April 28, 2025
Project No. 31489-22

Brad Wesley Holdings Ltd.
5359 8th Line
Erin, Ontario, N0B 1T0

Re: Servicing and Stormwater Management Report
Proposed Self Storage Complex
Part of Lot 237 Concession 2, 752065 Ida Street, Dundalk, Ontario

1.0 Introduction

Van Harten Surveying Inc. (Van Harten) was retained to prepare a Servicing and Stormwater Management Report in support of the Site Plan Application for the construction of a proposed self storage complex located at the above address.

The purpose of this Servicing and Stormwater Management Report is to outline proposed water servicing, sanitary servicing, and stormwater servicing for the proposed development. The following reports and background information were referenced to inform this report and supporting design calculations:

- CMT Engineering Inc. – Geotechnical Investigation (March 27, 2023)
- Riepma Consultants Inc. – Site Plan (September 2024)
- MGM Consulting Inc. – Floodplain Assessment (February 2025)
- Township of Southgate – Municipal Servicing Standards (June 2022)
- Township of Southgate As-Constructed Drawings
- Ministry of the Environment - Stormwater Management Planning and Design Manual (March 2003)

Relevant excerpts from the above reports and background information have been provided in Appendix A.

2.0 Existing Site Conditions

The undeveloped site encompasses an area of approximately 2.43 ha and is currently comprised of grassed vacant lands. The property is bounded by commercial land to the east, wastewater treatment ponds to the south, Ida Street to the west and Eco Parkway to the north.

CMT Engineering Inc. advanced twelve (12) boreholes across the site to confirm the subsurface soils and groundwater conditions on March 6th to 7th of 2023. Based on the borehole investigation the on-site soils are comprised of topsoil underlain by a fill layer comprised of sand, silt and gravel and then layers of silt and sand to silt and sand till. Monitoring wells were installed in boreholes 4 and 9 to measure the static groundwater levels. The water level in borehole 4 was measured at 0.55mbgs and the water level in borehole 9 was measured at 0.28mbgs. It should be noted that infiltration systems are not considered feasible for the site due to the presence of high groundwater levels.

MGM Consulting Inc. completed a Floodplain Assessment to determine the extent of the pre-development regional floodplain. See Appendix A for the Pre-Development Floodplain figure provided by MGM Consulting Inc.

3.0 Proposed Development Conditions

According to the Site Plan prepared by Riepma Consultants Inc. the proposed development will be comprised of the following:

- Seven (7) self-storage buildings.
- Asphalt parking areas and drive aisles with an entrance to Eco Parkway.
- Landscaped areas and a stormwater management facility.

4.0 Water Servicing

4.1 Existing Water Servicing

There is an existing 150mmØ watermain along the north side of Eco Parkway. There are no water services to the site in the existing condition. An existing hydrant exists in the Eco Parkway north boulevard along the northern frontage of the site.

4.2 Proposed Water Servicing

The proposed development will be serviced by a 25mmØ water service connecting to the existing 150mmØ watermain along the north side of Eco Parkway using a tapping sleeve and valve connection. The proposed 25mmØ service will provide domestic water service for the proposed development.

The existing fire hydrant will provide fire suppression for the proposed development. Should the Town require additional fire suppression it is anticipated that the Township will extend the Eco Parkway watermain and provide a new hydrant to support the Plan of Subdivision.

Details of the proposed water servicing can be referenced on the Site Servicing Plan.

5.0 Sanitary Servicing

5.1 Existing Sanitary Servicing

With reference to the Township of Southgate Plan and Profile drawing (Proj No. M5611) for Eco-Parkway there is an existing 250mm diameter PVC sanitary sewer on Eco Parkway approximately 188.8m northeast of the site.

5.2 Proposed Sanitary Servicing

The proposed development will be serviced by a 223.8 m forcemain extension, constructed by the Township of Southgate to support the associated Plan of Subdivision. This forcemain will connect to an existing manhole (SAMH 301, Inv = 507.93) located approximately 188.8 m northeast of the easternmost property boundary, within the Eco Parkway right-of-way.

6.0 Stormwater Management

6.1 Stormwater Management Criteria

The Township of Southgate Municipal Servicing Standards (June 2022) and the Ministry of Environment Stormwater Management Planning and Design Manual (March 2003) were referenced to determine the stormwater management criteria for the proposed development. Based on the manuals the following stormwater criteria must be met:

Stormwater Quantity Control – Control of post-development runoff flows to pre-development levels for rainfall events with return periods between the 5 year and 100 year storm event.

Stormwater Quality Control – Provide enhanced protection - 80% total suspended solid (TSS) removal.

6.2 Existing Drainage Patterns

An Existing Drainage Plan has been prepared based on the topographic survey completed by Van Harten. According to the topographic survey, the site slopes from north-east to south-west with a total topographic relief of approximately 1.75 m. The majority of stormwater runoff from the site drains overland towards the Ida Street roadside ditch, which is a GRCA regulated watercourse.

Two (2) catchments were identified in the pre-development condition. Catchment 101 represents the drainage area that sheet flows towards the Ida Street roadside ditch. Catchment 102 represents the drainage area that sheet flows towards the adjacent property to the east which discharges to the existing wastewater treatment ponds to the south.

Table 2 summarizes the pre-development drainage areas and hydrologic design parameters. The Pre-Development Drainage Plan can be referenced in the Appendix.

Table 2: Pre-development Catchments and Hydrologic Design Parameters

Hydrologic Parameter	Catchment 101[N]	Catchment 102[N]
Catchment Area (ha)	2.240	0.186
Curve Number	65.22	58.00
Initial Abstraction (mm)	6.66	7.00
Slope (%)	1.0	1.0
Time to Peak (hr)	0.29	0.17

N = Nashyd

6.3 Proposed Drainage Patterns

A proposed drainage plan has been prepared based on the Site Grading Plan prepared by Van Harten. To remain consistent with the existing drainage conditions the grading for the proposed development (Catchment 201) was completed to direct the majority of the stormwater runoff to the GRCA regulated watercourse/Ida Street ditch.

Catchment 201 – Consists of building, landscaped, asphalt parking lot and drive aisle runoff. All runoff from this catchment will be captured and conveyed by a proposed storm sewer network and controlled by the proposed stormwater management facility which will ultimately discharge to the GRCA watercourse/Ida Street ditch.

Catchment 202 – Consists of undeveloped landscaped runoff. All run-off from this catchment will sheet flow to the existing roadside ditch along Ida Street and will remain uncontrolled.

Catchment 203 – Consists of sideyard landscaped runoff. All run-off from this catchment will sheet flow to the adjacent property to the east, which ultimately drains to the wastewater treatment ponds to the southeast.

Table 3 summarizes the post-development drainage areas and hydrologic design parameters. The Post-Development Drainage Plan can be referenced in the Appendix.

Table 3: Post Development Catchments and Hydrologic Design Parameters

Hydrologic Parameter	Catchment 201^{S}		Catchment 202^{N}	Catchment 203^{N}
Catchment Area (ha)	1.089		1.151	0.150
Percent Imperv (%) / Curve Number	96%		58.00	61.00
Initial Abstraction | Depression Storage (mm)	5.0	2.0	7.0	5.0
Slope (%) (Perv | Imperv)	2.0	1.0	1.0	0.3
Time to Peak (hr)	-		0.31	0.58

N = Nashyd , S = Stanhyd

6.4 Stormwater Quantity Controls

The stormwater management quantity control criteria for the site are subject to the Township of Southgate Municipal Servicing Standards. The quantity control criterion for the proposed development includes controlling the post-development peak flows to the pre-development peak flow rates for the 5-year through 100-year storm events.

Calculations were prepared using Visual Otthymo and IDF parameters obtained from the MTO Lookup Tool – Dundalk Specific IDF (accessed April 5, 2025) to calculate the return period peak flows under the pre-development and post-development conditions for the 5-year through 100-year return periods (Table 4 & 5). The Visual Otthymo output files are provided in Appendix B.

Table 4: Peak Flow and Storage Requirements Summary (Catchment 201 & 202) – Ida Street Ditch Outlet

Storm Event (yr)	Pre-Development Peak Flow (m^3/s)	Post-Development Controlled Peak Flow (m^3/s)	Required Storage (m^3)	Provided Storage (m^3)
5	0.035	0.033	286	859
10	0.050	0.041	341	
25	0.071	0.051	412	
50	0.089	0.059	468	
100	0.108	0.067	521	

[1] Pre-Development Peak Flows = Catchment 101
[2] Post-Development Controlled Peak Flow = Catchment 201 + Catchment 202
[3] Storage provided includes freeboard

Table 5: Peak Flow and Storage Requirements Summary (Catchment 203) – Neighbouring Property Outlet

Storm Event (yr)	Catchment 102 Peak Flow (m^3/s)	Catchment 203 Peak Flow (m^3/s)	Reduction (L/s)
5	0.003	0.002	1
10	0.004	0.002	2
25	0.006	0.003	3
50	0.008	0.004	4
100	0.009	0.004	5

Quantity controls are required to attenuate the post-development peak flows to the pre-development levels. Quantity controls for the proposed development will be provided by a dry pond complete with an outlet control structure. The stormwater management facility will provide 859 m^3 of storage to meet the quantity control requirements.

Stormwater will be attenuated to pre-development levels through the implementation of a control structure complete with a 120mmØ circular orifice plate at the outlet of the dry pond within the proposed concrete ditch inlet catchbasin (DI1). Additional details of the outlet control structure and stormwater management facility design have been provided in Appendix B.

All proposed hard-surfaced areas will have runoff directed towards the proposed stormwater facility. The stormwater facility has been designed to capture, convey, and attenuate the 100-year storm event. Storm events larger than the 100-year event will be safely conveyed to the site outlet via a 4m wide emergency overland flow weir at an elevation of 585.90m, which will direct flows to the GRCA regulated watercourse/Ida Street ditch.

6.5 Stormwater Quality Controls

Stormwater quality controls for the proposed development will include “enhanced” level treatment, or 80% total suspended solid (TSS) removal. Enhanced TSS removal for Catchment 201 will be achieved through the implementation of an oil-grit separator. The Hydrostorm sizing software was used to determine the required size of oil-grit separator unit for the site. It was determined that a Hydrostorm HS6 will provide 82% TSS removal for all storm events captured by the storm sewer network (5 year storm and less).

The Hydrostorm unit will require regular inspection and maintenance as per the manufacturer's specifications to ensure the unit operates properly. See the maintenance manual provided in Appendix B.

Catchment 202 and Catchment 203 will be comprised of “clean runoff” from landscaped areas. Therefore, quality controls have not been provided for these catchments.

6.6 Operation and Maintenance

The future property owners will be required to inspect the works on an annual basis to ensure their continued functioning.

- All downspouts, splash pads and roof leaders shall be kept in good working order at all times.
- All grass swales should be maintained clear of obstructions so that they function as intended. The property owner should inspect on a routine basis for erosion, in particular at outlet locations, and repair any gullies, rills or bare spots.
- The oil-grit separator should be inspected per the manufactures specifications and suspended solids should be removed when sufficient buildup occurs.
- The depression storage outlet should be inspected for obstructions after every major rainfall event and suspended solids should be removed when sufficient buildup occurs

The maintenance of the stormwater management features on the site is the sole responsibility of the property owner and should be completed on an as needed basis.

7.0 Closure

The completed Servicing and Stormwater Management Report is specific to the site based on our knowledge of the proposed development. We trust that this report is suitable to support the Site Plan Application for the proposed development. Please contact our office if you have any questions or require further consultation.

Van Harten Surveying Inc.

[redacted]

Blair Henderson, C.E.T.
Certified Engineering Technologist

Van Harten Surveying Inc.

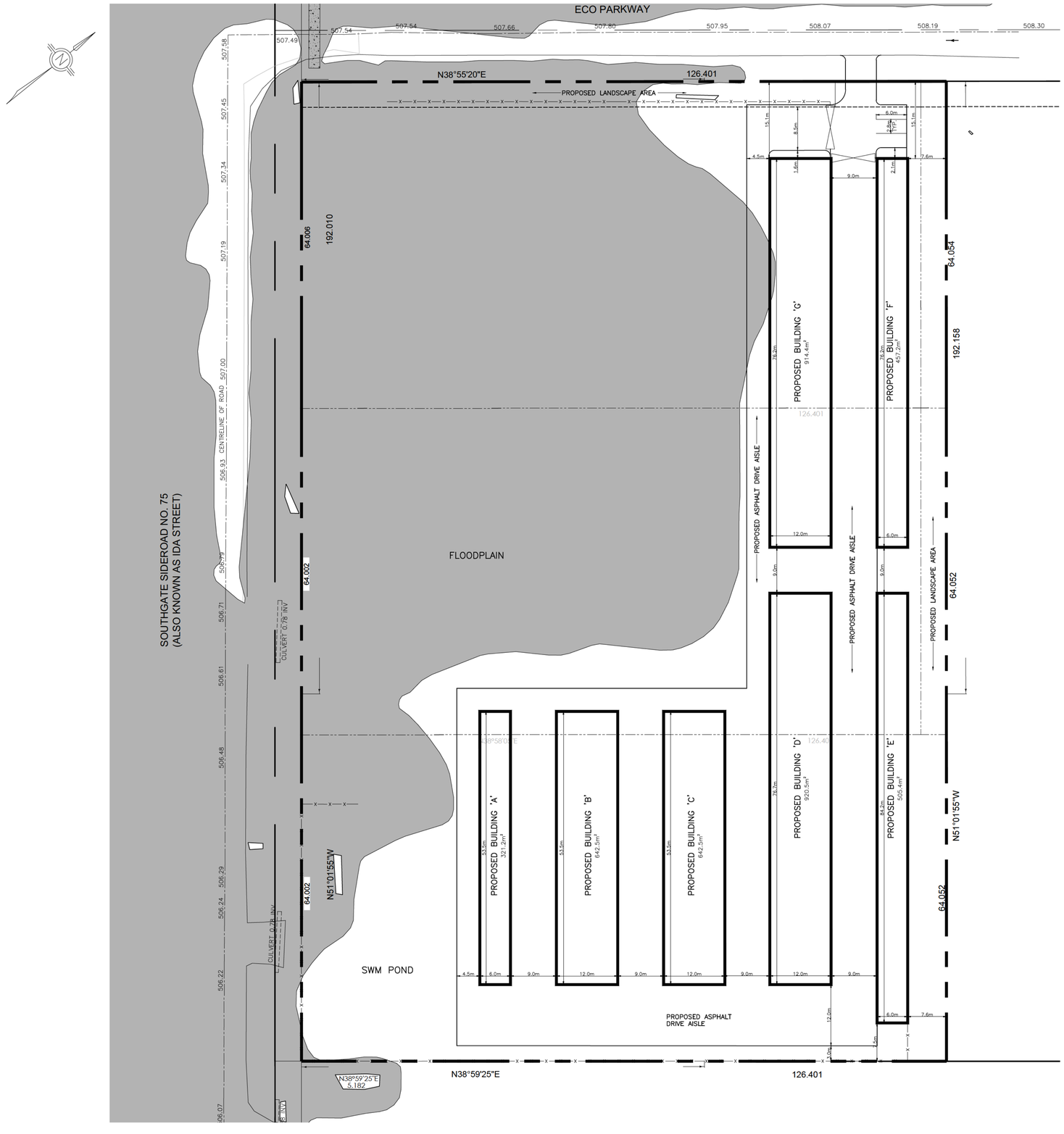
[redacted]

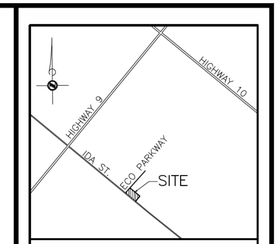
Brett Pond, P. Eng
Project Manager

Encl. Appendix A – Background Information
Encl. Appendix B – Stormwater Management Calculations

Encl. Drawings
Sheet 1 - Site Grading Plan
Sheet 2 - Site Servicing Plan
Sheet 3 - Notes and Details
Sheet 4 - Pre-Development Drainage Plan
Sheet 5 - Post-Development Drainage Plan

APPENDIX A
BACKGROUND INFORMATION





KEY PLAN

LEGEND

- PROPERTY LINE
- CHAIN LINK FENCE
- PRE-DEVELOPMENT FLOODPLAIN EXTENT

LEGAL DESCRIPTION

PART OF LOT 237
CONCESSION 2 SOUTHWEST OF THE TORONTO AND SYDENHAM ROAD
GEOGRAPHIC TOWNSHIP OF PROTON
TOWNSHIP OF SOUTHGATE
COUNTY OF GREY

SITE STATISTICS

TOTAL SITE AREA 5.999 ac/2.428ha

PROPOSED BUILDING AREAS

BUILDING 'A'	321.2m²
BUILDING 'B'	642.5m²
BUILDING 'C'	642.5m²
BUILDING 'D'	920.5m²
BUILDING 'E'	505.4m²
BUILDING 'F'	457.2m²
BUILDING 'G'	914.4m²
TOTAL BUILDING AREA	4,403.7m²
BULDING COVERAGE	18.1%
LANDSCAPE AREA	16,789.9m²
LANDSCAPE COVERAGE	69.2%

PARKING

TOTAL PARKING REQUIRED	– SPACES
TOTAL PARKING PROVIDED	3 SPACES

DATE	DESCRIPTION	CHECKED BY
SEPT. 12 2024	REVISED SITE PLAN & ISSUED FOR REVIEW	
JUNE 2023	REVISED SITE PLAN & ISSUED FOR REVIEW	
JUNE 2022	ISSUED FOR REVIEW	

REVISIONS

Riepma CONSULTANTS INC.
220 Kempenfelt Drive
Barrie, Ontario
L4M 1C4
416-346-8258
www.riepma.ca
riepma@riepma.ca

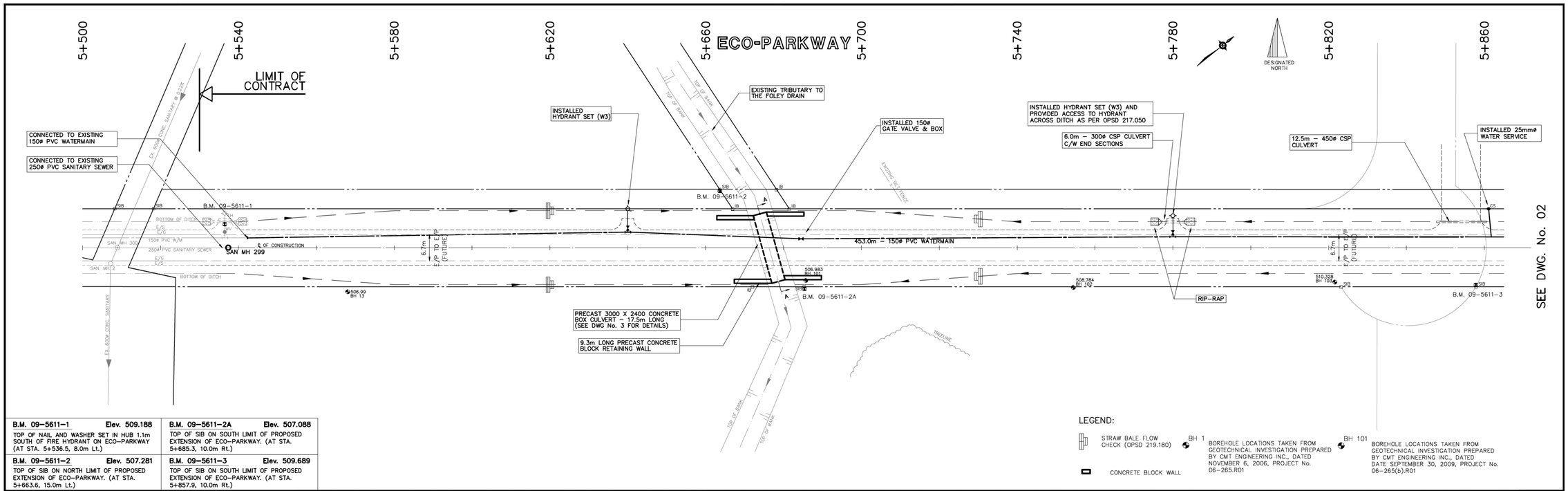
Project Title

PROPOSED SELF STORAGE UNITS
Ida Street
Dundalk, Ontario

Drawing

SITE PLAN

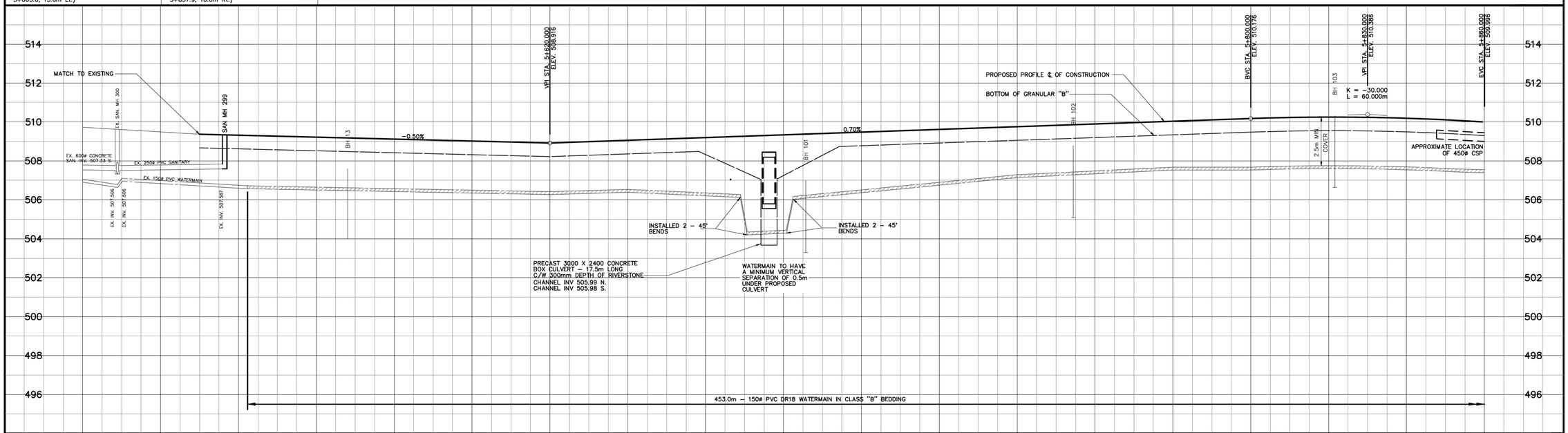
Date: June 2023	Issued
Job Number: 22–03	Drawn By: D.N.
Scale: 1:400	Checked By
Sheet Number: SP.1	



B.M. 09–5611–1 **Elev. 509.188** TOP OF NAIL AND WASHER SET IN HUB 1.1m SOUTH OF FIRE HYDRANT ON ECO–PARKWAY (AT STA. 5+536.5, 8.0m Lt.)	**B.M. 09–5611–2A** **Elev. 507.088** TOP OF SIB ON SOUTH LIMIT OF PROPOSED EXTENSION OF ECO–PARKWAY. (AT STA. 5+685.3, 10.0m Rt.)
B.M. 09–5611–2 **Elev. 507.281** TOP OF SIB ON NORTH LIMIT OF PROPOSED EXTENSION OF ECO–PARKWAY. (AT STA. 5+663.6, 15.0m Lt.)	**B.M. 09–5611–3** **Elev. 509.689** TOP OF SIB ON SOUTH LIMIT OF PROPOSED EXTENSION OF ECO–PARKWAY. (AT STA. 5+857.9, 10.0m Rt.)

LEGEND:

- STRAW BALE FLOW CHECK (OPSD 219.180)
- CONCRETE BLOCK WALL
- BH 1 — BOREHOLE LOCATIONS TAKEN FROM GEOTECHNICAL INVESTIGATION PREPARED BY CMT ENGINEERING INC., DATED NOVEMBER 6, 2006, PROJECT No. 06–265.R01
- BH 101 — BOREHOLE LOCATIONS TAKEN FROM GEOTECHNICAL INVESTIGATION PREPARED BY CMT ENGINEERING INC., DATED DATE SEPTEMBER 30, 2009, PROJECT No. 06–265(b).R01



NOTES

THE LOCATION OF UTILITIES IS APPROXIMATE ONLY AND SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION AGAINST DAMAGE.

No	DATE	REVISION	INITIAL
4.	JAN. 11	RECORD INFORMATION	k.j.b.
3.	OCT. 09	ISSUED FOR CONSTRUCTION	d.g.d.
2.	SEPT. 09	ISSUED FOR M.O.E. APPROVAL	d.g.d.
1.	SEPT. 09	ISSUED FOR G.R.C.A. APPROVAL	d.g.d.

CONSTRUCTION OF

ECO–PARKWAY

(DUNDALK)

TOWNSHIP OF SOUTHGATE
185667 GREY COUNTY ROAD No. 9
R.R.#1 DUNDALK, ONTARIO N0C 1B0

PLAN AND PROFILE
STATION 5+500 TO STATION 5+860

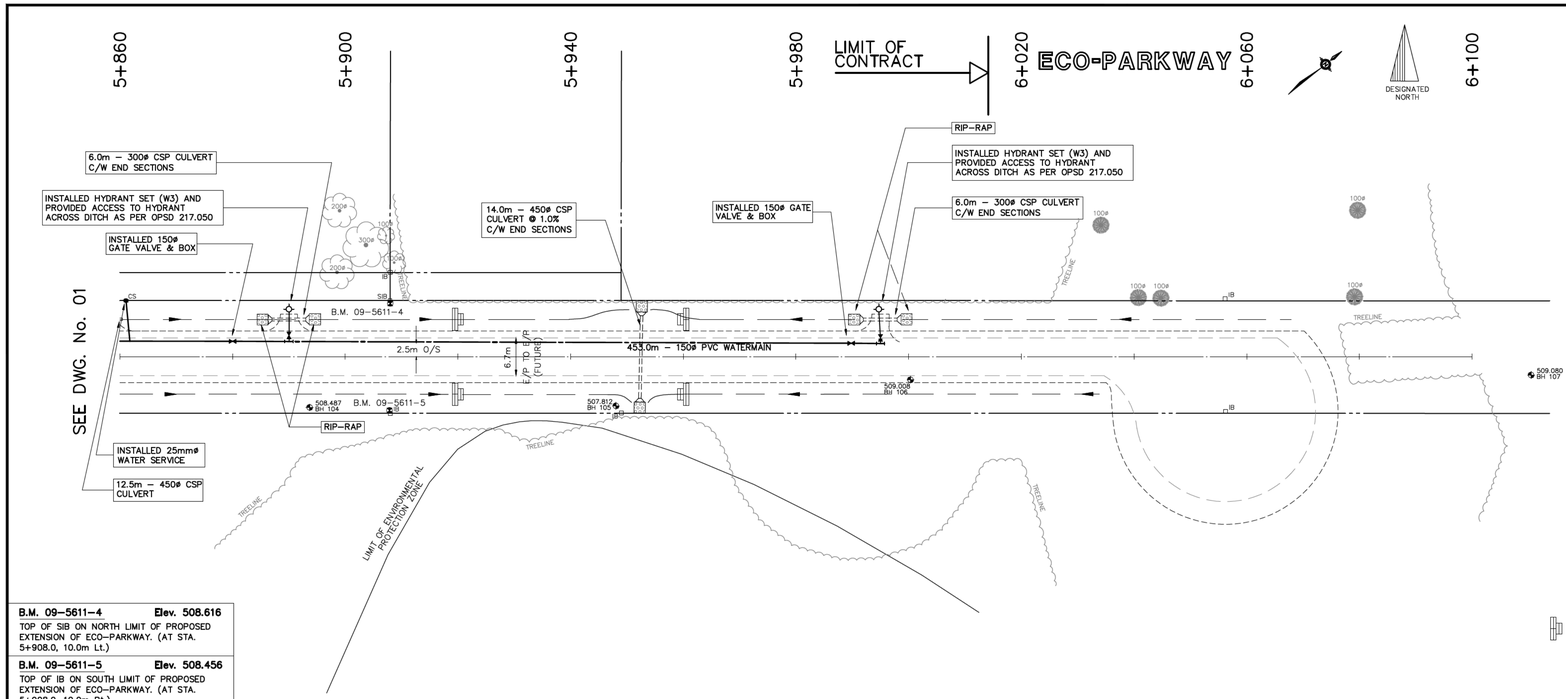
PROJECT No M5611

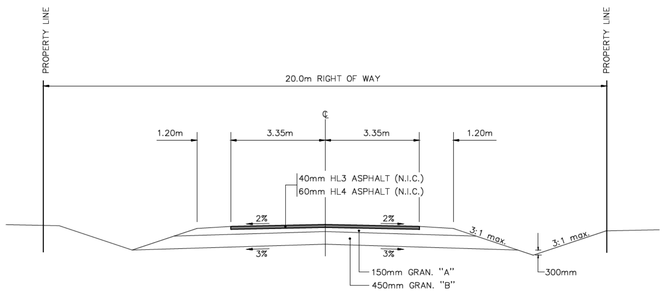
DRAWN BY· D.P.S. (AutoCAD)
CHECKED BY· D.G.D.
APPROVED BY· D.B.M.
DATE· AUGUST, 2009

TRITON ENGINEERING SERVICES LIMITED
Consulting Engineers

SCALES
1:500 HORIZONTAL
1:100 VERTICAL

DRAWING NUMBER **01**





INDUSTRIAL ROAD TYPICAL SECTION
N.T.S.

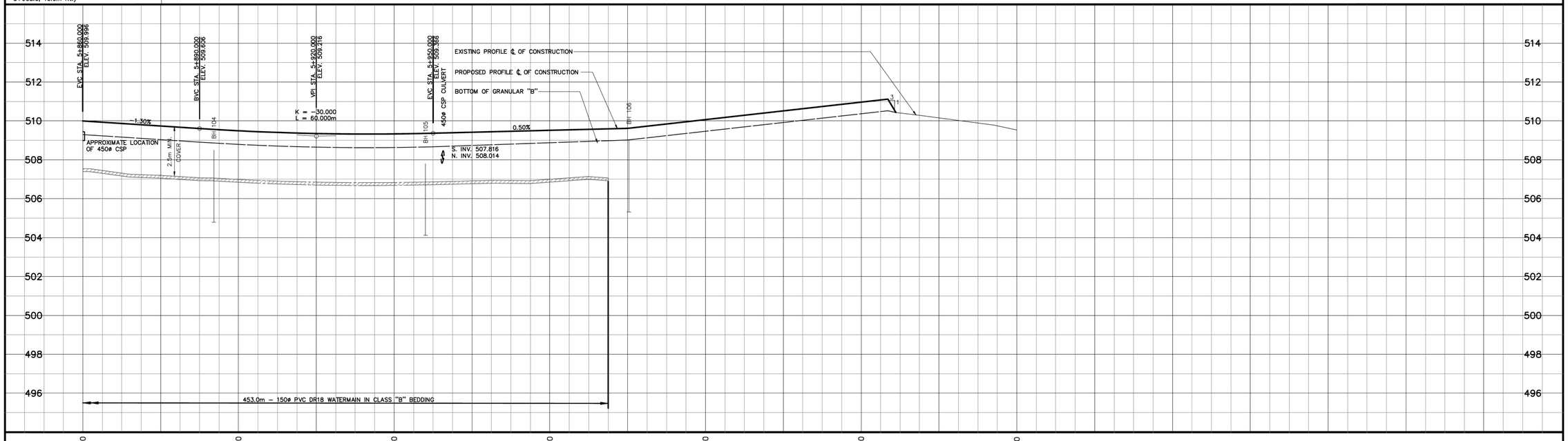
B.M. 09–5611–4 **Elev. 508.616**
TOP OF SIB ON NORTH LIMIT OF PROPOSED EXTENSION OF ECO–PARKWAY. (AT STA. 5+908.0, 10.0m Lt.)

B.M. 09–5611–5 **Elev. 508.456**
TOP OF IB ON SOUTH LIMIT OF PROPOSED EXTENSION OF ECO–PARKWAY. (AT STA. 5+908.0, 10.0m Rt.)

LEGEND:

STRAW BALE FLOW CHECK (OPSD 219.180)

BH 101 BOREHOLE LOCATIONS TAKEN FROM GEOTECHNICAL INVESTIGATION PREPARED BY CMT ENGINEERING INC., DATED DATE SEPTEMBER 30, 2009, PROJECT No. 06–265(b).R01



NOTES

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No	DATE	REVISION	INITIAL
3.	JAN. 11	RECORD INFORMATION	k.j.b.
3.	OCT. 09	ISSUED FOR CONSTRUCTION	d.g.d.
2.	SEPT. 09	ISSUED FOR M.O.E. APPROVAL	d.g.d.
1.	SEPT. 09	ISSUED FOR G.R.C.A. APPROVAL	d.g.d.

CONSTRUCTION OF

ECO–PARKWAY

(DUNDALK)

TOWNSHIP OF SOUTHGATE
185667 GREY COUNTY ROAD No. 9
R.R.#1 DUNDALK, ONTARIO N0C 1B0

PLAN AND PROFILE
STATION 5+860 TO STATION 6+100

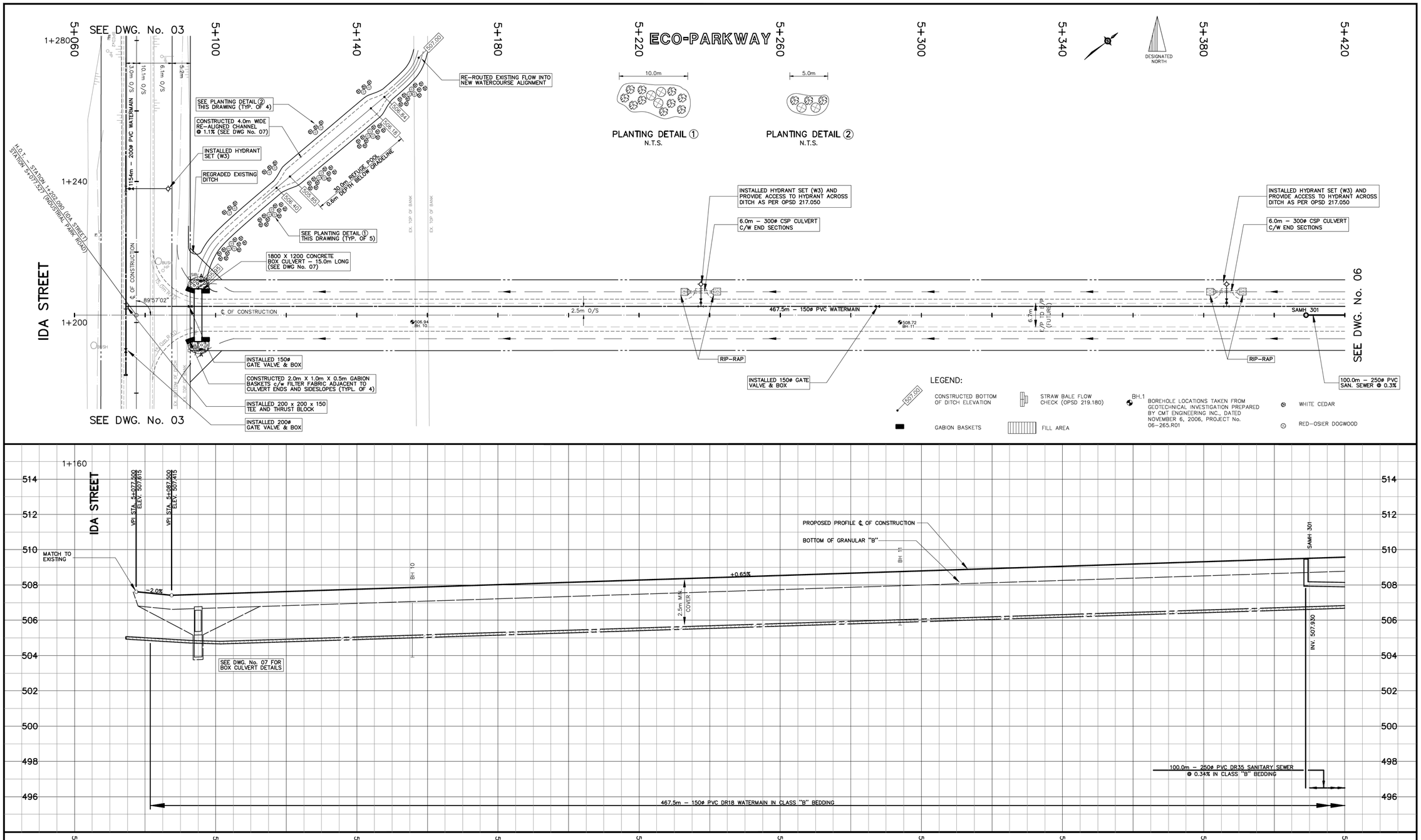
PROJECT No M5611

DRAWN BY: D.P.S. (AutoCAD)
CHECKED BY: D.G.D.
APPROVED BY: D.B.M.
DATE: AUGUST, 2009

TRITON ENGINEERING SERVICES LIMITED
Consulting Engineers

SCALES
HORIZONTAL 1:500 VERTICAL 1:100

DRAWING NUMBER **02**



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No	DATE	REVISION	INITIAL
4.	JAN. 10	RECORD INFORMATION	d.g.d.
3.	OCT. 07	ISSUED FOR TENDER	d.g.d.
2.	JUNE '07	ISSUED FOR G.R.C.A. APPROVAL	d.g.d.
1.	SEP. 06	ISSUED FOR M.O.E. APPROVAL	d.g.d.

CONSTRUCTION OF

ECO-PARKWAY

(DUNDALK)

TOWNSHIP OF SOUTHGATE

185667 GREY COUNTY ROAD No. 9
R.R.#1 DUNDALK, ONTARIO N0C 1B0

PLAN AND PROFILE

IDA ST. TO STATION 5+420

PROJECT No M5611

DRAWN BY: w.o. j.h. (AutoCAD)

CHECKED BY: D.G.D.

APPROVED BY: D.B.M.

DATE: AUGUST, 2006

TRITON ENGINEERING SERVICES LIMITED
Consulting Engineers

SCALES

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HORIZONTAL	VERTICAL

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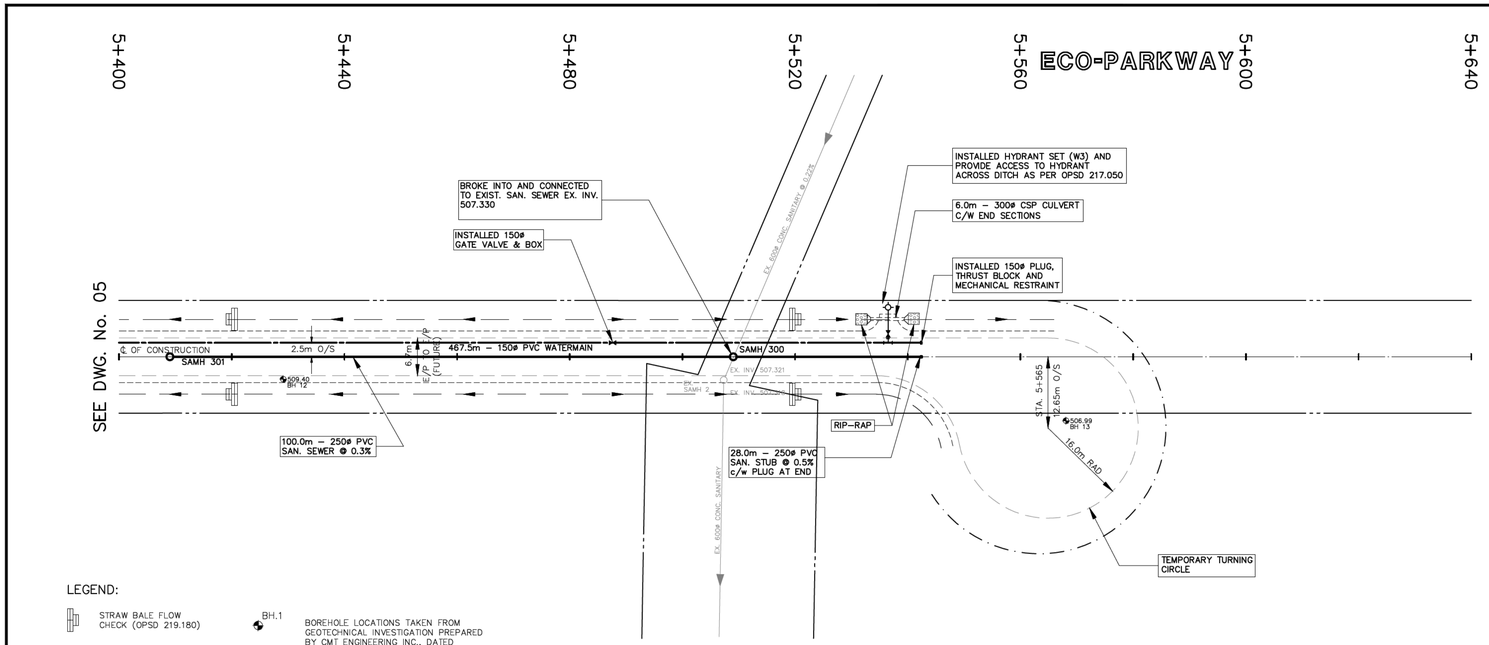
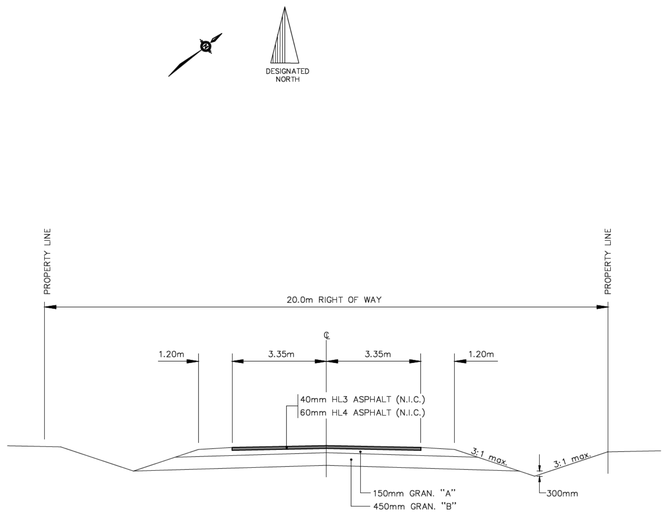
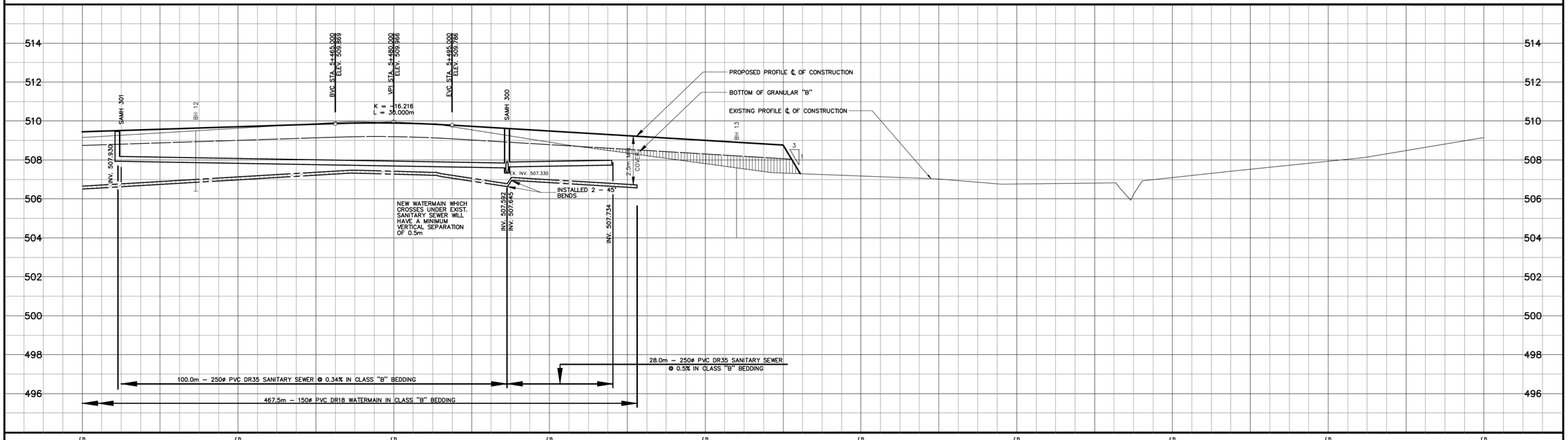




ECO-PARKWAY TYPICAL SECTION
N.T.S.



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4.	JAN. 10	RECORD INFORMATION	d.g.d.
3.	OCT. 07	ISSUED FOR TENDER	d.g.d.
2.	JUNE '07	ISSUED FOR G.R.C.A. APPROVAL	d.g.d.
1.	SEP. 06	ISSUED FOR M.O.E. APPROVAL	d.g.d.

CONSTRUCTION OF

ECO-PARKWAY

(DUNDALK)

TOWNSHIP OF SOUTHGATE
185667 GREY COUNTY ROAD No. 9
R.R.#1 DUNDALK, ONTARIO N0C 1B0

PLAN AND PROFILE
STATION 5+400 TO STATION 5+640

PROJECT No M5611
DRAWN BY: w.o. j.h. (AutoCAD)
CHECKED BY: D.G.D.
APPROVED BY: D.B.M.
DATE: AUGUST, 2006

TRITON ENGINEERING SERVICES LIMITED
Consulting Engineers

SCALES
1:500 HORIZONTAL
1:100 VERTICAL

DRAWING NUMBER 06

APPENDIX B
STORMWATER MANAGEMENT CALCULATIONS

Project No: 31489-22
Project Name: Self Storage Complex
Project Location: 752065 Ida Street
Date: 3/19/2025
Update: 3/19/2025

Van Harten
LAND SURVEYORS - ENGINEERS

NASHYD Hydraulic Parameter Sheet
Pre-Development Catchment 101

Catchment Area: 2.240 ha

On-site Soils:

Type	Classification
Listowel Silt Loam	B

*Per Ontario Soil Mapping and CMT Geotech Investigation

Impervious Land Use:

Roadway/Driveway		Gravel		Building		SWM Facility		Total	
Area	CN	Area	CN	Area	CN	Area	CN	Area	Weighted CN
		0.165	98					0.165	98.00

*All areas are in Hectares.

Pervious Land Use:

Lawn		Woodland		Meadow		Wetland		Total	
Area	CN	Area	CN	Area	CN	Area	CN	Area	Weighted CN
				2.240	58			2.240	58.00

*All areas are in Hectares.

Composite Initial Abstraction:

Landuse	IA (mm)	Area
Lawn	5	0
Woodland	10	0
Meadow	7	2.24
Wetland	16	0
Impervious	2	0.17
Catchment Weighted	6.66	2.40

Composite Runoff Coefficient:

Landuse	RC	Area
Lawn		0
Woodland		0
Meadow	0.25	2.24
Wetland		0
Impervious	0.90	0.17
Catchment Weighted	0.29	2.40

Composite Curve Number:	65.22
Composite Initial Abstraction (mm):	6.66
Composite Runoff Coefficient:	0.29
Flow Length (m):	100
Slope (%):	1
Time to Concentration (hr):	0.44
Time to Peak (hr):	0.29

Project No: 31489-22
Project Name: Self Storage Complex
Project Location: 752065 Ida Street
Date: 3/19/2025
Update: 3/19/2025

Van Harten
LAND SURVEYORS - ENGINEERS

NASHYD Hydraulic Parameter Sheet
Pre-Development Catchment 102

Catchment Area: 0.186 ha

On-site Soils:

Type	Classification
Listowel Silt Loam	B

*Per Ontario Soil Mapping and CMT Geotech Investigation

Impervious Land Use:

Roadway/Driveway		Gravel		Building		SWM Facility		Total	
Area	CN	Area	CN	Area	CN	Area	CN	Area	Weighted CN
								0.00	0.00

*All areas are in Hectares.

Pervious Land Use:

Lawn		Woodland		Meadow		Wetland		Total	
Area	CN	Area	CN	Area	CN	Area	CN	Area	Weighted CN
				0.186	58			0.186	58.00

*All areas are in Hectares.

Composite Initial Abstraction:

Landuse	IA (mm)	Area
Lawn	5	0
Woodland	10	0
Meadow	7	0.186
Wetland	16	0
Impervious	2	0
Catchment Weighted	7.00	0.186

Composite Runoff Coefficient:

Landuse	RC	Area
Lawn		0
Woodland		0
Meadow	0.25	0.186
Wetland		0
Impervious		0
Catchment Weighted	0.25	0.186

Composite Curve Number:	58.00
Composite Initial Abstraction (mm):	7.00
Composite Runoff Coefficient:	0.25
Flow Length (m):	30
Slope (%):	1
Time to Concentration (hr):	0.25
Time to Peak (hr):	0.17

Project No: 31489-22
Project Name: Self Storage Complex
Project Location: 752065 Ida Street
Date: 3/19/2025
Update: 4/16/2025

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LAND SURVEYORS - ENGINEERS

STANHYD Hydraulic Parameter Sheet
Post-Development Catchment 201

Catchment Area: 1.089 ha

On-site Soils:

Type	Classification
Listowel Silt Loam	B

*Per Ontario Soil Mapping and CMT Geotech Investigation

Impervious Land Use:

Roadway/Driveway		Gravel		Building		SWM Facility		Total	
Area	CN	Area	CN	Area	CN	Area	CN	Area	Weighted CN
0.491	98			0.457	98	0.095	50	1.043	93.62

*All areas are in Hectares.

Impervious Land Use VO Inputs:

Depression Storage (mm):	2.0
Slope (%):	1.0
Flow Length (m from model):	85.21
Total Indirectly Connected Impervious Area (ha):	1.043
Total Directly Connected Impervious Area (ha):	1.043
T IMP:	0.96
X IMP:	0.96

Pervious Land Use:

Lawn		Woodland		Meadow		Wetland		Total	
Area	CN	Area	CN	Area	CN	Area	CN	Area	Weighted CN
0.046	61							0.046	61.00

*All areas are in Hectares.

Pervious Land Use VO Inputs:

Pervious Curve Number:	61.0
Initial Abstraction (mm):	5.00
Slope (%):	2
Flow Length (m):	20

Pervious Initial Abstraction:

Landuse	IA (mm)	Area
Lawn	5	0.046
Woodland	10	0
Cultivated	7	0
Wetland	16	0
Catchment Weighted	5.00	0.046

Project No: 31489-22
Project Name: Self Storage Complex
Project Location: 752065 Ida Street
Date: 3/19/2025
Update: 3/19/2025

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LAND SURVEYORS - ENGINEERS

NASHYD Hydraulic Parameter Sheet
Post-Development Catchment 202

Catchment Area: 1.151 ha

On-site Soils:

Type	Classification
Listowel Silt Loam	B

*Per Ontario Soil Mapping and CMT Geotech Investigation

Impervious Land Use:

Roadway/Driveway		Gravel		Building		SWM Facility		Total	
Area	CN	Area	CN	Area	CN	Area	CN	Area	Weighted CN
								0.00	0.00

*All areas are in Hectares.

Pervious Land Use:

Lawn		Woodland		Meadow		Wetland		Total	
Area	CN	Area	CN	Area	CN	Area	CN	Area	Weighted CN
				1.151	58			1.151	58.00

*All areas are in Hectares.

Composite Initial Abstraction:

Landuse	IA (mm)	Area
Lawn	5	0
Woodland	10	0
Meadow	7	1.151
Wetland	16	0
Impervious	2	0
Catchment Weighted	7.00	1.151

Composite Runoff Coefficient:

Landuse	RC	Area
Lawn		0
Woodland		0
Meadow	0.25	1.151
Wetland		0
Impervious		0
Catchment Weighted	0.25	1.151

Composite Curve Number:	58.00
Composite Initial Abstraction (mm):	7.00
Composite Runoff Coefficient:	0.25
Flow Length (m):	100
Slope (%):	1
Time to Concentration (hr):	0.46
Time to Peak (hr):	0.31

Project No: 31489-22
Project Name: Self Storage Complex
Project Location: 752065 Ida Street
Date: 3/19/2025
Update: 3/19/2025

Van Harten
LAND SURVEYORS - ENGINEERS

NASHYD Hydraulic Parameter Sheet
Post-Development Catchment 203

Catchment Area: 0.150 ha

On-site Soils:

Type	Classification
Listowel Silt Loam	B

*Per Ontario Soil Mapping and CMT Geotech Investigation

Impervious Land Use:

Roadway/Driveway		Gravel		Building		SWM Facility		Total	
Area	CN	Area	CN	Area	CN	Area	CN	Area	Weighted CN
								0.00	0.00

*All areas are in Hectares.

Pervious Land Use:

Lawn		Woodland		Meadow		Wetland		Total	
Area	CN	Area	CN	Area	CN	Area	CN	Area	Weighted CN
0.150	61							0.150	61.00

*All areas are in Hectares.

Composite Initial Abstraction:

Landuse	IA (mm)	Area
Lawn	5	0.150
Woodland	10	0
Meadow	7	0
Wetland	16	0
Impervious	2	0
Catchment Weighted	5.00	0.150

Composite Runoff Coefficient:

Landuse	RC	Area
Lawn	0.25	0.150
Woodland		0
Meadow		0
Wetland		0
Impervious		0
Catchment Weighted	0.25	0.150

Composite Curve Number:	61.00
Composite Initial Abstraction (mm):	5.00
Composite Runoff Coefficient:	0.25
Flow Length (m):	160
Slope (%):	0.3
Time to Concentration (hr):	0.87
Time to Peak (hr):	0.58

Project No: 31489-22
Project Name: Self Storage Complex
Project Location: 752065 Ida Street
Date: 3/19/2025
Update: 4/16/2025

Storage and Control Structure Calculations

Circular Orifice (Low Flow):

$$Q = C_d\, A \sqrt{2\, g\, H}$$

Diameter = 0.120 m
Invert Elevation = 504.80 m
Orifice Coefficient = 0.62

Elev. (m)	Storage Volume (m^3)	Circular Orifice Discharge (m^3/s)	Total Discharge (m^3/s)	Storage (ha.m)
504.85	0	0.000	0.000	0.000
504.95	58	0.009	0.009	0.006
505.05	118	0.014	0.014	0.012
505.15	182	0.017	0.017	0.018
505.25	249	0.019	0.019	0.025
505.35	319	0.022	0.022	0.032
505.45	392	0.024	0.024	0.039
505.55	469	0.026	0.026	0.047
505.65	549	0.028	0.028	0.055
505.75	632	0.029	0.029	0.063
505.85	718	0.031	0.031	0.072
505.95	808	0.032	0.032	0.081
506.00	859	0.033	0.033	0.086

Pre-Development Uncontrolled Visual Otthymo Schematic

(100-Year Storm)

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       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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DATE: 04/16/2025                          TIME: 09:49:28

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COMMENTS: _____________________________________________________________


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  **********************************************
  ** SIMULATION : 100yr 3hr 10min Chicago       **
  **********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 892.273
| Ptotal= 70.94 mm |                          B=   0.000
--------------------                          C=   0.699
```

used in: INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	8.30	0.83	178.44	1.67	12.86	2.50	8.00
0.17	9.77	1.00	37.79	1.83	11.36	2.67	7.50
0.33	12.10	1.17	23.83	2.00	10.23	2.83	7.06
0.50	16.55	1.33	18.17	2.17	9.33		
0.67	30.79	1.50	14.97	2.33	8.61		

CALIB					
NASHYD (0101)	Area (ha)=	2.24	Curve Number (CN)=	65.2	
ID= 1 DT=10.0 min	Ia (mm)=	6.66	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.29			

Unit Hyd Qpeak (cms)= 0.295

PEAK FLOW (cms)= 0.108 (i)
TIME TO PEAK (hrs)= 1.167
RUNOFF VOLUME (mm)= 20.552
TOTAL RAINFALL (mm)= 70.941
RUNOFF COEFFICIENT = 0.290

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0102)	Area (ha)=	0.19	Curve Number (CN)=	58.0	
ID= 1 DT=10.0 min	Ia (mm)=	7.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.17			

Unit Hyd Qpeak (cms)= 0.042

PEAK FLOW (cms)= 0.009 (i)
TIME TO PEAK (hrs)= 1.000
RUNOFF VOLUME (mm)= 15.734
TOTAL RAINFALL (mm)= 70.941
RUNOFF COEFFICIENT = 0.222

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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6faf0b-e5f9-4d26-955a-22d402c26388\s


DATE: 04/16/2025                          TIME: 09:49:27

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  ********************************************
  ** SIMULATION : 10yr 3hr 10min Chicago        **
  ********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 622.842
| Ptotal= 49.52 mm |                          B=   0.000
--------------------                          C=   0.699
```

used in: INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	5.79	0.83	124.56	1.67	8.98	2.50	5.59
0.17	6.82	1.00	26.38	1.83	7.93	2.67	5.23
0.33	8.45	1.17	16.63	2.00	7.14	2.83	4.93
0.50	11.56	1.33	12.68	2.17	6.51		
0.67	21.49	1.50	10.45	2.33	6.01		

CALIB					
NASHYD (0101)	Area (ha)=	2.24	Curve Number (CN)=	65.2	
ID= 1 DT=10.0 min	Ia (mm)=	6.66	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.29			

Unit Hyd Qpeak (cms)= 0.295

PEAK FLOW (cms)= 0.050 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 10.234
TOTAL RAINFALL (mm)= 49.520
RUNOFF COEFFICIENT = 0.207

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0102)	Area (ha)=	0.19	Curve Number (CN)=	58.0	
ID= 1 DT=10.0 min	Ia (mm)=	7.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.17			

Unit Hyd Qpeak (cms)= 0.042

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 1.000
RUNOFF VOLUME (mm)= 7.614
TOTAL RAINFALL (mm)= 49.520
RUNOFF COEFFICIENT = 0.154

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
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        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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COMMENTS: _____________________________________________________________


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  ********************************************
  ** SIMULATION : 25yr 3hr 10min Chicago        **
  ********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 731.314
| Ptotal= 58.14 mm |                          B=   0.000
--------------------                          C=   0.699
```

used in: INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	6.80	0.83	146.25	1.67	10.54	2.50	6.56
0.17	8.01	1.00	30.97	1.83	9.31	2.67	6.14
0.33	9.92	1.17	19.53	2.00	8.38	2.83	5.79
0.50	13.57	1.33	14.89	2.17	7.65		
0.67	25.24	1.50	12.27	2.33	7.05		

CALIB					
NASHYD (0101)	Area (ha)=	2.24	Curve Number (CN)=	65.2	
ID= 1 DT=10.0 min	Ia (mm)=	6.66	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.29			

Unit Hyd Qpeak (cms)= 0.295

PEAK FLOW (cms)= 0.071 (i)
TIME TO PEAK (hrs)= 1.167
RUNOFF VOLUME (mm)= 14.086
TOTAL RAINFALL (mm)= 58.144
RUNOFF COEFFICIENT = 0.242

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0102)	Area (ha)=	0.19	Curve Number (CN)=	58.0	
ID= 1 DT=10.0 min	Ia (mm)=	7.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.17			

Unit Hyd Qpeak (cms)= 0.042

PEAK FLOW (cms)= 0.006 (i)
TIME TO PEAK (hrs)= 1.000
RUNOFF VOLUME (mm)= 10.612
TOTAL RAINFALL (mm)= 58.144
RUNOFF COEFFICIENT = 0.183

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

FINISH

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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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DATE: 04/16/2025                          TIME: 09:49:28

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COMMENTS: _____________________________________________________________


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  ********************************************
  ** SIMULATION : 50yr 3hr 10min Chicago        **
  ********************************************
```

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--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 813.543
| Ptotal= 64.68 mm |                          B=   0.000
--------------------                          C=   0.699
                        used in:   INTENSITY =  A / (t + B)^C

                        Duration of storm  =  3.00 hrs
                        Storm time step    = 10.00 min
                        Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    7.56 |  0.83  162.70 |  1.67   11.73 |  2.50    7.30
                0.17    8.91 |  1.00   34.45 |  1.83   10.36 |  2.67    6.83
                0.33   11.03 |  1.17   21.72 |  2.00    9.32 |  2.83    6.44
                0.50   15.09 |  1.33   16.57 |  2.17    8.51 |
                0.67   28.07 |  1.50   13.65 |  2.33    7.85 |


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0101)|   Area    (ha)=   2.24   Curve Number   (CN)= 65.2
|ID= 1 DT=10.0 min |   Ia      (mm)=   6.66   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.29

     Unit Hyd Qpeak  (cms)=   0.295

     PEAK FLOW       (cms)=   0.089 (i)
     TIME TO PEAK    (hrs)=   1.167
     RUNOFF VOLUME    (mm)=  17.286
     TOTAL RAINFALL   (mm)=  64.681
     RUNOFF COEFFICIENT   =   0.267

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0102)|   Area    (ha)=   0.19   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   7.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.042

     PEAK FLOW       (cms)=   0.008 (i)
     TIME TO PEAK    (hrs)=   1.000
     RUNOFF VOLUME    (mm)=  13.133
     TOTAL RAINFALL   (mm)=  64.681
```

RUNOFF COEFFICIENT = 0.203

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
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        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
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DATE: 04/16/2025 TIME: 09:49:28

USER:

COMMENTS: _____

****
** SIMULATION : 5yr 3hr 10min Chicago **
****

```
--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 535.364
| Ptotal= 42.56 mm |                          B=   0.000
--------------------                          C=   0.699
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  3.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    4.98 |  0.83  107.07 |  1.67    7.72 |  2.50    4.80
                0.17    5.86 |  1.00   22.67 |  1.83    6.82 |  2.67    4.50
                0.33    7.26 |  1.17   14.30 |  2.00    6.14 |  2.83    4.24
                0.50    9.93 |  1.33   10.90 |  2.17    5.60 |
                0.67   18.47 |  1.50    8.98 |  2.33    5.16 |


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0101)|   Area    (ha)=   2.24   Curve Number   (CN)= 65.2
|ID= 1 DT=10.0 min |   Ia      (mm)=   6.66   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.29

     Unit Hyd Qpeak  (cms)=   0.295

     PEAK FLOW       (cms)=   0.035 (i)
     TIME TO PEAK    (hrs)=   1.333
     RUNOFF VOLUME    (mm)=   7.474
     TOTAL RAINFALL   (mm)=  42.565
     RUNOFF COEFFICIENT   =   0.176

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0102)|   Area    (ha)=   0.19   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   7.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.042

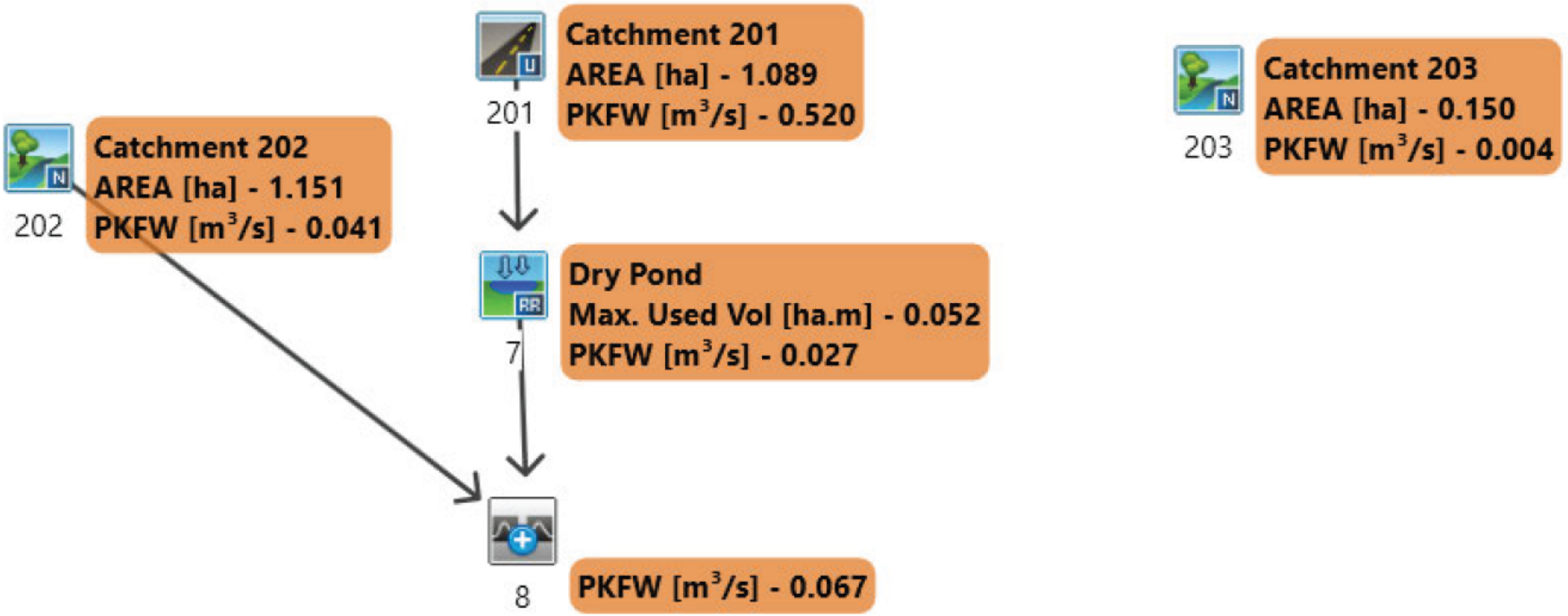
     PEAK FLOW       (cms)=   0.003 (i)
     TIME TO PEAK    (hrs)=   1.000
     RUNOFF VOLUME    (mm)=   5.495
     TOTAL RAINFALL   (mm)=  42.565
```

RUNOFF COEFFICIENT = 0.129

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

Post-Development Controlled Visual Otthymo Schematic

(100-Year Storm)



```
================================================================================
=======================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

  Output  filename:
C:\Users\brett.pond\AppData\Local\Civica\VH5\6ec45647-ad21-4b76-932e-273312f20f6a\54
96dc1a-2469-4b0c-9f12-fd5c53ae6d3d\s
  Summary filename:
C:\Users\brett.pond\AppData\Local\Civica\VH5\6ec45647-ad21-4b76-932e-273312f20f6a\54
96dc1a-2469-4b0c-9f12-fd5c53ae6d3d\s


DATE: 04/16/2025                          TIME: 10:00:58

USER:



COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
-----------------------
  ***********************************************
  ** SIMULATION : 100yr 3hr 10min Chicago       **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 892.273
| Ptotal= 70.94 mm |                          B=   0.000
--------------------                          C=   0.699
```

used in: INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	8.30	0.83	178.44	1.67	12.86	2.50	8.00
0.17	9.77	1.00	37.79	1.83	11.36	2.67	7.50
0.33	12.10	1.17	23.83	2.00	10.23	2.83	7.06
0.50	16.55	1.33	18.17	2.17	9.33		
0.67	30.79	1.50	14.97	2.33	8.61		

CALIB					
NASHYD (0203)	Area (ha)=	0.15	Curve Number (CN)=	61.0	
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.58			

Unit Hyd Qpeak (cms)= 0.010

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 19.027
TOTAL RAINFALL (mm)= 70.941
RUNOFF COEFFICIENT = 0.268

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0202)	Area (ha)=	1.15	Curve Number (CN)=	58.0	
ID= 1 DT=10.0 min	Ia (mm)=	7.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.31			

Unit Hyd Qpeak (cms)= 0.142

PEAK FLOW (cms)= 0.041 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 16.409
TOTAL RAINFALL (mm)= 70.941
RUNOFF COEFFICIENT = 0.231

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area    (ha)=   1.09
|ID= 1 DT=10.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.05         0.04
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      85.21        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     178.44        40.33
               over (min)        10.00        10.00
     Storage Coeff.  (min)=       1.84 (ii)    8.54 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.52         0.00          0.520 (iii)
     TIME TO PEAK    (hrs)=       1.00         1.00           1.00
     RUNOFF VOLUME    (mm)=      68.94        19.04          66.94
     TOTAL RAINFALL   (mm)=      70.94        70.94          70.94
     RUNOFF COEFFICIENT   =       0.97         0.27           0.94

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  61.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0007)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 10.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.0260      0.0469
                          0.0090      0.0058   |    0.0280      0.0549
                          0.0140      0.0118   |    0.0290      0.0632
                          0.0170      0.0182   |    0.0310      0.0718
                          0.0190      0.0249   |    0.0320      0.0808
                          0.0220      0.0319   |    0.0330      0.0859
                          0.0240      0.0392   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)      1.089      0.520      1.00      66.94
   OUTFLOW: ID= 1 (  0007)      1.089      0.027      2.33      66.81
```

```
                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  5.25
                  TIME SHIFT OF PEAK FLOW         (min)= 80.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0521

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0008)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0202):     1.15   0.041     1.33    16.41
     + ID2= 2 (  0007):     1.09   0.027     2.33    66.81
       ================================================
       ID = 3 (  0008):     2.24   0.067     1.33    40.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
================================================================================
=======================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

  Output  filename:
C:\Users\brett.pond\AppData\Local\Civica\VH5\6ec45647-ad21-4b76-932e-273312f20f6a\31
3592db-7816-4d68-af00-38806fee1072\s
  Summary filename:
C:\Users\brett.pond\AppData\Local\Civica\VH5\6ec45647-ad21-4b76-932e-273312f20f6a\31
3592db-7816-4d68-af00-38806fee1072\s


DATE: 04/16/2025                          TIME: 10:00:58
```

USER:

COMMENTS: _____

```
  ********************************************
  ** SIMULATION : 10yr 3hr 10min Chicago        **
  ********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 622.842
| Ptotal= 49.52 mm |                          B=   0.000
--------------------                          C=   0.699
                         used in:   INTENSITY =  A / (t + B)^C

                         Duration of storm  =  3.00 hrs
                         Storm time step    = 10.00 min
                         Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    5.79 |  0.83  124.56 |  1.67    8.98 |  2.50    5.59
                0.17    6.82 |  1.00   26.38 |  1.83    7.93 |  2.67    5.23
                0.33    8.45 |  1.17   16.63 |  2.00    7.14 |  2.83    4.93
                0.50   11.56 |  1.33   12.68 |  2.17    6.51 |
                0.67   21.49 |  1.50   10.45 |  2.33    6.01 |


--------------------
| CALIB            |
| NASHYD   (  0203)|   Area    (ha)=   0.15   Curve Number   (CN)= 61.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.58

     Unit Hyd Qpeak  (cms)=   0.010

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   9.564
     TOTAL RAINFALL   (mm)=  49.520
     RUNOFF COEFFICIENT   =   0.193

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0202)|   Area    (ha)=   1.15   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   7.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.31

     Unit Hyd Qpeak  (cms)=   0.142

     PEAK FLOW       (cms)=   0.019 (i)
     TIME TO PEAK    (hrs)=   1.333
     RUNOFF VOLUME    (mm)=   7.943
     TOTAL RAINFALL   (mm)=  49.520
     RUNOFF COEFFICIENT   =   0.160

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area    (ha)=   1.09
|ID= 1 DT=10.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.05         0.04
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      85.21        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     124.56        19.10
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       2.13 (ii)   11.15 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.36         0.00          0.360 (iii)
     TIME TO PEAK    (hrs)=       1.00         1.17           1.00
     RUNOFF VOLUME    (mm)=      47.52         9.58          45.99
     TOTAL RAINFALL   (mm)=      49.52        49.52          49.52
     RUNOFF COEFFICIENT   =       0.96         0.19           0.93

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  61.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0007)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 10.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                           0.0000      0.0000   |    0.0260      0.0469
                           0.0090      0.0058   |    0.0280      0.0549
                           0.0140      0.0118   |    0.0290      0.0632
                           0.0170      0.0182   |    0.0310      0.0718
                           0.0190      0.0249   |    0.0320      0.0808
                           0.0220      0.0319   |    0.0330      0.0859
                           0.0240      0.0392   |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)      1.089      0.360      1.00      45.99
   OUTFLOW: ID= 1 (  0007)      1.089      0.023      2.00      45.86

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.28
                  TIME SHIFT OF PEAK FLOW         (min)= 60.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0341

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0008)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0202):     1.15   0.019     1.33     7.94
     + ID2= 2 (  0007):     1.09   0.023     2.00    45.86
       ================================================
       ID = 3 (  0008):     2.24   0.041     1.33    26.38

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
================================================================================
=======================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
```

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

Output filename:
C:\Users\brett.pond\AppData\Local\Civica\VH5\6ec45647-ad21-4b76-932e-273312f20f6a\bdb03331-de37-4432-87f9-f917e2f16a15\s
Summary filename:
C:\Users\brett.pond\AppData\Local\Civica\VH5\6ec45647-ad21-4b76-932e-273312f20f6a\bdb03331-de37-4432-87f9-f917e2f16a15\s

DATE: 04/16/2025 TIME: 10:00:59

USER:

COMMENTS: _____

****
** SIMULATION : 25yr 3hr 10min Chicago **
****

| CHICAGO STORM |
| Ptotal= 58.14 mm |

IDF curve parameters: A= 731.314
B= 0.000
C= 0.699
used in: INTENSITY = A / (t + B)^C

Duration of storm = 3.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	6.80	0.83	146.25	1.67	10.54	2.50	6.56
0.17	8.01	1.00	30.97	1.83	9.31	2.67	6.14
0.33	9.92	1.17	19.53	2.00	8.38	2.83	5.79
0.50	13.57	1.33	14.89	2.17	7.65		
0.67	25.24	1.50	12.27	2.33	7.05		

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0203)|   Area    (ha)=   0.15   Curve Number   (CN)= 61.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.58

     Unit Hyd Qpeak  (cms)=   0.010

     PEAK FLOW       (cms)=   0.003 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  13.088
     TOTAL RAINFALL   (mm)=  58.144
     RUNOFF COEFFICIENT   =   0.225

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0202)|   Area    (ha)=   1.15   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   7.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.31

     Unit Hyd Qpeak  (cms)=   0.142

     PEAK FLOW       (cms)=   0.027 (i)
     TIME TO PEAK    (hrs)=   1.333
     RUNOFF VOLUME    (mm)=  11.070
     TOTAL RAINFALL   (mm)=  58.144
     RUNOFF COEFFICIENT   =   0.190

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area    (ha)=   1.09
|ID= 1 DT=10.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.05         0.04
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      85.21        20.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     146.25        26.89
               over (min)       10.00        10.00
```

```
     Storage Coeff.  (min)=       1.99 (ii)    9.87 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.42         0.00          0.424 (iii)
     TIME TO PEAK    (hrs)=       1.00         1.00           1.00
     RUNOFF VOLUME    (mm)=      56.14        13.10          54.42
     TOTAL RAINFALL   (mm)=      58.14        58.14          58.14
     RUNOFF COEFFICIENT   =       0.97         0.23           0.94

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  61.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0007)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 10.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000   |    0.0260      0.0469
                           0.0090      0.0058   |    0.0280      0.0549
                           0.0140      0.0118   |    0.0290      0.0632
                           0.0170      0.0182   |    0.0310      0.0718
                           0.0190      0.0249   |    0.0320      0.0808
                           0.0220      0.0319   |    0.0330      0.0859
                           0.0240      0.0392   |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)      1.089      0.424      1.00      54.42
   OUTFLOW: ID= 1 (  0007)      1.089      0.025      2.17      54.28

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  5.78
                  TIME SHIFT OF PEAK FLOW         (min)= 70.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0412

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0008)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0202):     1.15   0.027     1.33    11.07
      + ID2= 2 (  0007):     1.09   0.025     2.17    54.28
        ================================================
```

```
        ID = 3 (  0008):     2.24   0.051     1.33    32.08

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

 FINISH
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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

  Output  filename:
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DATE: 04/16/2025                          TIME: 10:00:59

USER:



COMMENTS: _____________________________________________________________

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----------------------
  ********************************************
  ** SIMULATION : 50yr 3hr 10min Chicago        **
  ********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 813.543
| Ptotal= 64.68 mm |                          B=   0.000
--------------------                          C=   0.699
                         used in:   INTENSITY =  A / (t + B)^C

                         Duration of storm  =  3.00 hrs
                         Storm time step    = 10.00 min
                         Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    7.56 |  0.83  162.70 |  1.67   11.73 |  2.50    7.30
                0.17    8.91 |  1.00   34.45 |  1.83   10.36 |  2.67    6.83
                0.33   11.03 |  1.17   21.72 |  2.00    9.32 |  2.83    6.44
                0.50   15.09 |  1.33   16.57 |  2.17    8.51 |
                0.67   28.07 |  1.50   13.65 |  2.33    7.85 |


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0203)|   Area    (ha)=   0.15   Curve Number   (CN)= 61.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.58

     Unit Hyd Qpeak  (cms)=   0.010

     PEAK FLOW       (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  16.021
     TOTAL RAINFALL   (mm)=  64.681
     RUNOFF COEFFICIENT   =   0.248

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0202)|   Area    (ha)=   1.15   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   7.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.31

     Unit Hyd Qpeak  (cms)=   0.142
```

```
     PEAK FLOW       (cms)=   0.034 (i)
     TIME TO PEAK    (hrs)=   1.333
     RUNOFF VOLUME    (mm)=  13.700
     TOTAL RAINFALL   (mm)=  64.681
     RUNOFF COEFFICIENT   =   0.212

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area    (ha)=   1.09
|ID= 1 DT=10.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.05         0.04
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      85.21        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     162.70        33.49
               over (min)        10.00        10.00
     Storage Coeff.  (min)=       1.91 (ii)    9.12 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.47         0.00          0.473 (iii)
     TIME TO PEAK    (hrs)=       1.00         1.00           1.00
     RUNOFF VOLUME    (mm)=      62.68        16.04          60.81
     TOTAL RAINFALL   (mm)=      64.68        64.68          64.68
     RUNOFF COEFFICIENT   =       0.97         0.25           0.94

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  61.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0007)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 10.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000      0.0000   |    0.0260      0.0469
                          0.0090      0.0058   |    0.0280      0.0549
                          0.0140      0.0118   |    0.0290      0.0632
```

```
                          0.0170      0.0182   |    0.0310      0.0718
                          0.0190      0.0249   |    0.0320      0.0808
                          0.0220      0.0319   |    0.0330      0.0859
                          0.0240      0.0392   |    0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)     1.089      0.473      1.00      60.81
   OUTFLOW: ID= 1 (  0007)     1.089      0.026      2.33      60.67

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  5.49
                  TIME SHIFT OF PEAK FLOW         (min)= 80.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0468

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0008)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0202):     1.15   0.034     1.33    13.70
     + ID2= 2 (  0007):     1.09   0.026     2.33    60.67
       ================================================
       ID = 3 (  0008):     2.24   0.059     1.33    36.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
================================================================================
========================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2017)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
```

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  Output  filename:
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  Summary filename:
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d939d1-24b7-4724-adba-667f95453b41\s


DATE: 04/16/2025                          TIME: 10:00:58

USER:



COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
-----------------------
  ***********************************************
  ** SIMULATION : 5yr 3hr 10min Chicago         **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 535.364
| Ptotal= 42.56 mm |                          B=   0.000
--------------------                          C=   0.699
                        used in:   INTENSITY =  A / (t + B)^C

                        Duration of storm  =  3.00 hrs
                        Storm time step    = 10.00 min
                        Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    4.98 |  0.83  107.07 |  1.67    7.72 |  2.50    4.80
                0.17    5.86 |  1.00   22.67 |  1.83    6.82 |  2.67    4.50
                0.33    7.26 |  1.17   14.30 |  2.00    6.14 |  2.83    4.24
                0.50    9.93 |  1.33   10.90 |  2.17    5.60 |
                0.67   18.47 |  1.50    8.98 |  2.33    5.16 |


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0203)|   Area    (ha)=   0.15   Curve Number   (CN)= 61.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.58

     Unit Hyd Qpeak  (cms)=   0.010
```

```
     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   7.045
     TOTAL RAINFALL   (mm)=  42.565
     RUNOFF COEFFICIENT   =   0.166

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0202)|   Area    (ha)=   1.15   Curve Number   (CN)= 58.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   7.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.31

     Unit Hyd Qpeak  (cms)=   0.142

     PEAK FLOW       (cms)=   0.013 (i)
     TIME TO PEAK    (hrs)=   1.333
     RUNOFF VOLUME    (mm)=   5.732
     TOTAL RAINFALL   (mm)=  42.565
     RUNOFF COEFFICIENT   =   0.135

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area    (ha)=   1.09
|ID= 1 DT=10.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.05         0.04
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      85.21        20.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     107.07         9.41
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       2.26 (ii)   14.24 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.31         0.00          0.308 (iii)
     TIME TO PEAK    (hrs)=       1.00         1.17           1.00
     RUNOFF VOLUME    (mm)=      40.56         7.06          39.22
     TOTAL RAINFALL   (mm)=      42.56        42.56          42.56
     RUNOFF COEFFICIENT   =       0.95         0.17           0.92
```

```
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  61.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0007)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 10.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000      0.0000   |    0.0260      0.0469
                           0.0090      0.0058   |    0.0280      0.0549
                           0.0140      0.0118   |    0.0290      0.0632
                           0.0170      0.0182   |    0.0310      0.0718
                           0.0190      0.0249   |    0.0320      0.0808
                           0.0220      0.0319   |    0.0330      0.0859
                           0.0240      0.0392   |    0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0201)      1.089      0.308      1.00      39.22
   OUTFLOW: ID= 1 (  0007)      1.089      0.021      2.00      39.09

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.68
                  TIME SHIFT OF PEAK FLOW         (min)= 60.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0286

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0008)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0202):     1.15   0.013     1.33     5.73
      + ID2= 2 (  0007):     1.09   0.021     2.00    39.09
        ================================================
        ID = 3 (  0008):     2.24   0.033     1.33    21.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

Hydroworks Sizing Summary

Dundalk Self-Storage

Asphalt Drive Aisle, Building and Landscape

04-09-2025

Recommended Size: HydroStorm HS 6

Hydroworks Sizing Program Version 5.8.5

A HydroStorm HS 6 is recommended to provide 80 % annual TSS removal based on a drainage area of 0.994 (ha) with an imperviousness of 95 % and Kitchener / Waterloo, Ontario rainfall for the 20 um to 2000 um particle size distribution.

The recommended HydroStorm HS 6 treats 99 % of the annual runoff and provides 82 % annual TSS removal for the Kitchener / Waterloo rainfall records and 20 um to 2000 um particle size distribution.

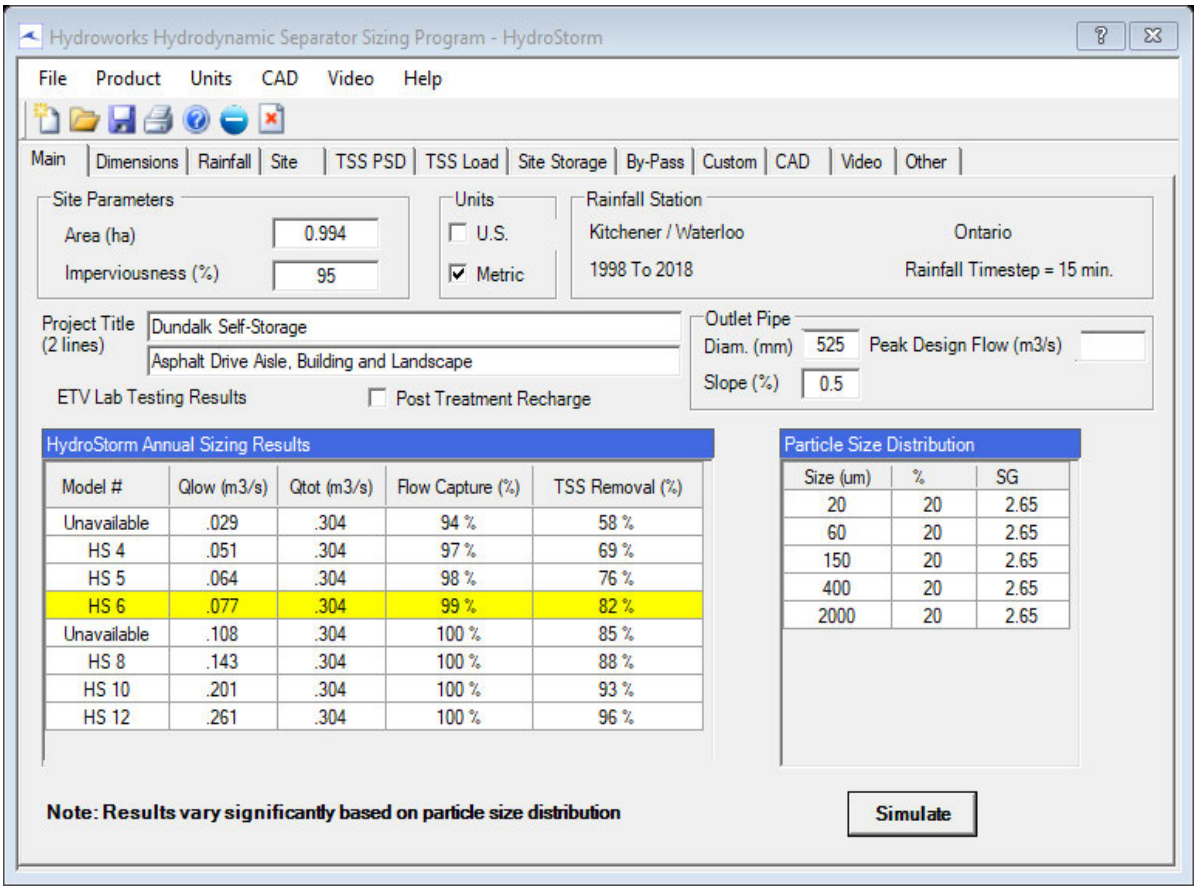
The HydroStorm has a headloss coefficient (K) of 1.04. Since a peak flow was not specified, headloss was calculated using the full pipe flow of .3 (m3/s) for the given 525 (mm) pipe diameter at .5% slope. The headloss was calculated to be 105 (mm) based on a flow depth of 525 (mm) (full pipe flow).

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.

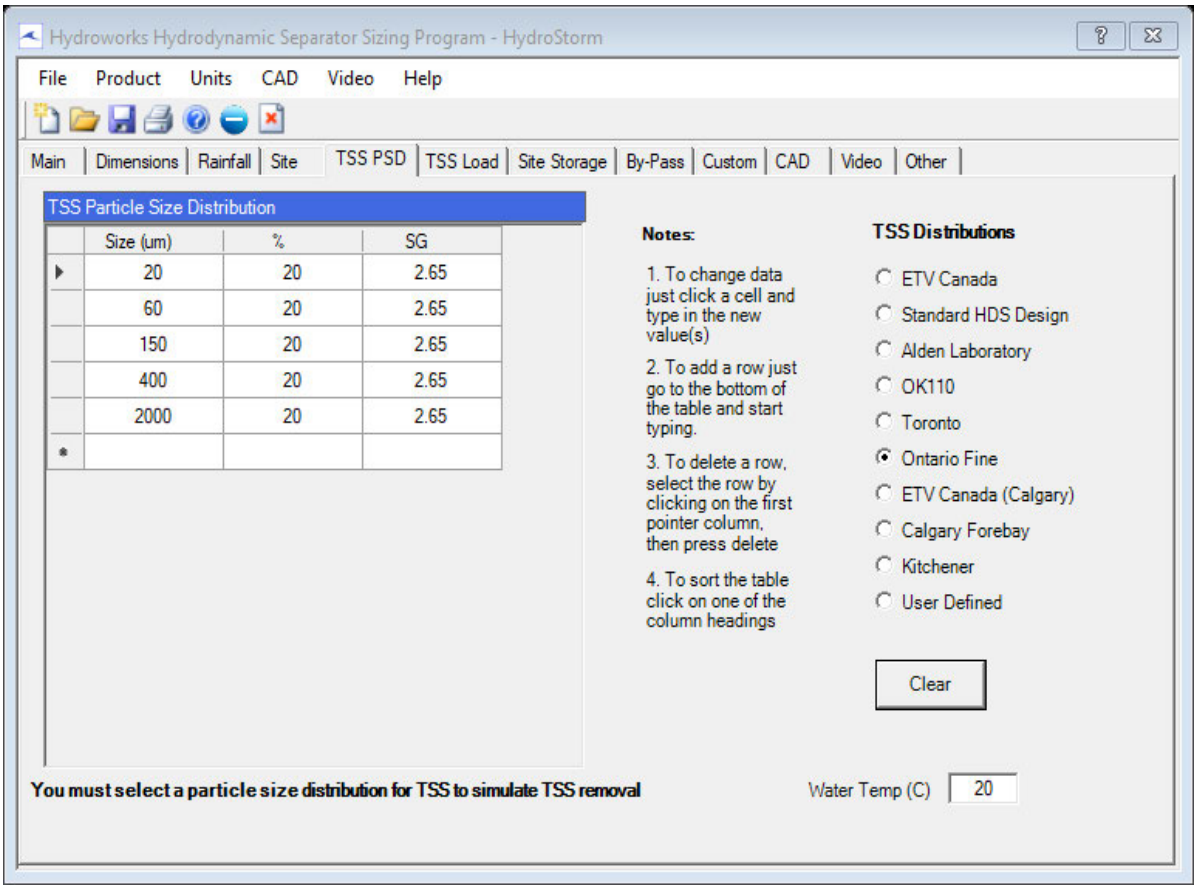
If you have any questions regarding this sizing summary please do not hesitate to contact Hydroworks at 888-290-7900 or email us at support@hydroworks.com.

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 .

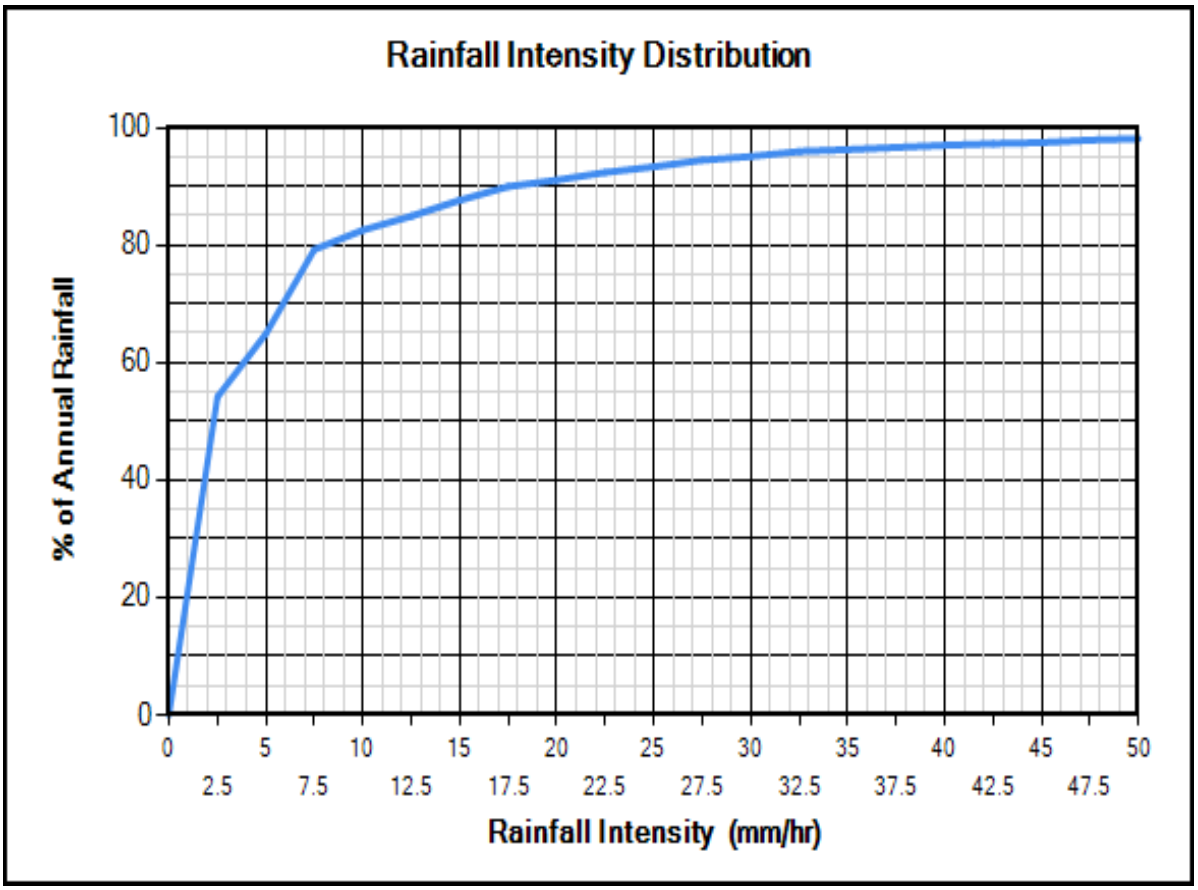
TSS Removal Sizing Summary



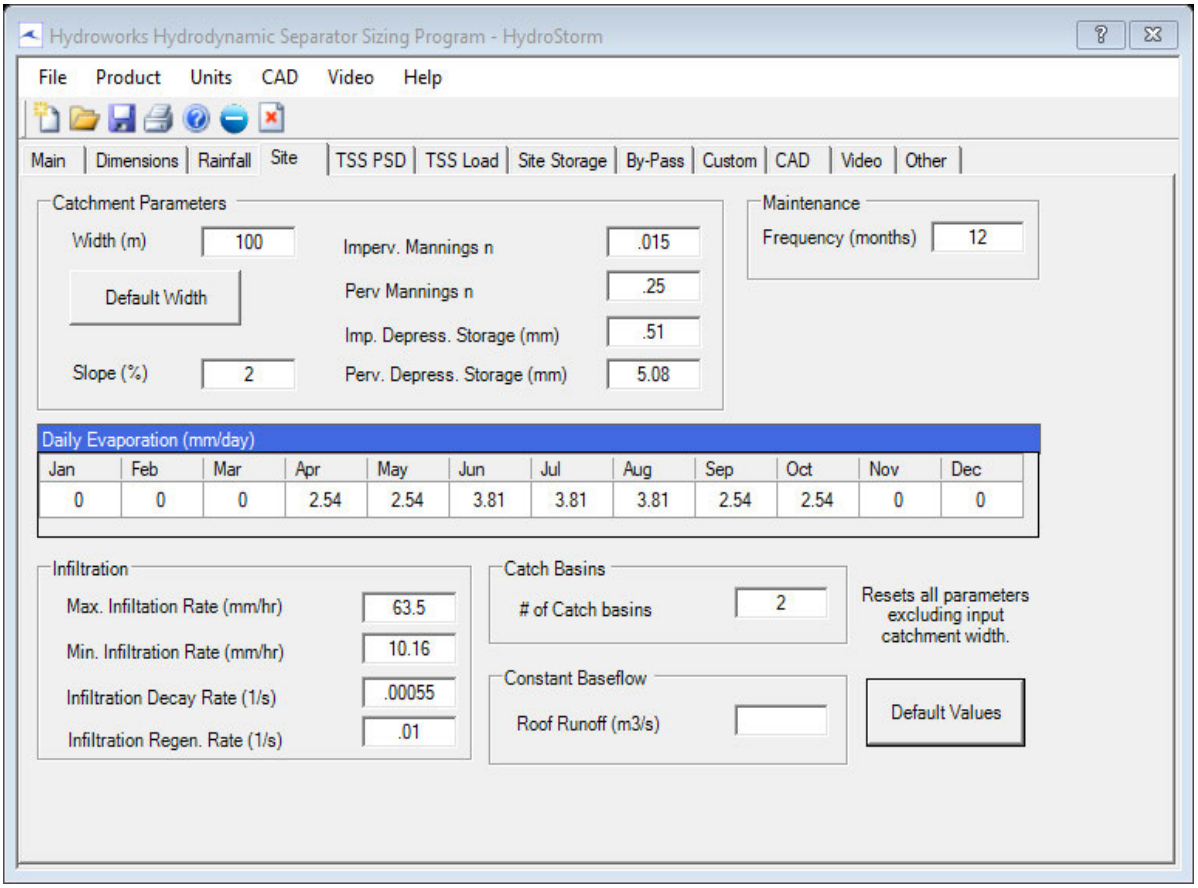
TSS Particle Size Distribution



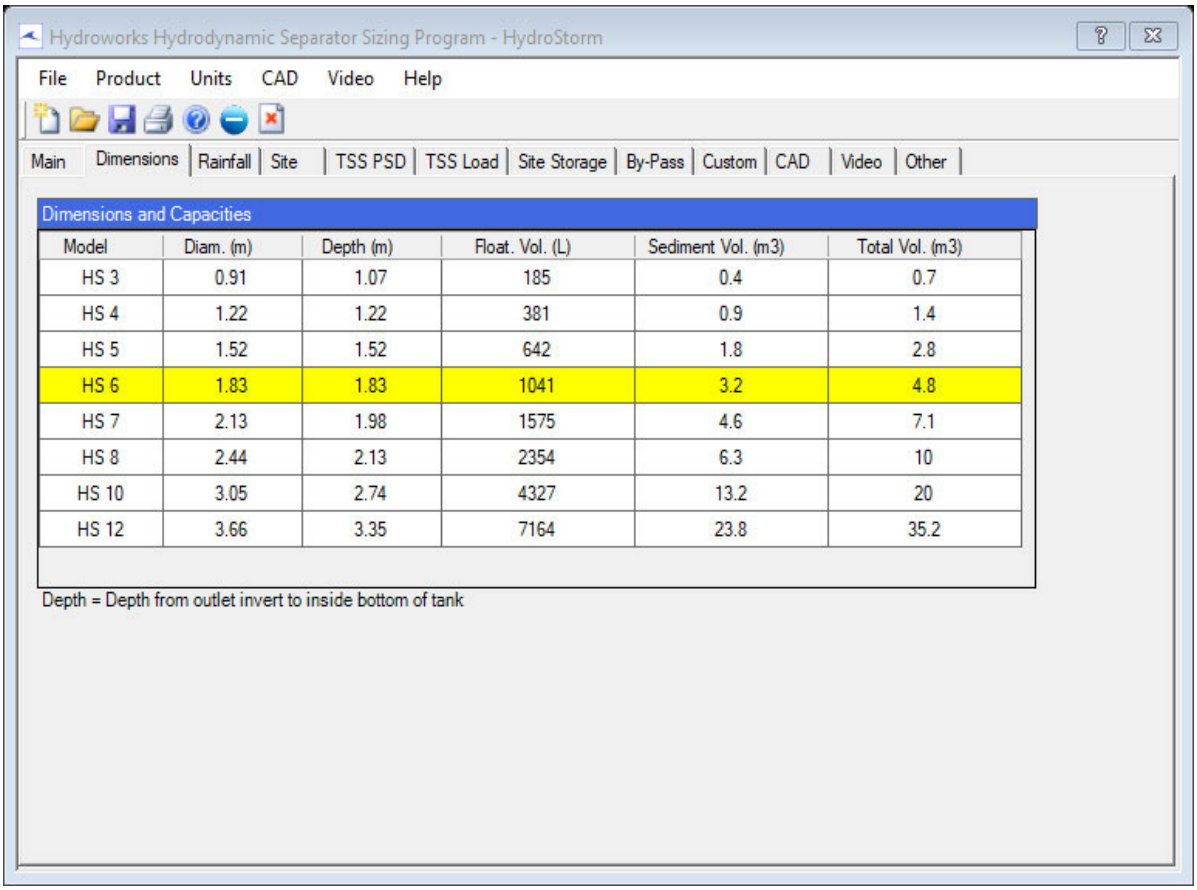
Rainfall Station - Kitchener / Waterloo, Ontario(1998 To 2018)



Site Physical Characteristics



Dimensions And Capacities

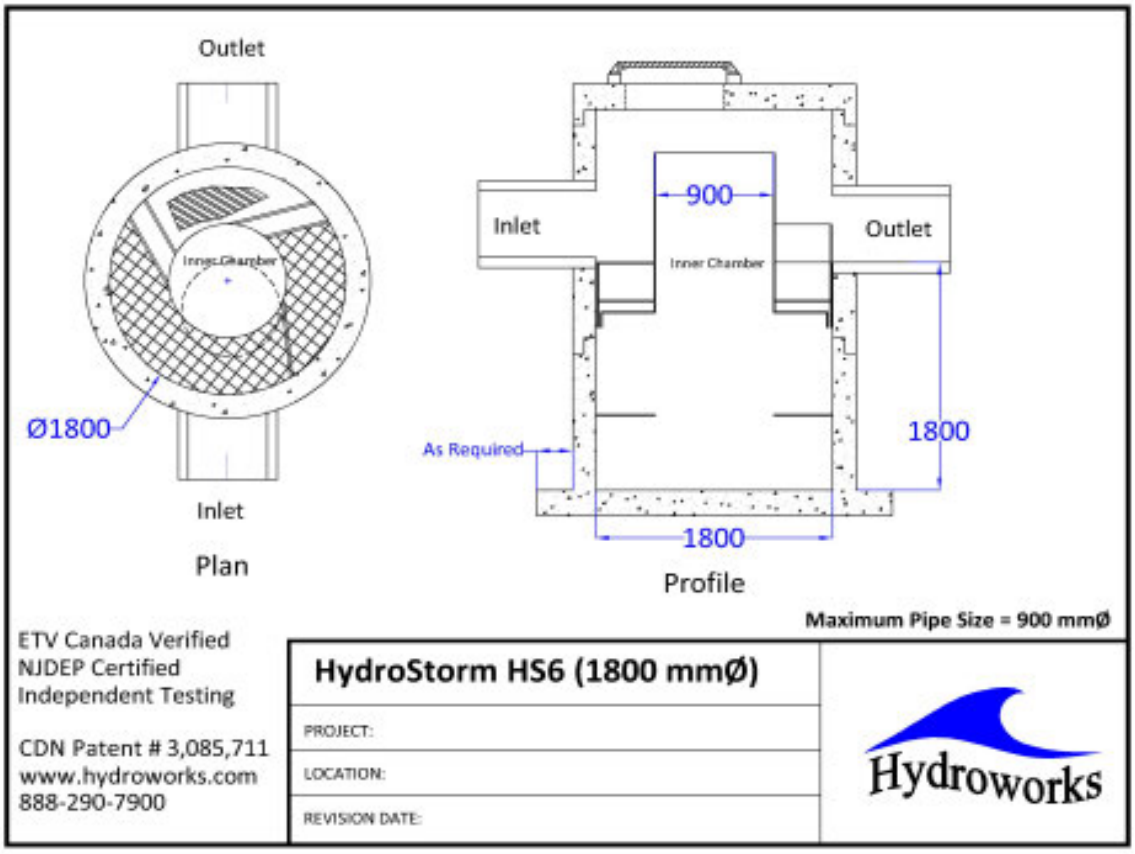


Dimensions and Capacities

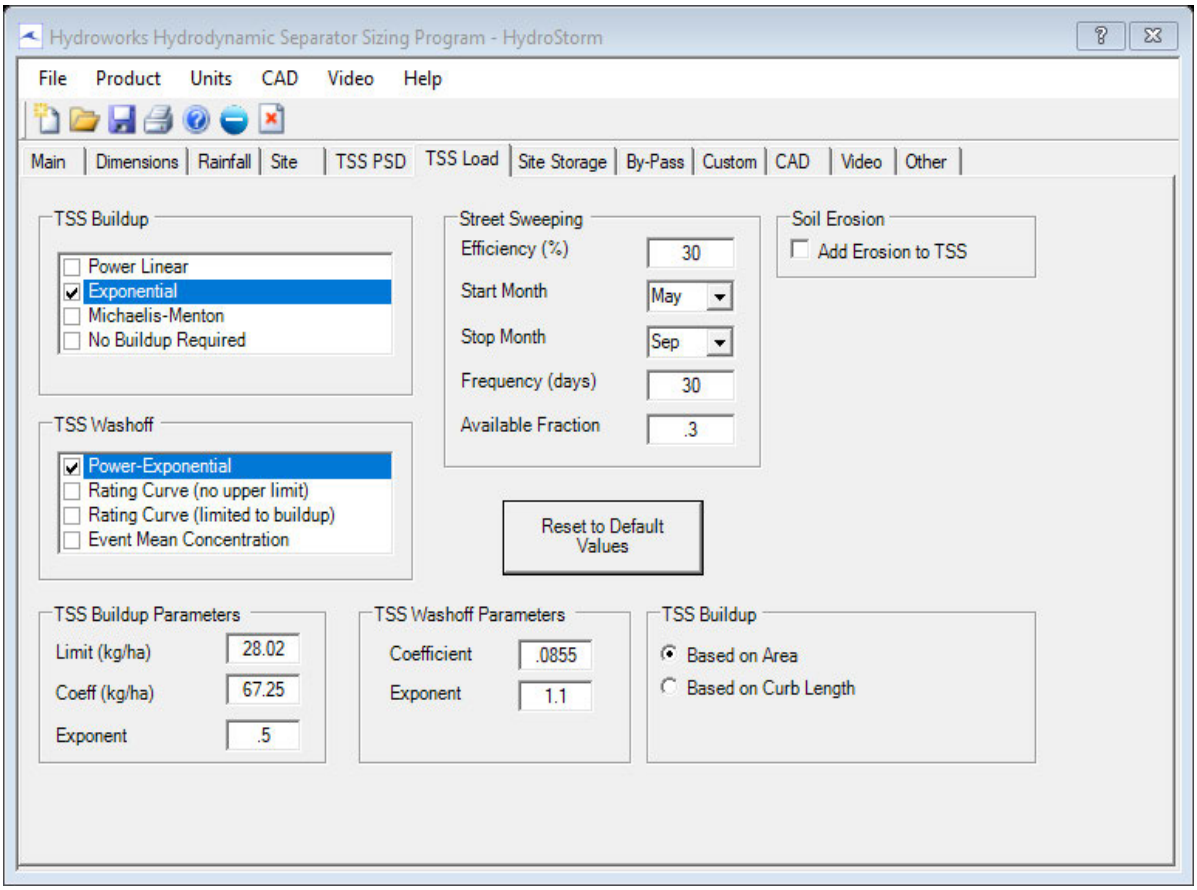
Model	Diam. (m)	Depth (m)	Float. Vol. (L)	Sediment Vol. (m3)	Total Vol. (m3)
HS 3	0.91	1.07	185	0.4	0.7
HS 4	1.22	1.22	381	0.9	1.4
HS 5	1.52	1.52	642	1.8	2.8
HS 6	1.83	1.83	1041	3.2	4.8
HS 7	2.13	1.98	1575	4.6	7.1
HS 8	2.44	2.13	2354	6.3	10
HS 10	3.05	2.74	4327	13.2	20
HS 12	3.66	3.35	7164	23.8	35.2

Depth = Depth from outlet invert to inside bottom of tank

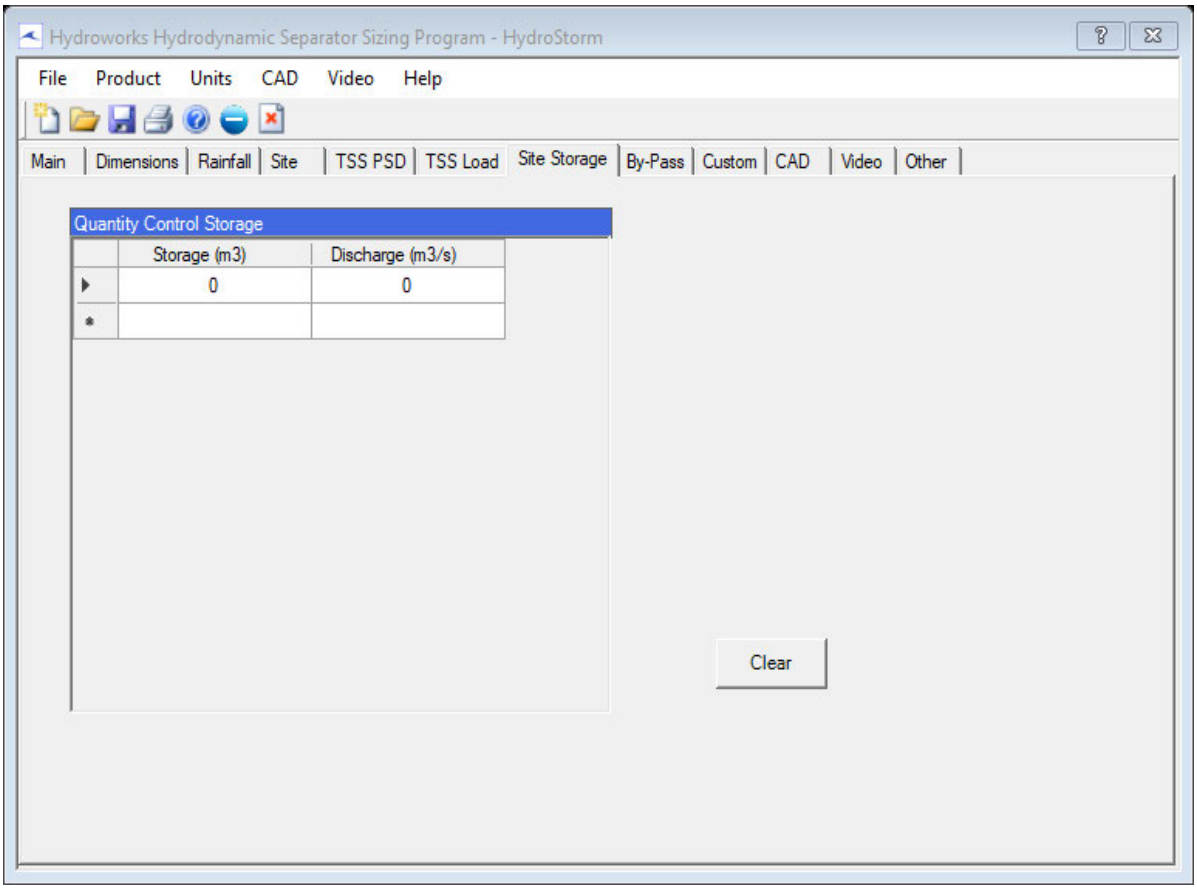
Generic HS 6 CAD Drawing



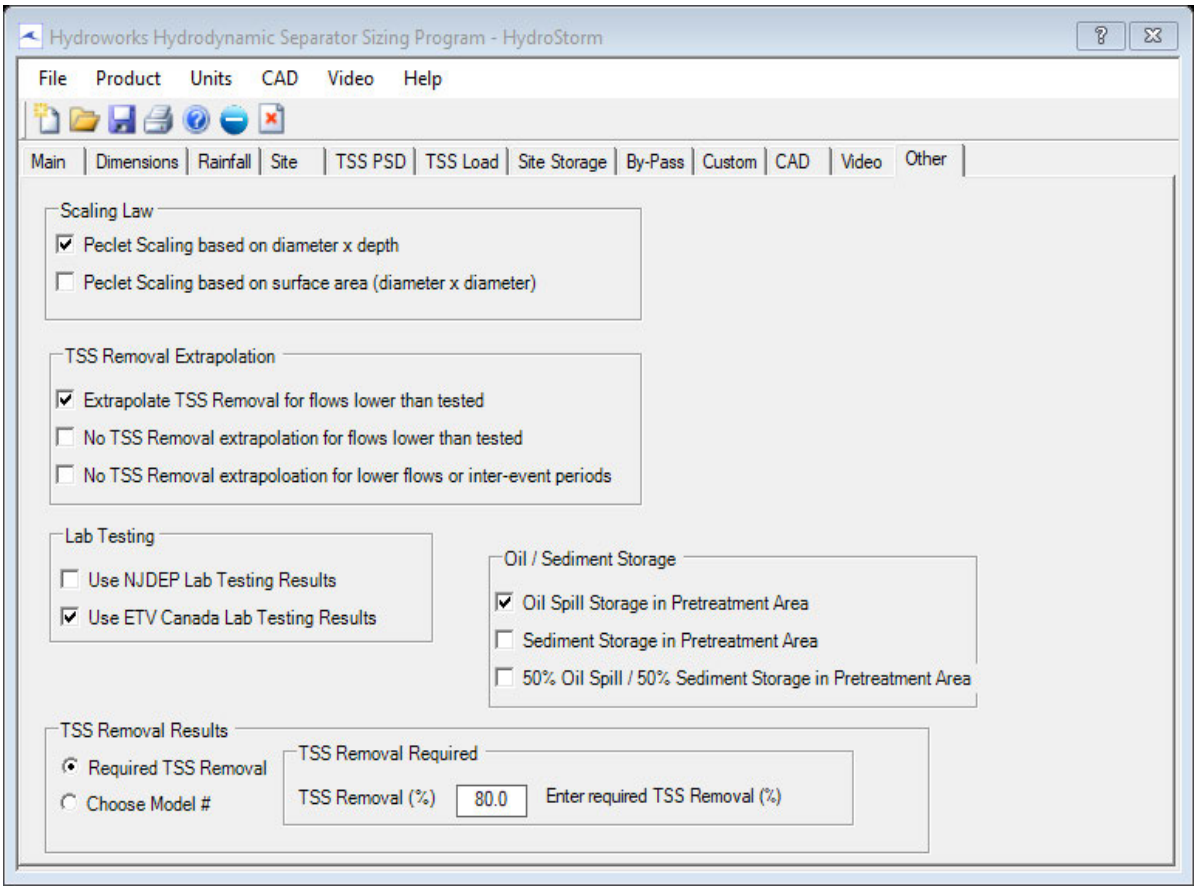
TSS Buildup And Washoff



Upstream Quantity Storage



Other Parameters



Flagged Issues

None

Hydroworks Sizing Program - Version 5.8.5
Copyright Hydroworks, LLC, 2024
1-800-290-7900
www.hydroworks.com

Hydroworks® HydroStorm

Operations & Maintenance Manual

Version 1.2

Please call Hydroworks at 888-290-7900 or email us at support@hydroworks.com if you have any questions regarding the Inspection Checklist. Please email a copy of the completed checklist to Hydroworks at for our records.

Introduction

The HydroStorm is a state-of-the-art hydrodynamic separator. Hydrodynamic separators remove solids, debris and lighter than water (oil, trash, floating debris) pollutants from stormwater. Hydrodynamic separators and other water quality measures are mandated by regulatory agencies (Town/City, State, Federal Government) to protect storm water quality from pollution generated by urban development (traffic, people) as part of new development permitting requirements.

As storm water treatment structures fill up with pollutants they become less and less effective in removing new pollution. Therefore, it is important that storm water treatment structures be maintained on a regular basis to ensure that they are operating at optimum performance. The HydroStorm is no different in this regard and this manual has been assembled to provide the owner/operator with the necessary information to inspect and coordinate maintenance of their HydroStorm.

Hydroworks® HydroStorm Operation

The Hydroworks HydroStorm (HS) separator is a unique hydrodynamic by-pass separator. It incorporates a protected submerged pretreatment zone to collect larger solids, a treatment tank to remove finer solids, and a dual set of weirs to create a high flow bypass. High flows are conveyed directly to the outlet and do not enter the treatment area, however, the submerged pretreatment area still allows removal of coarse solids during high flows.

Under normal or low flows, water enters an inlet area with a horizontal grate. The area underneath the grate is submerged with openings to the main treatment area of the separator. Coarse solids fall through the grate and are either trapped in the pretreatment area or conveyed into the main treatment area depending on the flow rate. Fines are transported into the main treatment area. Openings and weirs in the pretreatment area allow entry of water and solids into the main treatment area and cause water to rotate in the main treatment area creating a vortex motion. Water in the main treatment area is forced to rise along the walls of the separator to discharge from the treatment area to the downstream pipe.

The vortex motion forces solids and floatables to the middle of the inner chamber. Floatables are trapped since the inlet to the treatment area is submerged. The design maximizes the retention of settled solids since solids are forced to the center of the inner chamber by the vortex motion of water while water must flow up the walls of the separator to discharge into the downstream pipe.

A set of high flow weirs near the outlet pipe create a high flow bypass over both the pretreatment area and main treatment chamber. The rate of flow into the treatment area is regulated by the number and size of openings into the treatment chamber and the height of by-pass weirs. High flows flow over the weirs directly to the outlet pipe preventing the scour and resuspension of any fines collected in the treatment chamber.

A central access tube is located in the structure to provide access for cleaning. The arrangement of the inlet area and bypass weirs near the outlet pipe facilitate the use of multiple inlet pipes.

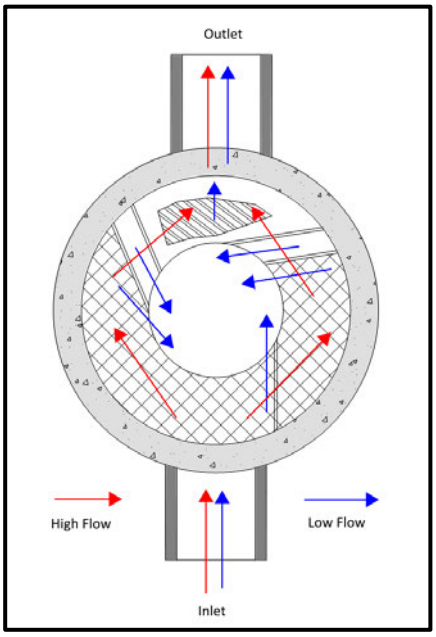


Figure 1. Hydroworks HydroStorm Operation – Plan View

Figure 2 is a profile view of the HydroStorm separator showing the flow patterns for low and high flows.

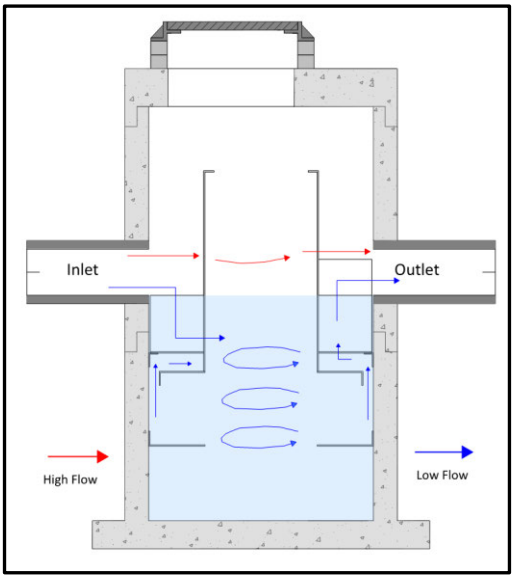


Figure 2. Hydroworks HydroStorm Operation – Profile View

Hydroworks

The HS 4i is an inlet version of the HS 4 separator. There is a catch-basin grate on top of the HS 4i. A funnel sits sits underneath the grate on the frame and directs the water to the inlet side of the separator to ensure all lows flows are properly treated. The whole funnel is removed for inspection and cleaning.

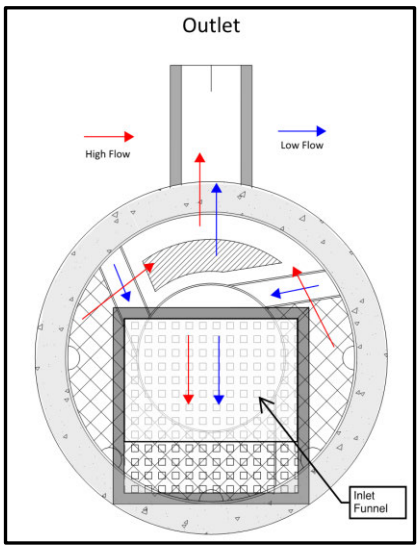


Figure 3. Hydroworks HS 4i Funnel

Construction Materials

The inner chamber and outlet baffle are made out of a copolymer plastic. The shell of the structure is pre-cast concrete. Pre-cast concrete is readily accepted by all municipalities since it has the following advantages:

- long service life
- ease of installation (less dependent on backfill (contractor proficiency) for structural integrity)
- concrete structures are designed for both anti-buoyancy and traffic loading without any field requirements (such as structural loading slabs in traffic areas and anti-buoyancy slabs to prevent groundwater uplift).
- low maintenance requirements

Hydroworks HS Separator Dimensions and Capacities

The HS separator is manufactured in a variety of sizes from 4 ft inside diameter to 12 ft inside diameter as shown in Table 1. Larger sizes may not be available in all areas. Please check with Hydroworks to ensure availability of the larger model sizes.

Table 1. Hydroworks HS Separator Dimensions*					
Model	Structure Inside Diam. (SID) (mm)	Structure Depth (mm)*	Sediment/ Sinking Trash Volume (L)	Oil/Floating Trash Volume (L)	Permanent Pool Wet Volume (L)
HS 3	900	1050	420	150	700
HS 4	1200	1200	845	355	1420
HS 5	1500	1500	1695	620	2775
HS 6	1800	1800	3110	1020	4800
HS 7	2100	1950	4530	1550	7080
HS 8	2400	2100	6225	2325	9960
HS 9	2700	2400	9200	3195	14410
HS 10	3000	2700	13025	4275	20015
HS 12	3600	3000	20525	7095	30535

*Dimensions vary with project requirements

The volumes provided in Table 1 for oil and sediment are to full capacity and not indicative of recommended depths/volumes for maintenance.

Headloss

Any water quality system implemented in a storm drain network will create headloss in the system. In general, depending on the configuration of the by-pass, systems designed to treat high flows or all of the flow will have a higher headloss impact on the storm drain network than systems that by-pass high flows.

The headloss created by the HS separator was measured in an independent laboratory (Alden Research Laboratory) for a full-scale HS 4. The K value ($h = K\ v^2/(2g)$) for headloss calculations was determined to be 1.04 as shown in Figure 3.

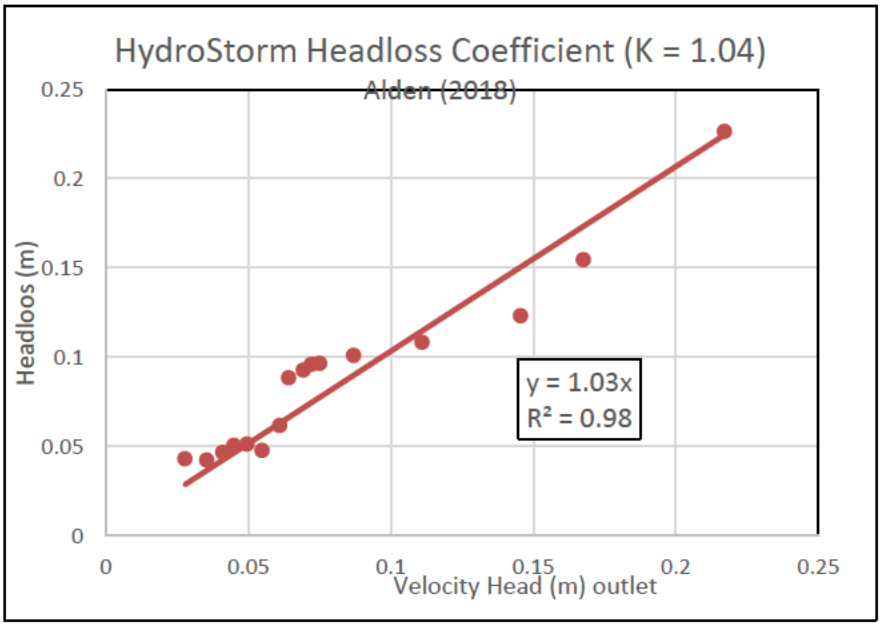


Figure 3. HydroStorm Headloss K Factor (1.04)

Hydroworks

Inspection

Procedure

Floatables

A visual inspection can be conducted for floatables by removing the covers and looking down into the center access tube of the separator. Separators with an inlet grate (HS 4i or custom separator) will have a plastic funnel located under the grate that must be removed from the frame prior to inspection or maintenance. If you are missing a funnel please contact Hydroworks at the numbers provided at the end of this document.

TSS/Sediment

Inspection for TSS build-up can be conducted using a Sludge Judge®, Core Pro®, AccuSludge® or equivalent sampling device that allows the measurement of the depth of TSS/sediment in the unit. These devices typically have a ball valve at the bottom of the tube that allows water and TSS to flow into the tube when lowering the tube into the unit. Once the unit touches the bottom of the device, it is quickly pulled upward such that the water and TSS in the tube forces the ball valve closed allowing the user to see a full core of water/TSS in the unit. The unit should be inspected for TSS through each of the access covers. Several readings (2 or 3) should be made at each access cover to ensure that an accurate TSS depth measurement is recorded.

Frequency

Construction Period

The HydroStorm separator should be inspected every four weeks and after every large storm (over 0.5” (12.5 mm) of rain) during the construction period.

Post-Construction Period

The Hydroworks HydroStorm separator should be inspected during the first year of operation for normal stabilized sites (grassed or paved areas). If the unit is subject to oil spills or runoff from unstabilized (storage piles, exposed soils) areas the HydroStorm separator should be inspected more frequently (4 times per year). The initial annual inspection will indicate the required future frequency of inspection and maintenance if the unit was maintained after the construction period.

Reporting

Reports should be prepared as part of each inspection and include the following information:

1. Date of inspection
2. GPS coordinates of Hydroworks unit
3. Time since last rainfall
4. Date of last inspection
5. Installation deficiencies (missing parts, incorrect installation of parts)
6. Structural deficiencies (concrete cracks, broken parts)
7. Operational deficiencies (leaks, blockages)
8. Presence of oil sheen or depth of oil layer
9. Estimate of depth/volume of floatables (trash, leaves) captured
10. Sediment depth measured
11. Recommendations for any repairs and/or maintenance for the unit
12. Estimation of time before maintenance is required if not required at time of inspection

A sample inspection checklist is provided at the end of this manual.

Maintenance

Procedure

The Hydroworks HydroStorm unit is typically maintained using a vacuum truck. There are numerous companies that can maintain the HydroStorm separator. Maintenance with a vacuum truck involves removing all of the water and sediment together. The water is then separated from the sediment on the truck or at the disposal facility.

A central access opening (24” (600 mm) or greater) is provided to the gain access to the lower treatment tank of the unit. This is the primary location to maintain by vacuum truck. The pretreatment area can also be vacuumed and/or flushed into the lower treatment tank of the separator for cleaning via the central access once the water level is lowered below the pretreatment floor.

In instances where a vacuum truck is not available other maintenance methods (i.e. clamshell bucket) can be used, but they will be less effective. If a clamshell bucket is used the water must be decanted prior to cleaning since the sediment is under water and typically fine in nature.

The local municipality should be consulted for the allowable disposal options for both water and sediments prior to any maintenance operation. Once the water is decanted the sediment can be removed with the clamshell bucket.

Disposal of the contents of the separator depend on local requirements. Maintenance of a Hydroworks HydroStorm unit will typically take 1 to 2 hours based on a vacuum truck and longer for other cleaning methods (i.e. clamshell bucket).

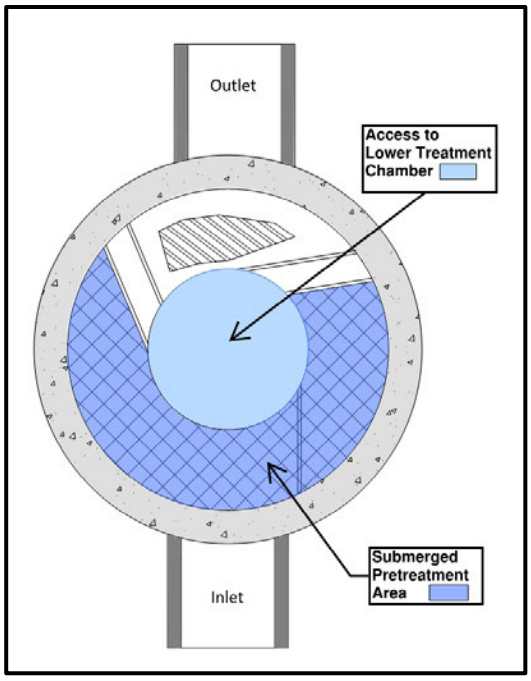


Figure 3. Maintenance Access

Frequency

Construction Period

A HydroStorm separator can fill with construction sediment quickly during the construction period. The HydroStorm must be maintained during the construction period when the depth of TSS/sediment reaches 24" (600 mm). It must also be maintained during the construction period if there is an appreciable depth of oil in the unit (more than a sheen) or if floatables other than oil cover over 50% of the area of the separator

The HydroStorm separator should be maintained at the end of the construction period, prior to operation for the post-construction period.

Post-Construction Period

The HydroStorm was independently tested by Alden Research Laboratory in 2017. A HydroStorm HS 4 was tested for scour with a 50% sediment depth of 0.5 ft.(150 mm). The sump depths given in Table 1 are scaled larger than required based on standard scaling requirements (NJDEP, ETV Canada). Accordingly maintenance depths for units larger than the HS 4 will be larger than 300 mm.

There will be designs with increased sediment storage based on specifications or site-specific criteria. A measurement of the total depth in the separator through the central access tube should be taken and compared to sump depth given in Table 1.

The standard sump depth from Table 1 should be subtracted from the measured depth and the resulting extra depth should be added to the values given in Table 2 to determine the site-specific sediment maintenance depth for that separator.

For example, if the measured sump depth in the HS-7 is 7.5 feet, then the sediment maintenance depth for that HS-7 is 2.25 ft (= 0.5 + 1.75) and the separator does not need to be cleaned for sediment accumulation until the measure sediment depth is 2.25 ft.

The HydroStorm separator must also be maintained if there is an appreciable depth of oil in the unit (more than a sheen) or if floatables other than oil cover over 50% of the water surface of the separator.

Table 2 Standard Maintenance Depths for HydroStorm Models

Model	Diameter ft (mm)	Sediment Maintenance Depth for Total Water Depth ft (mm)*
HS-3	3 (900)	1 (300)
HS-4	4 (1200)	1 (300)
HS-5	5 (1500)	1.75 (530)
HS-6	6 (1800)	2 (610)
HS-7	7 (2100)	1.75 (535)
HS-8	8 (2400)	1.5 (465)
HS-9	9 (2700)	1.75 (540)
HS-10	10 (3000)	2 (615)
HS-12	12 (3600)	1.5 (470)

*based on standard sump depths in Table 1

HYDROSTORM INSPECTION SHEET

Date _____
Date of Last Inspection _____

Site _____
City _____
State _____
Owner _____

GPS Coordinates _____

Date of last rainfall _____

Site Characteristics	**Yes**	**No**
Soil erosion evident	☐	☐
Exposed material storage on site	☐	☐
Large exposure to leaf litter (lots of trees)	☐	☐
High traffic (vehicle) area	☐	☐

HydroStorm	**Yes**	**No**
Obstructions in the inlet or outlet	☐ *	☐
Missing internal components	☐ **	☐
Improperly installed inlet or outlet pipes	☐ ***	☐
Internal component damage (cracked, broken, loose pieces)	☐ **	☐
Floating debris in the separator (oil, leaves, trash)	☐	☐
Large debris visible in the separator	☐ *	☐
Concrete cracks/deficiencies	☐ ***	☐
Exposed rebar	☐ **	☐
Water seepage (water level not at outlet pipe invert)	☐ ***	☐

Water level depth below outlet pipe invert _____“

Routine Measurements

Floating debris depth	**< 0.5” (13mm)**	☐	**>0.5” 13mm)**	☐ *
Floating debris coverage	**< 50% of surface area**	☐	**> 50% surface area**	☐ *
Sludge depth	**< 12” (300mm)**	☐	**> 12” (300mm)**	☐ ****

* Maintenance required
** Repairs required
*** Further investigation is required

Hydroworks

Other Comments:

Hydroworks

Hydroworks® HydroStorm

One Year Limited Warranty

Hydroworks, LLC warrants, to the purchaser and subsequent owner(s) during the warranty period subject to the terms and conditions hereof, the Hydroworks HydroStorm to be free from defects in material and workmanship under normal use and service, when properly installed, used, inspected and maintained in accordance with Hydroworks written instructions, for the period of the warranty. The standard warranty period is 1 year.

The warranty period begins once the separator has been manufactured and is available for delivery. Any components determined to be defective, either by failure or by inspection, in material and workmanship will be repaired, replaced or remanufactured at Hydroworks' option provided, however, that by doing so Hydroworks, LLC will not be obligated to replace an entire insert or concrete section, or the complete unit. This warranty does not cover shipping charges, damages, labor, any costs incurred to obtain access to the unit, any costs to repair/replace any surface treatment/cover after repair/replacement, or other charges that may occur due to product failure, repair or replacement.

This warranty does not apply to any material that has been disassembled or modified without prior approval of Hydroworks, LLC, that has been subjected to misuse, misapplication, neglect, alteration, accident or act of God, or that has not been installed, inspected, operated or maintained in accordance with Hydroworks, LLC instructions and is in lieu of all other warranties expressed or implied. Hydroworks, LLC does not authorize any representative or other person to expand or otherwise modify this limited warranty.

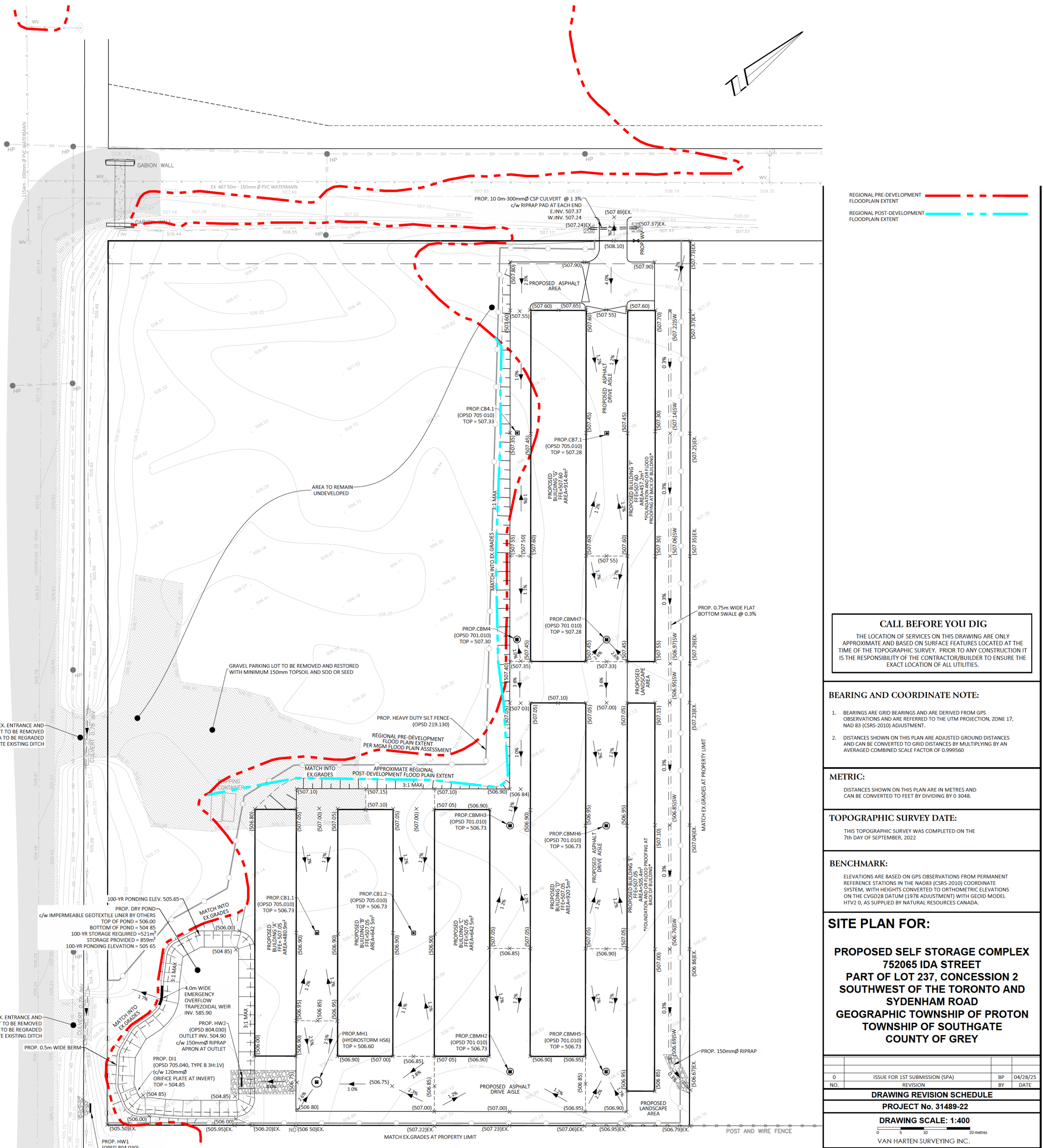
The owner shall provide Hydroworks, LLC with written notice of any alleged defect in material or workmanship including a detailed description of the alleged defect upon discovery of the defect. Hydroworks, LLC should be contacted at 136 Central Ave., Clark, NJ 07066 or any other address as supplied by Hydroworks, LLC. (888-290-7900).

This limited warranty is exclusive. There are no other warranties, express or implied, or merchantability or fitness for a particular purpose and none shall be created whether under the uniform commercial code, custom or usage in the industry or the course of dealings between the parties. Hydroworks, LLC will replace any goods that are defective under this warranty as the sole and exclusive remedy for breach of this warranty.

Subject to the foregoing, all conditions, warranties, terms, undertakings or liabilities (including liability as to negligence), expressed or implied, and howsoever arising, as to the condition, suitability, fitness, safety, or title to the Hydroworks HydroStorm are hereby negated and excluded and Hydroworks, LLC gives and makes no such representation, warranty or undertaking except as expressly set forth herein. Under no circumstances shall Hydroworks, LLC be liable to the Purchaser or to any third party for product liability claims; claims arising from the design, shipment, or installation of the HydroStorm, or the cost of other goods or services related to the purchase and installation of the HydroStorm. For this Limited Warranty to apply, the HydroStorm must be installed in accordance with all site conditions required by state and local codes; all other applicable laws; and Hydroworks' written installation instructions.

Hydroworks, LLC expressly disclaims liability for special, consequential or incidental damages (even if it has been advised of the possibility of the same) or breach of expressed or implied warranty. Hydroworks, LLC shall not be liable for penalties or liquidated damages, including loss of production and profits; labor and materials; overhead costs; or other loss or expense incurred by the purchaser or any third party. Specifically excluded from limited warranty coverage are damages to the HydroStorm arising from ordinary wear and tear; alteration, accident, misuse, abuse or neglect; improper maintenance, failure of the product due to improper installation of the concrete sections or improper sizing; or any other event not caused by Hydroworks, LLC. This limited warranty represents Hydroworks' sole liability to the purchaser for claims related to the HydroStorm, whether the claim is based upon contract, tort, or other legal basis.

DRAWINGS



CALL BEFORE YOU DIG

THE LOCATION OF SERVICES ON THIS DRAWING ARE ONLY APPROXIMATE AND BASED ON SURFACE FEATURES LOCATED AT THE TIME OF THE TOPOGRAPHIC SURVEY. PRIOR TO ANY CONSTRUCTION IT IS THE RESPONSIBILITY OF THE CONTRACTOR/BUILDER TO ENSURE THE EXACT LOCATION OF ALL UTILITIES.

BEARING AND COORDINATE NOTE:

1. BEARINGS ARE GRID BEARINGS AND ARE DERIVED FROM GPS OBSERVATIONS AND ARE REFERRED TO THE UTM PROJECTION, ZONE 17, NAD 83 (CSRS-2010) ADJUSTMENT.
2. DISTANCES SHOWN ON THIS PLAN ARE ADJUSTED GROUND DISTANCES AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY AN AVERAGED COMBINED SCALE FACTOR OF 0.999560

METRIC:

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0 3048.

TOPOGRAPHIC SURVEY DATE:

THIS TOPOGRAPHIC SURVEY WAS COMPLETED ON THE 7th DAY OF SEPTEMBER, 2022

BENCHMARK:

ELEVATIONS ARE BASED ON GPS OBSERVATIONS FROM PERMANENT REFERENCE STATIONS IN THE NAD83 (CSRS-2010) COORDINATE SYSTEM, WITH HEIGHTS CONVERTED TO ORTHOMETRIC ELEVATIONS ON THE CVGD28 DATUM (1978 ADJUSTMENT) WITH GEOID MODEL HTV2 0, AS SUPPLIED BY NATURAL RESOURCES CANADA.

SITE PLAN FOR:

PROPOSED SELF STORAGE COMPLEX
752065 IDA STREET
PART OF LOT 237, CONCESSION 2
SOUTHWEST OF THE TORONTO AND SYDENHAM ROAD
GEOGRAPHIC TOWNSHIP OF PROTON
TOWNSHIP OF SOUTHGATE
COUNTY OF GREY

NO.	REVISION	BY	DATE
0	ISSUE FOR 1ST SUBMISSION (SPA)	BP	04/28/25

DRAWING REVISION SCHEDULE

PROJECT No. 31489-22

DRAWING SCALE: 1:400

0 5 10 20 metres

VAN HARTEN SURVEYING INC.

CAUTION:
- THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED FOR TRANSACTION OR MORTGAGE PURPOSES
- THIS SKETCH IS PROTECTED BY COPYRIGHT

SITE GRADING PLAN

SHEET 1 OF 5

PROFESSIONAL [redacted] LIC 100583029 APR. 28, 2025 PROVINCE OF ONTARIO

PREPARED FOR:

BRAD WESLEY HOLDINGS LTD.

Van Harten SURVEYING INC.
LAND SURVEYORS and ENGINEERS

Kitchener/Waterloo	Guelph	Orangeville
Ph: 519-742-8371	Ph: 519-821-2763	Ph: 519-940-4110

www.vanharten.com info@vanharten.com

DRAWN BY:	DESIGN BY:	CHECKED BY:
BH	BH/BP	BP

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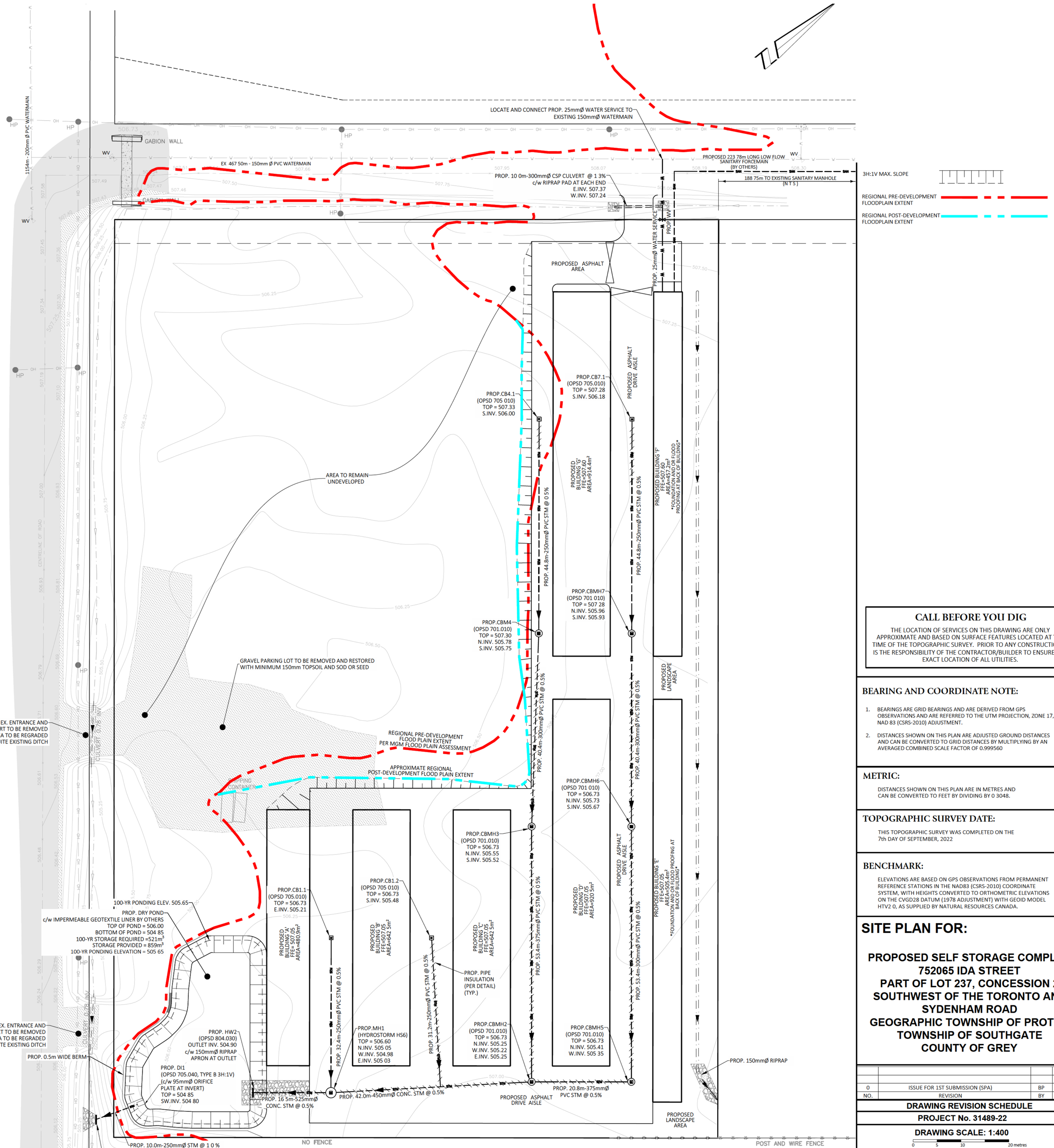
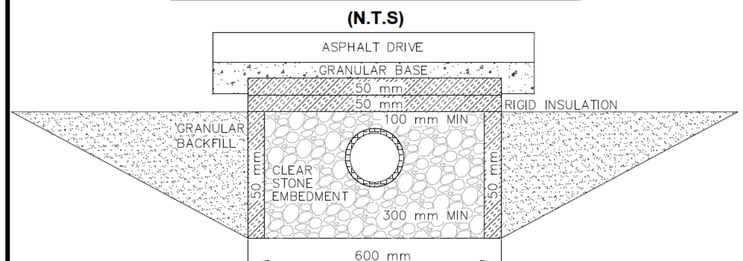
NOT FOR CONSTRUCTION



SHALLOW STORM SEWER INSULATION DETAIL

(N.T.S)



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NO.	REVISION	BY	DATE
0	ISSUE FOR 1ST SUBMISSION (SPA)	BP	04/28/25

DRAWING REVISION SCHEDULE

PROJECT No. 31489-22

DRAWING SCALE: 1:400

0 5 10 20 metres

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SITE SERVICING PLAN

SHEET 2 OF 5

LICENSED PROFESSIONAL [redacted] B.D. POND 100583029 APR. 28, 2025 PROVINCE OF ONTARIO

PREPARED FOR:

BRAD WESLEY HOLDINGS LTD.

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BH	BH/BP	BP

L:\Proton\Con 2 SWTSR\ACAD\SP.LT.237.BRADWESLEY (31489-22)UTM-2010 dwg

150mm TOPSOIL AND SOD UNLESS OTHERWISE SPECIFIED BY LANDSCAPE PLANS.
5. MATCH EXISTING GRADES AT ALL PROPERTY LIMITS. GRADING NOT TO EXTEND ONTO ADJACENT PROPERTIES WITHOUT PRIOR WRITTEN CONSENT OF ADJACENT PROPERTY OWNER.
6. SLOPES TO BE MAXIMUM 4H:1V UNLESS OTHERWISE NOTED.
7. RETAINING WALLS, IF ANY, TO BE DESIGNED BY OTHERS AND IN CONFORMANCE WITH THE ONTARIO BUILDING CODE.
8. UNLESS OTHERWISE RECOMMENDED BY A GEOTECHNICAL CONSULTANT, ALL GRANULAR MATERIAL TO BE COMPACTED TO 100% STANDARD PROCTOR MAX DRY DENSITY.
9. UNLESS OTHERWISE RECOMMENDED BY A GEOTECHNICAL CONSULTANT, ALL GENERAL BACKFILL TO BE APPROVED MATERIAL AND COMPACTED TO MINIMUM 95% STANDARD PROCTOR MAX DRY DENSITY.
10. FILL MATERIALS TO BE FREE OF ANY DELETERIOUS MATERIAL INCLUDING DEBRIS, LARGE ROCKS, ORGANICS, ETC. FILL MATERIAL TO BE FREE FROM LENSES, POCKETS OR LAYERS OF MATERIAL WHICH ARE SIGNIFICANTLY DIFFERENT IN GRADATION FROM SURROUNDING MATERIAL IN THE SAME ZONING. CARE SHOULD BE TAKEN TO ENSURE THAT FILL MATERIAL DOES NOT SEGREGATE DURING TRANSPORTATION OR STORAGE. IF SEGREGATION OCCURS, MATERIAL SHOULD BE MIXED PRIOR TO PLACEMENT.
11. ALL EARTHWORKS ACTIVITIES TO BE UNDERTAKEN IN COMPLIANCE WITH O.Reg 406/19 REGARDING ON-SITE AND EXCESS SOIL MANAGEMENT.

WORKS WITHIN THE MUNICIPAL RIGHT OF WAY

1. AN ENTRANCE PERMIT IS REQUIRED PRIOR TO CONSTRUCTION OF THE PROPOSED SITE ENTRANCE.
2. A ROAD OCCUPANCY PERMIT IS REQUIRED PRIOR TO ANY CONSTRUCTION WITHIN THE MUNICIPAL RIGHT-OF-WAY.
3. A PUBLIC TREE PERMIT IS REQUIRED TO REMOVE OR INJURE ANY TREE WITHIN THE TOWNSHIP RIGHT-OF-WAY.
4. CONTRACTOR TO CONFORM TO REQUIREMENTS OF ENTRANCE PERMIT AND ROAD OCCUPANCY PERMIT. WHERE THE PERMITS DIFFER FROM THESE NOTES, THE PERMIT CONDITIONS SHALL TAKE PRECEDENCE.
5. ALL WORKS WITHIN THE MUNICIPAL RIGHT-OF-WAY ARE AT THE DEVELOPER'S COST AND ARE TO BE COMPLETED BY A TOWNSHIP APPROVED CONTRACTOR.
6. CONTRACTOR TO BE RESPONSIBLE FOR PROPERLY COMPACTING BACKFILL MATERIAL AND RESTORING SURFACES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE TOWNSHIP.
7. BOULEVARDS TO BE RESTORED WITH MINIMUM 200mm TOPSOIL AND No. 1 NURSERY SOD TO THE SATISFACTION OF THE TOWNSHIP.
8. ROAD MUST BE MAINTAINED TO A MINIMUM OF ONE LANE AT ALL TIMES FOR EMERGENCY ACCESS PER OTM GUIDELINES.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL IN ACCORDANCE WITH THE ONTARIO TRAFFIC MANUAL, BOOK 7 – TEMPORARY CONDITIONS.

SERVICING NOTES

1. ALL MATERIALS AND CONSTRUCTION METHODS MUST CORRESPOND TO THE CURRENT TOWNSHIP OF SOUTHGATE STANDARDS AND SPECIFICATIONS AND APPLICABLE OPSS / OPSD.
2. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR LOCATES, EXPOSING, SUPPORTING AND PROTECTING ALL UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES EXISTING AT THE TIME OF CONSTRUCTION IN THE AREA OF THEIR WORK WHETHER SHOWN ON THE PLANS OR NOT AND FOR ALL REPAIRS AND CONSEQUENCES RELATING TO DAMAGE OF SAME.
3. THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE TO GIVE 72 HOURS WRITTEN NOTICE TO THE UTILITIES, FOR THE PURPOSES OF INSPECTION BY THE CONCERNED UTILITY. THIS INSPECTION WILL BE FOR THE DURATION OF CONSTRUCTION, WITH THE CONTRACTOR RESPONSIBLE FOR ALL COSTS ARISING FROM SUCH INSPECTION.

STORM

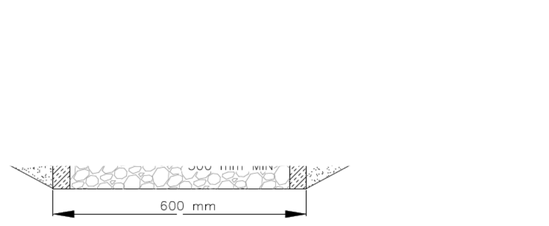
1. ALL STORM SEWERS TO BE PVC PIPE AND CONFORM TO OPSS 1820 AND ANY APPLICABLE CSA STANDARDS.
2. ALL CATCHBASINS TO BE 600mm x 600mm PRECAST CONCRETE PER OPSD 705.010 TYPE A.
3. ALL MANHOLES AND CATCHBASIN MANHOLES TO BE 1200mm DIAMETER PRECAST CONCRETE PER OPSD 701.010, UNLESS OTHERWISE NOTED.

MINIMUM OF 1% SODIUM HYPOCHLORITE SOLUTION. WHERE APPLICABLE, THE DRILL/CUTTING/TAPPING BITS AND ALL SURFACES OF MAINSTOPS, SERVICE SADDLES, TAPPING SLEEVES AND VALVES WHICH WILL COME INTO CONTACT WITH DRINKING WATER SHALL BE LIKEWISE CLEANED AND DISINFECTED USING A MINIMUM 1% SODIUM HYPOCHLORITE SOLUTION IMMEDIATELY PRIOR TO INSTALLATION. IF ANY OF THE DISINFECTED SURFACES COME IN CONTACT WITH SOIL AND/OR WATER IN THE EXCAVATION PRIOR TO USE, THE CLEANING AND DISINFECTION PROCEDURE SHALL BE REPEATED.

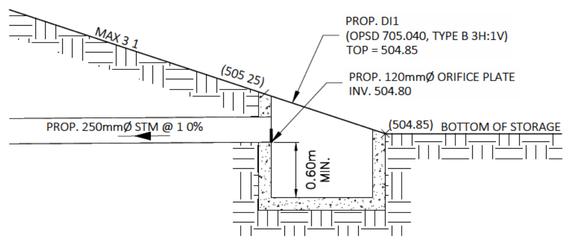
EROSION AND SEDIMENT CONTROL NOTES

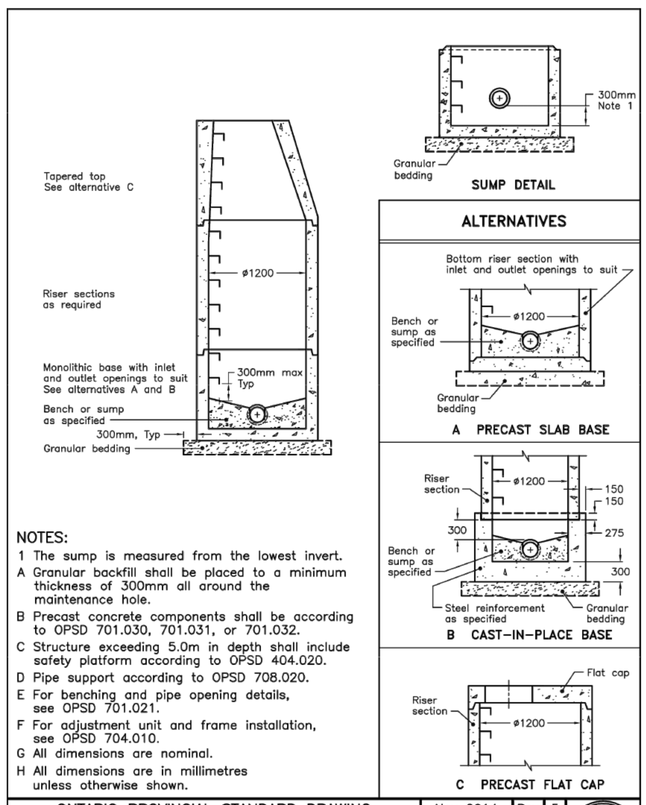
1. EROSION AND SEDIMENT CONTROL (ESC) MEASURES TO BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING THE CONSTRUCTION PHASES, TO PREVENT ENTRY OF SEDIMENT INTO THE STORMWATER. ALL DAMAGED EROSION AND SEDIMENT CONTROLS SHOULD BE REPAIRED AND/OR REPLACED WITHIN 48 HOURS OF INSPECTION.
2. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT TEMPORARY SEDIMENT CONTROLS ARE FUNCTIONING AS INTENDED.
3. DISTURBED AREAS TO BE MINIMIZED TO THE EXTENT POSSIBLE, AND TEMPORARILY OR PERMANENTLY STABILIZED/RESTORED AS THE WORK PROGRESSES.
4. ALL DISTURBED GROUND LEFT INACTIVE FOR 30 DAYS SHALL BE VEGETATED, SUBJECT TO WEATHER CONDITIONS.
5. THE EROSION AND SEDIMENT CONTROL STRATEGIES ARE NOT STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREA. IF THE IDENTIFIED MEASURES ON THE PLAN ARE NOT EFFECTIVE IN PREVENTING THE RELEASE OF A DELETERIOUS SUBSTANCE, INCLUDING SEDIMENT, THEN ALTERNATIVE MEASURES MUST BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS. ADDITIONAL ESC MEASURES ARE TO BE KEPT ON SITE AND USED AS NECESSARY.
6. NO ALTERNATIVE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THE DESIGN CONSULTANT AND THE TOWNSHIP. ANY DEVIATION FROM THE APPROVED PLANS MUST BE DESIGNED BY A QUALIFIED PROFESSIONAL.
7. INSPECTION OF ESC MEASURES SHOULD OCCUR, AT MINIMUM:
   DURING PERIODS OF EARTHWORKS ACTIVITIES:
   - ON A WEEKLY BASIS;
   - AFTER EVERY RAINFALL EVENT;
   - AFTER SIGNIFICANT SNOWMELT EVENTS;
   - DAILY DURING PERIODS OF EXTENDED RAIN OR SNOWMELT.

   DURING INACTIVE PERIODS:
   - ONCE A MONTH;
   - AFTER SIGNIFICANT RAINFALL OR SNOWMELT EVENTS.
8. ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, TO BE CONTROLLED TO PREVENT THE ENTRY OF PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE OR OTHER DELETERIOUS SUBSTANCES INTO SEWERS AND/OR DITCHES.
9. VEHICULAR REFUELING AND MAINTENANCE TO BE COMPLETED IN A DESIGNATED AREA.
10. ALL CONSTRUCTION VEHICLES MUST ENTER AND EXIT THE SITE ONLY FROM THE APPROVED ACCESS ROUTE.
11. CONTRACTOR TO BE RESPONSIBLE FOR PROVISIONS, MAINTENANCE AND RESTORATION OF THE CONSTRUCTION ACCESS.
12. MUD MAT TO BE CONSTRUCTED AT THE ACCESS POINT TO THE SITE. CONTRACTOR TO MAINTAIN MUD MAT TO MAXIMIZE EFFECTIVENESS AT ALL TIMES. ALL VEHICLES ARE TO ENTER AND LEAVE THE SITE VIA THE MUD MAT.
13. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING MUNICIPAL ROADWAYS AND SIDEWALKS ARE CLEANED OF ALL SEDIMENTS FROM VEHICULAR TRACKING AT THE END OF EACH WORKING DAY. STREET SWEEPING TO BE UNDERTAKEN AS NEEDED.
14. NO CONSTRUCTION ACTIVITY OR MACHINERY SHALL BE ALLOWED BEYOND THE LIMIT OF THE TEMPORARY SEDIMENT CONTROL FENCE OR THE SITE WORKS.
15. THE CONTRACTOR SHALL TAKE CARE AND CONTROL SPILLS, FLUIDS AND MATERIALS DURING CONSTRUCTION TO MINIMIZE RISK TO THE ENVIRONMENT.
16. DEWATERING WILL NOT BE PERMITTED DURING CONSTRUCTION. SHOULD DEWATERING BE REQUIRED, A SEPARATE PLAN AND APPROVAL IS TO BE OBTAINED. NO PUMPING OF SEDIMENT LADEN RUNOFF FORM THE SITE IS PERMITTED AT ANY TIME.
17. PRIOR TO SITE DISTURBANCE THE CONTRACTOR / PROPONENT SHOULD ENSURE THAT THE WORKS ARE IN CONFORMANCE WITH MIGRATORY BIRDS CONVENTION ACT. PLEASE NOTE THAT THE GENERAL BREEDING BIRD TIMING WINDOW FOR THIS AREA IS APRIL 1ST TO AUGUST 31ST, HOWEVER, BREEDING ACTIVITIES MIGHT INITIATE PRIOR TO AND CONTINUE PAST THIS PERIOD.
18. TOPSOIL AND TEMPORARY MATERIAL STOCKPILES TO BE ENCLOSED WITH SEDIMENT CONTROL FENCE. SEDIMENT CONTROL FENCE FOR STOCKPILES TO BE TERRAFIX TERRAFENCE OR APPROVED EQUIVALENT.
19. ACCUMULATED SEDIMENT TO BE REMOVED FORM THE SEDIMENT BARRIER ONCE IT REACHES A DEPTH OF MAXIMUM 300mm. ALL ACCUMULATED SEDIMENT IS TO BE REMOVED PRIOR TO REMOVING THE TEMPORARY SEDIMENT CONTROL FENCING.
20. REMOVE TEMPORARY SEDIMENT CONTROLS FOLLOWING COMPLETION OF CONSTRUCTION AND SITE STABILIZATION.
21. AN AFTER HOURS CONTACT LIST IS TO BE VISIBLY POSTED ON-SITE FOR EMERGENCIES. ALL THE PLANS SHOULD HAVE THE NAME AND CONTACT INFORMATION FOR THE PERSON RESPONSIBLE FOR MAINTENANCE OF ESC MEASURES.
22. ANY SEDIMENT OR OTHER SPILL FROM THE SITE IS TO BE REPORTED TO THE MINISTRY OF ENVIRONMENT (SPILL ACTION CENTRE) AT 1-800-268-6060.



DRY POND OUTLET DETAIL
(N.T.S)

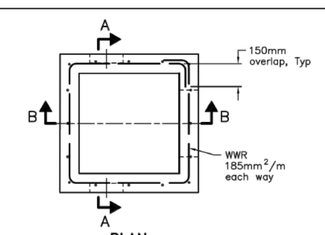


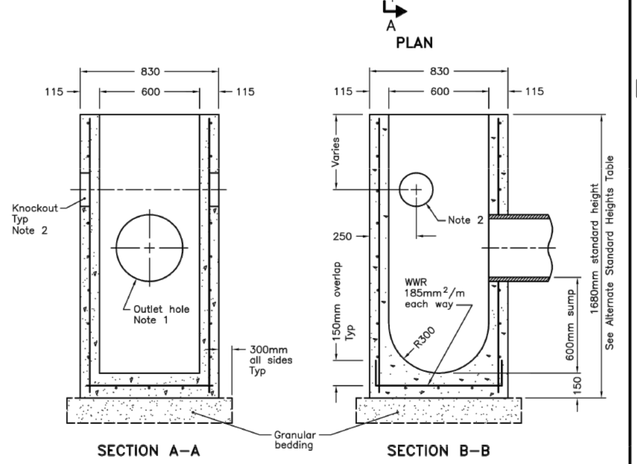


NOTES:
1 The sump is measured from the lowest invert.
A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
B Precast concrete components shall be according to OPSD 701.030, 701.031, or 701.032.
C Structure exceeding 5.0m in depth shall include safety platform according to OPSD 404.020.
D Pipe support according to OPSD 708.020.
E For benching and pipe opening details, see OPSD 701.021.
F For adjustment unit and frame installation, see OPSD 704.010.
G All dimensions are nominal.
H All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 5
PRECAST CONCRETE MAINTENANCE HOLE 1200mm DIAMETER		OPSD 701.010

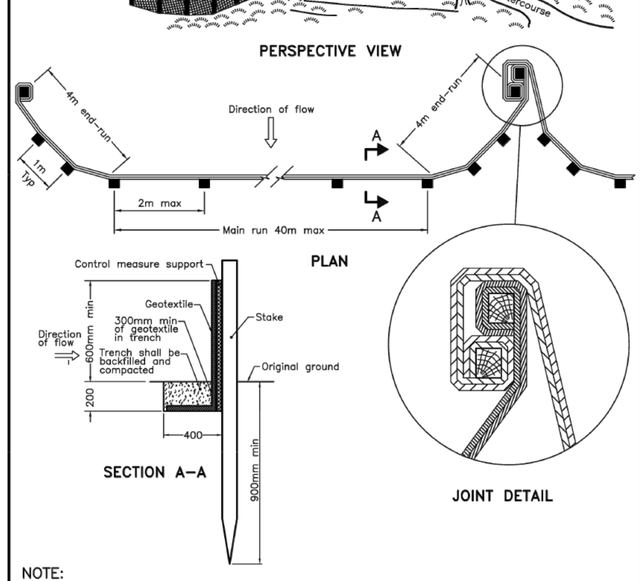
ALTERNATE STANDARD HEIGHTS	
ALTERNATIVE	DIMENSION
A	1980
B	1830
C	1520
D	1380





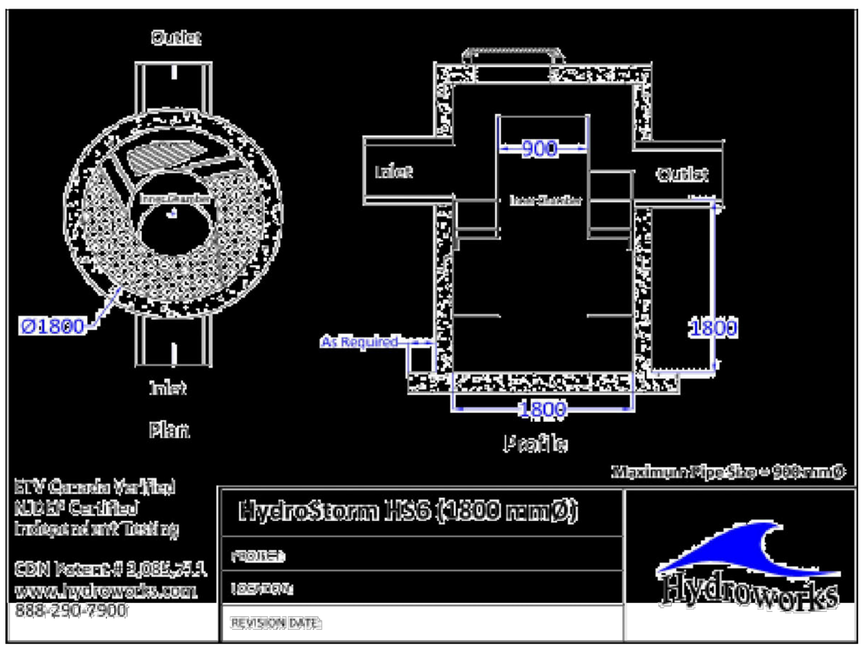
NOTES:
1 Outlet hole size 525mm diameter maximum, location as required.
2 200mm diameter knockout to accommodate subdrain. Knockout shall be 60mm deep.
A Centre reinforcing in base slab and walls ±20mm.
B Granular backfill shall be placed to a minimum thickness of 300mm all around the catch basin.
C Frame, grate, and adjustment units shall be installed according to OPSD 704.010.
D Pipe support shall be according to OPSD 708.020.
E All dimensions are nominal.
F All dimensions are in millimetres unless otherwise shown.

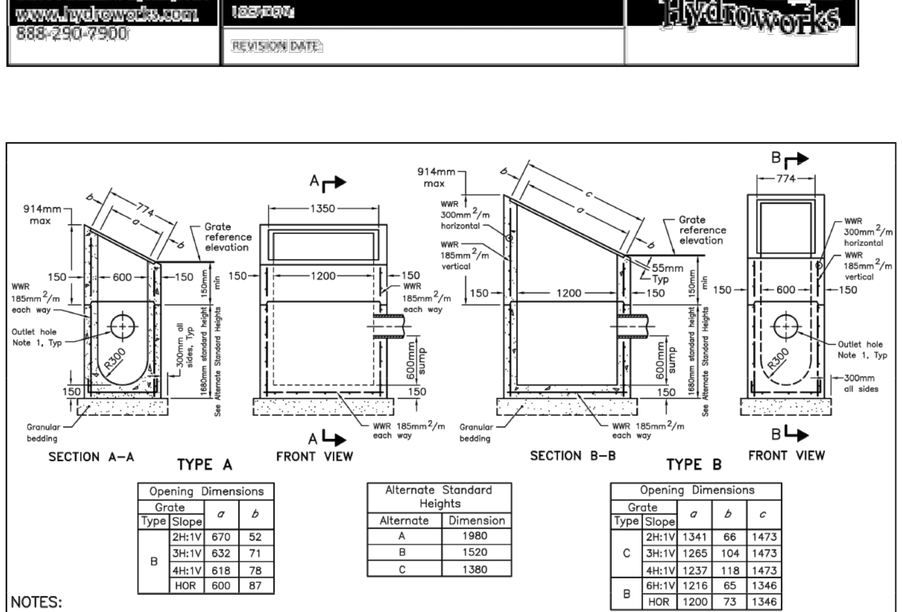
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 4
PRECAST CONCRETE CATCH BASIN 600x600mm		OPSD 705.010



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

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev 3
HEAVY-DUTY SILT FENCE BARRIER		OPSD 219.130





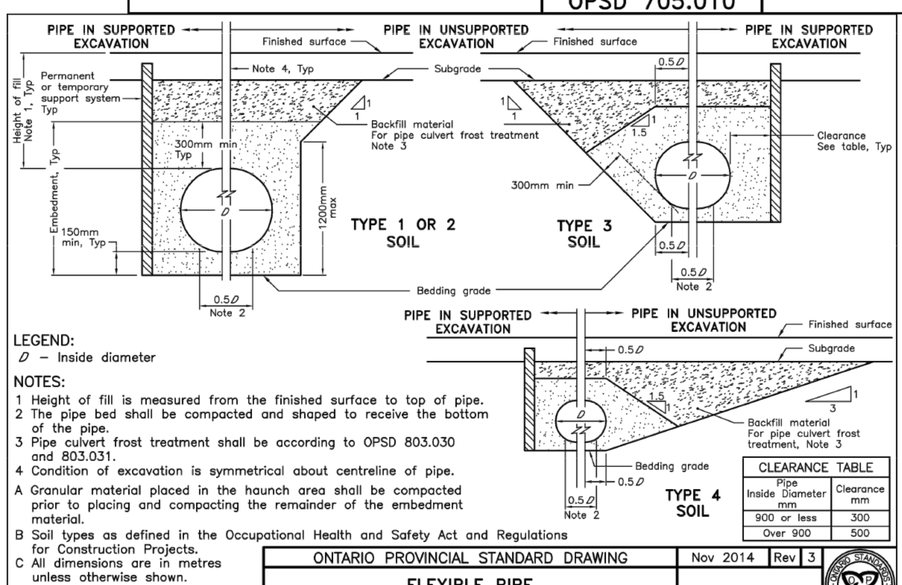
Opening Dimensions				
Grate Type	Slope	a	b	
B	2H:1V	670	52	
	3H:1V	632	71	
	4H:1V	618	78	
	HOR	600	87	

Alternate Standard Heights	
Alternate	Dimension
A	1980
B	1520
C	1380

Opening Dimensions				
Grate Type	Slope	a	b	c
C	2H:1V	1341	66	1473
	3H:1V	1265	104	1473
	4H:1V	1237	118	1473
B	6H:1V	1216	65	1346
	HOR	1200	73	1346

NOTES:
1 Outlet hole size 525mm max diameter.
A Where inlet is placed across ditch and is accessible to vehicular traffic, grating slope shall be 6H:1V or flatter.
B Center reinforcing in wall and base slab ±25mm.
C Lap riser horizontal wires 300mm. Laps shall be placed at corners.
D Granular backfill shall be placed to a minimum thickness of 300mm all around the ditch inlet.
E Grating shall be according to OPSD 403.010.
F Pipe support shall be according to OPSD 708.020.
G All dimensions are nominal.
H All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 4
PRECAST CONCRETE DITCH INLETS 600 x 1200mm		OPSD 705.040



LEGEND:
D – Inside diameter

NOTES:
1 Height of fill is measured from the finished surface to top of pipe.
2 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
3 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
4 Condition of excavation is symmetrical about centreline of pipe.
A Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embedment material.
B Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
C All dimensions are in metres unless otherwise shown.

CLEARANCE TABLE	
Pipe Inside Diameter mm	Clearance mm
900 or less	300
Over 900	500

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 3
FLEXIBLE PIPE EMBEDMENT AND BACKFILL EARTH EXCAVATION		OPSD 802.010

LEGEND:
OD – Outside diameter of pipe

NOTES:
A This OPSD to be read in conjunction with OPSD 3940.150.
B If a steel grate is required, refer to OPSD 804.05.
C Class of concrete: 30MPa.
D Cover to reinforcing bars 70mm ± 20mm.
E All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2017	Rev 2
CONCRETE HEADWALL FOR PIPE LESS THAN 900mm DIAMETER		OPSD 804.030

SITE PLAN FOR:

PROPOSED SELF STORAGE COMPLEX
752065 IDA STREET
PART OF LOT 237, CONCESSION 2
SOUTHWEST OF THE TORONTO AND SYDENHAM ROAD
GEOGRAPHIC TOWNSHIP OF PROTON
TOWNSHIP OF SOUTHGATE
COUNTY OF GREY

NO.	REVISION	BY	DATE
0	ISSUE FOR 1ST SUBMISSION (SPA)	BP	04/28/25

DRAWING REVISION SCHEDULE

PROJECT No. 31489-22

CAUTION:
- THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED FOR TRANSACTION OR MORTGAGE PURPOSES
- THIS SKETCH IS PROTECTED BY COPYRIGHT

DETAILS AND NOTES

SHEET 3 OF 5

PREPARED FOR:
BRAD WESLEY HOLDINGS LTD.

Van Harten SURVEYING INC.
LAND SURVEYORS and ENGINEERS
Kitchener/Waterloo Ph: 519-742-8371
Guelph Ph: 519-821-2763
Orangeville Ph: 519-940-4110
www.vanharten.com info@vanharten.com

DRAWN BY: BH | DESIGN BY: BH/BP | CHECKED BY: BP

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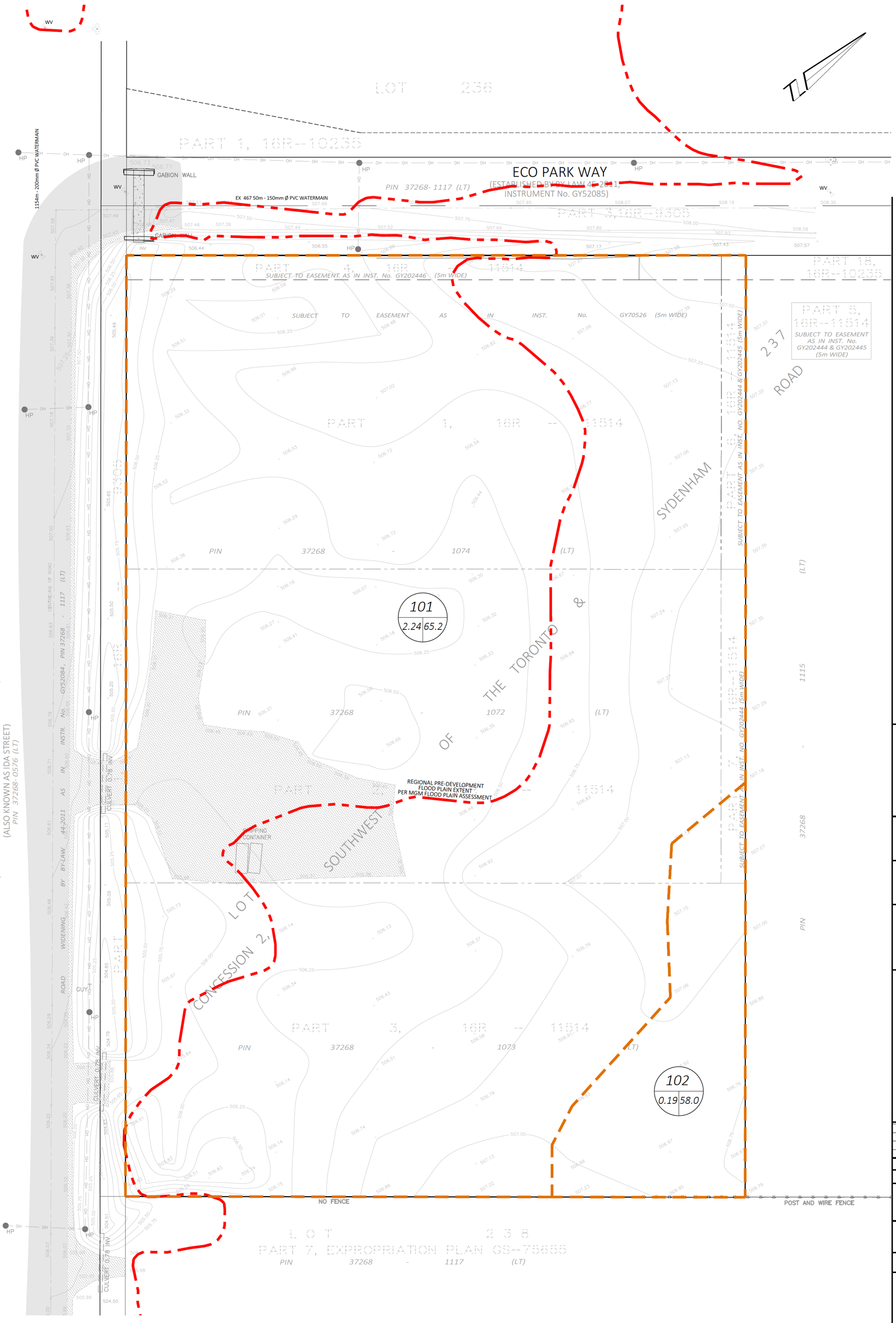

CALL BEFORE YOU DIG

THE LOCATION OF SERVICES ON THIS DRAWING ARE ONLY APPROXIMATE AND BASED ON SURFACE FEATURES LOCATED AT THE TIME OF THE TOPOGRAPHIC SURVEY. PRIOR TO ANY CONSTRUCTION IT IS THE RESPONSIBILITY OF THE CONTRACTOR/BUILDER TO ENSURE THE EXACT LOCATION OF ALL UTILITIES.

BEARING AND COORDINATE NOTE:

1. BEARINGS ARE GRID BEARINGS AND ARE DERIVED FROM GPS OBSERVATIONS AND ARE REFERRED TO THE UTM PROJECTION, ZONE 17, NAD 83 (CSRS-2010) ADJUSTMENT.
2. DISTANCES SHOWN ON THIS PLAN ARE ADJUSTED GROUND DISTANCES AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY AN AVERAGED COMBINED SCALE FACTOR OF 0.999560

METRIC:

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0 3048.

TOPOGRAPHIC SURVEY DATE:

THIS TOPOGRAPHIC SURVEY WAS COMPLETED ON THE 7th DAY OF SEPTEMBER, 2022

BENCHMARK:

ELEVATIONS ARE BASED ON GPS OBSERVATIONS FROM PERMANENT REFERENCE STATIONS IN THE NAD83 (CSRS-2010) COORDINATE SYSTEM, WITH HEIGHTS CONVERTED TO ORTHOMETRIC ELEVATIONS ON THE CVGD28 DATUM (1978 ADJUSTMENT) WITH GEOID MODEL HTV2 0, AS SUPPLIED BY NATURAL RESOURCES CANADA.

SITE PLAN FOR:

PROPOSED SELF STORAGE COMPLEX
752065 IDA STREET
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NO.	REVISION	BY	DATE
0	ISSUE FOR 1ST SUBMISSION (SPA)	BP	04/28/25

DRAWING REVISION SCHEDULE

PROJECT No. 31489-22

DRAWING SCALE: 1:400

0 5 10 20 metres

VAN HARTEN SURVEYING INC.

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PRE-DEVELOPMENT DRAINAGE PLAN

SHEET 4 OF 5

PROFESSIONAL LICENCE [redacted] 100583029 APR. 28, 2025 PROVINCE OF ONTARIO

PREPARED FOR:

BRAD WESLEY HOLDINGS LTD.

Van Harten SURVEYING INC.
LAND SURVEYORS and ENGINEERS

Kitchener/Waterloo	Guelph	Orangeville
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www.vanharten.com info@vanharten.com

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BH	BH/BP	BP

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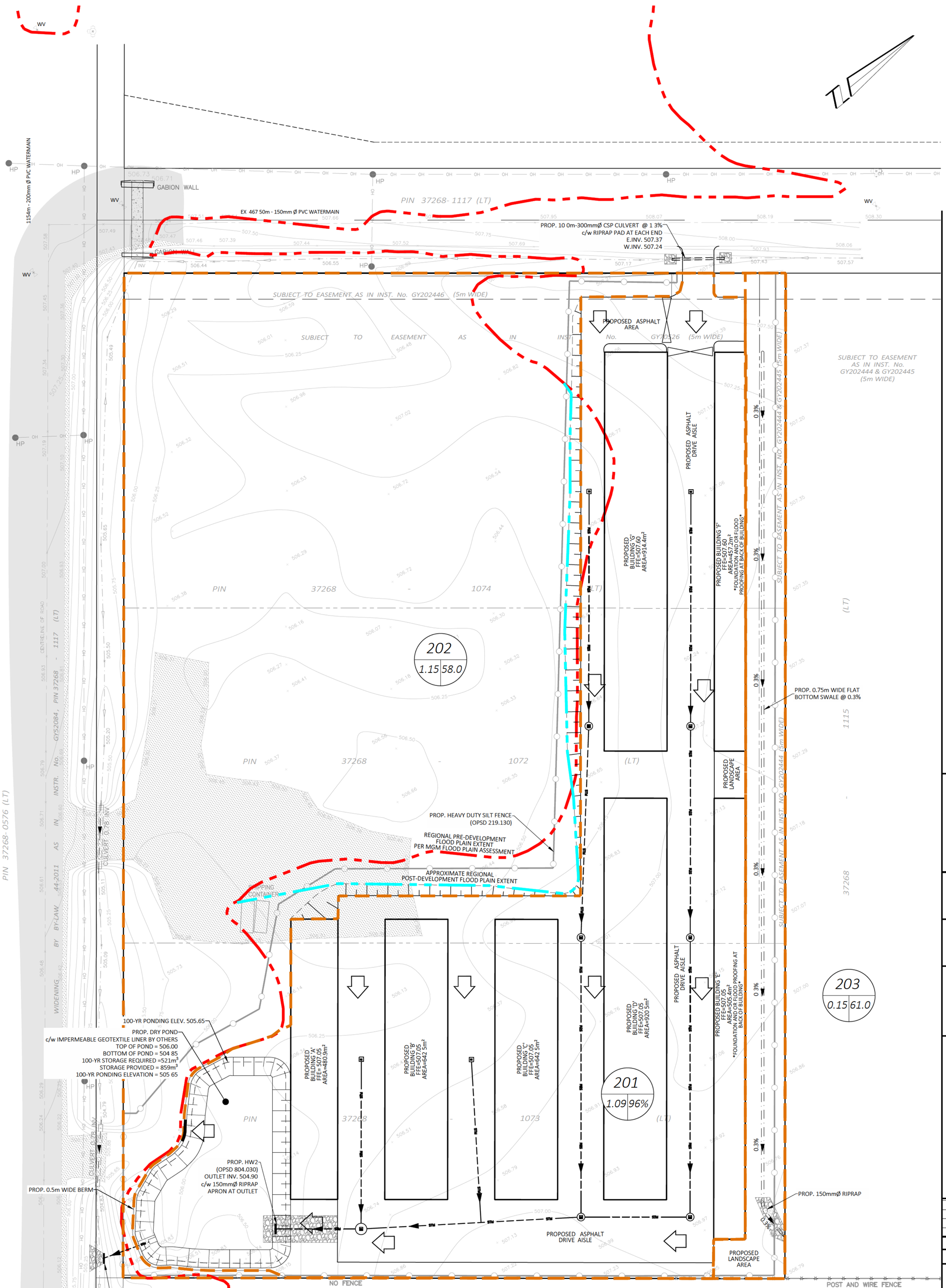

1.00 | 50% AREA (HA) | PERCENT IMPERVIOUS/CURVE NUMBER

REGIONAL PRE-DEVELOPMENT FLOODPLAIN EXTENT

REGIONAL POST-DEVELOPMENT FLOODPLAIN EXTENT

POST-DEVELOPMENT CATCHMENT LIMIT

CALL BEFORE YOU DIG

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NO.	REVISION	BY	DATE
0	ISSUE FOR 1ST SUBMISSION (SPA)	BP	04/28/25

DRAWING REVISION SCHEDULE

PROJECT No. 31489-22

DRAWING SCALE: 1:400

0 5 10 20 metres

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POST-DEVELOPMENT DRAINAGE PLAN

SHEET 5 OF 5

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