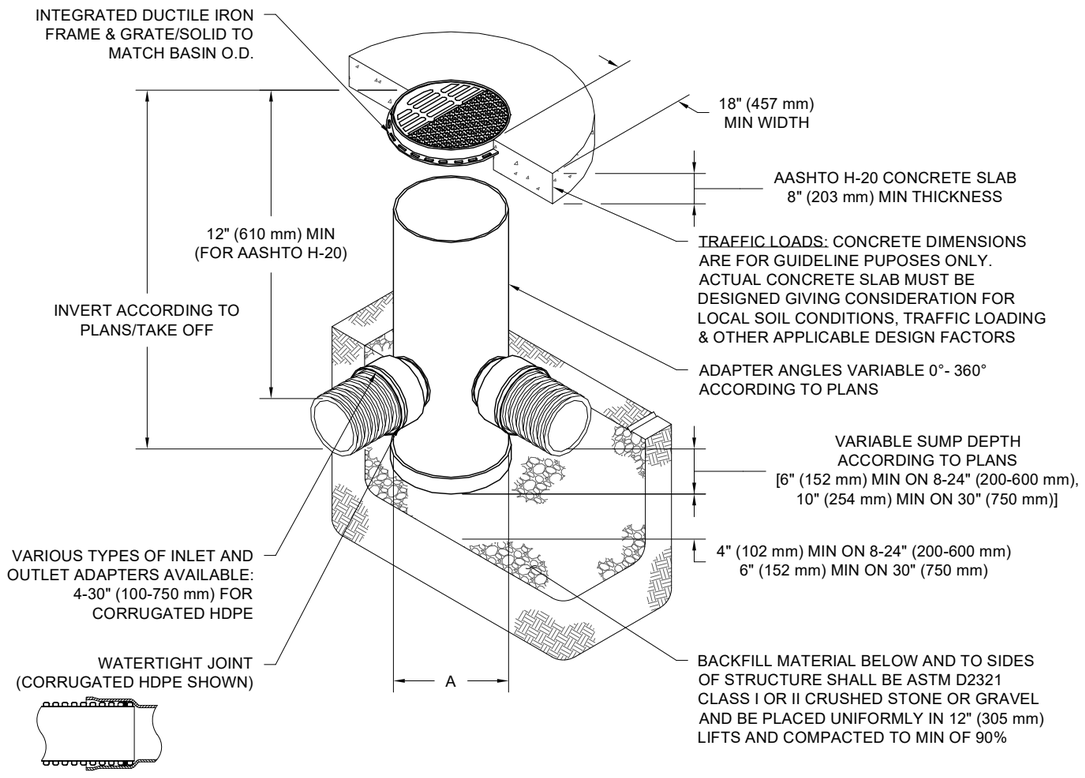
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1-800-733-7473

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NYLOPLAST DRAIN BASIN

NTS



NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

211 CENTRUM (A103A)
OTTAWA, ONTARIO

DATE:
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PROJECT #:
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REV	DRW	CHK	DESCRIPTION

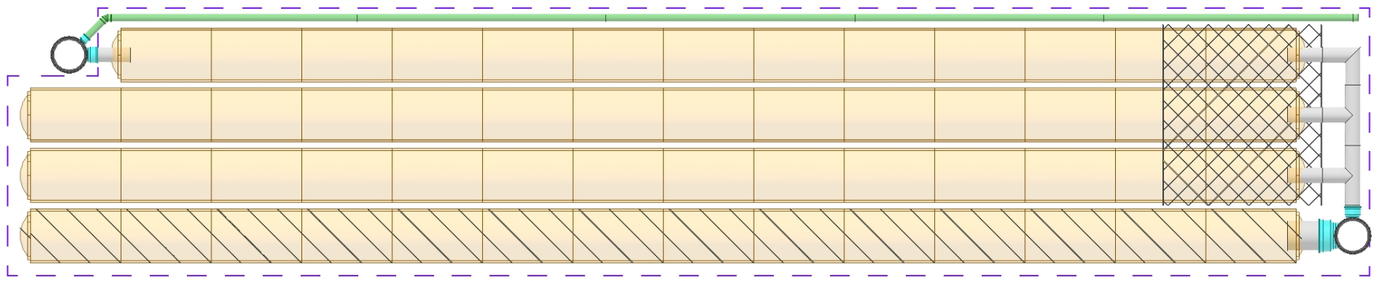
3130 VERONA AVE
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PHN (770) 932-2443
FAX (770) 932-2490
www.nyloplast-us.com

Nyloplast

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PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

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211 CENTRUM (A103B)
OTTAWA, CANADA

SC-740 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-740.
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 F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
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 50 mm (2").
   - 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 550 LBS/IN/IN. 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.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-740 SYSTEM

1. STORMTECH SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 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. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 20-50 mm (3/4-2").
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. 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 SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 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 THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

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PROPOSED LAYOUT

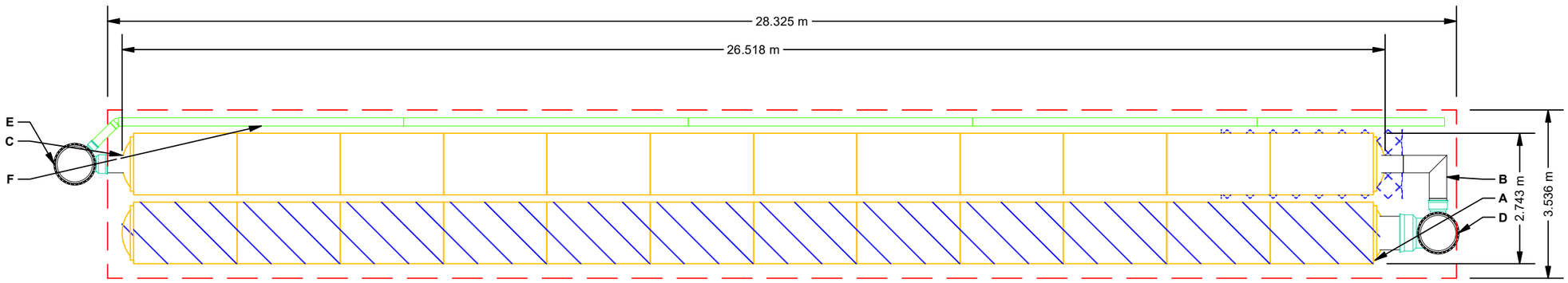
24	STORMTECH SC-740 CHAMBERS
4	STORMTECH SC-740 END CAPS
152	STONE ABOVE (mm)
152	STONE BELOW (mm)
40	STONE VOID
61.5	INSTALLED SYSTEM VOLUME (m^3) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)
100.1	SYSTEM AREA (m^2)
63.7	SYSTEM PERIMETER (m)

CONCEPTUAL ELEVATIONS

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	3.353
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	1.524
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	1.372
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	1.372
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	1.372
TOP OF STONE:	1.067
TOP OF SC-740 CHAMBER:	0.914
300 mm x 300 mm TOP MANIFOLD INVERT:	0.470
300 mm BOTTOM CONNECTION INVERT:	0.183
600 mm ISOLATOR ROW INVERT:	0.155
BOTTOM OF SC-740 CHAMBER:	0.152
UNDERDRAIN INVERT:	0.000
BOTTOM OF STONE:	0.000

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	600 mm BOTTOM PREFABRICATED END CAP/TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR ROWS	3 mm	
MANIFOLD	B	300 mm x 300 mm TOP MANIFOLD, ADS N-12	318 mm	
PIPE CONNECTION	C	300 mm BOTTOM CONNECTION	30 mm	
NYLOPLAST (INLET W/ ISO ROW)	D	750 mm DIAMETER (610 mm SUMP MIN)		65 L/s IN
NYLOPLAST (OUTLET)	E	750 mm DIAMETER (DESIGN BY ENGINEER)		57 L/s OUT
UNDERDRAIN	F	150 mm ADS N-12 DUAL WALL PERFORATED HDPE UNDERDRAIN		



ISOLATOR ROW
(SEE DETAIL)

PLACE MINIMUM 3.810 m OF ADS GEOSYNTHETICS 315WTK WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES

- 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.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- **NOT FOR CONSTRUCTION:** THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

211 CENTRUM (A103B)
OTTAWA, CANADA

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REV	DRW	CHK	DESCRIPTION

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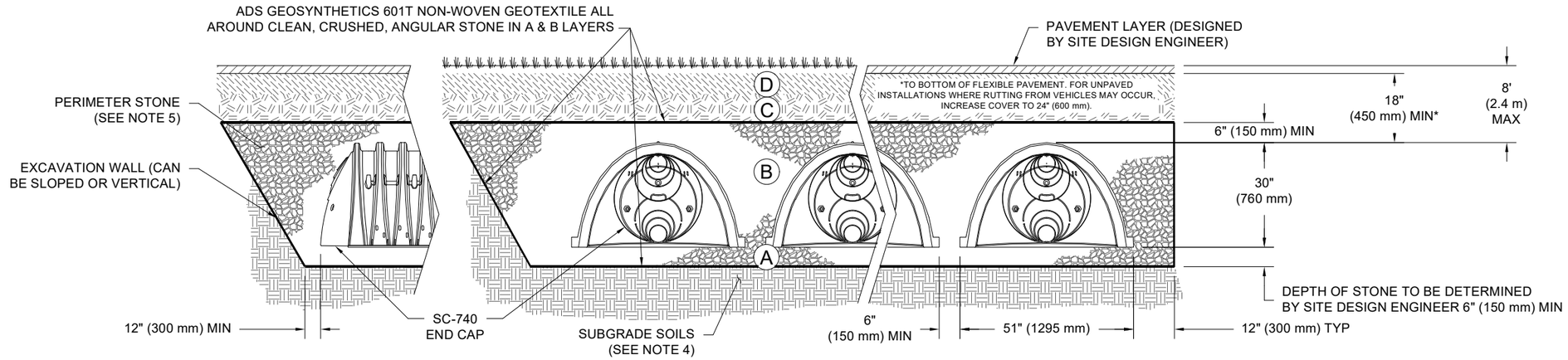
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ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

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 18" (450 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 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	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	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 6" (150 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.



NOTES:

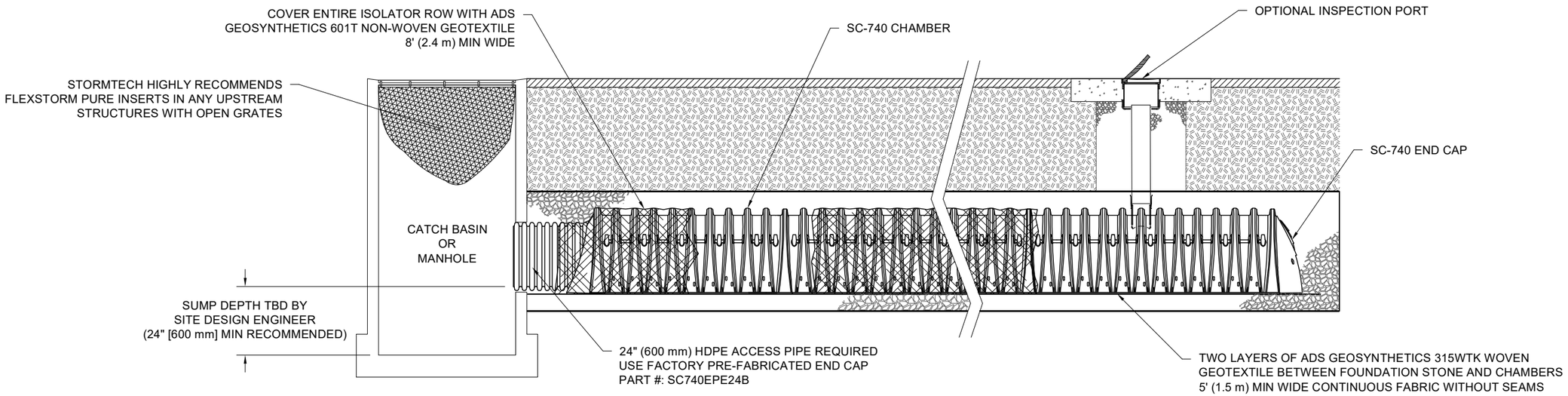
1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER 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.
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 2".
   - 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 550 LBS/IN/IN. 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.

211 CENTRUM (A103B)
OTTAWA, CANADA
DRAWN: BC
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DATE:
PROJECT #:

REV	DRW	CHK	DESCRIPTION

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SC-740 ISOLATOR ROW DETAIL

NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW 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 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 ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW 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 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.

211 CENTRUM (A103B)
OTTAWA, CANADA

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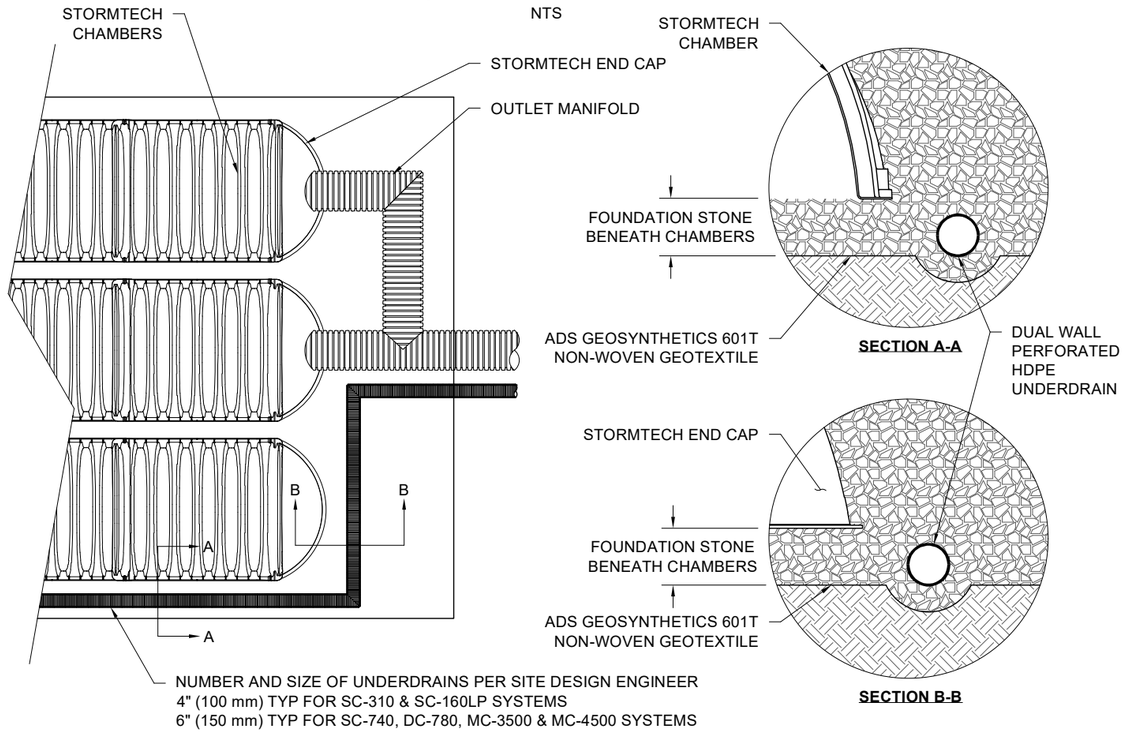
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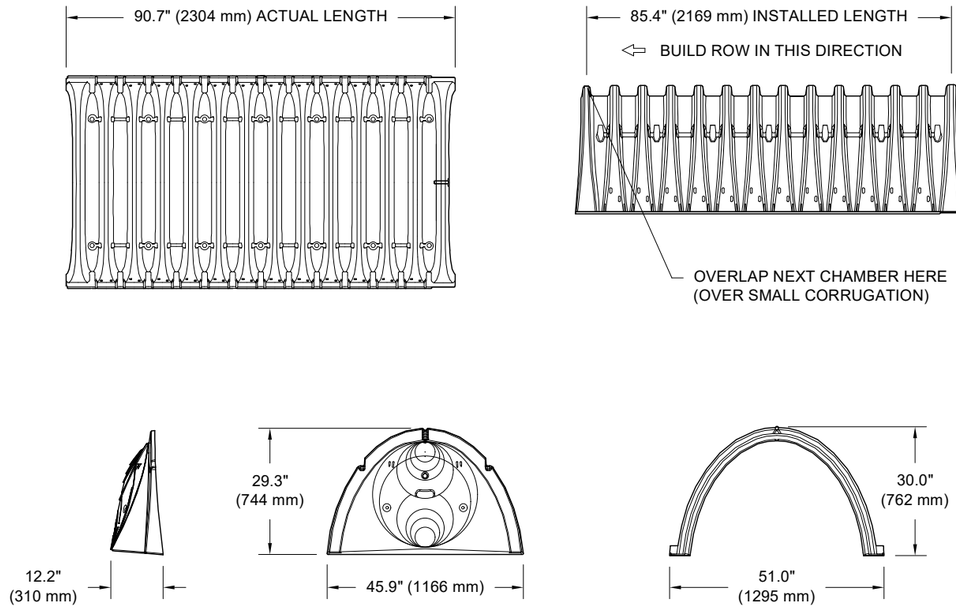
UNDERDRAIN DETAIL

NTS



SC-740 TECHNICAL SPECIFICATION

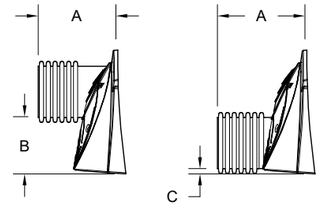
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NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET	(1.30 m³)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET	(2.12 m³)
WEIGHT	75.0 lbs.	(33.6 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS



PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPE06B / SC740EPE06BPC			---	0.5" (13 mm)
SC740EPE08T /SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	---
SC740EPE08B / SC740EPE08BPC			---	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	---
SC740EPE10B / SC740EPE10BPC			---	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	---
SC740EPE12B / SC740EPE12BPC			---	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	---
SC740EPE15B / SC740EPE15BPC			---	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	---
SC740EPE18B / SC740EPE18BPC			---	1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)

ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC740EPE24B THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

211 CENTRUM (A103B)
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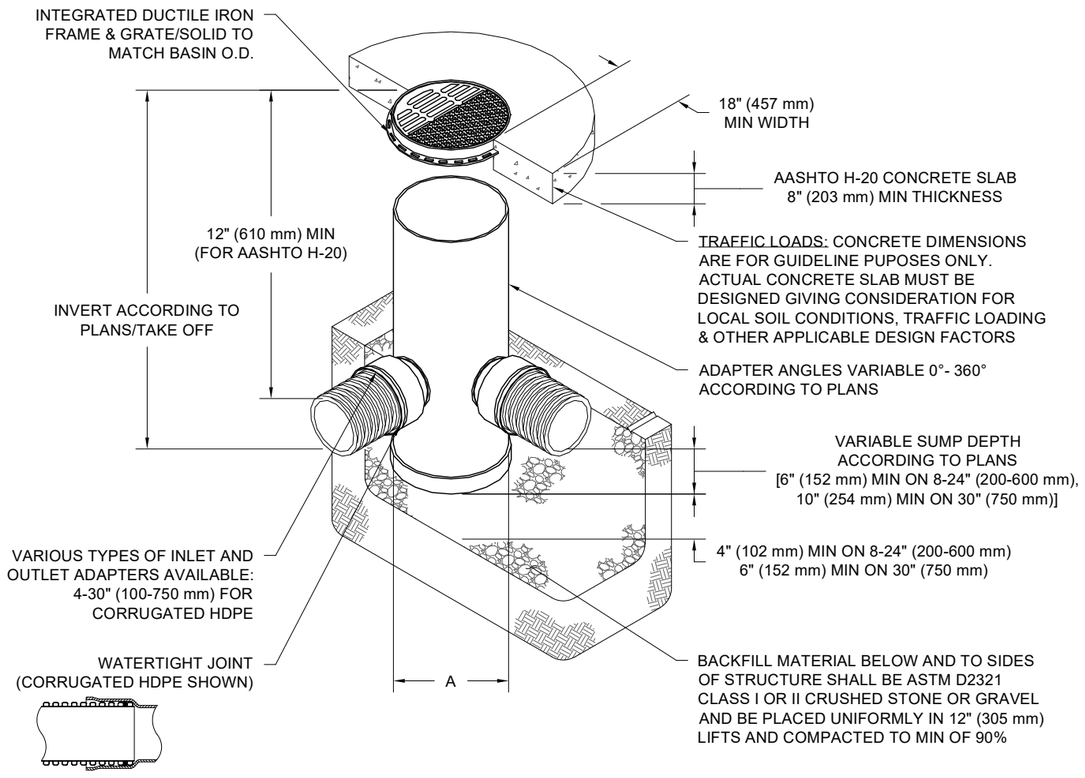
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NYLOPLAST DRAIN BASIN

NTS



NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

211 CENTRUM (A103B)
OTTAWA, CANADA

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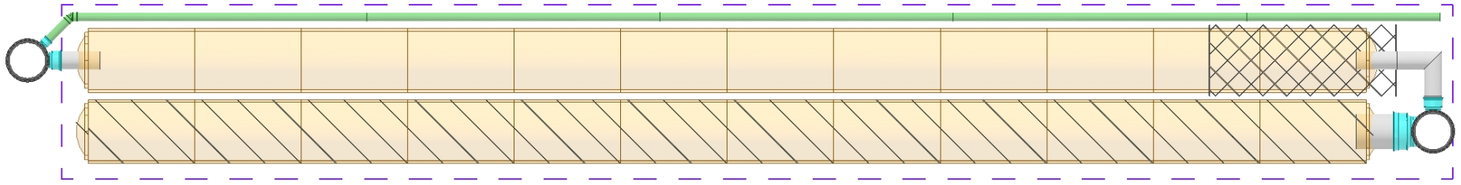
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PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

211 CENTRUM (A202)

OTTAWA, ONTARIO

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MC-4500 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-4500.
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 F2418-16a, "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 500 LBS/IN/IN. 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.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-4500 CHAMBER SYSTEM

1. STORMTECH MC-4500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-4500 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 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 WELL GRADED BETWEEN ¾" AND 2" (20-50 mm).
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-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-4500 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 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

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PROPOSED LAYOUT

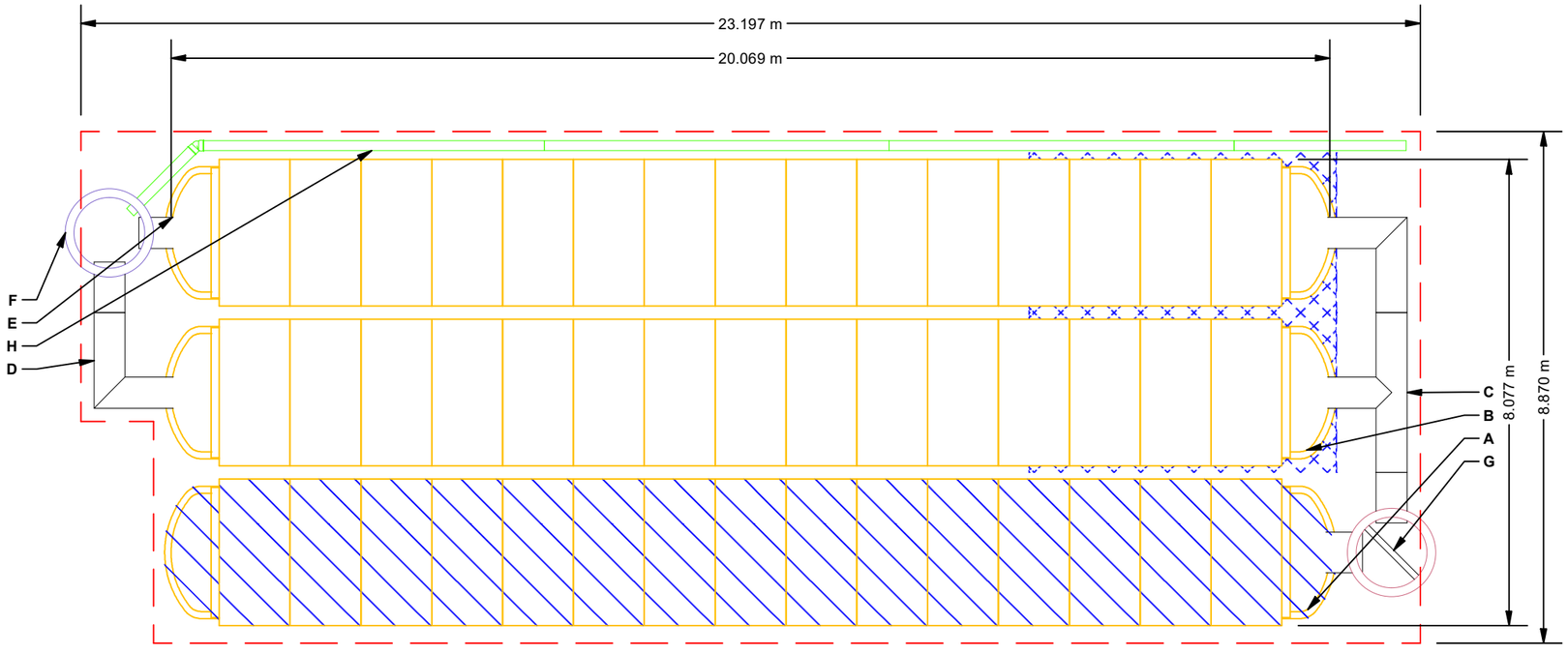
45	STORMTECH MC-4500 CHAMBERS
6	STORMTECH MC-4500 END CAPS
305	STONE ABOVE (mm)
229	STONE BELOW (mm)
40	STONE VOID
250.8	INSTALLED SYSTEM VOLUME (m³) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)
200.9	SYSTEM AREA (m²)
64.1	SYSTEM PERIMETER (m)

CONCEPTUAL ELEVATIONS

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	3.886
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	2.515
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	2.362
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	2.362
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	2.362
TOP OF STONE:	2.057
TOP OF MC-4500 CHAMBER:	1.753
600 mm ISOLATOR ROW INVERT:	0.286
450 mm x 450 mm BOTTOM MANIFOLD INVERT:	0.279
450 mm x 450 mm BOTTOM MANIFOLD INVERT:	0.279
450 mm BOTTOM CONNECTION INVERT:	0.279
BOTTOM OF MC-4500 CHAMBER:	0.229
UNDERDRAIN INVERT:	0.000
BOTTOM OF STONE:	0.000

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	600 mm BOTTOM PARTIAL CUT END CAP/TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR ROWS	57 mm	
PREFABRICATED END CAP	B	450 mm BOTTOM PARTIAL CUT END CAP/TYP OF ALL 450 mm BOTTOM CONNECTIONS	50 mm	
MANIFOLD	C	450 mm x 450 mm BOTTOM MANIFOLD, ADS N-12	50 mm	
MANIFOLD	D	450 mm x 450 mm BOTTOM MANIFOLD, ADS N-12	50 mm	
PIPE CONNECTION	E	450 mm BOTTOM CONNECTION	50 mm	
CONCRETE STRUCTURE	F	OCS (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		227 L/s OUT
CONCRETE STRUCTURE W/WEIR	G	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		311 L/s IN
UNDERDRAIN	H	150 mm ADS N-12 DUAL WALL PERFORATED HDPE UNDERDRAIN		



ISOLATOR ROW
(SEE DETAIL)

PLACE MINIMUM 5.334 m OF ADS GEOSYNTHETICS 315WTM WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES

- 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.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- **NOT FOR CONSTRUCTION:** THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

211 CENTRUM (A202)
OTTAWA, ONTARIO

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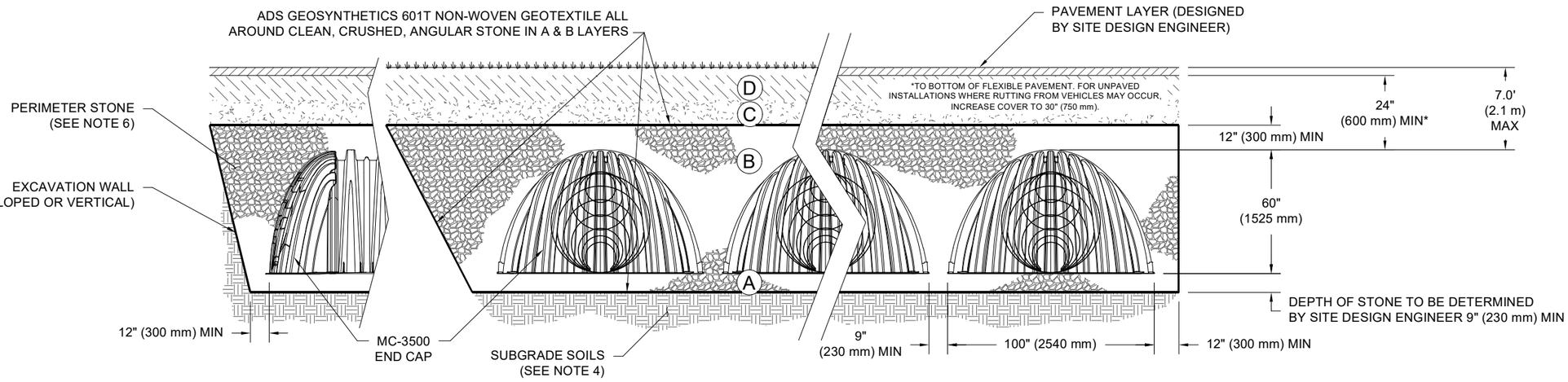
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ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

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	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	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.



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101
2. MC-4500 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.
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 AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LBS/IN/IN. 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.

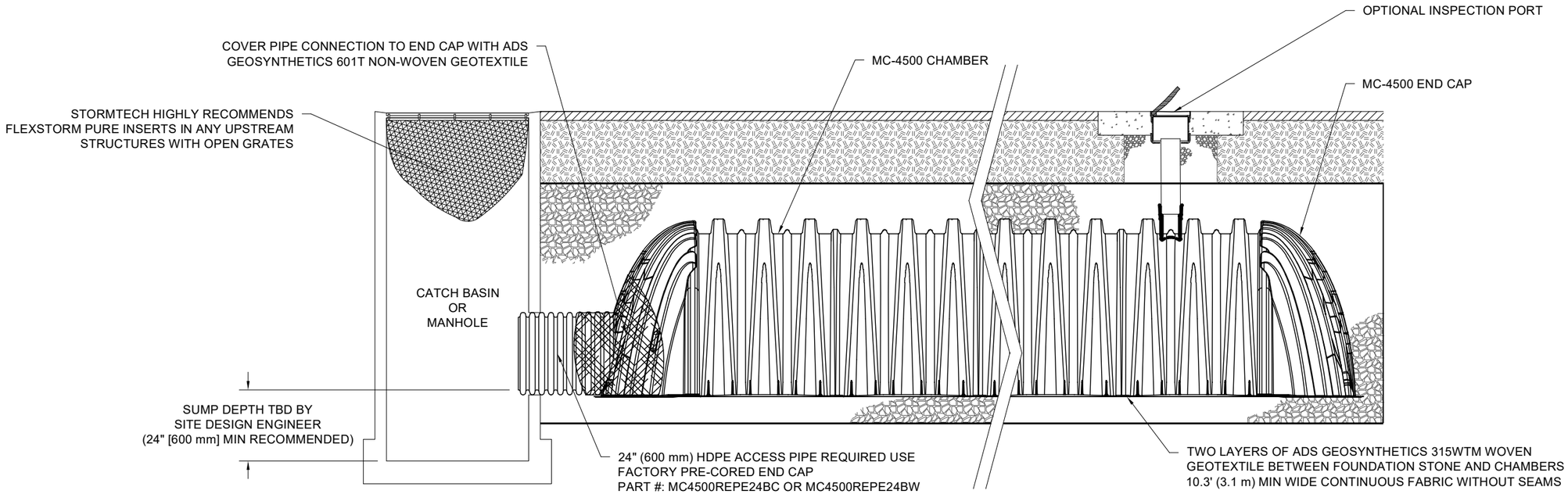
211 CENTRUM (A202)
OTTAWA, ONTARIO
DRAWN: BC
CHECKED: N/A
DATE:
PROJECT #:

REV	DRW	CHK	DESCRIPTION

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MC-4500 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW 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 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 ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW 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 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.

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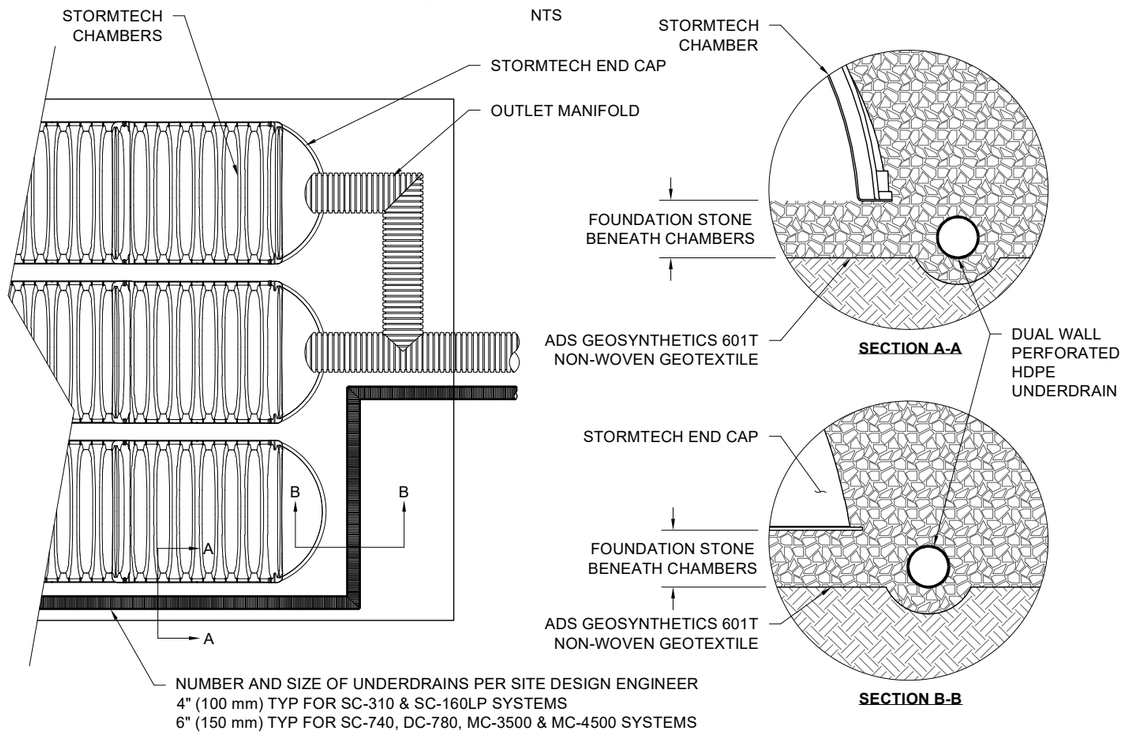
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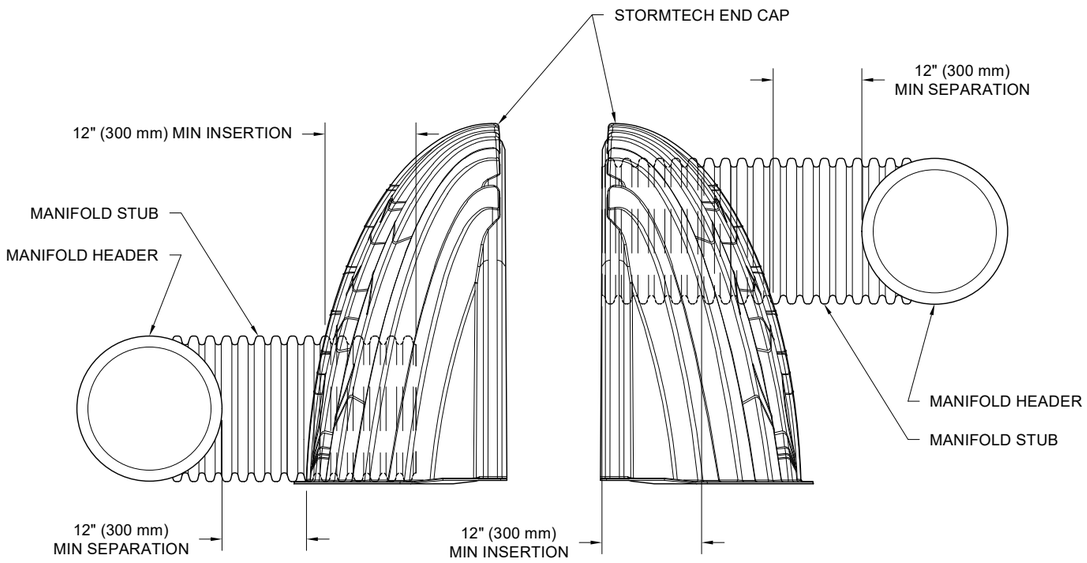
UNDERDRAIN DETAIL

NTS



MC-SERIES END CAP INSERTION DETAIL

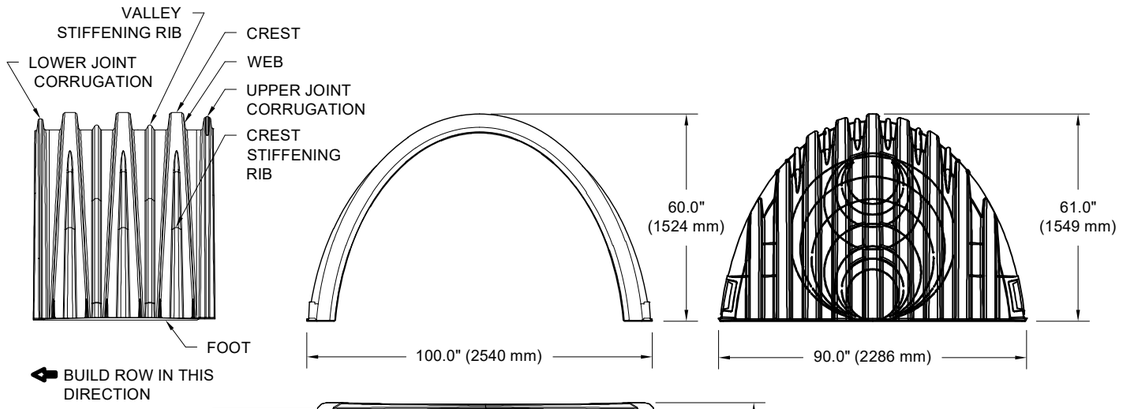
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NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

MC-4500 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 48.3"	(2540 mm X 1524 mm X 1227 mm)
CHAMBER STORAGE	106.5 CUBIC FEET	(3.01 m³)
MINIMUM INSTALLED STORAGE*	162.6 CUBIC FEET	(4.60 m³)
WEIGHT (NOMINAL)	125.0 lbs.	(56.7 kg)

NOMINAL END CAP SPECIFICATIONS

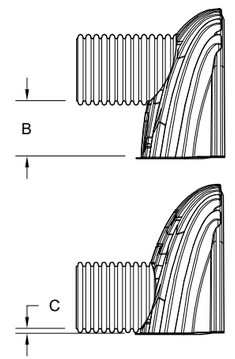
SIZE (W X H X INSTALLED LENGTH)	90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
END CAP STORAGE	39.5 CUBIC FEET	(1.12 m³)
MINIMUM INSTALLED STORAGE*	115.3 CUBIC FEET	(3.26 m³)
WEIGHT (NOMINAL)	90 lbs.	(40.8 kg)

*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
MC4500IEPP06T	6" (150 mm)	42.54" (1081 mm)	---
MC4500IEPP06B		---	0.86" (22 mm)
MC4500IEPP08T	8" (200 mm)	40.50" (1029 mm)	---
MC4500IEPP08B		---	1.01" (26 mm)
MC4500IEPP10T	10" (250 mm)	38.37" (975 mm)	---
MC4500IEPP10B		---	1.33" (34 mm)
MC4500IEPP12T	12" (300 mm)	35.69" (907 mm)	---
MC4500IEPP12B		---	1.55" (39 mm)
MC4500IEPP15T	15" (375 mm)	32.72" (831 mm)	---
MC4500IEPP15B		---	1.70" (43 mm)
MC4500IEPP18T	18" (450 mm)	29.36" (746 mm)	---
MC4500IEPP18TW			
MC4500IEPP18B		---	1.97" (50 mm)
MC4500IEPP18BW			
MC4500IEPP24T	24" (600 mm)	23.05" (585 mm)	---
MC4500IEPP24TW			
MC4500IEPP24B		---	2.26" (57 mm)
MC4500IEPP24BW			
MC4500IEPP30BW	30" (750 mm)	---	2.95" (75 mm)
MC4500IEPP36BW	36" (900 mm)	---	3.25" (83 mm)
MC4500IEPP42BW	42" (1050 mm)	---	3.55" (90 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PARTIAL CUT 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-4500 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.

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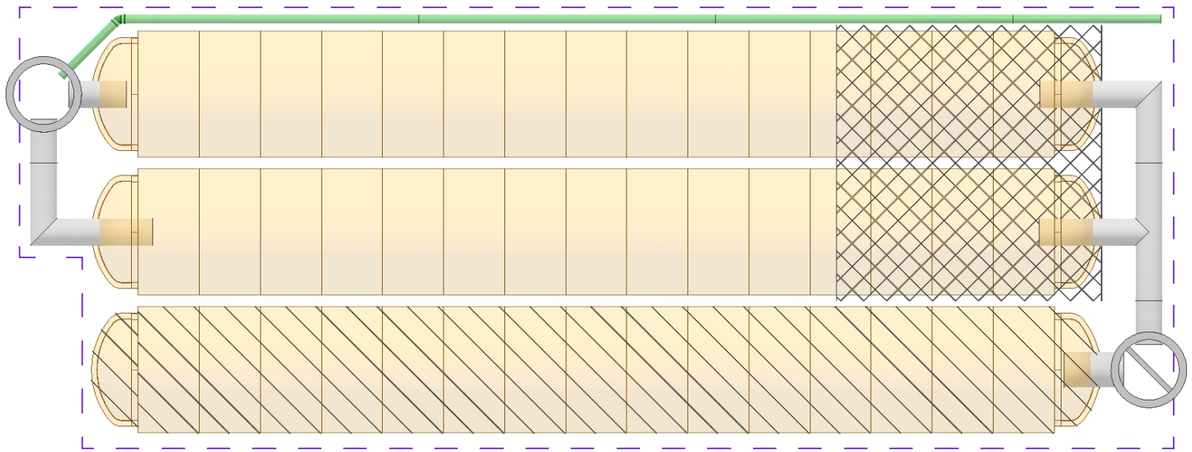
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Stormceptor®

FORTERRA

Stormceptor® EF Sizing Report

ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION STORMCEPTOR®

05/27/2020

Province:	Ontario
City:	Ottawa
Nearest Rainfall Station:	OTTAWA MACDONALD-CARTIER INT'L AP
NCDC Rainfall Station Id:	6000
Years of Rainfall Data:	37

Site Name:	211 Centrum Blvd.

Drainage Area (ha):	1.35
Runoff Coefficient 'c':	0.83

Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0
Required Water Quality Runoff Volume Capture (%):	90.0

Require Hydrocarbon Spill Capture?	Yes
Upstream Flow Control?	No
Estimated Water Quality Flow Rate (L/s):	40.49
Peak Conveyance (maximum) Flow Rate (L/s):	

Project Name:	211 Centrum Blvd.
Project Number:	-
Designer Name:	Brandon O'Leary
Designer Company:	Forterra
Designer Email/Phone:	brandon.oleary@forterrabp.com
Designer Email/Phone:	(905) 630-0359
EOR Name:	Brandon Chow
EOR Company:	David Schaeffer Engineering Ltd.
EOR Email/Phone:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	65
EFO6	76
EFO8	82
EFO10	85
EFO12	87

Recommended Stormceptor EFO Model: EFO8

Estimated Net Annual Sediment (TSS) Load Reduction (%): 82

Water Quality Runoff Volume Capture (%): > 90

imbrium

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 waterways.

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

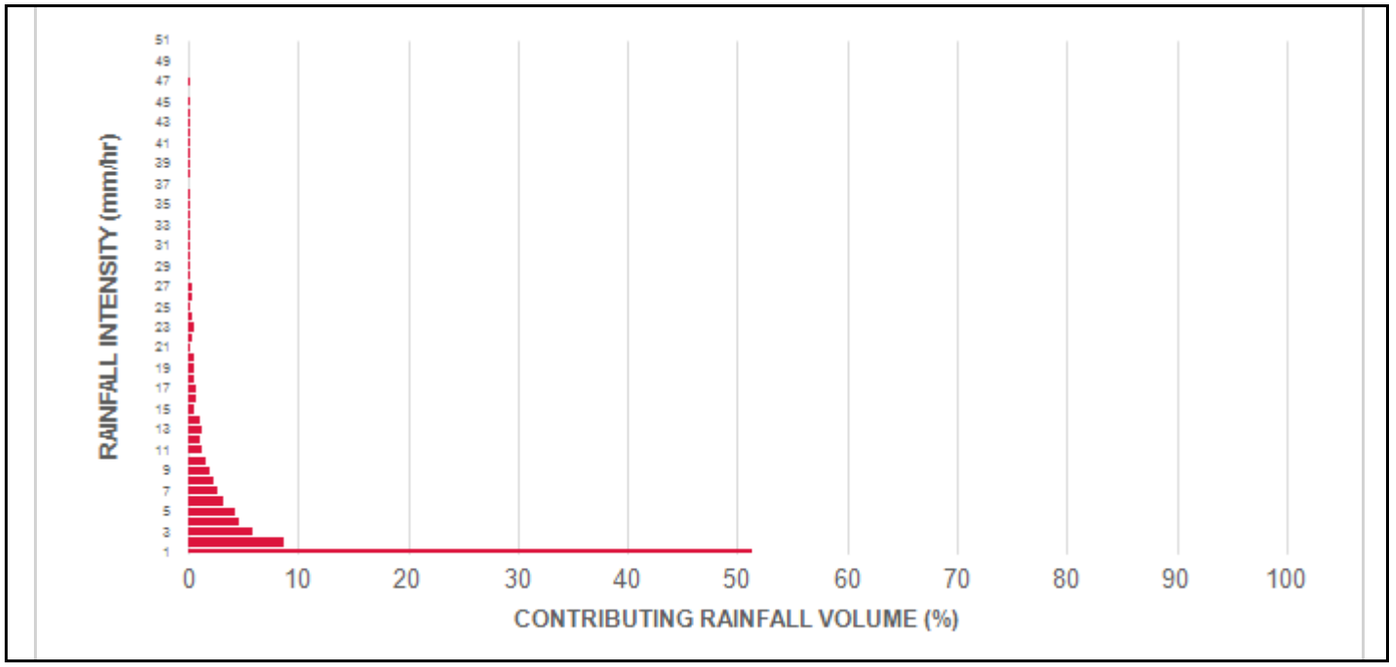
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Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
1	51.3	51.3	3.11	187.0	40.0	93	47.7	47.7
2	8.7	60.0	6.23	374.0	80.0	89	7.7	55.5
3	5.8	65.8	9.34	561.0	119.0	85	4.9	60.4
4	4.6	70.4	12.46	748.0	159.0	80	3.7	64.1
5	4.2	74.6	15.57	934.0	199.0	77	3.2	67.3
6	3.2	77.8	18.69	1121.0	239.0	73	2.3	69.6
7	2.6	80.4	21.80	1308.0	278.0	70	1.8	71.5
8	2.4	82.8	24.92	1495.0	318.0	66	1.6	73.0
9	1.9	84.7	28.03	1682.0	358.0	63	1.2	74.2
10	1.6	86.3	31.15	1869.0	398.0	59	0.9	75.2
11	1.3	87.6	34.26	2056.0	437.0	57	0.7	75.9
12	1.1	88.7	37.38	2243.0	477.0	56	0.6	76.5
13	1.3	90.0	40.49	2430.0	517.0	55	0.7	77.2
14	1.1	91.1	43.61	2617.0	557.0	54	0.6	77.8
15	0.6	91.7	46.72	2803.0	596.0	52	0.3	78.1
16	0.8	92.5	49.84	2990.0	636.0	52	0.4	78.6
17	0.7	93.2	52.95	3177.0	676.0	52	0.4	78.9
18	0.5	93.7	56.07	3364.0	716.0	51	0.3	79.2
19	0.6	94.3	59.18	3551.0	756.0	51	0.3	79.5
20	0.5	94.8	62.30	3738.0	795.0	51	0.3	79.7
21	0.2	95.0	65.41	3925.0	835.0	51	0.1	79.8
22	0.4	95.4	68.53	4112.0	875.0	51	0.2	80.0
23	0.5	95.9	71.64	4299.0	915.0	50	0.3	80.3
24	0.4	96.3	74.76	4486.0	954.0	50	0.2	80.5
25	0.1	96.4	77.87	4672.0	994.0	50	0.1	80.5

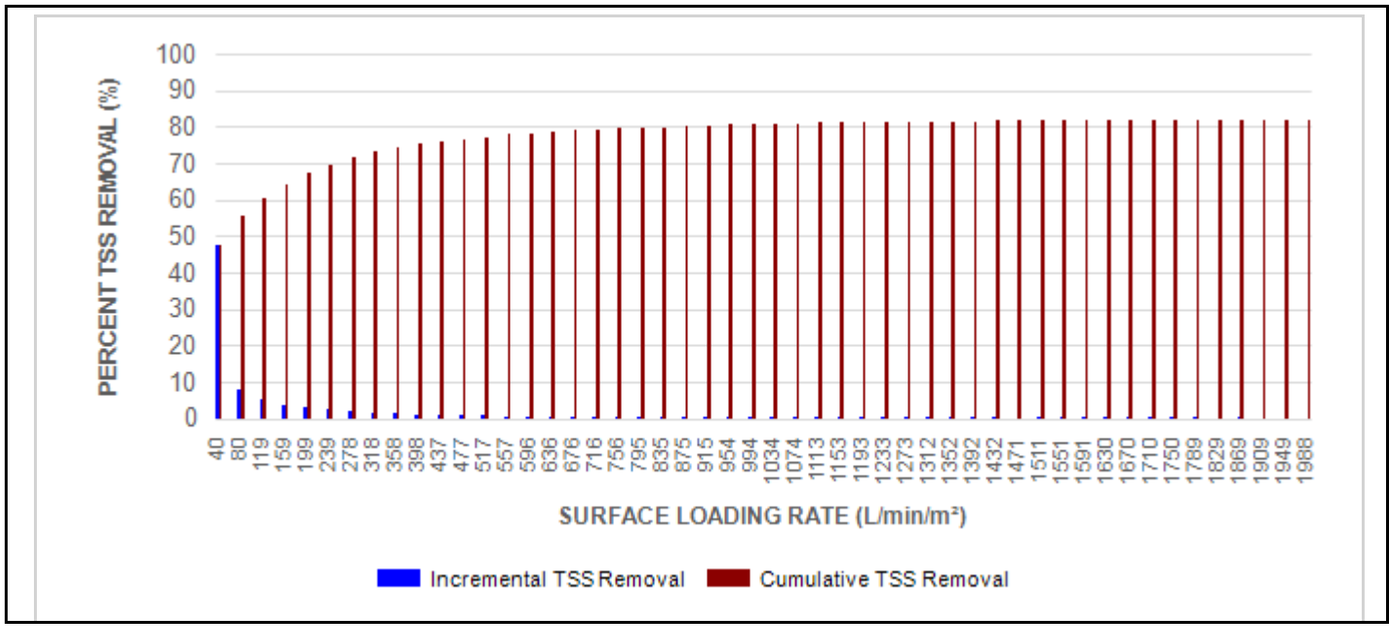
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
26	0.3	96.7	80.99	4859.0	1034.0	50	0.1	80.7
27	0.4	97.1	84.10	5046.0	1074.0	49	0.2	80.9
28	0.2	97.3	87.22	5233.0	1113.0	49	0.1	81.0
29	0.2	97.5	90.33	5420.0	1153.0	49	0.1	81.1
30	0.2	97.7	93.45	5607.0	1193.0	48	0.1	81.2
31	0.1	97.8	96.56	5794.0	1233.0	48	0.0	81.2
32	0.2	98.0	99.68	5981.0	1273.0	47	0.1	81.3
33	0.1	98.1	102.79	6168.0	1312.0	47	0.0	81.4
34	0.1	98.2	105.91	6355.0	1352.0	47	0.0	81.4
35	0.1	98.3	109.02	6541.0	1392.0	46	0.0	81.5
36	0.2	98.5	112.14	6728.0	1432.0	45	0.1	81.6
37	0.0	98.5	115.25	6915.0	1471.0	44	0.0	81.6
38	0.1	98.6	118.37	7102.0	1511.0	43	0.0	81.6
39	0.1	98.7	121.48	7289.0	1551.0	42	0.0	81.6
40	0.1	98.8	124.60	7476.0	1591.0	41	0.0	81.7
41	0.1	98.9	127.71	7663.0	1630.0	40	0.0	81.7
42	0.1	99.0	130.83	7850.0	1670.0	39	0.0	81.8
43	0.2	99.2	133.94	8037.0	1710.0	38	0.1	81.8
44	0.1	99.3	137.06	8224.0	1750.0	37	0.0	81.9
45	0.1	99.4	140.17	8410.0	1789.0	36	0.0	81.9
46	0.0	99.4	143.29	8597.0	1829.0	35	0.0	81.9
47	0.1	99.5	146.40	8784.0	1869.0	35	0.0	81.9
48	0.0	99.5	149.52	8971.0	1909.0	34	0.0	81.9
49	0.0	99.5	152.63	9158.0	1949.0	33	0.0	81.9
50	0.0	99.5	155.75	9345.0	1988.0	33	0.0	81.9
Estimated Net Annual Sediment (TSS) Load Reduction =								**82 %**

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RAINFALL DATA FROM OTTAWA MACDONALD-CARTIER INT'L AP 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

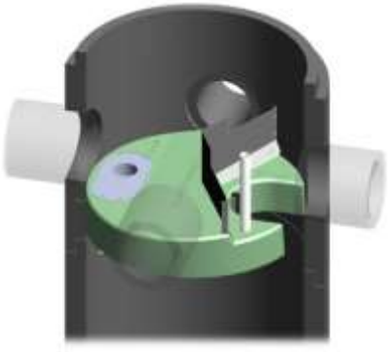
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test 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.

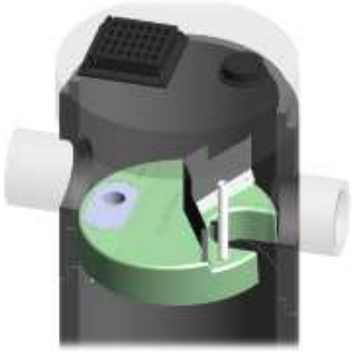
DESIGN FLEXIBILITY

►**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.

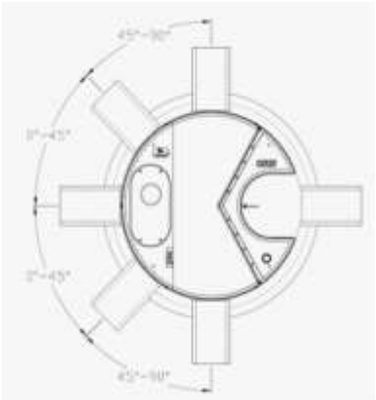
OIL CAPTURE AND RETENTION

►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.





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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	197	52	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	348	92	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	545	144	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	874	231	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	1219	322	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

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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 shall be determined using historical rainfall data and a sediment removal performance curve derived from the actual third-party verified laboratory testing data. 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/m2 to 2600 L/min/m2) 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.

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

PART 1 – GENERAL

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2.1.1

4ft (1219mm) Diameter OGS Units:	1.19m^3 sediment / 265L oil
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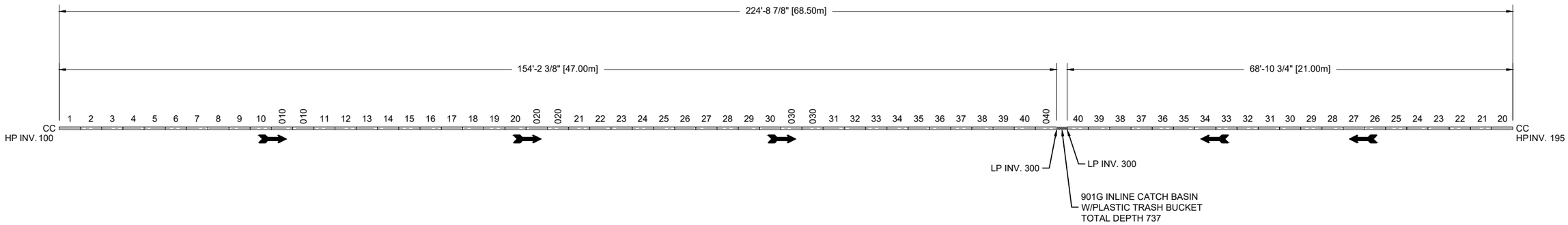
3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

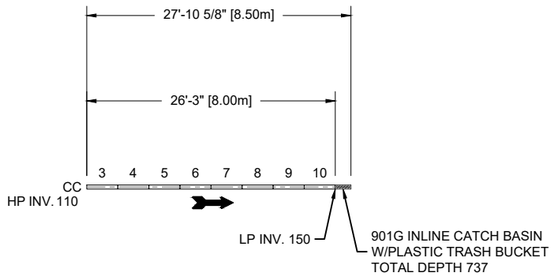
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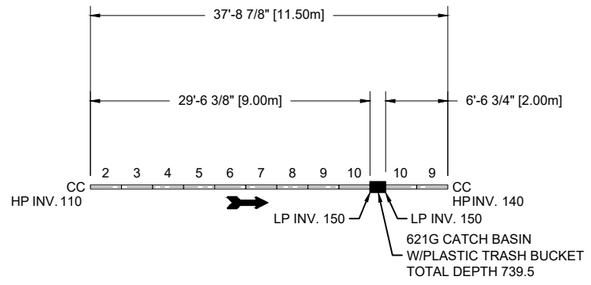
TD - 1 | K100 W/476D



TD - 2 | K100 W/476D



TD - 3 | K100 W/478Q



GENERAL NOTES

1. IT IS CUSTOMERS RESPONSIBILITY TO ENSURE THAT EACH PRODUCT IS FIT FOR IT'S INTENDED PURPOSE AND THAT THE ACTUAL CONDITIONS ARE SUITABLE.
2. IT IS THE CUSTOMERS RESPONSIBILITY TO FOLLOW ACO POLYMER PRODUCTS, INC. INSTALLATION INSTRUCTIONS FOR EACH PRODUCT. SEEK ENGINEERING ADVISE FOR INSTALLATIONS NOT ILLUSTRATED IN THE INSTALLATION GUIDELINES.
3. FOR FURTHER PRODUCT INFORMATION, CUT SHEETS, SPECIFICATIONS AND INSTALLATION INSTRUCTIONS, PLEASE VISIT US AT OUR WEBSITE: WWW.ACOUSA.COM.
4. ACO IS NOT RESPONSIBLE TO ENSURE PROPER FLOW TO SYSTEMS OUTLETS OR CATCH BASINS, REFER TO GRADING PLANS. ALL TRENCH DRAIN LAYOUTS ARE DESIGNED AT 0.0% LONGITUDINAL PAVEMENT SLOPE UNLESS OTHERWISE NOTED.

TRENCH NOTES

1. ALL FABRICATIONS TO BE COMPLETED BY INSTALLING CONTRACTOR.
2. DIMENSIONS ARE FROM OUTSIDE TO OUTSIDE

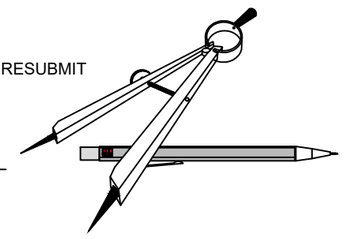
ALL DRAWINGS ARE AS ACCURATE AS THE INFORMATION SUPPLIED. ALL REASONABLE CARE HAS BEEN TAKEN IN COMPILING THE INFORMATION WITHIN. PLEASE REVIEW THIS INFORMATION FOR ACCURACY.

☐ APPROVED ☐ REVISE AND RESUBMIT
☐ APPROVED AS NOTED ☐ REJECTED

SIGNED: _____

DATE: _____

COMMENTS:



LEGEND

CHANNEL	CC = CLOSING CAP
CENTER LINE	OC = OUTLET CAP
INSTALLATION DIRECTION OF CHANNEL	INV = INVERT
	HP = HIGH POINT
	LP = LOW POINT
VOA = VERTICAL OUTLET ADAPTER	BO = BOTTOM OUTLET
BAU = BRICKSLOT ACCESS UNIT	

211 CENTRUM ON	
DRAWN BY: **KZ**	EMAIL: kyle.zheng@aco.com
DATE **05-27-2020**	CHECKED BY:
SHEET NO. **SHEET 1 OF 1**	DESIGN SERV. NO. **920-372** REV.

TRENCH DRAIN LAYOUT

SYSTEM(S) **K100** GRATE(S) **476D/478Q**

REVISIONS

NO.	DESCRIPTION	DATE	BY
A	-	-	-
B			
C			

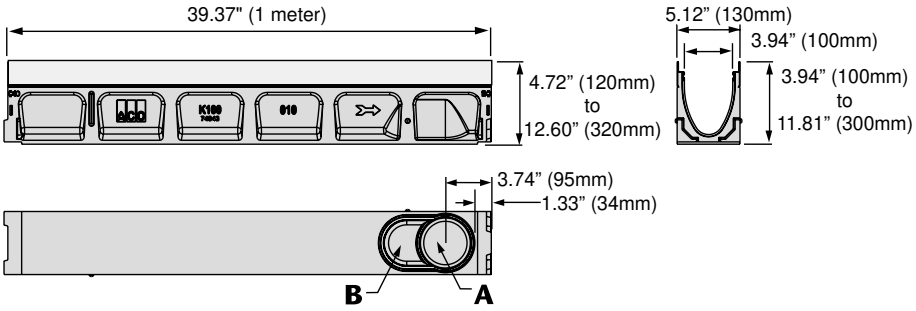
CANADA

ACO SYSTEMS LTD.
2910 BRIGHTON RD
OAKVILLE, ON
L6H 5S3
TEL: (905)-829-0665
FAX: (905)-829-2908
EMAIL: info@acocan.ca
WEB: www.acocan.com

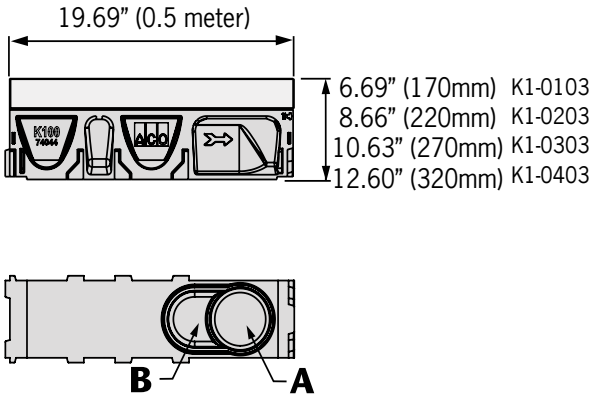
CANADIAN

KlassikDrain - K100 Galvanized steel edge rail channel system

One meter channel

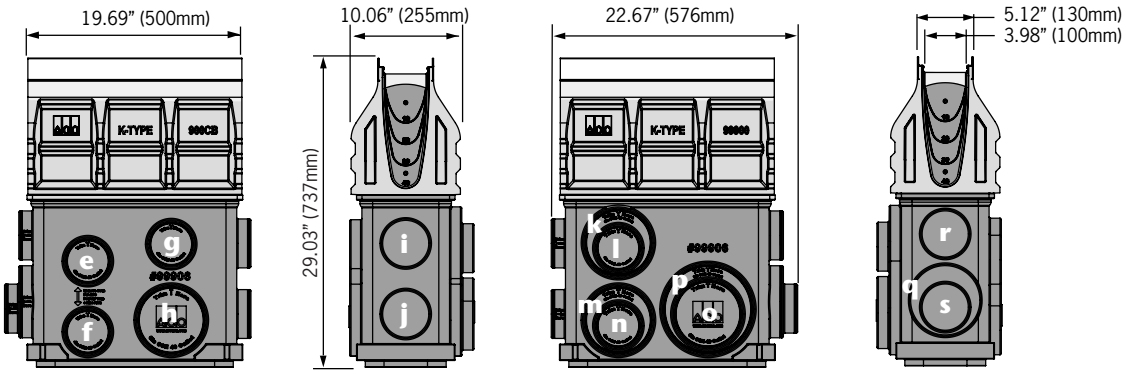


Half meter channel



Knock-outs included on every 5th channel

Type K901G In-line catch basin



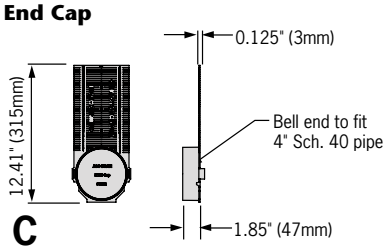
Total capacity =
10.49 gallons

Outlet flow rates

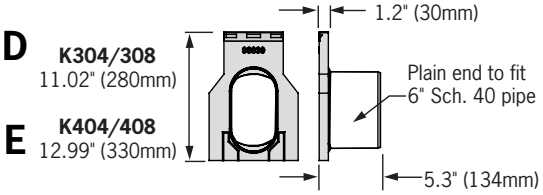
Outlet	Product	Outlet size (Sch. 40)	Invert Depth	GPM	CFS
A	Bottom outlet - K00	4" round	3.94"	108	0.24
A	Bottom outlet - K40	4" round	11.81"	187	0.42
B	Bottom outlet - K00	6" oval	3.94"	177	0.39
B	Bottom outlet - K40	6" oval	11.81"	306	0.68
C	End outlet - K20	4" round	7.87"	132	0.29
C	End outlet - K40	4" round	11.81"	171	0.38
D	K1-308-6 6" outlet cap	6" oval	9.84"	233	0.52
E	K1-408-6 6" outlet cap	6" oval	11.81"	264	0.59
F	Type K1-901G	4" round	19.30"	226	0.50
G	Type K1-901G	4" round	25.67"	265	0.59
H	Type K1-901G	4" round	25.30"	263	0.59
I	Type K1-901G	4" round	18.56"	222	0.49
J	Type K1-901G	6" round	25.85"	586	1.30
K	Type K1-901G	4" round	26.43"	269	0.60
L	Type K1-901G	4" round	19.36"	227	0.51
M	Type K1-901G	6" round	27.30"	604	1.35
N	Type K1-901G	6" round	19.99"	505	1.12
O	Type K1-901G	8" round	27.30"	1051	2.34
P	Type K1-901G	6" round	26.43"	593	1.32
Q	Type K1-901G	4" round	27.17"	273	0.61
R	Type K1-901G	4" round	20.68"	235	0.52
S	Type K1-901G	4" round	18.99"	224	0.50
T	Type K1-901G	6" round	27.17"	6.02	1.34

Note: These are the pipe flow rates at the specified outlet, **NOT** channel flow rates. Catch basin flow rates are without trash bucket - using trash bucket reduces flow.

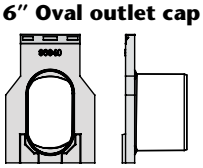
End Cap



6" Oval inlet cap



6" Oval outlet cap



ACO Specification Information

ACO DRAIN

KlassikDrain - K100 Galvanized steel edge rail channel system

Description	Part No.	Invert Inches[2]	Invert mm[2]	Weight Lbs.
K1-00 Neutral channel - 39.37" (1m)[1]	**74041**	**3.94**	**100**	**28.1**
K1-1 Sloped channel - 39.37" (1m)	**74001**	4.13	105	28.1
K1-2 Sloped channel - 39.37" (1m)	**74002**	4.33	110	28.9
K1-3 Sloped channel - 39.37" (1m)	**74003**	4.53	115	29.7
K1-4 Sloped channel - 39.37" (1m)	**74004**	4.72	120	30.5
K1-5 Sloped channel - 39.37" (1m)[1]	**74005**	4.92	125	31.3
K1-6 Sloped channel - 39.37" (1m)	**74006**	5.12	130	32.1
K1-7 Sloped channel - 39.37" (1m)	**74007**	5.31	135	32.9
K1-8 Sloped channel - 39.37" (1m)	**74008**	5.51	140	33.7
K1-9 Sloped channel - 39.37" (1m)	**74009**	5.71	145	34.5
K1-10 Sloped channel - 39.37" (1m)[1]	**74010**	5.91	150	35.3
K1-010 Neutral channel - 39.37" (1m)[1]	**74043**	**5.91**	**150**	**35.3**
K1-0103 Neutral channel - 19.69" (0.5m)[1]	**74044**	**5.91**	**150**	**17.0**
K1-11 Sloped channel - 39.37" (1m)	**74011**	6.10	155	36.1
K1-12 Sloped channel - 39.37" (1m)	**74012**	6.30	160	36.9
K1-13 Sloped channel - 39.37" (1m)	**74013**	6.50	165	37.7
K1-14 Sloped channel - 39.37" (1m)	**74014**	6.69	170	38.5
K1-15 Sloped channel - 39.37" (1m)[1]	**74015**	6.89	175	39.3
K1-16 Sloped channel - 39.37" (1m)	**74016**	7.09	180	40.1
K1-17 Sloped channel - 39.37" (1m)	**74017**	7.28	185	40.9
K1-18 Sloped channel - 39.37" (1m)	**74018**	7.48	190	41.7
K1-19 Sloped channel - 39.37" (1m)	**74019**	7.68	195	42.5
K1-20 Sloped channel - 39.37" (1m)[1]	**74020**	7.87	200	43.4
K1-020 Neutral channel - 39.37" (1m)[1]	**74045**	**7.87**	**200**	**43.4**
K1-0203 Neutral channel - 19.69" (0.5m)[1]	**74046**	**7.87**	**200**	**20.5**
K1-21 Sloped channel - 39.37" (1m)	**74021**	8.07	205	44.2
K1-22 Sloped channel - 39.37" (1m)	**74022**	8.27	210	45.0
K1-23 Sloped channel - 39.37" (1m)	**74023**	8.46	215	45.8
K1-24 Sloped channel - 39.37" (1m)	**74024**	8.66	220	46.6
K1-25 Sloped channel - 39.37" (1m)[1]	**74025**	8.86	225	47.4
K1-26 Sloped channel - 39.37" (1m)	**74026**	9.06	230	48.2
K1-27 Sloped channel - 39.37" (1m)	**74027**	9.25	235	49.0

Description	Part No.	Invert Inches[2]	Invert mm[2]	Weight Lbs.
K1-28 Sloped channel - 39.37" (1m)	**74028**	9.45	240	49.8
K1-29 Sloped channel - 39.37" (1m)	**74029**	9.65	245	50.6
K1-30 Sloped channel - 39.37" (1m)[1]	**74030**	9.84	250	51.4
K1-030 Neutral channel - 39.37" (1m)[1]	**74047**	**9.84**	**250**	**51.4**
K1-0303 Neutral channel - 19.69" (0.5m)[1]	**74048**	**9.84**	**250**	**24.0**
K1-31 Sloped channel - 39.37" (1m)	**74031**	10.04	255	52.2
K1-32 Sloped channel - 39.37" (1m)	**74032**	10.24	260	53.0
K1-33 Sloped channel - 39.37" (1m)	**74033**	10.43	265	53.8
K1-34 Sloped channel - 39.37" (1m)	**74034**	10.63	270	54.6
K1-35 Sloped channel - 39.37" (1m)[1]	**74035**	10.83	275	55.4
K1-36 Sloped channel - 39.37" (1m)	**74036**	11.02	280	56.2
K1-37 Sloped channel - 39.37" (1m)	**74037**	11.22	285	57.0
K1-38 Sloped channel - 39.37" (1m)	**74038**	11.42	290	57.9
K1-39 Sloped channel - 39.37" (1m)	**74039**	11.61	295	58.7
K1-40 Sloped channel - 39.37" (1m)[1]	**74040**	11.81	300	59.5
K1-040 Neutral channel - 39.37" (1m)[1]	**74049**	**11.81**	**300**	**59.5**
K1-0403 Neutral channel - 19.69" (0.5m)[1]	**74050**	**11.81**	**300**	**27.5**
K1-901G In-line catch basin - 19.69" (0.5m)[3]	**94608**	28.81	701.9	52.6
K1-621G catch basin - 19.69" (0.5m)[3]	**94617**	28.84	732.5	55.8
K1-631G catch basin - 19.69" (0.5m)[4]	**94631**	40.84	1037.4	65.8
K1-Series 600 Optional plastic riser	**99902**	-	-	10.0
Foul air trap - fits both 900 & 600 series basins	**90854**	-	-	1.2
K1-304-6 6" Inlet Cap	**96839**	9.84	250	5.2
K1-308-6 6" Outlet Cap	**96840**	9.84	250	5.0
K1-404-6 6" Inlet Cap	**96834**	11.81	300	6.0
K1-408-6 6" Outlet Cap	**96836**	11.81	300	5.8
Universal end cap	**96822**	11.81	300	0.4
Debris strainer for 4" bottom knockout	**93488**	-	-	0.2
4" Oval to 6" round outlet adapter	**95140**	-	-	1.1
K1-Installation device	**97477**	-	-	2.8
Grate removal tool	**01318**	-	-	0.3
K1-QuickLok locking bar	**02899**	-	-	0.1

Notes:
1. This channel offers a bottom knockout feature; 4" round/6" oval.
2. Inverts shown are for the male end; for female invert depth subtract 5mm (≈0.2") from the male invert (except for neutral channels, where it will be same as male invert). To calculate the overall channel depth add 20mm (≈0.8") to invert depth.
3. This catch basin kit includes a polymer concrete top, removable Quicklok locking bar, trash bucket and plastic base. Select an appropriate grate.
4. This catch basin kit includes a polymer concrete top, removable Quicklok locking bar, deep trash bucket, plastic riser and plastic base. Select an appropriate grate.

Specifications

General
The surface drainage system shall be ACO Drain K100 complete with gratings secured with 'QuickLok' locking as manufactured by ACO, Inc. or approved equal.

Materials
The trench system bodies shall be manufactured from polyester polymer concrete with the minimum properties as follows:

Compressive strength:	14,000 psi
Flexural strength:	4,000 psi
Water absorption	0.07%
Frost proof	YES
Salt proof	YES
Dilute acid and alkali resistant	YES

The nominal clear opening shall be 4" (100mm) with overall width of 5.12" (130mm). Pre-cast units shall be manufactured with either an invert slope of 0.5% or with neutral invert and have a wall thickness of at least 0.50" (13mm). Each unit will feature a partial radius in the trench bottom and a male to female interconnecting end profile. Units shall have horizontal cast in anchoring keys on the outside wall to ensure maximum mechanical bond to the surrounding bedding material and pavement surface. The galvanized steel edge rail will be integrally cast in by the manufacturer to ensure maximum homogeneity between polymer concrete body and edge rail. Each edge rail shall be at least 3/32" (2.5mm) thick.

Grates
Grates shall be specified. See separate ACO Spec Info grate sheets for details. After removal of grates and 'QuickLok' bar there shall be uninterrupted access to the trench to aid maintenance.

Installation
The trench drain system shall be installed in accordance with the manufacturer's installation instructions and recommendations.

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Type 476D Longitudinal ductile iron grate (ADA)

Product Features

- Certified to EN 1433 Load Class C - 56,000 lbs - 1,162 psi
- Uses 'DrainLok' boltless locking system
- Suitable for use with K100, KS100, and H100K-8 channels
- Manufactured from ductile iron to ASTM A 536-84 - Grade 65-45-12
- E- coated for improved resistance against rust
- Complies with ADA - American Disabilities Act of 1990 Section 4.5.4
- Bicycle Tire Penetration Resistant to AS 3996 - 2006



Specifications

General

The surface drainage system shall be ACO Drain K100, KS100, and H100K-8 channels*, complete with ACO Type 476D longitudinal ductile iron grate with 'DrainLok' locking as manufactured by ACO, Inc. or similar approved.

Materials

The covers shall be manufactured from ductile iron and have ***minimum*** properties as follows:

- ***Independently certified to meet Load Class C to EN 1433 - 56,000 lbs - 1,162 psi***
- ***Ductile iron to ASTM A 536-84 - Grade 65-45-12***
- ***Intake area of 22.6 sq. in. (145.16 cm²) per half meter of grate***

The overall width of 4.85" (123mm) and overall length of 19.69" (500mm). Slots measure at 2.1" (53.34mm) by 0.24" (6.09mm).

Installation

The trench drain system and grates shall be installed in accordance with the manufacturer's installation instructions and recommendations.

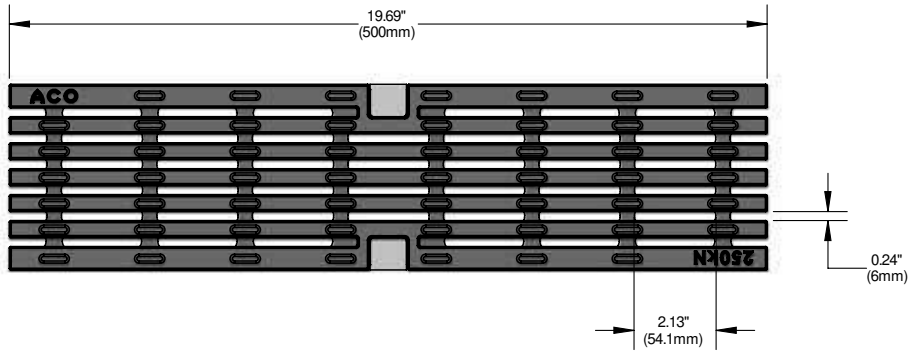
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ACO Specification Information

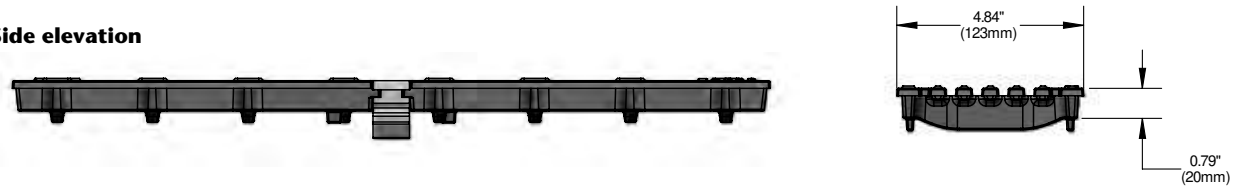
ACO DRAIN

Type 476D Longitudinal ductile iron grate (ADA)

Plan view

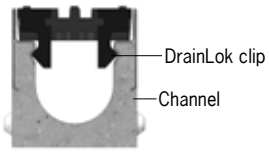


Side elevation



Description	Part No.	Length inches *(mm)*	Width inches *(mm)*	Weight lbs.
DrainLok grate Type 476D Ductile iron longitudinal grate	**142171**	19.69 (*500*)	4.85 (*123.1*)	7.0

'DrainLok' locking mechanism



ACO DrainLok™ is a patented, boltless locking system that removes the need for bolts and bars and improves the hydraulic capacity of the channel. The DrainLok™ mechanism simply clips into the channel edge rail for rapid installation. ACO DrainLok™ grates are fitted with an anti-shunt mechanism that restricts unwanted grate movement when installed, improving durability and longevity of the system.

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Type 478Q Longitudinal ductile iron grate (ADA)

Product Features

- Certified to EN 1433 Load Class E - 135,000 lbs - 2,788 psi
- Uses 'QuickLok' boltless locking system
- Suitable for use with K100, KS100, H100-8, H100-10, H100K-8 H100KS-8, and NW100 channels
- Manufactured from ductile iron to ASTM A 536-84 - Grade 65-45-12
- E- coated for improved resistance against rust
- Complies with ADA - American Disabilities Act of 1990 Section 4.5.4
- Bicycle Tire Penetration Resistant to AS 3996 - 2006



Specifications

General

The surface drainage system shall be ACO Drain K100, KS100, H100-8, H100-10, H100K-8, H100KS-8, and NW100 channels* complete with ACO Type 478Q longitudinal ductile iron grate with 'QuickLok' locking as manufactured by ACO, Inc. or similar approved.

Materials

The covers shall be manufactured from ductile iron and have ***minimum*** properties as follows:

- ***Independently certified to meet Load Class E to EN 1433 - 135,000 lbs - 2,788 psi***
- ***Ductile iron to ASTM A 536-84 - Grade 65-45-12***
- ***Intake area of 22.5 sq. in. (145.16 cm²) per half meter of grate***

The overall width of 4.85" (123mm) and overall length of 19.69" (500mm). Slots measure at a maximum of 0.28" (7mm).

Installation

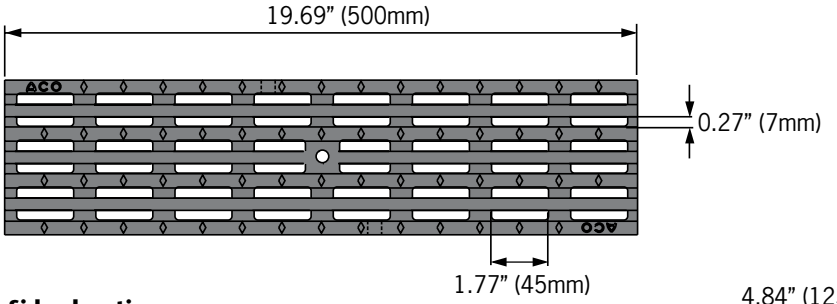
The trench drain system and grates shall be installed in accordance with the manufacturer's installation instructions and recommendations.

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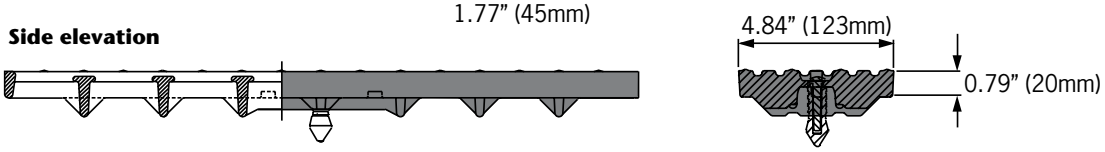
ACO DRAIN

Type 478Q Longitudinal ductile iron grate (ADA)

Plan view

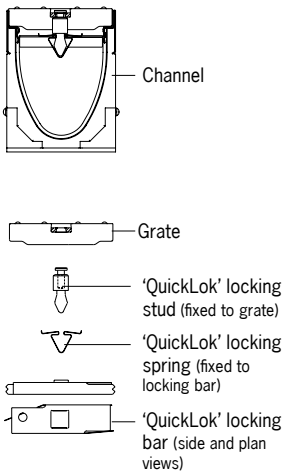


Side elevation



Description	Part No.	Length inches *(mm)*	Width inches *(mm)*	Weight lbs.
QuickLok grate				
Type 478Q Ductile iron longitudinal grate	**03314**	19.69 (*500*)	4.85 (*123.1*)	12.8
QuickLok locking bar	**02899**	-	-	0.5
QuickLok grate removal tool	**01318**	-	-	0.3

'QuickLok' locking mechanism



ACO 'QuickLok' is a patented boltless locking system, grates are removed and replaced with the minimum time and effort for ease of maintenance. The unique design provides a positive 'snap down' fit into the locking bar. A stud is fixed to the grate which 'locks' into the spring clip in the locking bar.

The 'QuickLok' stud is made from stainless steel and high density nylon, the locking bar and clip are stainless steel, for use in both general purpose and corrosive environments.

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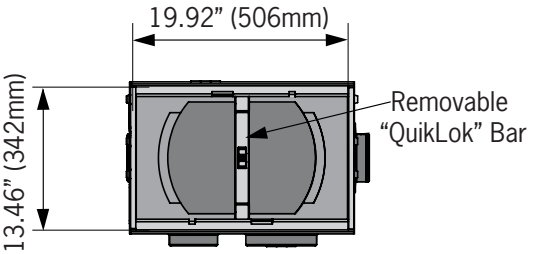
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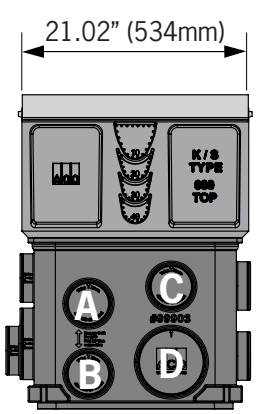
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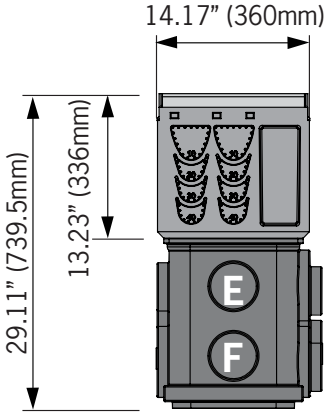
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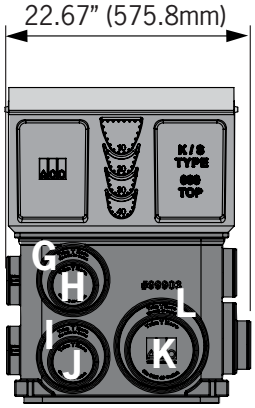
K1-621G Catch Basin

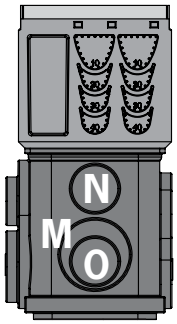
K1-621G Catch Basin











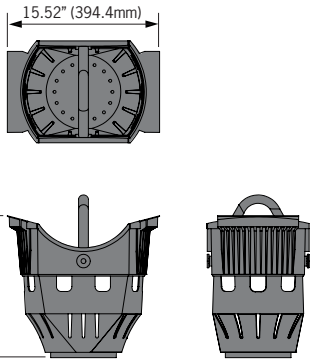
Outlet flow rates

Outlet	Product	Outlet size (Sch. 40)	Invert Depth	GPM	CFS
A	Type K1-621G	4" round	21.29"	239	0.53
B	Type K1-621G	4" round	27.79"	276	0.62
C	Type K1-621G	4" round	19.72"	229	0.51
D	Type K1-621G	6" round	27.79"	610	1.36
E	Type K1-621G	4" round	19.84"	230	0.51
F	Type K1-621G	4" round	26.34"	269	0.60
G	Type K1-621G	6" round	20.62"	514	1.15
H	Type K1-621G	4" round	20.07"	231	0.52
I	Type K1-621G	6" round	27.76"	609	1.36
J	Type K1-621G	4" round	27.19"	273	0.61
K	Type K1-621G	6" round	27.19"	602	1.34
L	Type K1-621G	8" round	27.76"	1061	2.36
M	Type K1-621G	6" round	26.28"	591	1.32
N	Type K1-621G	4" round	19.15"	225	0.50
O	Type K1-621G	4" round	25.86"	266	0.59

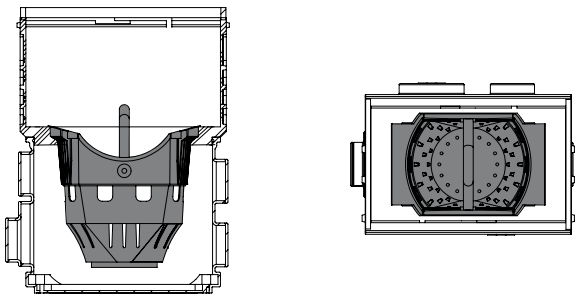
Notes:
1. These are the pipe flow rates at the specified outlet, **NOT** channel flow rates.
*Flow rates without trash bucket - using trash bucket or filter bag reduces flow rates.

2. 4" diameter foul air trap, part# 90854, can be fitted to catch basin base at outlet positions A/B and E/F

Trash Bucket



Note: Openings in trash bucket are 35.7"^{2} (23,033mm^2)



Note: Trash bucket position within K1-621G catch basin body and base

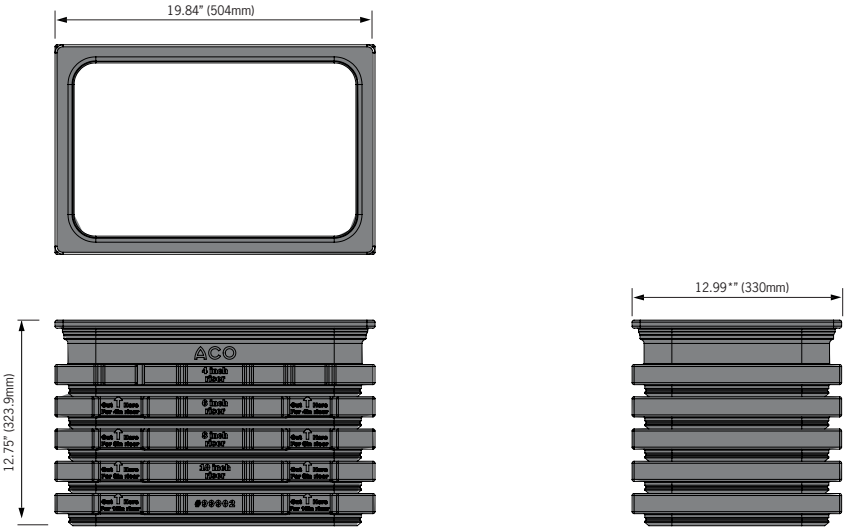
ACO DRAIN

K1-621G Catch Basin

ACO Specification Information

Description	Part No.	Invert Depth inches	Invert Depth *mm*	Weight lbs.
Type K1-621G Catch basin assembly - top, removable "QuikLok" bar, trash bucket & base	**94617**	28.86	733.2	55.8
Catch Basin Components				
Type 600 optional riser	**99902**	40.86	1038	10.0
Foul air trap - fits both Type 900 & Type 600 basins	**90854**	-	-	1.2
QuickLok grate removal tool	**01318**	-	-	0.3

Optional riser detail (Part# 99902)



Notes:
1. Riser can be cut down in 1" (25mm) increments.
2. Addition of riser will alter the outflow rates of base as shown on table overleaf.

Specifications

General
The catch basin shall be ACO Drain K1-621G Catch Basin - comprising of top section, trash bucket and base as manufactured by ACO, Inc. or similar approved.

Materials
The top unit body shall be manufactured from polyester polymer concrete with minimum properties as follows:

Compressive strength:	14,000 psi
Flexural strength:	4,000 psi
Water absorption	0.07%
Frost proof	YES
Salt proof	YES
Dilute acid and alkali resistant	YES

The nominal clear opening shall be 13.46" (342mm) wide by 19.92" (506mm) long. Overall width of 22.70" (575.8mm) by 15.38" (390.6mm) long. Type K1-621G catch basin assembly has overall depth of 29.11" (739.5mm). Polymer concrete top units shall incorporate a cast in galvanized steel frame manufactured with drillouts for channel connection and have a wall thickness of at least 0.59" (15mm). Top units shall have horizontal cast in anchoring key features on the outside to ensure maximum mechanical bond to the surrounding bedding material and pavement surface. The base unit shall be a LLDPE plastic molding and incorporate molded plastic pipe stubbs to facilitate pipe connection.

Optional Riser
Optional riser can be useful between polymer concrete top unit and LLDPE base unit. Use of riser is determined by acess and local building codes.

Grates
Grates shall be specified. See separate ACO Spec Info grate sheets for details. After removal of grates and 'QuickLok' bar there shall be uninterrupted access to the catch basin to aid maintenance. Accepts all half-meter ACO K300 Drainlok grates or K300 Quicklok grates with optional QL bar.

Installation
The trench drain/catch basin system shall be installed in accordance with the manufacturer's installation instructions and recommendations.

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Type 878Q Longitudinal ductile iron grate (ADA)



Product Features

- Certified to EN 1433 Load Class E - 135,000 lbs - 2,323 psi
- Uses 'QuickLok' boltless locking system
- Suitable for use with K300, KS300, H300K-13, and H300KS-13 channels and 621G, 621S, 631G, 631S catch basins
- Manufactured from ductile iron to ASTM A 536-84 - Grade 65-45-12
- E- coated for improved resistance against rust
- Complies with ADA - American Disabilities Act of 1990 Section 4.5.4
- Complies with ASME: A112.6.3 - 2001: Section 7.12

  Heel Resistant Strainers and Grates
- Bicycle Tire Penetration Resistant to AS 3996 - 2006



Specifications

General
The surface drainage system shall be ACO Drain K300, KS300, H300K-13, and H300KS-13, channels* and 621G, 621S, 631G, and 631S catch basins complete with ACO Type 878Q longitudinal ductile iron grate with 'QuickLok' locking as manufactured by ACO Polymer Products, Inc. or similar approved.

Materials
The covers shall be manufactured from ductile iron and have ***minimum*** properties as follows:

- ***Independently certified to meet Load Class E to EN 1433 - 135,000 lbs - 2,323 psi***
- ***Ductile iron to ASTM A 536-84 - Grade 65-45-12***
- ***Intake area of 61.85 sq. in. (665.16 cm²) per half meter of grate***

The overall width of 1.0" (338mm) and overall length of 0.31" (500mm). Slots measure at a maximum of 1.0" (25.5mm) by 0.31" (8mm).

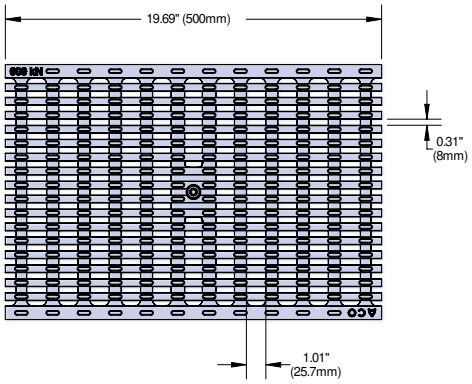
Installation
The trench drain system and grates shall be installed in accordance with the manufacturer's installation instructions and recommendations.

* delete as appropriate

ACO Specification Information

Type 878Q Longitudinal ductile iron grate (ADA)

Plan view

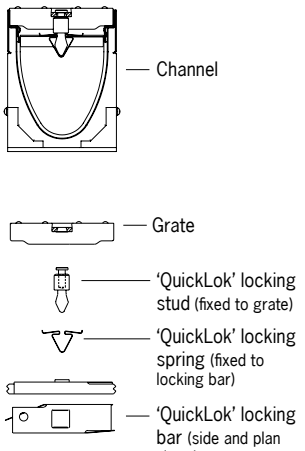


Side elevation



Description	Part No.	Length inches *(mm)*	Width inches *(mm)*	Weight lbs.
QuickLok grate				
Type 878Q Ductile iron longitudinal grate	**138130**	19.69 (*500*)	13.31 (*338*)	53.0
QuickLok locking bar	**10458**	-	-	0.5
QuickLok grate removal tool	**01318**	-	-	0.3

'QuickLok' locking mechanism



ACO 'QuickLok' is a patented boltless locking system, grates are removed and replaced with the minimum time and effort for ease of maintenance. The unique design provides a positive 'snap down' fit into the locking bar. A stud is fixed to the grate which 'locks' into the spring clip in the locking bar.

The 'QuickLok' stud is made from stainless steel and high density nylon, the locking bar and clip are stainless steel, for use in both general purpose and corrosive environments.

ACO Polymer Products, Inc.

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Toll free: (800) 543-4764
Fax: (440) 639-7235

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Tel: (520) 421-9988
Toll Free: (888) 490-9552
Fax: (520) 421-9899

Southeast Sales Office
4211 Pleasant Road
Fort Mill, SC 29708
Toll free: (800) 543-4764
Fax: (803) 802-1063

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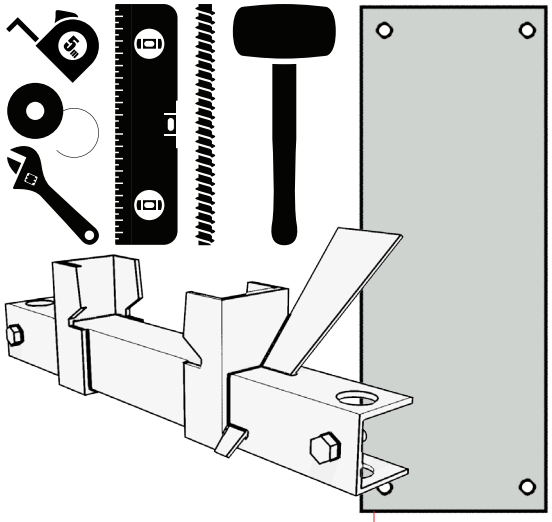
Electronic Contact:
info@ACODrain.us
www.ACODrain.us

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ACO Installation Device Install

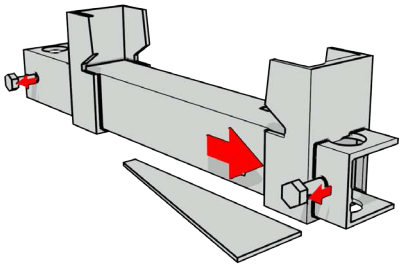
Tools

- Hammer
- Spirit level
- Tape measure
- 2 x String lines & pegs
- 12mm ring spanner / crescent wrench
- 16mm diameter reinforcing bars.
  Lengths to be determined by installer.
  Bar lengths will vary depending on soil type and height of channel above the trench depth.
  Number of reinforcing bars required:
  2 per channel + 2 for the end channel
- 1.1m length of timber to assist with leveling.
- Installation devices:
  1 per channel + 1 for the end channel



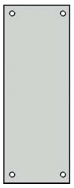
Installation Device Setup

- Loosen both screws to allow the device to be positioned over the reinforcing bars.
- Push the adjustable clamp to the outside to allow the channels to be installed.
- Wedge is fitted during final stage of installation.



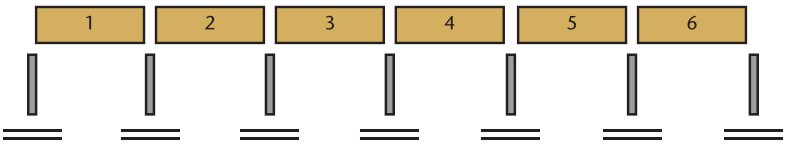
Step 1

Create the required width template using timber sheet or similarly suitable rigid material. Diagrams can be printed from the ACO website.
For ACO's KlassikDrain and PowerDrain System:
http://www.acodrain.us/technical.html



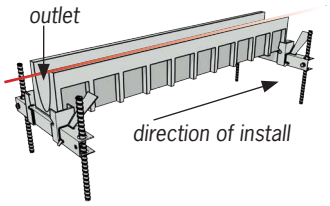
Step 2

Set out the top string line for the top edge of the channel run and lay the required channels in sequence along the string line. Also lay out 2 reinforcing bars and 1 installation device at the location of each channel joint.



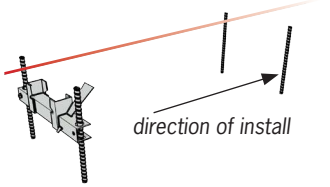
Step 3

Set the first channel without using the template to allow for flexibility. Note: The first channel to be set out must be at the outlet/deep end of the run. The fixed side of the installation device must be on the same side of the channel as the string line. Ensure the reinforcing bars are adequately pushed into the ground so they do not fall over once the channel is removed and do not sit higher than the top of the channel.



Step 4

Once the first channel is set, leveled and straightness is achieved, remove the channel and leave the first installation device in place. Remove the second device, but leave the reinforcing bars in place.

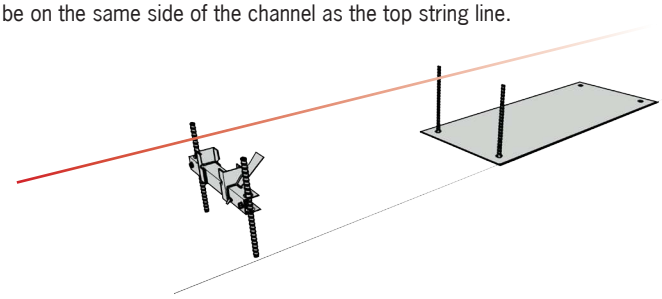


Step 5

Position the template over the second row of reinforcing bars.

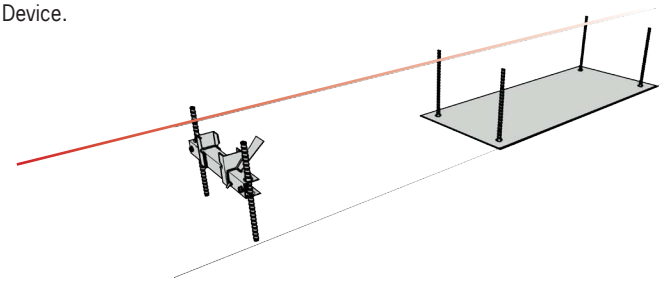
Step 6

Set up the second string line up against the template edge ensuring that both string lines are parallel. The second string line should be just above the ground level to keep the template straight when moving from one channel to the next. The string line should also be on the same side of the channel as the top string line.



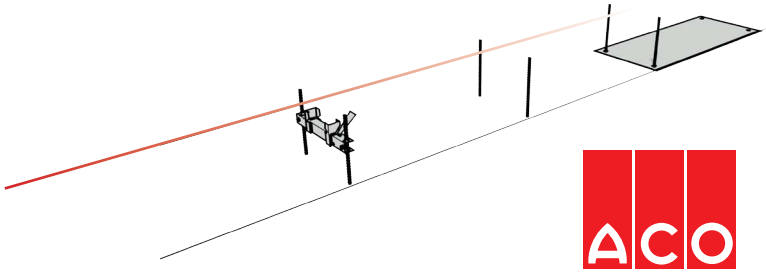
Step 7

Hammer in the next/third row of re-bar through the empty template holes. Drive the reinforcing bars into a sufficient depth, but not too low to stop the use of the Installation Device.



Step 8

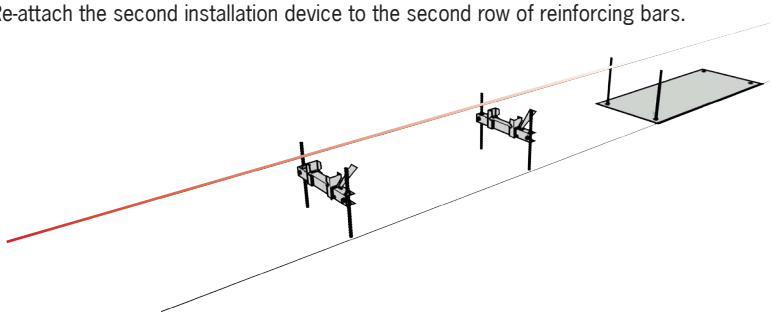
Remove the template and reposition the template again on the last two reinforcing bars that were just installed.



ACO Installation Device Install

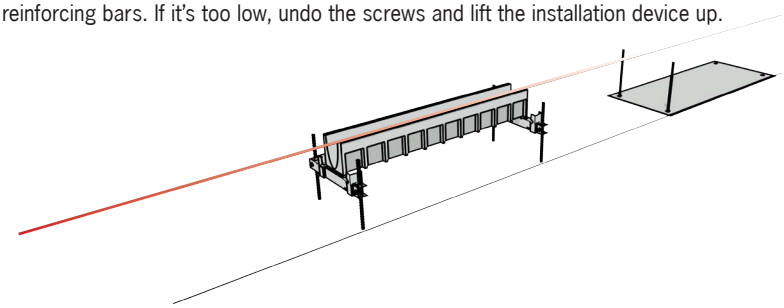
Step 9

Re-attach the second installation device to the second row of reinforcing bars.



Step 10

Replace the first channel WITHOUT securing it and ensure the channel is level with the top string line and is level across the width of the channel. If it's too high, tap down the reinforcing bars. If it's too low, undo the screws and lift the installation device up.



Once the first channel has been replaced, DO NOT lock the adjustable side of the clamp with the wedge yet. This allows some movement of the channel when placing the next channel in line. Do not place the channel all the way to the fixed side of the clamp where it will sit in the locked position. This allows for easier installation of channels.

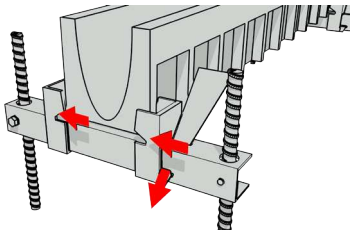
Note: Always allow two sets of reinforcing bars to be installed before placing channels. This allows the template to be removed and placed into the next position for setting the reinforcing bars.

Step 11

Continue to install devices and repeat process of setting the channels.

Step 12

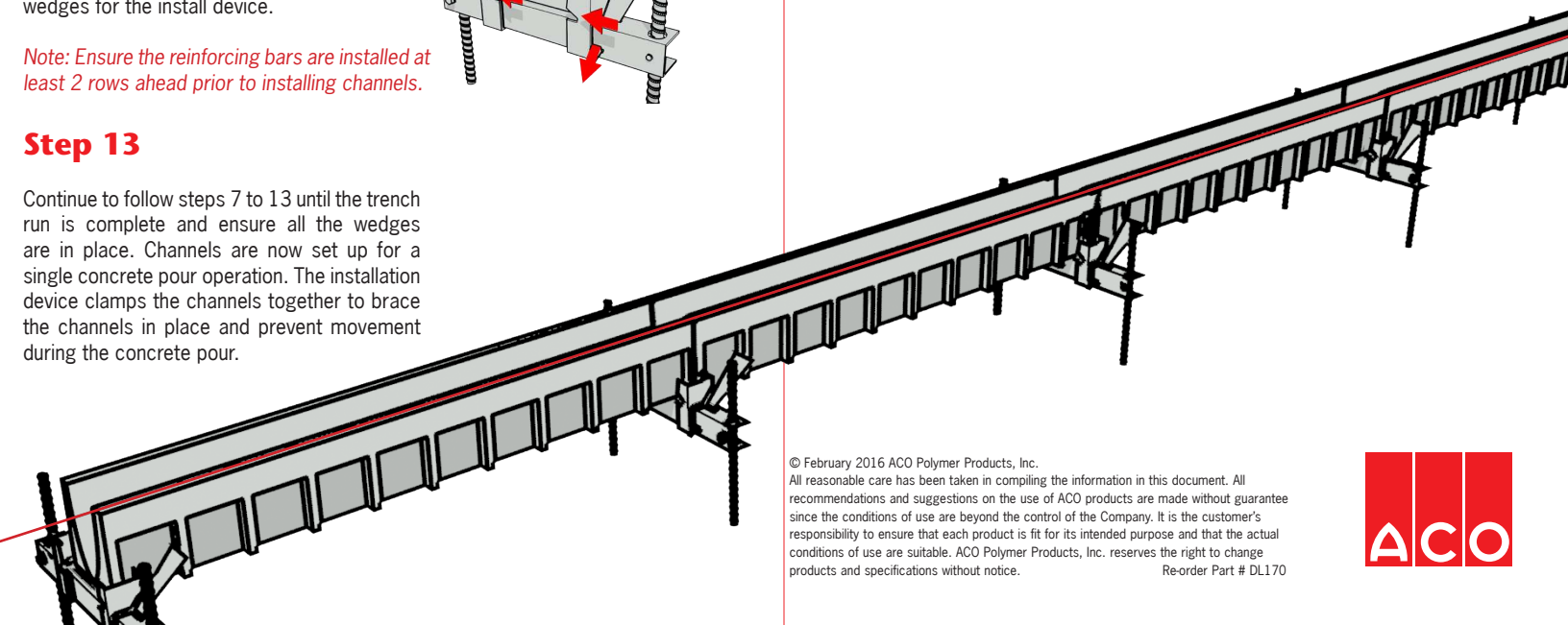
After the next/fourth channel is set, the first channel can be locked into position using the wedges for the install device.

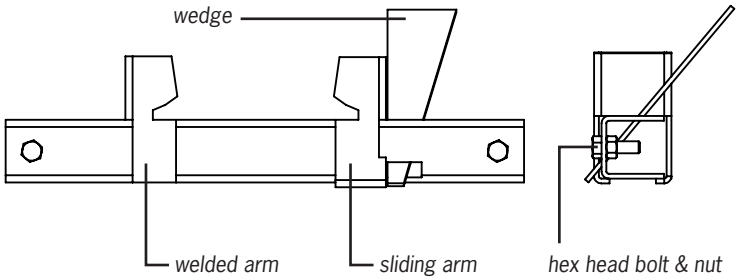


Note: Ensure the reinforcing bars are installed at least 2 rows ahead prior to installing channels.

Step 13

Continue to follow steps 7 to 13 until the trench run is complete and ensure all the wedges are in place. Channels are now set up for a single concrete pour operation. The installation device clamps the channels together to brace the channels in place and prevent movement during the concrete pour.

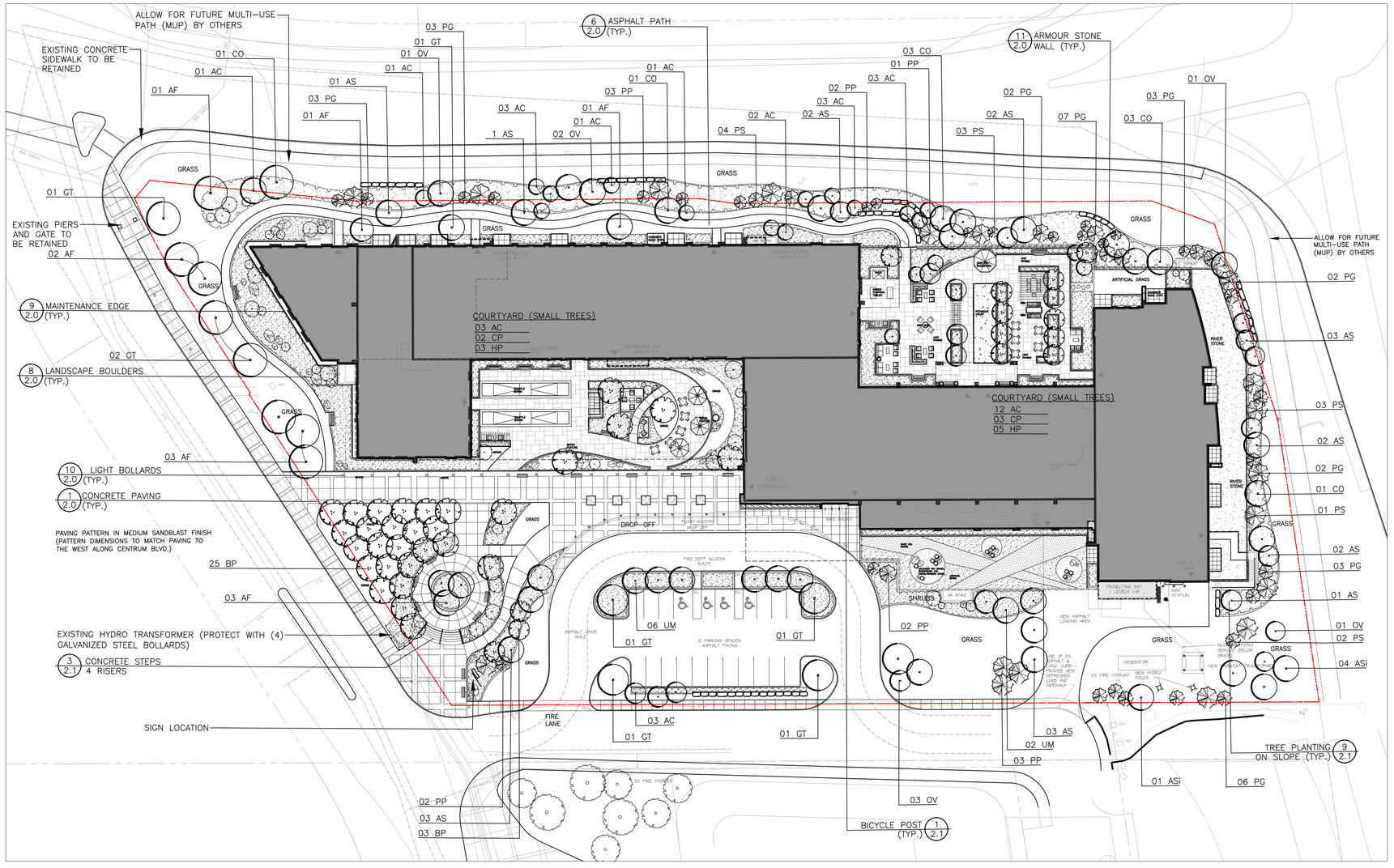






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Re-order Part # DL170

DRAWINGS / FIGURES



LEGEND

- PROPOSED DECIDUOUS TREE — 8 2.1
- PROPOSED CONIFEROUS TREE — 8 2.1
- PROPOSED ORNAMENTAL SHRUB PLANTING — 7 2.1
- PROPOSED NATIVE TREE AND SHRUB PLANTING — 7 2.1
- PROPOSED CONCRETE PAVING — 1 2.0
- PROPOSED UNIT PAVING — 4 2.0
- PROPOSED ARMOR STONE WALL — 11 2.0
- BENCHES
- SITE FURNITURE
- BOLLARDS

PLANT LIST

	Botanical Name	Common Name	Quantity	Size
Trees				
Large Deciduous				
AF	Acer freemanii 'Celzam'	Celebration Maple	10	70mm Cal. B.B./W.B.
AS	Acer saccharum	Sugar Maple	19	70mm Cal. B.B./W.B.
ASi	Acer saccharinum	Silver Maple	5	70mm Cal. B.B./W.B.
BP	Betula papyrifera	Paper Birch	28	2.4m HT. multi-stem B.B./W.B.
CO	Celtis occidentalis	Common Hackberry	9	70mm Cal. B.B./W.B.
GT	Gleditsia triacanthos 'Shademaster'	Shademaster Honeylocust	9	70mm Cal. B.B./W.B.
OV	Ostrya virginiana	Hop Hornbeam	8	70mm Cal. B.B./W.B.
UM	Ulmus morton	Accolade Elm	8	70mm Cal. B.B./W.B.
Small/Medium Deciduous				
AC	Amelanchier canadensis	Serviceberry	33	50mm Cal. B.B./W.B.
CP	Cornus alternifolia	Pagoda Dogwood	5	50mm Cal. B.B./W.B.
HP	Hydrangea paniculata 'Grandiflora'	Hydrangea (Tree Form)	8	30mm Cal. B.B./W.B.
Coniferous				
PG	Picea glauca	White Spruce	31	1.8 m Ht. B.B./W.B.
PP	Picea pungens	Colorado Spruce	13	1.8 m Ht. B.B./W.B.
PS	Pinus strobus	White Pine	13	1.8 m Ht. B.B./W.B.
TO	Thuja occidentalis 'Smaragd'	Emerald Cedar	0	1.8 m Ht. B.B./W.B.

Shrubs (Quantities to be completed during design development)				
CS	Cornus sericea 'Farrow'	Arctic Fire Dogwood	0	450mm Ht.
EF	Euonymus fortunei 'Sarcoxie'	Sarcoxie Euonymus	0	450mm Ht.
SB	Spirea betulifolia 'Tor	Tor spirea	0	450mm Ht.
HP	Hydrangea paniculata 'Little Quickfire'	Little Quickfire Hydrangea	0	450mm Ht.
HA	Hydrangea anomala petiolaris	Climbing Hydrangea	0	450mm Ht.
JC	Juniperus chinensis 'Monlep'	'Mint Julep' Juniper	0	450mm Spr.
MS	Magnolia stellata 'Royal Star'	Royal Star Magnolia	0	1200mm Ht.
RA	Rhus aromatica 'Grow-Low'	Low Grow Sumac	0	450mm Ht.
RM	Rosa 'Morden Centennial'	Morden Centennial Rose	0	450mm Ht.
TM	Taxus media densiformus	Densiformus Yew	0	450mm Spr.
Perennials				
	Astilbe sp.		0	1 Gal. Potted
	Astilbe sp.		0	1 Gal. Potted
EP	Echinacea purpurea	Purple Coneflower	0	1 Gal. Potted
GM	Geranium macrorrhizum	Cranesbill Geranium	0	1 Gal. Potted
	Heuchera sp.		0	1 Gal. Potted
	Hosta sp.		0	1 Gal. Potted
	Hosta sp.		0	1 Gal. Potted
NF	Nepeta x faascenii 'Walkers Low'	Walkers Low Catmint	0	1 Gal. Potted
PS	Phlox subulata 'Purple Beauty'	Creeping Phlox	0	1 Gal. Potted
SS	Sedum spectabile	Autumn Joy Sedum	0	1 Gal. Potted
Ornamental Grasses				
CA	Calamagrostis acutiflora	Foerster's Feather Reed Grass	0	1 Gal. Potted
CM	Carex morrowii 'Flacca'	Blue Zinger Japanese Sedge	0	1 Gal. Potted
SS	Schizachyrium scoparium	Little Bluestem	0	1 Gal. Potted

	NATIVE TREE / SHRUB MIX FOR SLOPES	AREA 850m2 - 1062 plants		
	Botanical Name	Common Name	Quantity	Size
APPROX. %	Trees			
	Deciduous			
5	Acer saccharum	Sugar Maple	53	20mm cal.
5	Betula papyrifera	White Birch	53	20mm cal.
2.5	Larix laricina	Tamarack	26	20mm cal.
5	Ulmus morton	Accolade Elm	53	20mm cal.
	Coniferous			
5	Picea glauca	White Spruce	53	1.0 m Ht. B.B./W.B.
2.5	Pinus strobus	White Pine	26	1.0 m Ht. B.B./W.B.
	Shrubs			
5	Diervilla lonicera	Bush honeysuckle	53	40cm HT. BAREROOT OR CONT.#1
50	Rhus typhina	Staghorn sumac	531	40cm HT. BAREROOT OR CONT.#1
10	Rosa rugosa	Rugosa rose	107	40cm HT. BAREROOT OR CONT.#1
10	Ribes alpinum	Alpine current	107	40cm HT. BAREROOT OR CONT.#1

0 5 15 25 50 100 Meters

Key Plan

No.	Revision	Date
9	RE-ISSUED FOR CO-ORDINATION	12.11.2020
8	RE-ISSUED FOR CO-ORDINATION	16.10.2020
7	ISSUED FOR REVIEW	09.10.2020
6	ISSUED FOR REVIEW	05.08.2020
5	RE-ISSUED FOR CO-ORDINATION	27.07.2020
4	RE-ISSUED FOR CO-ORDINATION	09.07.2020
3	RE-ISSUED FOR CO-ORDINATION	01.06.2020
2	RE-ISSUED FOR CO-ORDINATION	13.05.2020
1	ISSUED FOR CO-ORDINATION	06.04.2020

North:

Stamp: ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS — SHERI L. EDWARDS — OALA MEMBER

CSW

Landscape Architecture
Urban Design
Site Planning
Recreation and Park Planning
Project Management

319 McRae Avenue, Suite 502, Ottawa, Ontario, K1Z 0B9
Tel: (613) 729-4536

1. All measurements in millimeters unless specified otherwise. Do not scale drawing. All drawings to be read in conjunction with written specifications.
2. Copyright reserved. This drawing is the exclusive property of CSW Landscape Architects Ltd. and shall not be used without the consent thereof.
3. This Drawing may not be used for construction until signed by the landscape architect. It is the responsibility of the contractor to:
   - check and verify all dimensions on site;
   - report all errors and/or omissions to the landscape architect;
   - comply with all pertinent codes and by-laws;
   - check and verify locations of all underground services with all local utilities prior to any digging.

Project:

Le Groupe Maurice Centrum Retirement

211 Centrum Bvld
OTTAWA., ONTARIO

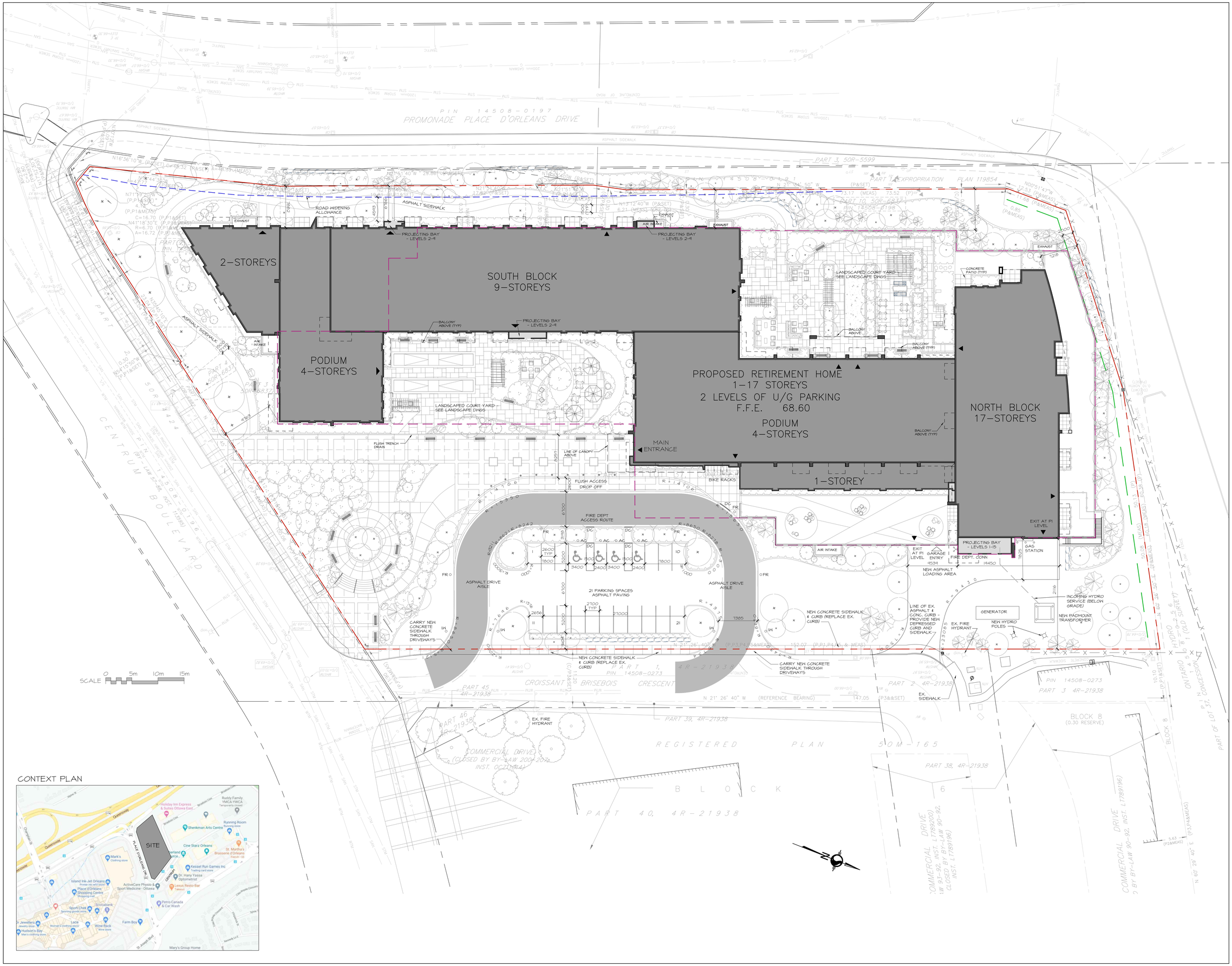
Drawing:

Landscape Plan

Scale:	Date:
1:400	Feb 2020
Design By: SE	Drawn By: SE
Project Number: 2051-01	Sheet Number: L 1.0

XXX-XX-XX-XXXX

Last Save: 11/12/2020 7:58:21 PM
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CONTEXT PLAN

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Fotenn
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Matthew McElligott
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NOTES:
1. SEE LANDSCAPE DRAWINGS FOR EXISTING AND NEW VEGETATION.
2. SEE SITE SERVICING AND GRADING DRAWINGS FOR EXISTING AND NEW GRADES AND SITE SERVICES.
3. SEE DRAWING A1.02 FOR SITE AND ZONING DATA.

LEGEND:
- DC DEPRESSED CURB (To be constructed as per paragraphs 3.8.3.2(2) (3) and (4) of the Ontario Building Code 2006)
- A.C. ACCESSIBLE PARKING SIGN - TO CITY OF OTTAWA STANDARDS
- F.R. "FIRE ROUTE - NO PARKING" SIGN - TO CITY OF OTTAWA STANDARDS
- I.N. "ONE-WAY" SIGN
- TONED AREA INDICATES EXTENT OF 6.0m WIDE FIRE DEPT. ACCESS ROUTE C/W 12.0 m CENTRELINE RADIUS. PROVIDE HEAVY DUTY ASPHALT PAVING FOR FULL WIDTH OF ASPHALT DRIVE AISLE
- ACCESSIBLE PARKING SPACE C/W SYMBOL PAINTED ON ASPHALT
- SITE PROPERTY LINE
- SET BACK LINE
- ROW PROTECTION LINE
- LINE OF PARKING GARAGE BELOW

no.	date	revision
01	20-11-20	ISSUED FOR SPC & ZONING

It is the responsibility of the appropriate contractor to check and verify all dimensions on site and report all errors and/or omissions to the architect.

All contractors must comply with all pertinent codes and by-laws.

Do not scale drawings.

This drawing may not be used for construction until signed.

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hobinarc.com
HOBIN ARCHITECTURE

PROJECT/LOCATION:
Le Groupe Maurice
Centrum Retirement
211 Centum Blvd. Ottawa, Ontario

DRAWING TITLE:
SITE PLAN

DRAWN BY:	DATE:	SCALE:
BB	20/04/08	1:250

PROJECT: 1936

DRAWING NO.: A1.01

REVISION NO.:



SITE & ZONING DATA

SURVEY INFORMATION TAKEN FROM:

SURVEYOR'S REAL PROPERTY REPORT
PART 1 - PLAN OF
LOT 37, CONCESSION 1 (OLD SURVEY)
(GEOGRAPHIC TOWNSHIP OF CUMBERLAND)
CITY OF OTTAWA
STANTEC GEOMATICS LTD. ONTARIO LAND SURVEYORS

SITE SUMMARY:

CIVIL ADDRESS :	211 CENTRUM BOULEVARD, OTTAWA, ONTARIO
ZONING : NORTH PORTION	MIXED USE CENTRE, SUB ZONE 1A, SPECIAL EXCEPTION (1939 (MC 14 (2888))
ZONING : SOUTH PORTION	MIXED USE CENTRE, SUB ZONE 1A, SPECIAL EXCEPTION (1520 SCHEDULE52 (MC 14 (1520) 552)
SITE AREA :	15,274 sq.m
PROPOSED USE :	RETIREMENT RESIDENCE: 9 x 11 FLOORS 2 LEVELS UNDERGROUND PARKING GARAGE
BUILDING FOOTPRINT: (ABOVE GRADE)	4,997.2 sq.m

ZONING SUMMARY:

	REQUIRED	PROVIDED
MIN LOT AREA :	NO MINIMM	15,274 sq.m
MIN LOT WIDTH :	NO MINIMM	87.8 m
MIN. BUILDING HEIGHT :	6.7 m	44 m
MAX. BUILDING HEIGHT : (NCM (2020) 552 ZONE WITHIN 10m OF CENTRUM BLVD)	18.0 m	13.4 m
MAX. BUILDING HEIGHT : (OTHER THAN ABOVE)	NONE	58.0 m

YARDS:

	REQUIRED	PROVIDED
FRONT YARD (CENTRUM BLVD)	0.0 m (min)	4.76 m
REAR YARD (NORTH)	2.0 m (min)	2.0 m
CORNER SIDE YARD (PLACE ORLEANS DR., BRISEBOIS CRES.)	0.0 m (min)	6.76 m 21.2 m
INTERIOR SIDE YARD (N/A)	0.0 m (min)	21.2 m

BICYCLE PARKING

	REQUIRED	PROVIDED
RETIREMENT HOME (310 dwelling units x 20 rooming units x 0.25 = 62 spaces)	62 spaces	31 spaces (interior) 8 spaces (Exterior)

VEHICULAR PARKING:

	REQUIRED	PROVIDED
RETIREMENT HOME PARKING 311 dwelling units + 20 rooming units located within Area Z (near transit) does not require spaces for residents.	0 spaces	282 spaces
PARKING FOR THE PHYSICALLY DISABLED INCLUDED WITHIN THE TOTAL PARKING COUNT BEING PROVIDED	0 spaces	6 spaces
VISITOR PARKING None required	0 spaces	21 spaces

AMENITY

	REQUIRED	PROVIDED
RETIREMENT HOME (Required, 6.0 sq. m/ dwelling unit plus 10% of the gross floor area of each rooming unit (Communal, 50% of Required)	2,348 sq.m 1,174 sq.m	5,081 sq.m 2,175 sq.m

BUILDING SUMMARY:

	GROSS FLOOR AREA (ZONING BY-LAW)	UNIT COUNT
311 DWELLING UNITS +20 ROOMING UNITS		
MECH. PENTHOUSE	0 sq.m.	0 UNITS
LEVELS 10-11 (TOTAL GFA AND UNIT COUNTS FOR LEVEL 10 TO 11 ARE COMBINED FOR THE 2 FLOORS)	7,000 sq.m. (8750 sq.m. per floor)	88 UNITS (11 units per floor)
LEVELS 5-9 (TOTAL GFA AND UNIT COUNTS FOR LEVEL 5 TO 9 ARE COMBINED FOR THE 5 FLOORS)	11,350 sq.m. (2270 sq.m. per floor)	150 UNITS (30 units per floor)
LEVEL 4	3,800 sq.m.	47 UNITS
LEVEL 3	3,800 sq.m.	47 UNITS
LEVEL 2 (incl. 20 AL Units)	3,311 sq.m.	48 UNITS
GROUND	1,209 sq.m.	17 UNITS
GARAGE P1	0 sq.m.	0 UNITS
GARAGE P2	0 sq.m.	0 UNITS
	30,270 sq.m.	397 UNITS

NOTE: Services to be designed to allow for up to 40 units to accommodate changing market conditions if required - floor areas and building envelope will not change.

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Fotenn
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no.	date	revision
01	20-11-20	ISSUED FOR SPC & ZONING

It is the responsibility of the appropriate contractor to check and verify all dimensions on site and report all errors and/or omissions to the architect.

All contractors must comply with all pertinent codes and by-laws.

Do not scale drawings.

This drawing may not be used for construction until signed.

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HOBIN ARCHITECTURE

PROJECT/LOCATION:
Le Groupe Maurice
Centrum Retirement
211 Centum Blvd. Ottawa, Ontario

DRAWING TITLE:
SITE PLAN - DEMOLITION
SITE & ZONING INFO

DRAWN BY:	DATE:	SCALE:
BB	20/04/08	1:250

PROJECT: 1936

DRAWING NO.: A1.02

REVISION NO.:

SITE PROPERTY LINE
SET BACK LINE
ROW PROTECTION LINE
LINE OF BUILDING BELOW

UNIT 17 1 BED (692 ft²)
UNIT 16 1 BED MODEL B - 3½ (672 ft²)
UNIT 15 1 BED MODEL B - 3½ (672 ft²)
UNIT 14 2 BED (994 ft²) SIM. FEATURES TO MODEL E
UNIT 13 1 BED MODEL B - 3½ (672 ft²)
UNIT 12 2 BED (939 ft²) SIM. FEATURES TO MODEL E
UNIT 11 1 BED (812 ft²) SIM. FEATURES TO MODEL B
UNIT 10 1 BED (668 ft²) SIM. FEATURES TO MODEL B
EXIT
GAR
ELECT
ELEV. A
ELEV. B
ELEV. C
AIR INTAKE
EXHAUST
CARD GAMES TABLES INTERNET
WINTER GARDEN (1,691 ft²)
OPEN TO ABOVE
LOUNGE (1,983 ft²)
BILLIARD
GOLF (554 ft²)
GYM (767 ft²)
WOMEN'S CLOAKROOM 243 SQ.FT.
POOL ENTRANCE
BOWLING MEC.
MEN'S CLOAKROOM 270 SQ.FT.
POOL (3,208 ft²) 60 FEET
INTERIOR BEACH
SAUNA
THEATRE (579 ft²)
BOWLING (1,367 ft²)
BANK OFFICE (356 ft²)
BISTRO
MAIN ENTRANCE LOBBY (1,435 ft²)
CONVENIENCE STORE/ PHARMACY (1,010 ft²)
HAIR SALON (832 ft²)
POST OFFICE BOXES
WC
ART RM (371 ft²)
WC (MULTIPLE)
SERVICES (SW ft²) WC (MULTIPLE)
WC (ADA)
MEC.
PRIVATE DINING (439 ft²)
PIANO LOUNGE
COPY ROOM
ACCOUNTING TECH.
HOTEL
ELEC
STORAGE
TECH. LOISIRS
ADMIN (1,486 ft²)
LOCATION OFFICE
GENERAL DIRECTOR
ACTIVITY ROOM (983 ft²)
DINING (7,455 ft²)
COMM. KITCHEN (2,020 ft²)
SERV ELEV
NORTH LOBBY (315 ft²)
MECH.
UNIT 01 2-BED (938 ft²) SIM. TO MODEL B
UNIT 02 2 BED (904 ft²) SIM. TO MODEL i
UNIT 03 1 BED MODEL Ccw - 3½ (684 ft²)
UNIT 04 1 BED MODEL Dc - 3½ (719 ft²)
UNIT 05 1 BED MODEL Cce - 3½ (747 ft²)
UNIT 06 2 BED MODEL E mod 4½ (934 ft²)
UNIT 07 1 BED MODEL E mod - 4½ (724 ft²)
UNIT 8 1 BED MODEL B sim - 3½ (809 ft²)
UNIT 9 1 BED MODEL B sim - 3½ (654 ft²)

COLOUR LEGEND
AL SUITE
IL SUITE
AMENITIES/ADMIN
SERVICES

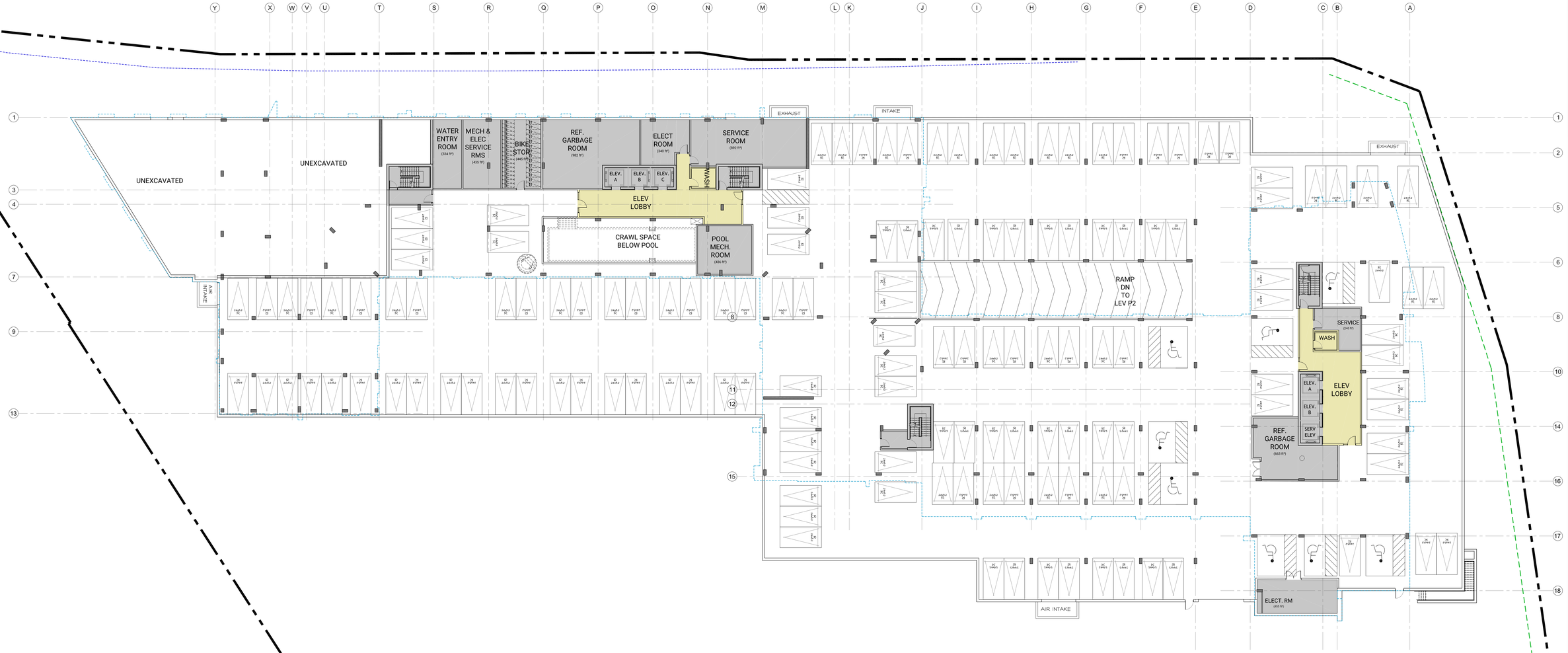
HOBIN ARCHITECTURE

211 CENTRUM RETIREMENT RESIDENCE

FLOOR PLAN - GROUND

SCALE 1:200
0 5 10 15 20 25 30ft
0 1 2 3 4 5 10.0m

November 20, 2020
Issued for SPC/ZoningAmendment



P1 LEVEL

GFA = 77,000 ft²

153 PARKING SPACES

COLOUR LEGEND
- AL SUITE
- IL SUITE
- AMENITIES/ADMIN
- SERVICES

HOBIN ARCHITECTURE

211 CENTRUM RETIREMENT RESIDENCE

FLOOR PLAN - PARKING LEVEL P1 - 153 Spaces

SCALE 1:200 0 5 10 15 20 25 30ft / 0 1 2 3 4 5 10.0m

November 20, 2020

Issued for SPC/ZoningAmendment

SITE PROPERTY LINE
SET BACK LINE
ROW PROTECTION LINE
LINE OF BUILDING ABOVE

UNEXCAVATED

UNEXCAVATED

SERVICE ROOM (551 ft²)

SERVICE ROOM (815 ft²)

ELEV. A
ELEV. B
ELEV. C
HK
WASH
ELEV LOBBY

EXHAUST

AIR INTAKE

EXHAUST

RAMP DOWN FROM LEV P1

SERVICE (174 ft²)
WASH

ELEV. A
ELEV. B
SERV ELEV
ELEV LOBBY

SERVICE (216 ft²)

SERVICE RM (465 ft²)

AIR INTAKE

P2 LEVEL
GFA = 58,440 ft²
129 PARKING SPACES

COLOUR LEGEND
- AL SUITE
- IL SUITE
- AMENITIES/ADMIN
- SERVICES

HOBIN ARCHITECTURE

211 CENTRUM RETIREMENT RESIDENCE

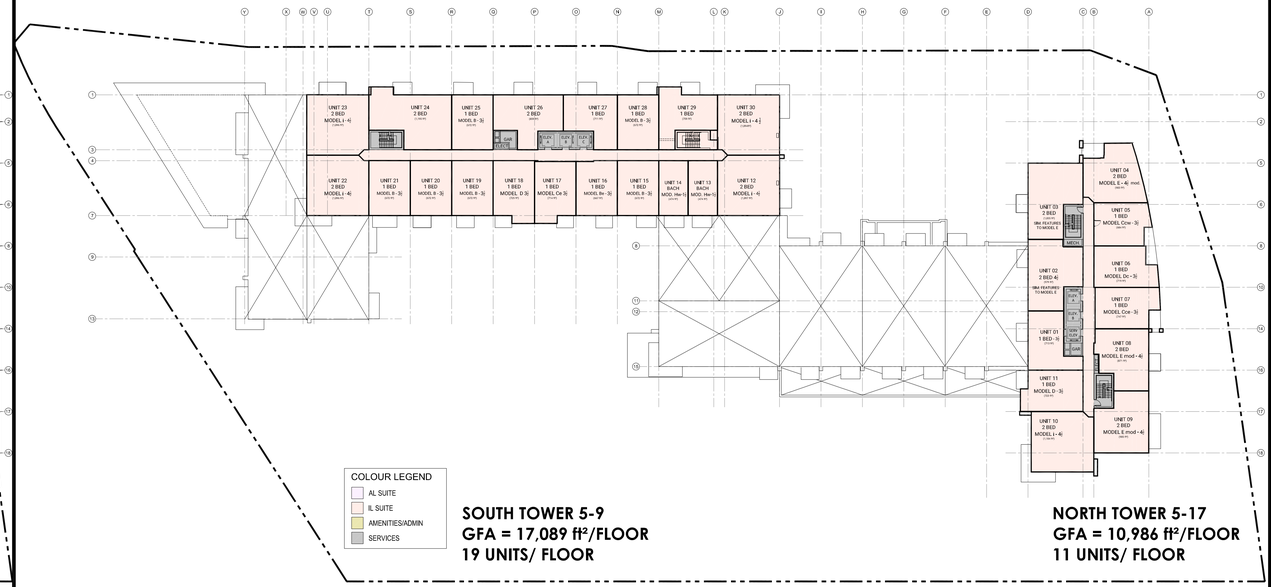
FLOOR PLAN - PARKING LEVEL P2 - 136 Spaces

SCALE 1:200 0 5 10 15 20 25 30ft / 0 1 2 3 4 5 10.0m

November 20, 2020
Issued for SPC/ZoningAmendment

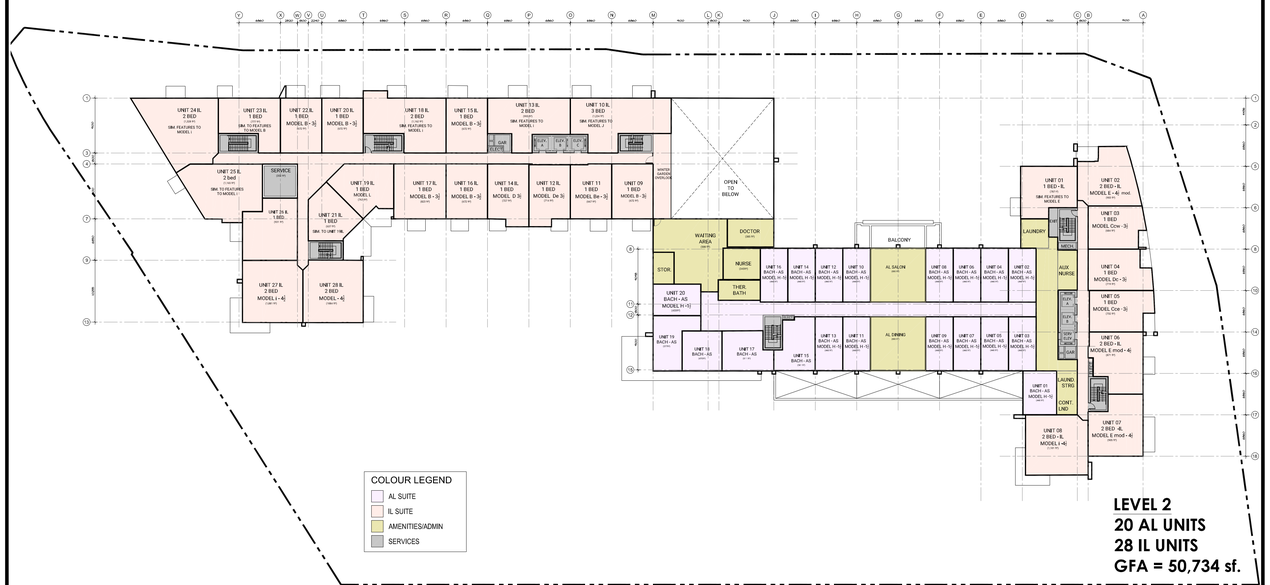


LEVELS 3 & 4
GFA = 47,141 ft²
47 UNITS PER FLOOR



SOUTH TOWER 5-9
GFA = 17,089 ft²/FLOOR
19 UNITS/ FLOOR

NORTH TOWER 5-17
GFA = 10,986 ft²/FLOOR
11 UNITS/ FLOOR



LEVEL 2
20 AL UNITS
28 IL UNITS
GFA = 50,734 sf.

SITE PROPERTY LINE
SET BACK LINE
ROW PROTECTION LINE
LINE OF BUILDING BELOW

HOBIN ARCHITECTURE

211 CENTRUM RETIREMENT RESIDENCE

FLOOR PLANS - SECOND, THIRD-FOURTH & FIVE-SEVENTEEN

SCALE 1:400 0 10 20 30 40 50 60ft / 0 2 4 6 8 10 20.0m

November 20, 2020
Issued for SPC/ZoningAmendment

2 December 2019 7:55 AM

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2105235

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY
ISSUED BY THE SURVEYOR
In accordance with Regulation 1026, Section 29(3)

SURVEYOR'S REAL PROPERTY REPORT
PART 1 - PLAN OF

PART OF LOT 37
CONCESSION 1 (OLD SURVEY)
(GEOGRAPHIC TOWNSHIP OF CUMBERLAND)
CITY OF OTTAWA

Scale 1:300
5 0 5 10 15 20 METRES

METRIC CONVERSION
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

BEARING NOTE
BEARINGS ARE GRID DERIVED FROM PART OF THE WESTERLY LIMIT OF PART 40, HAVING A BEARING OF N21°26'40"W AS SHOWN ON PLAN 4R-21938.

ELEVATION NOTE
ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD-1928:1978) AND ARE DERIVED FROM THE CAN-NET VRS NETWORK MONUMENT: OTTAWA ELEVATION=95.230.

NOTE
THIS PLAN OF SURVEY IS TO BE READ IN CONJUNCTION WITH THE REPORT SUMMARY NOTED AS PART 2 HEREON.
THIS REPORT CAN ONLY BE UPDATED BY THIS OFFICE. NO ADDITIONAL PRINTS OF THIS ORIGINAL REPORT WILL BE ISSUED SUBSEQUENT TO THE DATE OF CERTIFICATION.
ALL TIES ARE MINIMUM UNLESS OTHERWISE NOTED.
ALL TIES TO CURVED BOUNDARY ARE RADIAL TO ARC.
RISK OF UNDERGROUND SERVICES, MONUMENTATION PLANTED ACCORDINGLY.

PART 2
This Report was prepared for LE GROUPE MAURICE ERIC BURNS, and the undersigned accepts no responsibility for the use by other parties.
1. REGISTERED RIGHTS-OF-WAY/EASEMENTS
No rights-of-way or easements were found to be registered against the subject property.
2. PROPERTY IMPROVEMENTS
This is a foundation survey only.
3. COMPLIANCE WITH MUNICIPAL ZONING BYLAWS
Compliance is not certified by this report.
4. ADDITIONAL REMARKS
The building ties are to the unparged concrete foundation walls.

LEGEND

	DENOTES	
■	- -	FOUND MONUMENTS
□	"	SET MONUMENTS
IB	"	IRON BAR
IBØ	"	ROUND IRON BAR
SIB	"	STANDARD IRON BAR
SSIB	"	SHORT STANDARD IRON BAR
CC	"	CUT CROSS
CP	"	CONCRETE PIN
WIT	"	WITNESS
PIN	"	PROPERTY IDENTIFICATION NUMBER
MEAS	"	MEASURED
PROP	"	PROPORTIONED
OU	"	ORIGIN UNKNOWN
SG	"	STANTEC GEOMATICS LTD.
P	"	PLAN 50R-6837
P1	"	PLAN BY 1417 DATED MAY 2, 1991
P2	"	PLAN 4R-27826
P3	"	PLAN 4R-21938
P4	"	PLAN BY 1719 DATED OCT. 28, 2008
P5	"	PLAN 4R-28297
C/	"	CALCULATED PER
GV	"	CONTROL VALVE
AN	"	ANCHOR
B	"	BOLLARD
EB	"	ELECTRICAL BOX
ED	"	ELECTRICAL BOX
CB	"	CATCH BASIN
HTN	"	HYDRO TRANSFORMER
HYD	"	FIRE HYDRANT
LS	"	LIGHT STANDARD
MHSA	"	MAINTENANCE HOLE SANITARY
MHST	"	MAINTENANCE HOLE STORM
MHT	"	MAINTENANCE HOLE TRAFFIC
TPIT	"	TEST PIT
TC	"	TRAFFIC CONTROL BOX
SN	"	SIGN
UP	"	UTILITY POLE
VC	"	VALVE CHAMBER
WV	"	WATER VALVE
	"	TREE STUMP
	"	TREE CONIFEROUS
	"	TREE DECIDUOUS

T T T — UNDERGROUND TELEPHONE
P P P — UNDERGROUND HYDRO
WTM WTM WTM — WATERMAIN
G G G — GASMAIN
STM STM STM — STORM SEWER

SURVEYOR'S CERTIFICATE
I CERTIFY THAT :
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT. THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE DAY OF , 2019.

DATE

BRIAN J. WEBSTER
ONTARIO LAND SURVEYOR

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SRO MAP COORD.= 382003, 5038273

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stantec.com

DRAWN: NJ	CHECKED: KJ	PM: KJ	FIELD: ES	PROJECT No.: 161614149-110

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