



STORMWATER MANAGEMENT REPORT

Elite Developments

Type of Document:

Final Report

Project Name:

Smithville, West Lincoln

Project Number:

ALL-22020295-A0

Prepared and Reviewed By:

Steve Chulmin Park, P.Eng. and Preetinder Kaur

EXP

220 Commerce Valley Drive West, Suite 110

Markham, ON, L3T 0A8

t: +1.905.695.3217

f: +1.289.695.2411

Approved By:

Steve Chulmin Park

Date + Time Submitted:

2024-09-17

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1. Introduction

EXP Services Inc. has been retained by Elite Developments (“Owner”) to prepare a Stormwater Management (SWM) Report (“report”) in support of an application for Draft Plan of Subdivision (DPA) for the post development (“Site”) located on the northwest side of Smithville in the Township of West Lincoln.

The subject site is approximately 4.0 ha in area and is located on the northeast corner of the South Grimsby Road Six and West Street (Regional Road 20) intersection. The site is currently unoccupied with various treed and vegetated areas. The site is bound by Regional Road 20 (West Street) to the south, CP railways to the north, and vacant lands to the east and west. Finally, the site consists of an existing private drainage feature (“drainage feature”) on site which conveys flow in the southwesterly direction towards neighbouring property to the west and is all regulated by the Niagara Peninsula Conservation Authority (NPCA). Refer to Figure 1 for the Location Plan.

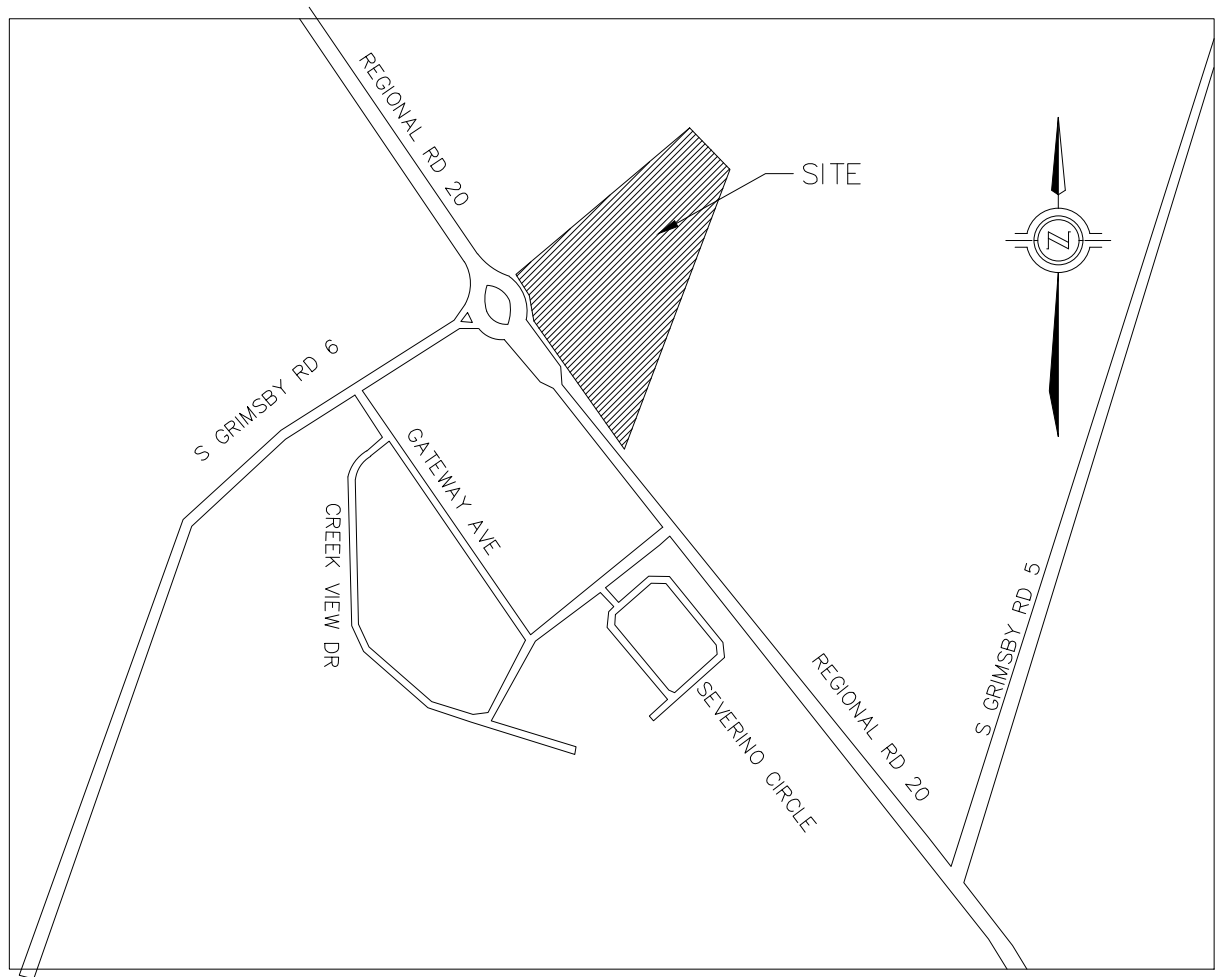
This report is intended to provide the proposed SWM strategy for the site while demonstrating conformance to Town of West Lincoln standards and no negative impact to neighbouring properties from the proposed development.

2. Site Description and Proposed Development

The proposed development includes a network of subdivision roads to facilitate the development of the internal blocks into various townhouse blocks and condo buildings. The proposed development is shown on the Owner’s Development Concept where development can be summarized as follows:

Phase 1	Parcel ‘A’ Townhouse units =	14
Phase 2	Parcel ‘B’ Townhouse units =	27
Phase 3	Parcel ‘B’ Condo Building units =	88
Phase 4	Parcel ‘B’ Condo Building units =	<u>88</u>
	Total =	217 units

Therefore, the proposed development concept shows a total of 217 units. The development includes associated surface parking and a single level underground parking structure, with landscaped areas and two access driveways from a future municipal road as shown in concept plan. Refer to the Site Plan prepared by Arsenault Architect Inc. in Appendix A for additional details.



Project: ELITE SMITHVILLE DEVELOPMENTS INC. WEST LINCOLN, ON			
Title: LOCATION PLAN			
Approved by:	S.P	Date:	AUG 2024
Project No.:	ALL-22020295-A0		
Drawn by:	P.K	Scale:	N.T.S.
Figure no.:	FIG-01		

3. Existing Drainage Conditions

3.1 Site Topography

To assess the existing site topography within and surrounding the site, EXP staff reviewed topographic survey information and City record drawings for the surrounding municipal roads. Some of the key characteristics of the existing topography can be summarized as follows;

- The existing elevation across the site generally falls in the southeasterly direction;
- The southeast side of the site appears to be a high point plan (or drainage divide) and the grades falling in the range of approximately 3 m in the northwest and southeast directions;
- Approx. 240 m long conveying flow through an existing private drainage feature on site from an existing culvert under CN Railways (Toronto-Hamilton-Buffalo Railways) in the southwesterly direction draining into neighbouring lands on the west side of the property; and
- A karst feature (sinkhole) located on neighbouring property along the west side of the property boundary near the existing drainage feature.

The existing drainage feature in the middle of the site is regulated by the NPCA for various hazards including a Regional Floodline where NPCA records show the theoretical floodline encroaching various portions of the site. Once a topographic survey was completed for the site, based on the NPCA records, a conservative theoretical floodline elevation of 191.00 was transposed across the site using three-dimensional (3D) software (Civil3D) to complete preliminary flood storage calculations to set boundary conditions for the preliminary grading design. The preliminary 3D flood storage calculations showed a theoretical flood volume of approx. of 3,435 m³ across the site which is to be maintained in the proposed grading design. For additional details regarding the existing site topography, refer to the topographic survey (prepared by A.T. McLaren Limited dated July 22, 2022) included in Appendix A for reference.

3.2 Existing Municipal Storm Sewers

Available record drawings from the Niagara Region show the following existing municipal storm sewers surrounding the site:

- Existing 450-600 mm diameter storm sewers along north side of West Street draining towards easterly direction;
- Existing 750 mm diameter storm sewer culvert located at the southeast corner of the property on West Street draining towards southerly direction under West Street (Highway 20); and,
- Existing 825mm diameter storm sewers along south side of West Street draining towards easterly direction.

The existing record drawings show that the drainage from the south side of the site, are conveyed through the municipal sewer system on West Street. For the record drawing information refer to Appendix A.

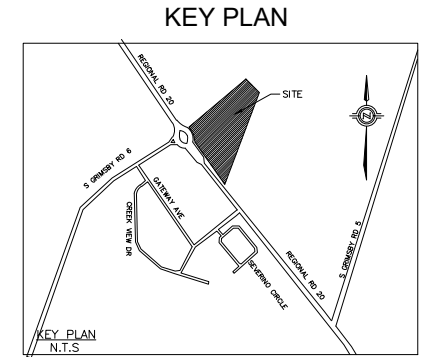
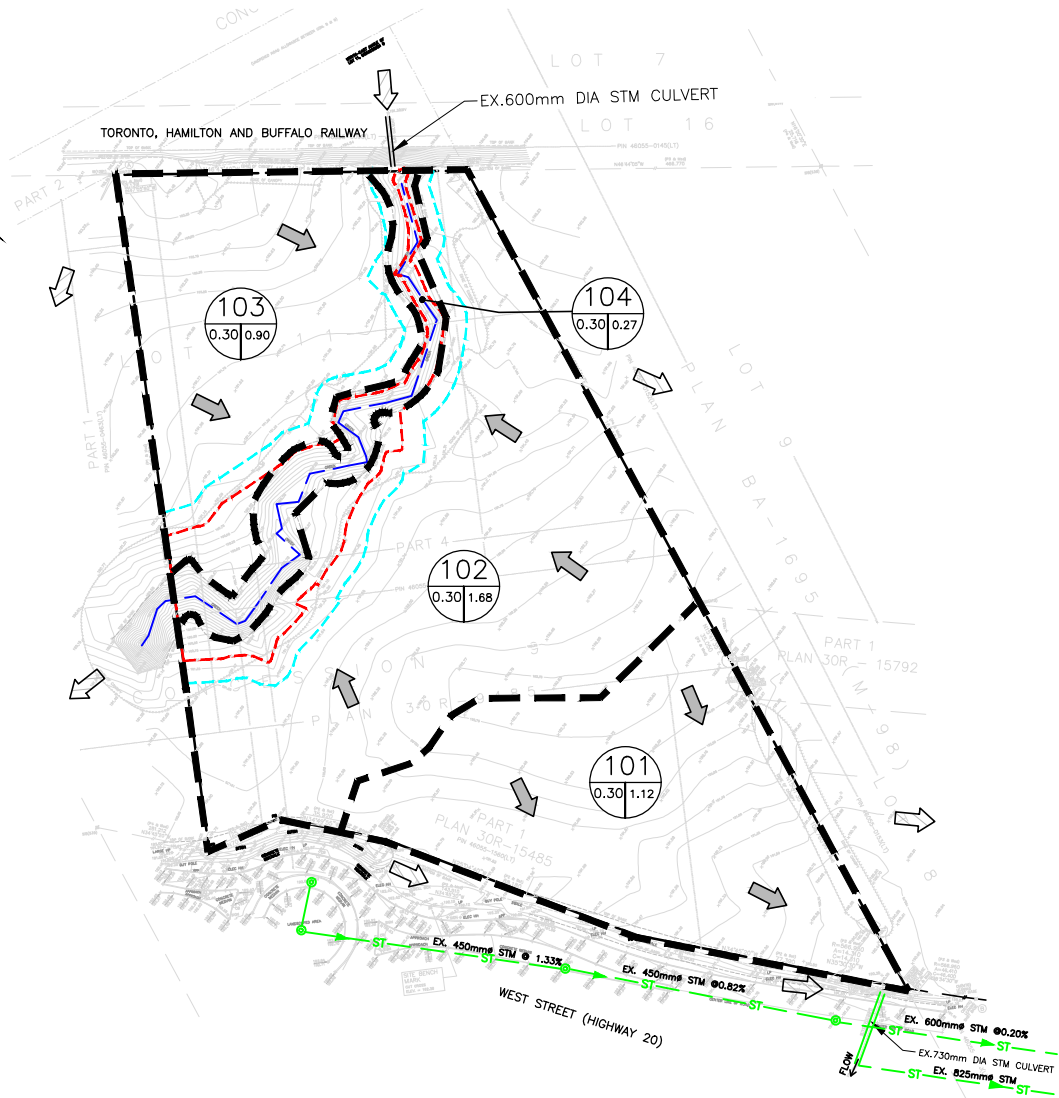
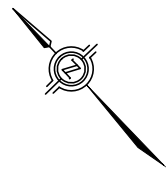
3.3 Existing Conditions Peak Flows

To simulate the existing drainage conditions, EXP staff created a digital model (Visual OTTHYMO Version 6.2) using the design parameters outlined within the Township of West Lincoln. The resultant peak flows for all storm events are summarized in Table 1 below:

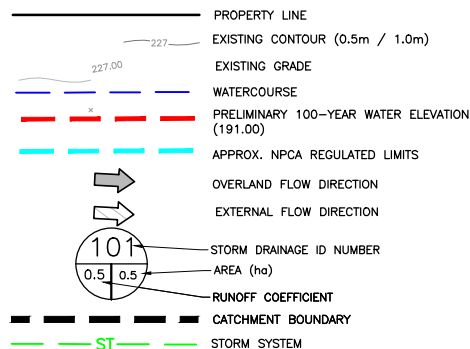
Table 1: Peak Flow Summary (Existing Conditions)

Outlet Location	Catchment Area ID#	Area (ha)	Runoff Coefficient	Peak Flow (L/sec)	
				5-Year	100-Year
Southeast Culvert	101	1.12	0.3	44	167
Sub-Total=		1.12	0.3	44	167
Private Drainage Feature	102	1.68	0.3	65	246
	103	0.90	0.3	41	157
	104	0.27	0.3	13	51
Sub-Total =		2.85	0.3	119	454
Total=		3.97	0.3	163	621

Based on the existing topography and the high point drainage divide along the south of the site, majority of the site drains into an existing drainage feature via sheet flow. The south drainage drains to an existing 750 mm diameter culvert on the southeast corner of the property on West Street. Therefore, the above results showed the 5-year peak flows to be 119 L/s for the outlet to the drainage feature and 44 L/s for the outlet to the southeast culvert, which is to be used as the maximum allowable release rates for the site. For details regarding the Existing Drainage Conditions Plan refer to Figure 2. The Visual OTTHYMO modelling and peak flow runoff calculations (including additional storm events) can be found in Appendix B.



LEGEND



Project:

ELITE SMITHVILLE DEVELOPMENTS INC.
WEST LINCOLN, ON

Title:

EXISTING CONDITIONS DRAINAGE PLAN

Approved by:

S.P

Date:

SEP 2024

Project No.:

ALL-22020295-A0

Drawn by:

P.K

Scale:

1:2500

Figure no.:

FIG-02

4. Proposed Drainage Conditions

4.1 Proposed Grading

The proposed preliminary grading design for the site was completed in concert with the proposed stormwater management strategy for the site which included various pre-consultations with Town of West Lincoln staff. After meeting with City staff, it was confirmed in principle that the frequent storm runoff will be redirected from the drainage feature to the existing storm sewer system on West Street located at the south of the site while the major overland flow drains to the existing drainage feature. Some of the key features of the preliminary grading design can be summarized as follows:

- Meeting the existing elevations at perimeter property lines surrounding the site;
- Meeting the existing elevations along the ecological limit and flood storage areas within the NPCA regulated areas;
- Providing 3:1 slopes and a retaining wall (maximum height = approx. 1.2 m) along the north development blocks (Parcel 'A') adjacent to the municipal drain and/or environmental areas to match existing grades along the ecological limit;
- Various lot grading drainage designs including split draining lots along the east side of the site;
- Meeting existing road elevations at proposed road connection points to West Street and Thrive subdivision on the east side of property;
- Providing temporary retaining walls (maximum height = approx. 1.4 m) adjacent to single detached lots within Thrive subdivision on the east side of property (pending grading permission from the subdivision developer);
- Providing a retaining wall (maximum height = approx. 0.5 m) on the west side of property along Highway 20;
- Providing a retaining wall (maximum height = approx. 2.1 m) adjacent to the existing school property on the south east side of property; and,
- Major overland flow directed towards existing drainage feature in the northeast side of the site and towards existing culvert on southwest corner of the site.

For additional grading details refer to the Preliminary Grading Plan Drawing SG-1.

4.2 Background Information and Methodology

Some of the key documents that were referenced for completing the SWM design for the site can be summarized as follows:

- Township of West Lincoln Municipal Engineering Standards, dated September 2022;
- Niagara Peninsula Conservation Authority (NPCA) Stormwater Management Guidelines (2022);
- Niagara Peninsula Conservation Authority (NPCA) Flood Plain Mapping;
- Ministry of Environment, Conservation and Parks - Stormwater Management Planning and Design Manual (2003); and
- Erosion and Sediment Control Guidelines for Urban Construction – Toronto and Region Conservation Authority (2006).

To design the proposed SWM facilities to meet the above requirements, the Visual Otthymo software (Version 6.2) was used to calculate the post development runoff and SWM storage requirements.

4.3 Proposed Conditions Peak Flows

Based on the proposed grading and servicing design for the site, the drainage areas were reviewed to assess the runoff coefficients for each catchment. The corresponding drainage areas and runoff coefficients are shown on the Proposed Conditions Drainage Plan on Figure 3.

The proposed drainage from the development area is generally divided into two main sewer systems: Southwest (0.88ha) discharging into an existing 450mm dia municipal sewer on West Street and Southeast (1.46 ha) discharging into the existing 750mm dia culvert along West Street on southeast corner of the site. Finally, along the north side of the site, there is some uncontrolled flow (1.63 ha) that will discharge to the existing drainage feature of the subject site.

The results of the proposed conditions modelling without any SWM controls are summarized in Table 3 below:

Table 3: Peak Flow Summary (Proposed Conditions– No SWM Controls)

Outlet	Catchment ID No.	Area (ha)	Runoff Coefficient	Peak Flow (L/sec)	
				5-Year	100-Year
Southeast Culvert	201A	0.61	0.70	85	269
	201B	0.85	0.70	115	370
Sub-Total=		1.46	0.70	200	639
Southwest Sewer System	202	0.29	0.70	34	117
	203	0.38	0.90	103	253
	204	0.12	0.30	6	22
Sub-Total =		0.67	0.74	143	392
Private Drainage Feature	301	0.90	0.30	41	157
	302	0.27	0.30	13	51
	303	0.55	0.30	26	100
Sub-Total =		1.84	0.30	80	308
Total=		3.97	0.53	423	1,339

For details regarding the Proposed Drainage Conditions Plan refer to Figure 3. The Visual OTTHYMO modelling and peak flow runoff calculations can be found in Appendix C.



CATCHMENT 204:
ALL STORM EVENTS UPTO AND INCLUDING 1:100
YEAR ARE CONTROLLED AND DISCHARGES TO
MUNICIPAL SEWER ON WEST STREET

-
- PROPERTY LINE
- EXISTING CONTOUR (0.5m / 1.0m)
- EXISTING GRADE
- WATERCOURSE
- PRELIMINARY 100-YEAR WATER ELEVATION (191.00)
- APPROX. NPCA REGULATED LIMITS
- ECOLOGICAL LIMIT
- OVERLAND FLOW DIRECTION
- EXTERNAL FLOW DIRECTION
- STORM DRAINAGE ID NUMBER
- AREA (ha)
- RUNOFF COEFFICIENT
- CATCHMENT BOUNDARY
- STORM SYSTEM

ELITE SMITHVILLE DEVELOPMENTS INC.
WEST LINCOLN, ON

PROPOSED CONDITIONS DRAINAGE PLAN

C.P

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FIG-03

4.4 Proposed SWM Quantity Controls

In order to determine the required SWM quantity controls for the site, EXP staff carefully reviewed the Niagara Region's record drawings which established the discharge rates into the municipal storm system. Based on the required allowable release rates for each outlet, SWM quantity controls are to be designed to attenuate flows from the post development runoff for all storm events up to and including the 100-year storm to the maximum release rate equivalent to the 5-year storm runoff for the following catchment areas:

Southeast municipal sewer system (Municipal Culvert)

To calculate the existing storm flows that tributary to existing 750 mm diameter municipal culvert on West Street, the following calculations were made:

Site area contribution to sewer (A) = 0.90 ha
Run off coefficient (C) = 0.30
Time of Concentration (Tc) = 10 min

Niagara Region's 5-year Intensity (I) Formula: $I = A*(T_c^B)$
Where I = Rainfall intensity in mm/hour
Tc = time of concentration in hours
A = 29.7, B = -0.699

Therefore: Intensity (I) = $29.7*((10/60)^{-0.699})$
= 103.92 mm/hr

Rational Method Formula: $Q = 2.78*C*I*A$
Therefore: $Q = 2.78*0.3*103.92*0.90$
= **78.0 L/s**

Southwest municipal sewer system (Municipal Sewer)

To calculate the existing storm flows that tributary to existing 450 mm diameter municipal sewer on West Street, the following calculations were made:

Site area contribution to sewer (A) = 0.37 ha (estimated from total 1.11 ha tributary area)
Run off coefficient (C) = 0.30
Time of Concentration (Tc) = 10 min

Niagara Region's 5-year Intensity (I) Formula: $I = A*(T_c^B)$
Where I = Rainfall intensity in mm/hour
Tc = time of concentration in hours
A = 29.7, B = -0.699

Therefore: Intensity (I) = $29.7*((10/60)^{-0.699})$
= 103.92 mm/hr

Rational Method Formula: $Q = 2.78*C*I*A$
Therefore: $Q = 2.78*0.3*102.92*0.37$
= **32.1 L/s**

EXP staff then moved forward to develop the proposed stormwater management (SWM) quantity controls for the site which can be summarized as follows:

- Maximum allowable storm release rate to existing 450 mm sewer on the West Street is 32.1 L/s and to existing 750 mm culvert on southeast corner of site is 78.0 L/s;
- Both major and minor flows from Catchment #201 (1.46 ha) are to be controlled and discharged to municipal culvert on West Street;
- Both major and minor flows from Catchment #202 (0.29 ha) are to be controlled and discharged to an existing municipal sewer on West Street;
- Minor flows from Catchment #203 (0.38 ha) are to be discharged to an existing municipal sewer on West Street, whereas major flows are directed towards the drainage feature;
- Ensure all post development flows from all storm events upto and including 100-year to the drainage feature are less than the existing condition flows;
- Provide an underground Superpipe system for Catchment #202 and a combination of underground Superpipe system and SWM cistern for Catchments #201A and #201B, while ensuring there isn't any spill to neighbouring properties for all storm events up to and including the 100-year storm; and,
- Ensure the site grading design provides an emergency overland flow towards the drainage feature in the northeast side of the site and towards existing culvert on southwest corner of the site.

As previously mentioned, in order to meet the maximum allowable release rate for the site, the proposed storm servicing design incorporated the use of four orifice controls: 75 mm diameter (Catchment #201A), 125 mm diameter (Catchment #201B), 75 mm diameter (Catchment #202) and 100 mm diameter (Catchment #203). The orifice controls are positioned upstream of the proposed SWM quality controls (Oil Grit Separator) prior to connecting to the existing municipal storm sewer systems at each outlet point. The resultant peak flows under post-development conditions with the implementation of the proposed SWM controls can be summarized in Table 3 below:

Table 3: Peak Flow Summary (Proposed Conditions – with SWM Controls)

Outlet	Catchment ID No.	Area (ha)	Runoff Coefficient	Allowable release rate (L/s)	Peak Flow (L/sec)		Storage Required (m ³)	Storage Provided (m ³)
					5-Year	100-Year		
Southeast Culvert	201A	0.61	0.70	78	11	17	356	362
	201B	0.85	0.70		34	61	405	572
Sub-Total=		1.46	0.70	78	45	78	761	934
Southwest Sewer System	202 & 203** & 204	0.79	0.74	32.1	23	32	370	387
Sub-Total =		0.67	0.74	32.1	23	32	370	387
Private Drainage Feature	203**	0.38	0.90	454	0	150	-	-
	301*	0.90	0.30		41	157	-	-
	302*	0.27	0.30		13	51	-	-
	303*	0.55	0.30		25	96	-	-
Sub-Total =		1.72	0.30	454	79	454	-	-
Total=		3.97	0.53	564.1	147	564	1,131	1,321

* Uncontrolled Catchments

*** All storm events upto and including 5-year are captured in the southwest storm sewer system and all storm events beyond 5-year including 100-Year are discharged uncontrolled to the drainage feature*

Overall, the actual release rates of the proposed SWM quantity controls can meet the maximum allowable release rates for the site before connecting to the municipal storm systems. For details regarding the Proposed Drainage Conditions Plan refer to Figure 3. The Visual OTTHYMO modelling and peak flow runoff calculations (including additional storm events) can be found in Appendix C.

4.5 Proposed SWM Quality Controls

The Town of west Lincoln requires the long-term average removal of 80% total suspended solids (TSS) on an annual loading basis from all runoffs leaving the proposed development site based on the post development level of imperviousness. This requirement for the long-term removal average of 80% TSS is consistent with the “Enhanced Protection” levels recommended in MECP SWM Planning and Design Manual. After review of the owner’s site development, it was determined that an oil and grit separator (OGS) would be implemented downstream of orifice controls to treat storm flow prior to being outlet to the storm sewer. Detailed OGS specifications will be decided at detailed design stage.

4.6 Water Balance

The use of Low Impact Development (LID) measures in Stormwater Management Design are encouraged in Town of West Lincoln. The use of LID measures such as bioswales or rainwater harvesting shall be based on best management practices (BMP). As recommended in EXP’s Preliminary Geotechnical and Hydrogeological Assessment, any proposed LID measures are to be supported with monitored groundwater elevation data and in-situ percolation testing to be successful. Therefore, water balance objectives can be met through the future detailed design process by incorporating some of the following measures:

- A bottomless Superpipe system as part of the municipal storm system within the future public road right-of-way to promote infiltration;
- A site plan design that promotes trees and planting beds that mitigate runoff and promote infiltration;
- LID style swales with shallow slopes finished with low maintenance landscaping; and,
- Roof drainage and foundation drainage (sump pumps) splashing to grade, directed to landscaped areas for natural infiltration.

4.7 SWM Facility Operations & Maintenance Recommendations

As the proposed SWM facility will be owned, maintained, and monitored by the Owner, it is recommended that continuous inspection and maintenance be provided to ensure that the required capacity and effectiveness of the SWM facility is maintained. The following recommendations are best management practices (BMPs) taken from the MECP SWM Planning and Design Manual, which are all to be considered through the detailed design of the SWM facility:

- The proposed superpipes shall be inspected after every significant storm, during first two years of operation, to ensure proper functioning of the facility;

- The proposed oil and grit separator (OGS) shall be monitored on an annual basis according to the manufacturer's specifications where sediment removal requirements shall be included in the overall SWM maintenance program;
- The SWM facility maintenance program should include the provision for the sediment at a frequency calculated using the MECP Stormwater Management Planning and Design Manual;
- Any placement or spreading of sediment within the SWM facility block for drying purposes is not recommended due to possible odour concerns; and,
- The immediate removal of sediment through trucking or hydraulic (vacuum truck) method is recommended, where the provision for sediment material testing be included in the maintenance program to ensure sediment disposal meets MECP guidelines.

5. Erosion and Sediment Controls during Construction

During construction it is imperative that the contractor installs and maintains all the necessary erosion and sediment control (ESC) measures to ensure there is no negative impact to surrounding properties and the local municipal sewer systems.

Outside the site, sediment control measures such as catchbasin silt sacks are to be installed inside the existing catchbasins along West Street immediately adjacent to the site. These silt sacks are to be monitored and maintained after all rainfall events.

Within the site, silt fencing is required to be installed around the perimeter of the site especially along the drainage feature in the middle to ensure during grading and building activity, the sediment is not transported overland during a rainfall event to neighbouring properties and the drainage feature. Similar to the required silt sacks within the catchbasins along West Street, the silt fence is to be monitored after every rainfall event and repaired as necessary. Mud tracking from construction truck transport is to be mitigated through the use of mud mats and any other maintenance requirements necessary by the contractor before driving back on existing municipal roads.

Additional ESC measures not mentioned may be required through the development of the detailed design for the site and the permitting process through the Town of West Lincoln.

6. Conclusions

In summary, based on the findings in this report the proposed SWM strategy can meet the requirements of the Town of West Lincoln drainage criteria and NPCA standards, where the results can be summarized as follows:

- Topographic information and site visits completed by EXP staff confirm that the existing drainage patterns show overland flow towards the existing private drainage feature on site, and municipal culvert at West Street
- Based on the Niagara Region's record drawings, maximum allowable release rates of 78.0 L/s for existing 750 mm diameter municipal culvert at the southeast corner of the site and 32.1 L/s for existing 450mm diameter municipal storm sewer on West Street have been established for the site
- Based on the proposed grading and servicing design for the site, the total drainage area of 2.25 ha will be controlled within the use of underground Superpipe system and SWM Cistern to allowable release rates established in the Niagara Region's record drawings
- The post development 100-year peak flow for the areas to be controlled is calculated to be 110.1 L/s, where orifice controls provide actual release rates of 32 L/s and 78 L/s resulted in required storage volumes of 370 m³ for both the public road and the north parcel (Parcel A), and 761m³ for the south parcel (Parcel B), where approximately total 1,321 m³ is provided in the design
- SWM quality controls and TSS removals can be provided through the use of oil and grit separator, before discharging flows to the municipal sewer system on West Street
- Water balance objectives can be achieved through the recommended LID measures, landscaping designs, and roof leaders and foundation drainage (sump pumps) splashing to grade for natural infiltration

Sincerely,
EXP Services Inc.

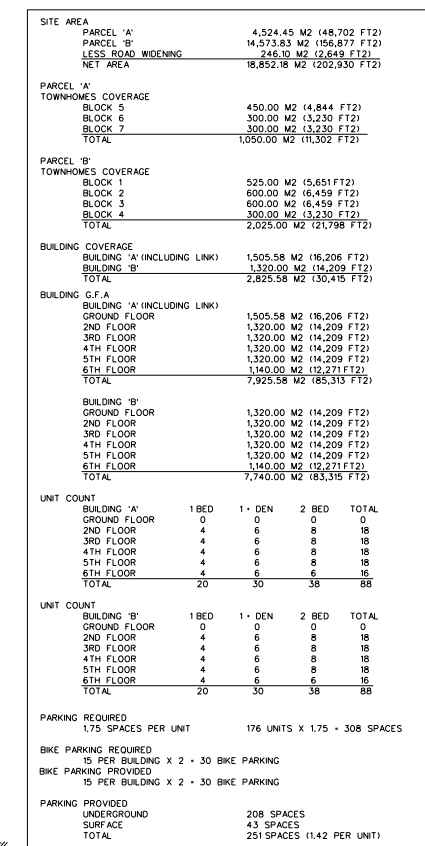


Steve Chulmin Park, P.Eng.
Project Manager, Land Development

A handwritten signature in black ink, appearing to read "P. Kaur".

Preetinder Kaur
Project Designer, Land Development

Appendix A – Site Plan, Topographic Survey, Background Information

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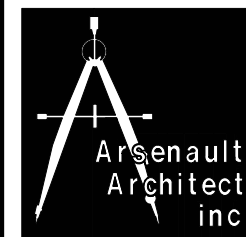
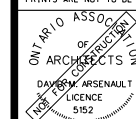
No	Date	Revisions
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CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS
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WORK.

ALL DRAWINGS, PRINTS AND SPECIFICATIONS ARE
THE PROPERTY OF THE ARCHITECT AND MUST BE
RETURNED TO HIM ON COMPLETION OF WORK.

LATEST APPROVED DRAWINGS ONLY TO BE USED FOR
CONSTRUCTION.

PRINTS ARE NOT TO BE SCALED.



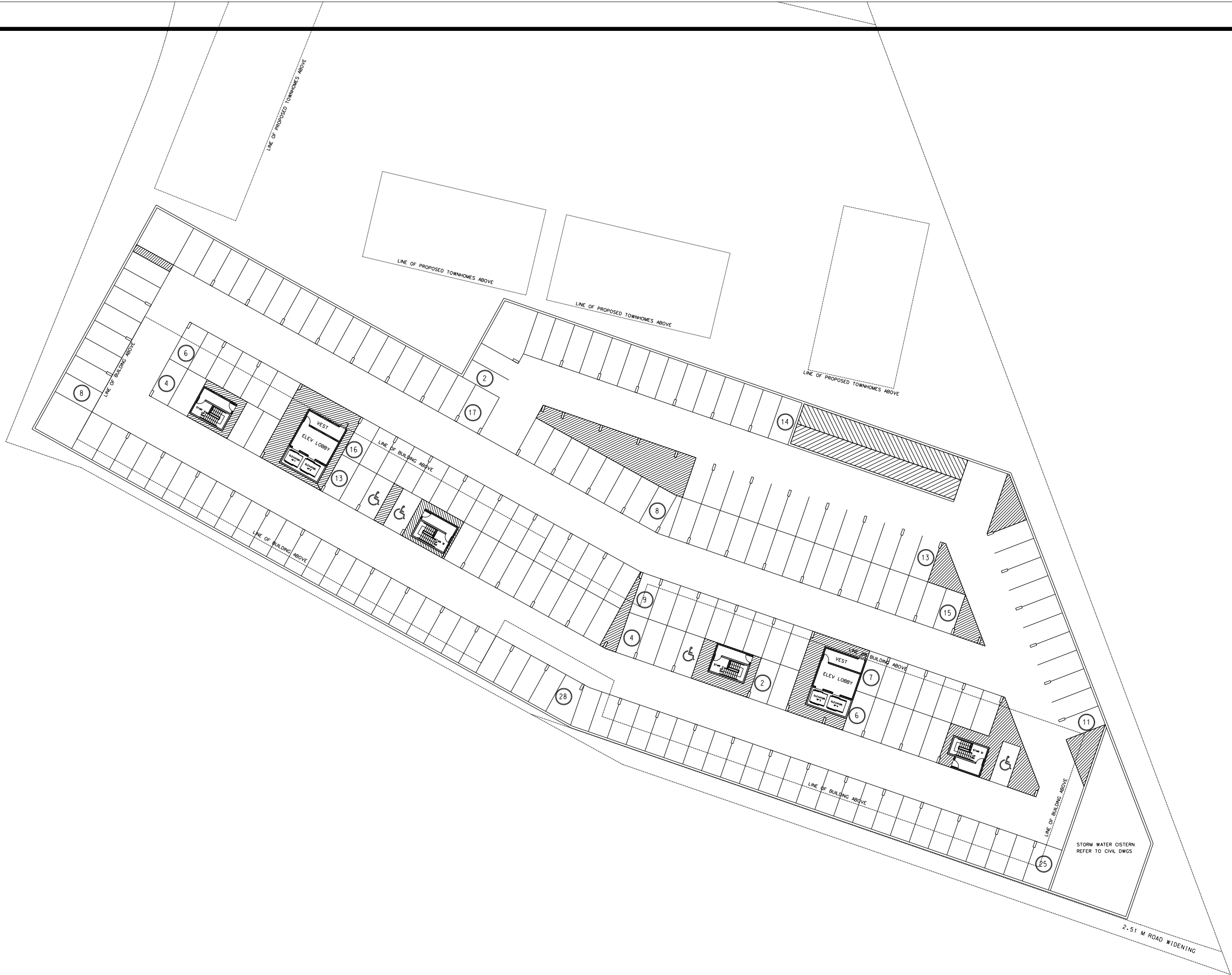
Tel (416).255.4378
Fax (416).255.4351

ARCHITECT	:	D. ARSENAULT
JOB CAPTAIN	:	D. ARSENAULT
DRAWN BY	:	
DATE OF PLOT	:	AUGUST 28 2024
SCALE	:	1 : 500
CLIENT'S NAME :	ELITE DEVELOPMENT	
102 - 3410 SOUTH SERVICE ROAD		
BURLINGTON, ONTARIO		
PROJECT NAME :	SMITHVILLE RESIDENTIAL DEVELOPMENT	

DRAWING TITLE :
CONTEXT PLAN

PROJECT NO. :	DRAWING NO. :
22-113	A-1

PATH NO. _____



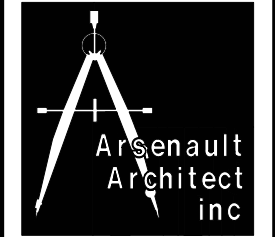
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DATE	ISSUED FOR

No	Date	Revisions

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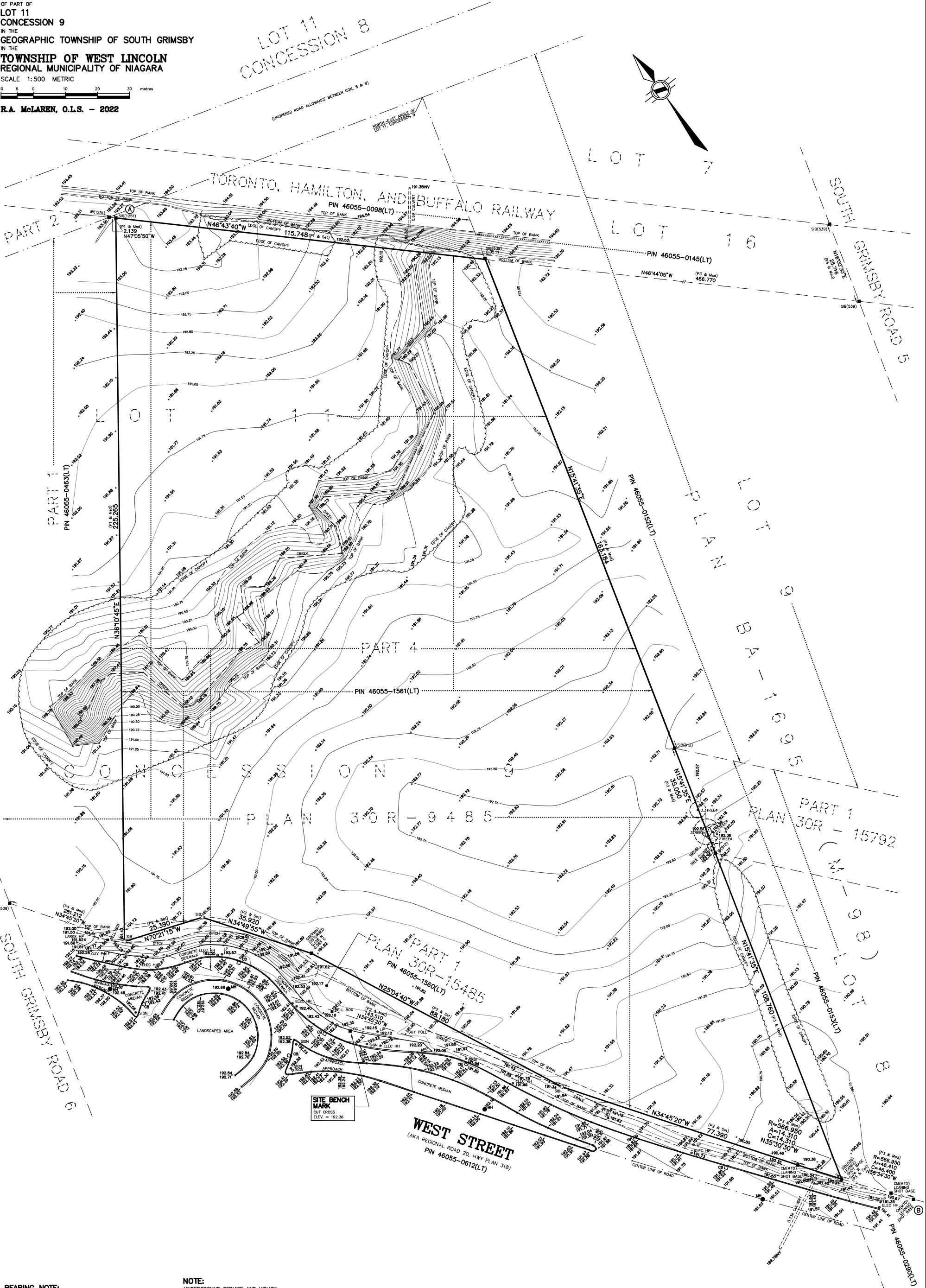
ARCHITECT	: D. ARSENAULT
JOB CAPTAIN	: D. ARSENAULT
DRAWN BY	:
DATE OF PLOT	: AUGUST 28 2024
SCALE	: 1 : 500
CLIENT'S NAME	: ELITE DEVELOPMENT 102 - 3410 SOUTH SERVICE ROAD BURLINGTON, ONTARIO
PROJECT NAME	: SMITHVILLE RESIDENTIAL DEVELOPMENT

DRAWING TITLE : UNDERGROUND PARKING

PROJECT NO.:	DRAWING NO.:
22-113	A-2

PATH NO.

PLAN OF SURVEY
OF PART OF
LOT 11
CONCESSION 9
IN THE
GEOGRAPHIC TOWNSHIP OF SOUTH GRIMSBY
IN THE
TOWNSHIP OF WEST LINCOLN
REGIONAL MUNICIPALITY OF NIAGARA
SCALE 1:500 METRIC
R.A. McLaren, O.L.S. - 2022



BEARING NOTE:
BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED
REFERENCE POINTS A AND B, BY REAL TIME NETWORK
OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0)

NOTE:
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY
MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99974824

INTEGRATION DATA

OBSERVED REFERENCE POINTS (ORP's): UTM ZONE 17, NAD83 (CSRS) (2010.0).		
POINT ID	NORTHING	EASTING
ORP A	4774273.854	617249.011
ORP B	4774273.854	617249.011

NOTE:
UNDERGROUND SERVICE AND UTILITY
LOCATIONS MUST BE VERIFIED PRIOR TO
CONSTRUCTION
INVERTS MUST BE VERIFIED PRIOR TO
CONSTRUCTION

BENCHMARK:
MONUMENT 00819708344

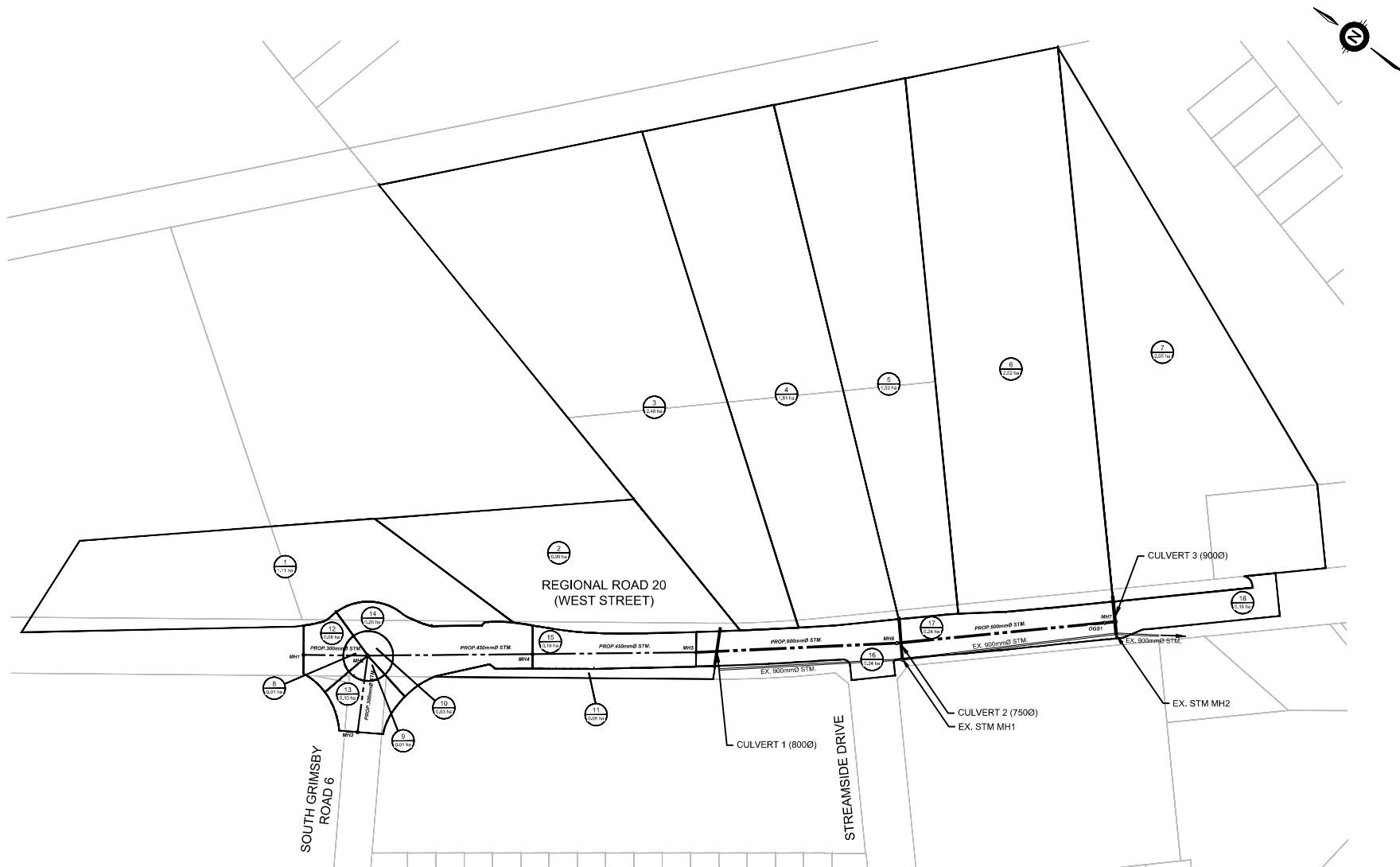
TWO STOREY RED BRICK HOUSE ON SOUTH SIDE OF
HWY 20, 2.7 KM EAST OF UNITED CHURCH IN THE
HAMLET OF SMITHVILLE, 33.5 M WEST OF PATTERSON
RD AND 43.0 M SOUTH OF CENTERLINE OF HWY 20.
TABLET IS SET HORIZONTALLY IN EAST FACE OF

LEGEND

- DENOTES MONUMENT SET
- MONUMENT FOUND
- IRON BAR
- STANDARD IRON BAR
- A.T. McLaren LTD
- KIRKUP MASCOE URE SURVEYING LTD.
- MINISTRY OF TRANSPORTATION ONTARIO
- REGIONAL MUNICIPALITY OF NIAGARA
- ERIC JOHNSON, O.L.S.
- A.A. CLARKE AND ASSOCIATES LTD.
- PLAN 30R-15485
- PLAN 30R-15485
- PLAN 30R-15792
- PLAN 30R-15792
- PLAN 30R-15792
- CATCH BASIN
- CATCH BASIN
- CATCH BASIN

METRIC NOTE:
DISTANCES AND COORDINATES
IN

SURVEYOR'S CERTIFICATE		A.T. McLaren Limited	
1. I CERTIFY THAT: 1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM. 2. THE SURVEY WAS COMPLETED ON THE 22ND DAY OF JULY, 2022		© R.A. McLaren, O.L.S. - 2022. NO PERSON MAY COPY, REPRODUCE, DISTRIBUTE OR ALTER THIS PLAN IN WHOLE OR IN PART WITHOUT THE WRITTEN PERMISSION OF R.A. McLaren, O.L.S.	
DATE		A.T. McLaren Limited 89 JOHN STREET SOUTH, SUITE 230 HAMILTON, ONTARIO, L8N 2B9 PHONE (905) 827-8559 FAX (905) 827-0032	
THIS PLAN OF SURVEY RELATES TO AOLS PLAN SUBMISSION FORM NUMBER 31160		Drawn J.M.	Checked R.M.
		Cross C.H.	Scale 1:500
		DW	DwgNo. 37048



NOTES/LEGEND

- THE POSITION OF POLE LINES, CONDUITS, WATERMANS, SEWER AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT INDICATED SHOWN ON THIS DRAWING. EXISTING AND NEW UTILITIES SHOWN ARE THE ACCORDING TO THE RECORD OF THE EXISTING LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.
- PROPERTY LINES WERE PLOTTED USING REGISTERED PLANS AND BARS LOCATED IN THE FIELD TO VERIFY THE ACCURACY OF THESE PROPERTY LINES. A LEGAL SURVEY SHOULD BE PERFORMED PRIOR TO CONSTRUCTION.
- ALL CONSTRUCTION MUST COMPLY WITH THE NIAGARA PENINSULA STANDARD CONTRACT DOCUMENT.
- CONTRACTOR TO SUPPLY AND INSTALL 1-2\"/>

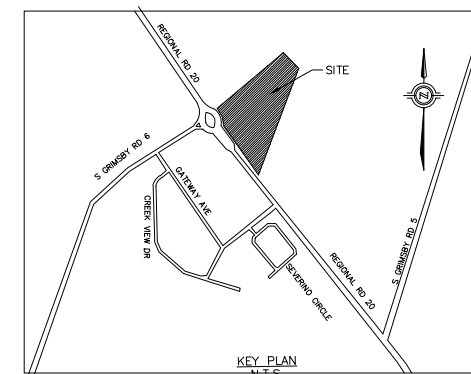
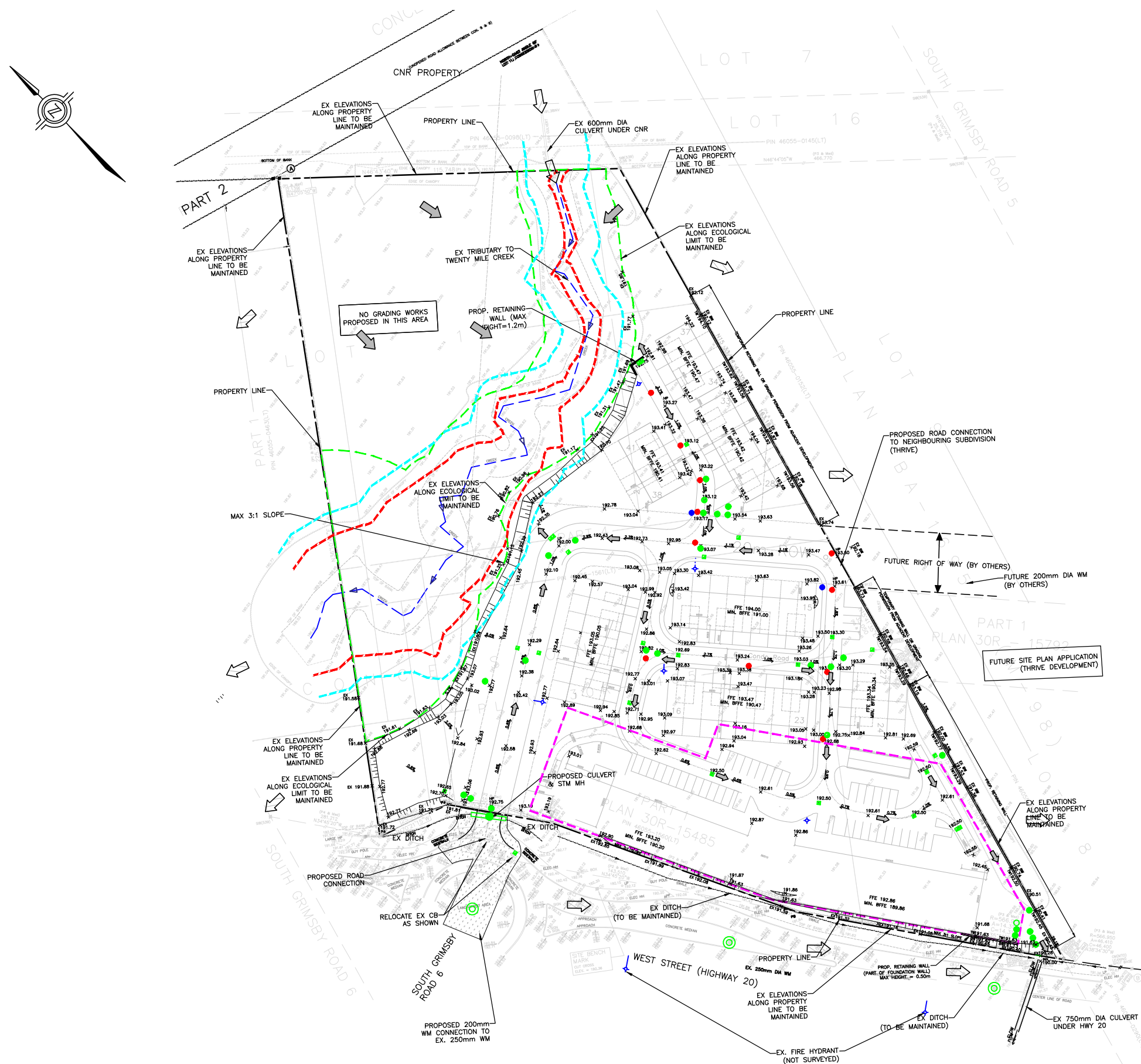
DRAFTING

PZ
CW
MM
MB



**ROAD RECONSTRUCTION
ON REGIONAL ROAD 20
BETWEEN SOUTH GRIMSBY RD 6 & TOWNLINE RD
IN THE TOWNSHIP OF WEST LINCOLN
PROPOSED CONDITION
STORM DRAINAGE PLAN - PHASE 1 (RURAL)**

CAD No.	20175171
DATE	APRIL 2019
SCALE	1:1000
REF. No.	2019-T-150
DWG No.	5171-G201
REV.	2



LEGEND:

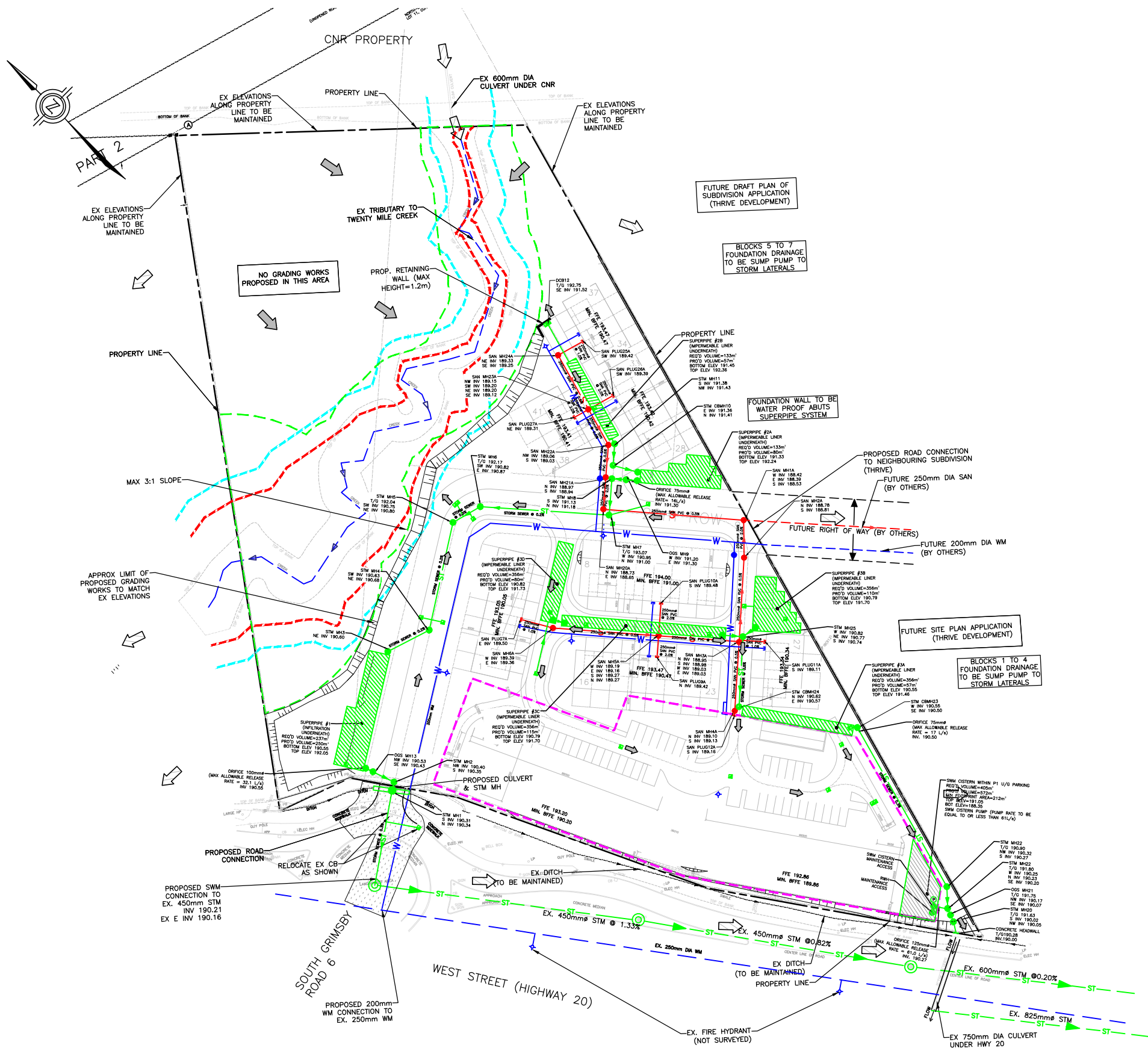
NOTE:

- BACKGROUND TOPOGRAPHIC INFORMATION PROVIDED BY AT. MCLAREN LIMITED DATED JULY 2022
- SITE PLAN CONCEPT PROVIDED BY WESTON CONSULTING
- NPCA REGULATED LIMITS DIGITED FROM NPCA INTERACTIVE MAPPING

	DRAWN BY	CHECKED BY
	P.K.	S.P.

PRELIMINARY GRADING PLAN

EAST OF REGIONAL ROAD 20
AND NORTHEAST OF GRIMSBY ROAD SIX
TOWNSHIP OF WEST LINCOLN



- LEGEND:**
- PROPERTY LINE
 - EX. WATERCOURSE (SURVEYED)
 - APPROX 100-YEAR WATER ELEVATION (191.00)
 - APPROX. NPCA REGULATED LIMITS
 - NEW / EXISTING WATER VALVE AND BOX
 - EXISTING HYDRANT
 - PROPOSED ELEVATION
 - EXISTING ELEVATION
 - DRAINAGE ARROW / SLOPE (MAX 3:1)
 - INTERNAL OVERLAND FLOW
 - EXTERNAL OVERLAND FLOW
 - EX. STORM/SANITARY M.H.
 - EX. CATCH BASIN
 - PROP. CATCHBASIN
 - PROP. STORM M.H.
 - PROP. SANITARY M.H.
 - EX. STORM SEWER
 - PROP. STORM SEWER
 - PROP. SANITARY SEWER
 - PROP. WATERMAIN
 - PROP. SWM QUANTITY STORAGE FACILITY
 - APPROX LIMIT OF DISTURBANCE WITHIN RIGHT OF WAY
 - PRELIMINARY GROUNDWATER CONTOURS

NOTE:

- BACKGROUND TOPOGRAPHIC INFORMATION PROVIDED BY AT. MCLAREN LIMITED DATED JULY 2022
- SITE PLAN CONCEPT PROVIDED BY WESTON CONSULTING
- NPCA REGULATED LIMITS DIGITED FROM NPCA INTERACTIVE MAPPING

SCALE: 1:1500

	DRAWN BY	CHECKED BY
	P.K.	S.P.

PRELIMINARY SERVICING PLAN	FIGURE SS-1
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EAST OF REGIONAL ROAD 20
AND NORTHEAST OF GRIMSBY ROAD SIX
TOWNSHIP OF WEST LINCOLN

PROJECT NUMBER: ALL-22020295-A0 DATE: SEP 2024

Appendix B – Existing Conditions Calculations

VO RESULTS - EXISTING CONDITIONS

```
=====
=====
V   V   I   SSSSS U   U   A   L           (v 6.2.2015)
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
```

```
000   TTTT   TTTT   H   H   Y   Y   M   M   000   TM
0   0   T     T   H   H   Y Y   MM MM   0   0
0   0   T     T   H   H   Y   M   M   0   0
000   T     T   H   H   Y   M   M   000
```

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DATE: 01/22/2024

TIME: 02:19:17

USER:

COMMENTS: _____

```
-----
*****
** SIMULATION : 100yr 6hr 10min Chicago **
*****
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-----
| CHICAGO STORM | IDF curve parameters: A=6300.000
| Ptotal=100.79 mm | B= 15.000
|                 | C= 1.000
-----
```

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

Duration of storm = 6.00 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	0.82	1.50	20.19	3.00	6.33	4.50	1.43
0.17	0.98	1.67	68.69	3.17	5.02	4.67	1.27
0.33	1.21	1.83	252.00	3.33	4.08	4.83	1.15
0.50	1.51	2.00	94.52	3.50	3.38	5.00	1.03
0.67	1.96	2.17	42.97	3.67	2.84	5.17	0.94
0.83	2.63	2.33	24.56	3.83	2.43	5.33	0.86
1.00	3.72	2.50	15.89	4.00	2.10	5.50	0.78
1.17	5.66	2.67	11.13	4.17	1.83	5.67	0.72
1.33	9.65	2.83	8.22	4.33	1.61	5.83	0.66

| CALIB |
| NASHYD (0101) | Area (ha)= 1.12 Curve Number (CN)= 74.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.31

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.82	1.583	20.19	3.083	6.33	4.58	1.43
0.167	0.82	1.667	20.19	3.167	6.33	4.67	1.43
0.250	0.98	1.750	68.69	3.250	5.02	4.75	1.27
0.333	0.98	1.833	68.69	3.333	5.02	4.83	1.27
0.417	1.21	1.917	252.00	3.417	4.08	4.92	1.15
0.500	1.21	2.000	252.00	3.500	4.08	5.00	1.15
0.583	1.51	2.083	94.52	3.583	3.38	5.08	1.03
0.667	1.51	2.167	94.52	3.667	3.38	5.17	1.03
0.750	1.96	2.250	42.97	3.750	2.84	5.25	0.94
0.833	1.96	2.333	42.97	3.833	2.84	5.33	0.94
0.917	2.63	2.417	24.56	3.917	2.43	5.42	0.86
1.000	2.63	2.500	24.56	4.000	2.43	5.50	0.86
1.083	3.72	2.583	15.89	4.083	2.10	5.58	0.78
1.167	3.72	2.667	15.89	4.167	2.10	5.67	0.78
1.250	5.66	2.750	11.13	4.250	1.83	5.75	0.72
1.333	5.66	2.833	11.13	4.333	1.83	5.83	0.72
1.417	9.65	2.917	8.22	4.417	1.61	5.92	0.66
1.500	9.65	3.000	8.22	4.500	1.61	6.00	0.66

Unit Hyd Qpeak (cms)= 0.138

PEAK FLOW (cms)= 0.167 (i)

TIME TO PEAK (hrs)= 2.333

RUNOFF VOLUME (mm)= 49.575

TOTAL RAINFALL (mm)= 100.794

RUNOFF COEFFICIENT = 0.492

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

| Junction Command(0001) |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2(0101)	1.12	0.17	2.33	49.58
OUTFLOW: ID= 2(0001)	1.12	0.17	2.33	49.58

CALIB			
NASHYD (0103)	Area (ha)= 0.90	Curve Number (CN)= 74.0	
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.24		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.82	1.583	20.19	3.083	6.33	4.58	1.43
0.167	0.82	1.667	20.19	3.167	6.33	4.67	1.43
0.250	0.98	1.750	68.69	3.250	5.02	4.75	1.27
0.333	0.98	1.833	68.69	3.333	5.02	4.83	1.27
0.417	1.21	1.917	252.00	3.417	4.08	4.92	1.15
0.500	1.21	2.000	252.00	3.500	4.08	5.00	1.15
0.583	1.51	2.083	94.52	3.583	3.38	5.08	1.03
0.667	1.51	2.167	94.52	3.667	3.38	5.17	1.03
0.750	1.96	2.250	42.97	3.750	2.84	5.25	0.94
0.833	1.96	2.333	42.97	3.833	2.84	5.33	0.94
0.917	2.63	2.417	24.56	3.917	2.43	5.42	0.86
1.000	2.63	2.500	24.56	4.000	2.43	5.50	0.86
1.083	3.72	2.583	15.89	4.083	2.10	5.58	0.78
1.167	3.72	2.667	15.89	4.167	2.10	5.67	0.78
1.250	5.66	2.750	11.13	4.250	1.83	5.75	0.72

1.333	5.66	2.833	11.13	4.333	1.83	5.83	0.72
1.417	9.65	2.917	8.22	4.417	1.61	5.92	0.66
1.500	9.65	3.000	8.22	4.500	1.61	6.00	0.66

Unit Hyd Qpeak (cms)= 0.143

PEAK FLOW (cms)= 0.157 (i)

TIME TO PEAK (hrs)= 2.250

RUNOFF VOLUME (mm)= 49.546

TOTAL RAINFALL (mm)= 100.794

RUNOFF COEFFICIENT = 0.492

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

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-----
| CALIB |
| NASHYD ( 0104) | Area (ha)= 0.26 Curve Number (CN)= 74.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 0.20

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NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

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----- TRANSFORMED HYETOGRAPH -----

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.82	1.583	20.19	3.083	6.33	4.58	1.43
0.167	0.82	1.667	20.19	3.167	6.33	4.67	1.43
0.250	0.98	1.750	68.69	3.250	5.02	4.75	1.27
0.333	0.98	1.833	68.69	3.333	5.02	4.83	1.27
0.417	1.21	1.917	252.00	3.417	4.08	4.92	1.15
0.500	1.21	2.000	252.00	3.500	4.08	5.00	1.15
0.583	1.51	2.083	94.52	3.583	3.38	5.08	1.03
0.667	1.51	2.167	94.52	3.667	3.38	5.17	1.03
0.750	1.96	2.250	42.97	3.750	2.84	5.25	0.94
0.833	1.96	2.333	42.97	3.833	2.84	5.33	0.94
0.917	2.63	2.417	24.56	3.917	2.43	5.42	0.86
1.000	2.63	2.500	24.56	4.000	2.43	5.50	0.86
1.083	3.72	2.583	15.89	4.083	2.10	5.58	0.78
1.167	3.72	2.667	15.89	4.167	2.10	5.67	0.78
1.250	5.66	2.750	11.13	4.250	1.83	5.75	0.72
1.333	5.66	2.833	11.13	4.333	1.83	5.83	0.72
1.417	9.65	2.917	8.22	4.417	1.61	5.92	0.66
1.500	9.65	3.000	8.22	4.500	1.61	6.00	0.66

Unit Hyd Qpeak (cms)= 0.050

PEAK FLOW (cms)= 0.051 (i)

TIME TO PEAK (hrs)= 2.167

RUNOFF VOLUME (mm)= 49.497
TOTAL RAINFALL (mm)= 100.794
RUNOFF COEFFICIENT = 0.491

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

| CALIB |
| NASHYD (0102) | Area (ha)= 1.68 Curve Number (CN)= 74.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.32

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.82	1.583	20.19	3.083	6.33	4.58	1.43
0.167	0.82	1.667	20.19	3.167	6.33	4.67	1.43
0.250	0.98	1.750	68.69	3.250	5.02	4.75	1.27
0.333	0.98	1.833	68.69	3.333	5.02	4.83	1.27
0.417	1.21	1.917	252.00	3.417	4.08	4.92	1.15
0.500	1.21	2.000	252.00	3.500	4.08	5.00	1.15
0.583	1.51	2.083	94.52	3.583	3.38	5.08	1.03
0.667	1.51	2.167	94.52	3.667	3.38	5.17	1.03
0.750	1.96	2.250	42.97	3.750	2.84	5.25	0.94
0.833	1.96	2.333	42.97	3.833	2.84	5.33	0.94
0.917	2.63	2.417	24.56	3.917	2.43	5.42	0.86
1.000	2.63	2.500	24.56	4.000	2.43	5.50	0.86
1.083	3.72	2.583	15.89	4.083	2.10	5.58	0.78
1.167	3.72	2.667	15.89	4.167	2.10	5.67	0.78
1.250	5.66	2.750	11.13	4.250	1.83	5.75	0.72
1.333	5.66	2.833	11.13	4.333	1.83	5.83	0.72
1.417	9.65	2.917	8.22	4.417	1.61	5.92	0.66
1.500	9.65	3.000	8.22	4.500	1.61	6.00	0.66

Unit Hyd Qpeak (cms)= 0.201

PEAK FLOW (cms)= 0.246 (i)
TIME TO PEAK (hrs)= 2.333
RUNOFF VOLUME (mm)= 49.577
TOTAL RAINFALL (mm)= 100.794
RUNOFF COEFFICIENT = 0.492

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

```

-----
| ADD HYD ( 0002) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
          ID1= 1 ( 0102):    1.68    0.246    2.33    49.58
          + ID2= 2 ( 0103):    0.90    0.157    2.25    49.55
          =====
          ID = 3 ( 0002):    2.58    0.394    2.25    49.57

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD ( 0002) |
| 3 + 2 = 1 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
          ID1= 3 ( 0002):    2.58    0.394    2.25    49.57
          + ID2= 2 ( 0104):    0.26    0.051    2.17    49.50
          =====
          ID = 1 ( 0002):    2.84    0.442    2.25    49.56

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH

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=====
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=====
=====
V   V   I   SSSSS U   U   A   L           (v 6.2.2015)
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
WV    I   SSSSS UUUUU A   A   LLLLL

```

```

000   TTTT   TTTT   H   H   Y   Y   M   M   000   TM
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0   0   T     T   H   H   Y   M   M 0   0
000   T     T   H   H   Y   M   M 000

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

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DATE: 01/22/2024 TIME: 02:19:17

USER:

COMMENTS: _____

** SIMULATION : 5yr 6hr 10min Chicago **

| CHICAGO STORM |
Ptotal= 50.13 mm

IDF curve parameters: A=3175.000
B= 20.000
C= 1.000

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

Duration of storm = 6.00 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	0.53	1.50	11.75	3.00	3.92	4.50	0.92
0.17	0.64	1.67	35.26	3.17	3.14	4.67	0.83
0.33	0.78	1.83	105.83	3.33	2.57	4.83	0.74
0.50	0.98	2.00	47.04	3.50	2.14	5.00	0.67
0.67	1.26	2.17	23.53	3.67	1.81	5.17	0.61
0.83	1.68	2.33	14.12	3.83	1.55	5.33	0.56
1.00	2.35	2.50	9.41	4.00	1.35	5.50	0.51
1.17	3.52	2.67	6.72	4.17	1.18	5.67	0.47
1.33	5.87	2.83	5.04	4.33	1.04	5.83	0.43

CALIB

NASHYD (0101)	Area (ha)= 1.12	Curve Number (CN)= 74.0
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)= 0.31	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.53	1.583	11.75	3.083	3.92	4.58	0.92
0.167	0.53	1.667	11.75	3.167	3.92	4.67	0.92
0.250	0.64	1.750	35.26	3.250	3.14	4.75	0.83
0.333	0.64	1.833	35.26	3.333	3.14	4.83	0.83
0.417	0.78	1.917	105.83	3.417	2.57	4.92	0.74
0.500	0.78	2.000	105.83	3.500	2.57	5.00	0.74
0.583	0.98	2.083	47.04	3.583	2.14	5.08	0.67
0.667	0.98	2.167	47.04	3.667	2.14	5.17	0.67
0.750	1.26	2.250	23.53	3.750	1.81	5.25	0.61
0.833	1.26	2.333	23.53	3.833	1.81	5.33	0.61
0.917	1.68	2.417	14.12	3.917	1.55	5.42	0.56
1.000	1.68	2.500	14.12	4.000	1.55	5.50	0.56
1.083	2.35	2.583	9.41	4.083	1.35	5.58	0.51
1.167	2.35	2.667	9.41	4.167	1.35	5.67	0.51
1.250	3.52	2.750	6.72	4.250	1.18	5.75	0.47
1.333	3.52	2.833	6.72	4.333	1.18	5.83	0.47
1.417	5.87	2.917	5.04	4.417	1.04	5.92	0.43
1.500	5.87	3.000	5.04	4.500	1.04	6.00	0.43

Unit Hyd Qpeak (cms)= 0.138

PEAK FLOW (cms)= 0.044 (i)

TIME TO PEAK (hrs)= 2.333

RUNOFF VOLUME (mm)= 15.150

TOTAL RAINFALL (mm)= 50.128

RUNOFF COEFFICIENT = 0.302

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

Junction Command(0001)

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2(0101)	1.12	0.04	2.33	15.15
OUTFLOW: ID= 2(0001)	1.12	0.04	2.33	15.15

```

-----
| CALIB |
| NASHYD ( 0103) | Area (ha)= 0.90 Curve Number (CN)= 74.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
-----
U.H. Tp(hrs)= 0.24

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.53	1.583	11.75	3.083	3.92	4.58	0.92
0.167	0.53	1.667	11.75	3.167	3.92	4.67	0.92
0.250	0.64	1.750	35.26	3.250	3.14	4.75	0.83
0.333	0.64	1.833	35.26	3.333	3.14	4.83	0.83
0.417	0.78	1.917	105.83	3.417	2.57	4.92	0.74
0.500	0.78	2.000	105.83	3.500	2.57	5.00	0.74
0.583	0.98	2.083	47.04	3.583	2.14	5.08	0.67
0.667	0.98	2.167	47.04	3.667	2.14	5.17	0.67
0.750	1.26	2.250	23.53	3.750	1.81	5.25	0.61
0.833	1.26	2.333	23.53	3.833	1.81	5.33	0.61
0.917	1.68	2.417	14.12	3.917	1.55	5.42	0.56
1.000	1.68	2.500	14.12	4.000	1.55	5.50	0.56
1.083	2.35	2.583	9.41	4.083	1.35	5.58	0.51
1.167	2.35	2.667	9.41	4.167	1.35	5.67	0.51
1.250	3.52	2.750	6.72	4.250	1.18	5.75	0.47
1.333	3.52	2.833	6.72	4.333	1.18	5.83	0.47
1.417	5.87	2.917	5.04	4.417	1.04	5.92	0.43
1.500	5.87	3.000	5.04	4.500	1.04	6.00	0.43

Unit Hyd Qpeak (cms)= 0.143

PEAK FLOW (cms)= 0.041 (i)

TIME TO PEAK (hrs)= 2.250

RUNOFF VOLUME (mm)= 15.141

TOTAL RAINFALL (mm)= 50.128

RUNOFF COEFFICIENT = 0.302

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

```

-----
| CALIB |
| NASHYD ( 0104) | Area (ha)= 0.26 Curve Number (CN)= 74.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
-----
U.H. Tp(hrs)= 0.20

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.53	1.583	11.75	3.083	3.92	4.58	0.92
0.167	0.53	1.667	11.75	3.167	3.92	4.67	0.92
0.250	0.64	1.750	35.26	3.250	3.14	4.75	0.83
0.333	0.64	1.833	35.26	3.333	3.14	4.83	0.83
0.417	0.78	1.917	105.83	3.417	2.57	4.92	0.74
0.500	0.78	2.000	105.83	3.500	2.57	5.00	0.74
0.583	0.98	2.083	47.04	3.583	2.14	5.08	0.67
0.667	0.98	2.167	47.04	3.667	2.14	5.17	0.67
0.750	1.26	2.250	23.53	3.750	1.81	5.25	0.61
0.833	1.26	2.333	23.53	3.833	1.81	5.33	0.61
0.917	1.68	2.417	14.12	3.917	1.55	5.42	0.56
1.000	1.68	2.500	14.12	4.000	1.55	5.50	0.56
1.083	2.35	2.583	9.41	4.083	1.35	5.58	0.51
1.167	2.35	2.667	9.41	4.167	1.35	5.67	0.51
1.250	3.52	2.750	6.72	4.250	1.18	5.75	0.47
1.333	3.52	2.833	6.72	4.333	1.18	5.83	0.47
1.417	5.87	2.917	5.04	4.417	1.04	5.92	0.43
1.500	5.87	3.000	5.04	4.500	1.04	6.00	0.43

Unit Hyd Qpeak (cms)= 0.050

PEAK FLOW (cms)= 0.013 (i)

TIME TO PEAK (hrs)= 2.250

RUNOFF VOLUME (mm)= 15.125

TOTAL RAINFALL (mm)= 50.128

RUNOFF COEFFICIENT = 0.302

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

CALIB			
NASHYD (0102)	Area (ha)=	1.68	Curve Number (CN)= 74.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.32	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.53	1.583	11.75	3.083	3.92	4.58	0.92
0.167	0.53	1.667	11.75	3.167	3.92	4.67	0.92
0.250	0.64	1.750	35.26	3.250	3.14	4.75	0.83

0.333	0.64	1.833	35.26	3.333	3.14	4.83	0.83
0.417	0.78	1.917	105.83	3.417	2.57	4.92	0.74
0.500	0.78	2.000	105.83	3.500	2.57	5.00	0.74
0.583	0.98	2.083	47.04	3.583	2.14	5.08	0.67
0.667	0.98	2.167	47.04	3.667	2.14	5.17	0.67
0.750	1.26	2.250	23.53	3.750	1.81	5.25	0.61
0.833	1.26	2.333	23.53	3.833	1.81	5.33	0.61
0.917	1.68	2.417	14.12	3.917	1.55	5.42	0.56
1.000	1.68	2.500	14.12	4.000	1.55	5.50	0.56
1.083	2.35	2.583	9.41	4.083	1.35	5.58	0.51
1.167	2.35	2.667	9.41	4.167	1.35	5.67	0.51
1.250	3.52	2.750	6.72	4.250	1.18	5.75	0.47
1.333	3.52	2.833	6.72	4.333	1.18	5.83	0.47
1.417	5.87	2.917	5.04	4.417	1.04	5.92	0.43
1.500	5.87	3.000	5.04	4.500	1.04	6.00	0.43

Unit Hyd Qpeak (cms)= 0.201

PEAK FLOW (cms)= 0.065 (i)

TIME TO PEAK (hrs)= 2.417

RUNOFF VOLUME (mm)= 15.151

TOTAL RAINFALL (mm)= 50.128

RUNOFF COEFFICIENT = 0.302

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

ADD HYD (0002)				
1 + 2 = 3				

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0102):	1.68	0.065	2.42	15.15
+ ID2= 2 (0103):	0.90	0.041	2.25	15.14
=====				
ID = 3 (0002):	2.58	0.105	2.33	15.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0002)				
3 + 2 = 1				

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0002):	2.58	0.105	2.33	15.15
+ ID2= 2 (0104):	0.26	0.013	2.25	15.12
=====				
ID = 1 (0002):	2.84	0.117	2.33	15.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Appendix C – Proposed Conditions Calculations

PROJECT: Elite Development-Smithville
PROJECT No: ALL-232020295-A0
CREATED: 28-Aug-24
PRINTED: 28-Aug-24

Impervious Area Calculation

Post Development Conditions

Catchment 201A	=	0.61 ha
Road Area	=	0.18 ha
Roof Area	=	0.21 ha
Landscaped	=	0.22 ha

% Impervious (TIMP)	=	64%
Directly Connected % Impervious (XIMP)	=	30%

Catchment 201B	=	0.85 ha
Road Area	=	0.24 ha
Roof Area	=	0.30 ha
Landscaped	=	0.31 ha

% Impervious (TIMP)	=	64%
Directly Connected % Impervious (XIMP)	=	28%

Catchment 202	=	0.29 ha
Road Area	=	0.06 ha
Roof Area	=	0.11 ha
Landscaped	=	0.12 ha

% Impervious (TIMP)	=	57%
Directly Connected % Impervious (XIMP)	=	21%

Catchment 203	=	0.38 ha
Road Area	=	0.34 ha
Roof Area	=	0.00 ha
Landscaped	=	0.00 ha

% Impervious (TIMP)	=	89%
Directly Connected % Impervious (XIMP)	=	89%



PROJECT: **Elite Development, Smithville**
 PROJECT No: **ALL-22020295-A0**
 CREATED: **28-Aug-24**
 PRINTED: **28-Aug-24**

Catchment #201A- SSD Table Sheet

Extended Detention Orifice Tube	
Diameter	75.0 mm
Radius	0.038 m
Invert	190.50 m
Discharge Coefficient, C	0.80 (orifice tube)

Elevation	WATER DEPTH	STORAGE SUPERPIPE #3A	STORAGE SUPERPIPE #3B	STORAGE SUPERPIPE #3C	STORAGE SUPERPIPE #3D	TOTAL STORAGE	ORIFICE RELEASE RATE
m	m	m ³	m ³	m ³	m ³	m ³	m ³ /s
190.50	0.00	0.00	0.00	0.00	0.00	0.00	0.000
190.55	0.05	0.00	0.00	0.00	0.00	0.00	0.002
190.60	0.10	3.13	0.00	0.00	0.00	3.13	0.004
190.65	0.15	6.26	0.00	0.00	0.00	6.26	0.005
190.70	0.20	9.40	0.00	0.00	0.00	9.40	0.006
190.75	0.25	12.53	0.00	0.00	0.00	12.53	0.007
190.79	0.29	15.03	0.00	0.00	0.00	15.03	0.008
190.80	0.30	15.66	1.21	1.26	0.00	18.13	0.008
190.82	0.32	16.91	3.63	3.79	0.00	24.33	0.008
190.85	0.35	18.79	7.25	7.58	2.64	36.26	0.009
190.90	0.40	21.92	13.30	13.90	7.03	56.15	0.009
190.95	0.45	25.05	19.34	20.22	11.43	76.04	0.010
191.00	0.50	28.19	25.38	26.54	15.82	95.93	0.011
191.05	0.55	31.32	31.43	32.86	20.22	115.82	0.011
191.10	0.60	34.45	37.47	39.18	24.62	135.71	0.012
191.15	0.65	37.58	43.52	45.49	29.01	155.60	0.012
191.20	0.70	40.71	49.56	51.81	33.41	175.49	0.013
191.25	0.75	43.85	55.60	58.13	37.80	195.38	0.013
191.30	0.80	46.98	61.65	64.45	42.20	215.27	0.014
191.35	0.85	50.11	67.69	70.77	46.59	235.16	0.014
191.40	0.90	53.24	73.74	77.09	50.99	255.05	0.015
191.45	0.95	56.37	79.78	83.41	55.38	274.95	0.015
191.46	0.96	57.00	80.99	84.67	56.26	278.92	0.015
191.50	1.00	57.00	85.82	89.73	59.78	292.33	0.015
191.55	1.05	57.00	91.87	96.04	64.18	309.09	0.016
191.60	1.10	57.00	97.91	102.36	68.57	325.85	0.016
191.65	1.15	57.00	103.96	108.68	72.97	342.60	0.017
191.70	1.20	57.00	110.00	115.00	77.36	359.36	0.017
191.73	1.23	57.00	110.00	115.00	80.00	362.00	0.017



PROJECT: Elite Development, Smithville

PROJECT No: ALL-22020295-A0

CREATED: 30-Aug-24

PRINTED: 30-Aug-24

Catchment #201B- SSD Table Sheet

Extended Detention Orifice Tube	
Diameter	125.0 mm
Radius	0.063 m
Invert	189.60 m
Discharge Coefficient, C	0.80 (orifice tube)

Elevation	WATER DEPTH	STORAGE CISTERN	ORIFICE RELEASE RATE
m	m	m ³	m ³ /s
189.60	0.00	0.00	0.000
189.70	0.10	19.76	0.008
189.80	0.20	39.51	0.016
189.90	0.30	59.27	0.021
190.00	0.40	79.02	0.025
190.10	0.50	98.78	0.029
190.20	0.60	118.54	0.032
190.30	0.70	138.29	0.035
190.40	0.80	158.05	0.037
190.50	0.90	177.80	0.040
190.60	1.00	197.56	0.042
190.70	1.10	217.32	0.044
190.80	1.20	237.07	0.046
190.90	1.30	256.83	0.048
191.00	1.40	276.59	0.050
191.10	1.50	296.34	0.052
191.20	1.60	316.10	0.054
191.30	1.70	335.85	0.056
191.40	1.80	355.61	0.057
191.50	1.90	375.37	0.059
191.60	2.00	395.12	0.060
191.65	2.05	405.00	0.061



PROJECT: Elite Development, Smithville

PROJECT No: ALL-22020295-A0

CREATED: 28-Aug-24

PRINTED: 28-Aug-24

Catchment #202- SSD Table Sheet 2

Extended Detention Orifice Tube	
Diameter	75.0 mm
Radius	0.038 m
Invert	191.21 m
Discharge Coefficient	0.80 (orifice tube)

Elevation	WATER DEPTH	STORAGE SUPERPIPE #2A	STORAGE SUPERPIPE #2B	TOTAL STORAGE	ORIFICE RELEASE RATE
m	m	m ³	m ³	m ³	m ³ /s
191.21	0.00	0.00	0.00	0.00	0.000
191.25	0.04	0.00	0.00	0.00	0.001
191.30	0.09	0.00	0.00	0.00	0.004
191.33	0.12	0.00	0.00	0.00	0.004
191.35	0.14	1.76	0.00	1.76	0.005
191.40	0.19	6.15	0.00	6.15	0.006
191.45	0.24	10.55	0.00	10.55	0.007
191.50	0.29	14.95	3.13	18.08	0.008
191.55	0.34	19.34	6.26	25.60	0.009
191.60	0.39	23.74	9.40	33.13	0.009
191.65	0.44	28.13	12.53	40.66	0.010
191.70	0.49	32.53	15.66	48.19	0.011
191.75	0.54	36.92	18.79	55.71	0.011
191.80	0.59	41.32	21.92	63.24	0.012
191.85	0.64	45.71	25.05	70.77	0.012
191.90	0.69	50.11	28.19	78.30	0.013
191.95	0.74	54.51	31.32	85.82	0.013
192.00	0.79	58.90	34.45	93.35	0.014
192.05	0.84	63.30	37.58	100.88	0.014
192.10	0.89	67.69	40.71	108.41	0.014
192.15	0.94	72.09	43.85	115.93	0.015
192.20	0.99	76.48	46.98	123.46	0.015
192.24	1.03	80.00	49.48	129.48	0.016
192.25	1.04	80.00	50.11	130.11	0.016
192.30	1.09	80.00	53.24	133.24	0.016
192.35	1.14	80.00	56.37	136.37	0.016
192.36	1.15	80.00	57.00	137.00	0.017



PROJECT: Elite Development, Smithville

PROJECT No: ALL-22020295-A0

CREATED: 28-Aug-24

PRINTED: 28-Aug-24

Catchment #203- SSD Table Sheet 2

Extended Detention Orifice Tube			
Diameter		100.0	mm
Radius		0.050	m
Invert		190.55	m
Discharge Coefficient, C		0.82	(orifice tube)

Elevation	WATER DEPTH	STORAGE SUPERPIPE #1	ORIFICE RELEASE RATE
m	m	m ³	m ³ /s
190.55	0.00	0.00	0.000
190.60	0.05	9.07	0.001
190.65	0.10	18.15	0.006
190.70	0.15	27.22	0.009
190.75	0.20	36.30	0.011
190.80	0.25	45.37	0.013
190.85	0.30	54.44	0.014
190.90	0.35	63.52	0.016
190.95	0.40	72.59	0.017
191.00	0.45	81.67	0.018
191.05	0.50	90.74	0.019
191.10	0.55	99.81	0.020
191.15	0.60	108.89	0.021
191.20	0.65	117.96	0.022
191.25	0.70	127.04	0.023
191.30	0.75	136.11	0.024
191.35	0.80	145.19	0.025
191.40	0.85	154.26	0.026
191.45	0.90	163.33	0.026
191.50	0.95	172.41	0.027
191.55	1.00	181.48	0.028
191.60	1.05	190.56	0.029
191.65	1.10	199.63	0.029
191.70	1.15	208.70	0.030
191.75	1.20	217.78	0.031
191.80	1.25	226.85	0.031
191.85	1.30	235.93	0.032
191.90	1.35	245.00	0.0325

VO RESULTS- PROPOSED CONDITIONS

```
=====
=====
V   V   I   SSSSS U   U   A   L           (v 6.2.2015)
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
```

```
000   TTTT   TTTT   H   H   Y   Y   M   M   000   TM
O   O   T     T   H   H   Y Y   MM MM   O   O
O   O   T     T   H   H   Y   M   M   O   O
000     T     T   H   H   Y   M   M   000
```

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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\V02\voin.dat

Output filename:

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b-37f3-4b36-8140-2f48150785e9\scenar

Summary filename:

C:\Users\KaurP\AppData\Local\Civica\XH5\cd0148be-7f4e-4b84-8360-f166568279e6\fe1f755
b-37f3-4b36-8140-2f48150785e9\scenar

DATE: 08/28/2024

TIME: 04:57:17

USER:

COMMENTS: _____

```
-----
*****
** SIMULATION : 100yr 6hr 10min Chicago **
*****
```

```
-----
| CHICAGO STORM |      IDF curve parameters: A=6300.000
| Ptotal=100.79 mm |      B= 15.000
|                  |      C= 1.000
-----
```

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

Duration of storm = 6.00 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	0.82	1.50	20.19	3.00	6.33	4.50	1.43
0.17	0.98	1.67	68.69	3.17	5.02	4.67	1.27
0.33	1.21	1.83	252.00	3.33	4.08	4.83	1.15
0.50	1.51	2.00	94.52	3.50	3.38	5.00	1.03
0.67	1.96	2.17	42.97	3.67	2.84	5.17	0.94
0.83	2.63	2.33	24.56	3.83	2.43	5.33	0.86
1.00	3.72	2.50	15.89	4.00	2.10	5.50	0.78
1.17	5.66	2.67	11.13	4.17	1.83	5.67	0.72
1.33	9.65	2.83	8.22	4.33	1.61	5.83	0.66

| CALIB |
| NASHYD (0204) | Area (ha)= 0.12 Curve Number (CN)= 74.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.22

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.82	1.583	20.19	3.083	6.33	4.58	1.43
0.167	0.82	1.667	20.19	3.167	6.33	4.67	1.43
0.250	0.98	1.750	68.69	3.250	5.02	4.75	1.27
0.333	0.98	1.833	68.69	3.333	5.02	4.83	1.27
0.417	1.21	1.917	252.00	3.417	4.08	4.92	1.15
0.500	1.21	2.000	252.00	3.500	4.08	5.00	1.15
0.583	1.51	2.083	94.52	3.583	3.38	5.08	1.03
0.667	1.51	2.167	94.52	3.667	3.38	5.17	1.03
0.750	1.96	2.250	42.97	3.750	2.84	5.25	0.94
0.833	1.96	2.333	42.97	3.833	2.84	5.33	0.94
0.917	2.63	2.417	24.56	3.917	2.43	5.42	0.86
1.000	2.63	2.500	24.56	4.000	2.43	5.50	0.86
1.083	3.72	2.583	15.89	4.083	2.10	5.58	0.78
1.167	3.72	2.667	15.89	4.167	2.10	5.67	0.78
1.250	5.66	2.750	11.13	4.250	1.83	5.75	0.72
1.333	5.66	2.833	11.13	4.333	1.83	5.83	0.72
1.417	9.65	2.917	8.22	4.417	1.61	5.92	0.66
1.500	9.65	3.000	8.22	4.500	1.61	6.00	0.66

Unit Hyd Qpeak (cms)= 0.021

PEAK FLOW (cms)= 0.022 (i)

TIME TO PEAK (hrs)= 2.167

RUNOFF VOLUME (mm)= 49.523

TOTAL RAINFALL (mm)= 100.794

RUNOFF COEFFICIENT = 0.491

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

| CALIB |
| STANDHYD (0202) | Area (ha)= 0.29
| ID= 1 DT= 5.0 min | Total Imp(%)= 57.00 Dir. Conn.(%)= 21.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.17	0.12
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	43.97	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.82	1.583	20.19	3.083	6.33	4.58	1.43
0.167	0.82	1.667	20.19	3.167	6.33	4.67	1.43
0.250	0.98	1.750	68.69	3.250	5.02	4.75	1.27
0.333	0.98	1.833	68.69	3.333	5.02	4.83	1.27
0.417	1.21	1.917	252.00	3.417	4.08	4.92	1.15
0.500	1.21	2.000	252.00	3.500	4.08	5.00	1.15
0.583	1.51	2.083	94.52	3.583	3.38	5.08	1.03
0.667	1.51	2.167	94.52	3.667	3.38	5.17	1.03
0.750	1.96	2.250	42.97	3.750	2.84	5.25	0.94
0.833	1.96	2.333	42.97	3.833	2.84	5.33	0.94
0.917	2.63	2.417	24.56	3.917	2.43	5.42	0.86
1.000	2.63	2.500	24.56	4.000	2.43	5.50	0.86
1.083	3.72	2.583	15.89	4.083	2.10	5.58	0.78
1.167	3.72	2.667	15.89	4.167	2.10	5.67	0.78
1.250	5.66	2.750	11.13	4.250	1.83	5.75	0.72
1.333	5.66	2.833	11.13	4.333	1.83	5.83	0.72
1.417	9.65	2.917	8.22	4.417	1.61	5.92	0.66
1.500	9.65	3.000	8.22	4.500	1.61	6.00	0.66

Max.Eff.Inten.(mm/hr)= 252.00 307.28

over (min)	5.00	10.00	
Storage Coeff. (min)=	1.08 (ii)	5.58 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.34	0.16	
			TOTALS
PEAK FLOW (cms)=	0.04	0.08	0.117 (iii)
TIME TO PEAK (hrs)=	2.00	2.08	2.00
RUNOFF VOLUME (mm)=	99.79	65.59	72.76
TOTAL RAINFALL (mm)=	100.79	100.79	100.79
RUNOFF COEFFICIENT =	0.99	0.65	0.72

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 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.

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| RESERVOIR( 0402) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
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	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.	0.0040	0.0000	0.0120	0.0071
	0.0050	0.0002	0.0130	0.0078
	0.0060	0.0006	0.0130	0.0086
	0.0070	0.0011	0.0140	0.0093
	0.0080	0.0018	0.0140	0.0101
	0.0090	0.0026	0.0150	0.0116
	0.0090	0.0033	0.0150	0.0123
	0.0100	0.0041	0.0160	0.0133
	0.0110	0.0056	0.0160	0.0136
	0.0120	0.0063	0.0170	0.0137

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0202)	0.290	0.117	2.00	72.76
OUTFLOW: ID= 1 (0402)	0.290	0.016	2.58	72.81

PEAK FLOW REDUCTION [Qout/Qin](%)= 13.71
 TIME SHIFT OF PEAK FLOW (min)= 35.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0133

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| CALIB          |
| STANDHYD ( 0203) | Area (ha)= 0.38

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|ID= 1 DT= 5.0 min | Total Imp(%)= 90.00 Dir. Conn.(%)= 90.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.34	0.04
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	50.33	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.82	1.583	20.19	3.083	6.33	4.58	1.43
0.167	0.82	1.667	20.19	3.167	6.33	4.67	1.43
0.250	0.98	1.750	68.69	3.250	5.02	4.75	1.27
0.333	0.98	1.833	68.69	3.333	5.02	4.83	1.27
0.417	1.21	1.917	252.00	3.417	4.08	4.92	1.15
0.500	1.21	2.000	252.00	3.500	4.08	5.00	1.15
0.583	1.51	2.083	94.52	3.583	3.38	5.08	1.03
0.667	1.51	2.167	94.52	3.667	3.38	5.17	1.03
0.750	1.96	2.250	42.97	3.750	2.84	5.25	0.94
0.833	1.96	2.333	42.97	3.833	2.84	5.33	0.94
0.917	2.63	2.417	24.56	3.917	2.43	5.42	0.86
1.000	2.63	2.500	24.56	4.000	2.43	5.50	0.86
1.083	3.72	2.583	15.89	4.083	2.10	5.58	0.78
1.167	3.72	2.667	15.89	4.167	2.10	5.67	0.78
1.250	5.66	2.750	11.13	4.250	1.83	5.75	0.72
1.333	5.66	2.833	11.13	4.333	1.83	5.83	0.72
1.417	9.65	2.917	8.22	4.417	1.61	5.92	0.66
1.500	9.65	3.000	8.22	4.500	1.61	6.00	0.66

Max.Eff.Inten.(mm/hr)=	252.00	119.27
over (min)	5.00	5.00
Storage Coeff. (min)=	1.17 (ii)	3.19 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.34	0.27

			TOTALS
PEAK FLOW	(cms)=	0.24	0.01
TIME TO PEAK	(hrs)=	2.00	2.00
RUNOFF VOLUME	(mm)=	99.79	49.59
TOTAL RAINFALL	(mm)=	100.79	100.79
RUNOFF COEFFICIENT	=	0.99	0.49

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 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.

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-----
| DUHYD   ( 0005) |
| Inlet Cap.= 0.103 |
| #of Inlets= 1 |
| Total(cms)= 0.1 |
-----

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	0.38	0.25	2.00	94.77
=====				
MAJOR SYS.(ID= 2):	0.09	0.15	2.00	94.77
MINOR SYS.(ID= 3):	0.29	0.10	1.92	94.77

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-----
| ADD HYD ( 0901) |
| 1 + 2 = 3 |
-----

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	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0204):	0.12	0.022	2.17	49.52
+ ID2= 2 (0402):	0.29	0.016	2.58	72.81
=====				
ID = 3 (0901):	0.41	0.036	2.25	66.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-----
| ADD HYD ( 0901) |
| 3 + 2 = 1 |
-----

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	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0901):	0.41	0.036	2.25	66.00
+ ID2= 2 (0005):	0.29	0.103	1.92	94.77
=====				
ID = 1 (0901):	0.70	0.133	2.17	77.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-----
| RESERVOIR( 0403) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----

```

OVERFLOW IS OFF				
OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
0.0000	0.0000	0.0210	0.0109	
0.0010	0.0009	0.0230	0.0127	

0.0060	0.0018	0.0250	0.0145
0.0090	0.0027	0.0260	0.0154
0.0110	0.0036	0.0270	0.0172
0.0140	0.0054	0.0290	0.0191
0.0170	0.0073	0.0300	0.0209
0.0180	0.0082	0.0310	0.0218
0.0190	0.0091	0.0320	0.0236
0.0200	0.0100	0.0330	0.0245

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0901)	0.697	0.133	2.17	77.86
OUTFLOW: ID= 1 (0403)	0.697	0.032	2.83	77.54

PEAK FLOW REDUCTION [Qout/Qin](%)= 24.20
TIME SHIFT OF PEAK FLOW (min)= 40.00
MAXIMUM STORAGE USED (ha.m.)= 0.0237

| Junction Command(0002) |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 1(0403)	0.70	0.03	2.83	77.54
OUTFLOW: ID= 2(0002)	0.70	0.03	2.83	77.54

CALIB			
NASHYD (0303)	Area (ha)=	0.55	Curve Number (CN)= 74.0
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.24	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.82	1.583	20.19	3.083	6.33	4.58	1.43
0.167	0.82	1.667	20.19	3.167	6.33	4.67	1.43
0.250	0.98	1.750	68.69	3.250	5.02	4.75	1.27
0.333	0.98	1.833	68.69	3.333	5.02	4.83	1.27
0.417	1.21	1.917	252.00	3.417	4.08	4.92	1.15
0.500	1.21	2.000	252.00	3.500	4.08	5.00	1.15
0.583	1.51	2.083	94.52	3.583	3.38	5.08	1.03
0.667	1.51	2.167	94.52	3.667	3.38	5.17	1.03

0.750	1.96	2.250	42.97	3.750	2.84	5.25	0.94
0.833	1.96	2.333	42.97	3.833	2.84	5.33	0.94
0.917	2.63	2.417	24.56	3.917	2.43	5.42	0.86
1.000	2.63	2.500	24.56	4.000	2.43	5.50	0.86
1.083	3.72	2.583	15.89	4.083	2.10	5.58	0.78
1.167	3.72	2.667	15.89	4.167	2.10	5.67	0.78
1.250	5.66	2.750	11.13	4.250	1.83	5.75	0.72
1.333	5.66	2.833	11.13	4.333	1.83	5.83	0.72
1.417	9.65	2.917	8.22	4.417	1.61	5.92	0.66
1.500	9.65	3.000	8.22	4.500	1.61	6.00	0.66

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.096 (i)
TIME TO PEAK (hrs)= 2.250
RUNOFF VOLUME (mm)= 49.546
TOTAL RAINFALL (mm)= 100.794
RUNOFF COEFFICIENT = 0.492

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

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-----
| ADD HYD ( 0902) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
ID1= 1 ( 0303):    0.55    0.096    2.25    49.55
+ ID2= 2 ( 0005):    0.09    0.150    2.00    94.77
=====
ID = 3 ( 0902):    0.64    0.199    2.00    56.06

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NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| Junction Command(0003) |
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	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 1(0902)	0.64	0.20	2.00	56.06
OUTFLOW: ID= 2(0003)	0.64	0.20	2.00	56.06

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-----
| CALIB
| STANDHYD ( 2011) |
| ID= 1 DT= 5.0 min |
-----
          Area      (ha)= 0.61
          Total Imp(%)= 64.00   Dir. Conn.(%)= 30.00

```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.39	0.22
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	63.77	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.82	1.583	20.19	3.083	6.33	4.58	1.43
0.167	0.82	1.667	20.19	3.167	6.33	4.67	1.43
0.250	0.98	1.750	68.69	3.250	5.02	4.75	1.27
0.333	0.98	1.833	68.69	3.333	5.02	4.83	1.27
0.417	1.21	1.917	252.00	3.417	4.08	4.92	1.15
0.500	1.21	2.000	252.00	3.500	4.08	5.00	1.15
0.583	1.51	2.083	94.52	3.583	3.38	5.08	1.03
0.667	1.51	2.167	94.52	3.667	3.38	5.17	1.03
0.750	1.96	2.250	42.97	3.750	2.84	5.25	0.94
0.833	1.96	2.333	42.97	3.833	2.84	5.33	0.94
0.917	2.63	2.417	24.56	3.917	2.43	5.42	0.86
1.000	2.63	2.500	24.56	4.000	2.43	5.50	0.86
1.083	3.72	2.583	15.89	4.083	2.10	5.58	0.78
1.167	3.72	2.667	15.89	4.167	2.10	5.67	0.78
1.250	5.66	2.750	11.13	4.250	1.83	5.75	0.72
1.333	5.66	2.833	11.13	4.333	1.83	5.83	0.72
1.417	9.65	2.917	8.22	4.417	1.61	5.92	0.66
1.500	9.65	3.000	8.22	4.500	1.61	6.00	0.66

Max.Eff.Inten.(mm/hr)=	252.00	333.28
over (min)	5.00	10.00
Storage Coeff. (min)=	1.35 (ii)	5.71 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.33	0.15

			TOTALS
PEAK FLOW (cms)=	0.13	0.16	0.269 (iii)
TIME TO PEAK (hrs)=	2.00	2.08	2.00
RUNOFF VOLUME (mm)=	99.79	66.94	76.79
TOTAL RAINFALL (mm)=	100.79	100.79	100.79
RUNOFF COEFFICIENT =	0.99	0.66	0.76

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 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(4011)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE
-----	(cms)	(ha.m.)	(cms)	(ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	0.0080	0.0015	0.0130	0.0175
	0.0080	0.0018	0.0130	0.0195
	0.0080	0.0024	0.0140	0.0215
	0.0090	0.0036	0.0140	0.0235
	0.0090	0.0056	0.0150	0.0279
	0.0100	0.0076	0.0150	0.0292
	0.0110	0.0096	0.0160	0.0309
	0.0110	0.0116	0.0160	0.0326
	0.0120	0.0136	0.0170	0.0343
	0.0120	0.0156	0.0170	0.0362
	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (2011)	0.610	0.269	2.00	76.79
OUTFLOW: ID= 1 (4011)	0.610	0.017	2.58	76.72
PEAK FLOW REDUCTION [Qout/Qin](%)= 6.33				
TIME SHIFT OF PEAK FLOW (min)= 35.00				
MAXIMUM STORAGE USED (ha.m.)= 0.0356				

CALIB				
STANDHYD (2012)	Area (ha)=	0.85		
ID= 1 DT= 5.0 min	Total Imp(%)=	64.00	Dir. Conn.(%)=	28.00

	IMPERVIOUS	PERVIOUS (i)		
Surface Area (ha)=	0.54	0.31		
Dep. Storage (mm)=	1.00	5.00		
Average Slope (%)=	1.00	2.00		
Length (m)=	75.28	40.00		
Mannings n =	0.013	0.250		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.82	1.583	20.19	3.083	6.33	4.58	1.43
0.167	0.82	1.667	20.19	3.167	6.33	4.67	1.43

0.250	0.98	1.750	68.69	3.250	5.02	4.75	1.27
0.333	0.98	1.833	68.69	3.333	5.02	4.83	1.27
0.417	1.21	1.917	252.00	3.417	4.08	4.92	1.15
0.500	1.21	2.000	252.00	3.500	4.08	5.00	1.15
0.583	1.51	2.083	94.52	3.583	3.38	5.08	1.03
0.667	1.51	2.167	94.52	3.667	3.38	5.17	1.03
0.750	1.96	2.250	42.97	3.750	2.84	5.25	0.94
0.833	1.96	2.333	42.97	3.833	2.84	5.33	0.94
0.917	2.63	2.417	24.56	3.917	2.43	5.42	0.86
1.000	2.63	2.500	24.56	4.000	2.43	5.50	0.86
1.083	3.72	2.583	15.89	4.083	2.10	5.58	0.78
1.167	3.72	2.667	15.89	4.167	2.10	5.67	0.78
1.250	5.66	2.750	11.13	4.250	1.83	5.75	0.72
1.333	5.66	2.833	11.13	4.333	1.83	5.83	0.72
1.417	9.65	2.917	8.22	4.417	1.61	5.92	0.66
1.500	9.65	3.000	8.22	4.500	1.61	6.00	0.66

Max.Eff.Inten.(mm/hr)= 252.00 346.85
over (min) 5.00 10.00
Storage Coeff. (min)= 1.49 (ii) 5.78 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.33 0.15

TOTALS

PEAK FLOW (cms)= 0.17 0.23 0.370 (iii)
TIME TO PEAK (hrs)= 2.00 2.08 2.00
RUNOFF VOLUME (mm)= 99.79 67.60 76.61
TOTAL RAINFALL (mm)= 100.79 100.79 100.79
RUNOFF COEFFICIENT = 0.99 0.67 0.76

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 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( 4012) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
| OUTFLOW   STORAGE | OUTFLOW   STORAGE
| (cms)     (ha.m.)  | (cms)     (ha.m.)
|-----|
| **** WARNING : FIRST OUTFLOW IS NOT ZERO.
| 0.0080    0.0020   | 0.0480    0.0257
| 0.0160    0.0040   | 0.0500    0.0277
| 0.0210    0.0059   | 0.0520    0.0296
| 0.0320    0.0119   | 0.0540    0.0316
| 0.0350    0.0138   | 0.0560    0.0336
| 0.0370    0.0158   | 0.0570    0.0356

```

0.0400	0.0178		0.0590	0.0375
0.0420	0.0198		0.0600	0.0395
0.0440	0.0217		0.0610	0.0405
0.0460	0.0237		0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (2012)	0.850	0.370	2.00	76.61
OUTFLOW: ID= 1 (4012)	0.850	0.061	2.50	76.55

PEAK FLOW REDUCTION [Qout/Qin](%)= 16.46
 TIME SHIFT OF PEAK FLOW (min)= 30.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0405

```

-----
| ADD HYD ( 0001) |
| 1 + 2 = 3 |
-----

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (4011):	0.61	0.017	2.58	76.72
+ ID2= 2 (4012):	0.85	0.061	2.50	76.55
=====				
ID = 3 (0001):	1.46	0.078	2.58	76.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH

```

V   V   I   SSSSS U   U   A   L           (v 6.2.2015)
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

```

```

000  TTTTT TTTTT H   H   Y   Y   M   M   000  TM
O   O   T   T   H   H   Y   Y   MM  MM  O   O
O   O   T   T   H   H   Y   M   M   O   O
000  T   T   H   H   Y   M   M   000

```

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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\V02\voin.dat

Output filename:

C:\Users\KaurP\AppData\Local\Civica\XH5\cd0148be-7f4e-4b84-8360-f166568279e6\31be087
0-1a45-4799-91df-44253b17d027\scenar

Summary filename:

C:\Users\KaurP\AppData\Local\Civica\XH5\cd0148be-7f4e-4b84-8360-f166568279e6\31be087
0-1a45-4799-91df-44253b17d027\scenar

DATE: 08/28/2024

TIME: 04:57:17

USER:

COMMENTS: _____

** SIMULATION : 5yr 6hr 10min Chicago **

| CHICAGO STORM |
Ptotal= 50.13 mm

IDF curve parameters: A=3175.000
 B= 20.000
 C= 1.000

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

Duration of storm = 6.00 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	0.53	1.50	11.75		3.00	3.92	4.50	0.92
0.17	0.64	1.67	35.26		3.17	3.14	4.67	0.83
0.33	0.78	1.83	105.83		3.33	2.57	4.83	0.74
0.50	0.98	2.00	47.04		3.50	2.14	5.00	0.67
0.67	1.26	2.17	23.53		3.67	1.81	5.17	0.61
0.83	1.68	2.33	14.12		3.83	1.55	5.33	0.56
1.00	2.35	2.50	9.41		4.00	1.35	5.50	0.51
1.17	3.52	2.67	6.72		4.17	1.18	5.67	0.47
1.33	5.87	2.83	5.04		4.33	1.04	5.83	0.43

```

-----
| CALIB |
| NASHYD ( 0204) | Area (ha)= 0.12 Curve Number (CN)= 74.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 0.22

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.53	1.583	11.75	3.083	3.92	4.58	0.92
0.167	0.53	1.667	11.75	3.167	3.92	4.67	0.92
0.250	0.64	1.750	35.26	3.250	3.14	4.75	0.83
0.333	0.64	1.833	35.26	3.333	3.14	4.83	0.83
0.417	0.78	1.917	105.83	3.417	2.57	4.92	0.74
0.500	0.78	2.000	105.83	3.500	2.57	5.00	0.74
0.583	0.98	2.083	47.04	3.583	2.14	5.08	0.67
0.667	0.98	2.167	47.04	3.667	2.14	5.17	0.67
0.750	1.26	2.250	23.53	3.750	1.81	5.25	0.61
0.833	1.26	2.333	23.53	3.833	1.81	5.33	0.61
0.917	1.68	2.417	14.12	3.917	1.55	5.42	0.56
1.000	1.68	2.500	14.12	4.000	1.55	5.50	0.56
1.083	2.35	2.583	9.41	4.083	1.35	5.58	0.51
1.167	2.35	2.667	9.41	4.167	1.35	5.67	0.51
1.250	3.52	2.750	6.72	4.250	1.18	5.75	0.47
1.333	3.52	2.833	6.72	4.333	1.18	5.83	0.47
1.417	5.87	2.917	5.04	4.417	1.04	5.92	0.43
1.500	5.87	3.000	5.04	4.500	1.04	6.00	0.43

Unit Hyd Qpeak (cms)= 0.021

PEAK FLOW (cms)= 0.006 (i)

TIME TO PEAK (hrs)= 2.250

RUNOFF VOLUME (mm)= 15.132

TOTAL RAINFALL (mm)= 50.128

RUNOFF COEFFICIENT = 0.302

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

```

-----
| CALIB |
| STANDHYD ( 0202) | Area (ha)= 0.29
| ID= 1 DT= 5.0 min | Total Imp(%)= 57.00 Dir. Conn.(%)= 21.00
-----

```

IMPERVIOUS PERVIOUS (i)

Surface Area	(ha)=	0.17	0.12
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	43.97	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.53	1.583	11.75	3.083	3.92	4.58	0.92
0.167	0.53	1.667	11.75	3.167	3.92	4.67	0.92
0.250	0.64	1.750	35.26	3.250	3.14	4.75	0.83
0.333	0.64	1.833	35.26	3.333	3.14	4.83	0.83
0.417	0.78	1.917	105.83	3.417	2.57	4.92	0.74
0.500	0.78	2.000	105.83	3.500	2.57	5.00	0.74
0.583	0.98	2.083	47.04	3.583	2.14	5.08	0.67
0.667	0.98	2.167	47.04	3.667	2.14	5.17	0.67
0.750	1.26	2.250	23.53	3.750	1.81	5.25	0.61
0.833	1.26	2.333	23.53	3.833	1.81	5.33	0.61
0.917	1.68	2.417	14.12	3.917	1.55	5.42	0.56
1.000	1.68	2.500	14.12	4.000	1.55	5.50	0.56
1.083	2.35	2.583	9.41	4.083	1.35	5.58	0.51
1.167	2.35	2.667	9.41	4.167	1.35	5.67	0.51
1.250	3.52	2.750	6.72	4.250	1.18	5.75	0.47
1.333	3.52	2.833	6.72	4.333	1.18	5.83	0.47
1.417	5.87	2.917	5.04	4.417	1.04	5.92	0.43
1.500	5.87	3.000	5.04	4.500	1.04	6.00	0.43

Max.Eff.Inten.(mm/hr)=	105.83	85.33
over (min)	5.00	10.00
Storage Coeff. (min)=	1.53 (ii)	9.05 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.33	0.12

TOTALS

PEAK FLOW (cms)=	0.02	0.02	0.034 (iii)
TIME TO PEAK (hrs)=	2.00	2.08	2.00
RUNOFF VOLUME (mm)=	49.13	23.41	28.80
TOTAL RAINFALL (mm)=	50.13	50.13	50.13
RUNOFF COEFFICIENT =	0.98	0.47	0.57

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 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( 0402) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----

```

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
------------------	--------------------	------------------	--------------------

**** WARNING : FIRST OUTFLOW IS NOT ZERO.

0.0040	0.0000	0.0120	0.0071
0.0050	0.0002	0.0130	0.0078
0.0060	0.0006	0.0130	0.0086
0.0070	0.0011	0.0140	0.0093
0.0080	0.0018	0.0140	0.0101
0.0090	0.0026	0.0150	0.0116
0.0090	0.0033	0.0150	0.0123
0.0100	0.0041	0.0160	0.0133
0.0110	0.0056	0.0160	0.0136
0.0120	0.0063	0.0170	0.0137

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0202)	0.290	0.034	2.00	28.80
OUTFLOW: ID= 1 (0402)	0.290	0.009	2.58	28.93

PEAK FLOW REDUCTION [Qout/Qin](%)= 27.80
 TIME SHIFT OF PEAK FLOW (min)= 35.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0036

```

-----
| CALIB          |
| STANDHYD ( 0203) |
| ID= 1 DT= 5.0 min |
-----

```

Area (ha)= 0.38
 Total Imp(%)= 90.00 Dir. Conn.(%)= 90.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.34	0.04
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	50.33	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.53	1.583	11.75	3.083	3.92	4.58	0.92
0.167	0.53	1.667	11.75	3.167	3.92	4.67	0.92
0.250	0.64	1.750	35.26	3.250	3.14	4.75	0.83

0.333	0.64	1.833	35.26	3.333	3.14	4.83	0.83
0.417	0.78	1.917	105.83	3.417	2.57	4.92	0.74
0.500	0.78	2.000	105.83	3.500	2.57	5.00	0.74
0.583	0.98	2.083	47.04	3.583	2.14	5.08	0.67
0.667	0.98	2.167	47.04	3.667	2.14	5.17	0.67
0.750	1.26	2.250	23.53	3.750	1.81	5.25	0.61
0.833	1.26	2.333	23.53	3.833	1.81	5.33	0.61
0.917	1.68	2.417	14.12	3.917	1.55	5.42	0.56
1.000	1.68	2.500	14.12	4.000	1.55	5.50	0.56
1.083	2.35	2.583	9.41	4.083	1.35	5.58	0.51
1.167	2.35	2.667	9.41	4.167	1.35	5.67	0.51
1.250	3.52	2.750	6.72	4.250	1.18	5.75	0.47
1.333	3.52	2.833	6.72	4.333	1.18	5.83	0.47
1.417	5.87	2.917	5.04	4.417	1.04	5.92	0.43
1.500	5.87	3.000	5.04	4.500	1.04	6.00	0.43

Max.Eff.Inten.(mm/hr)= 105.83 27.08
over (min) 5.00 5.00
Storage Coeff. (min)= 1.65 (ii) 4.52 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.32 0.23

TOTALS

PEAK FLOW (cms)= 0.10 0.00 0.103 (iii)
TIME TO PEAK (hrs)= 2.00 2.00 2.00
RUNOFF VOLUME (mm)= 49.13 15.16 45.73
TOTAL RAINFALL (mm)= 50.13 50.13 50.13
RUNOFF COEFFICIENT = 0.98 0.30 0.91

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 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.

DUHYD (0005)				
Inlet Cap.= 0.103				
#of Inlets= 1				
Total(cms)= 0.1				

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
TOTAL HYD.(ID= 1):	0.38	0.10	2.00	45.73
=====				
MAJOR SYS.(ID= 2):	0.00	0.00	2.00	45.73
MINOR SYS.(ID= 3):	0.38	0.10	2.00	45.73

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 | ADD HYD (0901) |
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0204):	0.12	0.006	2.25	15.13
+ ID2= 2 (0402):	0.29	0.009	2.58	28.93
=====				
ID = 3 (0901):	0.41	0.015	2.25	24.89

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 | ADD HYD (0901) |
3 + 2 = 1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0901):	0.41	0.015	2.25	24.89
+ ID2= 2 (0005):	0.38	0.103	2.00	45.73
=====				
ID = 1 (0901):	0.79	0.113	2.00	34.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 | RESERVOIR(0403) |
 | IN= 2---> OUT= 1 |
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0210	0.0109
0.0010	0.0009	0.0230	0.0127
0.0060	0.0018	0.0250	0.0145
0.0090	0.0027	0.0260	0.0154
0.0110	0.0036	0.0270	0.0172
0.0140	0.0054	0.0290	0.0191
0.0170	0.0073	0.0300	0.0209
0.0180	0.0082	0.0310	0.0218
0.0190	0.0091	0.0320	0.0236
0.0200	0.0100	0.0330	0.0245

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0901)	0.790	0.113	2.00	34.91
OUTFLOW: ID= 1 (0403)	0.790	0.023	2.58	34.63

PEAK FLOW REDUCTION [Qout/Qin](%)= 20.37
 TIME SHIFT OF PEAK FLOW (min)= 35.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0127

Junction Command(0002)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 1(0403)	0.79	0.02	2.58	34.63
OUTFLOW: ID= 2(0002)	0.79	0.02	2.58	34.63

| CALIB |
| NASHYD (0303) | Area (ha)= 0.55 Curve Number (CN)= 74.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.24

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.53	1.583	11.75	3.083	3.92	4.58	0.92
0.167	0.53	1.667	11.75	3.167	3.92	4.67	0.92
0.250	0.64	1.750	35.26	3.250	3.14	4.75	0.83
0.333	0.64	1.833	35.26	3.333	3.14	4.83	0.83
0.417	0.78	1.917	105.83	3.417	2.57	4.92	0.74
0.500	0.78	2.000	105.83	3.500	2.57	5.00	0.74
0.583	0.98	2.083	47.04	3.583	2.14	5.08	0.67
0.667	0.98	2.167	47.04	3.667	2.14	5.17	0.67
0.750	1.26	2.250	23.53	3.750	1.81	5.25	0.61
0.833	1.26	2.333	23.53	3.833	1.81	5.33	0.61
0.917	1.68	2.417	14.12	3.917	1.55	5.42	0.56
1.000	1.68	2.500	14.12	4.000	1.55	5.50	0.56
1.083	2.35	2.583	9.41	4.083	1.35	5.58	0.51
1.167	2.35	2.667	9.41	4.167	1.35	5.67	0.51
1.250	3.52	2.750	6.72	4.250	1.18	5.75	0.47
1.333	3.52	2.833	6.72	4.333	1.18	5.83	0.47
1.417	5.87	2.917	5.04	4.417	1.04	5.92	0.43
1.500	5.87	3.000	5.04	4.500	1.04	6.00	0.43

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.025 (i)
TIME TO PEAK (hrs)= 2.250
RUNOFF VOLUME (mm)= 15.141
TOTAL RAINFALL (mm)= 50.128
RUNOFF COEFFICIENT = 0.302

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

```
-----
| ADD HYD ( 0902) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
      ID1= 1 ( 0303):  0.55  0.025  2.25  15.14
+ ID2= 2 ( 0005):  0.00  0.000  2.00  45.73
=====
      ID = 3 ( 0902):  0.55  0.025  2.25  15.15
-----
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| Junction Command(0003) |
-----
```

```
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 1( 0902)  0.55  0.03  2.25  15.15
OUTFLOW: ID= 2( 0003)  0.55  0.03  2.25  15.15
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-----
| CALIB
| STANDHYD ( 2011) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 0.61
Total Imp(%)= 64.00 Dir. Conn.(%)= 30.00
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```
          IMPERVIOUS      PERVIOUS (i)
Surface Area (ha)= 0.39 0.22
Dep. Storage (mm)= 1.00 5.00
Average Slope (%)= 1.00 2.00
Length (m)= 63.77 40.00
Mannings n = 0.013 0.250
-----
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NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

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----- TRANSFORMED HYETOGRAPH -----
TIME    RAIN | TIME    RAIN | TIME    RAIN | TIME    RAIN
  hrs   mm/hr |  hrs   mm/hr |  hrs   mm/hr |  hrs   mm/hr
0.083   0.53 | 1.583  11.75 | 3.083   3.92 | 4.58   0.92
0.167   0.53 | 1.667  11.75 | 3.167   3.92 | 4.67   0.92
0.250   0.64 | 1.750  35.26 | 3.250   3.14 | 4.75   0.83
0.333   0.64 | 1.833  35.26 | 3.333   3.14 | 4.83   0.83
0.417   0.78 | 1.917 105.83 | 3.417   2.57 | 4.92   0.74
-----
```

0.500	0.78	2.000	105.83	3.500	2.57	5.00	0.74
0.583	0.98	2.083	47.04	3.583	2.14	5.08	0.67
0.667	0.98	2.167	47.04	3.667	2.14	5.17	0.67
0.750	1.26	2.250	23.53	3.750	1.81	5.25	0.61
0.833	1.26	2.333	23.53	3.833	1.81	5.33	0.61
0.917	1.68	2.417	14.12	3.917	1.55	5.42	0.56
1.000	1.68	2.500	14.12	4.000	1.55	5.50	0.56
1.083	2.35	2.583	9.41	4.083	1.35	5.58	0.51
1.167	2.35	2.667	9.41	4.167	1.35	5.67	0.51
1.250	3.52	2.750	6.72	4.250	1.18	5.75	0.47
1.333	3.52	2.833	6.72	4.333	1.18	5.83	0.47
1.417	5.87	2.917	5.04	4.417	1.04	5.92	0.43
1.500	5.87	3.000	5.04	4.500	1.04	6.00	0.43

Max.Eff.Inten.(mm/hr)= 105.83 94.07
over (min) 5.00 10.00
Storage Coeff. (min)= 1.91 (ii) 9.14 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.32 0.12

TOTALS

PEAK FLOW (cms)= 0.05 0.04 0.085 (iii)
TIME TO PEAK (hrs)= 2.00 2.08 2.00
RUNOFF VOLUME (mm)= 49.13 24.20 31.67
TOTAL RAINFALL (mm)= 50.13 50.13 50.13
RUNOFF COEFFICIENT = 0.98 0.48 0.63

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 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.

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| RESERVOIR( 4011) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
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OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0080	0.0015	0.0130	0.0175
0.0080	0.0018	0.0130	0.0195
0.0080	0.0024	0.0140	0.0215
0.0090	0.0036	0.0140	0.0235
0.0090	0.0056	0.0150	0.0279
0.0100	0.0076	0.0150	0.0292
0.0110	0.0096	0.0160	0.0309
0.0110	0.0116	0.0160	0.0326
0.0120	0.0136	0.0170	0.0343

**** WARNING : FIRST OUTFLOW IS NOT ZERO.

	0.0120	0.0156		0.0170	0.0362
	AREA	QPEAK		TPEAK	R.V.
	(ha)	(cms)		(hrs)	(mm)
INFLOW : ID= 2 (2011)	0.610	0.085		2.00	31.67
OUTFLOW: ID= 1 (4011)	0.610	0.011		2.83	31.61

PEAK FLOW REDUCTION [Qout/Qin](%)= 13.30
 TIME SHIFT OF PEAK FLOW (min)= 50.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0121

CALIB	
STANDHYD (2012)	Area (ha)= 0.85
ID= 1 DT= 5.0 min	Total Imp(%)= 64.00 Dir. Conn.(%)= 28.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.54	0.31
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	75.28	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.53	1.583	11.75	3.083	3.92	4.58	0.92
0.167	0.53	1.667	11.75	3.167	3.92	4.67	0.92
0.250	0.64	1.750	35.26	3.250	3.14	4.75	0.83
0.333	0.64	1.833	35.26	3.333	3.14	4.83	0.83
0.417	0.78	1.917	105.83	3.417	2.57	4.92	0.74
0.500	0.78	2.000	105.83	3.500	2.57	5.00	0.74
0.583	0.98	2.083	47.04	3.583	2.14	5.08	0.67
0.667	0.98	2.167	47.04	3.667	2.14	5.17	0.67
0.750	1.26	2.250	23.53	3.750	1.81	5.25	0.61
0.833	1.26	2.333	23.53	3.833	1.81	5.33	0.61
0.917	1.68	2.417	14.12	3.917	1.55	5.42	0.56
1.000	1.68	2.500	14.12	4.000	1.55	5.50	0.56
1.083	2.35	2.583	9.41	4.083	1.35	5.58	0.51
1.167	2.35	2.667	9.41	4.167	1.35	5.67	0.51
1.250	3.52	2.750	6.72	4.250	1.18	5.75	0.47
1.333	3.52	2.833	6.72	4.333	1.18	5.83	0.47
1.417	5.87	2.917	5.04	4.417	1.04	5.92	0.43
1.500	5.87	3.000	5.04	4.500	1.04	6.00	0.43

Max.Eff.Inten.(mm/hr)= 105.83 98.69

over (min)	5.00	10.00	
Storage Coeff. (min)=	2.11 (ii)	9.20 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.31	0.12	
			TOTALS
PEAK FLOW (cms)=	0.07	0.06	0.115 (iii)
TIME TO PEAK (hrs)=	2.00	2.08	2.00
RUNOFF VOLUME (mm)=	49.13	24.59	31.45
TOTAL RAINFALL (mm)=	50.13	50.13	50.13
RUNOFF COEFFICIENT =	0.98	0.49	0.63

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 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(4012)		OVERFLOW IS OFF		
IN= 2---> OUT= 1				
DT= 5.0 min				

**** WARNING : FIRST OUTFLOW IS NOT ZERO.				
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0080	0.0020	0.0480	0.0257
	0.0160	0.0040	0.0500	0.0277
	0.0210	0.0059	0.0520	0.0296
	0.0320	0.0119	0.0540	0.0316
	0.0350	0.0138	0.0560	0.0336
	0.0370	0.0158	0.0570	0.0356
	0.0400	0.0178	0.0590	0.0375
	0.0420	0.0198	0.0600	0.0395
	0.0440	0.0217	0.0610	0.0405
	0.0460	0.0237	0.0000	0.0000
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (2012)	0.850	0.115	2.00	31.45
OUTFLOW: ID= 1 (4012)	0.850	0.034	2.50	31.38
PEAK FLOW REDUCTION [Qout/Qin](%)= 29.28				
TIME SHIFT OF PEAK FLOW (min)= 30.00				
MAXIMUM STORAGE USED (ha.m.)= 0.0130				

 | ADD HYD (0001) |

1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (4011):	0.61	0.011	2.83	31.61
+ ID2= 2 (4012):	0.85	0.034	2.50	31.38
=====				
ID = 3 (0001):	1.46	0.045	2.58	31.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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