WOODMAN ARCHITECT & ASSOCIATES INC.

357-361-363 PRESTON STREET
STORMWATER MANAGEMENT REPORT

MARCH 07, 2022

357-361-363 PRESTON STREET STORMWATER MANAGEMENT REPORT

WOODMAN ARCHITECT & ASSOCIATES INC.

1ST SUBMISSION

PROJECT NO.: 221-00041-00
CLIENT REF:
DATE: MARCH 07, 2022

WSP
SUITE 300
2611 QUEENSVIEW DRIVE
OTTAWA, ON, CANADA K2B 8K2

T: +1 613 829-2800
F: +1 613 829-8299
WSP.COM

REVISION HISTORY

FIRST ISSUE

March 7th, 2022	Draft SWM Report			
Prepared by	Reviewed by	Approved By		
MO	AJ	AJ		

SIGNATURES

PREPARED BY

Meaghan O'Neill, EIT
Designer, Water Resources

March 7th, 2022

APPROVED[1] BY

Ayham Jadallah, M.Eng., P.Eng.
Project Engineer, Water Resources

March 7th, 2022

WSP Canada Inc. ("WSP") prepared this report solely for the use of the intended recipient, Woodman Architect & Associates Inc., in accordance with the professional services agreement. The intended recipient is solely responsible for the disclosure of any information contained in this report. The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation. If a third party makes use of, relies on, or makes decisions in accordance with this report, said third party is solely responsible for such use, reliance or decisions. WSP does not accept responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken by said third party based on this report. This limitations statement is considered an integral part of this report.

The original of this digital file will be conserved by WSP for a period of not less than 10 years. As the digital file transmitted to the intended recipient is no longer under the control of WSP, its integrity cannot be assured. As such, WSP does not guarantee any modifications made to this digital file subsequent to its transmission to the intended recipient.

[1] Approval of this document is an administrative function indicating readiness for release and does not impart legal liability on to the Approver for any technical content contained herein. Technical accuracy and fit-for-purpose of this content is obtained through the review process. The Approver shall ensure the applicable review process has occurred prior to signing the document.

CONTRIBUTORS

CLIENT

Woodman Architect & Associates Inc.	Joseph Peloso

WSP

Water Resources, Designer	Meaghan O'Neill
Water Resources, Project Engineer	Ayham Jadallah

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1 INTRODUCTION

1.1 SCOPE

WSP Canada Inc. was retained by Woodman Architect & Associates Inc. to prepare a Stormwater Management (SWM) report for the proposed construction of a six (6) storey building comprising of underground vehicle parking with commercial space on the ground floor. This SWM report examines the potential water quality and quantity impacts of the proposed development and summarizes how each will be addressed in accordance with applicable guidelines.

1.2 SITE LOCATION

The proposed development is located across three existing lots, 357, 361, and 363 Preston Street, Ottawa, Ontario. The subject site is bounded by Aberdeen Street, Preston Street, and Beech Street to the north, west, and south respectively, and a large parking area to the east. The location of the proposed development is illustrated in Figure 1

Figure 1: Project Location

1.3 STORMWATER MANAGEMENT PLAN OBJECTIVES

The objectives of the stormwater management plan are as follows:

- → Collect and review background information.
- → Determine the site-specific stormwater management requirements to ensure that the proposals are in conformance with the applicable Provincial, Municipal and Conservation Authority stormwater management and development guidelines.
- → Evaluate various stormwater management practices that meet the applicable SWM and development requirements and recommend a preferred strategy.
- → Prepare a stormwater management report documenting the strategy along with the technical information necessary for the justification and sizing of the proposed stormwater management facilities.

1.4 DESIGN CRITERIA

Design criteria were taken from the Pre-Application Consultation Meeting with the City of Ottawa on June 21st, 2021 (meeting notes included in **Appendix A**). Criteria for the Preston Street development are as follows:

- → **Stormwater Quantity-** control post-development flows (2 to 100-year storm events) to the 2-year pre-development discharge with a runoff coefficient that is the lesser of the actual runoff coefficient or 0.5 per City of Ottawa Standards for a redevelopment.
- → **Storm Quality-** Per correspondence with the Rideau Valley Conservation Authority (RVCA), there are no water quality criteria for this site. Best practices stormwater management approaches will be applied. RVCA correspondence is included in **Appendix B**.

2 PRE-DEVELOPMENT CONDITIONS

2.1 GENERAL

Under existing conditions, 357, 361, and 363 Preston Street are currently developed as a paved parking area, a residential building, and a commercial restaurant respectively. The three lots are all completely impervious, paved parking and walkway, and building area. Vehicular access to the sites is off of both Preston Street and Aberdeen Street.

Under existing conditions the site drains overland to the existing combined sewers along Preston and Aberdeen Street.

As shown on Figure 2, the three sites are approximately 0.08 ha of entirely impervious area with a runoff coefficient of 0.90. However, as discussed in section 1.4, per City of Ottawa criteria, a runoff coefficient of 0.5 was used when evaluating pre-development peak flows.

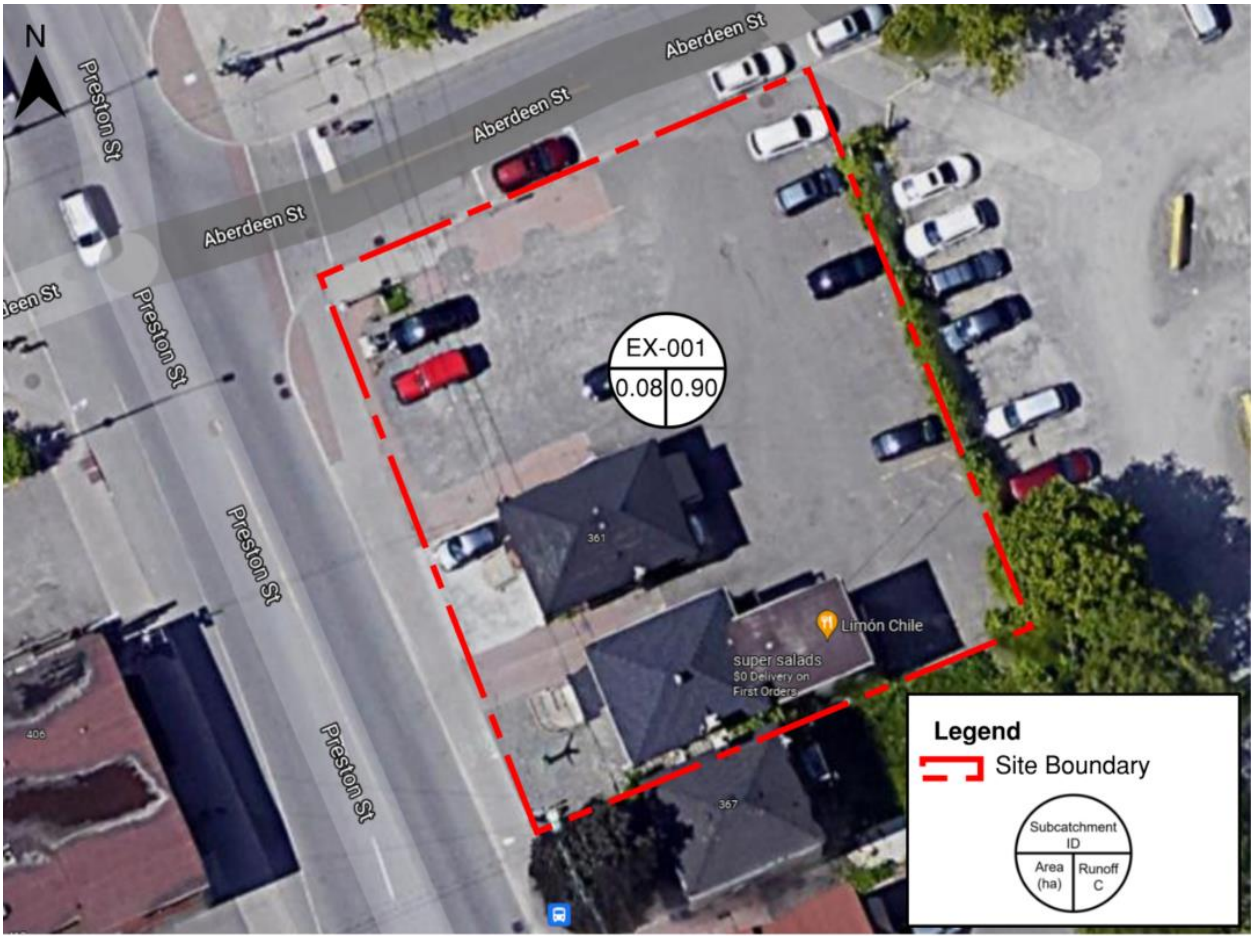


Figure 2: Existing Conditions Catchment Area

2.2 RAINFALL INFORMATION

The rainfall intensity is calculated in accordance with Section 5.4.2 of the Ottawa Sewer Design Guidelines (October, 2012):

Where;

$$i = \left[\frac{A}{(Td + C)^B}\right]$$

- A, B, C = regression constants for each return period (defined in section 5.4.2)
- i = rainfall intensity (mm/hour)
- Td = storm duration (minutes)

The IDF parameters/regression constants are per the Ottawa Sewer Design Guidelines (October, 2012).

2.3 ALLOWABLE FLOW RATES

As noted in section 1.4, it is required that post development discharge rates from the site match the pre-development 2-year storm event peak discharge rate (8.8 L/s).

HydroCAD software was used to calculate the pre-development peak flow rates for the 2 through 100-year storm events, results are summarized in Table 1. Detailed Rational Method calculations is included in **Appendix C**.

Table 1: Pre-Development Peak Flow Rate Calculations (Based on T_d = 10 minutes, C = 0.5)

RETURN PERIOD (Years)	RAINFALL INTENSITY, I (mm/hour)	SITE PEAK FLOW RATE (L/s)	TARGET RELEASE RATE (L/s)
2	76.8	8.8	**8.8**
5	104.2	12.0	
10	122.1	14.0	
25	144.7	18.3	
50	161.5	22.2	
100	178.6	25.4	

3 POST-DEVELOPMENT CONDITIONS

3.1 GENERAL

The site will be developed with a 6-storey multi use commercial and residential building covering the majority of the project site. The remainder of the 0.08 ha site will remain impervious paved area. The proposed building will include a commercial space on the ground floor, residential units on the remaining 5 storeys, an underground parking facility, and a rooftop amenity space. Under proposed conditions the site will continue to be accessed from Preston Street and Aberdeen Street.

An estimated area breakdown of the proposed site layout is summarized in Table 2 and shown on Figure 3.

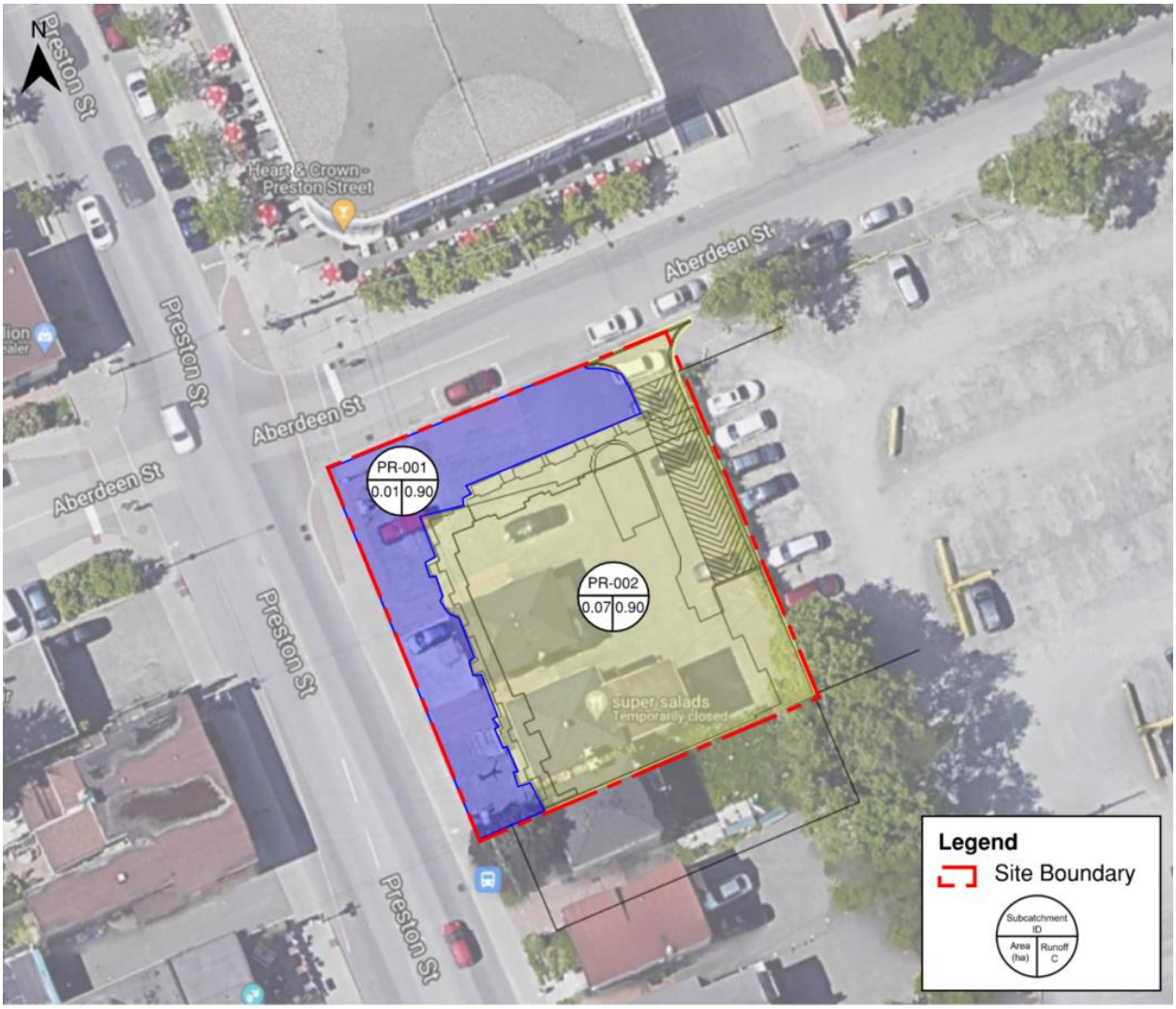


Figure 3: Proposed Conditions Catchment Areas

Table 2: Proposed Land-Use Area Breakdown

Catchment ID	AREA (ha)	% COVERAGE OF PROJECT AREA	RUNOFF COEFFICIENT
Un-Controlled Drainage Areas			
PR-001 (Pathway / Patio Area)	0.01	12.5%	0.90 (1.00*)
Controlled Drainage Areas			
PR-002 (Building Area)	0.07	87.5%	0.90 (1.00*)
TOTAL SITE AREA	**0.08**		**0.90 (1.00*)**

*Runoff coefficients increased by 25% 100-year storm per the City of Ottawa Sewer Design Guidelines (Section 5.4.5.2.1)

To meet the stormwater management objectives, as defined by the design criteria outlined in Section 1.4, the following components have been proposed:

- → Underground storage unit located within the parking facility
- → Flow controlled with a Hydrovex 75VHV-1 (or equivalent) inlet control device (ICD)

The application and sizing of these proposed stormwater management facilities is outlined in the following sections.

3.2 WATER QUANTITY

As noted previously, it is required that the post-development discharge rate from the site be controlled to the pre-development 2-year peak flow. Therefore, the allowable discharge rate to the Aberdeen sewer is 8.8 L/s.

It is noted that only the building area will drain to the proposed underground storage unit. Surface drainage from surrounding the building will be drained uncontrolled into the road ROW. As shown in Table 2, the uncontrolled area is approximately 12.5% of the total site area. Post development runoff calculations have accounted for runoff from uncontrolled areas such that the total peak discharge from the site meets the allowable release rate of 8.8 L/s. There are no external drainage areas draining to the site.

HydroCAD software was used to model the behaviour of the proposed SWM system and determine its response under various storm events. The software calculates flow rates and related storage values and helps identify the critical duration for different components of the system. For this site, the critical storm duration (100-year) for peak discharge from the site occurs at 12 minutes, however, the maximum storage utilized occurs at 42 minutes.

It was determined that a 25.4 m^3 storage unit controlled with a 75VHV-1 (or equivalent) ICD is sufficient to meet the quantity control requirements. A summary of the modeling results is provided Table 3, detailed HydroCAD output is included in **Appendix C**.

Table 3: Summary of HydroCAD Modelling Results

Return Period (Years)	Time of Conc. (min)	Utilized Storage	Total Flow Leaving Site	Max Head in Storage Unit	ICD Flow at Max Head	Allowable 100-yr Flow Rate
		(m^3)	(L/s)	(m)	(L/s)	(L/s)
100 (Peak Discharge)	12	19.8	**8.8**	1.5	5.5	**8.8**
100 (Peak Storage)	42	**25.4**	8.0	**2.0**	6.4	

As the proposed storage unit is located in the underground parking garage, an overflow pipe is proposed at the 100-year water level to prevent excess water from backing up within the building. In an extreme event in which the 100-

year volume is exceeded, excess flow will be discharged via the overflow pipe to an overflow manhole located in the north-west corner of the property which will spill flow overland to the road ROW.

3.3 WATER QUALITY

As per Section 1.4, there are no specific quality control criteria for this site. Therefore, best practice stormwater management approaches have been applied.

As previously discussed, all parking for the proposed site will be covered underground, and the majority of the site will be building roof area, thus, the surface of the site will have no vehicular traffic. Therefore, it is assumed the site will generally be free of typical sediment generating activities and runoff will leave the site effectively unchanged and can be considered clean for the purposes of water quality assessment. Additionally, under existing conditions the site is primarily above ground parking area, and so, the proposed development is seen as a significant improvement on existing conditions from a quality control perspective.

4 CONCLUSIONS

A stormwater management report has been prepared to support the design of the proposed multi use 6-storey building located at 357, 361, and 363 Preston Street in Ottawa. The key points are summarized below.

WATER QUANTITY

Controlled runoff from the site will be detained in a 25.4 m^3 underground storage unit and released at a controlled rate using an ICD (75VHV-1 or equivalent).

WATER QUALITY

Per correspondence with the RVCA, no water quality infrastructure is required. Due to the proposed land use conditions of the site, runoff will leave the site effectively unchanged and can be considered clean from a water quality perspective.

This report has demonstrated the proposed SWM strategy will address stormwater management related impacts from this project and meet the applicable design requirements.

APPENDIX

A PRE-CONSULTATION MEETING MINUTES

Pre-Application Consultation Meeting Notes

Property Address: 357, 361 and 363 Preston Street
PC2021-0208
Monday, June 21, 2021
2pm – 3pm via Microsoft Teams

Attendees:

City of Ottawa
Jean-Charles Renaud, File Lead
Holly Newitt, Student Planner
Wally Dubyk, Transportation
Reza Bakhit, Engineer
Randolph Wang, Urban Design
Forestry – regrets

Applicant Team
Jefferey Kelly, Novatech
Murray Chown, Novatech
Woodman Team
Joshua Audia
Jennifer Luong
Miro Savic

Community Association
Ed McKenna
David Seaborn

Subject: 357, 361 and 363 Preston Street

Meeting Notes:

Opening & attendee introduction

- Introduction of attendees and opening remarks

Overview of proposal

Woodman Team

- Situated on the corner of Aberdeen and Preston
- 6 storey mixed use, commercial at grade with residential – 40 units including penthouse
    - Mix of 2-bedroom, 1-bedroom and studio units
    - 2 commercial units
    - Rooftop amenity space and private balcony/terraces
- Aberdeen Street setback infringement- MV or ZBA
    - Caused by a balcony
- 29 bike spots on ground floor
- Ramp to access underground parking garage
- 11 parking spaces underground
- Mixed palette materiality - glazing, metal, stone, and cladding

Technical Comments:

Jean-Charles Renaud, Planner

- Bike parking at grade is great, would encourage 1:1 or better
- Consider the 450 Rochester proposal in terms of proximity, adjacency and interactions
- Consult the Secondary Plan in providing landscaping along the street edge.

Randolph, Urban Design

- A Design Brief is required as part of the submission. The Terms of Reference of the Design Brief is attached for convenience. As part of the Design Brief, it is important to show the proposed development in both the existing and planned context. The future context can be represented by the proposed development at 450 Rochester, which can be found on the City's Dev Apps.
- The Preston-Carling District Secondary Plan requires the completion of a public realm network study for any development in the area within the context of the Council-approved Preston-Carling District Public Realm Study.
    - Please forward the Preston-Carling District Public Realm Study to the applicant (I have shared with you).
    - An example of such a study can be found as part of the 450 Rochester.
- The property is within a Design Priority Area. The proposed development is subject to the former review by the City's Urban Design Review Panel (UDRP). Please visit the UDRP website for detailed information about submission and scheduling.
- The height and massing of the proposed building is generally appropriate. Please consider the following for further advancement:
    - Please ensure ROW protections are taken as part of development.
    - Please study the public realm plan of Preston Street and the development 450 Rochester to ensure seamless integration.
    - Please note the proposed garage entrance abuts the proposed loading area of 450 Rochester. Coordination between the two projects is required.
    - The proposed "angles" at the corner of Preston and Aberdeen are interesting yet arbitrary. It may create some volumetric effects on the building facades but it may be not be most conducive to public realm and may compromise interior efficiencies. With respect to public realm, for example, it looks like the building wants to draw pedestrian attention to its garbage room and the garage entrance (see Diagram 1). Generally speaking, provision of more generous public realm at the street corner is more appropriate and desirable.
    - The many "intersecting" brick and stone "frames" on the Preston facade may be too complicated (see Diagram 2);
    - The hanging brick "frame" on Aberdeen also requires some more thinking (see Diagram 3). Generally, a "grounded" building is more appropriate for public realm and blend into the urban fabric more harmoniously.
    - Please continue to study the relationship between the east facing units and the proposed development at 450 Rochester.

Wally Dubyk, Transportation

- A Screening Form is to be submitted to determine if a transportation study is required. Consultants should fill in the form in Appendix 'B'. Click on the website: www.ottawa.ca/TIA
- Update to the TIA Guideline Forecasting Report
    - We would like to inform all consultants making TIA Forecasting Report submissions to the City of Ottawa as part of a development application, that all new applications (pre-consultation meetings dated after March 3, 2021) must use the NEW TRANS Trip

Generation Manual when forecasting site generated trips using this manual (see attached).
    - The TRANS committee (a joint transportation planning committee serving the National Capital region) finalized a new manual early in March 2021. The document will be available in French and English on the TRANS website http://www.ncr-trans-rcn.ca/surveys/2009-trip-generation.
    - The new manual has simplified the conversion from vehicle trips to person trips and then trips by modal share. The City has also developed a spreadsheet that will apply the factors of location and building type to quickly provide the existing trip numbers by mode share.
- Preston Street is designated as an Arterial road within the City's Official Plan with a ROW protection of 23.0 metres. The ROW protection limit offset distance (11.5 metres) is to be dimensioned from the existing centerline of pavement and shown on the drawings. The Certified Ontario Land Surveyor is to confirm the ROW protected limits and any portion that may fall within the private property to be conveyed to the City.
- ROW interpretation – Land for a road widening will be taken equally from both sides of a road, measured from the centreline in existence at the time of the widening if required by the City. The centreline is a line running down the middle of a road surface, equidistant from both edges of the pavement. In determining the centreline, paved shoulders, bus lay-bys, auxiliary lanes, turning lanes and other special circumstances are not included in the road surface.
- A 5.0 metres x 5.0 metres sight triangle would be required at the intersection of Preston Street and Aberdeen Street. The sight triangle dimensions are to be measured from the ROW protected limits and is to be shown on all drawings. The sight triangle area is to be conveyed to the City.
- Please keep in mind that on street parking is not a viable option for tenants. Ensure that potential tenants are aware that there is no provision for parking.
- All underground and above ground building footprints and permanent walls need to be shown on the plan to confirm that any permanent structure does not extend either above or below into the existing property lines, sight triangles and/or future road widening protection limits.
- Permanent structures such as curbing, stairs, retaining walls, and underground parking foundation also bicycle parking racks are not to extend into the City's right-of-way limits.
- The consultant should review the sight distance at the intersection and any obstructions that may hinder the view of the driver.
- No private approach shall be constructed within 0.3 metres of any adjacent property measured at the highway line, and at the curb line or roadway edge.
- The closure of an existing private approach shall reinstate the sidewalk, shoulder, curb and boulevard to City standards.
- The concrete sidewalk should be 2.0 metres in width and be continuous and depressed through the proposed access.
- The proponent shall comply with the Private Approach By-Law 2003-447
- Ensure that the driveway grade does not exceed 2% within the private property for a distance of 6.0 metres from the ROW limit; see Section 25 (s) of the Private Approach By-Law #2003-447. Any grade exceeding 6% will require a subsurface melting device. For private property, the mechanism to vary the slope is a minor variance. The consultant would need to provide technical rationale.
- The Owner shall be required to enter into maintenance and liability agreement for all pavers, plant and landscaping material placed in the City right-of-way and the Owner shall assume all maintenance and replacement responsibilities in perpetuity.

- Bicycle parking spaces are required as per Section 111 of the Ottawa Comprehensive Zoning By-law. Bicycle parking spaces should be located in safe, secure places near main entrances and preferably protected from the weather.
- A construction Traffic Management Plan is to be provided for approval by the Senior Engineer, Traffic Management, Transportation Services Dept.

Reza Bakhit, Engineer

General:

- It is the sole responsibility of the consultant to investigate the location of existing underground utilities in the proposed servicing area and submit a request for locates to avoid conflict(s). The location of existing utilities and services shall be documented on an **Existing Conditions Plan**.
- Any easements on the subject site shall be identified and respected by any development proposal and shall adhere to the conditions identified in the easement agreement. A **legal survey plan** shall be provided, and all easements shall be shown on the engineering plans.
- An application to consolidate the parcels (357, 361 and 363 Preston Street) of land will be required otherwise the proposed stormwater works will be servicing more than one parcel of land and thus does not meet the exemption set out in O.Reg. 525/98. This would mean an **ECA would be required** regardless of who owns the parcels.
- The subject site is located within a combined sewershed therefore the approval exemption under O.Reg. 525/98 **would not apply,** and an Environmental Compliance Approval **(ECA) application** will be required. (One ECA can cover both SWM and the connection to the combined sewer). Please note that the ECA for connection to the combined sewer system will be warranted regardless of consolidating the subject lots.
- Reference documents for information purposes :
    - Ottawa Sewer Design Guidelines (October 2012)
    - Technical Bulletin PIEDTB-2016-01
    - Technical Bulletins ISTB-2018-01, ISTB-2018-02 and ISTB-2018-03.
    - Ottawa Design Guidelines - Water Distribution (2010)
    - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
    - City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
    - City of Ottawa Environmental Noise Control Guidelines (January 2016)
    - City of Ottawa Accessibility Design Standards (2012) (City recommends development be in accordance with these standards on private property)
    - Ottawa Standard Tender Documents (latest version)
    - Ontario Provincial Standards for Roads & Public Works (2013)
    - Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-424 x.44455).
- Please note that this is the applicant responsibility to refer to the latest applicable guidelines while preparing reports and studies.

Disclaimer:
The City of Ottawa does not guarantee the accuracy or completeness of the data and information contained on the above image(s) and does not assume any responsibility or liability with respect to any damage or loss arising from the use or interpretation of the image(s) provided. This image is for schematic purposes only

Stormwater Management Criteria and Information:

- **Water Quantity Control:** Please control post-development runoff from the subject site, up to and including the **100-year storm event**, to **a 2-year pre-development level.** The pre-development runoff coefficient will need to be determined **as per existing conditions** but in no case more than 0.5. [**If 0.5 applies it needs to be clearly demonstrated in the report that the pre-development runoff coefficient is greater than 0.5**]. The time of concentration (T_c) used to determine the pre-development condition should be calculated. *Tc should not be less than 10 min. since IDF curves become unrealistic at less than 10 min; T_c of 10 minutes shall be used for all post-development calculations*].
- Any storm events greater than the established **2-year allowable** release rate, up to and including the **100-year storm event**, shall be detained on-site. The SWM measures required to avoid impact on downstream sewer system will be subject to review.
- Please note that foundation drainage is to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention. **It is recommended that the foundation drainage system be drained by a sump pump connection to the storm sewer to minimize risk of basement flooding as it will provide the best protection from the uncontrolled sewer system compared to relying on the backwater valve.**
- **Water Quality Control:** Please consult with the local conservation authority (RVCA) regarding water quality criteria prior to submission of a Site Plan Control Proposal application to establish any water quality control restrictions, criteria and measures for the site. Correspondence and clearance shall be provided in the Appendix of the report.
- Please note that as per *Technical Bulletin PIEDTB-2016-01 section 8.3.11.1 (p.12 of 14)* **there shall be no surface ponding on private parking areas during the 5-year storm rainfall event**.
- **If Underground Storage proposed:** Please note that the Modified Rational Method for storage computation in the Sewer Design Guidelines was originally intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head

was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate.

  - When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. **We therefore require that an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate.**
  - In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modellers in the Water Resources Group.
  - Please provide information on UG storage pipe. Provide required cover over pipe and details, chart of storage values, capacity etc. How will this pipe be cleaned of sediment and debris?
  - Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc.
  - Provide a cross section of underground chamber system showing invert and obvert/top, major and minor HWLs, top of ground, system volume provided during major and minor events. UG storage to provide actual 2- and 100-year event storage requirements.
  - In regard to all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.
  - Modeling can be provided to ensure capacity for both storm and sanitary sewers for the proposed development by City's Water Distribution Dept. – Modeling Group, through PM and upon request.

- Please note that the minimum orifice dia. for a plug style **ICD is 83mm and the minimum flow rate from a vortex ICD is 6 L/s** in order to reduce the likelihood of plugging.
- Post-development site grading shall match existing property line grades in order to minimize disruption to the adjacent residential properties. A **topographical plan of survey** shall be provided as part of the submission and a note provided on the plans.
- Please provide a **Pre-Development Drainage Area Plan** to define the pre-development drainage areas/patterns. **Existing drainage patterns shall be maintained and discussed as part of the proposed SWM solution**.
- **If rooftop control and storage is proposed** as part of the SWM solutions sufficient details (Cl. 8.3.8.4) shall be discussed and document in the report and on the plans. Roof drains are to be connected downstream of any incorporated ICDs within the SWM system and not to the foundation drain system. Provide a **Roof Drain Plan** as part of the submission.
- Considering the size of the site, it would be acceptable to control the roof portion only and leave the remainder of the site uncontrol as long as the uncontrolled portion is directed towards the right of way. The grading plan should clearly demonstrate that the uncontrolled portion of the site would send the water towards the ROW.
- If **Window wells** are proposed, they are to be indirectly connected to the footing drains. A detail of window well with indirect connection is required, as is a note at window well location speaking to indirect connection.
- There must be at least **15cm of vertical clearance** between the spill elevation and the ground elevation at the building envelope that is in proximity of the flow route or ponding area. The exception in this case would be at reverse sloped loading dock locations. At these locations, a

minimum of 15cm of vertical clearance must be provided below loading dock openings. Ensure to provide discussion in report and ensure grading plan matches if applicable.

Combined Sewers:

- A 1500mm dia. CONC combined sewer (2008) is available within Preston Street**.**
- A 1200mm dia. CONC combined sewer (1997) is available within Aberdeen Street.
  Note: The connection to either would be acceptable. However, the Aberdeen is preferred.

Water:

- A 406 mm dia. PVC watermain (2008) is available within Preston Street**.**
- A 203mm dia. PVC watermain (1997) is available within Aberdeen Street.
- Existing residential service to be blanked at the main. (This has to be shown and noted on the servicing plans)
- **Water Supply Redundancy:** Residential buildings with a basic day demand greater than 50m^3/day (0.57 L/s) are required to be connected to a minimum of two water services separated by an isolation valve to avoid a vulnerable service area as per the *Ottawa Design Guidelines - Water Distribution, WDG001, July 2010 Clause 4.3.1 Configuration.* The basic day demand for this site not expected to exceed 50m^3/day.
- Please **review Technical Bulletin ISTB-2018-0**, maximum fire flow hydrant capacity is provided in Section 3 Table 1 of Appendix I. A **hydrant coverage figure** shall be provided and **demonstrate there is adequate fire protection for the proposal**. Two or more public hydrants are anticipated to be required to handle fire flow.
- Boundary conditions are required to confirm that the require fire flows can be achieved as well as availability of the domestic water pressure on the City street in front of the development. Use Table 3-3 of the MOE Design Guidelines for Drinking-Water System to determine Maximum Day and Maximum Hour peaking factors for 0 to 500 persons and use Table 4.2 of the Ottawa Design Guidelines, Water Distribution for 501 to 3,000 persons. Please provide the following information to the City of Ottawa via email to request water distribution network boundary conditions for the subject site. Please note that once this information has been provided to the City of Ottawa it takes approximately 5-10 business days to receive boundary conditions.
    - Type of Development and Units
    - Site Address
    - A plan showing the proposed water service connection location.
    - **Average Daily Demand** (L/s)
    - **Maximum Daily Demand** (L/s)
    - **Peak Hour Demand** (L/s)
    - **Fire Flow** (L/min)
        - [*Fire flow demand requirements shall be based on **Fire Underwriters Survey (FUS)** Water Supply for Public Fire Protection 1999*]
        - *Exposure separation distances shall be defined on a figure to support the FUS calculation and required fore flow (RFF).*
    - **Hydrant capacity shall be assessed to demonstrate the RFF can be achieved**. Please identify which hydrants are being considered to meet the RFF on a fire hydrant coverage plan as part of the boundary conditions request.

Road Reinstatement

- Where servicing involves three or more service trenches, either a full road width or full lane width 40 mm asphalt overlay will be required, as per amended Road Activity By-Law 2003-445 and City Standard Detail Drawing R10. The amount of overlay will depend on condition of roadway and width of roadway(s).

Permits and Approvals:

- Please note that this project will be subject to an Environmental Compliance Approval (ECA).

Required Engineering Plans and Studies:

- **Plans**
  - Existing Conditions and Removals Plan
  - Site Servicing Plan
  - Grade Control and Drainage Plan
  - Erosion and Sediment Control Plan
  - Roof Drainage Plan
  - Topographical survey
- **Reports**
  - Site Servicing and Stormwater Management Report
  - Geotechnical Study/Investigation
  - Slope Stability Assessment Reports (if required, please see requirements below)
  - Noise Control Study
  - Phase I ESA
  - Phase II ESA (Depending on recommendations of the Phase I ESA)
  - Site lighting certificate
- Please refer to the **City of Ottawa Guide to Preparing Studies and Plans [Engineering]:**
  - Specific information has been incorporated into both the Guide to Preparing Studies and Plans for a site plan. The guide outlines the requirement for a statement to be provided on the plan about where the property boundaries have been derived from.
  - Added to the general information for servicing and grading plans is a note that an **O.L.S**. should be engaged when reporting on or relating information to property boundaries or existing conditions. The importance of engaging an **O.L.S.** for development projects is emphasized.

Phase One Environmental Site Assessment:

- A Phase I ESA is required to be completed in accordance with Ontario Regulation 153/04 in support of this development proposal to determine the potential for site contamination. Depending on the Phase I recommendations a Phase II ESA may be required.
- The Phase I ESA shall provide all the required Environmental Source Information as required by O. Reg. 153/04. ERIS records are available to public at a reasonable cost and need to be included in the ESA report to comply with O.Reg. 153/04 and the Official Plan. The City will not be in a position to approve the Phase I ESA without the inclusion of the ERIS reports.
- Official Plan Section 4.8.4: https://ottawa.ca/en/city-hall/planning-and-development/official-plan-and-master-plans/official-plan/volume-1-official-plan/section-4-review-development-applications#4-8-protection-health-and-safety

Geotechnical Investigation:

- A Geotechnical Study/Investigation shall be prepared in support of this development proposal.
- Reducing the groundwater level in this area can lead to potential damages to surrounding structures due to excessive differential settlements of the ground. The impact of groundwater lowering on adjacent properties needs to be discussed and investigated to ensure there will be no short term and long term damages associated with lowering the groundwater in this area.

- Geotechnical Study shall be consistent with the **Geotechnical Investigation and Reporting Guidelines for Development Applications**.
  https://documents.ottawa.ca/sites/default/files/documents/cap137602.pdf

Slope Stability Assessment Reports

- A report addressing the stability of slopes, prepared by a qualified geotechnical engineer licensed in the Province of Ontario, should be provided wherever a site has slopes (existing or proposed) steeper than 5 horizontal to 1 vertical (i.e., 11 degree inclination from horizontal) and/or more than 2 metres in height.
- A report is also required for sites having retaining walls greater than 1 metre high, that addresses the global stability of the proposed retaining walls.
  https://documents.ottawa.ca/en/document/slope-stability-guidelines-development-applications

Noise Study:

- A **Transportation Noise Assessment** is required as the subject development is located within 100m proximity of an Arterial Road .
- A **Stationary Noise Assessment** is required in order to assess the noise impact of the proposed sources of stationary noise (mechanical HVAC system/equipment) of the development onto the surrounding residential area to ensure the noise levels do not exceed allowable limits specified in the City Environmental Noise Control Guidelines.
  https://documents.ottawa.ca/sites/default/files/documents/enviro_noise_guide_en.pdf

Exterior Site Lighting:

- Any proposed light fixtures (both pole-mounted and wall mounted) must be part of the approved Site Plan. All external light fixtures must meet the criteria for Full Cut-off Classification as recognized by the Illuminating Engineering Society of North America (IESNA or IES), and must result in minimal light spillage onto adjacent properties (as a guideline, 0.5 fc is normally the maximum allowable spillage). In order to satisfy these criteria, the please provide the City with a **Certification (Statement) Letter** from an acceptable professional engineer stating that the design is compliant.

Construction approach:

- Please contact the Right-of-Ways Permit Office TMconstruction@ottawa.ca early in the Site Plan process to determine the ability to construct site and copy File Lead Jean-Charles.Renaud@ottawa.ca on this request.

Mark Richardson, Forestry

LP tree planting requirements:

For additional information on the following please contact adam.palmer@Ottawa.ca

- Minimum Setbacks
  - Maintain 1.5m from sidewalk or MUP/cycle track.
  - Maintain 2.5m from curb
  - Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.
  - Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing.
  - Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

- Tree specifications
    - Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
    - Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
    - Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).
    - Plant native trees whenever possible
    - No root barriers, dead-man anchor systems, or planters are permitted.
    - No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)
- Hard surface planting
    - Curb style planter is highly recommended
    - No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
    - Trees are to be planted at grade
- Soil Volume
    - Please ensure adequate soil volumes are met:

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

Please note that these soil volumes are not applicable in cases with Sensitive Marine Clay.

- Sensitive Marine Clay
    - Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines

Community Association

Ed McKenna

- Favorable response to the architecture and relationship of the building to the street
- Appreciates the balconies on both Aberdeen and Preston and emphasizing the pedestrian space
- The garbage room projection is a good screen for the ramp
- Wondering if the lobby entrance could have added emphasis
- Would encourage additional bike parking to get to a 1:1 ratio
    - Happy to see the ground floor access for the bikes
- Concerned that the mail room is too small for parcel quantity and storage prior to collection
- Would like to highlight the importance of street trees
- Would like to see materiality reflect the existing Preston Square building and how it will relate to proposed development to the south/wrapping the site

David Seaborn

- Would also like to highlight the importance of 1:1 bike ratio
- Found the massing of the building interesting and appreciates the unique architecture

Next steps:

- We encourage the applicant to discuss the proposal with the local Councillor and the community association
- We will follow up with meeting minutes and a list of required documents for the submission

APPENDIX

B RVCA CORRESPONDENCE

O'Neill, Meaghan

From: Eric Lalande <eric.lalande@rvca.ca>
Sent: Tuesday, January 25, 2022 3:17 PM
To: O'Neill, Meaghan
Subject: RE: Stormwater Quality Requirements - Site Development - 357, 361, 363 Preston Street

Hi Meghan,

The RVCA has no required water quality protections on site based on the provided site plan. It is encouraged to implement best practices where possible on site to maximize efforts to protect water quality coming from your site.

Thank you,

Eric Lalande, MCIP, RPP
Planner, RVCA
613-692-3571 x1137

From: O'Neill, Meaghan <Meaghan.ONeill@wsp.com>
Sent: Thursday, January 13, 2022 12:43 PM
To: Glen McDonald <glen.mcdonald@rvca.ca>
Subject: FW: Stormwater Quality Requirements - Site Development - 357, 361, 363 Preston Street

Hi Glen,

Please see the email below. I got an automatic replay from Jamie to contact you in his absence, are you able to confirm the quality control criteria for this site?

Thank you,

Meaghan

Meaghan O'Neill, EIT
Designer, Water Resources
T+ 1 613-690-1151

From: O'Neill, Meaghan
Sent: Thursday, January 13, 2022 12:00 PM
To: emma.bennett@rvca.ca; jamie.batchelor@rvca.ca
Cc: Hughes, Michelle <Michelle.Hughes@wsp.com>; McCaughey, Stephen <Stephen.Mccaughey@wsp.com>; Blanchette, Erin <Erin.Blanchette@wsp.com>
Subject: Stormwater Quality Requirements - Site Development - 357, 361, 363 Preston Street

Hi Emma and Jamie,

We are currently working on a development project within the RVCA boundaries located at 357, 361, and 363 Preston Street, Ottawa, ON. Please see the image below for the project location as well as the proposed site plan attached. As shown on the site plan, the site will be developed with a 6-storey multi use commercial and residential building. The majority of the site will be covered with the proposed building, and all parking will be underground. Under existing conditions the entire approximately 0.08 ha site is impervious parking or building surface and will remain impervious under proposed conditions, however there will be no surface parking in proposed conditions.

As per the pre-consultation meeting notes from June 21st, 2021, the City of Ottawa requested we consult with the RVCA regarding the quality control requirements for this site. I am reaching out to you as our group has previously corresponded with you regarding stormwater quality control requirements.

Can you provide the quality control criteria for this site?

Thank you,

Meaghan

Meaghan O'Neill
Designer, Water Resources
EIT

T+ 1 613-690-1151

WSP Canada Inc.
2611 Queensview Drive, Suite 300
Ottawa, Ontario
K2B 8K2 Canada

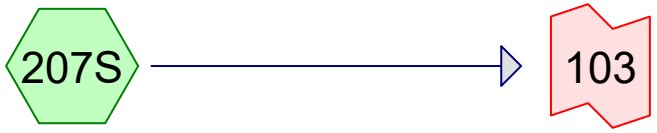
wsp.com

-LAEmHhHzdJzBITWfa4Hgs7pbKI

APPENDIX

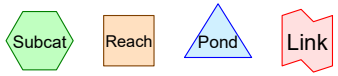
C CALCULATIONS & HYDROCAD OUTPUT

PRE-DEVELOPMENT CONDITIONS



EX-001

Pre-Development Site Discharge



Routing Diagram for Preston St_2022-01-12
Prepared by WSP, Printed 2/24/2022
HydroCAD® 10.00-21 s/n 10697 © 2018 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-meters)	C	Description (subcatchment-numbers)
841.0	0.50	(207S)
841.0	**0.50**	**TOTAL AREA**

Time span=0.00-6.00 hrs, dt=0.01 hrs, 601 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment207S: EX-001 Runoff Area=841.0 m² 0.00% Impervious Runoff Depth=6 mm
Tc=10.0 min C=0.50 Runoff=0.00881 m³/s 5.4 m³

Link 103: Pre-DevelopmentSite Discharge Inflow=0.00881 m³/s 5.4 m³
Primary=0.00881 m³/s 5.4 m³

Total Runoff Area = 841.0 m² Runoff Volume = 5.4 m³ Average Runoff Depth = 6 mm
100.00% Pervious = 841.0 m² 0.00% Impervious = 0.0 m²

Summary for Subcatchment 207S: EX-001

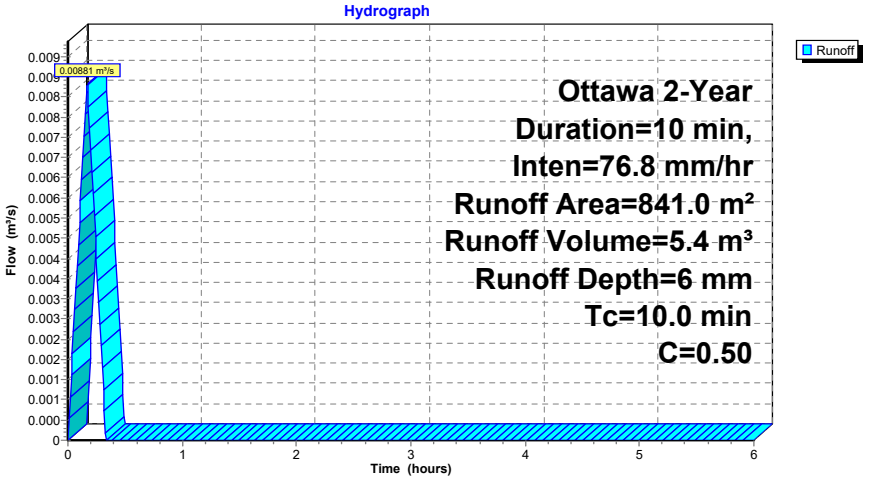
Runoff = 0.00881 m³/s @ 0.17 hrs, Volume= 5.4 m³, Depth= 6 mm

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-6.00 hrs, dt= 0.01 hrs
Ottawa 2-Year Duration=10 min, Inten=76.8 mm/hr

Area (m²)	C	Description
841.0	0.50	
841.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
10.0					**Direct Entry,**

Subcatchment 207S: EX-001

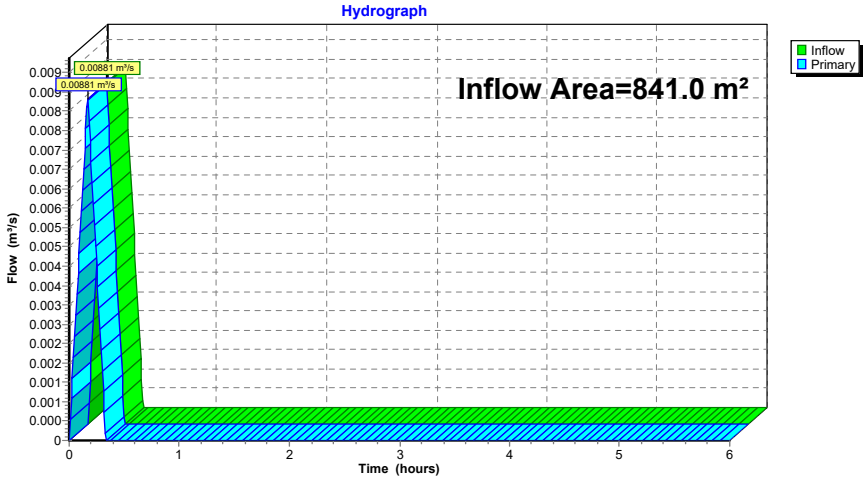


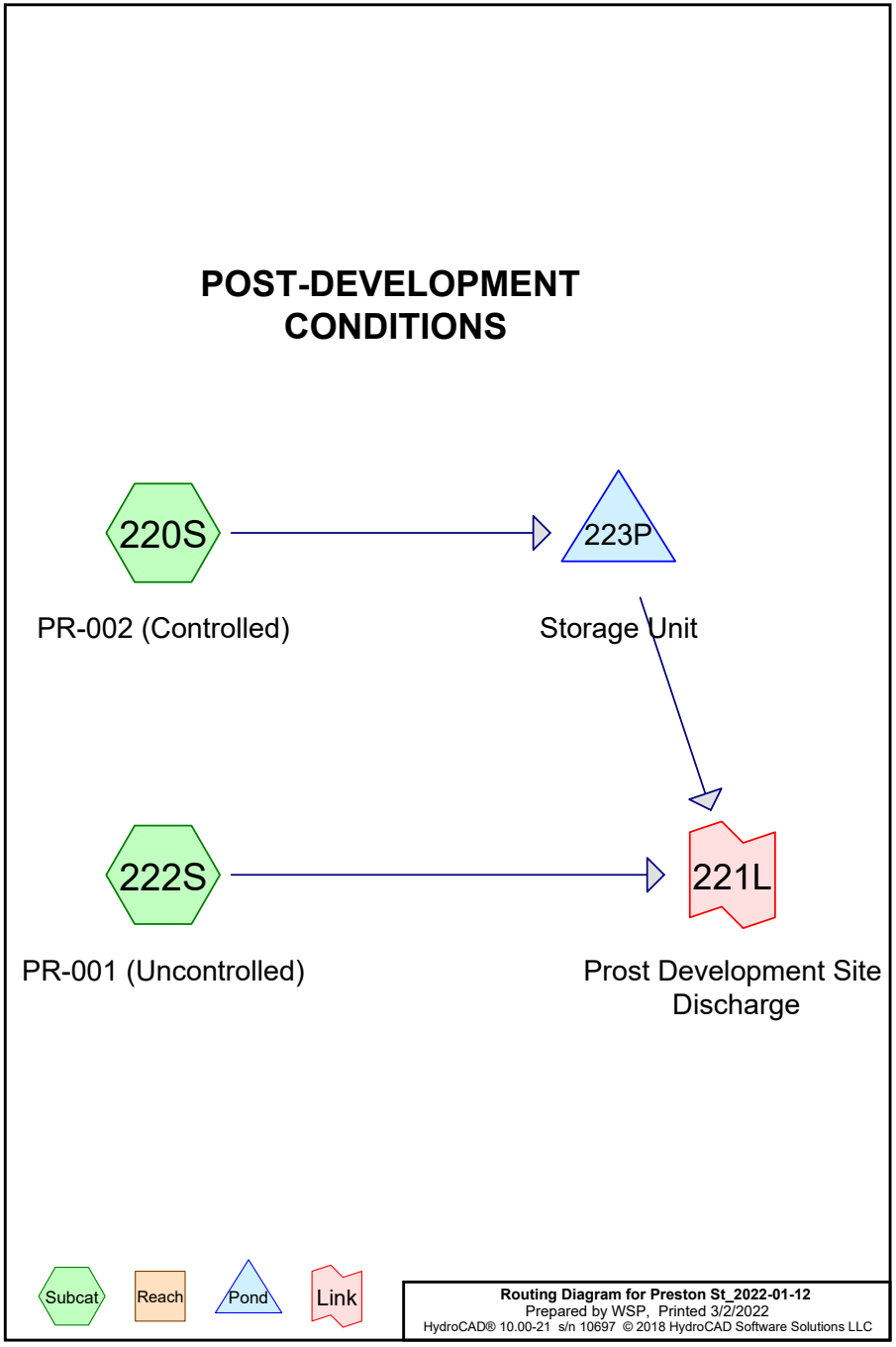
Summary for Link 103: Pre-Development Site Discharge

Inflow Area = 841.0 m², 0.00% Impervious, Inflow Depth = 6 mm for 2-Year event
Inflow = 0.00881 m³/s @ 0.17 hrs, Volume= 5.4 m³
Primary = 0.00881 m³/s @ 0.17 hrs, Volume= 5.4 m³, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-6.00 hrs, dt= 0.01 hrs

Link 103: Pre-Development Site Discharge





Area Listing (selected nodes)

Area (sq-meters)	C	Description (subcatchment-numbers)
841.0	1.00	(220S, 222S)
841.0	**1.00**	**TOTAL AREA**

Time span=0.00-6.00 hrs, dt=0.01 hrs, 601 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment220S: PR-002 Runoff Area=748.0 m² 100.00% Impervious Runoff Depth=32 mm
Tc=10.0 min C=1.00 Runoff=0.03369 m³/s 24.3 m³

Subcatchment222S: PR-001 Runoff Area=93.0 m² 100.00% Impervious Runoff Depth=32 mm
Tc=10.0 min C=1.00 Runoff=0.00419 m³/s 3.0 m³

Pond 223P: Storage Unit Peak Elev=1.526 m Storage=19.8 m³ Inflow=0.03369 m³/s 24.3 m³
Outflow=0.00548 m³/s 24.3 m³

Link 221L: Prost DevelopmentSite Discharge Inflow=0.00875 m³/s 27.3 m³
Primary=0.00875 m³/s 27.3 m³

Total Runoff Area = 841.0 m² Runoff Volume = 27.3 m³ Average Runoff Depth = 32 mm
0.00% Pervious = 0.0 m² 100.00% Impervious = 841.0 m²

Preston St_2022-01-12 *Ottawa 100-Year Duration=12 min, Inten=162.1 mm/hr*
Prepared by WSP Printed 3/2/2022
HydroCAD® 10.00-21 s/n 10697 © 2018 HydroCAD Software Solutions LLC

Summary for Subcatchment 220S: PR-002 (Controlled)

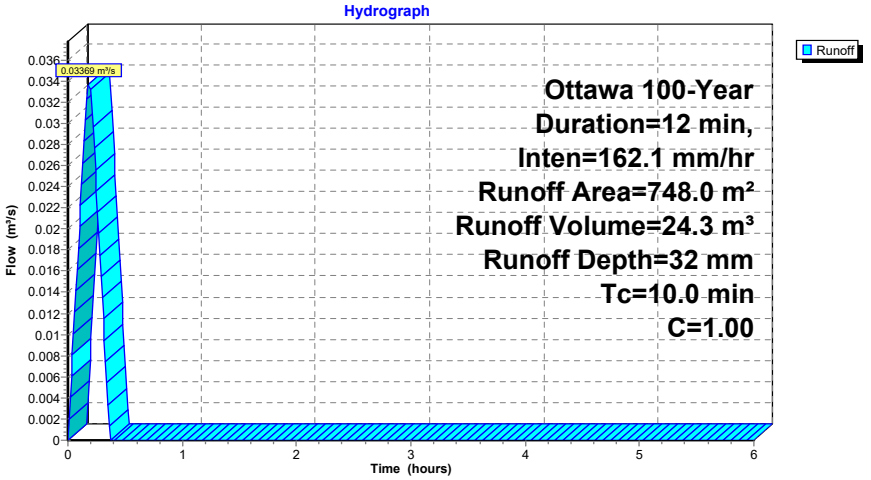
Runoff = 0.03369 m³/s @ 0.17 hrs, Volume= 24.3 m³, Depth= 32 mm

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-6.00 hrs, dt= 0.01 hrs
Ottawa 100-Year Duration=12 min, Inten=162.1 mm/hr

Area (m²)	C	Description
748.0	1.00	
748.0		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
10.0					**Direct Entry,**

Subcatchment 220S: PR-002 (Controlled)



Summary for Subcatchment 222S: PR-001 (Uncontrolled)

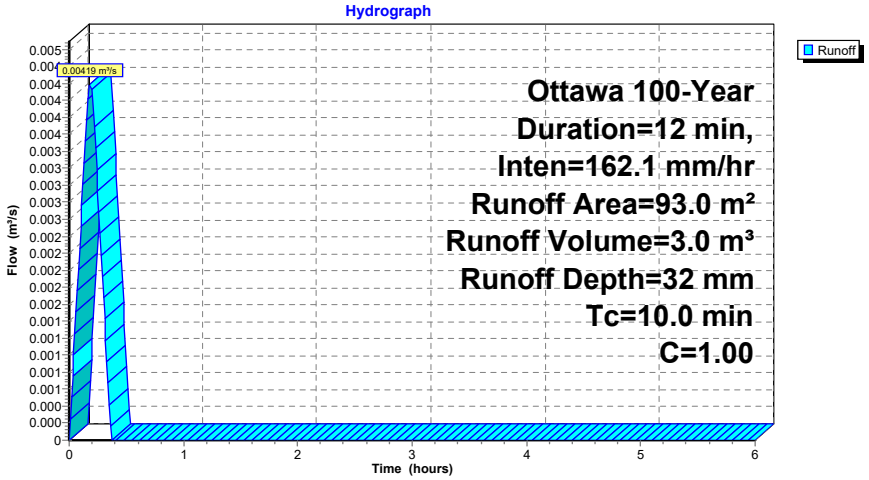
Runoff = 0.00419 m³/s @ 0.17 hrs, Volume= 3.0 m³, Depth= 32 mm

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-6.00 hrs, dt= 0.01 hrs
Ottawa 100-Year Duration=12 min, Inten=162.1 mm/hr

Area (m²)	C	Description
93.0	1.00	
93.0		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
10.0					**Direct Entry,**

Subcatchment 222S: PR-001 (Uncontrolled)



Summary for Pond 223P: Storage Unit

Inflow Area = 748.0 m²,100.00% Impervious, Inflow Depth = 32 mm for 100-Year event
Inflow = 0.03369 m³/s @ 0.17 hrs, Volume= 24.3 m³
Outflow = 0.00548 m³/s @ 0.34 hrs, Volume= 24.3 m³, Atten= 84%, Lag= 10.2 min
Primary = 0.00548 m³/s @ 0.34 hrs, Volume= 24.3 m³

Routing by Stor-Ind method, Time Span= 0.00-6.00 hrs, dt= 0.01 hrs
Peak Elev= 1.526 m @ 0.34 hrs Surf.Area= 13.0 m² Storage= 19.8 m³

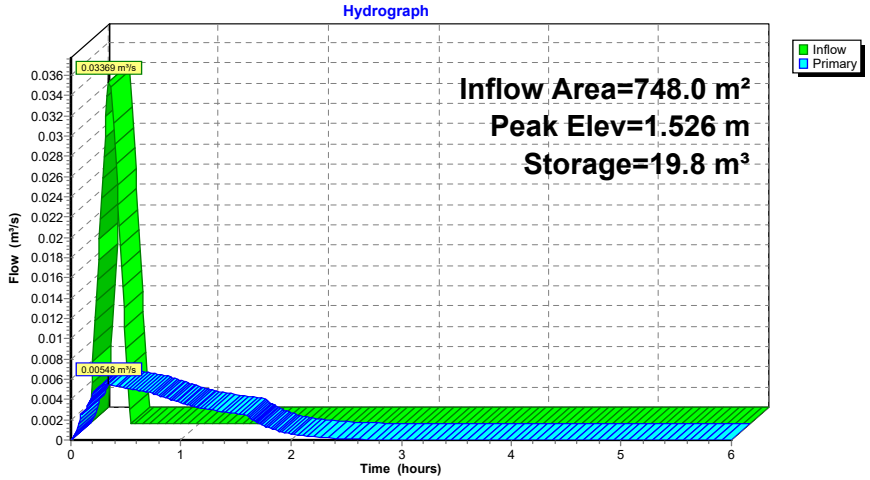
Plug-Flow detention time= 41.3 min calculated for 24.3 m³ (100% of inflow)
Center-of-Mass det. time= 41.1 min (52.2 - 11.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.000 m	38.9 m³	**3.60 mW x 3.60 mL x 3.00 mH Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	0.000 m	**Hydrovex 75VHV-1-copy2 X 1.55** Elev. (meters) 0.000 0.200 0.500 1.000 1.500 2.000 2.500 3.000 3.500 4.000 4.500 5.000 5.500 6.000 Disch. (m³/s) 0.000000 0.001600 0.002000 0.003000 0.003500 0.004200 0.004600 0.005100 0.005500 0.006000 0.006200 0.006600 0.007000 0.007200

Primary OutFlow Max=0.00548 m³/s @ 0.34 hrs HW=1.526 m (Free Discharge)
↑└**1=Hydrovex 75VHV-1-copy2** (Custom Controls 0.00548 m³/s)

Pond 223P: Storage Unit

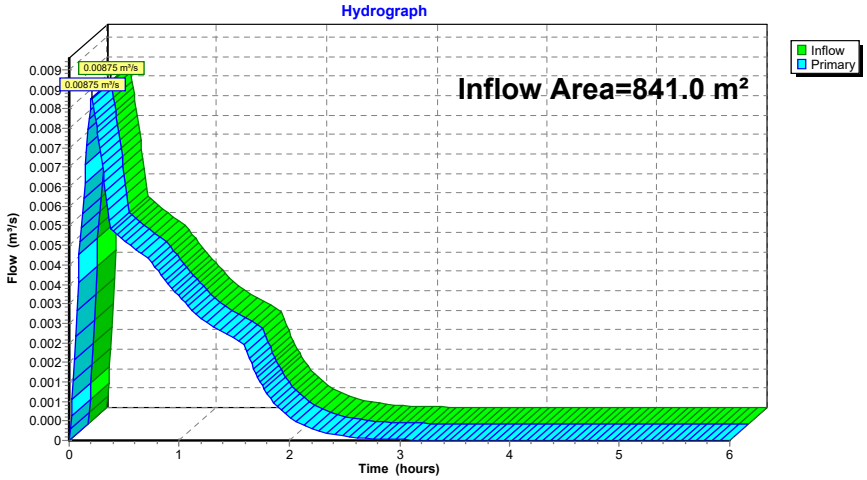


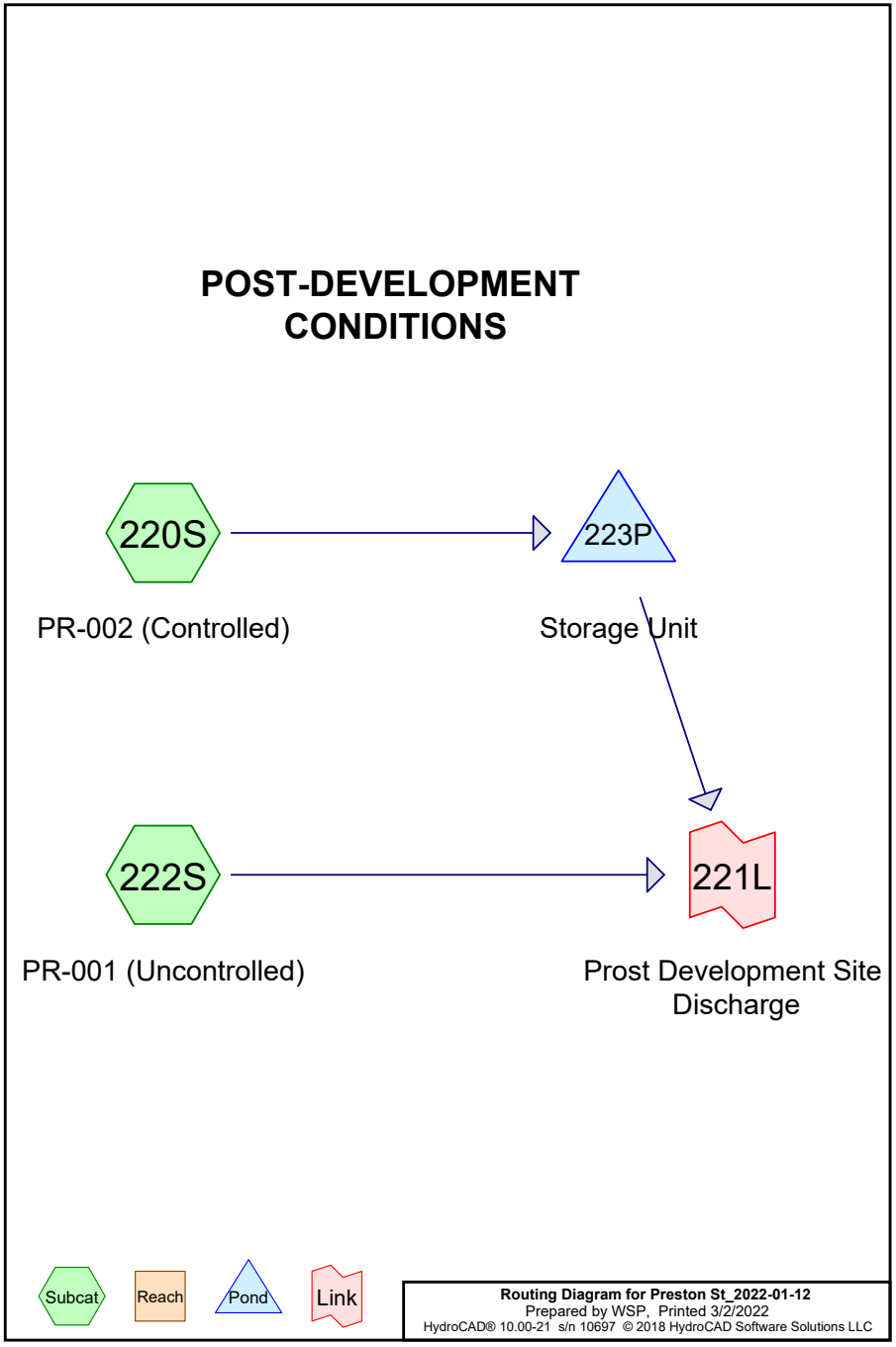
Summary for Link 221L: Prost Development Site Discharge

Inflow Area = 841.0 m²,100.00% Impervious, Inflow Depth = 32 mm for 100-Year event
Inflow = 0.00875 m³/s @ 0.20 hrs, Volume= 27.3 m³
Primary = 0.00875 m³/s @ 0.20 hrs, Volume= 27.3 m³, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-6.00 hrs, dt= 0.01 hrs

Link 221L: Prost Development Site Discharge





Area Listing (selected nodes)

Area (sq-meters)	C	Description (subcatchment-numbers)
841.0	1.00	(220S, 222S)
841.0	**1.00**	**TOTAL AREA**

Time span=0.00-6.00 hrs, dt=0.01 hrs, 601 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment220S: PR-002 Runoff Area=748.0 m² 100.00% Impervious Runoff Depth=51 mm
Tc=10.0 min C=1.00 Runoff=0.01508 m³/s 38.0 m³

Subcatchment222S: PR-001 Runoff Area=93.0 m² 100.00% Impervious Runoff Depth=51 mm
Tc=10.0 min C=1.00 Runoff=0.00187 m³/s 4.7 m³

Pond 223P: Storage Unit Peak Elev=1.958 m Storage=25.4 m³ Inflow=0.01508 m³/s 38.0 m³
Outflow=0.00642 m³/s 38.0 m³

Link 221L: Prost DevelopmentSite Discharge Inflow=0.00804 m³/s 42.7 m³
Primary=0.00804 m³/s 42.7 m³

Total Runoff Area = 841.0 m² Runoff Volume = 42.7 m³ Average Runoff Depth = 51 mm
0.00% Pervious = 0.0 m² 100.00% Impervious = 841.0 m²

Summary for Subcatchment 220S: PR-002 (Controlled)

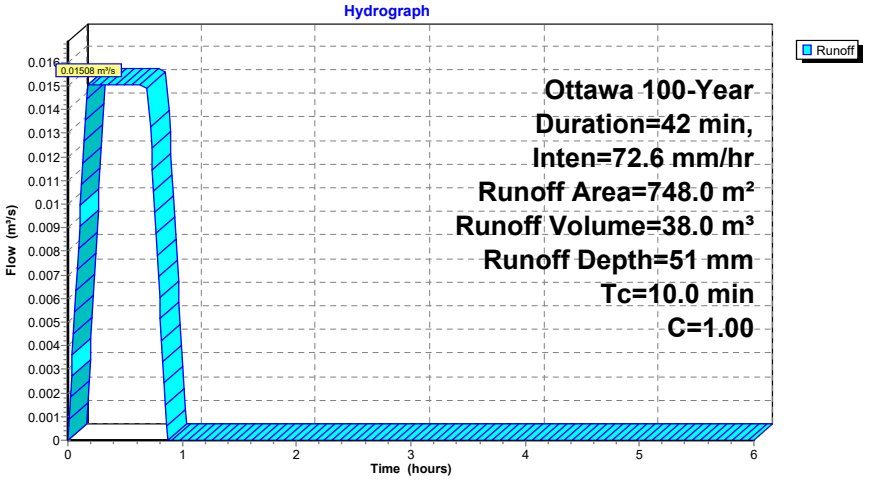
Runoff = 0.01508 m³/s @ 0.17 hrs, Volume= 38.0 m³, Depth= 51 mm

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-6.00 hrs, dt= 0.01 hrs
Ottawa 100-Year Duration=42 min, Inten=72.6 mm/hr

Area (m²)	C	Description
748.0	1.00	
748.0		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
10.0					**Direct Entry,**

Subcatchment 220S: PR-002 (Controlled)



Summary for Subcatchment 222S: PR-001 (Uncontrolled)

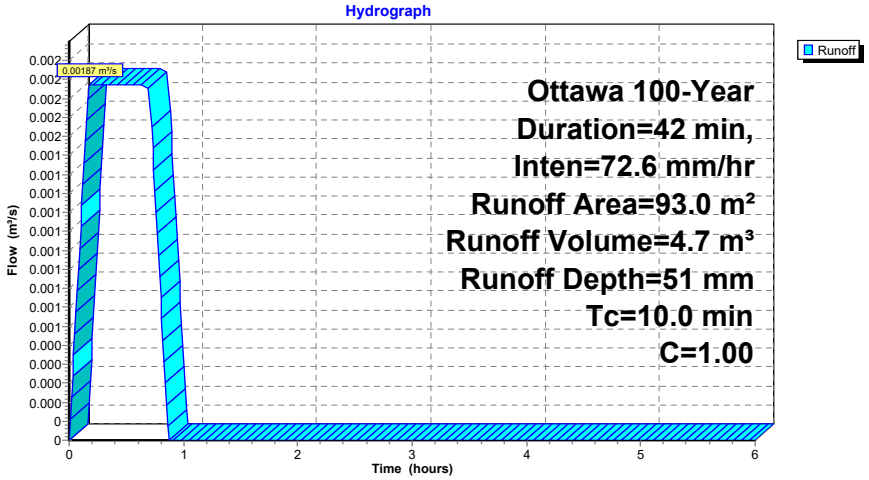
Runoff = 0.00187 m³/s @ 0.17 hrs, Volume= 4.7 m³, Depth= 51 mm

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-6.00 hrs, dt= 0.01 hrs
Ottawa 100-Year Duration=42 min, Inten=72.6 mm/hr

Area (m²)	C	Description
93.0	1.00	
93.0		100.00% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
10.0					**Direct Entry,**

Subcatchment 222S: PR-001 (Uncontrolled)



Summary for Pond 223P: Storage Unit

Inflow Area = 748.0 m²,100.00% Impervious, Inflow Depth = 51 mm for 100-Year event
Inflow = 0.01508 m³/s @ 0.17 hrs, Volume= 38.0 m³
Outflow = 0.00642 m³/s @ 0.80 hrs, Volume= 38.0 m³, Atten= 57%, Lag= 37.5 min
Primary = 0.00642 m³/s @ 0.80 hrs, Volume= 38.0 m³

Routing by Stor-Ind method, Time Span= 0.00-6.00 hrs, dt= 0.01 hrs
Peak Elev= 1.958 m @ 0.80 hrs Surf.Area= 13.0 m² Storage= 25.4 m³

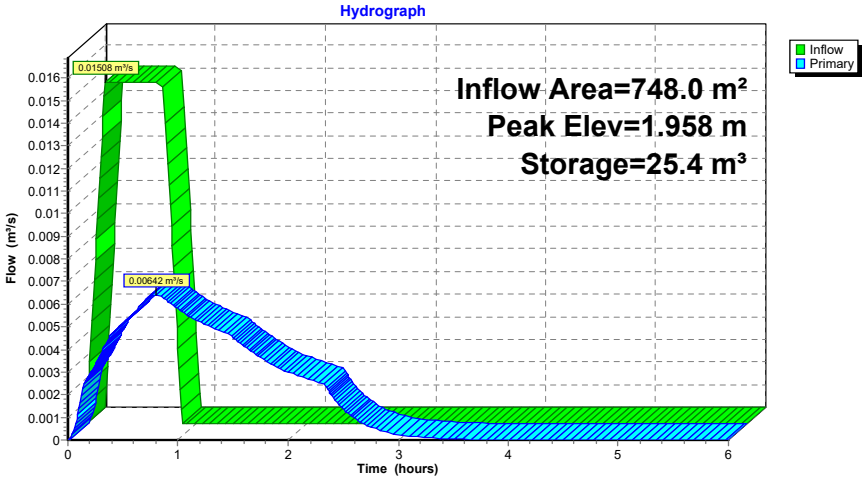
Plug-Flow detention time= 47.7 min calculated for 38.0 m³ (100% of inflow)
Center-of-Mass det. time= 47.6 min (73.6 - 26.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.000 m	38.9 m³	**3.60 mW x 3.60 mL x 3.00 mH Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	0.000 m	**Hydrovex 75VHV-1-copy2 X 1.55** Elev. (meters) 0.000 0.200 0.500 1.000 1.500 2.000 2.500 3.000 3.500 4.000 4.500 5.000 5.500 6.000 Disch. (m³/s) 0.000000 0.001600 0.002000 0.003000 0.003500 0.004200 0.004600 0.005100 0.005500 0.006000 0.006200 0.006600 0.007000 0.007200

Primary OutFlow Max=0.00642 m³/s @ 0.80 hrs HW=1.958 m (Free Discharge)
↑**1=Hydrovex 75VHV-1-copy2** (Custom Controls 0.00642 m³/s)

Pond 223P: Storage Unit

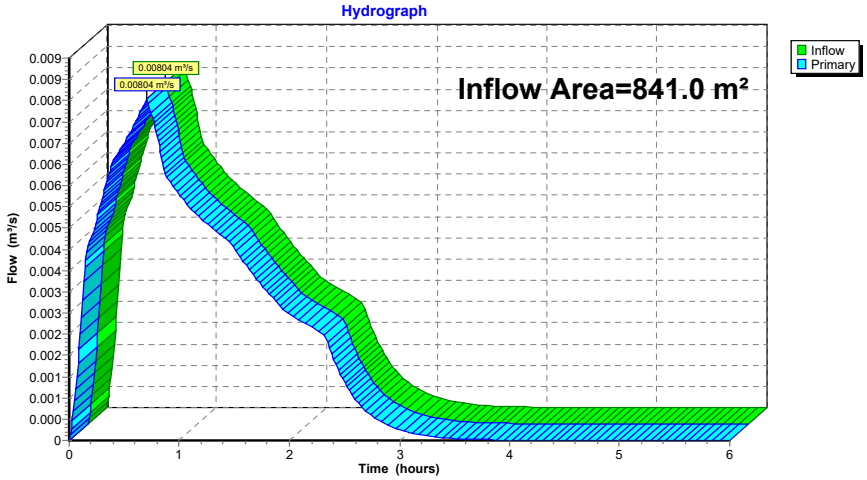


Summary for Link 221L: Prost Development Site Discharge

Inflow Area = 841.0 m²,100.00% Impervious, Inflow Depth = 51 mm for 100-Year event
Inflow = 0.00804 m³/s @ 0.70 hrs, Volume= 42.7 m³
Primary = 0.00804 m³/s @ 0.70 hrs, Volume= 42.7 m³, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-6.00 hrs, dt= 0.01 hrs

Link 221L: Prost Development Site Discharge

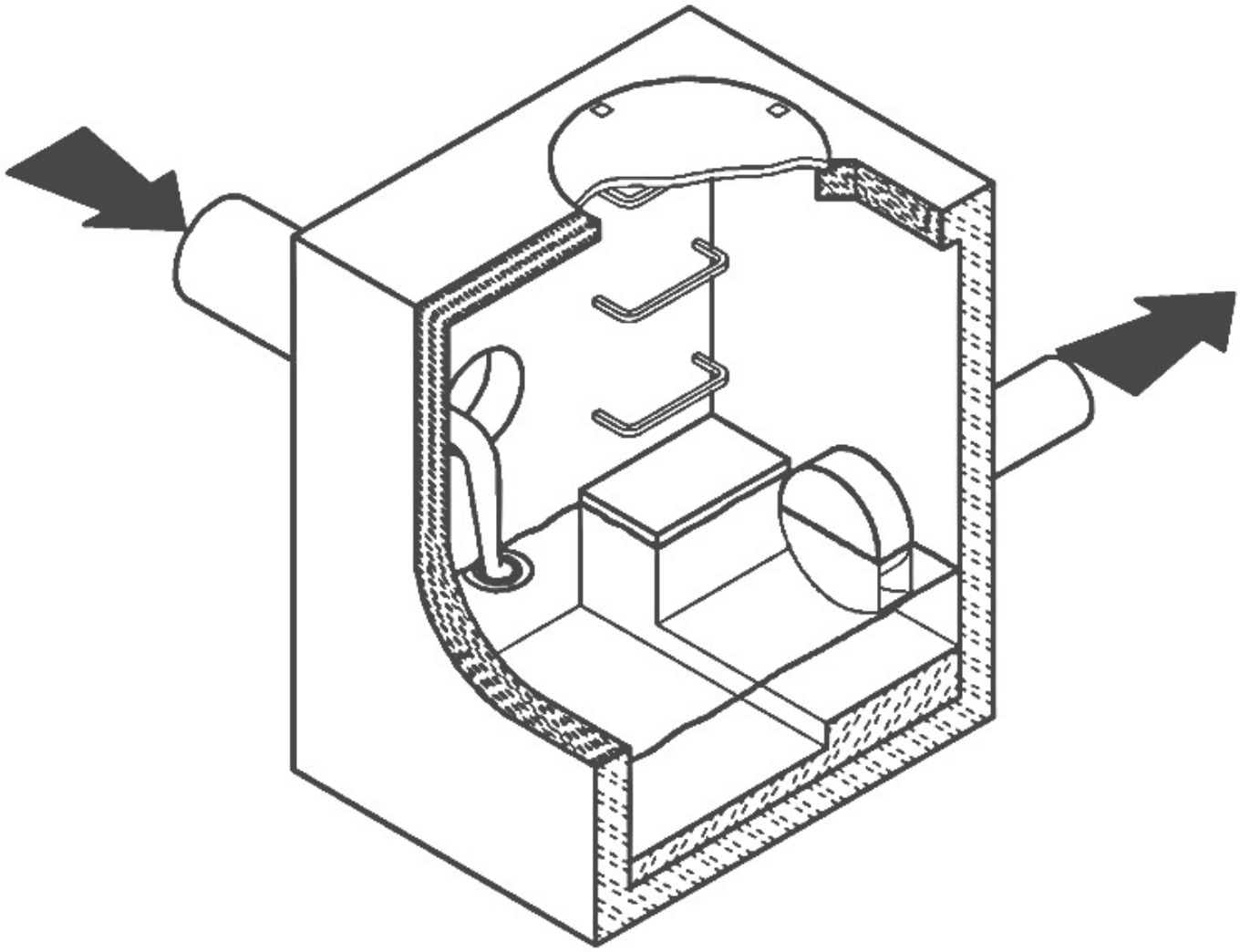


APPENDIX

D SUPPORTING DOCUMENTS

CSO/STORMWATER MANAGEMENT

HYDROVEX® VHV / SVHV
Vertical Vortex Flow Regulator



JOHN MEUNIER

APPLICATIONS

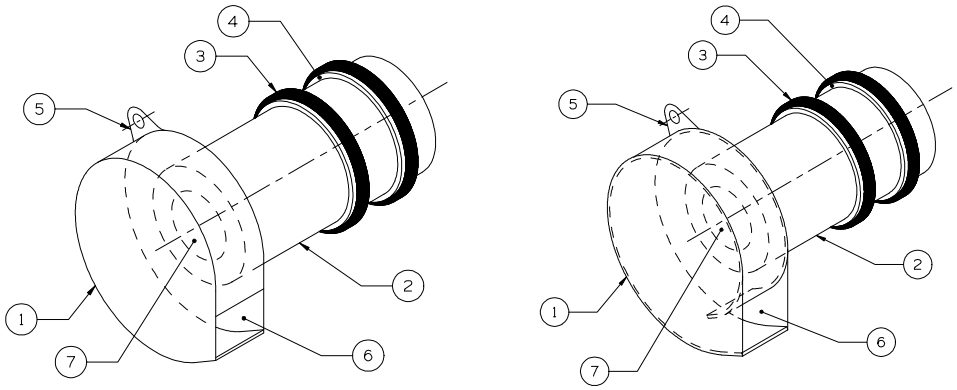
One of the major problems of urban wet weather flow management is the runoff generated after a heavy rainfall. During a storm, uncontrolled flows may overload the drainage system and cause flooding. Due to increased velocities, sewer pipe wear is increased dramatically and results in network deterioration. 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.

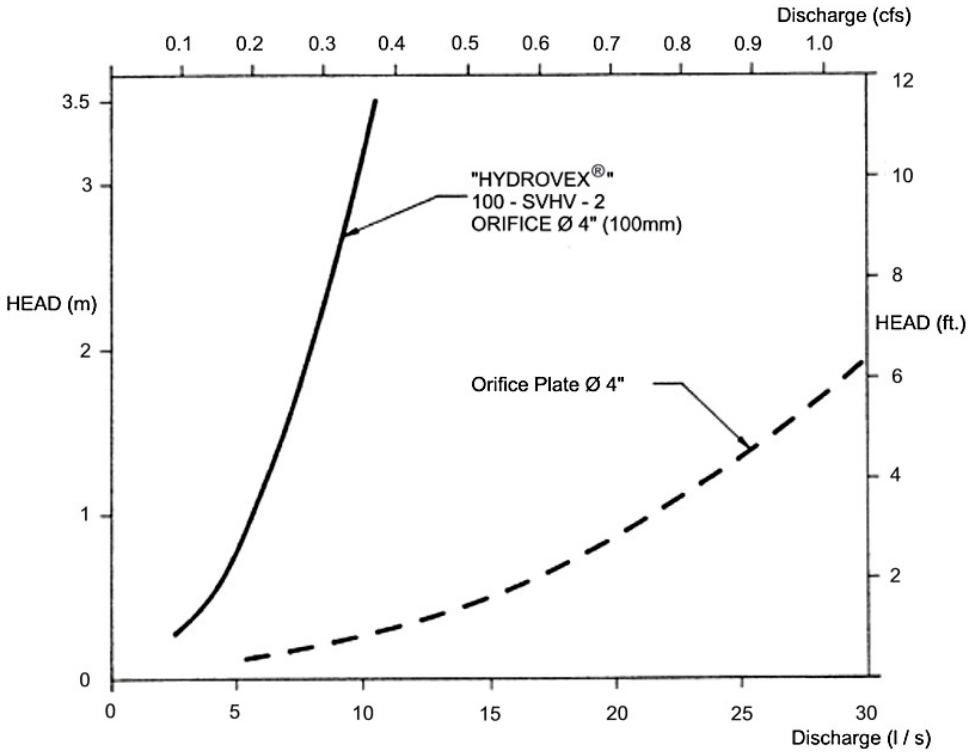


FIGURE 2: DISCHARGE CURVE SHOWING A HYDROVEX® FLOW REGULATOR VS AN ORIFICE PLATE

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:

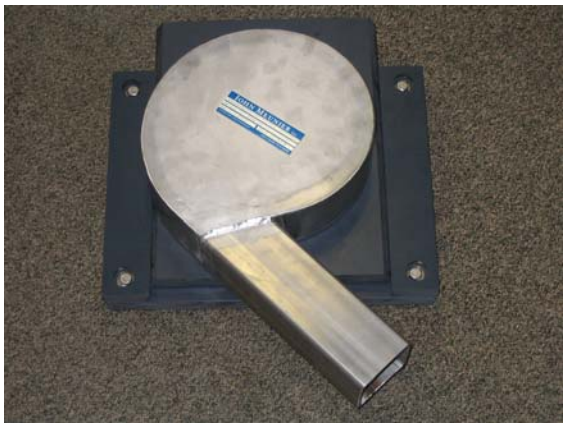
- ***project design flow rate***
- ***pressure head***
- ***chamber's outlet pipe diameter and type***

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

HYDROVEX®

VHV Vertical Vortex Flow Regulator

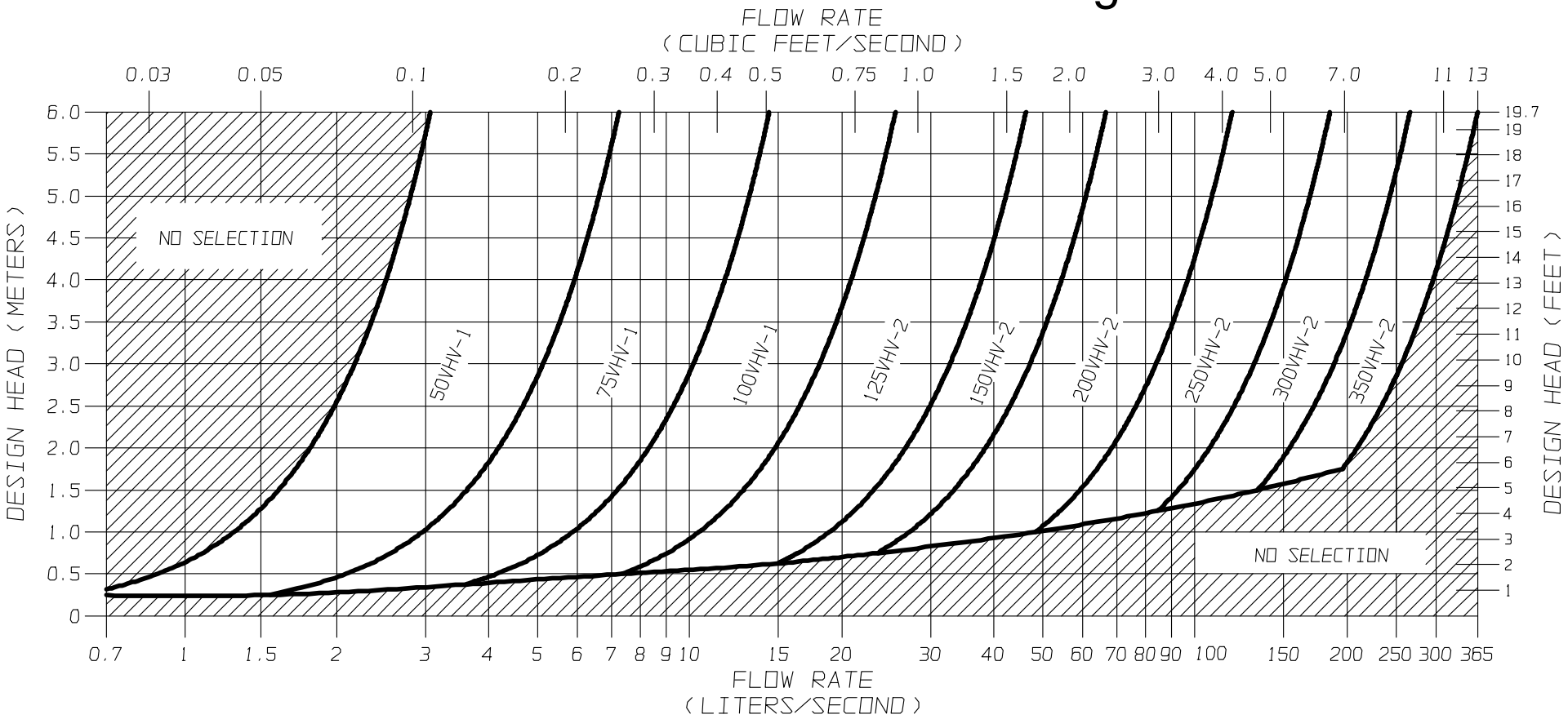


FIGURE 3 - VHV

JOHN MEUNIER

HYDROVEX®

SVHV Vertical Vortex Flow Regulator

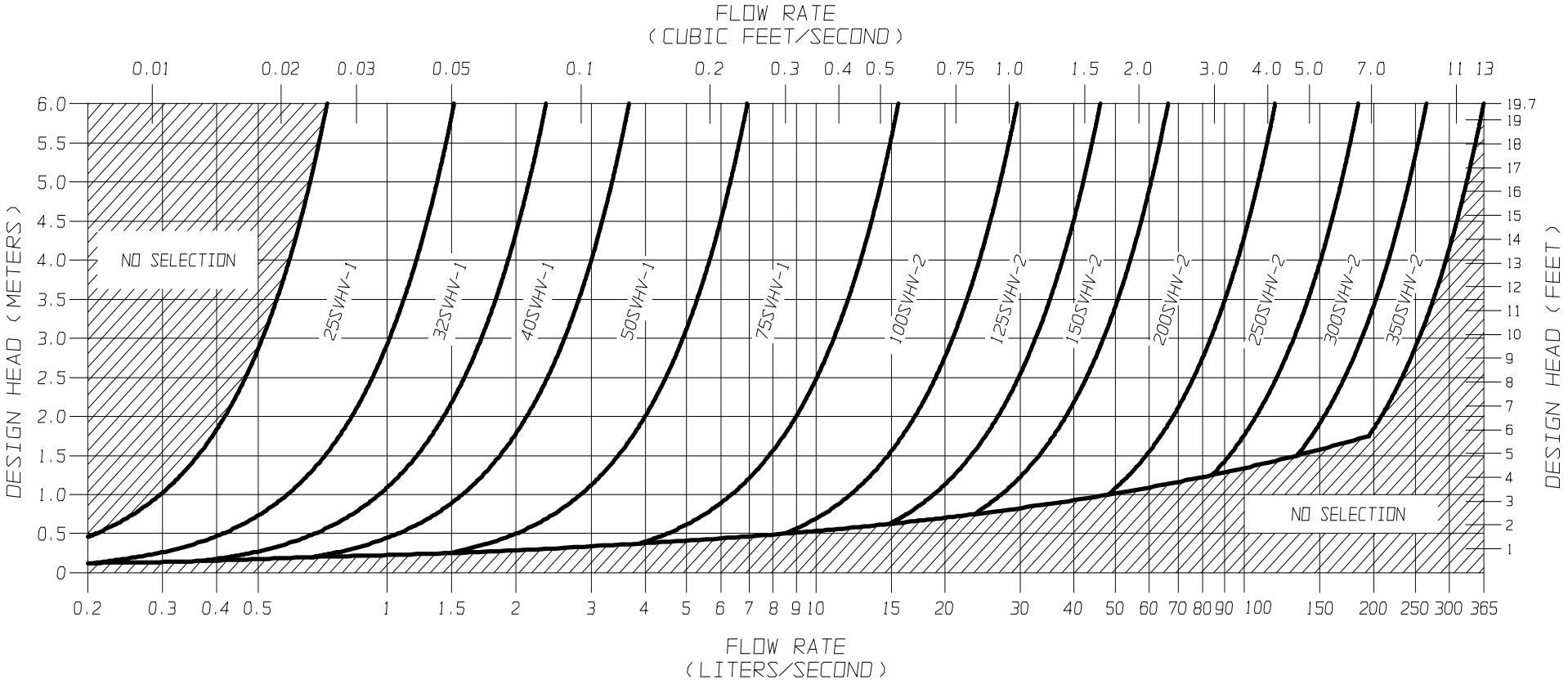
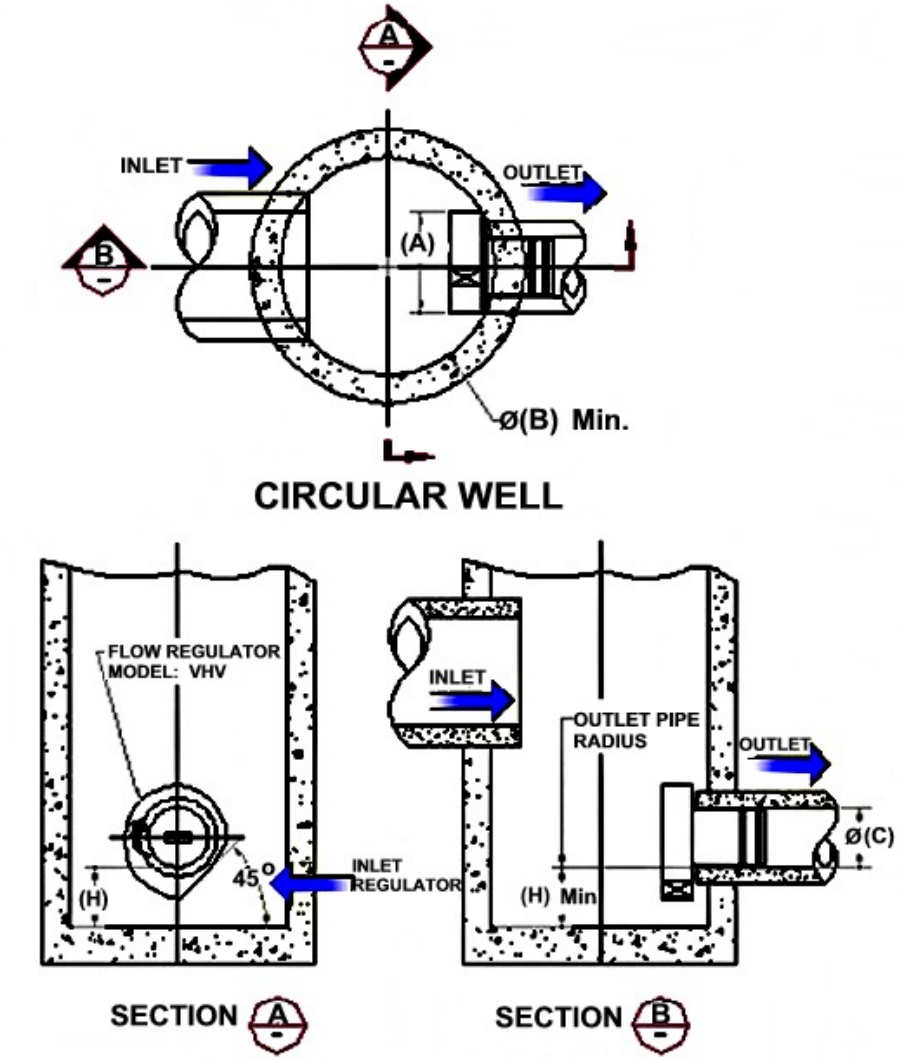


FIGURE 3 - SVHV

JOHN MEUNIER

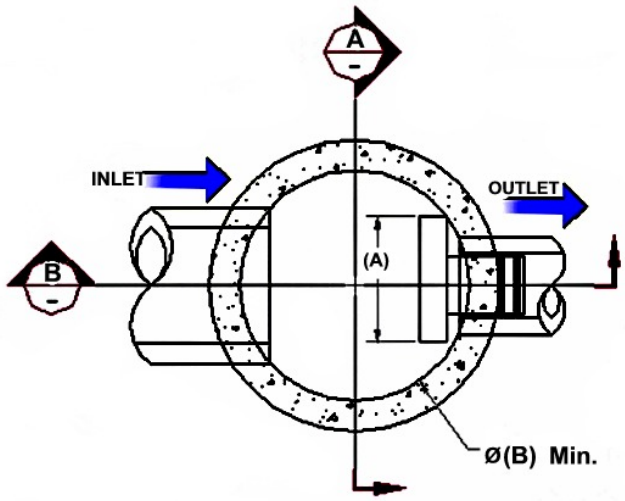
FLOW REGULATOR TYPICAL INSTALLATION IN CIRCULAR MANHOLE
FIGURE 4 (MODEL VHV)

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

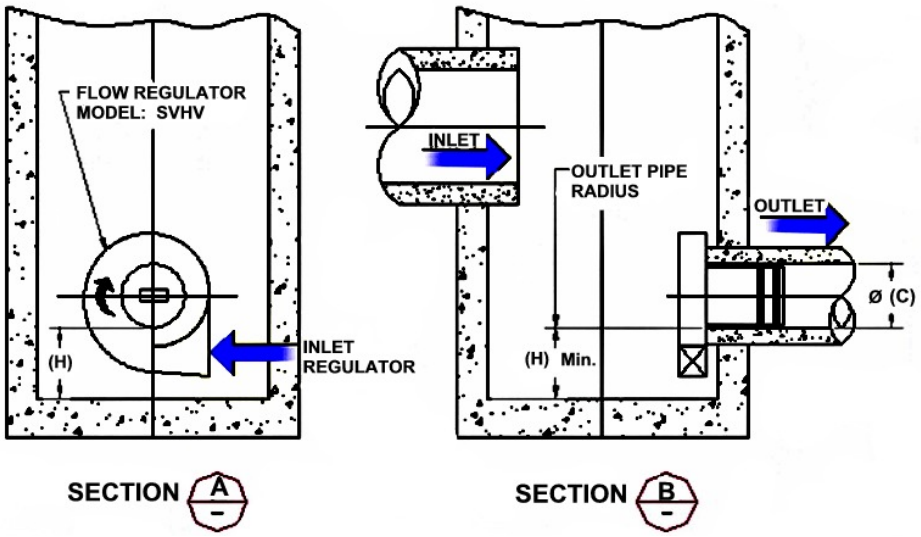


FLOW REGULATOR TYPICAL INSTALLATION IN CIRCULAR MANHOLE
FIGURE 4 (MODEL SVHV)

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



CIRCULAR WELL

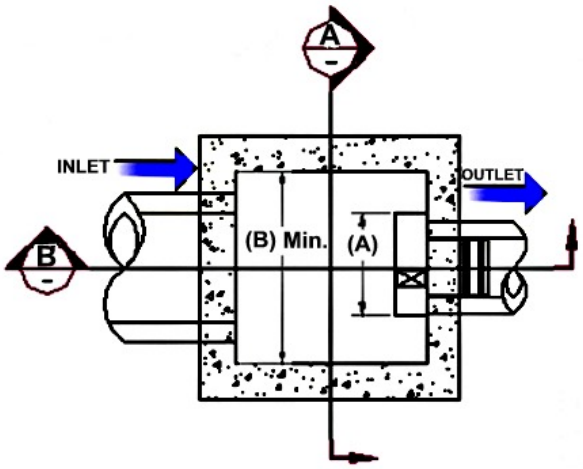


SECTION A **SECTION B**

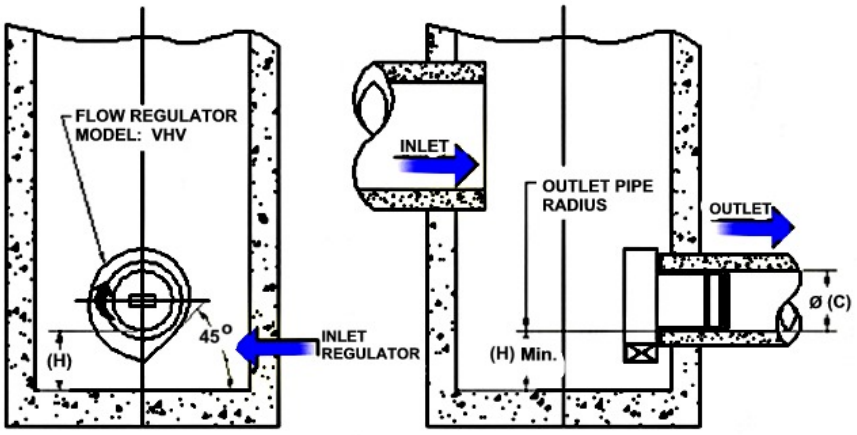
FLOW REGULATOR TYPICAL INSTALLATION IN SQUARE MANHOLE
FIGURE 4 (MODEL VHV)

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.***



SQUARE / RECTANGULAR WELL

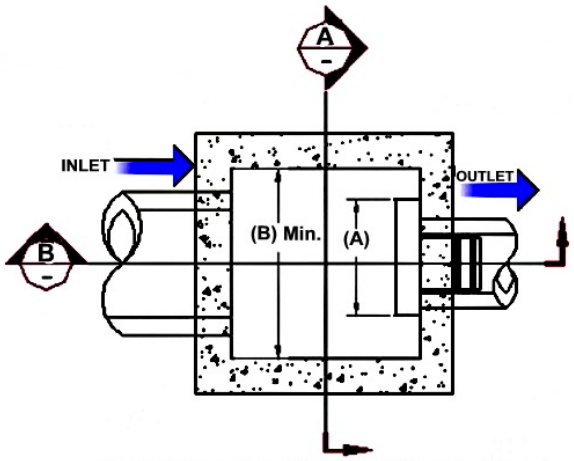


SECTION A **SECTION B**

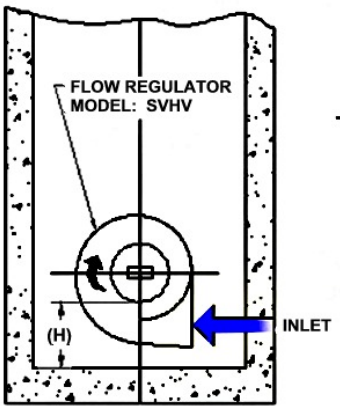
FLOW REGULATOR TYPICAL INSTALLATION IN SQUARE MANHOLE
FIGURE 4 (MODEL SVHV)

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

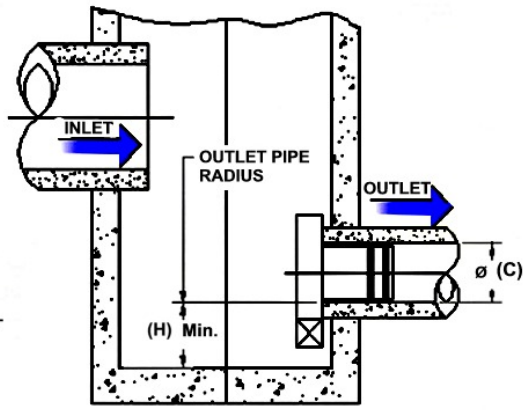
NOTE: ***In the case of a square manhole, the outlet flow pipe must be centered on the wall to ensure enough clearance for the unit.***



SQUARE / RECTANGULAR WELL



SECTION A



SECTION B

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.

John Meunier Inc.
ISO 9001 : 2008

Head Office
4105 Sartelon
Saint-Laurent (Quebec) Canada H4S 2B3
Tel.: 514-334-7230 www.johnmeunier.com
Fax: 514-334-5070 cso@johnmeunier.com

Ontario Office
2000 Argentia Road, Plaza 4, Unit 430
Mississauga (Ontario) Canada L5N 1W1
Tel.: 905-286-4846 www.johnmeunier.com
Fax: 905-286-0488 ontario@johnmeunier.com

USA Office
2209 Menlo Avenue
Glenside, PA USA 19038
Tel.: 412- 417-6614 www.johnmeunier.com
Fax: 215-885-4741 asteele@johnmeunier.com

Revised: 2011-05-03