Stormwater Management Report
291 Watson Ave. Windsor
9-Unit Residential Development

Prepared for

PE Real Estate Solutions

Tecumseh, ON

Prepared by

Milena Stevanov, P.Eng.

January 9, 2025

Project E24225

Rev.	Date	Description
1	25/05/26	Storage Type
0	25/01/09	Initial Issue

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1 INTRODUCTION

GS Engineering Consultants Inc. (GSE) was retained by PE Real Estate Solutions to prepare a stormwater management report for the proposed development at 291 Watson Ave. in Windsor ON. The property is located on the northwest corner of Watson Avenue and Clairview Avenue in the area known as Riverside in Windsor, Ontario. The existing site is approximately 825 m2 (0.2 acres) in area, with a frontage of 24.4 m (80 ft) along Watson Avenue, and an exterior side lot line length of 33.8 m (111 ft) along Clairview Avenue. The existing site consists of a single-family dwelling and a detached garage with impervious driveway access and pervious landscaped area. See Image 1 for an aerial map of the subject property. The proposed development will consist of a multi-storey 9-unit residential building with a footprint of 203.6 m2 (2192 ft2) and associated parking and landscaping. See Appendix B for the proposed site plan.

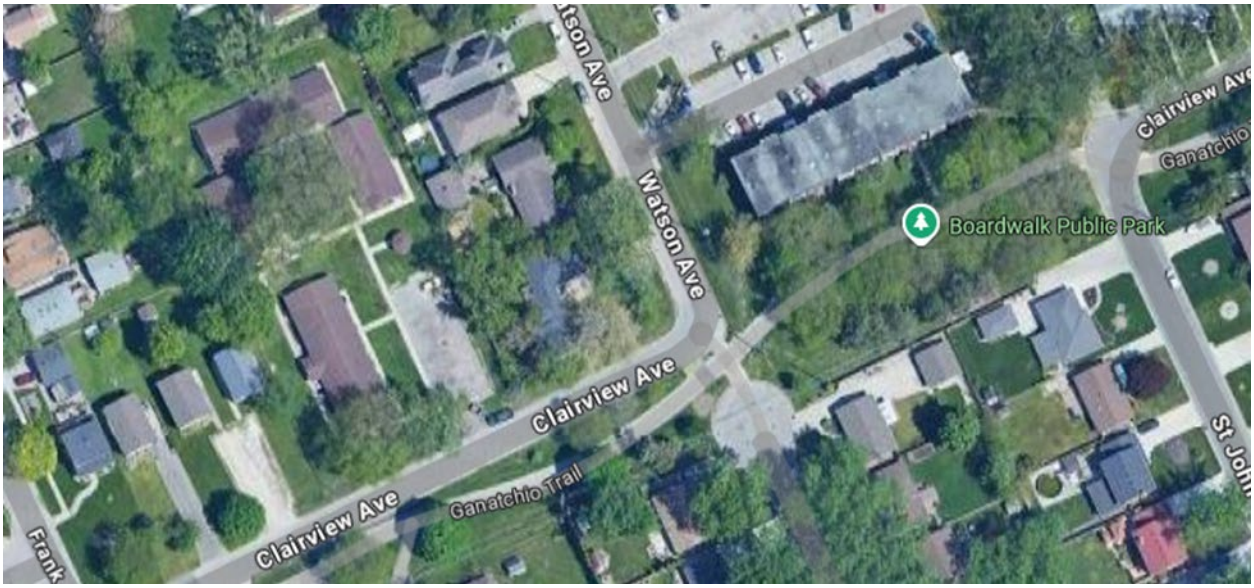


Image 1: Aerial Map of Subject Property - 291 Watson Ave.

The proposed property is serviced by separate storm sewer and sanitary sewer. The stormwater outflow from the proposed development is assumed to outlet to the storm sewer on Clairview Avenue, municipal ID PSR 6R869_6R868. Municipal records indicate this sewer is a 1,500 mm diameter reinforced concrete pipe, currently in service. This sewer is a part of the Windsor Area Drainage and leads to the St. Paul Pumping Station. See Image 2 for the municipal storm sewers surrounding the subject property.

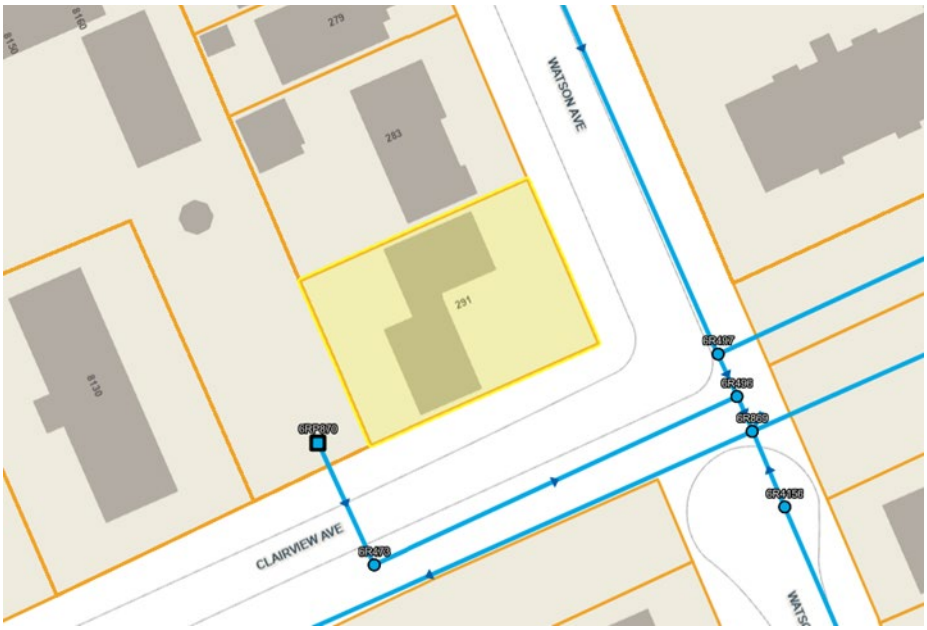


Image 2: Municipal storm sewers servicing 291 Watson Ave.

2 Scope of Work

This report will establish the allowable release rate for the site, the stormwater storage quantity requirements and the quality requirements to be submitted as part of the site plan control application for this development and determine the feasibility of a stormwater management system on this site.

3 Design Criteria

The design criteria for the stormwater management system on this site are based on the City of Windsor Development Manual (2015), the Ministry of Environment (MOE) Stormwater Management Planning and Design Manual (2003) and the Windsor-Essex Region Stormwater Management Standards Manual (2018) (WERSMSM).

3.1 Quantity Control

The rational method is used to evaluate the flow of stormwater onto the site due to a storm event. Since the property is under 2 ha in area, the rational method is appropriate for use per the WERSMSM 2018. An allowable release rate is to be established to not exceed the pre-development outflow for a 5-year storm. The storage requirements are determined by evaluating the difference between inflow of stormwater onto the site, less the outflow of water off the site. The inflow is calculated using the modified rational method with the use

of a 100-year runoff coefficient (C-Value) as defined by the WERSMSM 2018, the 100-year storm event. The outflow is set as the allowable release rate.

No backwater conditions have been considered for this site yet as site grade and pipe elevations have not been established. The municipality has provided estimated HGL within the storm sewer system at the nearest maintenance hole, 6R869. The final stormwater management system design will take into consideration backwater conditions once site elevations are available and established.

3.1.1 Site Pre-Development Conditions

The existing site consists of a single-family dwelling, a detached garage, and driveway. See Appendix A for the current site condition. To establish a pre-development runoff coefficient, the existing runoff coefficient (C Value) is compared to the system original design value. The storm system servicing the subdivision was designed to allow a runoff coefficient of 0.40, based on the 1973 study, as per information provided by City of Windsor Engineering department. The calculation in Appendix C establishes the existing runoff coefficient for the site as 0.45. Since the existing condition has more runoff than the design allowance, the system design will consider the pre-development coefficient to be 0.4.

3.1.2 Time of Concentration

The time of concentration for the site is calculated using the formula:

$$T_c = t_{sheet} + t_{shallow} + t\_concentrated$$

The time of concentration for the site is calculated as 9.7 minutes. See Appendix C for the detailed calculation. The time of concentration of the site is less than two times the maximum inlet time for this site, which allows for the rational method to be used. The maximum inlet time is 10 minutes per WERSMSM 2018 graph 3.2.2.6.

3.1.3 Rainfall Intensity

The rainfall intensity-duration-frequency curve used with the rational method is as defined in the WERSMSM 2018 section 3.2.1:

$$I = \frac{a}{(T + b)^c}$$

Where I is the rainfall intensity in mm/hr, and T is the time of concentration in minutes, a, b, and c are as defined in Table 1.

Table 1: IDF Curve Parameters per WERSWMSM 2018

Return Period (Years)	5	100
a	1259	2375
b	9.5	11.0
c	0.845	0.861

3.2 Quality Control

Stormwater runoff to be treated on site will be treated to a "Normal" protection level. Suspended solids removal will be implemented via settling and hydrodynamic separation to a "Normal" protection level. A minimum of 90% of the total runoff volume will be captured and treated to a minimum overall removal efficiency of 70% suspended solids removal based on the MOE 1994 Typical Particle Size Distribution.

4 MODELLING

4.1 Allowable Release Rate

The proposed site is to outlet to the storm sewer on Clairview Ave. The allowable release rate is calculated using the rational formula where;

$$Q = C * I * A,$$

C is the pre-development runoff coefficient, 0.4, I is the rainfall intensity for a 1:5-year design storm based on the ERCA rainfall intensity chat from City of Windsor Airport Data, at a time of concentration of 9.7 minutes, and a site area of A.

The allowable release rate of stormwater is established to be 10.0 L/s [0.353 ft^3/s].

4.2 Stormwater Storage Requirements

The quantity of stormwater required to be stored on site is established by calculating the difference between inflow and outflow from the site. The inflow rate is calculated using the modified rational method 100-year runoff coefficient as defined by the WERSMSM 2018, and the 100-year rainfall intensity. The 100-year runoff coefficient is 0.94. The outflow is held constant as the allowable release rate. The quantity of stormwater to be stored is evaluated for each step during the storm event until the storage volume required is zero. The size of the storage system is taken as the largest value. See Appendix C for the detailed calculation. The site stormwater management system must have a minimum storage volume of 20,012 L [707 ft^3].

This does not consider the backwater conditions. The final detailed design will consider the HGL at the municipal receiver. Should backwater conditions exist and reduce the outflow to less than the allowable release rate, the storage volume will need to increase.

The proposed method of storage for the stormwater on site is surface ponding on the parking area. The parking area is divided into two areas, providing a total of 20,415 L of storage volume at a depth of 200mm. This site has been granted an exemption from the requirement to store the first 32mm of rainfall by method of surface ponding on parking lots. See Appendix D for a proposed stormwater system layout.

4.3 Outflow Restriction

The outflow of water from the site will be controlled with an orifice with a minimum diameter of 4 in. Should the orifice not restrict the flow adequately, a flow restrictor device, such as the Tempest Inlet Control device, will be used. In the situation where the detention system must be lower to allow for adequate ground cover, a manhole with a pump will be implemented. The pump will restrict the outflow.

4.4 Stormwater Quality Treatment

Proposed on the site is the use of the Canadian Infrastructure Products Hydrostrom hydrodynamic sparator. A sizing has been done for this system to remove at least 80% of TSS at a flow rate of 10.0 L/s. The proposed unit is the HS 4. The removal efficiency summary report is in Appendix E.

5 RECOMMENDATIONS

This study has established design criteria for the stormwater management system at 291 Watson Avenue. Based on the analysis performed, the following are the design requirements of the system:

- An allowable release rate of 10.0 L/s [0.353 ft^3/s]
- A storage volume of 20,012 L [707 ft^3]
- Stormwater quality treatment to 70% TSS removed with 90% of total runoff volume captured

The final detailed design of the stormwater management system will take into consideration the elevation of the site and pipes, and backwater conditions to establish the HGL of the system.

6 CONCLUSION

Based on the design criteria established, stormwater management system components have been preliminarily selected for the design. To maintain the allowable release rate, an orifice, flow restrictor device, or pump will be used. Adequate volume for storage is provided by ponding on the parking surface at a maximum depth of 200mm. Water quality treatment to remove at least 70% TSS from total runoff will be done with the ADS Water Quality Unit.

Based on the above assessment and design strategy, it is established that the proposed development at 291 Watson Ave is feasible from a stormwater management perspective. As a result, the site development will not have a negative impact on the municipal system.

Should you have any questions, please contact the office.

Respectfully Submitted

GS Engineering Inc.

Milena Stevanov, P.Eng.
Principal Engineer

Limitations and Disclaimer

This report reflects the judgment of the author based on the facts and information available at the time this report was prepared.

This report has been prepared for the use of our client only. Use of this report by a third party is only permitted with the written permission of GSE. Any damages suffered by third parties as a result of decision or action taken based on this report are the sole responsibility of the third party taking such decisions or actions.

The fees charged for the preparation of this report are for the work prepared to date including the conclusion and opinion rendered. There is no allowance for further investigation or consultation.

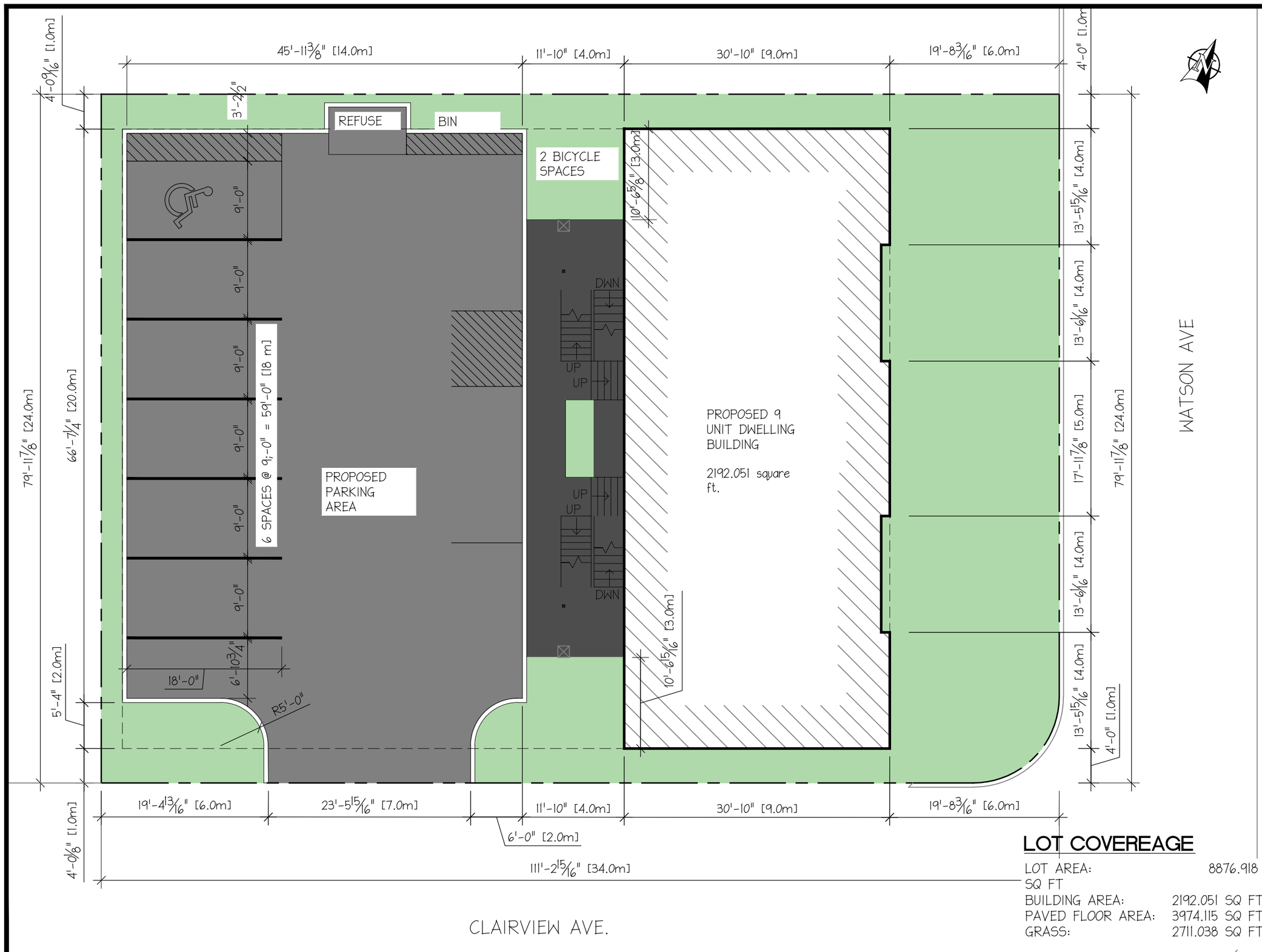
Appendix A

Existing Site Condition


Residence:
140 m²
Driveway: 70 m²
Garage
60 m²
Watson Ave
rview Ave
Clairview Ave

Appendix B

Proposed Site Plan



LOT COVEREAGE

LOT AREA:	8876.918 SQ FT
BUILDING AREA:	2192.051 SQ FT
PAVED FLOOR AREA:	3974.115 SQ FT
GRASS:	2711.038 SQ FT

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NOT FOR CONSTRUCTION

25/05/27	REPORT	B
25/01/09	REPORT	A

REVISION RECORD

CLIENT: PE Real Estate Solutions
1290 Deer Run Trail

PROJECT: SWM Design
291 Watson Ave. Windsor

DATE: 24/11/18

SCALE: 3/32"=1'-0"

DRN. BY: SA

CHK'D. BY: MS

PROJECT No.: E24225

TITLE: PROPOSED SITE PLAN

DWG No.: P100

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Appendix C

Preliminary Stormwater Management Calculations

GS ENGINEERING

Preliminary Stormwater Management

- Calculation -

Project Name: **291 Watson Ave. Windsor** Project Number: **E24225**

Sheet ID: **A** Rev: **1** Designer: **M. Stevanov** Date: **25/05/27** Page: **1/6**

Inputs

Site Conditions

Site area and development conditions

0.204 acre	(824.7 m^2)	Total Site Area (include area units acres, ft^2, m^2, etc.)
5		Pre-development storm event (2 or 5) for outflow restriction
5		Post development storm event

Pre-development Run-off Coefficient

Calculation of C based on existing site areas.

Select the area type	Area			C
Roof	2152.78 ft^2	200 m^2	24.3%	0.95
Concrete	753.47 ft^2	70 m^2	8.5%	0.95
Grass - clay soil	5970.74 ft^2	554.7 m^2	67.3%	0.20
Check Sum	0 sf		100%	0.45

C based on receiving sewer design. Used for the site design

Residential - Single Family	0.4	C_{pre} Runoff Coefficient

Time of Concentration

0.01		Average slope of the ground from the furthest point to the outlet
60 ft	(18.288 m)	Overland distance from the furthest point to the outlet
25 ft	(7.62 m)	shallow flow length
67 ft	(20.422 m)	Concentrated flow length
2 m/s		Concentrated flow velocity

$Tc = t_{sheet} + t_{shallow} + t_{concentrated}$ = 9.695 Time of concentration.

$$t_{sheet} = \frac{6.92 * \left(\frac{Site_{length1}}{1\ m}\right)^{0.6} * 0.17^{0.6}}{\left(\left(\frac{RainfallIntensity.I\left(T_{t,sheet,trial}, Y_{pre}\right) * 1\ hr}{1\ mm}\right)^{0.4} * Site_{slope1}^{0.3}\right)} = 8.07$$

T_t_sheet_trial = 8.08

$$t_{shallow} = \frac{\frac{Site_{shallow}}{1\ m}}{60 * 0.619 * 0.02^{0.5}} = 1.451$$

$$t_{concentrated} = \frac{\frac{Site_{concentrated}}{V_{concentrated}}}{1\ min} = 0.170$$

9.69 Time of Concentration in minutes

Flow (Q)

Flow is based on the rational formula of C*I*A

$$Q(C, T, A, y) = C * \left(RainfallIntensity.I(T, y)\right) * A$$

Pre Development Peak Flow Rate

$$Q_{pre} = Q\left(C_{pre}, T_{cr}, Area_{site}, Y_{pre}\right) = Q(0.4, 9.69, 0.204\ acre, 5)$$

0.3534 cfs 10.007 L/s 5-year storm

Post Development Conditions

Enter the area and runoff coefficient for the various areas into the table below. Check sum subtracts the areas entered from the total site area. Adjust the area entries for the four areas till check sum to equal zero.

Select the area type	Area			C	C_mod
Roof	2192 ft^2	203.6 m^2	24.7%	0.95	0.95
Concrete	3974 ft^2	369.2 m^2	44.8%	0.95	0.95
Grass - clay soil	2711 ft^2	251.9 m^2	30.5%	0.20	0.91
Check Sum	0 sf		100%	0.72	0.94

0.72 Post development site average runoff coefficient

0.94 Post development modified site average runoff coefficient

(See WE SWM Standards Manual 3.3.2.2)

Saturated Soil Run-off Coefficient (WE SWM Standards Manual 3.3.2.1)

Group D Select the Soil group for the area. - Brookstone Clay

80 Enter Number from 51 to 100 to represent the soil imperviousness

$$SatStorageDepth = \begin{cases} 11 + 0.95 * Soil_{imp} & \text{if } Soil_{Group} == \text{"Group A"} \\ 12 + 0.94 * Soil_{imp} & \text{if } Soil_{Group} == \text{"Group B"} \\ 50 + 0.56 * Soil_{imp} & \text{if } Soil_{Group} == \text{"Group C"} * 1\ mm = 98.4\ mm \\ 72 + 0.33 * Soil_{imp} & \text{if } Soil_{Group} == \text{"Group D"} \\ \text{"Enter Data"} & \text{otherwise} \end{cases}$$

$$C_{GrassSat} = \frac{SatStorageDepth}{108\ mm} = 0.911$$

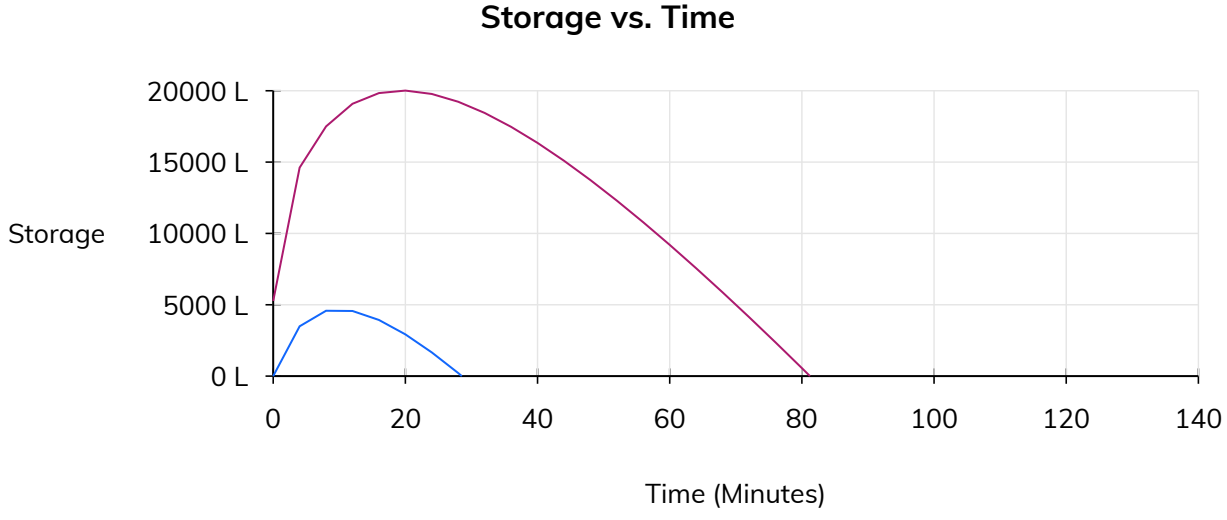
Post Development Flow Rate

$$Q_{post5} = Q\left(C_{post}, T_{cr}, Area_{site}, 5\right) = 0.637\ cfs$$

$$Q_{post100Sat} = Q\left(C_{postMod}, T_{cr}, Area_{site}, 5\right) = 0.829\ cfs$$

Required Storage

Volume of storage required is calculated as Qin-Qout for each time step.



Return Period	Required Storage	Required Storage
5	4580 L	162 ft^3
100sat	20012 L	707 ft^3

Volume required to be stored underground (Exception for this site)

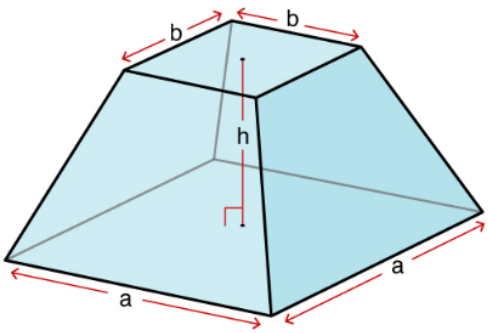
$$V_{out,parking} = \left(\frac{32\ mm}{4\ hr}\right) * T_{cr} * 1\ min * Area_{site} = 1066\ L$$

Stress Test Run off

$$V_{StressTest} = 1.75\ \frac{mm}{hr} * T_{cr} * 1\ min * Area_{site} = 233.196\ L$$

Parking Lot Storage

Volume of a Truncated Pyramid



$$V = \frac{1}{3} h(a^2 + b^2 + ab)$$

	Area	Depth	Volume
CB1	151 m^2	200 mm	10,620 L
CB2	139 m^2	200 mm	9,795 L

Total **20,415 L**

Adequate Parking Storage Volume

Post Development Storage Requirements

4 Time Step

5-Year Design Storm

Time Step (minutes)	Intensity 5 Year Storm	Qin	Volumn In	Volumn Out	Volume to be Stored
0			0 L	0 L	0 L
4	231 mm/hr	24.55 L/s	5892 L	2402 L	3491 L
8	188 mm/hr	19.55 L/s	9383 L	4803 L	4580 L
12	160 mm/hr	16.35 L/s	11769 L	7205 L	4564 L
16	139 mm/hr	14.11 L/s	13541 L	9606 L	3934 L
20	123 mm/hr	12.44 L/s	14933 L	12008 L	2925 L
24	111 mm/hr	11.16 L/s	16069 L	14410 L	1659 L
28	101 mm/hr	10.13 L/s	17024 L	16811 L	212 L
32	93 mm/hr	9.29 L/s	17844 L	19213 L	-1369 L
36	86 mm/hr	8.59 L/s	18561 L	21615 L	-3053 L
40	80 mm/hr	8.00 L/s	19197 L	24016 L	-4819 L
44	75 mm/hr	7.49 L/s	19768 L	26418 L	-6650 L
48	71 mm/hr	7.04 L/s	20285 L	28819 L	-8534 L
52	67 mm/hr	6.65 L/s	20757 L	31221 L	-10464 L
56	64 mm/hr	6.31 L/s	21192 L	33623 L	-12431 L
60	60 mm/hr	6.00 L/s	21594 L	36024 L	-14430 L
64	58 mm/hr	5.72 L/s	21968 L	38426 L	-16458 L
68	55 mm/hr	5.47 L/s	22318 L	40827 L	-18510 L
72	53 mm/hr	5.24 L/s	22646 L	43229 L	-20583 L
76	51 mm/hr	5.03 L/s	22956 L	45631 L	-22675 L
80	49 mm/hr	4.84 L/s	23249 L	48032 L	-24784 L
84	47 mm/hr	4.67 L/s	23526 L	50434 L	-26908 L
88	45 mm/hr	4.51 L/s	23790 L	52836 L	-29045 L
92	44 mm/hr	4.36 L/s	24042 L	55237 L	-31195 L
96	42 mm/hr	4.22 L/s	24282 L	57639 L	-33357 L
100	41 mm/hr	4.09 L/s	24512 L	60040 L	-35528 L
104	40 mm/hr	3.96 L/s	24733 L	62442 L	-37709 L
108	39 mm/hr	3.85 L/s	24945 L	64844 L	-39899 L
112	38 mm/hr	3.74 L/s	25149 L	67245 L	-42096 L
116	37 mm/hr	3.64 L/s	25346 L	69647 L	-44301 L
120	36 mm/hr	3.55 L/s	25536 L	72048 L	-46513 L
MAX				**162 cf**	**4,580 L**

100 year storm with saturated soil

Time Step (minutes)	Intensity 5 Year Storm	Qin	Volumn In	Volumn Out	Volume to be Stored
0			0 L	0 L	
4	149 mm/hr	31.95 L/s	7667 L	2402 L	5266 L
8	118 mm/hr	40.45 L/s	19416 L	4803 L	14612 L
12	99 mm/hr	34.31 L/s	24706 L	7205 L	17501 L
16	85 mm/hr	29.89 L/s	28694 L	9606 L	19087 L
20	75 mm/hr	26.54 L/s	31845 L	12008 L	19837 L
24	68 mm/hr	23.90 L/s	34422 L	14410 L	20012 L
28	61 mm/hr	21.78 L/s	36586 L	16811 L	19775 L
32	56 mm/hr	20.02 L/s	38442 L	19213 L	19229 L
36	52 mm/hr	18.55 L/s	40059 L	21615 L	18444 L
40	48 mm/hr	17.29 L/s	41487 L	24016 L	17471 L
44	45 mm/hr	16.20 L/s	42763 L	26418 L	16345 L
48	43 mm/hr	15.25 L/s	43914 L	28819 L	15095 L
52	40 mm/hr	14.41 L/s	44961 L	31221 L	13740 L
56	38 mm/hr	13.67 L/s	45920 L	33623 L	12298 L
60	36 mm/hr	13.00 L/s	46804 L	36024 L	10780 L
64	35 mm/hr	12.40 L/s	47623 L	38426 L	9198 L
68	33 mm/hr	11.86 L/s	48386 L	40827 L	7559 L
72	32 mm/hr	11.37 L/s	49099 L	43229 L	5870 L
76	30 mm/hr	10.91 L/s	49769 L	45631 L	4138 L
80	29 mm/hr	10.50 L/s	50399 L	48032 L	2367 L
84	28 mm/hr	10.12 L/s	50995 L	50434 L	561 L
88	27 mm/hr	9.77 L/s	51560 L	52836 L	-1276 L
92	26 mm/hr	9.44 L/s	52096 L	55237 L	-3141 L
96	26 mm/hr	9.13 L/s	52607 L	57639 L	-5032 L
100	25 mm/hr	8.85 L/s	53094 L	60040 L	-6946 L
104	24 mm/hr	8.58 L/s	53560 L	62442 L	-8882 L
108	23 mm/hr	8.33 L/s	54007 L	64844 L	-10837 L
112	23 mm/hr	8.10 L/s	54435 L	67245 L	-12810 L
116	22 mm/hr	7.88 L/s	54847 L	69647 L	-14800 L
120	21 mm/hr	7.67 L/s	55243 L	72048 L	-16805 L
124	21 mm/hr	7.48 L/s	55625 L	74450 L	-18825 L
128	20 mm/hr	7.29 L/s	55994 L	76852 L	-20857 L
132	20 mm/hr	7.11 L/s	56351 L	79253 L	-22903 L
MAX				**707 cf**	**20,012 L**

x5 yIN5 yOUT yIN100 ySTORE5 ySTORE100

Preliminary Stormwater Management

- Rainfall Intensity -

Rainfall Intensity (I)

Rainfall intensity chart (*Idata*) based on City of Windsor Airport data (*Table 3.2.1.1*).

year	2	5	10	25	50	100
A	854	1259	1511	1851	2114	2375
B	7	8.8	9.5	10.2	10.6	11
C	0.818	0.838	0.845	0.852	0.858	0.861

Rainfall intensity formula based on the A, B, and C values extracted from the chart and T is in minutes with the results forced to mm/hr.

$$I(T, y) := \left(\frac{A(y)}{\left(T + B(y)\right)^{C(y)}} \right) * \left(1 \ \frac{mm}{hr} \right)$$

A(y) = Hlookup(y, Idata.B1 : G4, 2) Extract the A value from the chart

B(y) = Hlookup(y, Idata.B1 : G4, 3) Extract the B value from the chart

C(y) = Hlookup(y, Idata.A1 : G4, 4) Extract the C value from the chart

MTO Intensity (I_{mto})

An alternate method using the MTO data and the Gumbel method. The following data is from the MTO information for the Windsor Airport

year	2	5	10	25	50	100
A	24.1	31.8	36.9	43.2	48	52.7
B	-0.699	-0.699	-0.699	-0.699	-0.699	-0.699

In the Gumbel formula the time T is in hours and AA and BB are extracted from the MTO table above

$$I_{mto}(T, y) = AA(y) * \left(\frac{T}{60} \right)^{BB(y)} * 1 \ \frac{mm}{hr}$$

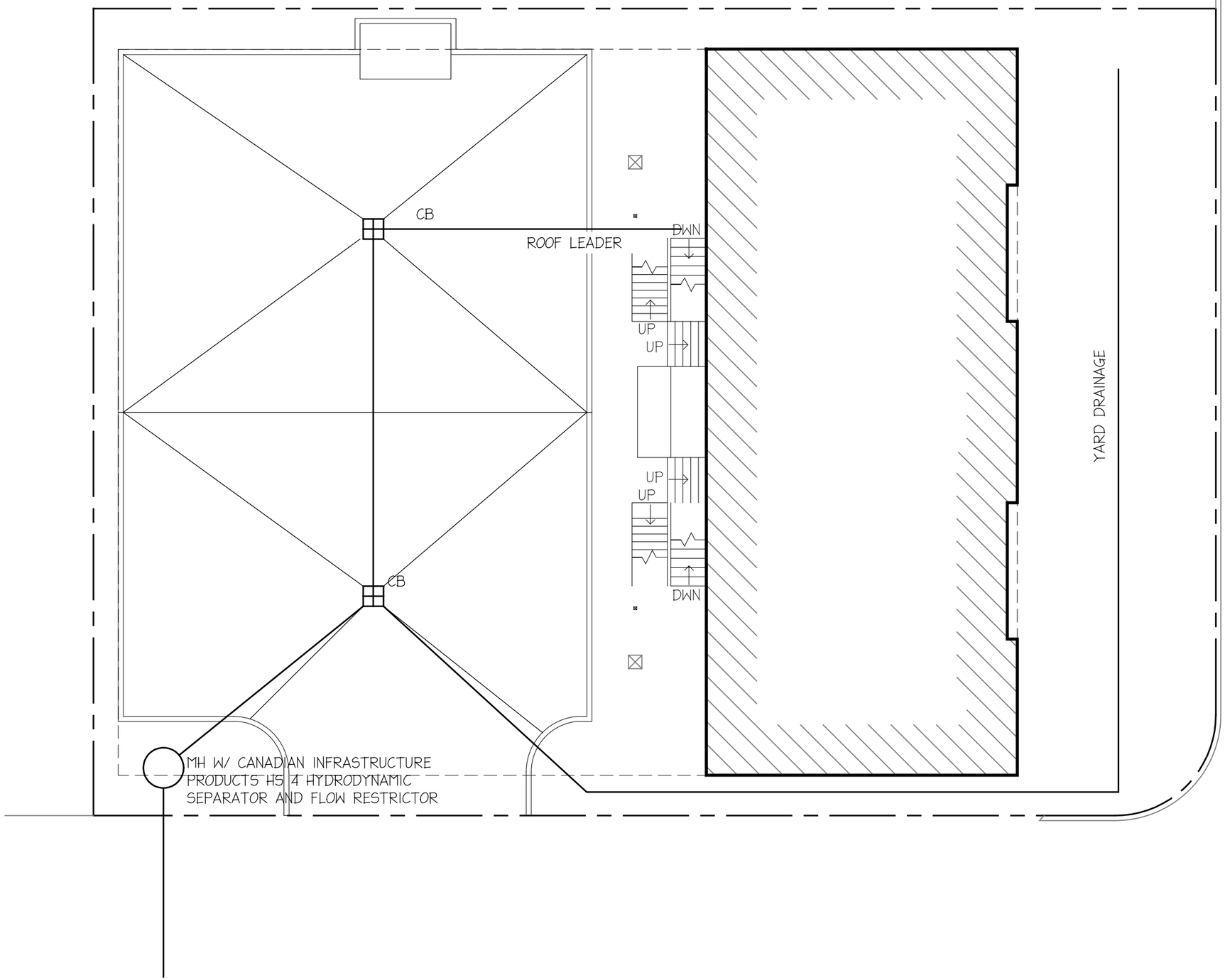
AA(y) = Hlookup(y, MTOIDF.A1 : G3, 2) Extract of A value from MTO IDF table

BB(y) = Hlookup(y, MTOIDF.A1 : G3, 3) Extract of B value from MTO IDF table

Curves for other areas in Ontario may be found on the MTO website [MTO IDF Website]

Appendix D

Proposed Stormwater Management System Layout



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NOT FOR CONSTRUCTION

25/05/27	REPORT	B
25/01/09	REPORT	A

REVISION RECORD

CLIENT: PE Real Estate Solutions
Windsor, ON

PROJECT: SWM Design
291 Watson Ave. Windsor

DATE: 24/11/18

SCALE: 3/32"=1'-0"

DRN. BY: SA

CHK'D. BY: MS

PROJECT No.: E24225

TITLE: PROPOSED STORM SERVICING PLAN

DWG No.: P200

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Appendix E

TSS Removal Efficiency Report

Hydroworks Sizing Summary

291 Watson Ave

05-27-2025

Recommended Size: HydroStorm HS 4

Hydroworks Sizing Program Version 5.8.5

A HydroStorm HS 4 is recommended to provide 80 % annual TSS removal based on a drainage area of 0.083 (ha) with an imperviousness of 72 % and Windsor A, Ontario rainfall for the User defined particle size distribution.

The recommended HydroStorm HS 4 treats 100 % of the annual runoff and provides 98 % annual TSS removal for the Windsor A rainfall records and User defined particle size distribution.

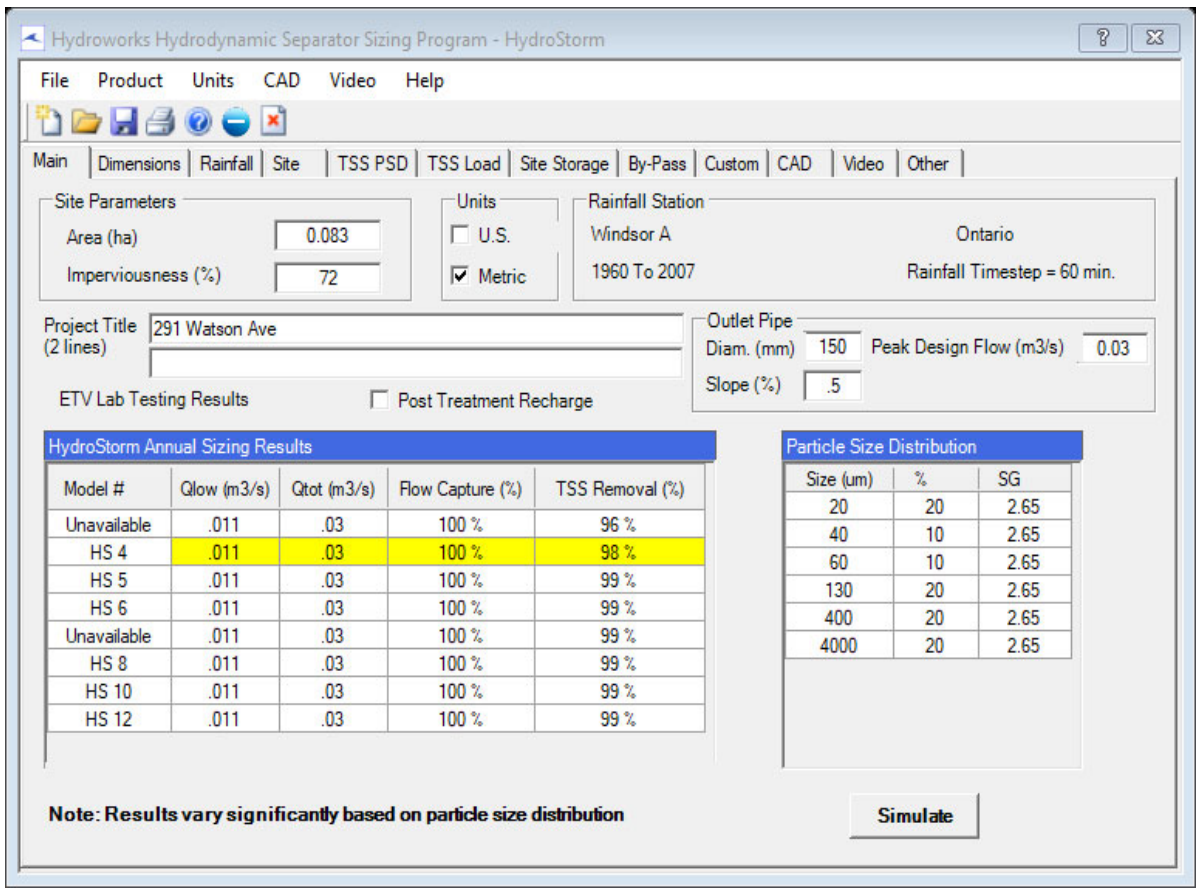
The HydroStorm has a headloss coefficient (K) of 1.04. The given peak flow of .03 (m3/s) Is greater than the full pipe flow of .01 (m3/s) indicating the pipe will be surcharged during the peak flow. Full pipe flow was assumed For the headloss calculations. The pressure head in the pipe was Not evaluated since this would require a hydraulic gradeline analysis. The headloss was calculated to be 153 (mm) based on a flow depth of 150 (mm) (full pipe flow).

This summary report provides the main parameters that were used for sizing. These parameters are shown on the summary tables and graphs provided in this report.

If you have any questions regarding this sizing summary please do not hesitate to contact Hydroworks at 888-290-7900 or email us at support@hydroworks.com.

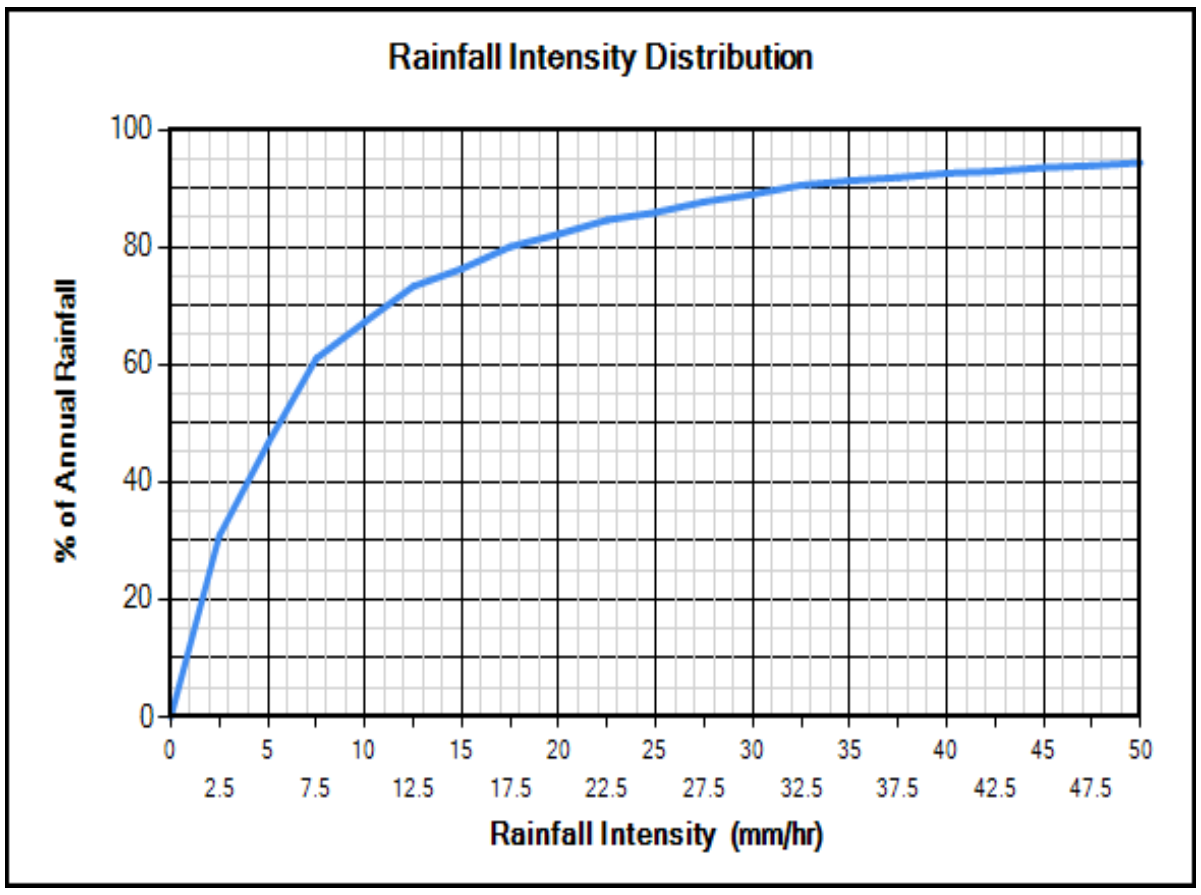
The sizing program is for sizing purposes only and does not address any site specific parameters such as hydraulic gradeline, tailwater submergence, groundwater, soils bearing capacity, etc. Headloss calculations are not a hydraulic gradeline calculation since this requires a starting water level and an analysis of the entire system downstream of the HydroStorm .

TSS Removal Sizing Summary

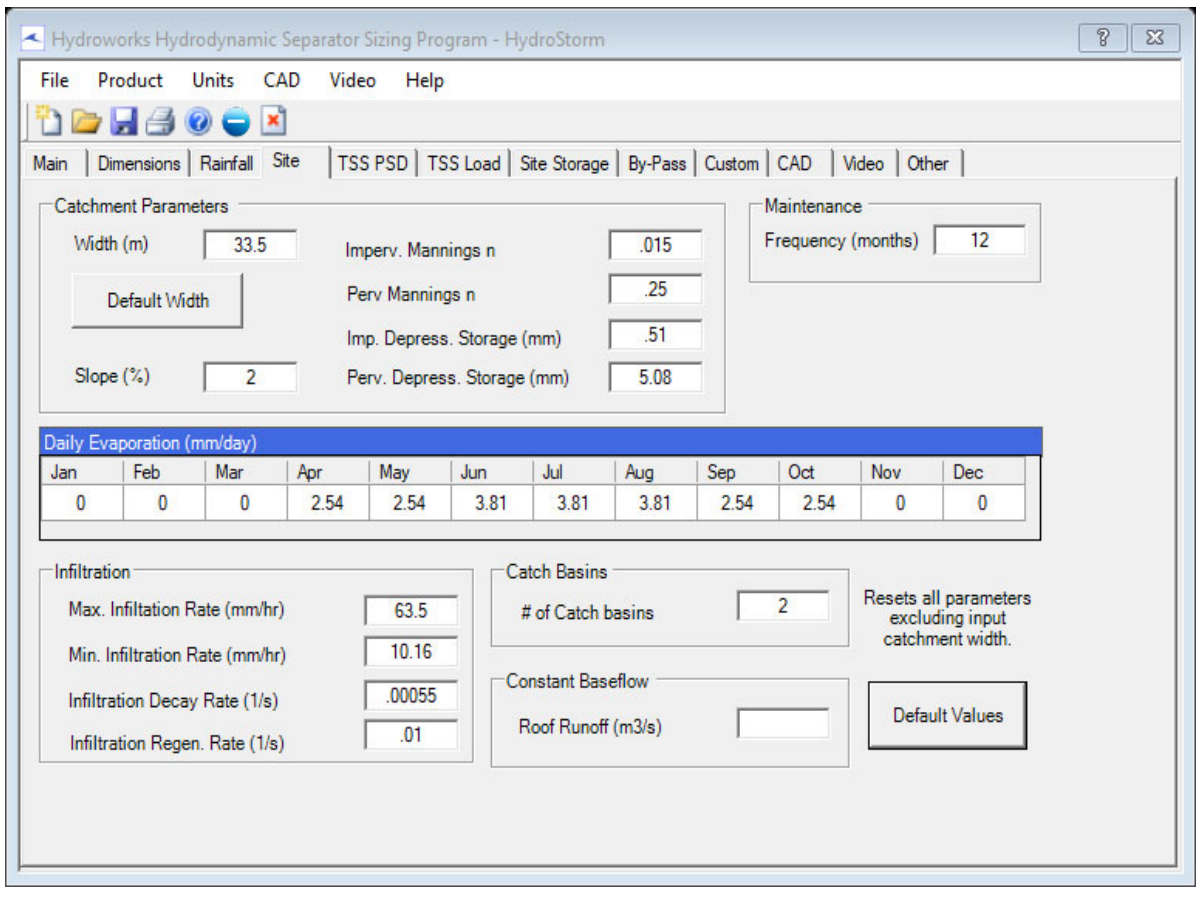


TSS Particle Size Distribution

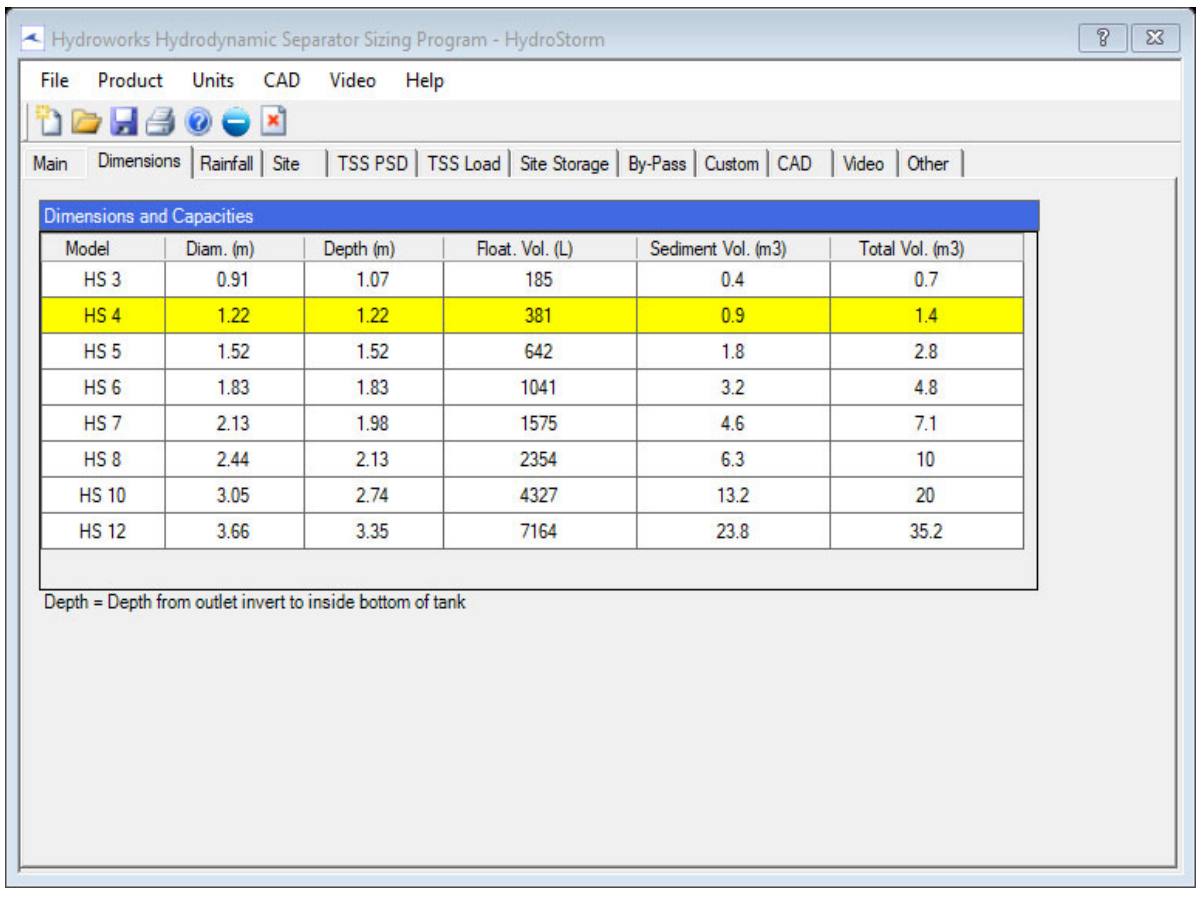
Rainfall Station - Windsor A, Ontario(1960 To 2007)



Site Physical Characteristics

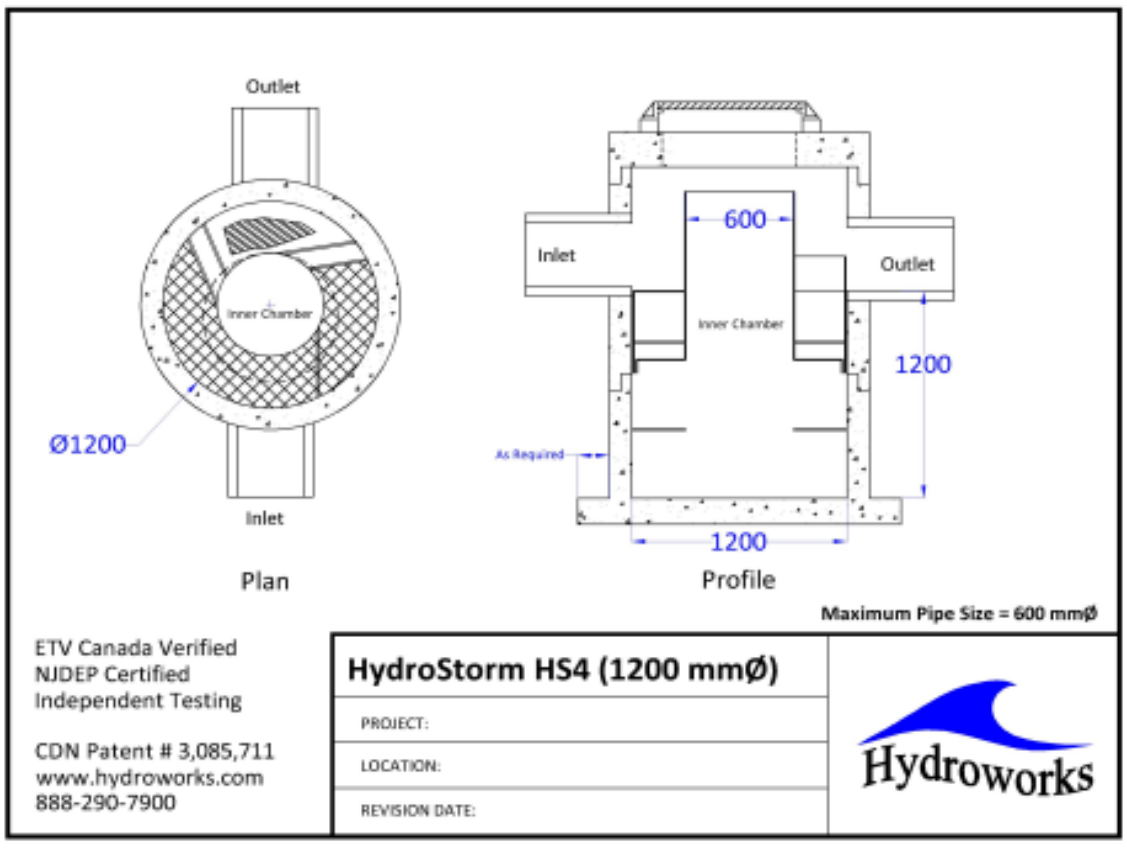


Dimensions And Capacities

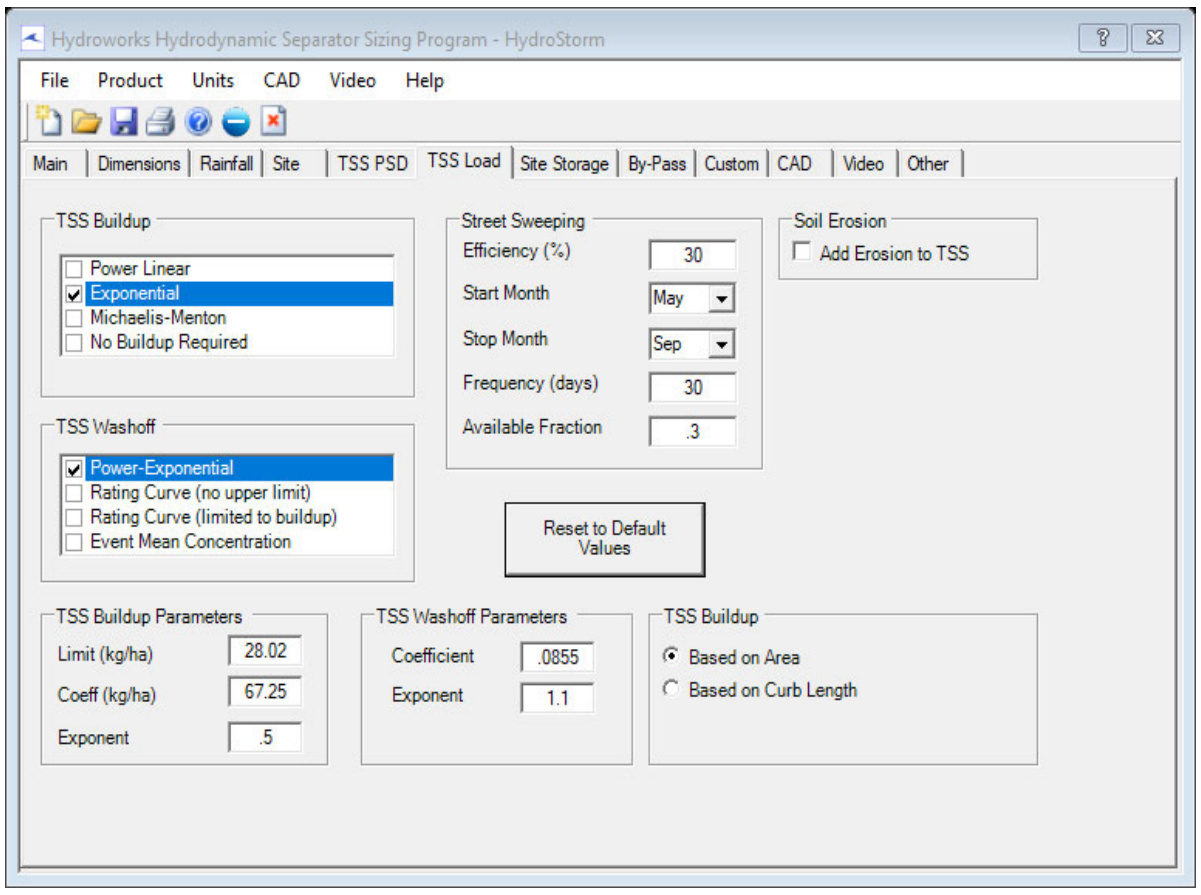


Model	Diam. (m)	Depth (m)	Float. Vol. (L)	Sediment Vol. (m3)	Total Vol. (m3)
HS 3	0.91	1.07	185	0.4	0.7
HS 4	1.22	1.22	381	0.9	1.4
HS 5	1.52	1.52	642	1.8	2.8
HS 6	1.83	1.83	1041	3.2	4.8
HS 7	2.13	1.98	1575	4.6	7.1
HS 8	2.44	2.13	2354	6.3	10
HS 10	3.05	2.74	4327	13.2	20
HS 12	3.66	3.35	7164	23.8	35.2

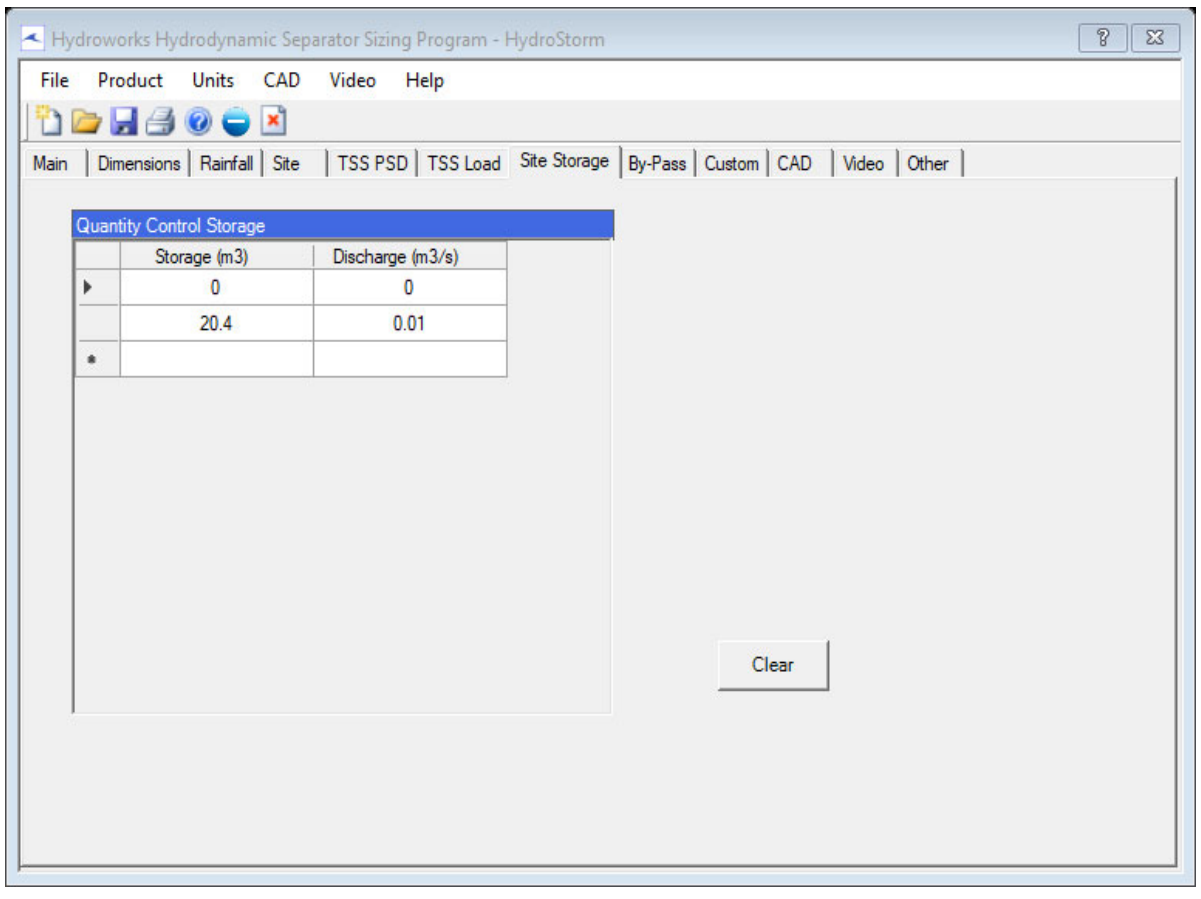
Generic HS 4 CAD Drawing



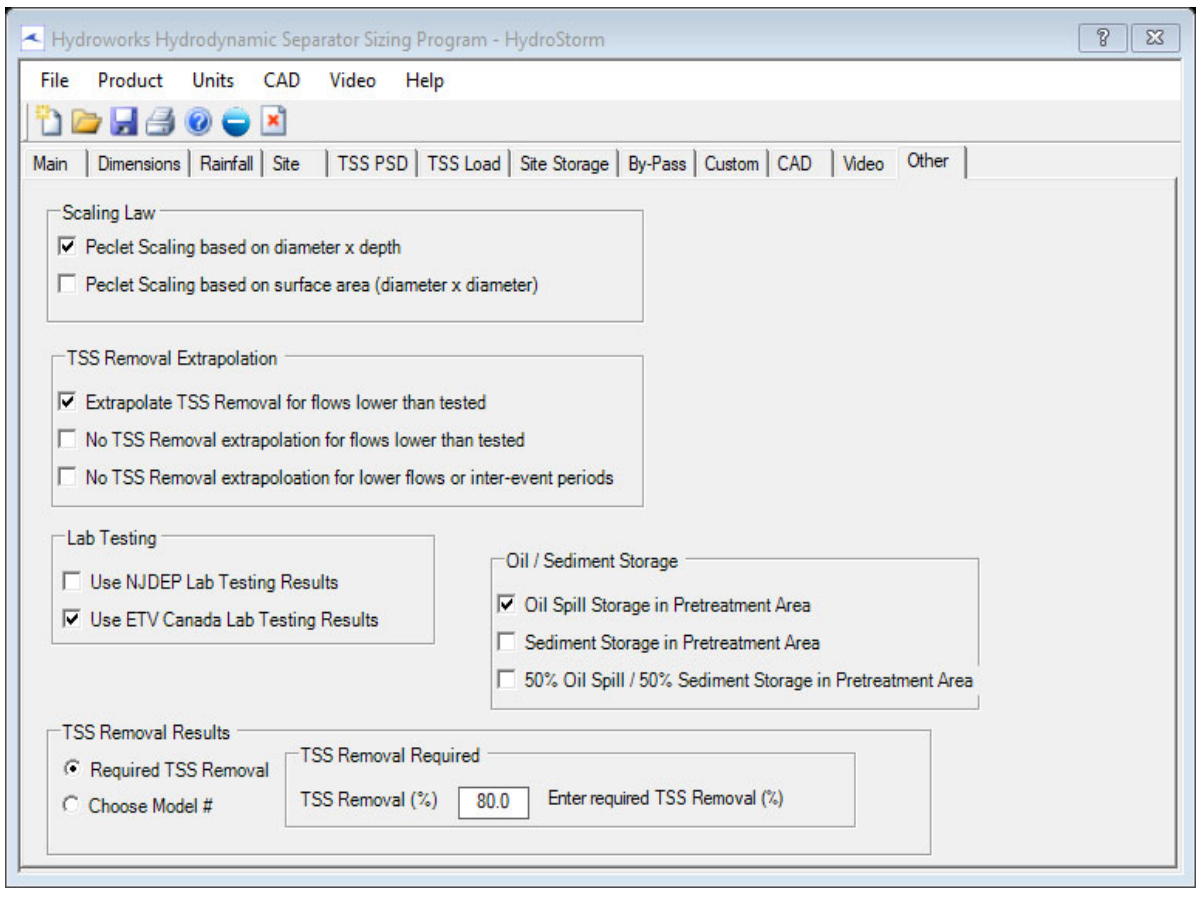
TSS Buildup And Washoff



Upstream Quantity Storage



Other Parameters



Flagged Issues

None

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