TATHAM ENGINEERING

Enhancing our communities

1412 Stittsville Main Street

SITE SERVICING & STORMWATER MANAGEMENT REPORT

Elite Property Developments Inc.

File 524659 | September 13, 2024

Document Control

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Issue	Date	Description
1	July 30, 2024	Final Report
2	September 13, 2024	Revised Report

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1 Introduction

Tatham Engineering Limited (Tatham) has been retained by Elite Property Developments Inc. to prepare a Site Servicing & Stormwater Management (SWM) Report in support of Site Plan Approval (SPA) to allow for a proposed 305.9 m^2 three-storey, 18-unit, apartment building, with a semi-basement (sunken level), parking areas and landscaped areas at 1412 Stittsville Main Street in the City of Ottawa. Specifically, this report has been prepared to confirm the servicing and SWM designs for the site are in accordance with the appropriate municipal guidelines and surrounding infrastructure has adequate capacity to service the development.

The site is approximately 0.14 ha and currently consists of an empty grassed lot. There is currently no existing vehicular entrance to the site.

The site and adjacent properties are zoned Traditional Mainstreet (TM9). The site is bounded by Stittsville Main Street to the northeast, a commercial plaza to the northwest, treed area (as part of the neighbouring massage parlour) to the southwest and a residential dwelling to the southeast. A key plan illustrating the site location is provided on the drawings enclosed at the back of this report.

The servicing and SWM designs included herein are based on a topographic survey completed by Farley, Smith & Denis Surveying Ltd. completed on January 11, 2022.

2 Geotechnical Investigation

A geotechnical investigation to assess subsurface conditions was completed at the site by LRL Associates Ltd. (LRL) in September 2022. The report has been submitted under separate cover.

A total of four boreholes, labelled BH1 through BH4, were drilled across the site (i.e. BH1 was drilled at the site frontage to the northeast and BH4 was drilled towards the back of the site) to obtain understanding of the site's soil conditions. The boreholes ranged from 2.18 m to 5.74 m below ground surface. At the surface of all boring locations, a 300 mm thick layer of topsoil was encountered. Sand was found underlying BH1 to a depth of 4.42 m. BH2-BH4 all were found to have a layer of glacial till underneath the topsoil to depths ranging between 2.18 and 5.74 m below grade.

Groundwater levels were observed within the boreholes at varying depths ranging from 1.8-2.0 m at BH 1, 2 and 3, while within BH4 groundwater was not encountered.

Practical auger refusal was encountered in all the boreholes, ranging in depths between 2.18 and 5.74 m, this was encountered on larger boulders within the glacial till, or possible bedrock.

3 Water Supply and Fire Protection

3.1 EXISTING SITE CONDITIONS

In the existing conditions, no water service is currently provided to the site. There is an existing 406 mm diameter watermain on Stittsville Main Street that provides a service connection opportunity for the proposed development.

Based on geoOttawa online mapping, there are four (4) municipal fire hydrants within 150 m of the site. The hydrants are located at:

- The southeast corner of the Stittsville Main Street and Wintergreen Drive intersection;
- The southwest corner of the Stittsville Main Street and Mulkins Street intersection;
- Near the end of Riverbank Court; and
- The southwest corner of the Stittsville Main Street and Beverly Street intersection.

The hydrants can be used for fire protection for the proposed development. The contributions of the existing nearby fire hydrants toward the proposed development's required fire flow are described in further detail in the sections below.

3.2 DOMESTIC WATER DEMANDS

The average day water consumption rate and maximum day and peak hour peaking factors used to calculate the water supply demands for the proposed development are based on the 2010 City of Ottawa Design Guidelines for Water Distribution, the 2010 City of Ottawa Technical Bulletin ISD-2010-2 and the 2018 City of Ottawa Technical Bulletin ISTB-2018-01.

Based on an average day water consumption rate of 280 L/c/d and maximum day peaking factor of 2.5 (multiplier with average day) and peak hour peaking factor of 2.2 (multiplier with maximum day) respectively, the water demand calculations for the proposed three-storey, 18-unit, apartment building confirm an average daily water demand of 0.08 L/s, a maximum daily demand of 0.21 L/s, and a peak hourly demand of 0.46 L/s. The water demands shall be re-confirmed by the mechanical engineer at the building permit phase.

The above water demands do not include allowances for fire protection (i.e. sprinkler systems, etc.), irrigation, etc.

The water demand calculations are included in Appendix A.

3.3 WATER SERVICE SIZING

Water service sizing calculations for the proposed condition have been completed using the demands established in Section 2.2 above.

Boundary condition results for the existing conditions were provided by the City of Ottawa and utilized to determine pressures for maximum day and peak hour scenarios as well as a third scenario for maximum day plus fire flow. The calculated pressures were found to be within the City of Ottawa pressure and demand objectives per Section 4.2.2 of the City of Ottawa Design Guidelines for Water Distribution, which are in conformity with MECP guidelines. The following pressures were calculated for the existing conditions:

- A maximum day demand pressure of 64.10 psi which is in the 50 to 80 psi MECP range;
- a peak hour demand pressure of 58.12 psi which is within the 40 to 80 psi MECP range; and
- A maximum day plus fire flow demand pressure of 55.0 psi which is not less than the 20 psi MECP desired pressure.

Based on the above, the proposed building will be serviced with a 100 mm diameter water service, from the existing municipal watermain on Stittsville Main Street to the three-storey, 18-unit, apartment building. The 100 mm diameter service provides additional capacity for potential unforeseen changes come the building permit phase and allows for potential future expansion of the proposed development.

The water service sizing and pressure calculations are included in Appendix A.

The existing municipal watermain on Stittsville Main Street and the required 100 mm diameter water service to the three-storey, 18-unit, apartment building are shown on the Site Servicing Plan (Drawing SS-1).

3.4 FIRE PROTECTION

The fire flow demand was calculated in accordance with the Fire Underwriters Survey, Water Supply for Public Fire Protection (FUS, 2020). This method is based on the type of building construction and the floor area of the building to be protected while accounting for reductions and surcharges related to combustibility of contents and building exposure of surrounding structures. The fire flow calculations resulted in a fire water demand of 4,000 L/min.

The proposed building is located within 90 m of a hydrant (on Riverbank Court), in compliance with OBC requirements. Fire flow protection can be provided by the additional three hydrants, mentioned in Section 3.1, which are within 150 m (uninterrupted path) of the proposed building.

Fire hydrant bonnets are color coded to indicate the available flow at a residual pressure of 150 kPa (20 psi), in accordance with the NFPA 291 Fire Flow Testing and Marking of Hydrants Code.

The existing hydrants near the site, all consist of a blue bonnet and as such are Class AA-rated hydrants. As summarized in Table 1, the required demand of 4,000 L/min for fire protection of the proposed building is available from the existing hydrants on Riverbank Court, Mulkins Street, Wintergreen Drive, and Beverly Street.

Table 1: Hydrants Required for Fire Flow

HYDRANT CLASS	DISTANCE TO BUILDING (m)[1]	CONTRIBUTION TO REQUIRED FIRE FLOW (L/min)	NUMBER OF USABLE NEARBY HYDRANTS	MAXIMUM FLOW TO BE CONSIDERED (L/min)	CUMULATIVE MAXIMUM FLOW TO BE CONSIDERED (L/min)
AA	≤ 75	5,700	1	5,700	17,100
AA	> 75 & ≤ 150	3,800	3	3,800	
A	≤ 75	3,800	0	0	
A	> 75 & ≤ 150	2,850	0	0	
B	≤ 75	1,900	0	0	
B	> 75 & ≤ 150	1,500	0	0	
C	≤ 75	800	0	0	
C	> 75 & ≤ 150	800	0	0	

Notes: 1. Distance of contributing hydrant from the structure, measured in accordance with NFPA 1.

A hydrant flow test is recommended to confirm the hydrant classes, thereby confirming adequate flow and pressure is available for fire protection.

The fire flow calculations are included in Appendix A.

4 Sewage Collection

4.1 EXISTING SITE CONDITIONS

In existing conditions, there is currently no sewage service to the site. There is an existing 600 mm diameter sanitary sewer on Stittsville Main Steet that provides a service connection opportunity for the proposed development.

4.2 SEWAGE FLOWS

Sewage flow calculations for the proposed development have been completed using the 2012 City of Ottawa Sewer Design Guidelines and the 2018 City of Ottawa Technical Bulletin ISTB-2018-01.

The average daily sewage design flow for the proposed development was determined to be 0.22 L/s, inclusive of extraneous flow. The peak daily sewage flow is anticipated to be 0.44 L/s.

The increased flow to the downstream sanitary sewer system is considered negligible as the receiving 600 mm diameter sanitary sewer within Stittsville Main Street has an approximate capacity of 271.89 L/s. The calculated site flow of 0.44 L/s represents a marginal flow increase of 0.2% to the receiving sewer. Thus, the proposed development does not adversely affect the downstream sanitary sewer system and sufficient system capacity is available to service the development.

The sewage flow calculations are included in Appendix B.

4.3 SANITARY SERVICE SIZING

The design criteria used to size the sanitary service from the proposed building structure to the existing 600 mm diameter sanitary sewer on Stittsville Main Street are as per the 2012 City of Ottawa Sewer Design Guidelines, the 2018 City of Ottawa Technical Bulletin ISTB-2018-01, the 2008 Ministry of the Environment, Conservation and Parks (MECP) Design Guidelines for Sewage Works, and the 2012 OBC. The design criteria are summarized as follows:

- Peak sewage flow derived from the Harmon formula;
- Permissible sewage velocity within MECP range of 0.6 and 3.0 m/s;
- Peak extraneous flow of 0.33 L/s/ha per City of Ottawa Technical Bulletin ISTB-2018-01; and
- Minimum sanitary sewer depth of 2.5 m as per City of Ottawa Sewer Design Guidelines.

Based on the above criteria, the peak sewage flow was calculated to be 0.44 L/s, inclusive of extraneous flow. A 150 mm diameter sanitary service is proposed and will be sufficient to convey the peak sewage flows to the existing municipal sewage collection system on Stittsville Main Street.

The sanitary service sizing calculations are included in Appendix B.

The proposed 150 mm diameter sanitary service is shown on the Site Servicing Plan (Drawing SS-1).

5 Stormwater Management

The primary objective of the SWM plan is to demonstrate that post-development conditions will not adversely impact the hydrologic cycle and surface water runoff characteristics of the area. This will be accomplished by evaluating the effects of the proposed development on local drainage conditions. Where necessary, solutions will be provided to mitigate any adverse impacts. The stormwater management sections of the report will present the following:

- Existing runoff conditions including constraints and opportunities for improvement;
- Criteria to be applied in the SWM design;
- An overall SWM plan that complies with municipal and agency technical SWM guidelines; and
- Erosion and sediment control strategies.

The SWM plan was prepared recognizing provincial guidelines on water resources and the environment, including the following publications:

- Design Criteria for Sanitary Sewers, Storm Sewers and Forcemains for Alterations Authorized under Environmental Compliance Approval (The Ministry of the Environment, Conservation and Parks, 2022);
- The City of Ottawa Sewer Design Guidelines (2012) and relevant technical bulletins (ISDTB-2014-01, PIEDTB-2016-01, ISTB 2018-01, ISTB-2018-04 and ISTB-2019-02); and
- Erosion and Sediment Control Guide for Urban Construction (Toronto and Region Conservation Authority, 2019).

5.1 STORMWATER MANAGEMENT DESIGN CRITERIA

Criteria met regarding drainage and stormwater management on the site are summarized as follows:

- The site has been developed in accordance with applicable municipal and agency guidelines and standards;
- Attenuation of proposed condition peak flow rates to target peak flow rates will occur during all design storm events;
- MECP “Enhanced” level water quality control is provided, to ensure the development will have no negative impacts on the downstream receivers;
- Safe conveyance of storm flows from all design storm events has been confirmed;

- The proposed storm sewers have been sized for conveyance of the 2-year design storm; and
- Site development includes implementation of erosion and sediment control measures during and following construction to minimize erosion and sediment transport off-site.

5.2 EXISTING SITE DRAINAGE CONDITIONS

The existing topography, ground cover, and drainage patterns were obtained through a review of available plans, base mapping and site investigation. A detailed topographic survey of the site was completed by Farley, Smith & Denis Surveying Ltd. 2022, completed on January 11, 2022, to confirm the existing features and elevations.

The site is approximately 0.14 ha and currently consists of an empty property consisting of grass and treed land. The topography of the site is relatively flat.

Runoff from the existing condition drainage (Drainage Area 101), drains overland, from the drainage area limits towards Stittsville Main Street where it is captured by an existing boulevard catch basin just east of the property line within Stittsville Main Street and conveyed to the existing 900 mm diameter municipal storm sewer on Stittsville Main Street.

The Ontario Soil Survey Complex characterizes the native soils onsite as Granby, having a corresponding hydrologic soil group B.

The Existing Condition Drainage Plan (Drawing DP-1), illustrating the existing condition drainage characteristics of the site, is attached at the back of this report.

5.3 EXISTING CONDITION PEAK FLOW CALCULATIONS

The modified rational method was utilized to quantify the existing condition peak flows from Drainage Area 101. Parameters were calculated utilizing the Nash Instantaneous and Hydrograph Method (NasHYD) and a summary of all hydrologic parameters established for the existing condition hydrologic model has been included in Appendix C.

The catchment delineations were determined based on the topographic survey.

The peak flow for the 5-year through 100-year storm events were calculated for the existing site condition using IDF data derived from Meteorological Services of Canada (MSC) rainfall data taken from the Ottawa MacDonald-Cartier Airport. Detailed calculations are included in Appendix C with the results for the 5-year and 100-year storms summarized below in Table 2.

Table 2: Existing Condition Peak Flow Summary

DESIGN STORM	TOTAL DRAINAGE AREA 101 0.14 ha		
	TC (minutes)	I (mm/hr)	Q (L/s)
2-Year	31.80	38.5	4.2
5-Year	31.80	51.8	5.6
100-Year	31.80	88.3	12.0

As per Table 2, the existing 2-year storm flow of 4.2 L/s results in an allowable release rate of 2.1 L/s.

5.4 PROPOSED SWM PLAN

The SWM plan recognizes the SWM requirements for the site and has been developed to follow the existing topography of the land as much as feasibly possible to maintain the existing condition drainage patterns, while safely conveying stormwater runoff overland.

In the proposed condition, the site will consist of a 305.9 m^2 three-storey, 18-unit, apartment building, with basement, covered parking areas and landscaped areas. The site entrance will be located near the east corner of the site on Stittsville Main Street and will provide access to the site.

Treated and controlled runoff from the site (Drainage Area 201) will discharge to the existing 900 mm diameter storm sewer on Stittsville Main Street.

The proposed SWM plan is summarized as follows:

- Controlled runoff from Drainage Area 201 (0.14 ha) will discharge to the existing 900 mm diameter storm sewer on Stittsville Main Street, to remain consistent with predevelopment conditions. The post development peak flow rate from this area during a 100-year event (in accordance with the pre application consultation meeting comments) will be controlled to half (0.5x) the 2-year pre-development peak flow from Drainage Area 101 (0.14 ha). The above reflects typical stormwater quantity control for sites fronting onto municipal roads serviced with municipal storm sewer.
- Runoff from Drainage Area 201 will be captured by four surface inlets (catch basins), as well as eight lawn drains located on the perimeter of the site and stored in an underground

storage system consisting of underground storage chambers (Stormtech Model SC-310) and controlled by an orifice plate flow restrictor located in CBMH 4.

- Downstream of the orifice flow control, runoff will be treated by a proposed Stormceptor Model EFO4 oil-grit separator (OGS) to provided MECP "Enhanced" level water quality treatment including 80% minimum TSS removal from on-site runoff.
- All internal storm sewers will be sized based on the 5-year design storm. Additionally, storage volumes pertaining to the 2-year and 5-year post-development storm intensities will be stored within the proposed underground storage chambers and structures. Post-development storm intensities greater than the 5-year storm will utilize underground storage as well as the parking lot surface storage (up to 0.3m).

The Proposed Condition Drainage Plan (Drawing DP-2), illustrating the proposed condition drainage characteristics of the site, is attached at the back of this report.

5.5 WATER QUANTITY CONTROL

A hydrovex model 50 VHV-1, installed in the southeast invert of CBMH4, is proposed to control peak flows from Drainage Area 201, to ensure the 100-year post development peak flow from the site is less than or equal to half (0.5x) of the existing 2-year peak flow rate from Drainage Area 101 (existing conditions).

The modified rational method was utilized to quantify the proposed condition peak flow from the site. The drainage area delineation for the contributing lands was completed according to the proposed site grading illustrated on Drawing SG-1, which is included at the back of this report. The proposed surface cover and the existing soil type were used to establish the percent imperviousness, curve numbers, and other hydrologic parameters used in the hydrologic model. Summaries of all hydrologic parameters, calculations and stage-storage-discharge tables, established for the post-development conditions, have been included in Appendix C.

Peak runoff rates are shown in the table below and the results of the modelling are included in Appendix C.

Table 3: Proposed Condition Peak Flow Summary

DESIGN STORM	TOTAL DRAINAGE AREA 201 0.14 ha			
	TC (minutes)	I (mm/hr)	Q (L/s)	Required Storage Volume (m^3)
2-Year	60	24.6	2.0	18.5 (28.4)[2]
5-Year	70	29.4	2.0	27.6 (28.4)[2]
100-Year	150	27.6	2.0 (2.1)[1]	72.8 (77.8)[2]

Note: 1. refers to the allowable release rate.
2. refers to storage volume provided.

Table 3 above confirms the proposed SWM plan will attenuate the proposed condition 100-year peak flow at or below the existing condition 2-year peak flow. The maximum storage required during the 100-year storm was determined to be 72.8 m^3, whereas 28.4 m^3 of storage volume is provided underground (via chamber system, structures and pipes) as well as 51.7 m^3 of storage from the parking surface ponding, totaling to 77.8 m^3 of available storage within the underground storage chambers, parking surface ponding and storm structures shown on Drawing SS-1. Additional details related to the Stormtech chamber system are included in Appendix C.

5.6 WATER QUALITY CONTROL

The proposed water quality treatment objective under the proposed condition is to provide MECP enhanced level treatment including 80% TSS removal from on-site runoff.

Water quality control for the development will be provided via a proposed Stormceptor Model EFO4 oil-grit-separator.

5.6.1 Oil-grit-separator

All runoff from Drainage Area 201 will be treated by a Stormceptor Model EFO4 OGS prior to discharging into the 900 mm diameter storm sewer on Stittsville Main Street. The OGS has been sized to treat a minimum of 90% of annual runoff and provide 80% TSS removal based on a fine particle size distribution. The specified Stormceptor Model EFO4 will provide nearly 100% TSS removal from the contributing drainage area, thus exceeding the MECP's requirement for enhanced level water quality control. The Stormceptor EFO Sizing Report and its environmental technology verification (ETV) ISO 14034 verification statement is included in Appendix C.

6 Erosion and Sediment Control

Erosion and sediment control will be implemented for all construction activities within the development site, including vegetation clearing, topsoil stripping, drive aisle and parking area construction, and stockpiling of materials. The principles considered and to be utilised to minimize erosion and sedimentation at the site and resultant negative environmental impacts consist of the following:

- Minimize disturbance activities where possible;
- Expose the smallest possible land area to erosion for the shortest possible time;
- Institute specified erosion control measures immediately;
- Implement sediment control measures before the outset of construction activities;
- Carry out regular inspections of erosion/sediment control measures and repair or maintain as necessary; and
- Seed or sod exposed soils as soon as possible after construction and keep chemical applications to suppress dust and control pests and vegetation to a minimum.

The proposed grading and building construction for the subject site will be carried out in such a manner that a minimum amount of erosion occurs and such that sedimentation facilities control any erosion that does occur. Specific erosion, sediment, and pollution control measures included within the proposed design, which are to be utilized on-site, consist of the following:

- Installing and maintaining the sediment traps (specifically the Terrafix Siltsacks) within the specified drainage structures;
- Placing and maintaining a stone mud mat at the site's construction entrance;
- Installing and maintaining heavy duty silt fence, as per OPSD 219.180 along the perimeter of the site; and
- Bi-weekly inspections of control measures to be instituted through a monitoring and mitigation plan and repairs made as necessary.

The proposed erosion and sediment controls are shown on the Siltation and Erosion Control Plan (Drawing SC-1).

7 Summary

The proposed site development has been designed recognizing the pertinent Municipal, Agency, and Provincial guidelines along with site specific constraints and criteria.

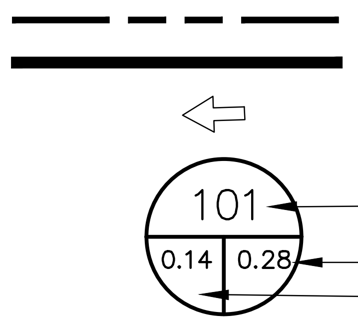
The domestic water supply to the proposed building will be provided via a 100 mm diameter water service connected to the existing 406 mm diameter watermain on Stittsville Main Street. The available fire flow from the nearest hydrant on Riverbank Court alone is sufficient to protect the proposed structure from fire. The most up to date boundary conditions have been reviewed by Tatham to ensure they are still adequate for the proposed system.

A 150 mm diameter sanitary service is required from the building structure to the existing 600 mm diameter municipal sanitary sewage system on Stittsville Main Street. We have assumed the existing municipal sanitary sewer system and the municipal wastewater treatment plant have adequate capacity to service the proposed development, however, these are required to be confirmed by the City.

The SWM plan for the site includes an underground storage system consisting of underground storage chambers to store runoff. All the runoff from the site (Drainage Area 201 – 0.14 ha) will be controlled underground by an hydrovex flow regulator model 50 VHV-1, prior to discharging to the 900 mm diameter storm sewer on Stittsville Main Street. The 100-year post development peak flow from this portion of the site will be controlled to half (0.5x) the 2-year existing condition peak flow (from Drainage Area 101 – 0.14 ha). Water quality control for runoff from Drainage Area 201 is proposed to be provided by means of a Stormceptor Model EFO4 OGS, which achieves MECP enhanced level water quality control.

We trust this report is sufficient to confirm the proposed development can be adequately serviced with domestic and fire water supply and sewage collection services and will have no negative impact with regards to SWM.

LEGEND



SUBJECT PROPERTY BOUNDARY (APPROXIMATE)

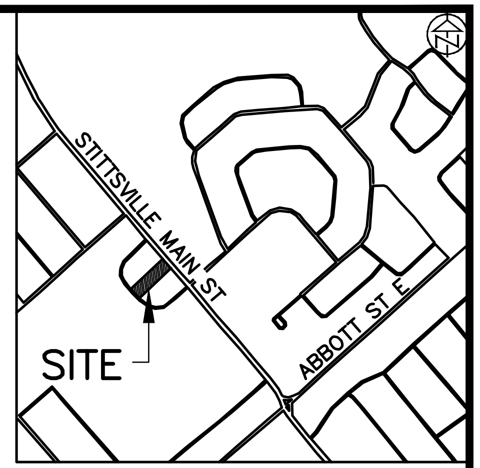
DRAINAGE AREA BOUNDARY

PRE–EXISTING CONDITION DRAINAGE DIRECTION

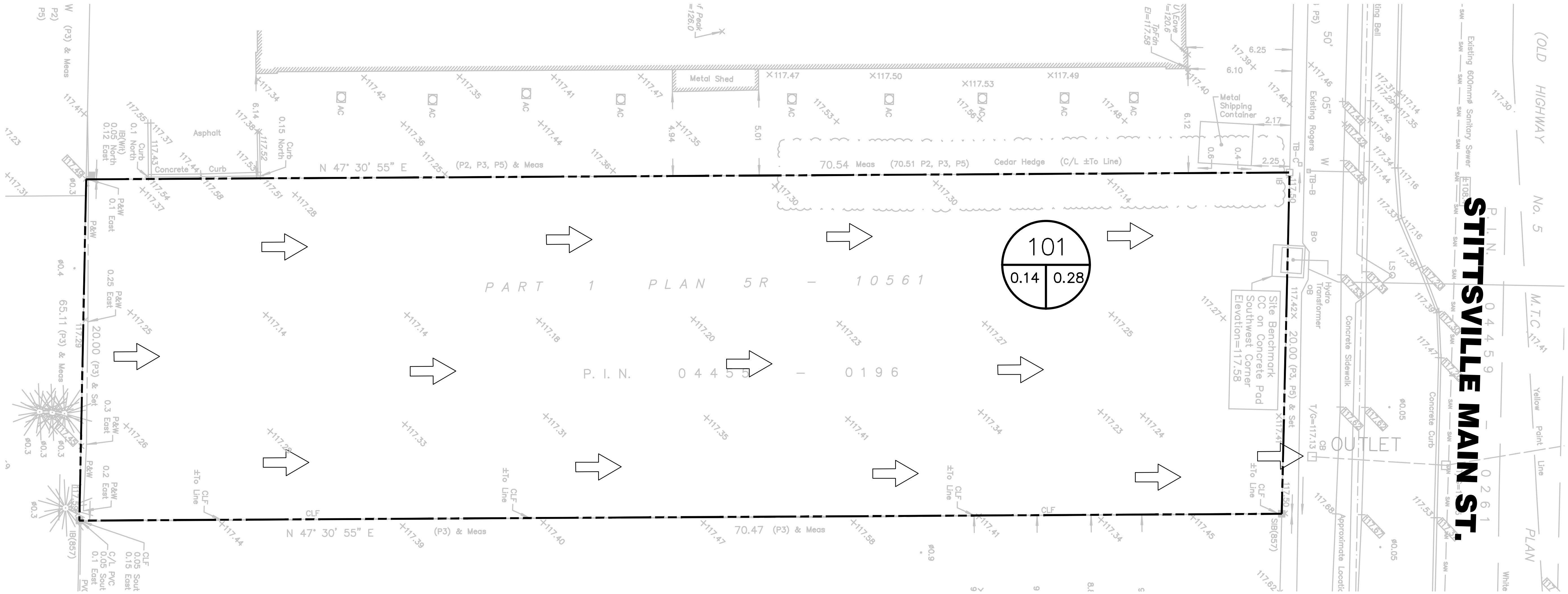
DRAINAGE AREA ID

RUNOFF COEFFICIENT

AREA (ha.)



KEY PLAN



CONTRACT DRAWINGS

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

TOPOGRAPHIC SURVEY WAS COMPLETED BY FARLEY, SMITH & DENNIS SURVEYING LTD. ON JANUARY 11, 2022.

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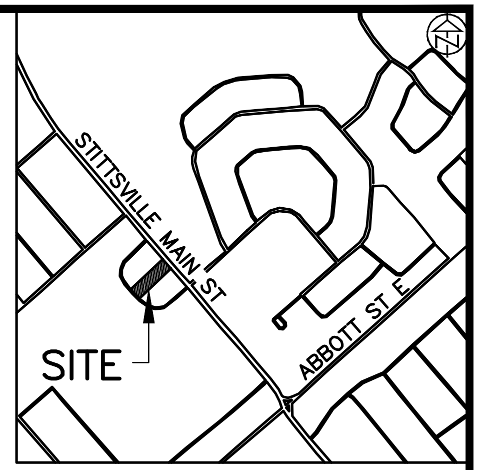
EXISTING CONDITION DRAINAGE PLAN

SCALE: 1:250	DRAWN: HY	DATE: JAN, 2024	JOB NO. 523659

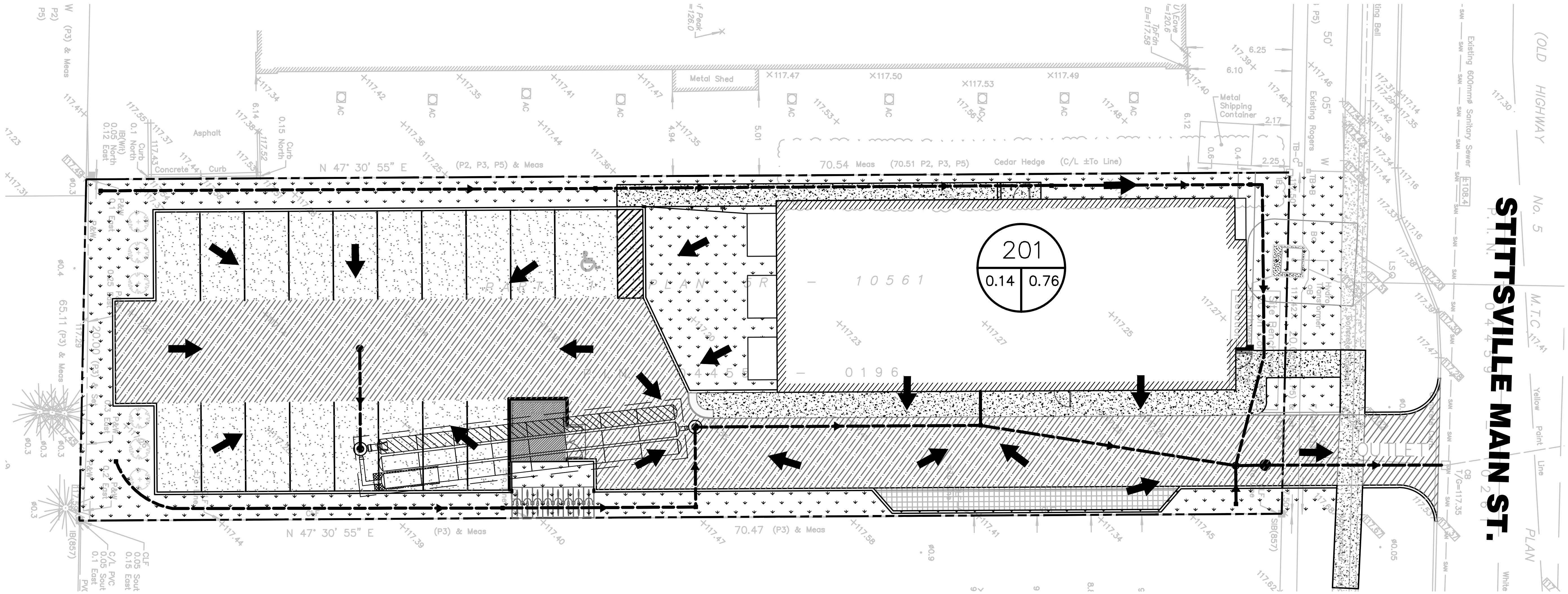
DWG. No. **DP-1**



KEY PLAN

LEGEND

— — —	SUBJECT PROPERTY BOUNDARY (APPROXIMATE)
———	DRAINAGE AREA BOUNDARY
←	PRE-EXISTING CONDITION DRAINAGE DIRECTION
201	DRAINAGE AREA ID
0.76	RUNOFF COEFFICIENT
0.14	AREA (ha.)



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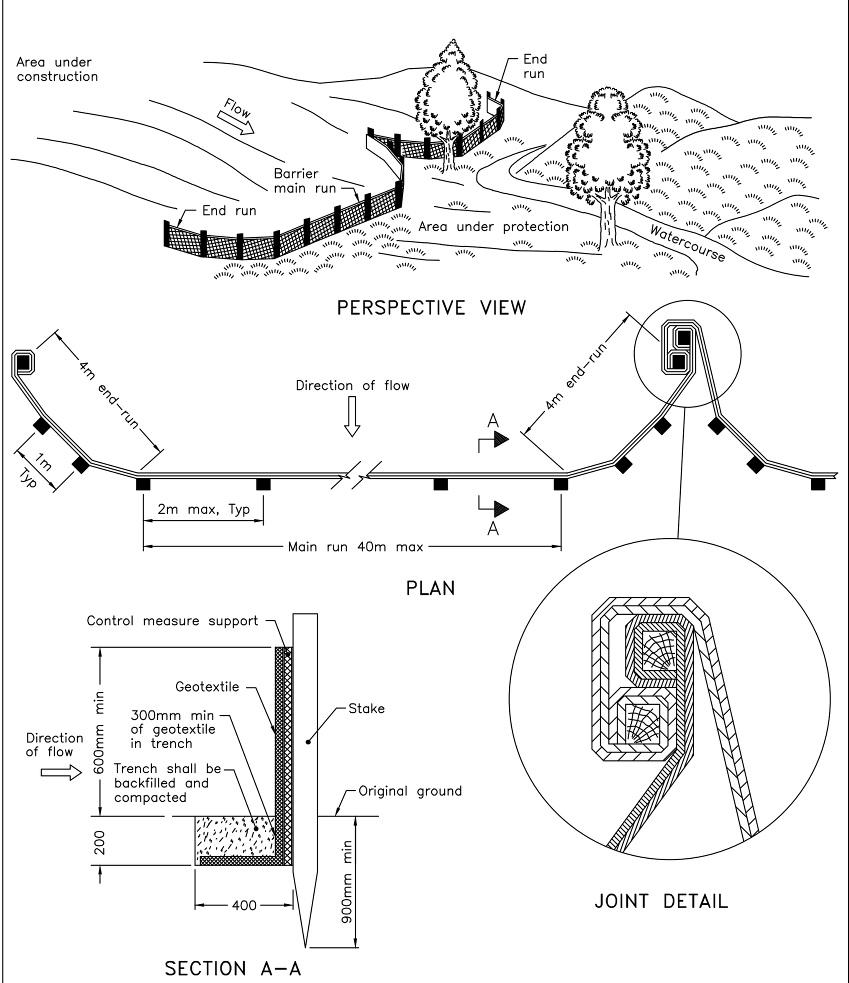
PROPOSED CONDITION DRAINAGE PLAN

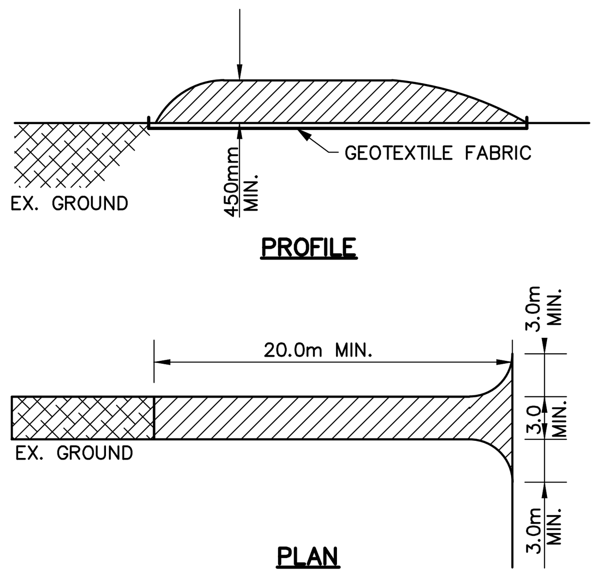
SCALE: 1:250	DRAWN: HY	DATE: JAN, 2024	JOB NO. 523659

DWG. No. **DP-2**



NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2
HEAVY-DUTY SILT FENCE BARRIER	OPSD 219.130	



STONE SIZE – THE STONE PAD SHALL BE A MIN. 450mm THICK. USE 50ømm STONE OR RECLAIMED CONCRETE EQUIVALENT FOR FIRST 10m FROM ADJACENT ROAD & 150mmø STONE. FOR REMAINDER OF STONE PAD.

LENGTH – AS REQUIRED BUT NOT LESS THAN 20m.

WIDTH – 4m MIN. BUT NOT LESS THAN THE WIDTH AT POINTS WHERE INGRESS. AND EGRESS OCCURS. GEOTEXTILE FABRIC (TERRAFIX 270R OR EQUAL) WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.

SURFACE WATER – ALL SURFACE WATER FLOWING OR DIRECTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE.

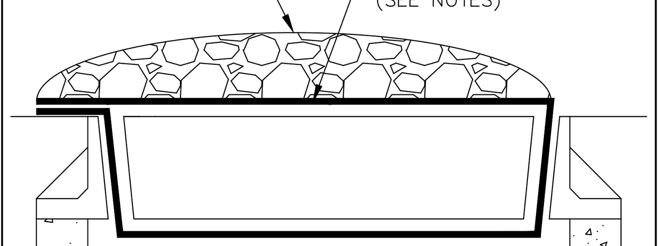
MAINTENANCE – THE CONTRACTOR SHALL MAINTAIN THE ENTRANCE IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY BY THE CONTRACTOR. UPON OBSERVATION OF CONTINUOUS MUD TRACKING ONTO ADJACENT STREETS, THE STONE MAT IS TO BE FULLY REPLACED.

WASHING – WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

INSPECTION AND REQUIRED MAINTENANCE AFTER EACH RAIN SHALL BE PROVIDED BY THE CONTRACTOR.

STONE MUD MAT DETAIL
SCALE: N.T.S

1. CONTRACTOR TO INSTALL AND MAINTAIN SILT FENCE AT LOCATIONS SHOWN OR AS DIRECTED BY THE ENGINEER.
2. CONTRACTOR TO ARRANGE PRE-CONSTRUCTION MEETING WITH ENGINEER AFTER PLACING ALL SILTATION CONTROL WORKS.
3. SILTATION AND EROSION CONTROL WORKS MUST BE INSTALLED PRIOR TO CONSTRUCTION.
4. ALL SEDIMENT CONTROL WORKS MUST BE CLEANED AND MAINTAINED AFTER EACH MAJOR STORM EVENT OR AS DEEMED NECESSARY BY THE ENGINEER.
5. THE CONTRACTOR WILL INSPECT THE SEDIMENT AND EROSION CONTROL MEASURES WEEKLY AND AFTER EACH MAJOR STORM EVENT. THE CONTRACTOR WILL NOTIFY THE ENGINEER OF CORRECTIVE ACTIONS REQUIRED AS SOON AS DEFICIENCIES ARE NOTED. THE CONTRACTOR MAINTAINS ULTIMATE RESPONSIBILITY TO ENSURE PROPER SEDIMENT AND EROSION CONTROL MEASURES ARE IMPLEMENTED AND MAINTAINED. ALL DEFICIENCIES AND CORRECTIVE MEASURES WILL BE DOCUMENTED IN A WEEKLY INSPECTION REPORT. A COPY OF THE WEEKLY INSPECTION REPORT WILL BE PROVIDED TO THE ENGINEER.
6. IF CONSTRUCTION IS INTERRUPTED AND/OR INACTIVITY EXCEEDS 30 DAYS, THEN STOCKPILED, STRIPPED OR EXPOSED AREAS MUST BE STABILIZED BY HYDROSEEDING AND ANY OTHER APPROPRIATE GEOTEXTILE MATERIAL, IF REQUIRED.
7. REMOVAL OF ALL SILT FENCES AT THE END OF CONSTRUCTION TO BE APPROVED BY THE ENGINEER AFTER THE SITE HAS STABILIZED.
8. ALL SILT FENCE TO OPSD 219.130.
9. CLEARING OF VEGETATION AND TREE COVER IS TO OCCUR OUTSIDE OF BIRD BREEDING SEASON AS RECOMMENDED BY ENVIRONMENT CANADA (APRIL 15 – AUGUST 15)
10. ALL SIDE SLOPES 3:1 OR GREATER ARE TO BE STABILIZED IMMEDIATELY WITH HYDROSEED (USING A NATIVE SEED MIX) UNLESS OTHERWISE NOTED. USE OF AN EROSION CONTROL BLANKET SUCH AS TERRAFIX S-100 (OR APPROVED EQUAL) IS RECOMMENDED IF CONSTRUCTION OCCURS OUTSIDE OF THE GROWING SEASON.

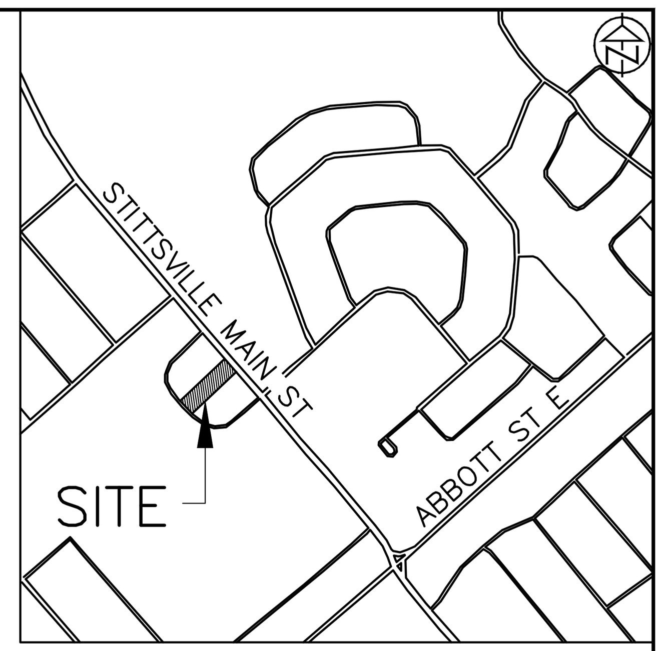


NOTES:
1) GRATE TO BE DOUBLE WRAPPED WITH WOVEN GEOTEXTILE
2) WOVEN GEOTEXTILE TO HAVE A MINIMUM EQUIVALENT OPENING SIZE OF 0.15mm AND A MAXIMUM OF 0.25mm
3) WOVEN GEOTEXTILETO BE REPLACED PERIODICALLY WHEN ACCUMULATED SEDIMENT INTERFERES WITH DRAINAGE

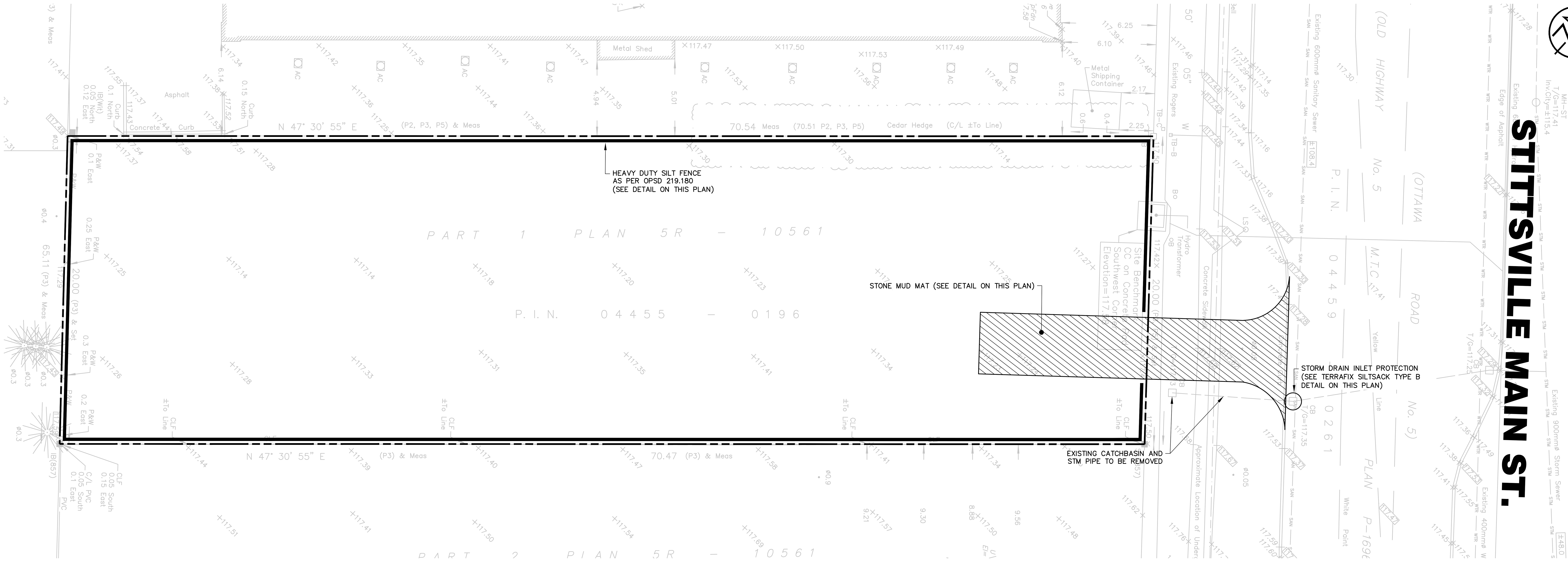
STORM DRAIN INLET PROTECTION
SCALE: N.T.S

SCHEDULE OF CONSTRUCTION WORKS

1. IMPLEMENTATION OF EROSION CONTROL MEASURES AS SPECIFIED ON THIS PLAN
2. REMOVALS AS SPECIFIED ON THIS PLAN
3. TOPSOIL STRIPPING AND STOCKPILING
4. EARTH EXCAVATION AND GRADING



KEY PLAN - N.T.S.



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TOPOGRAPHIC SURVEY WAS COMPLETED BY FARLEY, SMITH & DENNIS SURVEYING LTD. ON JANUARY 11, 2022.

ELEVATIONS ARE DERIVED FROM ONTARIO CONTROL MONUMENT 0011968U118, HAVING A PUBLISHED ELEVATION OF 126.180m

TBM: CC ON THE SOUTHWEST CORNER OF THE HYDRO TRANSFORMER CONCRETE PAD. ELEV. 117.58

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR SPA	JULY. 2024
2.	RE-ISSUED FOR SPA	SEPT. 2024

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
J. RASH
100123062
Sept. 13, 2024
PROVINCE OF ONTARIO

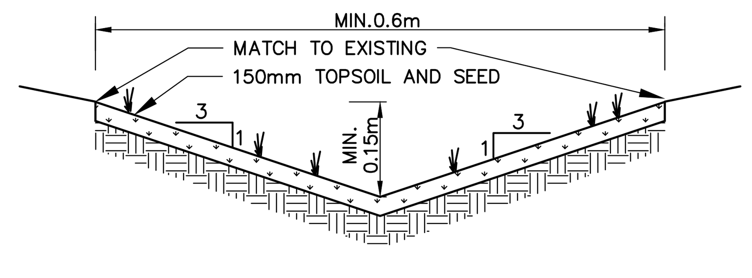
1412 STITTSVILLE MAIN STREET
TOWNSHIP OF STITTSVILLE

TATHAM ENGINEERING

REMOVAL, SILTATION AND EROSION CONTROL PLAN

DESIGN: HY	FILE: 524569	DWG:
DRAWN: HY	DATE: JUNE 2024	SC-1
CHECK: GC	SCALE: 1:150	

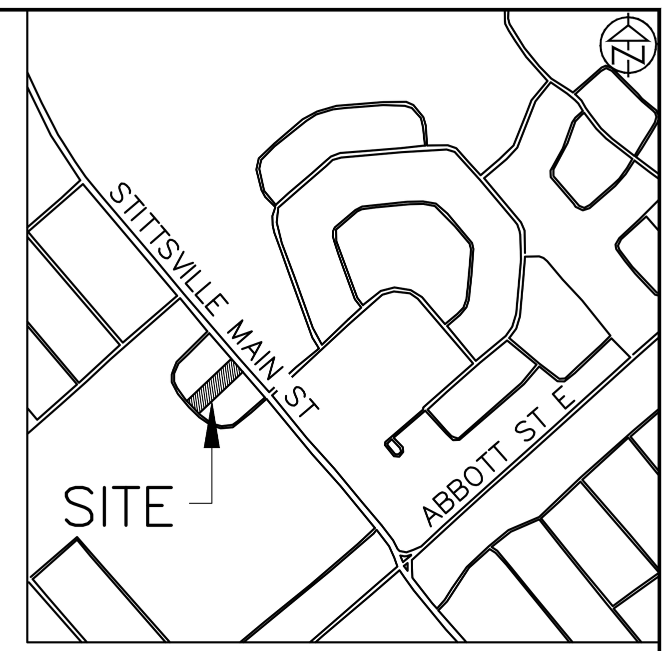
Drawing Name: 524659-SC01.dwg, Plotted: Sep 13, 2024



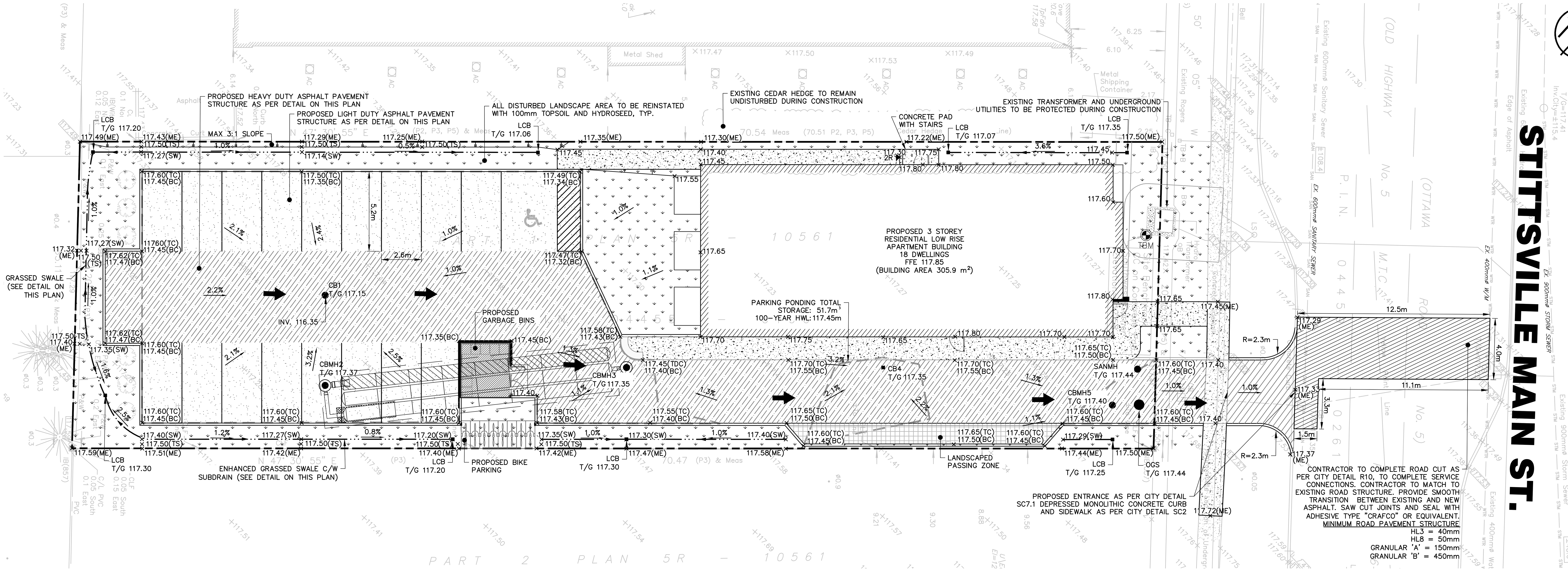
GRASSED SWALE DETAIL
NTS

PAVEMENT STRUCTURE (PGAC 58-34)			
Course	Compaction Requirement	Light Duty	Heavy Duty
Surface Course Asphalt	OPSS 1150	50mm HL3	40mm HL3
Binder Course Asphalt	OPSS 1150		50mm HL8
Granular Base	100% SPMDD	150mm OPSS 1010 Granular A	150mm OPSS 1010 Granular A
Granular Subbase	100% SPMDD	350mm OPSS 1010 Granular B	450mm OPSS 1010 Granular B

PAVEMENT STRUCTURE AS PER GEOTECHNICAL INVESTIGATION PROVIDED BY LRL ENGINEERING LTD. DATED SEPTEMBER 2022.



KEY PLAN - N.T.S.



LEGEND

× 262.25	PROPOSED ELEVATION
× 262.25(ME)	PROPOSED ELEVATION MATCH EXISTING
× 262.25(TC)	PROPOSED TOP OF CURB
× 262.25(BC)	PROPOSED BOTTOM OF CURB
× 262.25(TW)	PROPOSED TOP OF RETAINING WALL
× 262.25(BW)	PROPOSED BOTTOM OF RETAINING WALL
× 262.25(SW)	PROPOSED BOTTOM OF SWALE
× 262.25(TS)	PROPOSED TOP OF SWALE
× 262.25(TDC)	PROPOSED TOP OF DEPRESSED CURB
	PROPOSED OVERLAND FLOW ROUTE
	PROPOSED HEAVY DUTY ASPHALT
	PROPOSED LIGHT DUTY ASPHALT
CB	PROPOSED CATCHBASIN
LCB	PROPOSED LAWN CATCHBASIN
CBMH	PROPOSED CATCHBASIN MANHOLE
STMMH	PROPOSED STORM MANHOLE
SANMH	PROPOSED SANITARY MANHOLE
OGS	PROPOSED OIL GRIT SEPARATOR
	PROPOSED DOOR ENTRANCE/EXIT
	APPROXIMATE PROPERTY BOUNDARY

3.0m 1.5 0 3.0 6.0m
SCALE: 1:150

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No.	REVISION DESCRIPTION	DATE
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2.	RE-ISSUED FOR SPA	SEPT. 2024

ENGINEER STAMP
LICENSED PROFESSIONAL ENGINEER J. RASH 100123062 PROVINCE OF ONTARIO

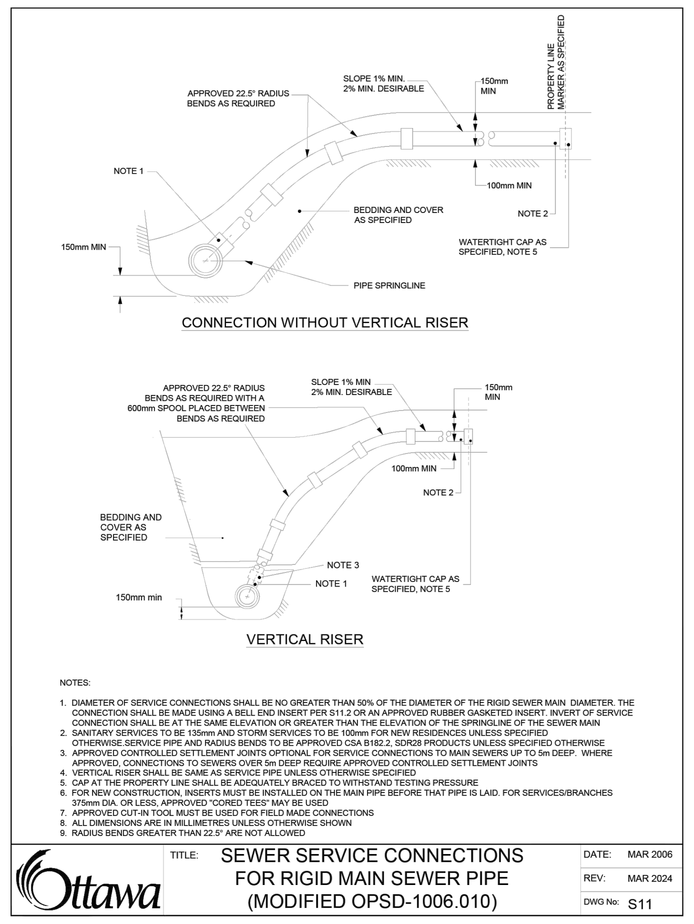
1412 STITTSVILLE MAIN STREET
TOWNSHIP OF STITTSVILLE

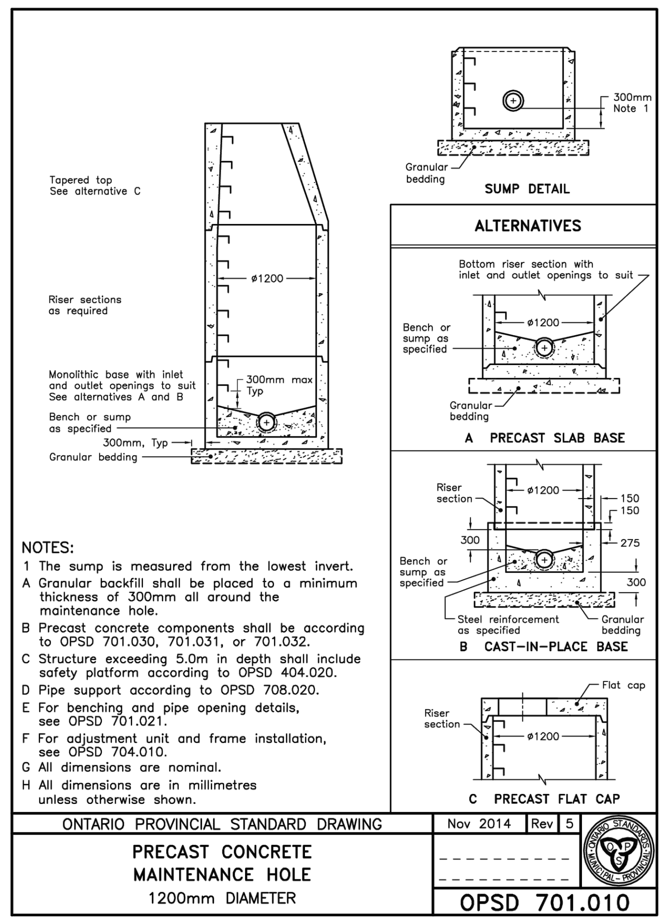
SITE GRADING PLAN

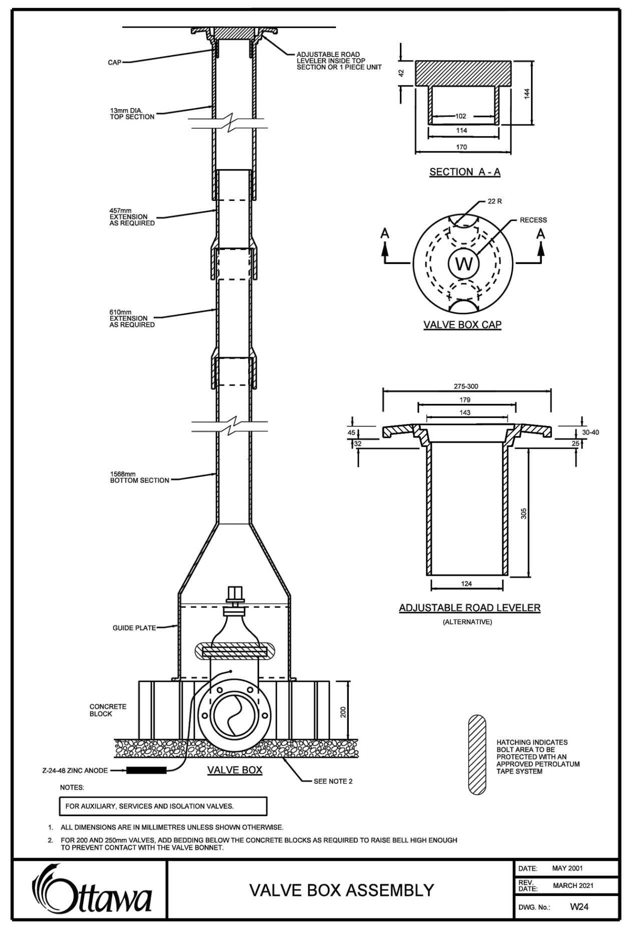
TATHAM ENGINEERING

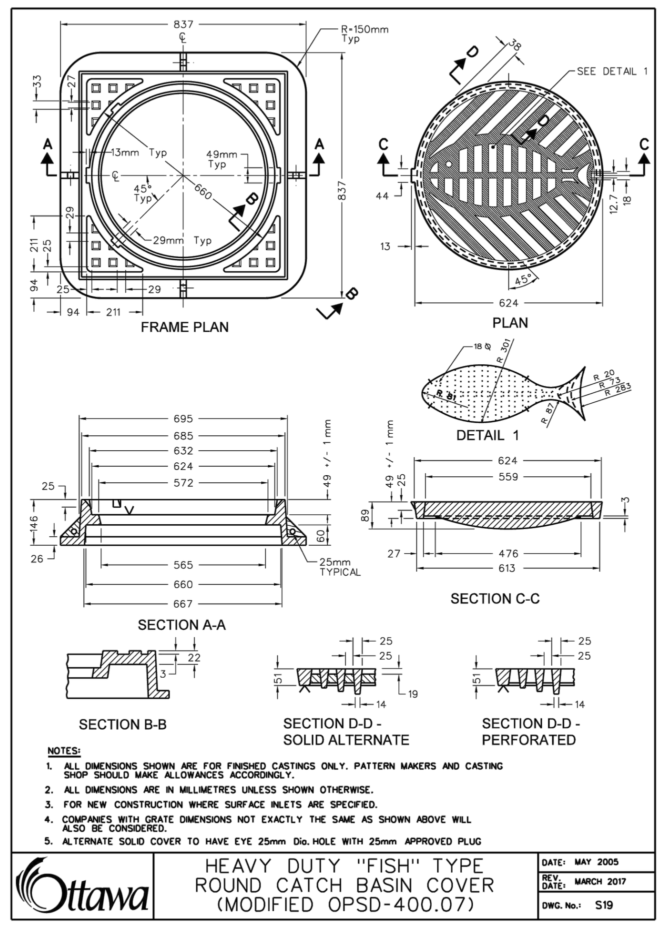
DESIGN: HY	FILE: 524569	DWG: SG-1
DRAWN: HY	DATE: JUNE 2024	
CHECK: GC	SCALE: 1:150	

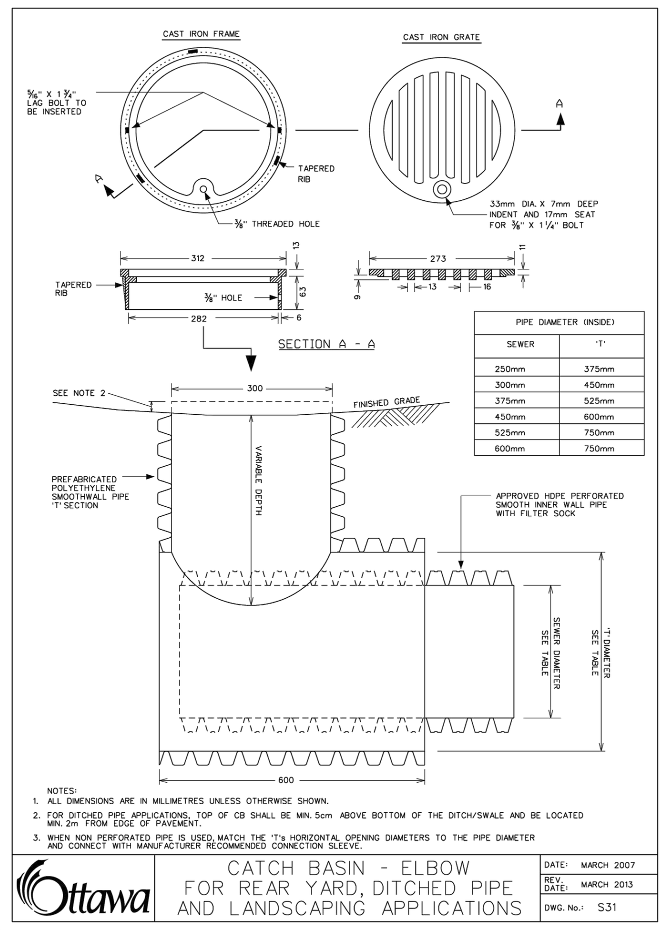
Drawing Name: 524659-SG01.dwg, Plotted: Sep 16, 2024

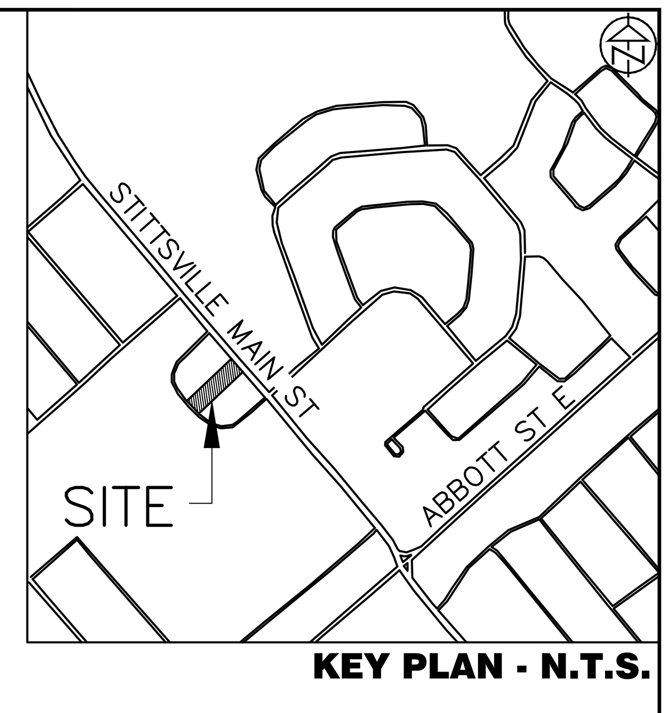




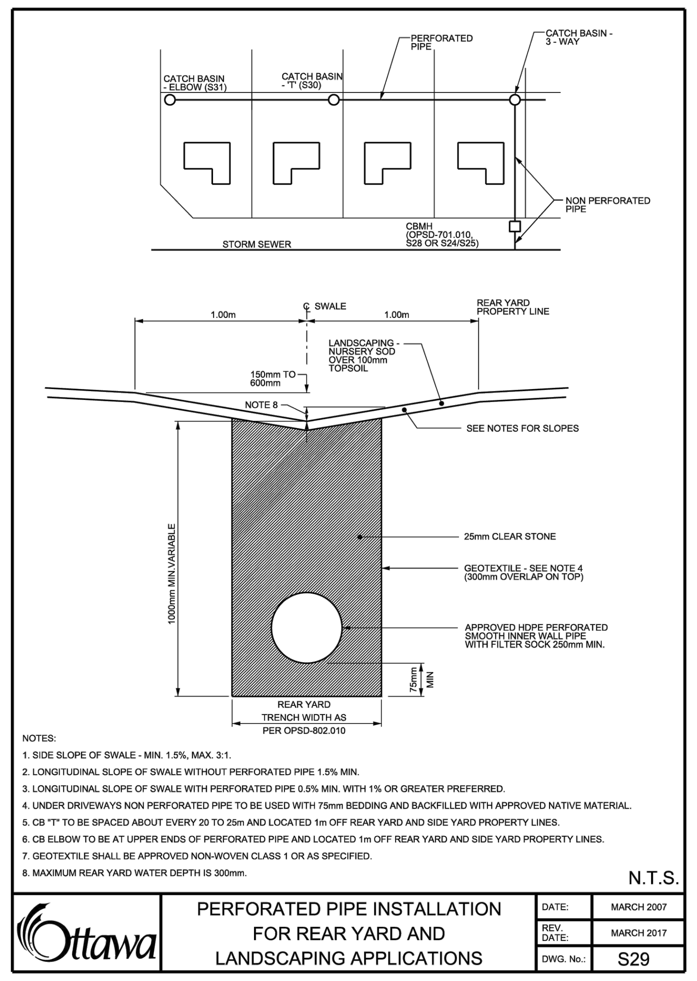


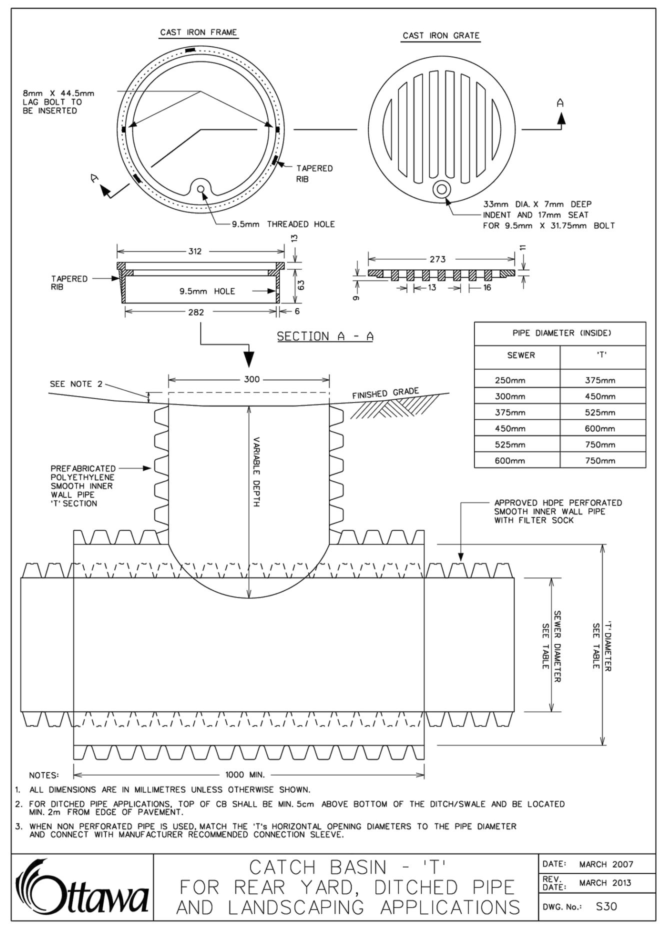


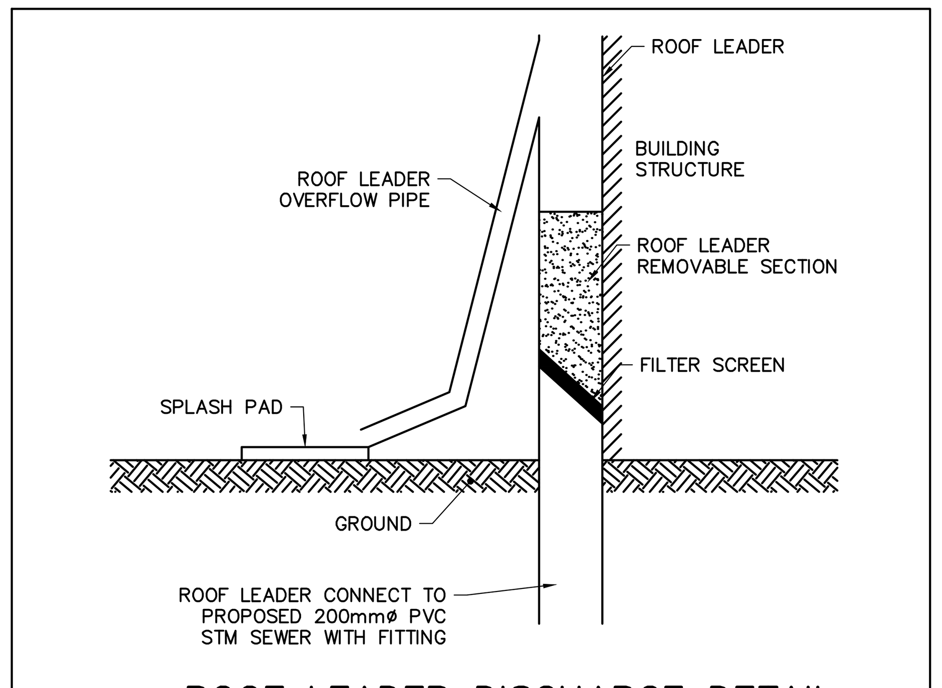




KEY PLAN - N.T.S.

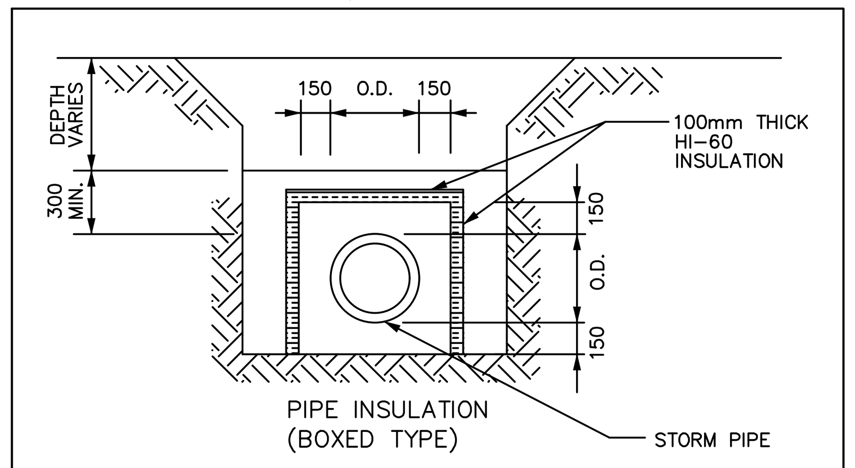






ROOF LEADER DISCHARGE DETAIL

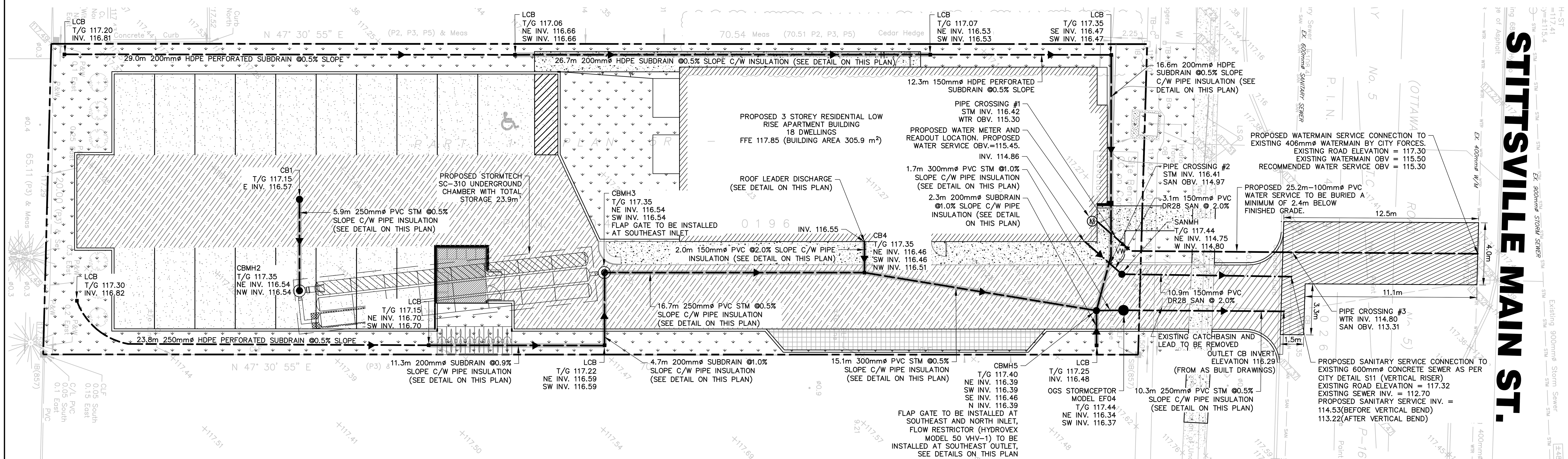
NTS



NOTE :
1. WHEREVER INSULATION IS USED; PROVIDE GRANULAR 'A' BEDDING AND COVER.
2. ALL NOTES PERTAINING TO BEDDING DETAILS SHALL APPLY.
3. FROST TAPERS TO OPSD 803.030 AND OPSD 803.031 AND AS DIRECTED BY THE ENGINEER.

STORM PIPE FROST PROTECTION DETAIL

SCALE: NTS



LEGEND

- PROPOSED WATER SERVICE
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- PROPOSED PIPE INSULATION
- APPROXIMATE PROPERTY BOUNDARY

3.0m 1.5 0 3.0 6.0m

SCALE: 1:150

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ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER J. R. ASH 100123062 PROVINCE OF ONTARIO

1412 STITTSVILLE MAIN STREET
TOWNSHIP OF STITTSVILLE

SITE SERVICING PLAN

TATHAM ENGINEERING

DESIGN: HY	FILE: 524569	DWG:
DRAWN: HY	DATE: JUNE 2024	SS-1
CHECK: GC	SCALE: 1:150	

Drawing Name: 524659-SS01.dwg, Plotted: Sep 16, 2024

PROJECT INFORMATION

ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

Advanced Drainage Systems, Inc.

SiteAssist® FOR STORMTECH INSTALLATION INSTRUCTIONS VISIT OUR APP

1412 STITTSVILLE MAIN STREET

STITTSVILLE, ON, CANADA

SC-310 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-310.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE OR POLYETHYLENE COPOLYMERS.
3. CHAMBERS SHALL BE CERTIFIED TO CSA B184, "POLYMERIC SUB-SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE REQUIREMENTS OF ASTM F2922 (POLETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR 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 F2922 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 23° C / 73° F), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2922 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-310 SYSTEM

1. STORMTECH SC-310 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-310 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-310 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-310 & 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.

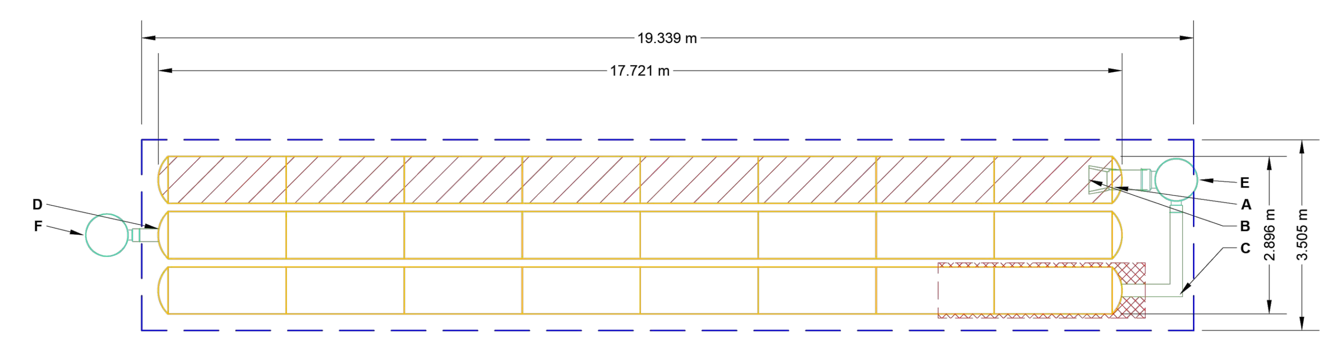
CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT	
24	STORMTECH SC-310 CHAMBERS
6	STORMTECH SC-310 END CAPS
152	STONE ABOVE (mm)
152	STONE BELOW (mm)
40	STONE VOID
25.3	INSTALLED SYSTEM VOLUME (m^3) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)
67.8	SYSTEM AREA (m^2)
45.7	SYSTEM PERIMETER (m)

CONCEPTUAL ELEVATIONS:	
MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	2.997
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	1.168
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	1.016
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	1.016
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	1.016
TOP OF STONE:	0.711
TOP OF SC-310 CHAMBER:	0.559
200 mm x 200 mm TOP MANIFOLD INVERT:	0.241
300 mm ISOLATOR ROW PLUS INVERT:	0.175
200 mm BOTTOM CONNECTION INVERT:	0.168
BOTTOM OF SC-310 CHAMBER:	0.152
BOTTOM OF STONE:	0.000

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED EZ END CAP	A	300 mm BOTTOM PREFABRICATED EZ END CAP, PART#: SC310ECEZ / TYP OF ALL 300 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	23 mm	
FLAMP	B	INSTALL FLAMP ON 300 mm ACCESS PIPE / PART#: SC31012RAMP		
MANIFOLD	C	200 mm x 200 mm TOP MANIFOLD, MOLDED FITTINGS	89 mm	
PIPE CONNECTION	D	200 mm BOTTOM CONNECTION	15 mm	
NYLOPLAST (INLET W/ ISO PLUS ROW)	E	750 mm DIAMETER (610 mm SUMP MIN)		25 L/s IN
NYLOPLAST (OUTLET)	F	750 mm DIAMETER (DESIGN BY ENGINEER)		20 L/s OUT



ISOLATOR ROW PLUS (SEE DETAIL)

PLACE MINIMUM 3.810 m OF ADSPLUS625 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.

1412 STITTSVILLE MAIN STREET
STITTSVILLE, ON, CANADA
DRAWN: HY
CHECKED: N/A
DATE:
PROJECT #:

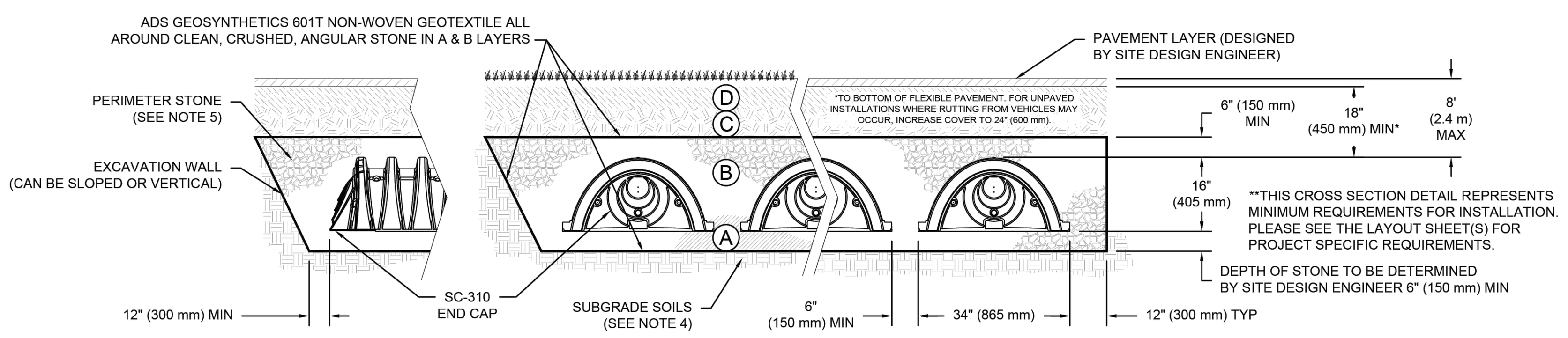
StormTech® Chamber System
888-892-2694 | WWW.STORMTECH.COM
4640 TRUEMAN BLVD HILLIARD, OH 43026 1-800-733-7473
SCALE = 1 : 100

SHEET 2 OF 6

ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 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 OR RECYCLED CONCRETE5	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE5	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.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2922 (POLETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-310 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 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

1412 STITTSVILLE MAIN STREET
STITTSVILLE, ON, CANADA
DRAWN: HY
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DATE:
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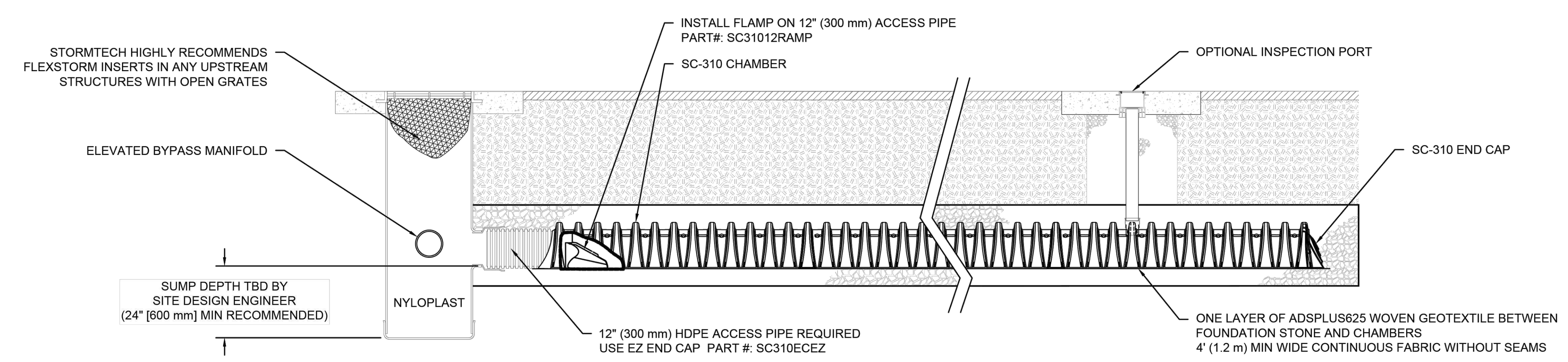
SHEET 3 OF 6



SC-310 ISOLATOR ROW PLUS DETAIL

NTS

INSPECTION & MAINTENANCE

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

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

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

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

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

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SHEET 4 OF 6

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TOPOGRAPHIC SURVEY WAS COMPLETED BY FARLEY, SMITH & DENNIS SURVEYING LTD. ON JANUARY 11, 2022.

ELEVATIONS ARE DERIVED FROM ONTARIO CONTROL MONUMENT 0011968U118, HAVING A PUBLISHED ELEVATION OF 126.180m

TBM: CC ON THE SOUTHWEST CORNER OF THE HYDRO TRANSFORMER CONCRETE PAD. ELEV. 117.58

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR SPA	JULY. 2024
2.	RE-ISSUED FOR SPA	SEPT. 2024

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER J. RASH 100123062 Sept. 13, 2024 PROVINCE OF ONTARIO

1412 STITTSVILLE MAIN STREET
TOWNSHIP OF STITTSVILLE

DETAILS

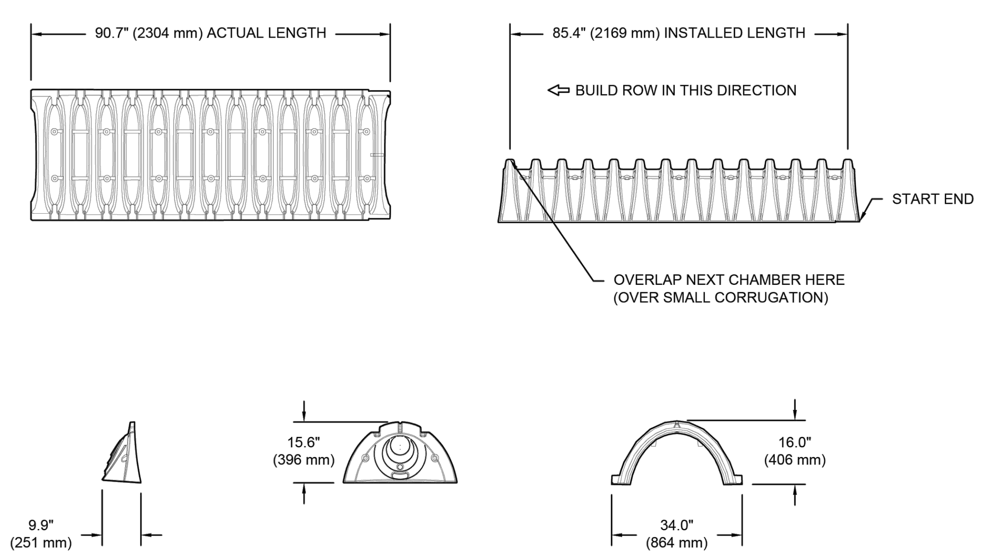
TATHAM ENGINEERING

DESIGN: HY	FILE: 524569	DWG:
DRAWN: HY	DATE: JUNE 2024	DET-1
CHECK: GC	SCALE:	

Drawing Name: 524659-DET01.dwg, Plotted: Sep 13, 2024

SC-310 TECHNICAL SPECIFICATION

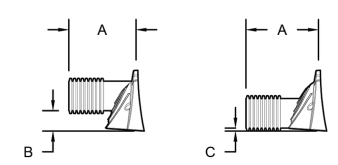
NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	34.0" X 16.0" X 85.4"	(864 mm X 406 mm X 2169 mm)
CHAMBER STORAGE	14.7 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	31.0 CUBIC FEET	(0.88 m³)
WEIGHT	35.0 lbs.	(16.8 kg)

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



PRE-FAB STUB AT BOTTOM OF END CAP WITH FLAMP END WITH "BR"
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
SC310EPE06T / SC310EPE06TPC	6" (150 mm)	9.6" (244 mm)	5.8" (147 mm)	---
SC310EPE06B / SC310EPE06BPC			---	0.5" (13 mm)
SC310EPE08T / SC310EPE08TPC	8" (200 mm)	11.9" (302 mm)	3.5" (89 mm)	---
SC310EPE08B / SC310EPE08BPC			---	0.6" (15 mm)
SC310EPE10T / SC310EPE10TPC	10" (250 mm)	12.7" (323 mm)	1.4" (36 mm)	---
SC310EPE10B / SC310EPE10BPC			---	0.7" (18 mm)
SC310ECEZ*	12" (300 mm)	13.5" (343 mm)	---	0.9" (23 mm)

ALL STUBS, EXCEPT FOR THE SC310ECEZ 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 SC310ECEZ THE 12" (300 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 0.25" (6 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

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1412 STITTSVILLE MAIN STREET
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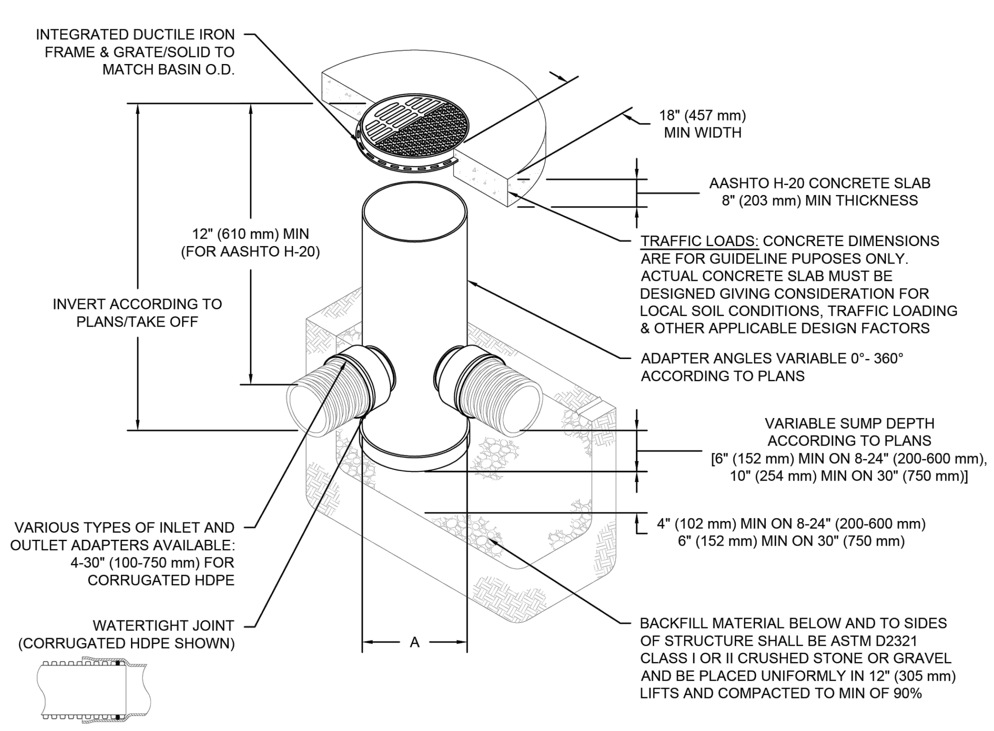
SHEET 5 OF 6

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

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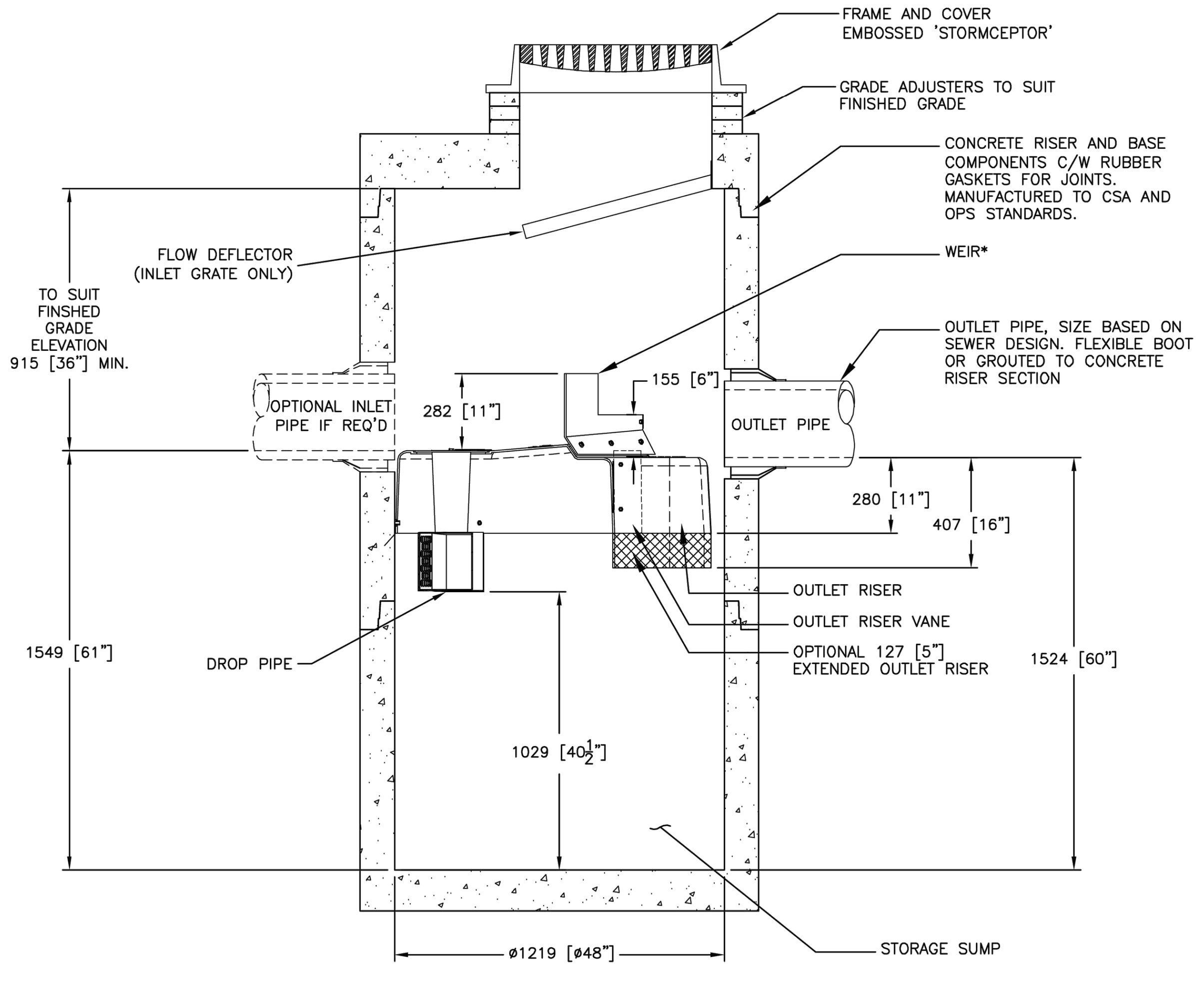
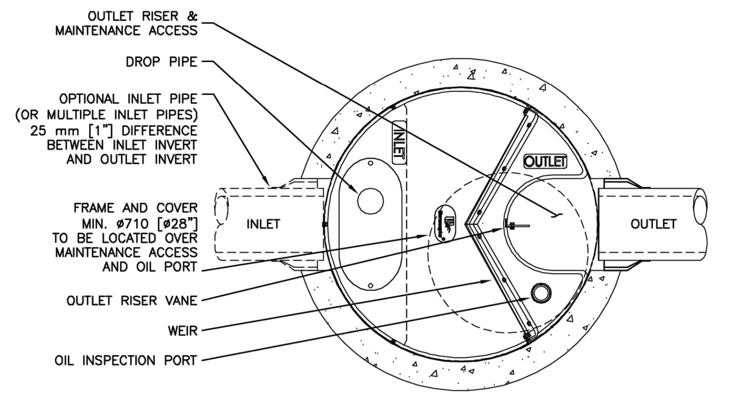
1412 STITTSVILLE MAIN STREET
STITTSVILLE, ON, CANADA

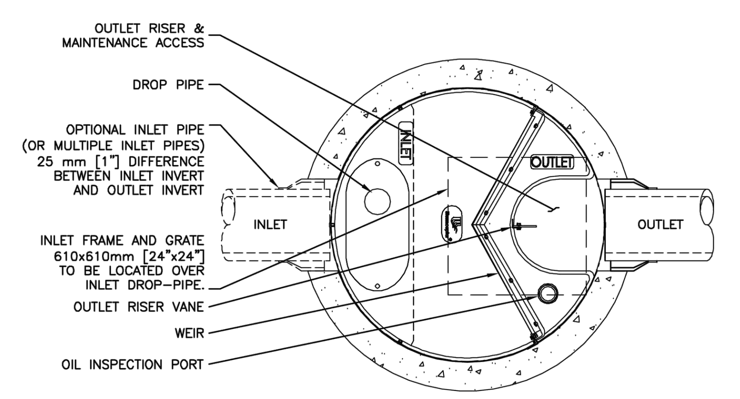
SHEET 6 OF 6



SECTION VIEW



PLAN VIEW (STANDARD)



PLAN VIEW (INLET TOP)

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

GENERAL NOTES:

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

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

INSTALLATION NOTES

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

STANDARD DETAIL
NOT FOR CONSTRUCTION

SITE SPECIFIC DATA REQUIREMENTS

STORMCEPTOR MODEL	EFO4				
STRUCTURE ID					*
HYDROCARBON STORAGE REQ'D (L)					*
WATER QUALITY FLOW RATE (L/s)					*
PEAK FLOW RATE (L/s)					*
RETURN PERIOD OF PEAK FLOW (yrs)					*
DRAINAGE AREA (HA)					*
DRAINAGE AREA IMPERVIOUSNESS (%)					*
PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*

* PER ENGINEER OF RECORD

Stormceptor® EF
SCALE = NTS

imbrium®
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TF 800-565-4801 CA 416-960-9900 INTL +1-416-960-9900

DATE: 10/13/2017	
DESIGNED: JSK	DRAWN: JSK
CHECKED: BSF	APPROVED: SP
PROJECT No.: EFO4	SEQUENCE No.: *
SHEET: 1 OF 1	

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CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

TOPOGRAPHIC SURVEY WAS COMPLETED BY FARLEY, SMITH & DENNIS SURVEYING LTD. ON JANUARY 11, 2022.

ELEVATIONS ARE DERIVED FROM ONTARIO CONTROL MONUMENT 0011968U118, HAVING A PUBLISHED ELEVATION OF 126.180m

TBM: CC ON THE SOUTHWEST CORNER OF THE HYDRO TRANSFORMER CONCRETE PAD. ELEV. 117.58

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR SPA	JULY. 2024
2.	RE-ISSUED FOR SPA	SEPT. 2024

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
J. RASH
100123062
Sept. 13, 2024
PROVINCE OF ONTARIO

1412 STITTSVILLE MAIN STREET
TOWNSHIP OF STITTSVILLE

DETAILS

TATHAM ENGINEERING

DESIGN: HY	FILE: 524569	DWG:
DRAWN: HY	DATE: JUNE 2024	DET-2
CHECK: GC	SCALE:	

Drawing Name: 524659-DET01.dwg, Plotted: Sep 13, 2024

Appendix A: Water Supply Calculations

Water Service Calculations - Residential

Tatham File No. : 524659
Project : 1412 Stittsville Main St
Date : July 29, 2024
Designed by : EBW
Reviewed by : JA

Water Demands

Population			
Unit Type	Persons Per Unit	Number of Units	Population
Studio/1 Bedroom Apartment	1.4	18	25.2
2 Bedroom Apartment	2.1	0	0
3 Bedroom Apartment	3.1	0	0
		18	25.2

(# of units is in accordance with architectural plans)
(Population per unit is in accordance with Table 4.1 of 2010 City of Ottawa Design Guidelines for Water Distribution)

Population	26	Persons			(per table above)
Average Day Consumption Rate	280	L/c/d			(per 2018 City of Ottawa Technical Bulletin ISTB-2018-01)
Maximum Day Peaking Factor	2.5				(per Table 4.2 of 2010 City of Ottawa Design Guidelines for Water Distribution)
Peak Hour Peaking Factor	2.2				(per Table 4.2 of 2010 City of Ottawa Design Guidelines for Water Distribution and 2010 City of Ottawa Technical Bulletin ISD-2010-2)
Average Day Demand	7,280	L/d	0.08	L/s	
Maximum Day Demand	18,200	L/d	0.21	L/s	
Peak Hour Demand	40,040	L/d	0.46	L/s	

Required Water Service Capacity

Fixture Count			
Fixture or Device	Fixture/Device Count	Private Use Hydraulic Load, Fixture Units	Total
Shower Head	18	1.4	25.2
Clothes washer	18	1.4	25.2
Dishwasher	18	1.4	25.2
Lavatory	18	0.7	12.6
Kitchen sink	18	1.4	25.2
Water closet	18	2.2	39.6
			153

(Fixture count is in accordance with Table 7.6.3.2.A of 2012 Ontario Building Code)

Total Fixture Units	153		
Peak Flow	81.25	gpm	(Conversion of fixture units to gpm as per PS&D Table 13-4)
	442,893	L/d	
	5.13	L/s	

Building Water Service Pipe Sizing

$Q = VA$ Where:

V = design velocity of 1.5 m/s x 3600 = 5400 m/h (as per OBC guidelines)
A = area of pipe = $(\pi/4) \times D^2$
Q = water supply flow rate to be accounted for in m^3/h (required water service capacity based on fixture method)

Minimum required pipe diameter:
d = $(4Q/\pi V)^{1/2}$ (derived from Q = VA formula)
d = 0.066 m
d = 66 mm

Proposed pipe diameter: 100 mm

(Notes:
- Larger pipe size allows for additional safety buffer in case of potential changes at building permit stage.
- Larger pipe size also allows for potential future expansion of development.
- Due to high pressure, IPEX "Pipe with the Stripe" (green stripe: rated for 100 psi) is preferred and is CSA certified).

FUS Fire Flow Calculations

Tatham File no. :	524659
Project:	1412 Stittsville Main St
Date:	15-Jul-24
Designed by:	EBW
Checked by:	JA

$$RFF = 220C\sqrt{A}$$

Where:

RFF = the Required Fire Flow in litres per minutes (LPM)
C = the Construction Coefficient is related to the type of construction of the building
A = the Total Effective Floor Area (effective building area) in square metres of the building

Determine the Construction Coefficient (C)							
1	Choose frame used for building	Coefficient C related to the type of construction	Type V Wood Frame Construction	1.5	Type II Noncombustible Construction	0.8	
			Type IV-A Mass Timber Construction	0.8			
			Type IV-B Mass Timber Construction	0.9			
			Type IV-C Mass Timber Construction	1.0			
			Type IV-D Mass Timber Construction	1.5			
			Type III Ordinary Construction	1.0			
			Type II Noncombustible Construction	0.8			
			Type I Fire Resistive Construction	0.6			
Determine Total Effective Floor Area (A)							
2	Option 1						
	The Construction coefficient is greater or equal to 1	FALSE	100% of all floor area (Excluding basements at least 50% below grade)		Total Effective Area	0	sq.m.
	Option 2						
	The Construction coefficient is less than 1	TRUE	Are vertical openings in the building protected? (Per NBC Division B, Section 3.5. Vertical Transportation)	YES	Are the floor areas uniform throughout the building	NO	
	Unprotected Vertical Openings, Uniform Floor Area						
	FALSE	Number of Floors		Area of Floor(s)		Total Effective Area	0 sq.m.
	Unprotected Verticle Openings, Dissimillar Floor Area						
	FALSE	Area of 2 largest adjoining floors		Area of floors above 2 largest adjoining floors (up to a maximum of 8 floors)		Total Effective Area	0 sq.m.
	Protected Verticle Openings, Uniform Floor Area						
	FALSE	Number of Floors		Area of Floor		Total Effective Area	0 sq.m.
	Protected Verticle Openings, Dissimillar Floor Area						
	TRUE	Area of the largest floor	303.8	Area of floor directly above largest floor	299	Total Effective Area	452.025 sq.m.
				Area of floor directly below largest floor	293.9		
Determine the Required Fire Flow							
3	Obtain Required Fire Flow		$RFF = 220C\sqrt{A}$	Required Fire Flow		4,000	L/min
						66.7	L/s
Reduction or Surcharge Due to Factors Affecting Burning							
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	
			Limited combustible	-0.15			
			Combustible	0			
			Free burning	0.15		3,400	L/min
			Rapid burning	0.25		56.7	L/s
5	Choose reduction for sprinklers	Sprinkler reduction	Sprinklers conforming to NFPA13 (wet or dry system)	-0.30	NO	0	
			Water supply is standard for both the system and fire department hose lines (siamese connection)	-0.10	NO	0	
			Fully supervised system (electronic monitoring system on at all times)	-0.10	NO	0	
			All buildings within 30m of the proposed structure are confirmed to have a sprinkler system	-0.25	NO	0	3,400 L/min; 56.7 L/s
Exposure Adjustment Charge							
6	Exposure distance between units	North side	3.1 to 10m	Length - Height Value Assumed worst case exposed building facing wall	>100	Exposure Adjustment Charge	0.04
		East side	Over 30m		>100	Exposure Adjustment Charge	0
		South side	10.1 to 20m		>100	Exposure Adjustment Charge	0.03
		West side	Over 30m		>100	Exposure Adjustment Charge	0.00
	Cumulative Required Fire Flow					3,638	L/min
						60.6	L/s
Total Required Fire Flow							
7	Obtain fire flow, duration	Minimum required fire flow rate (rounded to nearest 1000)				**4,000**	L/min
		Minimum required fire flow rate				**66.7**	L/s
		Required duration of fire flow				**2**	Hrs

Water Pressure Calculations	
Tatham File No. :	524659
Project :	1412 Stittsville Main Street
Date :	July 29, 2024
Designed by :	MC
Reviewed by :	JA

Piezometric Head Equation (Derived from Bernoulli's Equation)

$$h = \frac{p}{\gamma} + z$$

Where:

h = HGL (m)

p = Pressure (Pa)

γ = Specific weight (N/m3) = 9810

z = Elevation of centreline of pipe (m) = 115.25

Water Pressure at Phoenix Crescent Connection			
HGL (m)		Pressure	
		kPa	psi
Max Day	160.3	441.94	64.10
Peak Hour	156.1	400.74	58.12
Max. Day + Fire =	156.7	406.62	58.98

Hazen Williams Equation

$$h_f = \frac{10.67 \times Q^{1.85} \times L}{C^{1.85} \times d^{4.87}}$$

Where:

h_f = Head loss over the length of pipe (m)

Q = Volumetric flow rate (m^3/s)

L = Length of pipe (m)

C = Pipe roughness coefficient

d = Pipe diameter (m)

Scenario 1: maximum daily demand

Q (L/s)	0.21	
C	150	
L (m.)	25.2	
I.D. (mm)	100	
V (m/s)	0.03	
h_f (m)	0.00	
Head Loss (psi)	0.00	
Pressure (psi)	64.10	
Service Obv. @ Street Connection (m)	115.30	
Service Obv. @ Building Connection (m)	115.45	
Pressure Adjustment (psi)	-0.21	(due to service elevation difference from street to building)
Adjusted Min. Pressure (psi)	63.88	(must not be less than 50 psi; must not be more than 80 psi)

Scenario 2: maximum hourly demand

Q (L/s)	0.46	
C	150	
L (m.)	25.2	
I.D. (mm)	100	
V (m/s)	0.06	
h_f (m)	0.00	
Head Loss (psi)	0.00	
Pressure (psi)	58.12	
Service Obv. @ Street Connection (m)	115.30	
Service Obv. @ Building Connection (m)	115.45	
Pressure Adjustment (psi)	-0.21	(due to service elevation difference from street to building)
Adjusted Min. Pressure (psi)	57.91	(must not be less than 40 psi; must not be more than 80 psi)

Boundary Conditions
1412 Stittsville Main St

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	5	0.08
Maximum Daily Demand	13	0.21
Peak Hour	29	0.48
Fire Flow Demand #1	4,000	66.67

Location

Results

Connection 1 – Stittsville Main St

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.3	60.1
Peak Hour	156.1	54.2
Max Day plus Fire Flow #1	156.7	55.0

[1] Ground Elevation = 118.0 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 B:
Sewage Flow Calculations

TATHAM ENGINEERING

Sanitary Flow Calculations

Tatham File No. : 524659
Project : 1412 Stittsville Main St
Date : July 16, 2024
Designed by : EBW
Reviewed by : JA

Sewage Design Flow

Sewage Design Flow

Population			
Unit Type	Persons Per Unit	Number of Units	Population
Studio/1 Bedroom Apartment	1.4	18	25.2
2 Bedroom Apartment	2.1	0	0
3 Bedroom Apartment	3.1	0	0
		18	25.2

(# of units is in accordance with architectural plans)
(population per unit is in accordance with Table 4.2 of 2012 City of Ottawa Sewer Design Guidelines

Residential Flow				
Population	26 Persons			(per table above)
Sewage Design Flow Rate	280 L/c/d			(per Technical Bulletin ISTB-2018-01)
Residential Design Flow	7,280 L/d	0.08 L/s		
Extraneous flow	0.33 L/s/ha			(per Technical Bulletin ISTB 2018-01, (I/I dry: 0.05 L/s/ha) + (I/I wet: 0.28 L/s/ha))
	0.33 L/s * 0.4 ha			(tributary area accounts for entire site (conservative))
	11,405 L/d	0.13 L/s		
Sewage Design Flow	18,685 L/d	0.22 L/s		

Sewage Peak Flow

Peaking factor Harmon formula = $P.F. = 1 + \left(\frac{14}{4 + \left(\frac{P}{1000} \right)^{\frac{1}{2}}} \right) * K$

Where: P = 25.2 Persons
K = 0.8 Correction Factor

= 3.69

Peak Site Sewage Flow 38,291 L/day 0.44 L/s

TATHAM ENGINEERING

Sanitary Service Sizing Calculations

Tatham File No. : 524659
Project : 1412 Stittsville Main St
Date : July 29, 2024
Designed by : EBW
Checked by : JA

Design Parameters:

Design flow	18,685 L/day	0.22 L/s	(Inclusive of extraneous flow allowance)
Peaking factor	3.69		(Derived from Harmon formula)
Peak flow	38,291 L/day	0.44 L/s	
Manning's coefficient (n)	0.013		
Minimum velocity	0.6 m/s		
Maximum velocity	3.0 m/s		

From				To				Peak Flow		Pipe					
Tag	Grade level (m)	Invert level (m)	Cover (m)	Tag	Grade level (m)	Invert level (m)	Cover (m)	Peak Flow (L/day)	Peak Flow (L/s)	Length (m)	Dia. (mm)	Slope (%)	Full Capacity (L/s)	Velocity Full (m/s)	Q/Q_{full} (%)
BLDG	117.80	115.15	2.50	MAIN	117.35	112.80	4.40	38,291	0.44	40.0	150	5.9%	36.91	2.1	1.2

Sanitary Sewer Main Calculations

Tatham File No. : 524659
Project : 1412 Stittsville Main St
Date : July 29, 2024
Designed by : EBW
Checked by : JA

Design Parameters:

Design flow	18,685 L/day	0.22 L/s	(Inclusive of extraneous flow allowance)
Peaking factor	3.69		(Derived from Harmon formula)
Peak flow	38,291 L/day	0.44 L/s	
Manning's coefficient (n)	0.013		
Minimum velocity	0.6 m/s		
Maximum velocity	3.0 m/s		

From				To				Peak Flow		Pipe					
Tag	Grade level (m)	Invert level (m)	Cover (m)	Tag	Grade level (m)	Invert level (m)	Cover (m)	Peak Flow (L/day)	Peak Flow (L/s)	Length (m)	Dia. (mm)	Slope (%)	Full Capacity (L/s)	Velocity Full (m/s)	Q/Q_{full} (%)
MHSA46712	117.14	112.95	3.59	MHSA51914	117.75	112.75	4.40	38,291	0.44	102.0	600	0.2%	271.89	1.0	0.2

Appendix C: Stormwater Management Calculations

TATHAM ENGINEERING

Visual OTTHYMO Model
Parameter Calculations (NasHYD)

Project Details

Project Number	524659

Prepared By

Name	HY

Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)

Pre-Development Condition

Watershed:	N/A
Catchment ID:	101
Catchment Area (ha):	0.14
Impervious %:	

Average Curve Number (CN), Runoff Coefficient (C) and Initial Abstraction (IA)

Soil Symbol		Kg											
Soil Series		Kars											
Hydrologic Soils Group		B											
Soil Texture		Sandy Loam											
Runoff Coefficient Type		2											
Area (ha)		0.14											
Percentage of Catchment		100%											
Land Cover Category	**IA**	**A (ha)**	**CN**	**C**	**A (ha)**	**CN**	**C**	**A (ha)**	**CN**	**C**	**A (ha)**	**CN**	**C**
Impervious	2		98	0.95									
Gravel	3		89	0.27									
Woodland	10		60	0.25									
Pasture/Lawns	5	0.14	69	0.28									
Meadows	8		65	0.27									
Cultivated	7		74	0.35									
Waterbody	12		50	0.05									
Average CN		69.00											
Average C		0.28											
Average IA		5.00											

Time to Peak Calculations

Max. Catchment Elev. (m):	117.30
Min. Catchment Elev. (m):	117.10
Catchment Length (m):	65
Catchment Slope (%):	0.31%
Method: Airport Method	
Time of Concentration (mins):	31.80

Summary

Catchment CN:	69.0
Catchment C:	0.28
Catchment IA (mm):	5.00
Time of Concentration (hrs):	0.53
Catchment Time to Peak (hrs):	0.35
Catchment Time Step (mins):	4.24

Visual OTTHYMO Model
Parameter Calculations (NasHYD)

Project Details

Project Number	524659

Prepared By

Name	HY

Data Sources

Detailed Soil Survey Reports for Ontario, MTO Drainage Management Manual (1997)

Pre-Development Condition

Watershed:	N/A
Catchment ID:	201
Catchment Area (ha):	0.14
Impervious %:	71%

Average Curve Number (CN), Runoff Coefficient (C) and Initial Abstraction (IA)

Soil Symbol		**Gsl**												
Soil Series		Granby												
Hydrologic Soils Group		B												
Soil Texture		Sand Loam												
Runoff Coefficient Type		2												
Area (ha)		0.14												
Percentage of Catchment		100%												
Land Cover Category	**IA**	**A (ha)**	**CN**	**C**	**A (ha)**	**CN**	**C**	**A (ha)**	**CN**	**C**	**A (ha)**	**CN**	**C**
Impervious	2	0.10	98	0.95									
Gravel	3		89	0.27									
Woodland	10		60	0.25									
Pasture/Lawns	5	0.04	69	0.28									
Meadows	8		65	0.27									
Cultivated	7		74	0.35									
Waterbody	12		50	0.05									
Average CN		89.71											
Average C		0.76											
Average IA		2.86											

Time to Peak Calculations

Max. Catchment Elev. (m):	117.30
Min. Catchment Elev. (m):	117.00
Catchment Length (m):	20
Catchment Slope (%):	1.50%
Method:	Bransby-Williams Formula
Time of Concentration (mins):	1.28

Summary

Catchment CN:	89.7
Catchment C:	0.76
Catchment IA (mm):	2.86
Time of Concentration (hrs):	0.02
Catchment Time to Peak (hrs):	0.01
Catchment Time Step (mins):	0.17

TATHAM ENGINEERING	Project:	1412 Stittsville Main Street	Date:	Jul-24
	File No.:	524659	Designed By:	HY
	Subject:	Pre Storm Dischage	Checked By:	GC

PRE DEVELOPMENT ANALYSIS

CATCHMENT 101

Runoff Coefficient (Municipal Standard)

2 Year	0.28	
5 Year	0.28	
10 Year	0.28	
25 Year	0.31	$=C_5*1.10$
50 Year	0.34	$=C_5*1.20$
100 Year	0.35	$=C_5*1.25$

Peak Rainfall Intensity (Ottawa Macdonald Cartier)

	2 YR	5 YR	10 YR	25 YR	50 YR	100 YR
A	733.0	998.1	1174.2	1402.9	1569.0	1735.7
B	0.810	0.814	0.816	0.819	0.820	0.820
C	6.199	6.053	6.014	6.018	6.014	6.014

Drainage Area 0.14 ha

Tc 31.80 min

Peak Runoff Rate - Rational Method (L/s) (Allowable)

2 Year	4.2
5 Year	5.6
10 Year	6.6
25 Year	8.6
50 Year	10.4
100 Year	12.0

TATHAM ENGINEERING	Project:	1412 Stittsville Main Street	Date:	Jul-24
	File No.:	524659	Designed By:	HY
	Subject:	Post Storm Dischage	Checked By:	GC

POST DEVELOPMENT ANALYSIS

CATCHMENT 201

Runoff Coefficient (Municipal Standard)

2 Year	0.76	
5 Year	0.76	
10 Year	0.76	
25 Year	0.83	$=C_5*1.10$
50 Year	0.91	$=C_5*1.20$
100 Year	0.95	$=C_5*1.25$

Peak Rainfall Intensity (Ottawa Macdonald Cartier)

	2 YR	5 YR	10 YR	25 YR	50 YR	100 YR
A	733.0	998.1	1174.2	1402.9	1569.0	1735.7
B	0.810	0.814	0.816	0.819	0.820	0.820
C	6.199	6.053	6.014	6.018	6.014	6.014

Drainage Area 0.14 ha

Uncontrolled Runoff Rate - Rational Method (L/s)

Dur. Td	2 YR	5 YR	10 YR	25 YR	50 YR	100 YR
10	22.7	30.8	36.1	47.0	57.2	65.9
20	15.4	20.7	24.3	31.6	38.4	44.3
30	11.8	15.9	18.6	24.2	29.4	33.9
40	9.7	13.0	15.2	19.8	24.1	27.7
50	8.3	11.1	13.0	16.9	20.5	23.6
60	7.3	9.7	11.4	14.7	17.9	20.6
70	6.5	8.7	10.1	13.1	15.9	18.4
80	5.9	7.8	9.1	11.9	14.4	16.6
90	5.4	7.2	8.4	10.8	13.2	15.2
100	4.9	6.6	7.7	10.0	12.1	14.0
110	4.6	6.1	7.2	9.3	11.3	13.0
120	4.3	5.7	6.7	8.7	10.5	12.1
130	4.0	5.4	6.3	8.2	9.9	11.4
140	3.8	5.1	5.9	7.7	9.3	10.8
150	3.6	4.8	5.6	7.3	8.8	10.2
160	3.4	4.6	5.3	6.9	8.4	9.7
170	3.3	4.4	5.1	6.6	8.0	9.2

Allowable Outflow Rate From Post-Dev.201 (Pre-Dev. 101 - Post-Dev.202) (L/s)

2 YR	5YR	10 YR	25 YR	50 YR	100 YR
2.1	2.1	2.1	2.1	2.1	2.1

Controled Outflow Rate From Post-Dev. 201 (L/s)

2 YR	5 YR	10 YR	25 YR	50 YR	100 YR
2.0	2.0	2.0	2.0	2.0	2.0

Required Storage Volumes (m^3)

Dur.	2 YR	5 YR	10 YR	25 YR	50 YR	100 YR
10	12.3	17.2	20.4	26.9	33.1	38.3
20	15.9	22.4	26.6	35.4	43.6	50.6
30	17.5	24.9	29.7	39.8	49.2	57.3
40	18.3	26.3	31.5	42.5	52.7	61.5
50	18.5	27.1	32.6	44.3	55.2	64.5
60	18.5	27.5	33.3	45.5	56.9	66.7
70	18.4	27.6	33.7	46.3	58.2	68.4
80	18.0	27.6	33.8	46.9	59.1	69.6
90	17.6	27.4	33.8	47.2	59.8	70.6
100	17.1	27.1	33.7	47.4	60.2	71.3
110	16.5	26.7	33.4	47.4	60.6	71.9
120	15.8	26.3	33.1	47.4	60.7	72.3
130	15.2	25.8	32.7	47.2	60.8	72.6
140	14.4	25.2	32.3	47.0	60.8	72.7
150	13.7	24.6	31.8	46.7	60.7	72.8
160	12.9	23.9	31.2	46.3	60.5	72.8
170	12.1	23.3	30.6	45.9	60.3	72.7

Note: The maximum required storage volume is calculated by subtracting the Controlled Outflow Rate (Post-Dev. 201) from the Uncontrolled Runoff Rate multiplied by the storm duration for a range of storm durations.

TATHAM ENGINEERING

Project :	1412 Stittsville Main Street
File No.	524659
Date:	Jul-24
Designed By:	HY
Checked By:	GC
Subject:	Orifice sizing

OUTLET CONTROL

Invert Elevation (m):	116.39
Outlet Pipe Size (mm):	300
Top water level	117.45
Waterhead	1.06
Hydrovex 50VHV-1 Discharge (m3/s)	0.0020
5-Year Storage required	27.61
Underground Storage provided	28.41
100-Year Storage required	72.83
Total Storage provided	77.76

Project :	1412 Stittsville Main Street
File No.	524659
Date:	May-24
Designed By:	HY
Checked By:	GC
Subject:	Storm chamber Stage Storage

Underground Storage Chambers (Stormtech Model SC-310)

Elevation	Depth	Quantity Volume	Total chambers	Total Volume
(m)	(m)	(m^3)	(ea)	(m^3)
116.45	0.00	0.00	24	0.0
116.50	0.00	0.13	24	3.0
116.55	0.05	0.25	24	6.0
116.60	0.10	0.37	24	8.8
116.65	0.15	0.48	24	11.5
116.70	0.20	0.58	24	14.0
116.75	0.25	0.68	24	16.3
116.80	0.30	0.76	24	18.1
116.85	0.35	0.82	24	19.7
116.90	0.40	0.88	24	21.1
116.95	0.45	0.93	24	22.4
117.00	0.50	0.99	24	23.9

Parking surface ponding 1

Elevation	Depth	Increasing Area	Accum Area	Volume	Total Volume
(m)	(m)	(m^2)	(m^2)	(m^3)	(m^3)
71.10	0.00	0.0	0.0	0.0	0.0
71.15	0.05	14.4	14.4	0.2	0.2
71.20	0.10	43.1	57.4	1.7	1.9
71.25	0.15	71.8	129.3	4.5	6.5
71.30	0.20	100.5	229.8	8.9	15.3
71.35	0.25	129.3	359.0	14.6	29.9
71.40	0.30	158.0	517.0	21.8	51.7

Storm Structure Storage

Elevation	Depth	Quantity Volume	Total chambers	Total Volume
(m)	(m)	(m^3)	(ea)	(m^3)
116.45	0.00	0.00	3	0.0
116.50	0.05	0.06	3	0.2
116.55	0.10	0.11	3	0.2
116.60	0.15	0.17	3	0.3
116.65	0.20	0.23	3	0.5
116.70	0.25	0.28	3	0.7
116.75	0.30	0.34	3	0.8
116.80	0.35	0.40	3	1.0
116.85	0.40	0.45	3	1.2
116.90	0.45	0.51	3	1.4
116.95	0.50	0.57	3	1.5
117.00	0.55	0.62	3	1.7
117.05	0.60	0.68	3	1.9
117.10	0.65	0.74	3	2.0
117.15	0.70	0.79	3	2.2

Storm Pipe Storage

Diameter	Length	Quantity Volume
(m)	(m)	(m^3)
0.30	33.20	2.35

Stormceptor EF Sizing Report

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

07/18/2024

Province:	Ontario
City:	Ottawa
Nearest Rainfall Station:	OTTAWA CDA RCS
Climate Station Id:	6105978
Years of Rainfall Data:	20
Site Name:	
Drainage Area (ha):	0.14
Runoff Coefficient 'c':	0.76

Project Name:	1412 Stittsville Main Street
Project Number:	524659
Designer Name:	Mattew Charters
Designer Company:	Tatham Engineering
Designer Email:	mcharters@tathameng.com
Designer Phone:	613-747-3636
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0
Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	3.43
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	Yes
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	2.00
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	100
Estimated Average Annual Sediment Load (kg/yr):	70
Estimated Average Annual Sediment Volume (L/yr):	57

Net Annual Sediment (TSS) Load Reduction Sizing Summary

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

Recommended Stormceptor EFO Model:	**EFO4**
Estimated Net Annual Sediment (TSS) Load Reduction (%):	**100**
Water Quality Runoff Volume Capture (%):	**> 90**

THIRD-PARTY TESTING AND VERIFICATION

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

PERFORMANCE

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

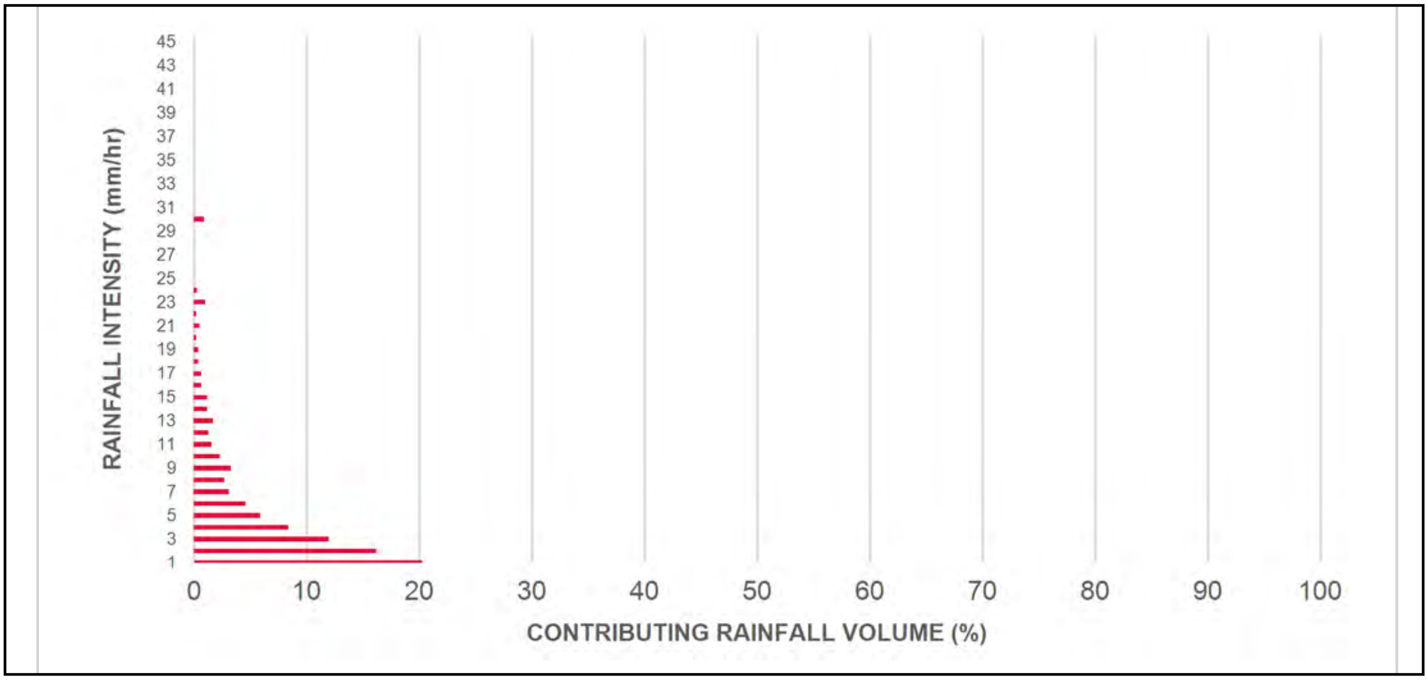
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Upstream Flow Controlled Results

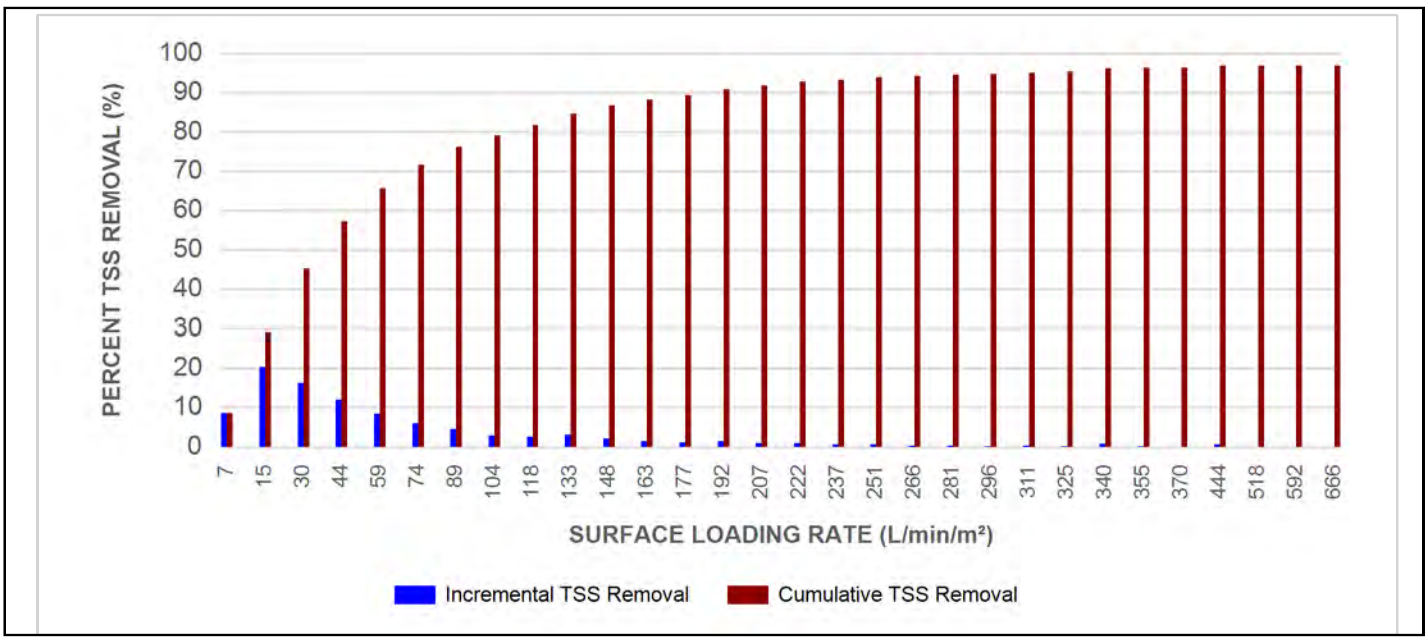
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.6	8.6	0.15	9.0	7.0	100	8.6	8.6
1.00	20.3	29.0	0.30	18.0	15.0	100	20.3	29.0
2.00	16.2	45.2	0.59	35.0	30.0	100	16.2	45.2
3.00	12.0	57.2	0.89	53.0	44.0	100	12.0	57.2
4.00	8.4	65.6	1.18	71.0	59.0	100	8.4	65.6
5.00	5.9	71.6	1.48	89.0	74.0	100	5.9	71.6
6.00	28.4	100.0	1.77	106.0	89.0	98	28.0	99.6
7.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
8.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
9.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
10.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
11.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
12.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
13.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
14.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
15.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
16.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
17.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
18.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
19.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
20.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
21.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
22.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
23.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
24.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
25.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
30.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
35.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
40.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
45.00	0.0	100.0	2.00	120.0	100.0	96	0.0	99.6
Estimated Net Annual Sediment (TSS) Load Reduction =								**100 %**

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

RAINFALL DATA FROM OTTAWA CDA RCS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL
FOR THE RECOMMENDED STORMCEPTOR® MODEL



Maximum Pipe Diameter / Peak Conveyance

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

SCOUR PREVENTION AND ONLINE CONFIGURATION

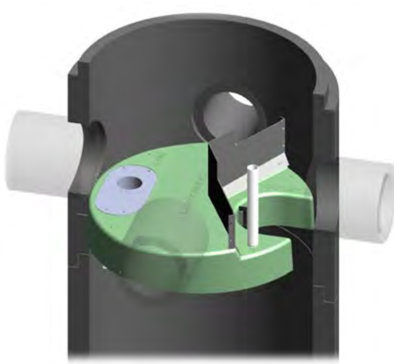
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test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

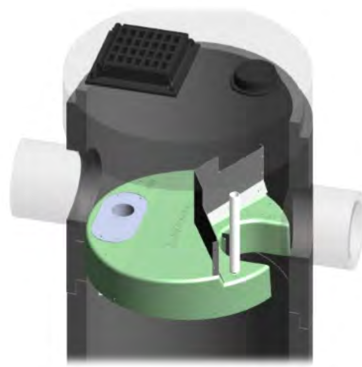
DESIGN FLEXIBILITY

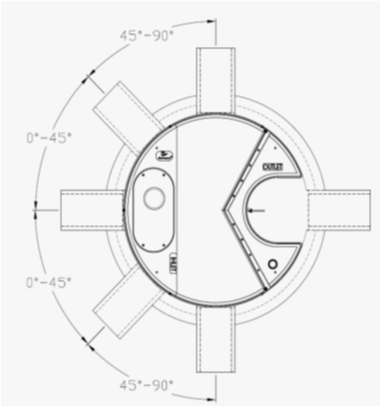
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend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

OIL CAPTURE AND RETENTION

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







INLET-TO-OUTLET DROP

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

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

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

HEAD LOSS

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

Pollutant Capacity

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

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

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

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

STANDARD STORMCEPTOR EF/EFO DRAWINGS

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

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

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

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

PART 1 – GENERAL

1.1 WORK INCLUDED

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

1.2 REFERENCE STANDARDS & PROCEDURES

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

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

1.3 SUBMITTALS

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

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

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

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

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

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

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

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

3.2 SIZING METHODOLOGY

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

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

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

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

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

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

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

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

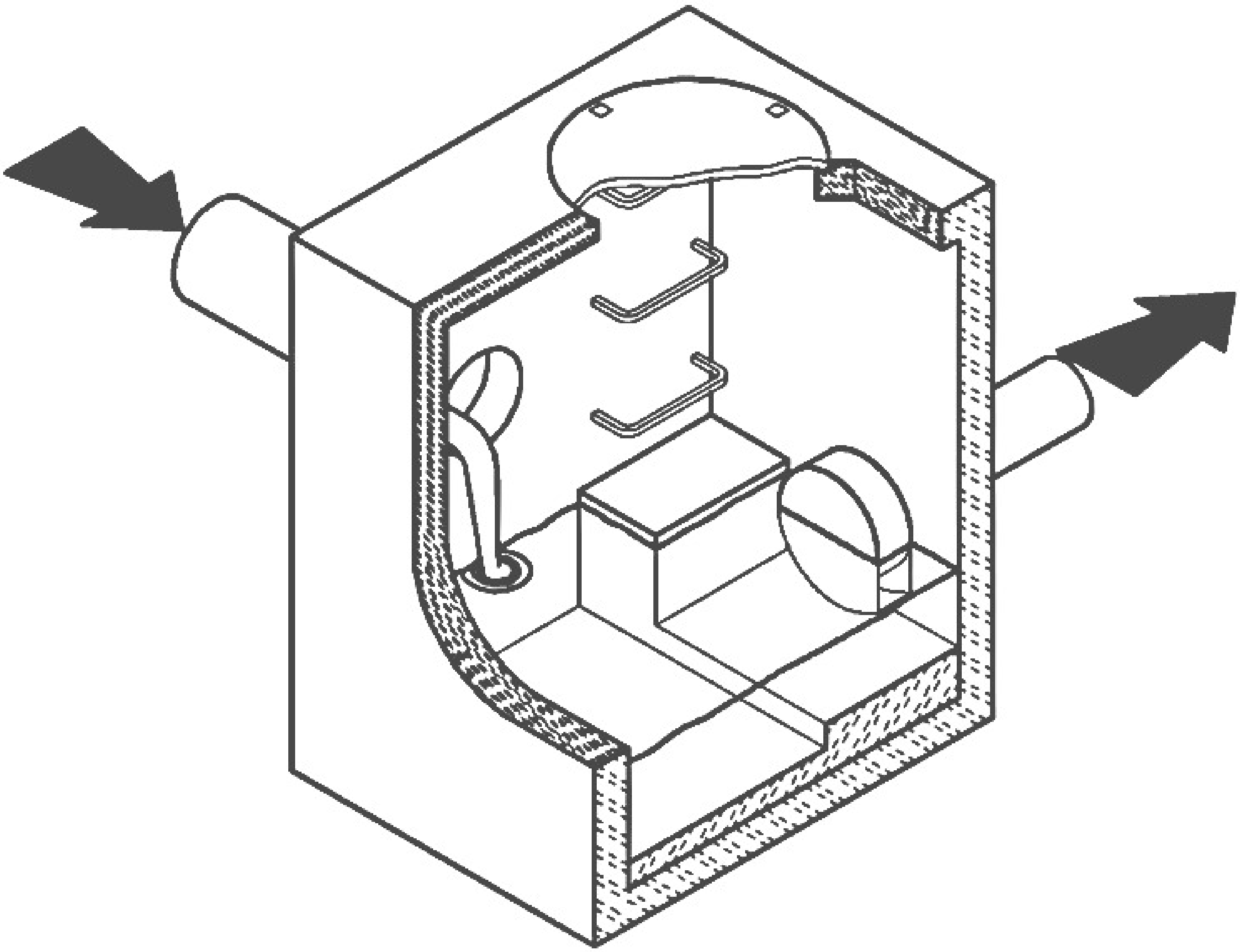
3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

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

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

® HYDROVEX® VHV / SVHV
Vertical Vortex Flow Regulator



JOHN MEUNIER

HYDROVEX® VHV / SVHV VERTICAL VORTEX FLOW REGULATOR

APPLICATIONS

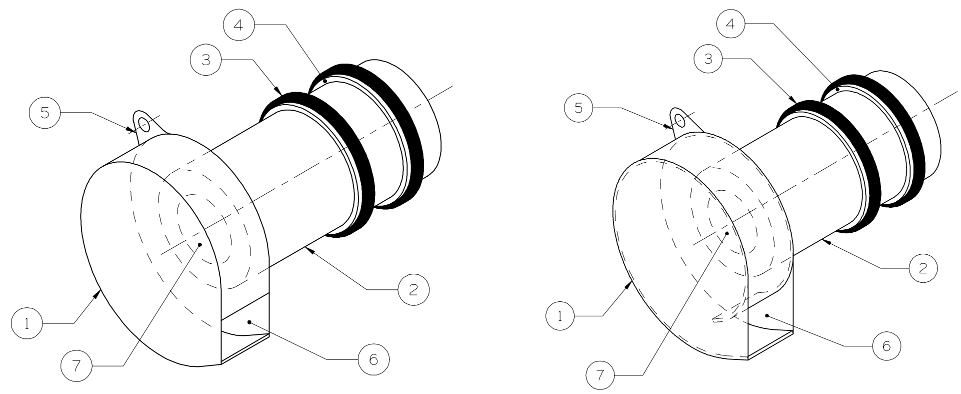
One of the major problems of urban wet weather flow management is the runoff generated after a heavy rainfall. During a storm, uncontrolled flows may overload the drainage system and cause flooding. Due to increased velocities, sewer pipe wear is increased dramatically and results in network deterioration. In a combined sewer system, the wastewater treatment plant may also experience significant increases in flows during storms, thereby losing its treatment efficiency.

A simple means of controlling excessive water runoff is by controlling excessive flows at their origin (manholes). **John Meunier Inc.** manufactures the **HYDROVEX® VHV / SVHV** line of vortex flow regulators to control stormwater flows in sewer networks, as well as manholes.

The vortex flow regulator design is based on the fluid mechanics principle of the forced vortex. This grants flow regulation without any moving parts, thus reducing maintenance. The operation of the regulator, depending on the upstream head and discharge, switches between orifice flow (gravity flow) and vortex flow. Although the concept is quite simple, over 12 years of research have been carried out in order to get a high performance.

The **HYDROVEX® VHV / SVHV** Vertical Vortex Flow Regulators **(refer to Figure 1)** are manufactured entirely of stainless steel, and consist of a hollow body (**1**) (in which flow control takes place) and an outlet orifice (**7**). Two rubber "O" rings (**3**) seal and retain the unit inside the outlet pipe. Two stainless steel retaining rings (**4**) are welded on the outlet sleeve to ensure that there is no shifting of the "O" rings during installation and use.

1. **BODY**
2. **SLEEVE**
3. **O-RING**
4. **RETAINING RINGS (SQUARE BAR)**
5. **ANCHOR PLATE**
6. **INLET**
7. **OUTLET ORIFICE**



VHV ***SVHV***

FIGURE 1: HYDROVEX® VHV-SVHV VERTICAL VORTREX FLOW REGULATORS

ADVANTAGES

- The **HYDROVEX® VHV / SVHV** line of flow regulators are manufactured entirely of stainless steel, making them durable and corrosion resistant.
- Having no moving parts, they require minimal maintenance.
- The geometry of the **HYDROVEX® VHV / SVHV** flow regulators allows a control equal to an orifice plate, having a cross section area 4 to 6 times smaller. This decreases the chance of blockage of the regulator, due to sediments and debris found in stormwater flows. **Figure 2** illustrates the comparison between a regulator model 100 SVHV-2 and an equivalent orifice plate. One can see that for the same height of water, the regulator controls a flow approximately four times smaller than an equivalent orifice plate.
- Installation of the **HYDROVEX® VHV / SVHV** flow regulators is quick and straightforward and is performed after all civil works are completed.
- Installation requires no special tools or equipment and may be carried out by any contractor.
- Installation may be carried out in existing structures.

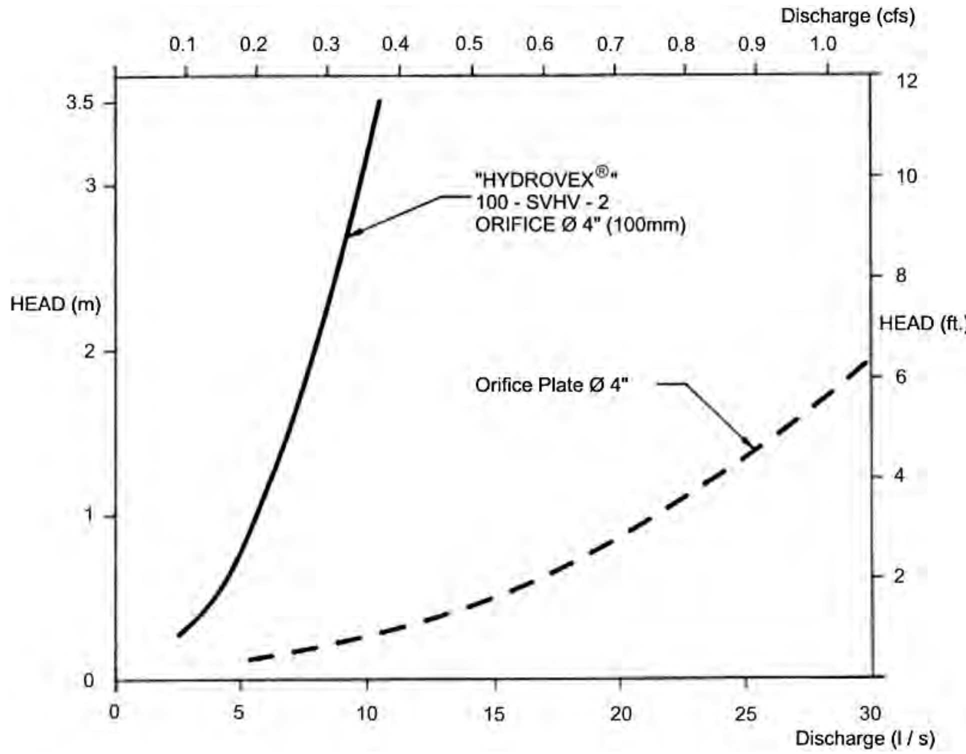


FIGURE 2: DISCHARGE CURVE SHOWING A HYDROVEX® FLOW REGULATOR VS AN ORIFICE PLATE

SELECTION

Selection of a **VHV or SVHV** regulator can be easily made using the selection charts found at the back of this brochure (see **Figure 3**). These charts are a graphical representation of the maximum upstream water pressure (head) and the maximum discharge at the manhole outlet. The maximum design head is the difference between the maximum upstream water level and the invert of the outlet pipe. All selections should be verified by John Meunier Inc. personnel prior to fabrication.

Example:

✓ Maximum design head	2m (6.56 ft.)
✓ Maximum discharge	6 L/s (0.2 cfs)
✓ Using **Figure 3** - VHV	model required is a **75 VHV-1**

INSTALLATION REQUIREMENTS

All **HYDROVEX® VHV / SVHV** flow regulators can be installed in circular or square manholes. **Figure 4** gives the various minimum dimensions required for a given regulator. ***It is imperative to respect the minimum clearances shown to ensure easy installation and proper functioning of the regulator.***

SPECIFICATIONS

In order to specify a **HYDROVEX®** regulator, the following parameters must be defined:

- The model number (ex: 75-VHV-1)
- The diameter and type of outlet pipe (ex: 6" diam. SDR 35)
- The desired discharge (ex: 6 l/s or 0.21 CFS)
- The upstream head (ex: 2 m or 6.56 ft.) *
- The manhole diameter (ex: 36" diam.)
- The minimum clearance "H" (ex: 10 inches)
- The material type (ex: 304 s/s, 11 Ga. standard)

*	***Upstream head is defined as the difference in elevation between the maximum upstream water level and the invert of the outlet pipe where the HYDROVEX® flow regulator is to be installed.***

PLEASE NOTE THAT WHEN REQUESTING A PROPOSAL, WE SIMPLY REQUIRE THAT YOU PROVIDE US WITH THE FOLLOWING:

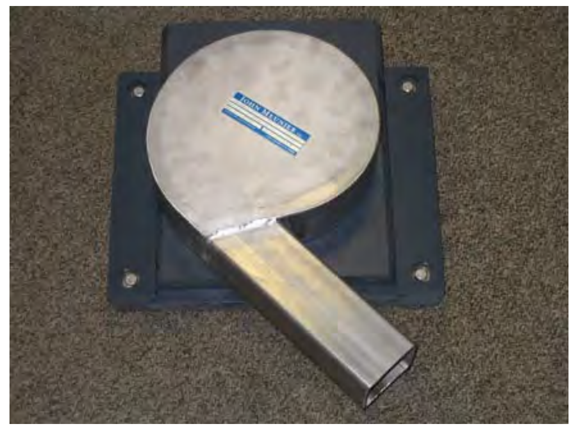
- ***project design flow rate***
- ***pressure head***
- ***chamber's outlet pipe diameter and type***

Typical VHV model in factory

OPTIONS

FV – SVHV (mounted on sliding plate)

VHV-1-O (standard model with odour control inlet)



FV – VHV-O (mounted on sliding plate with odour control inlet)

VHV with Gooseneck assembly in existing chamber without minimum release at the bottom

VHV with air vent for minimal slopes

VHV Vertical Vortex Flow Regulator

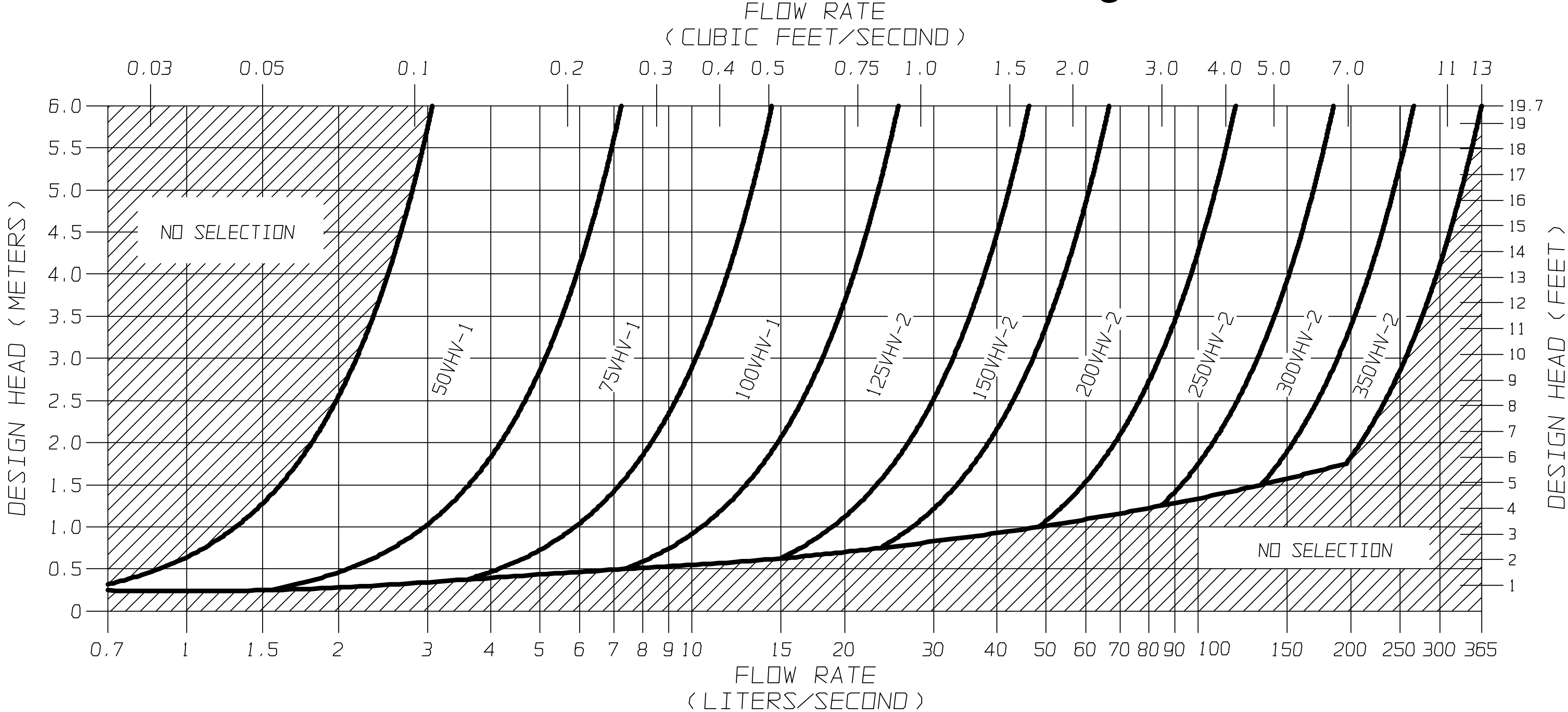


FIGURE 3 - VHV

HYDROVEX®

SVHV Vertical Vortex Flow Regulator

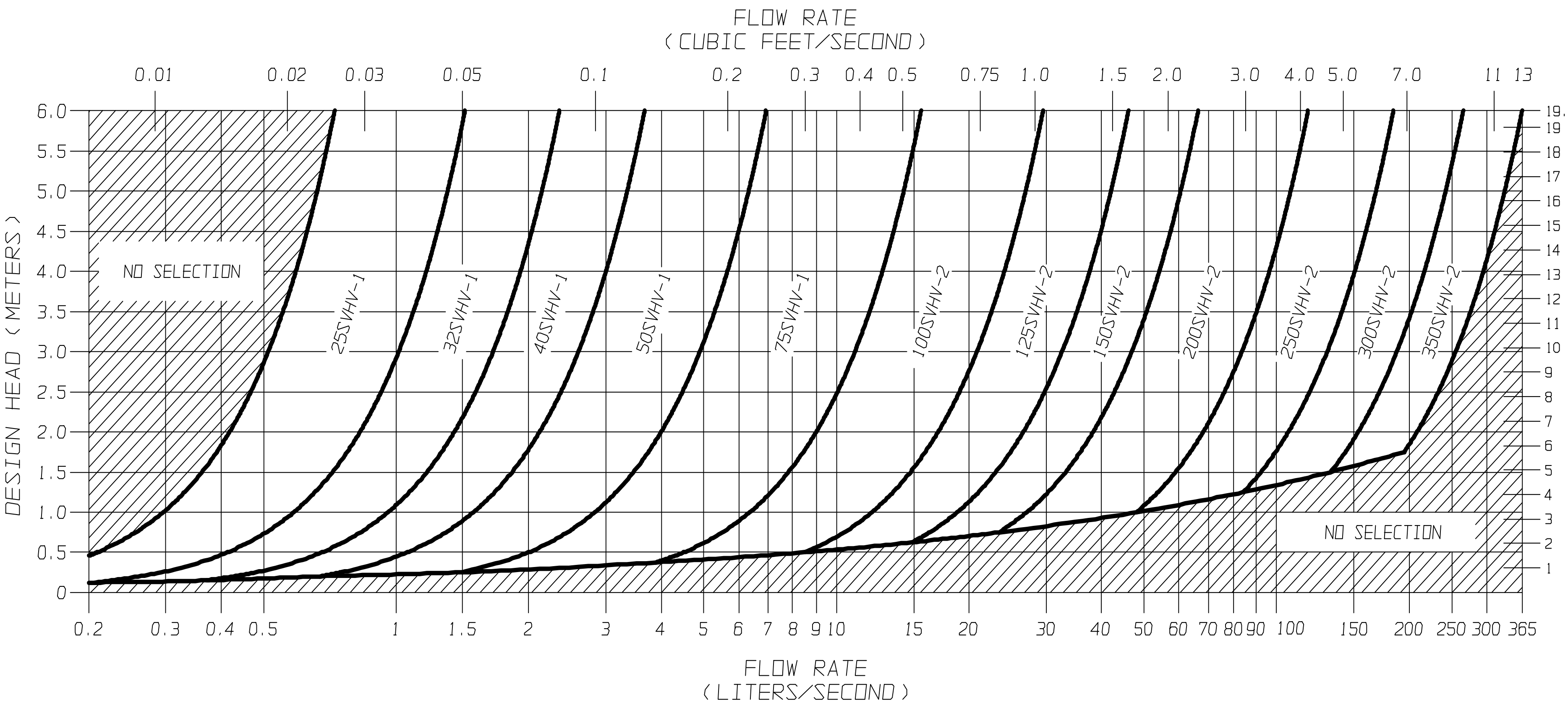
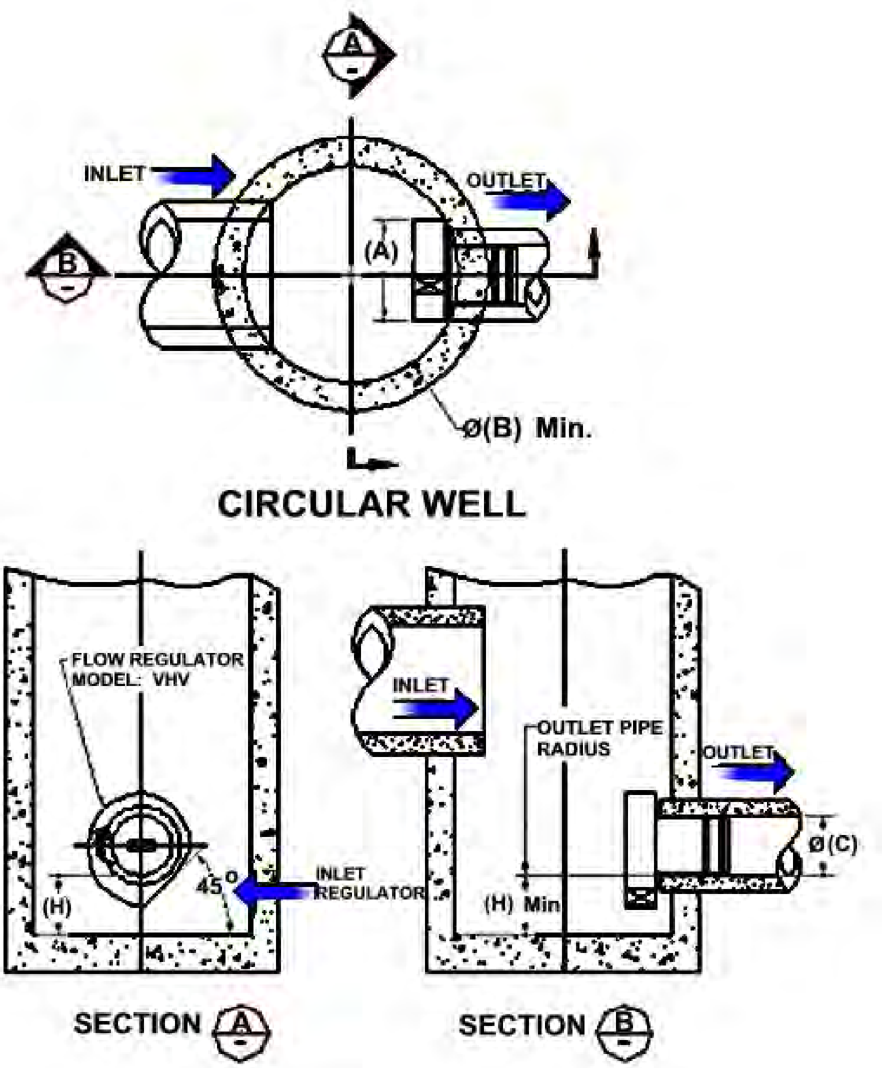


FIGURE 3 - SVHV

JOHN MEUNIER

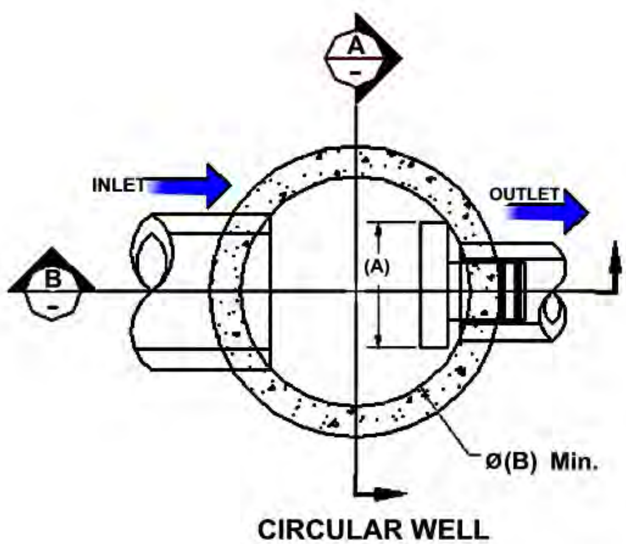
FLOW REGULATOR TYPICAL INSTALLATION IN CIRCULAR MANHOLE
FIGURE 4 (MODEL VHV)

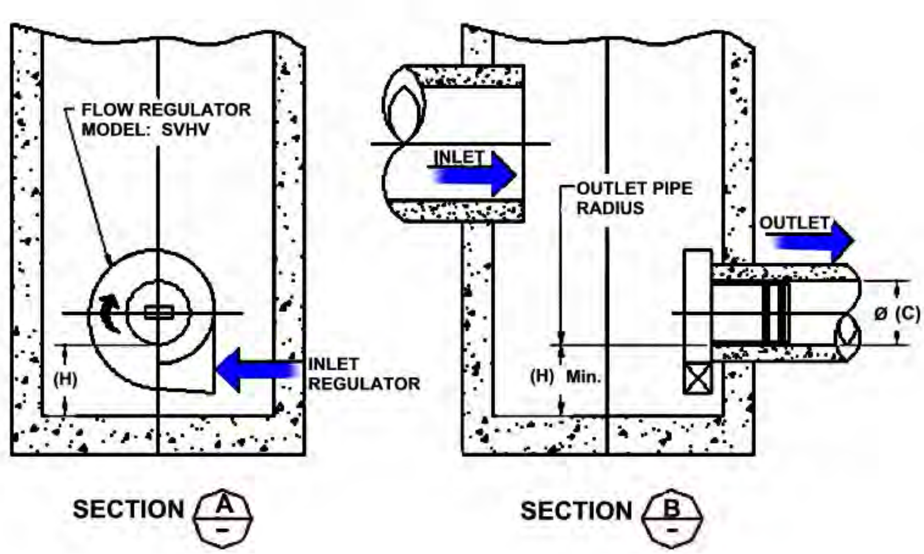
Model Number	Regulator Diameter		Minimum Manhole Diameter		Minimum Outlet Pipe Diameter		Minimum Clearance	
	A (mm)	**A** (in.)	**B** (mm)	**B** (in.)	**C** (mm)	**C** (in.)	**H** (mm)	**H** (in.)
50VHV-1	150	6	600	24	150	6	150	6
75VHV-1	250	10	600	24	150	6	150	6
100VHV-1	325	13	900	36	150	6	200	8
125VHV-2	275	11	900	36	150	6	200	8
150VHV-2	350	14	900	36	150	6	225	9
200VHV-2	450	18	1200	48	200	8	300	12
250VHV-2	575	23	1200	48	250	10	350	14
300VHV-2	675	27	1600	64	250	10	400	16
350VHV-2	800	32	1800	72	300	12	500	20



FLOW REGULATOR TYPICAL INSTALLATION IN CIRCULAR MANHOLE
FIGURE 4 (MODEL SVHV)

Model Number	Regulator Diameter		Minimum Manhole Diameter		Minimum Outlet Pipe Diameter		Minimum Clearance	
	A (mm)	**A** (in.)	**B** (mm)	**B** (in.)	**C** (mm)	**C** (in.)	**H** (mm)	**H** (in.)
25 SVHV-1	125	5	600	24	150	6	150	6
32 SVHV-1	150	6	600	24	150	6	150	6
40 SVHV-1	200	8	600	24	150	6	150	6
50 SVHV-1	250	10	600	24	150	6	150	6
75 SVHV-1	375	15	900	36	150	6	275	11
100 SVHV-2	275	11	900	36	150	6	250	10
125 SVHV-2	350	14	900	36	150	6	300	12
150 SVHV-2	425	17	1200	48	150	6	350	14
200 SVHV-2	575	23	1600	64	200	8	450	18
250 SVHV-2	700	28	1800	72	250	10	550	22
300 SVHV-2	850	34	2400	96	250	10	650	26
350 SVHV-2	1000	40	2400	96	250	10	700	28

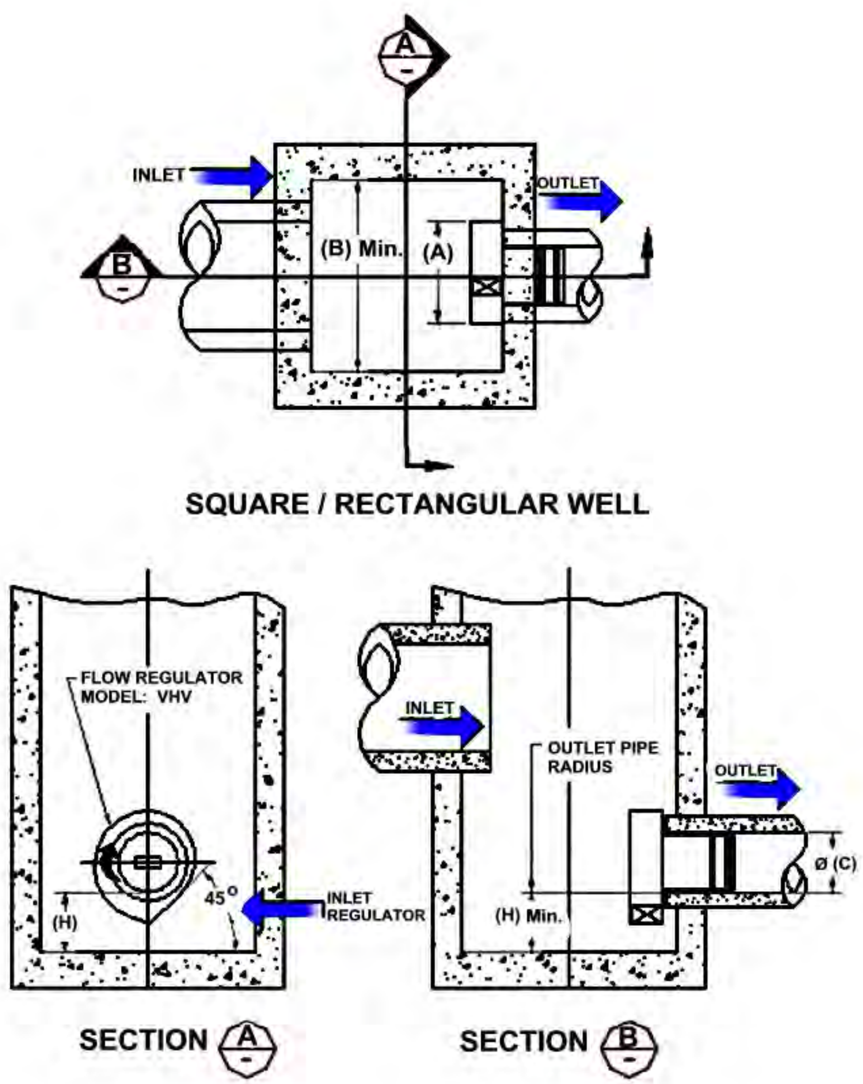




FLOW REGULATOR TYPICAL INSTALLATION IN SQUARE MANHOLE
FIGURE 4 (MODEL VHV)

Model Number	Regulator Diameter		Minimum Chamber Width		Minimum Outlet Pipe Diameter		Minimum Clearance	
	A (mm)	**A** (in.)	**B** (mm)	**B** (in.)	**C** (mm)	**C** (in.)	**H** (mm)	**H** (in.)
50VHV-1	150	6	600	24	150	6	150	6
75VHV-1	250	10	600	24	150	6	150	6
100VHV-1	325	13	600	24	150	6	200	8
125VHV-2	275	11	600	24	150	6	200	8
150VHV-2	350	14	600	24	150	6	225	9
200VHV-2	450	18	900	36	200	8	300	12
250VHV-2	575	23	900	36	250	10	350	14
300VHV-2	675	27	1200	48	250	10	400	16
350VHV-2	800	32	1200	48	300	12	500	20

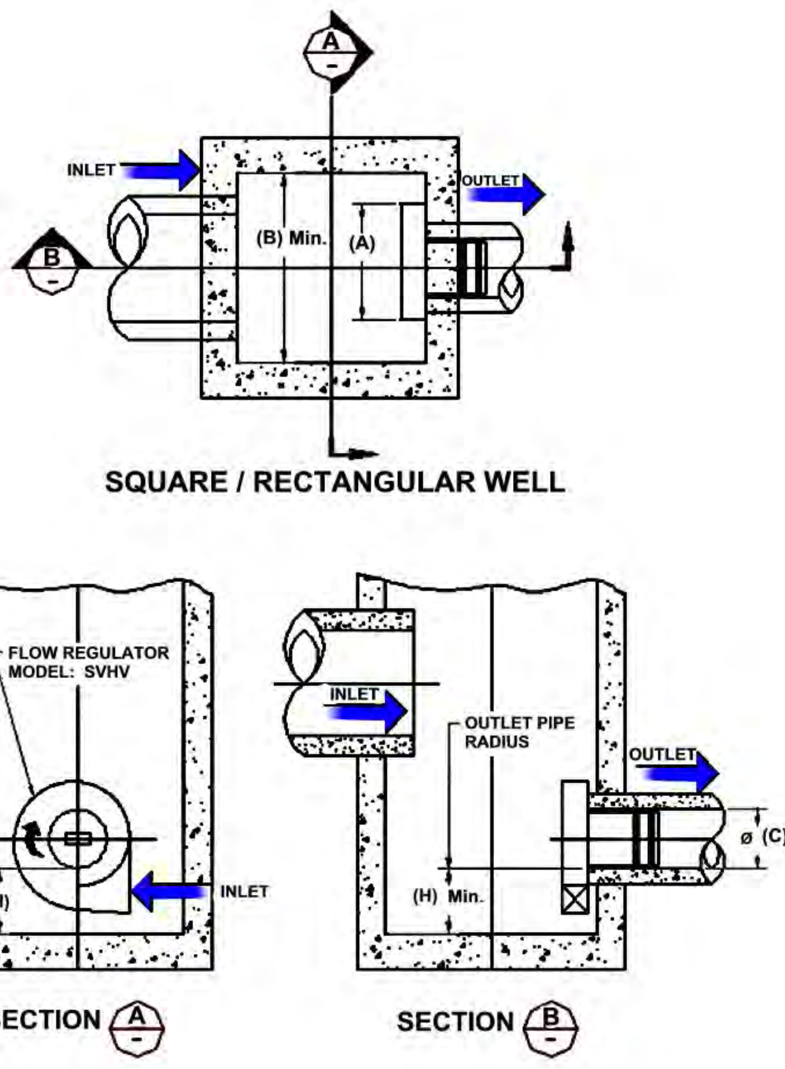
NOTE: ***In the case of a square manhole, the outlet flow pipe must be centered on the wall to ensure enough clearance for the unit.***



FLOW REGULATOR TYPICAL INSTALLATION IN SQUARE MANHOLE
FIGURE 4 (MODEL SVHV)

Model Number	Regulator Diameter		Minimum Chamber Width		Minimum Outlet Pipe Diameter		Minimum Clearance	
	A (mm)	**A** (in.)	**B** (mm)	**B** (in.)	**C** (mm)	**C** (in.)	**H** (mm)	**H** (in.)
25 SVHV-1	125	5	600	24	150	6	150	6
32 SVHV-1	150	6	600	24	150	6	150	6
40 SVHV-1	200	8	600	24	150	6	150	6
50 SVHV-1	250	10	600	24	150	6	150	6
75 SVHV-1	375	15	600	24	150	6	275	11
100 SVHV-2	275	11	600	24	150	6	250	10
125 SVHV-2	350	14	600	24	150	6	300	12
150 SVHV-2	425	17	600	24	150	6	350	14
200 SVHV-2	575	23	900	36	200	8	450	18
250 SVHV-2	700	28	900	36	250	10	550	22
300 SVHV-2	850	34	1200	48	250	10	650	26
350 SVHV-2	1000	40	1200	48	250	10	700	28

NOTE: ***In the case of a square manhole, the outlet flow pipe must be centered on the wall to ensure enough clearance for the unit.***



INSTALLATION

The installation of a **HYDROVEX®** regulator may be undertaken once the manhole and piping is in place. Installation consists of simply fitting the regulator into the outlet pipe of the manhole. **John Meunier Inc.** recommends the use of a lubricant on the outlet pipe, in order to facilitate the insertion and orientation of the flow controller.

MAINTENANCE

HYDROVEX® regulators are manufactured in such a way as to be maintenance free; however, a periodic inspection (every 3-6 months) is suggested in order to ensure that neither the inlet nor the outlet has become blocked with debris. The manhole should undergo periodically, particularly after major storms, inspection and cleaning as established by the municipality

GUARANTY

The **HYDROVEX®** line of **VHV / SVHV** regulators are guaranteed against both design and manufacturing defects for a period of 5 years. Should a unit be defective, **John Meunier Inc.** is solely responsible for either modification or replacement of the unit.

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ISO 9001 : 2008

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