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Project Number: 1614-14473 Date: August 2024

Sign-off Sheet

This document entitled Smithville Phase 3A/Block Plan 9, Smithville, Ontario Functional Servicing Report was prepared by Stantec Consulting Ltd. ("Stantec") for the account of Lockbridge Development Inc. ("Client") to support the Block Plan Submission and Draft Plan Application Submission (the "Application") for a portion of Smithville Phase 3A/Block Plan Area 9 (the "Project"). In connection thereto, this document may be reviewed and used by the provincial and municipal government agencies participating in the permitting process in the normal course of their duties. Except as set forth in the previous sentence, any reliance on this document by any third party for any other purpose is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

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Introduction August 2024

1.0 Introduction

The purpose of this Report is to outline how Stage 1 Draft Plan of the Subject Lands and Block Plan for Phase 3A can be developed with full municipal services, including grading, sanitary, storm drainage, domestic water and utility services. This Report is in support of the proposed Block Plan and Draft Plan of Subdivision Approval.

Stantec Consulting Ltd. (Stantec) was retained by Lockbridge Development (the "Client") to complete a Functional Servicing Report (FSR) in support of Draft Plan for Stage 1 and Block Plan Area 9 Approvals located in Smithville (Town), Township of West Lincoln (Township), Region of Niagara (Region). Block Plan Area 9 is bounded by Port Davidson Road to the west, Townline Road to the North, agricultural/non-urban lands to the south and existing residential and agricultural lands to the east.

Smithville has expanded their Urban Boundary and the subject lands are within the Phase 3A Urban Expansion. As noted in preconsultation for both the Block Plan and Draft Plan, the Block Plan has been developed in conjunction with three (3) Owners/Developers, Lockbridge Development, Hendler Properties and Kingma Properties, who combined make approximately 33.2ha. Figure 1 illustrates the Block Plan Area 9 site location. Property fronting Townline Road and/or Port Davidson Road to the northwest and east of abandoned rail corridor/Shurie Road to the east, have not been studied or included in this Block Plan Submission. These lands have been conceptually incorporated in the preliminary design and will need further studies to meet the Block Planning requirements. Through this report, the aforementioned lands will be mentioned as *Ultimate Block Plan* and will be discussed in sections outlining municipal servicing strategies.

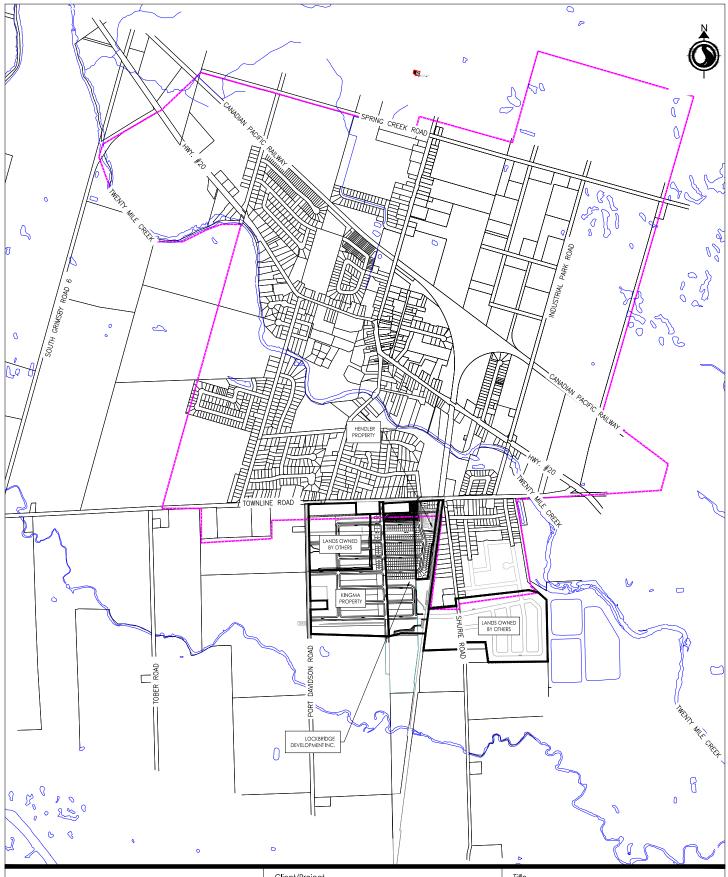
The Entire Total Area of Block Plan Area 9 which is part of Phase 3A is 63.5ha hectares (ha) and it consists of other multiple owners/developers.

1.1 BACKGROUND/OVERVIEW

The Township of West Lincoln has completed an Urban Boundary Expansion in 2023. As part of this Expansion, Block Plan Area 9 is one of fourteen Block Plan Areas that was successfully brought into the Smithville Urban Boundary under Official Plan Amendment (OPA) 63. Various studies were completed in support of OPA 63 including the Draft Smithville Master Community Plan – Water and Wastewater Master Servicing Plan (listed below).

The purpose of this FSR is to demonstrate how Block Plan Area 9 can be developed with municipal services including sanitary, domestic water, storm drainage, stormwater management (SWM) and utilities in accordance with applicable municipal standards and related requirements of the various approval agencies/authorities.







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BLOCK PLAN AREA 9 SMITHVILLE 3A

Project No. 161414473 SITE LOCATION

Revision	Date 2024-08-16	
Reference Sheet	Figure No.	

Introduction August 2024

The servicing strategies presented in this Report are conceptual in nature; detailed engineering drawings and a final SWM Report will be prepared as part of the detailed design process once the Block and Draft Plans have been approved. The proposed Block Plan and the conclusions of the Smithville Master Community Plan studies form the basis of the preliminary engineering strategies for the site.

This report is to be read in conjunction with the following reports which provide the basis for servicing and stormwater management strategies for the complete development build-out:

- Smithville Master Community Plan Water and Wastewater Master Servicing Plan (Draft), prepared by AECOM, dated January 2023
- 2021 Water and Wastewater Master Servicing Plan Update, Niagara Region, prepared by GM Blue Plan Engineering, dated December 2023
- Geotechnical Investigation, Smithville 3A/Block Plan Area 9 Smithville, ON, prepared by Stantec Consulting Ltd., dated July 2, 2024
- HydroGeotechnical Investigation, Smithville 3A/Block Plan Area 9 Smithville, ON, prepared by Stantec Consulting Ltd., dated July, 2024
- Geotechnical Desktop Study, Smithville 3A/Block Plan Area 9, Townline and Port Davidson Road, Smithville, ON, prepared by Stantec Consulting Ltd., dated July 2, 2024
- Karst Assessment, Stage 3A, Lockbridge Developments, Smithville ON, prepared by Terra-Dynamics Consulting Inc., dated July 25, 2024
- Traffic Impact Study, Smithville 3A Block Plan Area 9 Development, in West Lincoln, Ontario, prepared by Stantec Consulting Ltd., dated August 19, 2024
- Proposed Residential Development Smithville Phase 3A/Block Plan Area 9 Submission, Smithville,
 Ontario Noise Impact Study, prepared by Stantec Consulting Ltd., dated August 2024



Existing Conditions August 2024

2.0 Existing Conditions

2.1 LAND USE AND TOPOGRAPHY

The existing predevelopment site conditions for the Block Plan Area 9 are illustrated on Drawings C-050 and C-051 provided in Appendix A.

The subject lands are currently undeveloped agricultural lands. Legal Boundary Information and existing topographic information was obtained from by Metropolitan Consulting Inc, May 2022 via Landsmith Engineering.

There are two (2) existing culverts in the north along Townline Road, a 600 mm dia. and a 900 mm dia., a karst feature located in the northern portion of the site and surface drainage features within the Block Plan site. The 600 mm dia. discharges surface flows from the existing swale (from the abandoned rail corridor) to the storm sewer system along Townline Road with the remaining northern lands directed to the existing 900 mm dia. culvert crossing Townline Road.

The topography of the Block Plan site ranges from ±186 m asl to ±191 m. The site is generally split by a central high point. Generally, the northeastern portion of the site flows northeast to aforementioned existing culvert discharging under Townline Road. The southern portion drains to an existing water feature, and western lands fronting Port Davidson drain to existing 600 mm dia, culvert crossing underneath under Port Davidson Road or directed further south.

2.2 GEOTECHNICAL INFROMATION

A Geotechnical Investigation was completed on the Block Plan Area 9 (Stantec, July 2024), for the lands owned by Lockbridge Developments, Hendler Properties and Kingma Properties. A Desktop Study was also completed for the balance of lands within the Northwest portion of the Block Plan, contiguous to the Draft Plan.

A total of twenty-seven (27) boreholes were installed and were advanced to depths of 2.3 m to 11.4 m below ground below ground surface (BGS), terminating at inferred bedrock in some locations and/or at various depth within the bedrock. The subsurface conditions encountered in boreholes were found to be approximately 460 mm thick topsoil, underlain by clay and dolostone bedrock.

Nine (9) additional boreholes equipped with single monitoring wells and three (3) multi-level monitoring wells were installed within the site. Water level monitoring readings during installation from February 27, 2024 to March 5, 2024 were found to range from approximately 1.0 m to 2.5 m above the bedrock and 1.0 m to 7.0 m BGS at the monitoring wells.



Existing Conditions August 2024

For further details on the geotechnical characteristics of the site, please refer to the Reports referenced in Section 1.1.

2.3 KARST INFORMATION

One karst hazard has been identified in the vicinity of the site (see the Karst Assessment for more details). A sinkhole has been identified and is located within the northern portion of the site. The sinkhole's water travels under Townline Road via the 900 mm dia. culvert and eventually joins the existing Rock St spring.

In support of Block Plan Approval, Terra-Dynamics Consulting Inc. completed a Karst Assessment for the site (July 2024). It is stated in the Report that there should be no ecological risk to the Twenty Mile Creek or downstream channel through Rock Street Park and is subject to a permit process close-out or remediation.

For further details on the Karst characteristics of the site, please refer to the reports referenced in Section 1.1.



Concept Plan August 2024

3.0 Concept Plan

3.1 DRAFT PLAN STAGE 1

The Draft Plan for Stage 1 is provided in Appendix B as prepared by Arcadis Canada Inc. The Draft Plan has two main entrances off Townline Road, and consists of a combination of single-detached, semi-detached homes, one multi-family block, Gas Easement Park, Open Space/Trails and a Stormwater Management Facility (SWMF) Block. Lockbridge Development consists of 105 single-detached homes and Hendler Property consist of 32 single-detached, 12 semi-detached, and estimate 30 townhouses within a multi-family block. Kingma Properties owns the lands west of new Street B comprising of 17 single-family lots for totaling of 196 residential units. The total area of the Stage 1 Draft Plan lands is 12.5ha.

3.2 BLOCK PLAN AREA 9

The Block Plan for the subject site is provided in Appendix B and was also prepared by Arcadis Inc. This plan incorporates the Stage 1 Draft Plan (as mentioned above) and shows an additional three entrances at Port Davidson Road and 2 entrances in the southeast at Shurie Road and Alma Drive that will connect to the existing subdivision. Within the Block Plan, there are single-detached homes, multi-residential units, neighbourhood parks, as well as a SWMF in the south end.



Grading August 2024

4.0 Grading

Preliminary Grading Plans are provided in Appendix C, Drawings C-400 and C-401. The Concept Plans (as referenced in Section 3.0) were used as a base plan for the preliminary grading design. In addition, the associated roads profiles are also included in Appendix C, Drawings C-200, C-201 and C-202 to show how the Municipal Road Design Standards have been followed (within the Block Plan).

Based on the Smithville Master Community Plan, 20 m wide local road cross-section and 22 m wide collector road cross-section was utilized for the subject Draft Plan and is shown on Figures 2.1 and 2.2.

The road grades within the proposed concept plans generally range from a minimum of 0.5% to a maximum of 6.0% to match the perimeter grades, maintain existing topography, cover over the existing gas easement, and overland flow to the proposed stormwater management facilities, as well as maintain minimum cover for local utilities (hydro, gas and communications).

The proposed lot grading within the site ranges from a minimum grade of 2% to a maximum of 6.0%; however, 3:1 (horizontal and vertical) transitions slopes are utilized to accommodate the various grades changes within the subdivision. Combinations of 'A' Type (back to front), 'B' type (rear walkouts), and 'D' type (split drainage) lots are planned for the design of this development, as shown on Drawings C-400 and C-401.

With the single-detached homes and semi-detached homes adjacent to Block 66 (the abandoned existing Rail Corridor), the backyards will drain discharge onto Block 66. Proposed catchbasins within the Block will intercept and direct the surface water under the proposed trail to the existing swale before it discharges to the existing 600 mm dia. culvert at Townline Road.

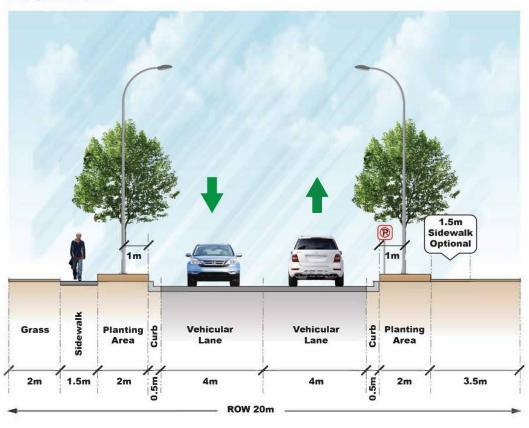
Preliminary earthworks calculations have been performed based on the preliminary road profile and Lot Grading Plans. Surplus topsoil is to be reused onsite as fill where feasible, to minimize the export of surplus topsoil materials and import of fill to address the fill shortage. The Conceptual Cut/Fill Plan and earth quantities is provided on Drawings C-900 and C-901 in Appendix C.

It should be noted that grades follow existing drainage patterns where possible. The current/existing high point in the site remains generally unchanged – the drainage patterns proposed are generally in keeping with existing conditions.



Streetscape Cross Section - Local Road

Local Road



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Client/Project
LOCKBRIDGE DEVELOPMENT INC.

BLOCK AREA 9 SMITHVILLE 3A

Project No. 161414473

Title

TYPICAL ROAD CROSS-SECTION, 20.0M

Revision

Date 2024-07-10

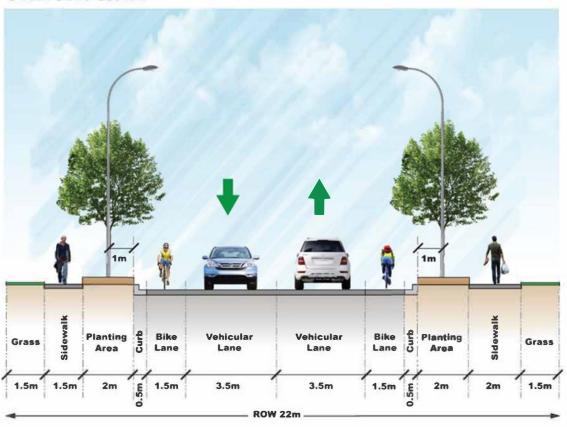
Reference Sheet

Figure No. 2.1

Smithville Master Community Plan Integrated Municipal Class Environmental Assessment

Streetscape Cross Section – Collector Road

Collector Road



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Client/Project

LOCKBRIDGE DEVELOPMENT INC.

BLOCK AREA 9 SMITHVILLE 3A

Project No. 161414473

Title

TYPICAL ROAD CROSS-SECTION, 22.0M

Revision

Date 2024-07-09

Reference Sheet

Figure No. 2.2

Grading August 2024

In addition to matching existing grades around the perimeter of the site, the grading design also accounts for AODA accessible pedestrian access to the parklands, trails and walkways.

Other Grading design constraints include:

- Maintain cover around and above Enbridge pipeline corridor
- 5.0% maximum grade (standard for Park Blocks)
- Match existing grades, where possible, to minimize grading and cut/fill quantities and minimize changes to the surface hydrology of the site
- Provide major overland flow conveyance from the site through to the proposed stormwater management facilities
- Satisfy the Township of West Lincoln's requirements for minimum and maximum road grades
- Maintain adequate cover over storm and sanitary sewers, and watermains



Watermain Servicing August 2024

5.0 Watermain Servicing

5.1 EXISTING WATERMAIN SYSTEM

Smithville is currently serviced by the Grimsby Water Treatment Plant that supplies the domestic water to local municipalities through a series of watermain networks, pumping stations and reservoirs. The Grimsby Water Plant provides treatment and pumps water to service Smithville. Smithville does have its own elevated water tank, pumping station and reservoirs.

From the 2021 Niagara Region Master Servicing Plan Update (2021 MSP), an overview of the existing water system for the Grimsby Water Treatment Plant can be found in Appendix D, Figure 3.A.1.

The 2021 MSP outlines the existing water usage data and the capacities of the existing water infrastructure within Smithville. Using the information presented in the 2021 MSP Report, Smithville can design and size the watermains to service the expansion of the Urban Boundary and balance of the subject lands to the south within Block Plan Area 9.

5.2 STAGE 1 DRAFT PLAN

The proposed site will connect to the existing watermain along Townline Road at the proposed intersections at Streets A and Street B. The existing watermain on Townline Road is a 150 mm dia. PVC pipe as shown in Appendix C, Preliminary Servicing Plans, Drawings C-100 and C-101.

The following sections outline the domestic water demand and fire flow requirements for the proposed development.

5.2.1 Domestic Use

Based on the domestic water demand calculations completed for the proposed development included in Appendix D, full occupancy of the proposed development is expected to have an average day demand of approximately 172.5 m³/day (2.0 L/s), a maximum day demand of approximately 345 m³/day (4.0 L/s), and a peak hour demand of approximately 690 m³/day (8.0 L/s).



Watermain Servicing August 2024

The projected domestic water demand was calculated based on the following criteria for the proposed development:

 Population density (ppu) for each housing type based on the 2024 Development Charges Background Study for Township of West Lincoln as noted below:

Single-Detached Units: 3.07 ppu
 Semi-Detached Units: 3.07 ppu
 Townhouse Units: 2.16 ppu

- A residential water usage rate of 300 L/c/d based on the 2016 Master Servicing Plan Update for the Region of Niagara
- A maximum day demand factor of 2.0, and a peak hour factor of 4.0 based on the 2016 Master Servicing Plan Update for the Region of Niagara

5.2.2 Fire Flow Requirements

According to the Region of Niagara design criteria, the fire flow requirements for any development shall be determined in accordance with the current issue of the Water Supply for Public Fire Protection, Fire Underwriter's Survey (FUS). The FUS manual outlines the following criteria for the fire flow requirements:

- Modern semi and detached homes >3 m separation 4,000 L/min (67 L/S)
- Modern semi and detached homes <3 m separation 6,000 L/min (100 L/S)
- High density, contiguous multi-block homes 8,000 L/min (133 L/S)

Assuming a worst-case scenario where the majority of the proposed residences may be within a 3 m separation of each other, the larger 100 L/S fire flow is generally used in the water modeling of semi and single-detached residential areas. The multi-residential blocks (i.e., townhouses) are generally modeled using the 133 L/S fire flow demand.

5.2.3 Water Servicing Strategy

The subdivision's domestic water and fire flow servicing will be provided via connections to the Townline Road watermain. A Water Distribution Analysis will be completed by the Township to identify the appropriate sizes of the proposed watermains within the development to adequately distribute the above-noted projected water demands including fire flow demands and to confirm that the required fire flows can be achieved through the proposed fire hydrants onsite under various domestics and fire demand scenarios within the subdivision.



Watermain Servicing August 2024

5.3 BLOCK PLAN AREA 9

To service the remainder of Block Plan Area 9 (not including the Draft Plan Stage 1), the remainder of site will require the design and construction of the Phase 2 distribution watermain (servicing lands south of the creek). This includes new watermains throughout Phases 3A and 3B and Phase 4 lands, and upgrades along Townline Road and Port Davidson Road that are outlined in Smithville's 2023 Master Community Plan prepared by AECOM.

Further review of these required upgrades should commence immediately by the Region and Township such to allow additional lands to be brought on stream. It is our understanding that these upgrades are needed for any portion of the Block Plan to be developed beyond the current proposed stage presented in this Report.



Sanitary Servicing August 2024

6.0 Sanitary Servicing

6.1 EXISTING SANITARY SYSTEM

Within Smithville, there are two Sanitary Pumping Stations (SPS), Streamside SPS and Smithville SPS. Streamside SPS collects sanitary flows from Streamside Subdivision located on the east side of Smithville and pumps it to the sanitary collection system of Smithville SPS. Smithville SPS collects sanitary flows from the Streamside SPS and the rest of the serviced area of Smithville and pumps it to Grimsby's sanitary drainage system ultimately discharging to Baker Road Wastewater Treatment Plant located in Grimsby.

Based on the 2021 Niagara Region Master Servicing Plan (2021 MSP), Streamside SPS has an operational firm capacity of 16 L/s and the Smithville SPS has an operational firm capacity of 104L/s.

An overview of the existing wastewater system for the Baker Road Wastewater Treatment Plant serving Smithville and other areas as presented in the 2021 MSP can be found in Appendix E-1, Figure 4.A.1.

6.2 STAGE 1 DRAFT PLAN

The Stage 1 Draft Plan is within the northern portion of the Block Plan Area 9. From Smithville's Master Community Plan, it indicates that a portion of the northern half of Block Plan 9 can discharge by gravity to the existing Smithville SPS via existing creek crossing under Twenty Mile Creek via existing sewers along Anderson Crescent and Townline Road.

In reference to Drawing C-100 in Appendix C, the proposed sanitary sewer design from the site includes a 200 mm dia. sewer that discharges sanitary flows to the existing 200 mm dia. sewer along Townline Road at the proposed intersection at Street A. Throughout the site, the proposed depth of cover over the sanitary sewer ranges from 2.8 m to 5.0 m.

The proposed sanitary flow discharging from Stage 1 of the Subject Draft Plan is estimated at 8.86L/s resulting in the proposed sanitary flow crossing under the creek of 33.41L/s. With the additional flow from Stage 1 of the Subject Draft Plan discharging to the pipe under the creek crossing, the theoretical flow within this pipe has exceeded the theoretical capacity of this sanitary sewer. A Sanitary Drainage Plan and Design Sheet for Stage 1 Draft Plan lands can be found in Appendix E-2.

It should be noted that Stantec had prepared a memo in October 2023 that outlined the approach and methodology for the sanitary flow calculations discharging to the Smithville SPS. It can be found in Appendix E-3.



Sanitary Servicing August 2024

In correspondences with the Township of West Lincoln, the Township has shared sanitary flow monitoring data (Appendix E-4) at an existing manhole on Anderson Crescent (CIV 9) before it discharges to the creek crossing to the existing Smithville Pumping Station. The data monitoring is from September 2023 to January 2024 with the highest peak flow measured at 11.57L/s on January 9, 2024 to January 10, 2024.

It should be noted that the theoretical design flow without the proposed Stage 1 Draft Plan Lands added is 24.55L/s (33.41L/s -8.86 L/s). The monitored flow from CV9 is 11.57L/s from January 2024, which is less than half the theoretical flow within the system, indicating an ability for the system to accommodate the additional flows from the Stage 3A Draft Plan into the existing sewer system without the need for upgrading. By adding the monitored flow from the existing system and the proposed flow from Stage 1 Draft Plan Lands, the combined sanitary flow generated is estimated at 19.70L/s. The Sanitary Design Sheet showing the calculations can be found in Appendix E-5.

Further, calculations have been undertaken to consider a scenario whereby the existing built-up area within the existing sanitary catchment (that discharges through Andrew Cresent) intensifies, resulting in the need for additional capacity. These calculations were carried out on the basis of including People Per Unit (PPU) instead of People per Hectare (pp/ha). Each unit was increased to 6.0 PPU to allow for two additional dwelling units per property: 1.) dwelling housing 2 people and 2.) the other dwelling housing one person. The flow generated from Stage 1 of the Subject Draft Plan and the intensification of the existing built-up area, the theoretical flow generated is estimated at 38.46L/s. Sanitary calculations can be found in Appendix E-6.

6.3 BLOCK PLAN

To service the remainder of Block Plan Area 9 (not including the Draft Plan Stage 1), a new sanitary pumping station will be required, somewhere along Port Davidson Road, as outlined in the 2023 Smithville Water and Wastewater Master Servicing Plan prepared by AECOM. It should be noted that an exact location of the pumping station has not been determined yet – discussions have occurred that the current preferred location per the AECOM report may not be feasible due to landowner participation. Through discussions, the Ownership Group have offered to locate the future SPS on lands within Block 9, should that prove to be more feasible when required. All remaining portions of the Block Plan Area 9 will discharge to the proposed pumping station and pumped by forcemain to Townline Road, and eventually to the Smithville SPS as outlined in Smithville's Master Community Plan.

The southeast side of the Block Plan (east of the abandoned rail corridor) will discharge by gravity to the new proposed pumping station near Port Davidson Road (which then ultimately connects to the existing Smithville pumping station, per 2023 AECOM Report. In order to discharge these areas by gravity, the sanitary sewer along Street B will be ranging from 2.8 m to 10.2 m deep. This depth is solely due to the length of the service required to allow the Almas Lands to drain by gravity. The proposed sanitary sewer will be within the groundwater and bedrock.



Storm Servicing August 2024

7.0 Storm Servicing

7.1 STAGE 1 DRAFT PLAN

As shown on the Preliminary Servicing Plan, Drawing No. C-100, included in Appendix C, the design includes a storm sewer that ranges from 300 mm to 1200 mm dia. which discharges to the proposed north SWMF.

The site's minor flows are piped and designed to the 5-year storm event. The minor flows will discharge to the proposed north SWM Block via storm sewers and major flows are conveyed over land and follow a similar route as the minor piped flows.

The flow from the proposed North SWMF will outlet to the existing 900 mm dia. culvert under Townline Road and ultimately to Twenty Mile Creek.

Storm services will be provided to all residential units, at minimum 2% slope and services will connect directly into the proposed storm sewers. The foundation weeping tiles will not drain by gravity and will be pumped via sump pumps to the storm service laterals.

Storm sewers are proposed to be installed with a minimum cover of 1.5 m at slopes between 0.25% and 1.0%.

For more information regarding the preliminary north SWM strategy, please refer to Appendix F.

7.2 BLOCK PLAN

To service the remainder of contiguous Block Plan Area 9, as shown as shown on the Preliminary Servicing Plan, Drawing No. C-100, included in Appendix C, the proposed storm sewers will discharge to a SWMF in the south of the Block Plan.

The proposed storm sewer will range from 300 mm to 1200 mm in dia. and is designed to the 5-year storm event. Minor flows will discharge to the proposed south SWM Block and the major flows are conveyed over land and follow a similar route as the minor piped flows.

The south SWMF will outlet to an existing watercourse that is defined by the NPCA at the south.

It is expected that a further SWMF will be required east of Shurie Road, in conjunction with development of the Almas lands. This is shown conceptually on the Block Plan and will be subject to clarification through preliminary design of these lands.



Erosion and Sediment Control August 2024

8.0 Erosion and Sediment Control

The erosion and sediment control strategy has been developed and is to be implemented during the construction process, in order to minimize the potential for offsite discharge of sediment and the resultant negative environmental impacts. This plan will focus on the protection of the downstream areas.

8.1 EROSION POTENTIAL

The Toronto and Region Conservation Authority's Erosion and Sediment Control Guide for Urban Construction (2019) was used to determine the erosion potential of the Site. The erosion potential is based on slope gradient, slope length, and soil texture and is then used to determine the appropriate erosion control methods, as follows:

- Site Slopes: Generally gentle (< 2%) to moderate (2-10%) average slope is approximately 2%.
- Slope Lengths: Long (generally greater than 30 m).
- Erodibility Classification: High erodibility rate for silty sand and low erodibility rate for sandy soils.

Therefore, based on this classification the Site has moderate to high erosion potential, depending on the specific location within the Site.

8.2 PRELIMINARY EROSION AND SEDIMENTATION CONTROL PLAN

The following approach to erosion and sediment control onsite has been prepared to minimize the potential impacts associated with onsite erosion and/or offsite transport of sediment to downstream areas.

Prior to any grading or servicing works commencing onsite, erosion and sedimentation control measures shall be implemented as detailed on the Pre-grading, Erosion and Sedimentation Control Plans (prepared during detail design). The erosion and sedimentation controls will include the following items:

- Steep slopes (>3:1) shall have erosion blankets.
- Light and/or heavy-duty silt fencing will be erected on all site boundaries where there is potential for
 runoff to be discharged offsite, to protect adjacent downstream lands from migration of sediment in
 overland flow. The location of this fencing will be adjacent to the limit of grading. Silt fence attached
 to paige wire fencing will be installed periodically throughout the Site adjacent to sensitive areas. Silt
 fencing should be erected before grading begins to protect adjacent and downstream areas from
 migration of sediment in overland flow.
- Storm service outlets will be installed during servicing and roadworks construction to provide lot level dead and live storage where appropriate.



Erosion and Sediment Control August 2024

- Erosion control berms/swales will be located in appropriate (critical) areas to divert flows to temporary sediment basins.
- A construction entrance feature ("mud-mat") will be provided at all site entrances to minimize the
 offsite transport of sediment via construction vehicles.
- Runoff will be directed to a temporary sedimentation facility via swales to minimize untreated runoff discharged from the Site.
- The temporary sedimentation facility should not be sited in the location of the proposed permanent SWMF as it may inhibit the function of the final SWMF as an infiltration basin.
- Swales constructed onsite will have temporary rock check dams to help attenuate flows and encourage deposition of suspended sediment where appropriate.
- All disturbed areas where construction is not expected for 30 days shall be re-vegetated with 50 mm of topsoil and hydro-seeding according to OPSS 572.
- During construction, all catchbasins are to be sealed until roads are paved to prevent sediment deposition in the catchbasins' sumps and conveyance of silt to the SWMF.
- An Erosion Control Implementation Schedule will be included with the Detailed Erosion and Sedimentation Control Plan, prepared in conjunction with the pre-grading application and/or final engineering design.
- Following completion of construction and site stabilization, all erosion and sediment control measures and accumulated sediment are to be removed.

The erosion control measures shall be maintained in good repair during the entire construction period and shall only be removed as contributing drainage areas are restored and stabilized. In addition, the condition of erosion control works, their overall performance, and any repairs, replacement, or modifications to the installed item shall be noted in the Monitoring Reports submitted to the NPCA and the Township. The Monitoring Reports should be submitted bi-monthly (quarterly during periods of inactivity or house construction) and should be based on inspection completed bi-weekly or after any significant rainfall events (>13 mm), whichever is more frequent.

8.3 MONITORING, MAINTENANCE AND MITIGATION

Monitoring and maintenance activities are an important part of a SWM Plan to ensure that the designed features continue to operate as intended. A Monitoring Program should be established in consultation with the Region of Niagara, Township of West Lincoln, and the Ministry of Environment, Conservation and Parks and incorporated into the Final Stormwater Management Plan at the detailed design stage.



Utilities August 2024

9.0 Utilities

9.1 NIAGARA PENINSULA ENERGY INC

NPEI advises that they can supply power to the proposed site and that there are no capacity issues. These services will be extended to service the subject lands, there, no constraints for providing hydro services to the proposed development.

9.2 NATURAL GAS

Enbridge advises that the site can likely be accommodated if immediate application is made. There is an existing main on the North side of Townline Road. These services will be extended to service the subject lands. There are no constraints for providing natural gas services to the proposed development.

9.3 **BELL**

Bell has advised that they can have the infrastructure in place in the area to service the site. These services will be extended to service the subject lands. There are no constraints for providing telecommunication services to the proposed development.

9.4 COGECO

Cogeco advises that they are able to service the site and have infrastructure in the area. These services will be extended to service the subject lands. There are no constraints for providing hydro services to the proposed development.

9.5 ENBRIDGE GAS EASEMENT

The existing pipelines will be daylighted at the locations where the roadways cross the gas easement to confirm elevations and the impacts to the services and grading. The ground surface within the easement will be regraded and fill will be added around and over the existing pipelines.

9.6 UTILITY SUMMARY

Internal hydro services, Bell and Cogeco cable lines and gas mains for the development can be design and constructed within a joint trench within the Subject Plan.



Conclusions and Recommendations August 2024

10.0 Conclusions and Recommendations

10.1 CONCLUSIONS

Based on the finding of this Report, it is concluded that:

- The proposed Stage 1 Draft Plan within Block Plan Area 9 can be adequately serviced by municipal sewage, storm drainage, water services and utilities.
- The proposed North SWMF features provides water quantity and water quality control for the proposed Stage 1 Draft Plan development.
- The proposed SWMF provides sufficient storage to attenuate post-development discharge to maintain existing target flow rates.
- SWM measures can be provided in accordance with various agency guidelines

10.2 RECOMMENDATIONS

This Report be circulated to the Municipalities and various approval agencies in support of Draft Plan of Subdivision and Block Plan Approval.

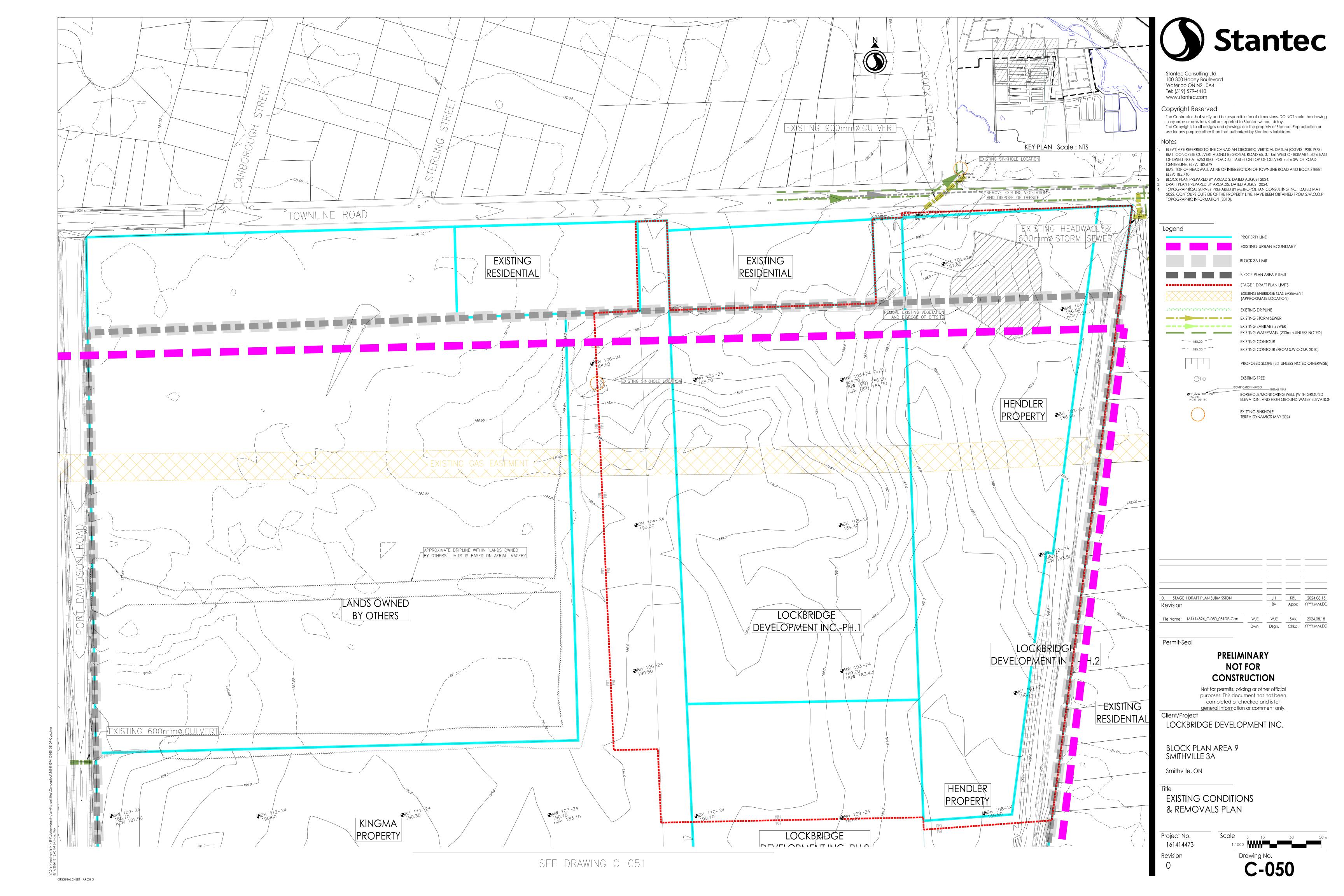
Detailed grading and servicing design drawings will be prepared, a Final Stormwater Management Report and Erosion Settlement Control Plan be completed once the Draft Plan of Development for has been conditionally approved to support construction.

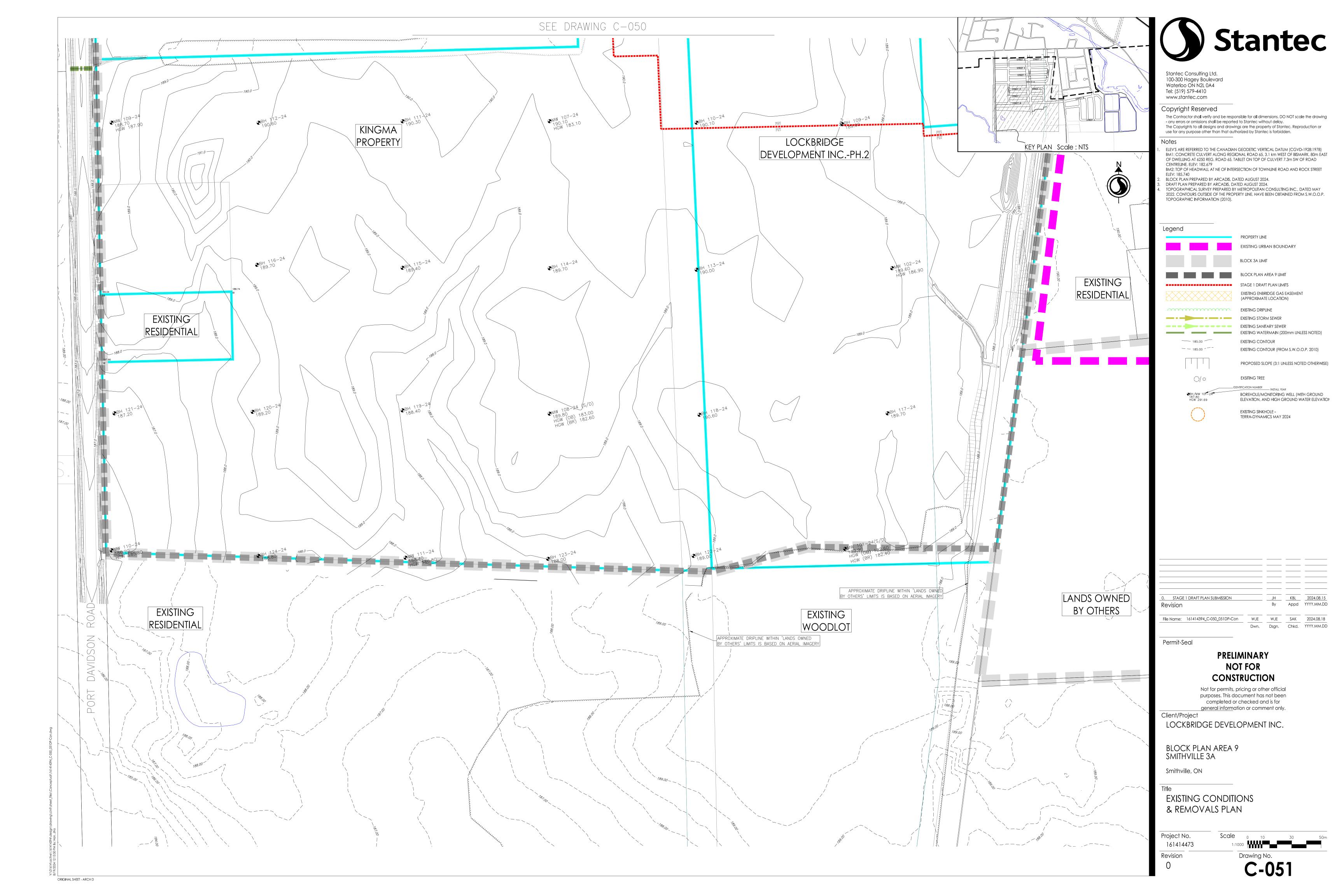


APPENDIX A Existing Conditions

Existing Conditions & Removals Plan, C-050 Existing Conditions & Removals Plan, C-051



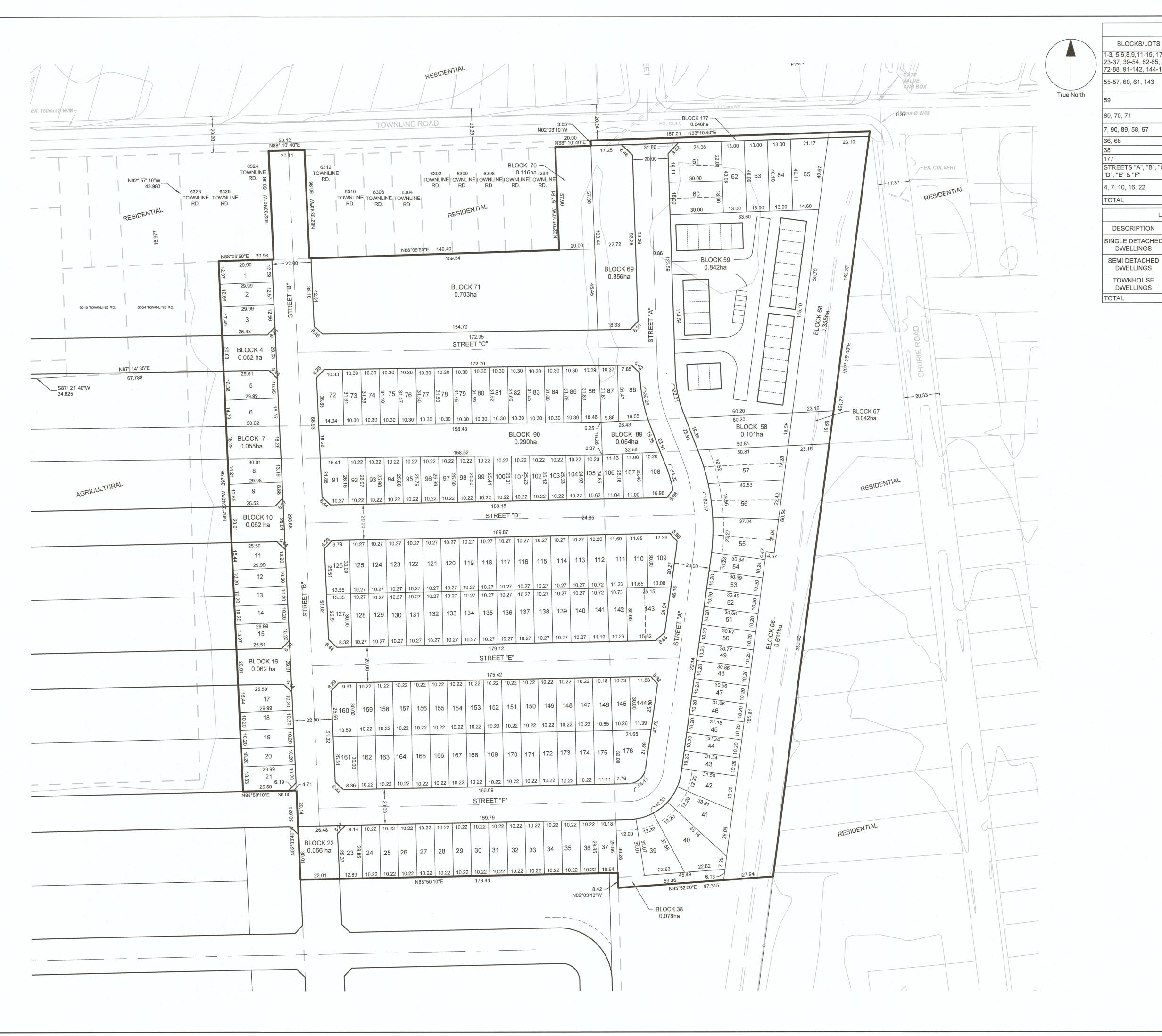




APPENDIX B Concept Plans

Draft Plan of Subdivision Block Plan Area 9 - Preferred Land Use Concept





LAND USE SCHEDULE				
BLOCKS/LOTS	DESCRIPTION	AREA (ha)	AREA (Acres)	# UNITS
1-3, 5,6,8,9,11-15, 17-21, 23-37, 39-54, 62-65, 72-88, 91-142, 144-176	SINGLE DETACHED DWELLINGS	5.265	13.010	154
55-57, 60, 61, 143	SEMI DETACHED DWELLINGS	0.429	1.060	12
59	TOWNHOUSE DWELLINGS	0.842	2.081	30
69, 70, 71	STORMWATER MANAGEMENT	1.175	2.903	
7, 90, 89, 58, 67	GAS EASEMENT	0.542	1.340	
66, 68	OPEN SPACE/TRAIL	0.986	2.436	
38	OPEN SPACE ACCESS	0.078	0.193	
177	ROAD WIDENING	0.046	0.113	
STREETS "A", "B", "C", "D", "E" & "F"	PUBLIC R.O.W.	2.897	7.160	
4, 7, 10, 16, 22	FUTURE ROAD CONNECTION	0.252	0.623	
TOTAL		12.512	30.296	196

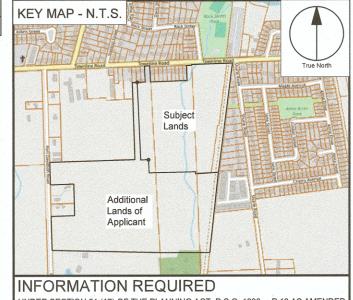
TOTAL		12.512
LA	ND USE SCHEDULE	
DESCRIPTION	OWNER	# UNITS
SINGLE DETACHED DWELLINGS	HENDLER	32
	LOCKBRIDGE	122
SEMI DETACHED	HENDLER	12
DWELLINGS	LOCKBRIDGE	0
TOWNHOUSE DWELLINGS	HENDLER	30
	LOCKBRIDGE	0
TOTAL	196	

DRAFT PLAN OF SUBDIVISION SMITHVILLE BLOCK 9

PART OF LOTS 31 & 32, CONCESSION 6 AND PART OF THE ROAD ALLOWANCE BETWEEN LOTS 31 & 32, GEOGRAPHIC TOWNSHIP OF GAINSBOROUGH, TOWNSHIP OF WEST LINCOLN, REGIONAL MUNICIPALITY OF NIAGARA

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Arcadis Professional Services (Canada) Inc.



UNDER SECTION 51 (17) OF THE PLANNING ACT, R.S.O. 1990. c.P.13 AS AMENDED

(b) - AS SHOWN (c) - AS SHOWN (d) - AS LISTED BELOW (e) - AS SHOWN

(f) - AS SHOWN (g) - AS SHOWN (h) - MUNICIPAL WATER (i) - LACUSTRINE SILTY/HEAVY CLAY

(j) - AS SHOWN (k) - MUNICIPAL SANITARY AND STORM SEWERS (I) - NONE

SURVEYOR'S CERTIFICATE I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

ROY S. KIRKUR, ONTARIO LAND SURVEYOR J.D. BARNES LIMITED

DATE Aug 16, 2024 OWNER'S CERTIFICATE I HEREBY CONSENT TO THE FILING OF THIS PLAN BY ARCADIS,

IN DRAFT FORM. SIGNED D Z DON MANSON LOCKBRIDGE DEVELOPMENT INC.

JUDY HENDLER

DATE AU 12 2024

FRED VANDERVELDE TEK CORPORATION DATE Augre, 2024

01 FIRST DPS SUBMISSION 2024-08-13 DATE DESCRIPTION DRAWING ISSUE RECORD



360 James Street North - Suite 200 Hamilton ON L8L 1H5 Canada

tel 905 546 1010 www.arcadis.com

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CHECKED BY: J. MARCUS J. MARCUS PROJECT MGR: APPROVED BY: J. MARCUS J. ARIENS

SHEET TITLE

DRAFT PLAN OF SUBDIVISION

SHEET NUMBER

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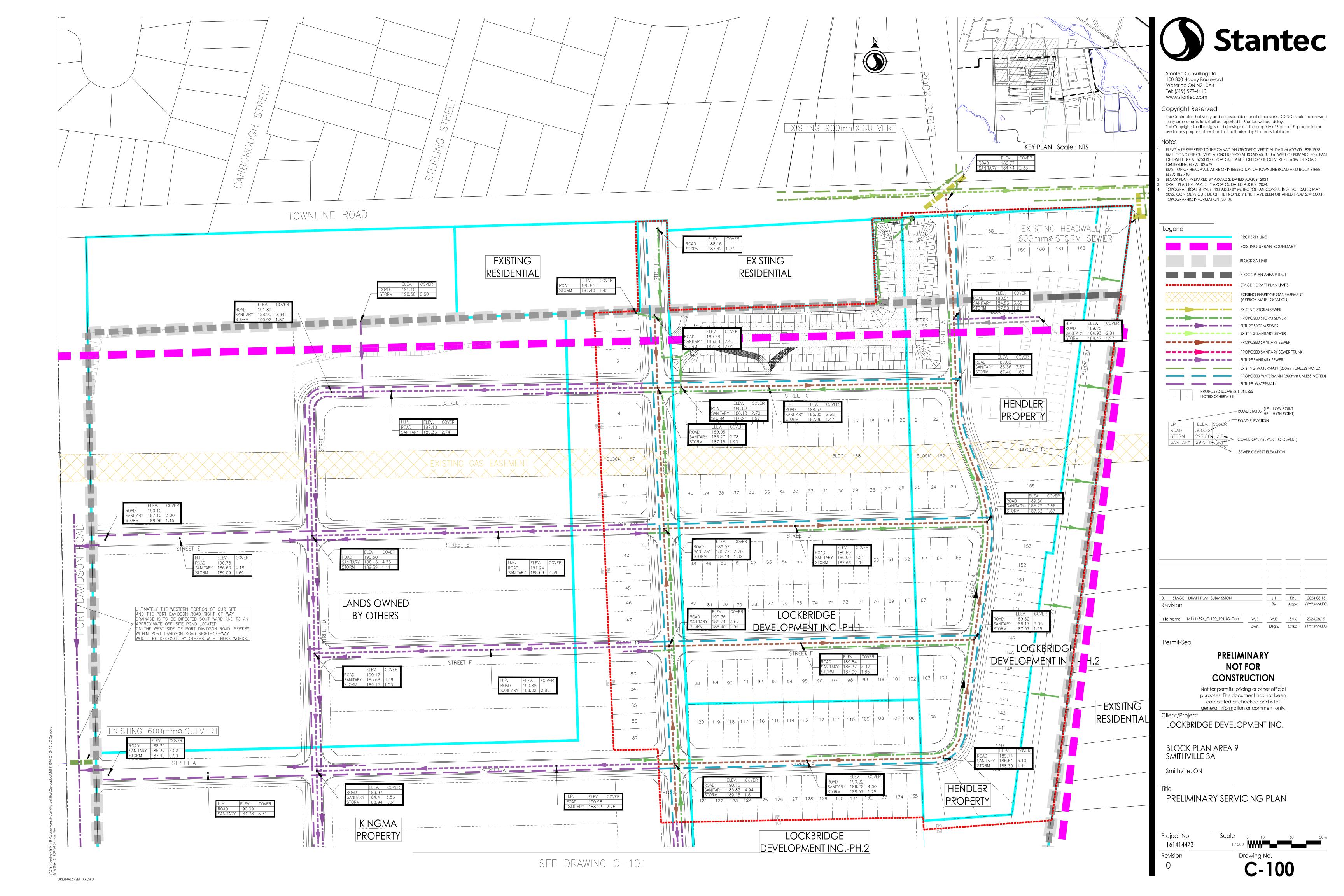
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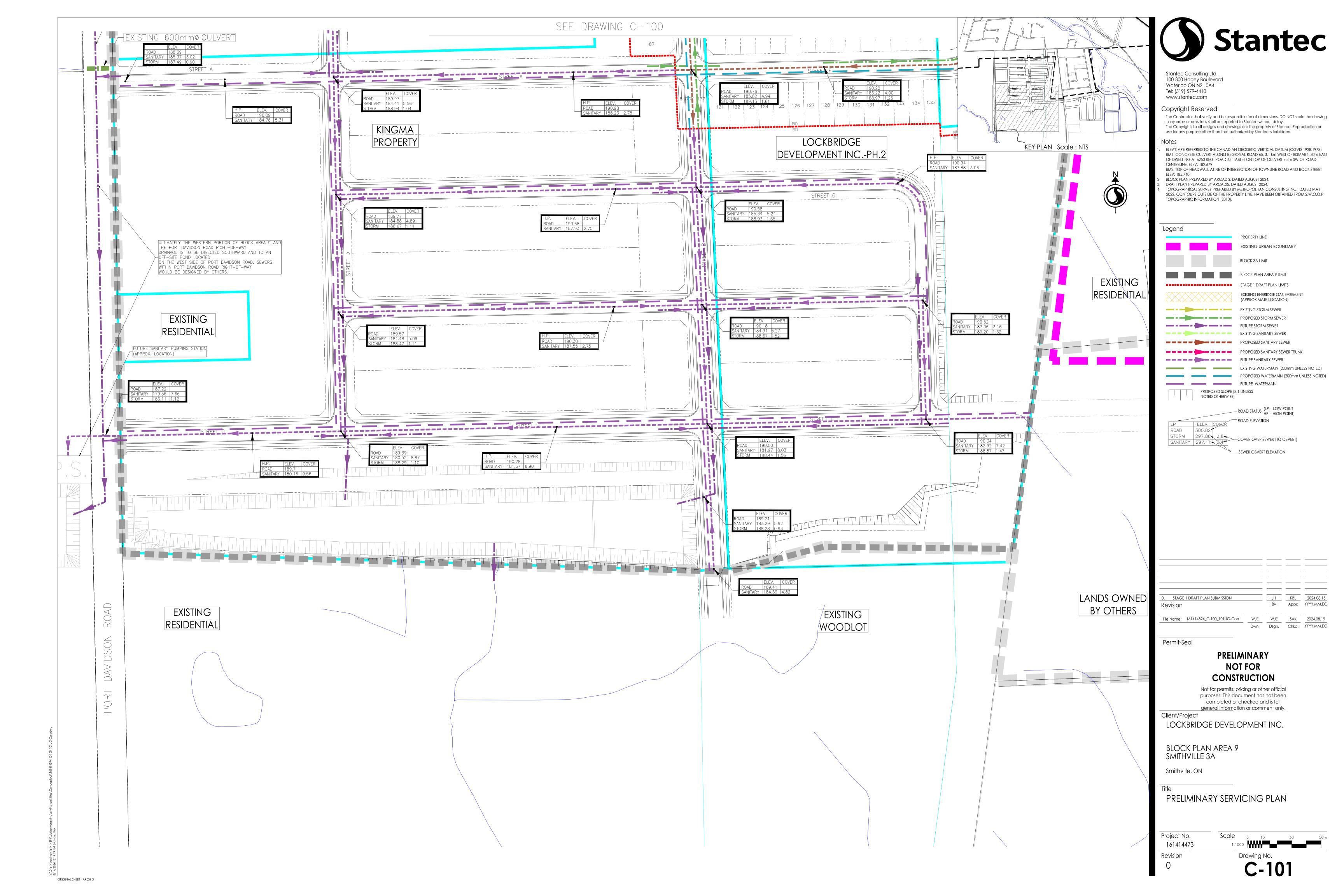
SOUTHEAST SMITHVILLE - BLOCK PLAN AREA 9
PREFERRED LAND USE CONCEPT
(*BASED ON APPROVED OPA 63)

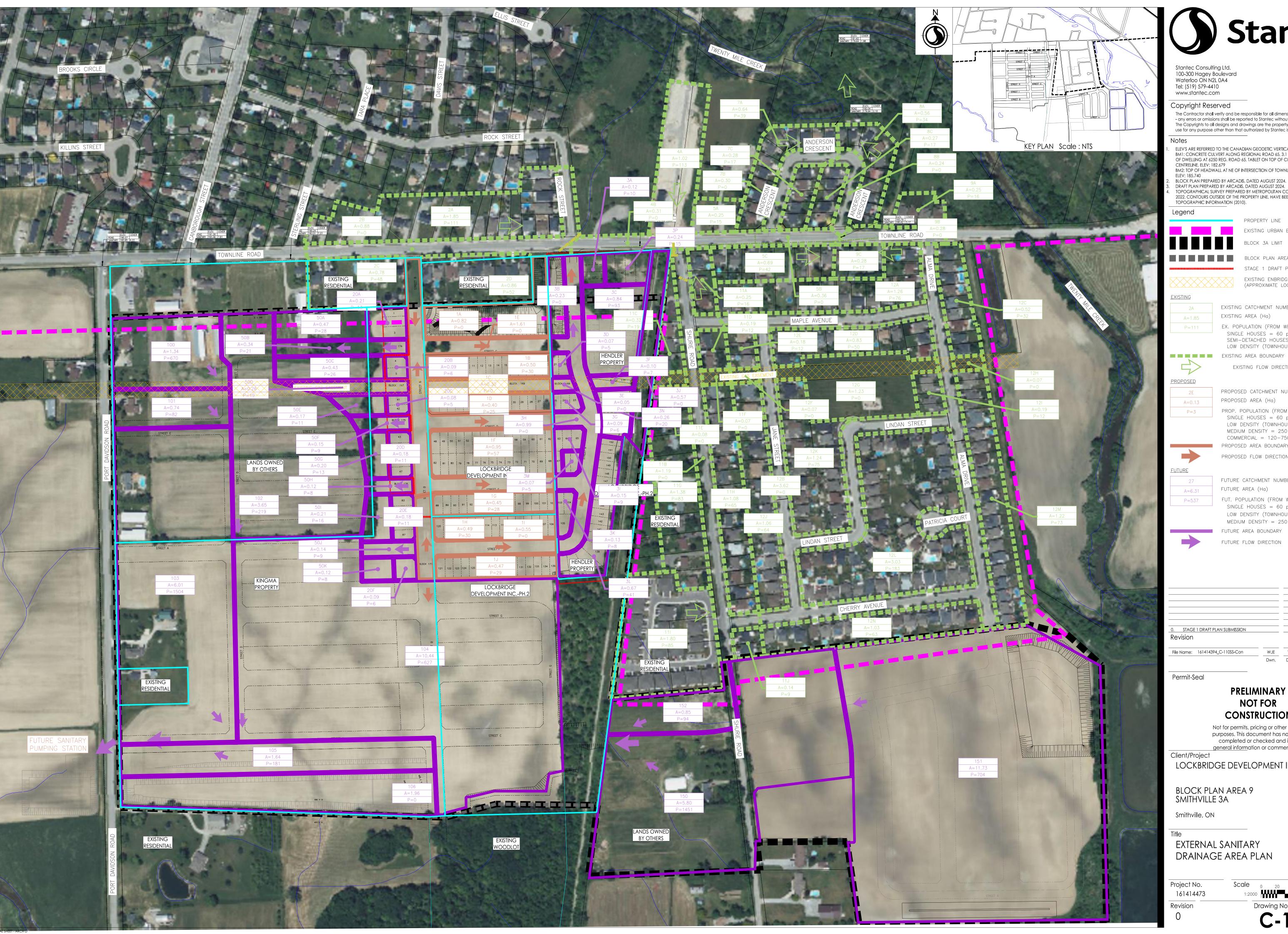
DATE JANUARY 05, 2024
PROJECT No. 144262

APPENDIX C Engineering Drawings

Preliminary Servicing Plan, C-100
Preliminary Servicing Plan, C-101
External Sanitary Drainage Area Plan, C-110
Conceptual Road Profiles - Streets A & B, C-200
Conceptual Road Profiles - Streets C & J, C-201
Conceptual Road Profiles - Streets D, E & F, C-202
Preliminary Grading Plan, C-400
Preliminary Grading Plan, C-401
Preliminary SWM Facility Plan - North, C-800
Conceptual Cut/Fill Plan, C-900
Conceptual Cut/Fill Plan, C-901









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BM2: TOP OF HEADWALL AT NE OF INTERSECTION OF TOWNLINE ROAD AND ROCK STREET BLOCK PLAN PREPARED BY ARCADIS, DATED AUGUST 2024.

DRAFT PLAN PREPARED BY ARCADIS, DATED AUGUST 2024.

DRAFT PLAN PREPARED BY ARCADIS, DATED AUGUST 2024.

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EXISTING URBAN BOUNDARY

PROPERTY LINE

BLOCK PLAN AREA 9 LIMIT STAGE 1 DRAFT PLAN LIMIT

EXISTING ENBRIDGE GAS EASEMENT (APPROXIMATE LOCATION)

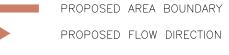
EXISTING CATCHMENT NUMBER EXISTING AREA (Ha)

EX. POPULATION (FROM WEST LINCOLN MANUAL) SINGLE HOUSES = 60 p/ha SEMI-DETACHED HOUSES = 75 p/ha LOW DENSITY (TOWNHOUSES) = 110 p/ha

EXISTING FLOW DIRECTION

PROPOSED CATCHMENT NUMBER PROPOSED AREA (Ha)

PROP. POPULATION (FROM WEST LINCOLN MANUAL) SINGLE HOUSES = 60 p/haLOW DENSITY (TOWNHOUSES) = 110 p/ha MEDIUM DENSITY = 250 p/ha COMMERCIAL = 120-750 p/ha (ASSUMING 500)



FUTURE CATCHMENT NUMBER

FUTURE AREA (Ha)

FUT. POPULATION (FROM WEST LINCOLN MANUAL) SINGLE HOUSES = 60 p/ha

LOW DENSITY (TOWNHOUSES) = 110 p/ha MEDIUM DENSITY = 250 p/ha FUTURE AREA BOUNDARY

FUTURE FLOW DIRECTION



By Appd YYYY.MM.DD File Name: 161414394_C-110SS-Con WJE WJE SAK 2024.08.16

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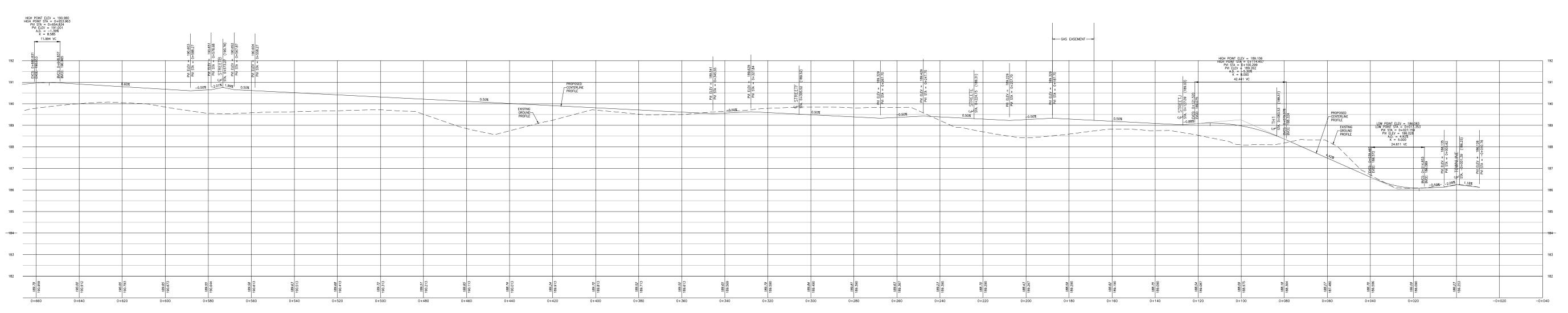
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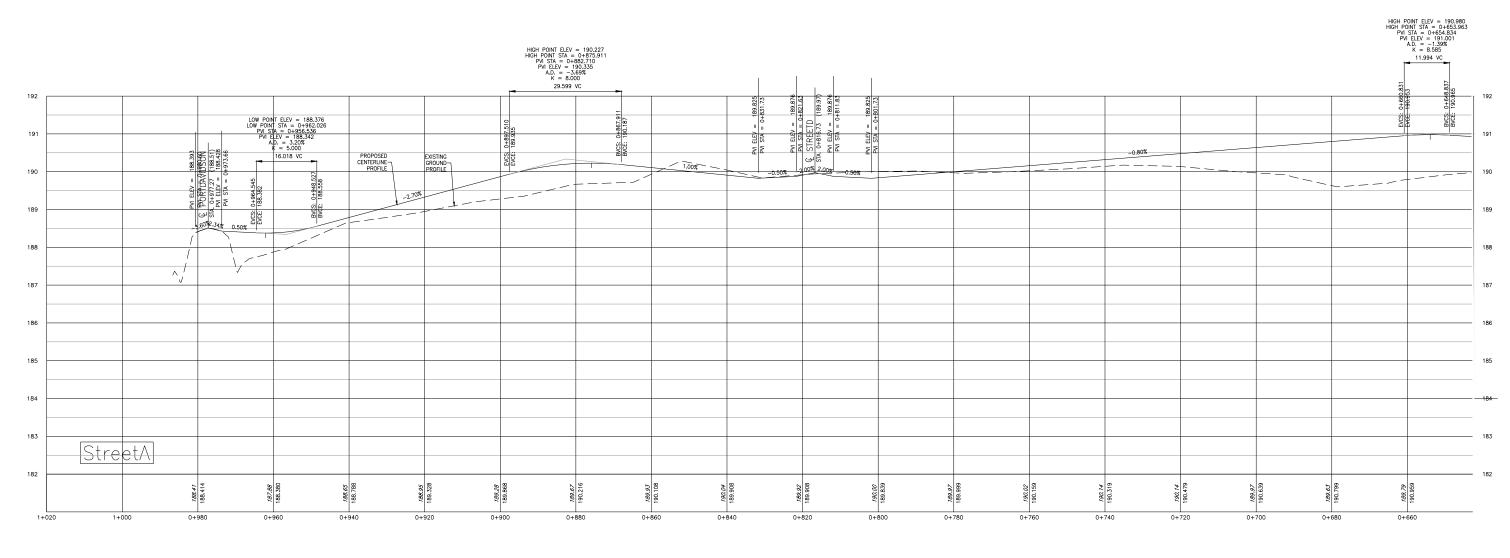
BLOCK PLAN AREA 9

EXTERNAL SANITARY DRAINAGE AREA PLAN

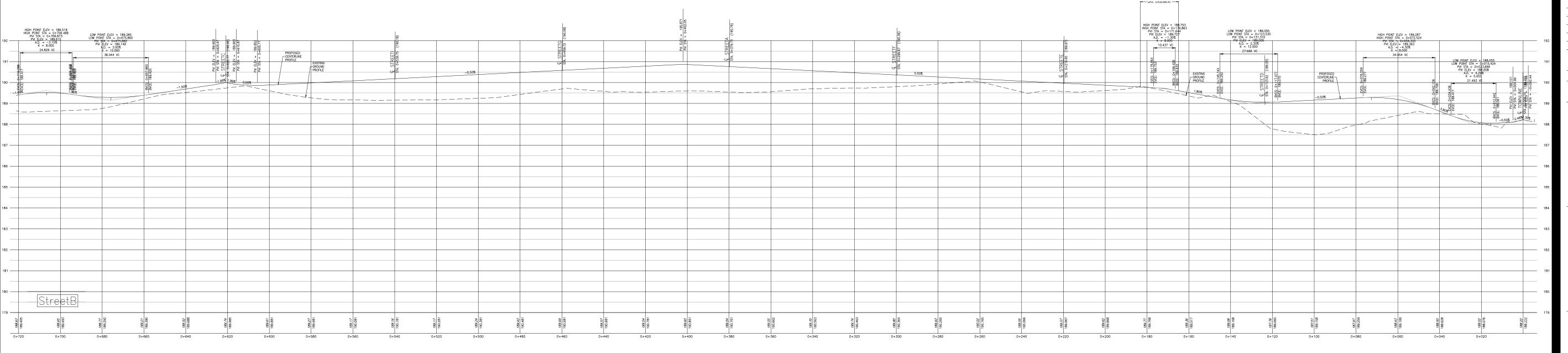
Drawing No.

C-110





STREET A



STREET B



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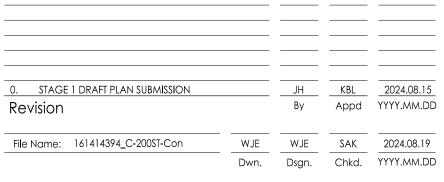
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ELEV: 185.740 BLOCK PLAN PREPARED BY ARCADIS, DATED AUGUST 2024. DRAFT PLAN PREPARED BY ARCADIS, DATED AUGUST 2024.

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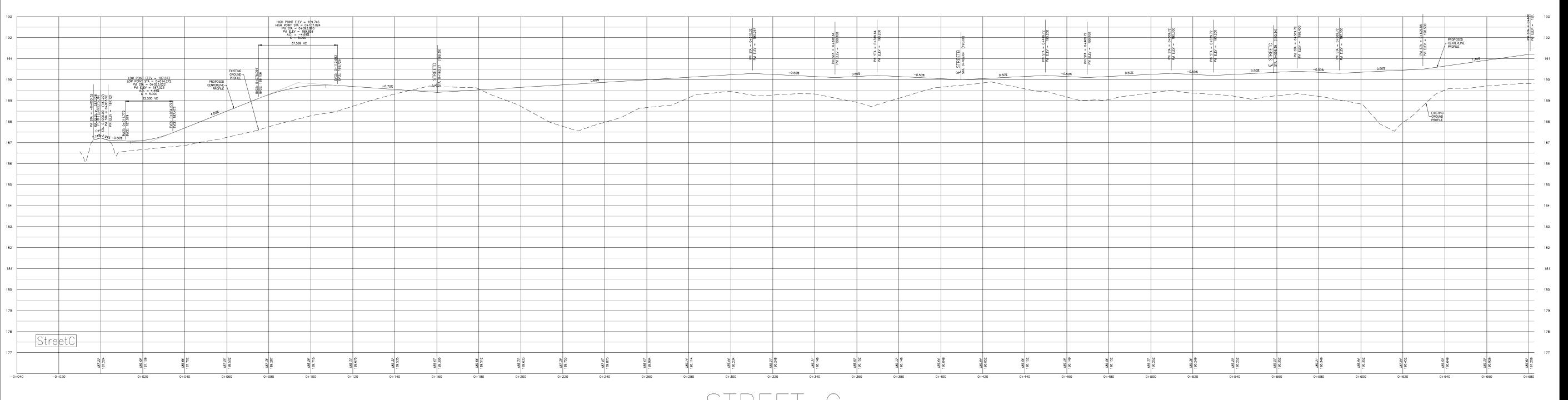
BLOCK PLAN AREA 9 SMITHVILLE 3A

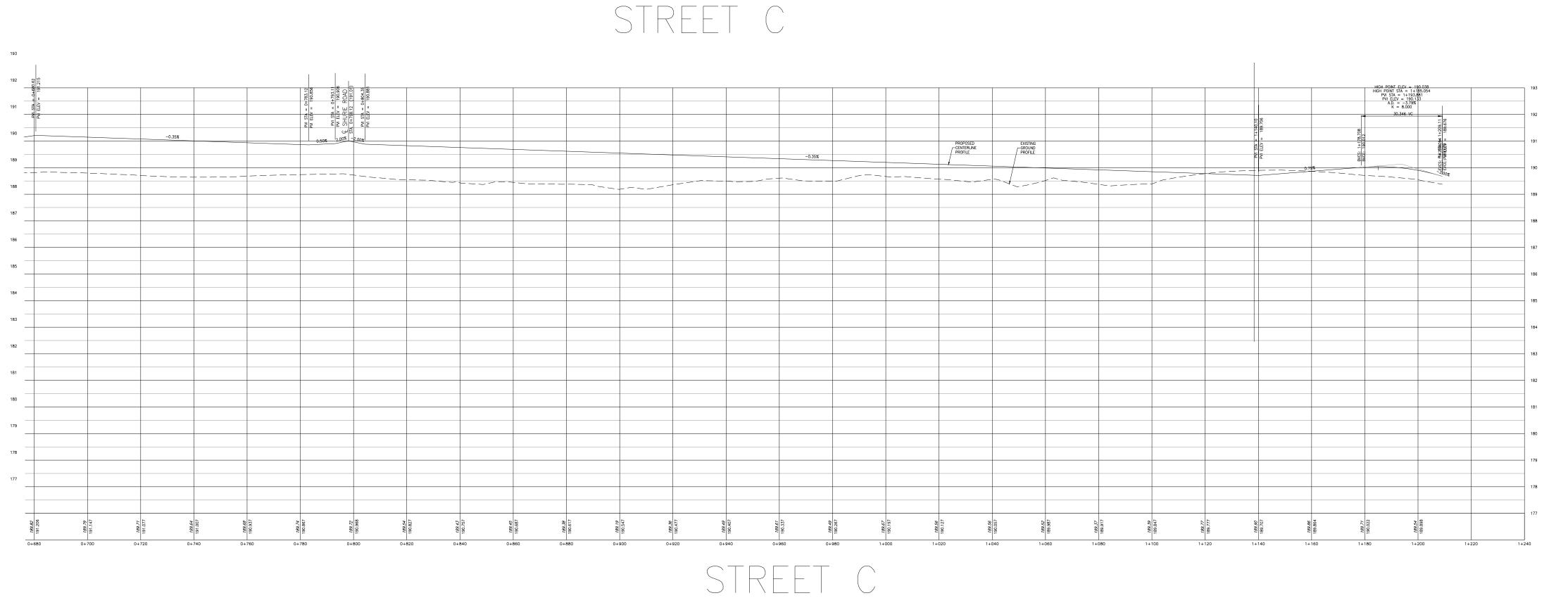
Smithville, ON

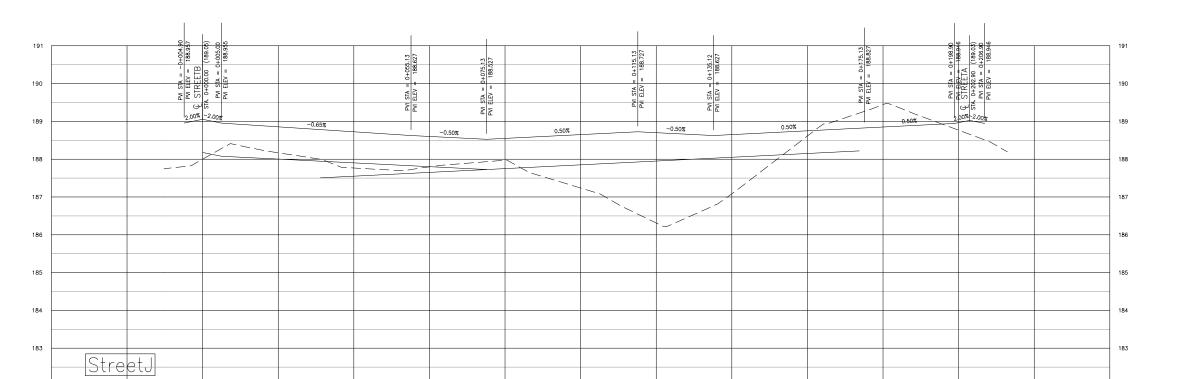
CONCEPTUAL ROAD PROFILES STREETS A & B

Project No. 161414473 Revision

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ELEV: 185.740 BLOCK PLAN PREPARED BY ARCADIS, DATED AUGUST 2024. DRAFT PLAN PREPARED BY ARCADIS, DATED AUGUST 2024.

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BLOCK PLAN AREA 9

Smithville, ON

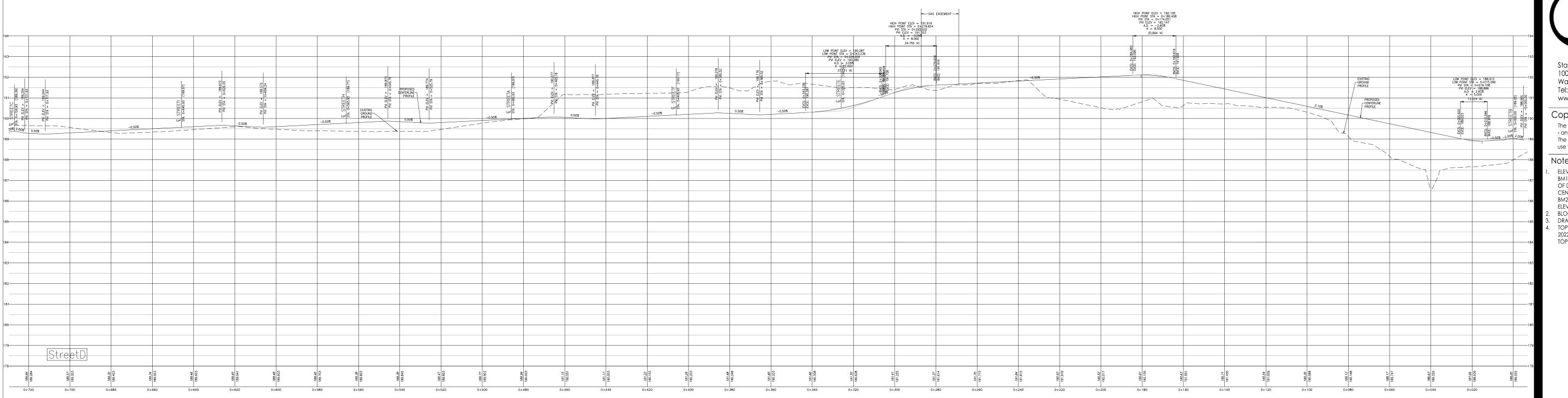
SMITHVILLE 3A

CONCEPTUAL ROAD PROFILES STREETS C & J

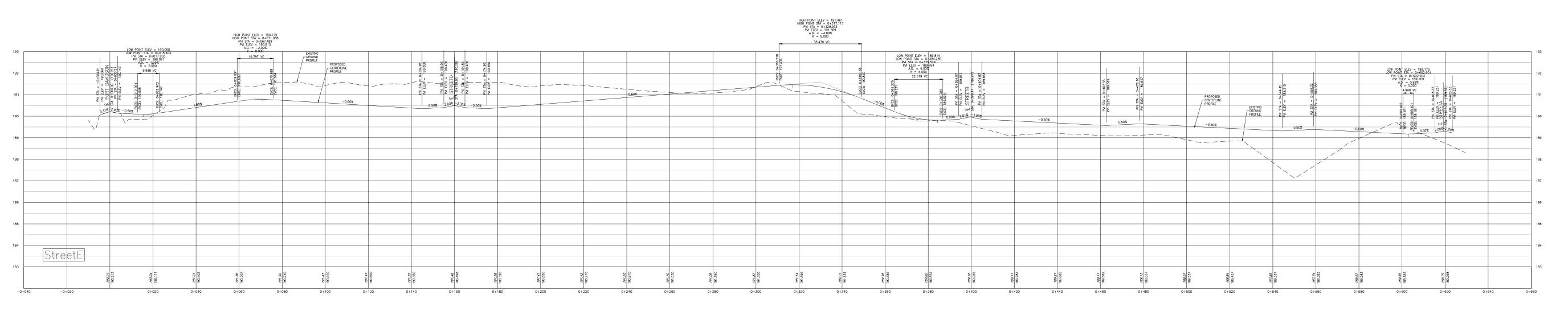
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Drawing No.

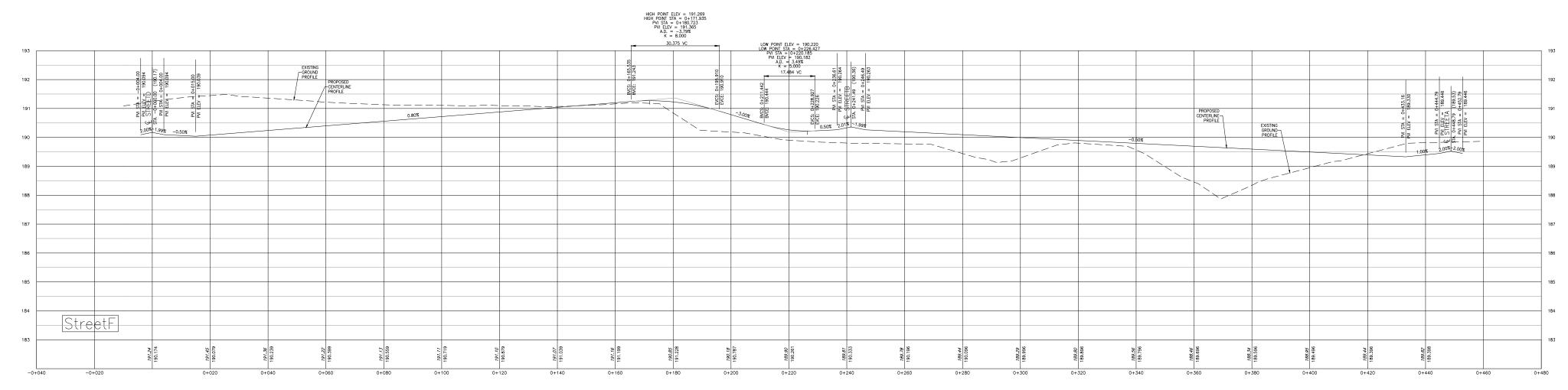
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STREET D



STREET E



STREET F



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LOCKBRIDGE DEVELOPMENT INC.

BLOCK PLAN AREA 9

Smithville, ON

SMITHVILLE 3A

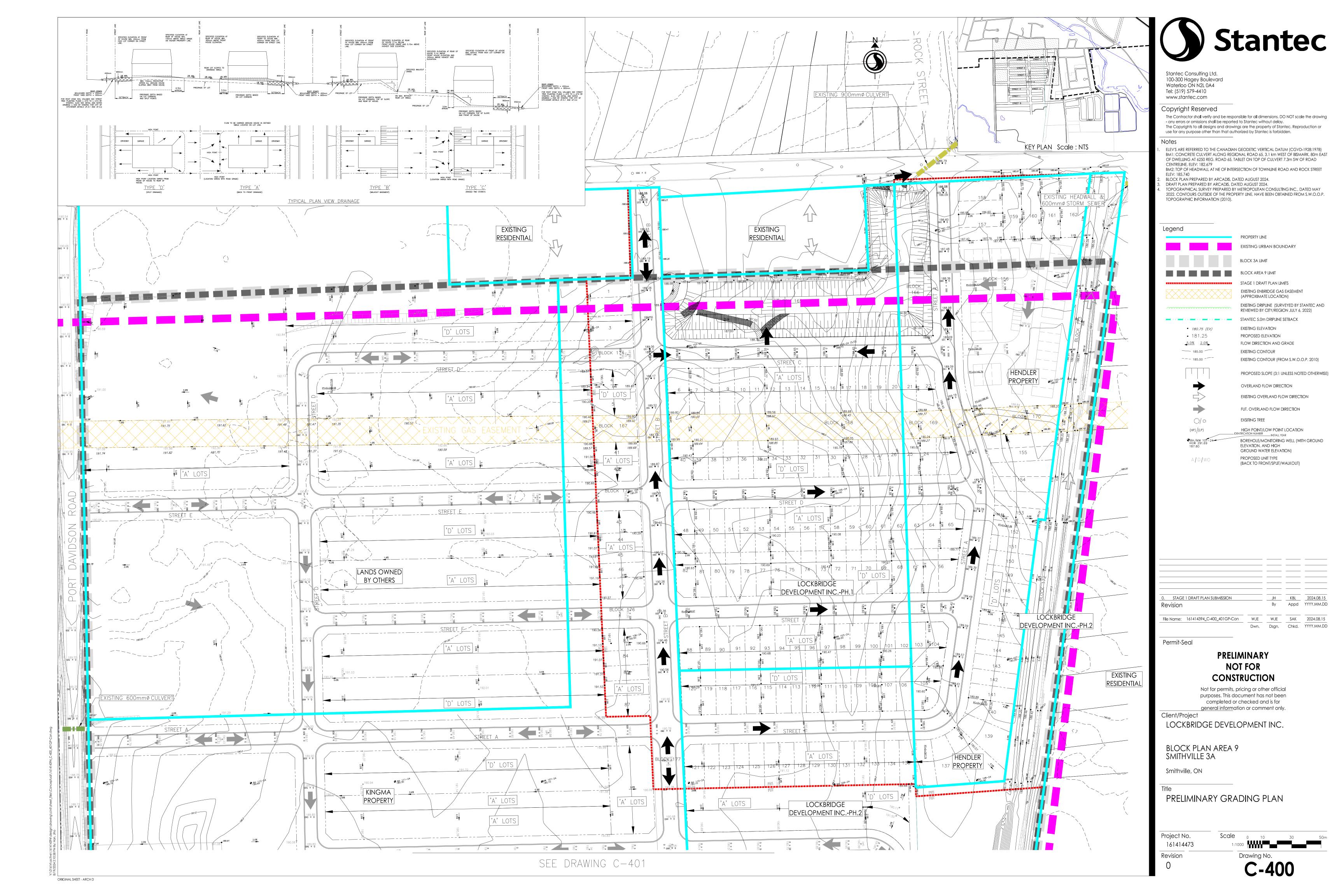
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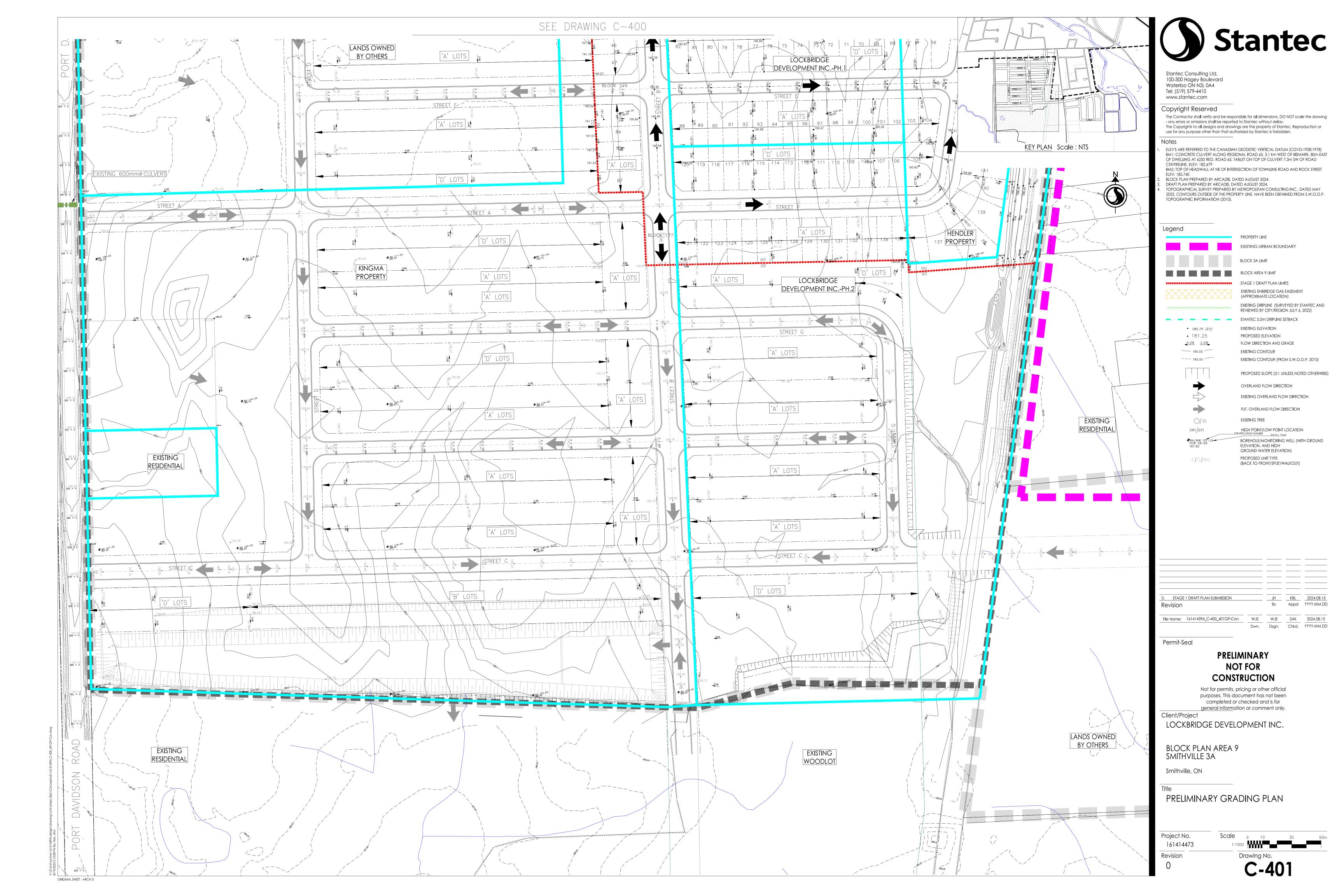
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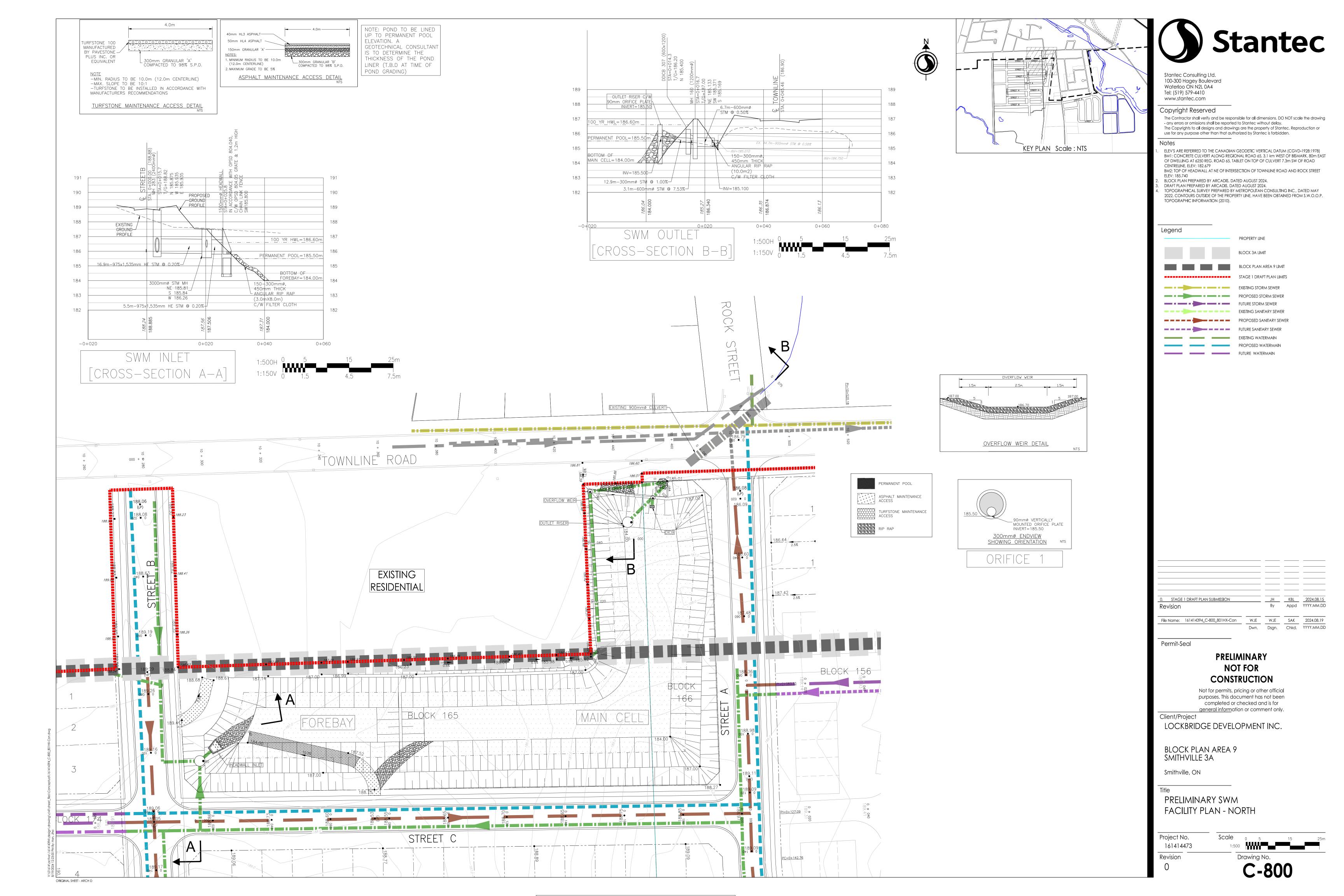
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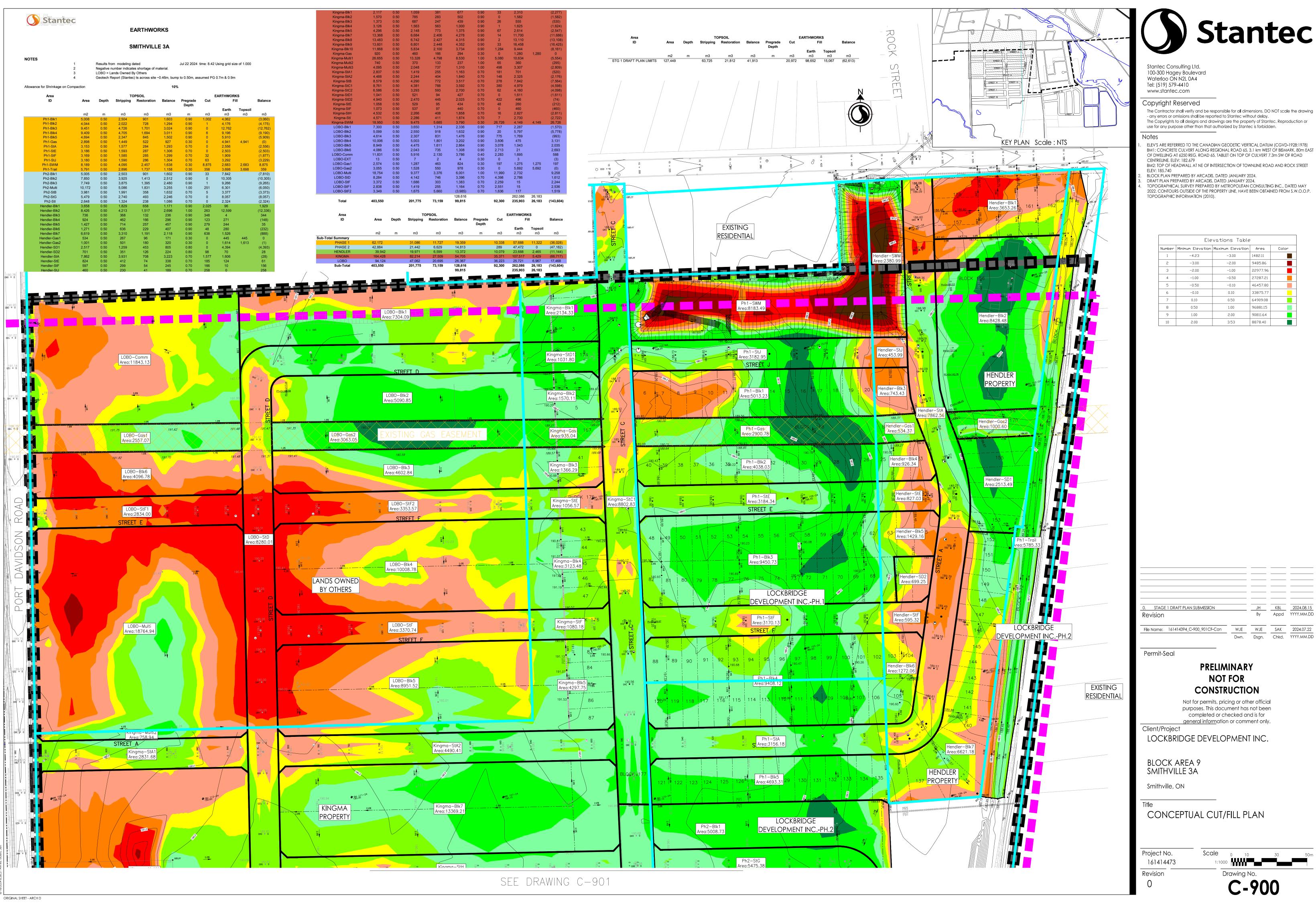
C-202

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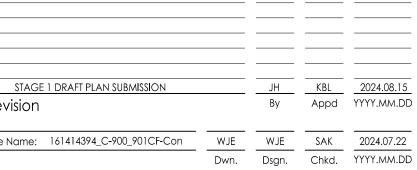


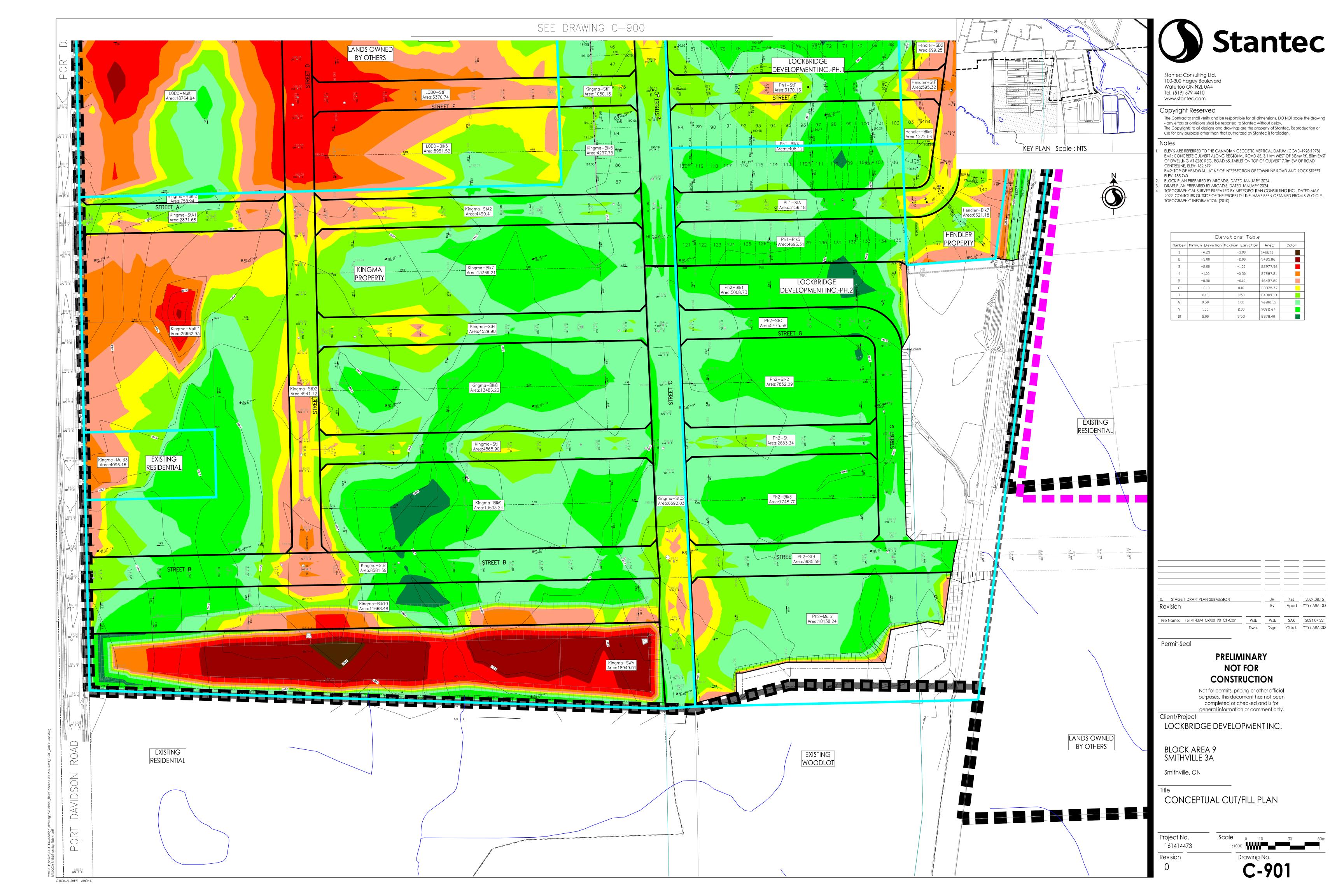




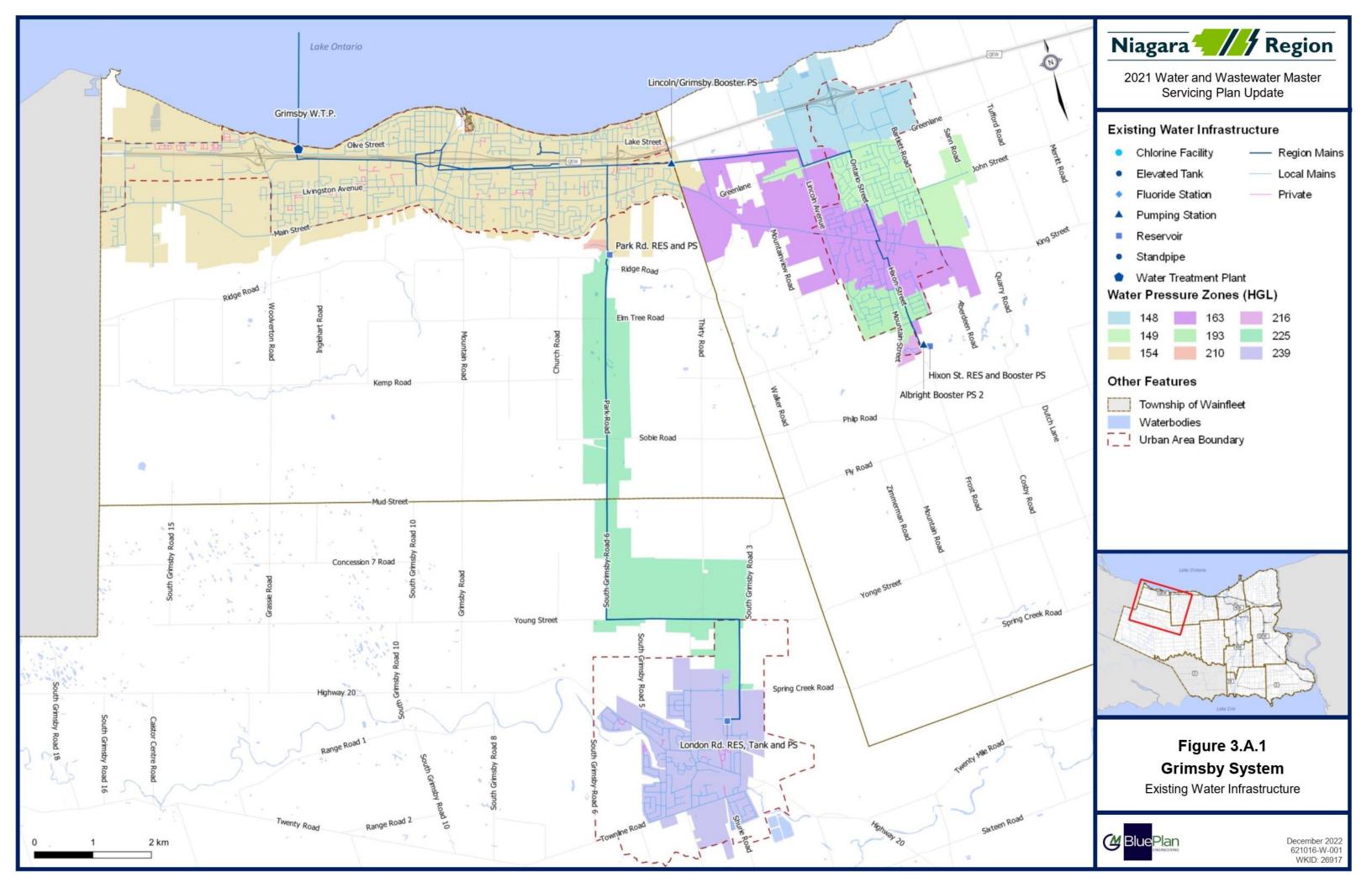
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APPENDIX D Watermain Background Figure 3.A.1 Existing Water System



APPENDIX E SANITARY ANALYSIS

APPENDIX E-1 Figure 4.A.1 Existing Wastewater System

➤ APPENDIX E-2 Sanitary Sewer Design Sheet

APPENDIX E-3 Gravity Initial First Phase

Sanitary Servicing Analysis Brief

> APPENDIX E-4 CIV 09 Data Chart and Flow

Monitoring

➤ APPENDIX E-5 Sanitary Design – CIV 09

Monitoring Flow and Theoretical

Sanitary Flow from the

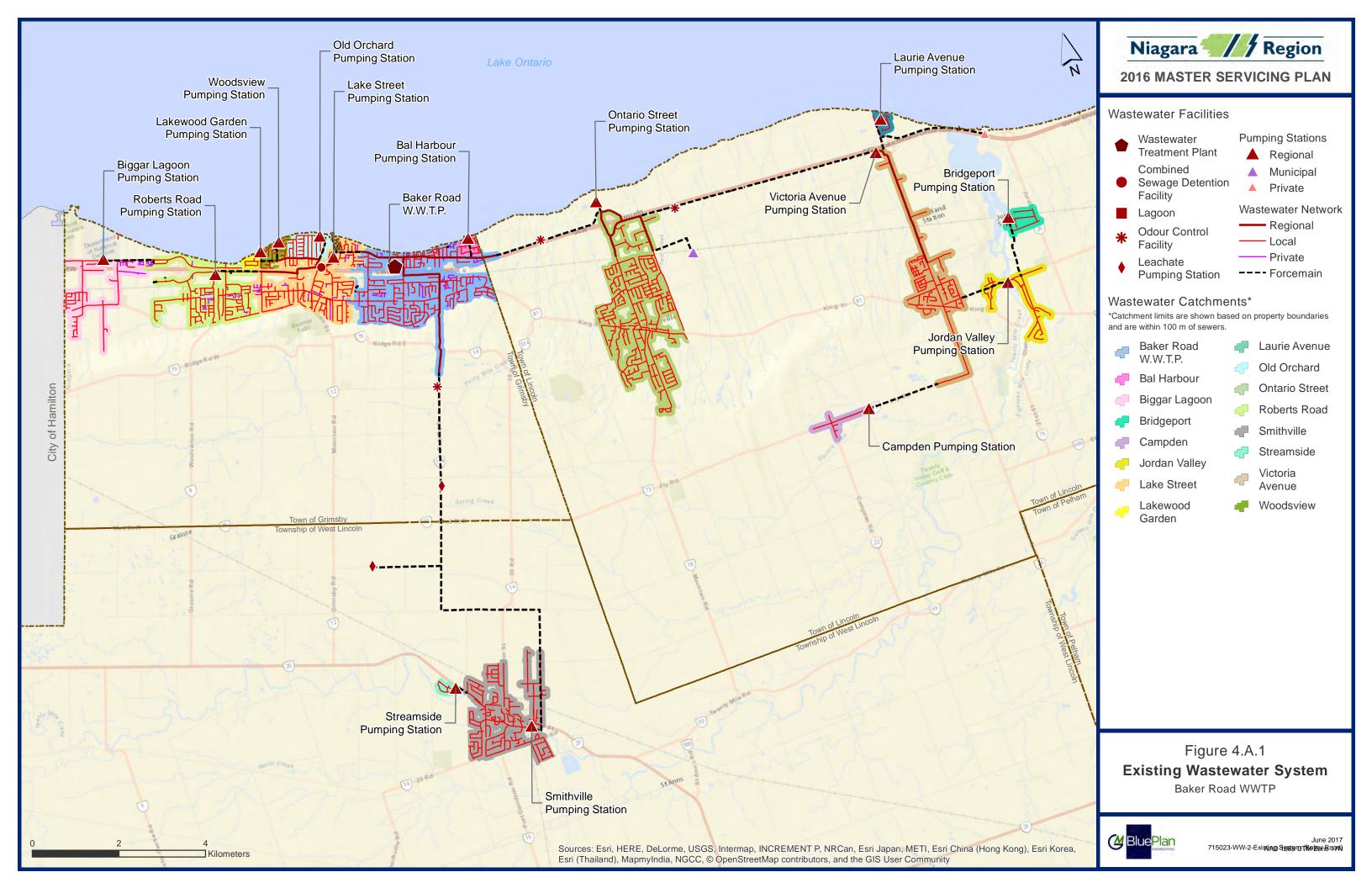
Proposed Site

➤ APPENDIX E-6 Sanitary Design – Existing

Built-Up Area Intensification

APPENDIX E-1

FIGURE 4.A.1 EXISTING WASTEWATER SYSTEM



APPENDIX E-2

SANITARY SEWER DESIGN SHEET Stantec

Lockbridge Development Inc Smithville 3A

People/Hectare (p/ha)

August 16, 2024

DESIGNED BY:

CHECKED BY:

WJE FILE NUMBER: N/A Project Number 161414394 SAK

SANITARY SEWER DESIGN SHEET

Design Parameters Residential: 255 L/day/Person 0.0030 L/s/Person

Mininum Velocity= 0.600 m/s

Comercial: 1.500 L/s/Ha 1.000 L/s/Ha

0.286 L/s/Ha

Infiltration:

n= 0.013 Max Peak Factor= 5.000 Industrial: 0.375 L/s/Ha Min Peak Factor= 2.000 Institutional:

LOCA	TION				P	ESIDENTIAL ARE	A AND PODITION	TION				COMMERC	TAI	INDUSTR	IAI		NSTITUTIO	MAI			INFILTRATIO)N				DIDE CI	ELECTION			
LOCA	IIION		-		<u></u>	ESIDENTIAL ARE	A AND POPULAT	ION				COMMEN	JAL	INDUSTR	IAL		Namono	INAL			INFILINATIO	JIN				FIFE 31	ELECTION	1		1
Street	U/S	D/S	Area ID		Population	Population		Cumulative	Peak	Peak Flow	Area ID	Area	Accumula ted Area ID	Area	Accumula	Area ID	Area	Accumula	Total	Total Area	Accumula ted Area	Flow	Total Flow	Length	Design Size	Slope	Full	Full	Actual	Q _A /Q _c
	-,-	_,-		Area	Density		Area	Population	Factor				ted Area		ted Area			ted Area	C+I+I Flow	,	ted Area			Design		Design	Capacity	Velocity	Velocity	
				(ha)	(P/ha)	(P)	(ha)	(min)		L/s		(ha)	(ha)	(ha)	(ha)		(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)	(m)	(mm)	(%)	(L/s)	(m/s)	(m/s)	(%)
				, ,			<u> </u>							, ,					, , ,					<u> </u>	, ,	, ,			, , ,	
Townline Road			2A	1.85	60	111																								
			2B	0.88	0	0																								
			2C	0.78	60	48																								
			2D	0.86	60	52																								
	72	71		4.37		211	4.37	211	4.14	2.58			0.00		0.00			0.00	0.00	4.37	4.37	1.250	3.83	95.7	200	0.60	25.41	0.81	0.92	15.1%
	71					<u> </u>	4.37	211					0.00		0.00			0.00	0.00											
	7-						,						0.00		0.00			0.00	0.00											
Our Site			1A	0.82	0	0	_																							
3A (Subject Property)			1B	0.50	60	30																								
3A (Subject Froperty)			1C	0.30	0	0														-										
			1D	0.40	60	25														-										
				1.61	0	0						1								1										
	}	-	1E 1F	0.95	60	57	+	1	1	1	}	1		1	 		1	 	}	+	+	-	+				}	}	-	
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	-	-	1H 1I	0.49	0	30 0	+	1	-		 	-	 	-	 		-	 	-	 	-	-	+				-	-	-	\vdash
							_						-							-	-									
Win			1J	0.47	60	29																								
Kingma			20A	0.21	60	13																								
			20B	0.09	60	6																								
			20C	0.08	60	5																								
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			20E	0.18	60	<u>11</u>															L									
	284	142		7.28	ļ	245	7.28	245	4.11	2.98			0.00		0.00			0.00	0.00	7.28	7.28	2.082	5.06	52.7	200	0.50	23.19	0.74	0.84	21.8%
	142				ļ		7.28	245					0.00		0.00			0.00	0.00											
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Hendler			3A	0.12	75	10																								
			3B	0.23	0	0																								
			3C	0.84	110	93						ļ																		
			3D	0.07	60	5						ļ																		
			3E	0.05	0	0																								
			3F	0.10	60	7																								
			3G	0.09	60	6																								
			3H	0.99	0	0																								
			31	0.15	60	9					ļ				ļ			<u> </u>		1	1									
			3J	0.57	0	0					ļ				ļ			<u> </u>		1	1									
			3K	0.13	60	8									ļ															
			3L	0.67	60	41									ļ															
			3M	0.07	75	5									ļ															
			3N	0.26	75	20									ļ															
			3P	<u>0.24</u>	60	<u>15</u>									ļ															
	267	142		4.58		219	4.58	219	4.13	2.67			0.00		0.00			0.00	0.00	4.58	4.58	1.310	3.98	65.4	200	1.00	32.80	1.04	1.19	12.1%
	142						4.58	219					0.00		0.00			0.00	0.00											
						ļ									ļ															
Outlet from Our Site	142	71					11.86	464	3.99	5.47			0.00		0.00			0.00	0.00	0.00	11.86	3.392	8.86	77.0	200	0.49	22.96	0.73	0.83	38.6%
	71																													
Townline Road			4A	1.02	110	113	1								ļ			ļ	1											
			4B	<u>0.31</u>	0	<u>0</u>	1				ļ				ļ			ļ												
	71	70		1.33	ļ	113	17.56	788	3.86	8.99	ļ		0.00		0.00			0.00	0.00	1.33	17.56	5.022	14.01	68.9	200	0.60	25.41	0.81	0.92	55.1%
					1										ļ			ļ			1									
	70	69					17.56	788	3.86	8.99			0.00		0.00			0.00	0.00	0.00	17.56	5.022	14.01	67.4	200	1.70	42.76	1.36	1.55	32.8%
	69						17.56	788					0.00		0.00			0.00	0.00											

Stantec

Lockbridge Development Inc Smithville 3A

People/Hectare (p/ha)

August 16, 2024

WJE

FILE NUMBER: N/A

DESIGNED BY:

SANITARY SEWER DESIGN SHEET

Design Parameters

Mininum Velocity=

Residential:

255 L/dav/Person 0.0030 L/s/Person

n= 0.013 Max Peak Factor= 5.000 Min Peak Factor= 2.000

0.600 m/s

Comercial: 1.500 L/s/Ha Industrial: Institutional:

1.000 L/s/Ha 0.375 L/s/Ha

CHECKED BY: SAK Project Number 161414394 Infiltration: 0.286 L/s/Ha RESIDENTIAL AREA AND POPULATION LOCATION COMMERCIAL INDUSTRIAL INSTITUTIONAL INFILTRATION PIPE SELECTION Peak Length Street U/S D/S Area ID Peak Flow Area ID Total Flow Design Size Q_{A}/Q_{C} **Population** Area Area Area Total Area ted Area ted Area ted Area C+I+I Flow ted Area Velocity Design Capacity (L/s) (m/s) (P/ha) (ha) (ha) (ha) (ha) (ha) (ha) (L/s) (L/s) (%) (L/s) (m/s) (%) (ha) (ha) (ha) Shurie Road 0.25 11B 1.19 0 60 19 11C 0.32 11D 0.19 60 12 11E 0.08 0.07 11F 0 11G 1.38 60 83 11H 1.08 60 65 1.80 135 111 75 60 11J 0.14 93 69 6.50 339 6.50 339 4.06 4.06 0.00 0.00 0.00 0.00 6.50 6.50 1.859 5.92 85.8 200 0.55 24.32 0.77 0.88 24.3% 6.50 0.00 0.00 0.00 0.00 Townline Road 5A 0.25 60 15 5B 0.36 0 0 5C 0.69 60 77 1184 3.75 13.11 0.00 0.00 0.00 0.00 1.30 25.36 7.253 20.36 119.5 0.49 22.96 0.73 0.83 88.7% 69 1.30 25.36 200 1.09 34.24 1.09 1.24 59.5% 77 76 25.36 1184 3.75 13.11 0.00 0.00 0.00 0.00 0.00 25.36 7.253 20.36 84.4 200 76 25.36 1184 0.00 0.00 0.00 0.00 Townline Road 9A 0.25 60 16 9B 0.28 0 0 0.28 12A 1.26 60 76 12B 3.62 0 0 12C 0.52 60 32 12D 0.83 12E 0.18 60 12 12F 0.07 0 12G 1.23 0 0 12H 0.07 121 0.19 60 12 121 1.06 60 64 12K 1.24 12L 3.03 60 183 12M 1.22 60 73 12N 1.03 60 0.46 22.24 0.71 0.81 55.9% 78 76 16.36 673 16.36 673 3.90 7.76 0.00 0.00 0.00 0.00 16.36 16.36 4.679 12.43 111.6 200 673 0.00 0.00 0.00 16.36 0.00 Anderson Crescent 8A 0.56 60 34 8B 0.24 8C 0.27 60 76 85 1.07 51 42.79 1908 3.60 20.28 0.00 0.00 0.00 0.00 1.07 42.79 12.238 32.52 95.3 250 0.37 36.17 0.74 0.84 89.9% 0.00 0.00 0.00 0.00 0.00 42.79 12.238 32.52 0.63 47.20 0.96 1.10 68.9% 85 20.28 0.00 0.00 0.00 42.79 12.238 32.52 10.3 84 83 42.79 1908 3.60 20.28 0.00 0.00 250 0.87 55.47 1.13 1.29 58.6% 83 42 79 1908 0.00 0.00 0.00 0.00 Anderson Crescent 7B 0.30 0 0 60 7C 0.28 87 86 1.22 1.22 56 4.30 0.71 0.00 0.00 0.00 0.00 1.22 1.22 0.349 1.06 80.2 200 1.18 35.63 1.13 1.29 3.0% 86 83 1.22 56 4.30 0.71 0.00 0.00 0.00 0.00 0.00 1.22 0.349 1.06 200 0.73 28.02 0.89 1.02 3.8% 83 1.22 56 0.00 0.00 0.00 0.00 North to SPS 0.00 0.00 33.64 83 0.32 81 44.01 1964 3.59 20.82 0.00 0.00 0.00 0.00 0.00 44.01 12.587 33.41 87.5 250 0.35 35.18 0.72 0.82 95.0% 82 0.00 81 80 44.01 1964 3.59 20.82 0.00 0.00 0.00 0.00 44.01 12.587 33.41 113.5 0.27 30.90 0.63 0.72 108.1% 250 80 79 44.01 1964 3.59 20.82 0.00 0.00 0.00 0.00 0.00 44.01 12.587 33.41 13.1 250 1.38 69.86 1.42 1.62 47.8% 79 44.01 1964 0.00 0.00 0.00 0.00

2

APPENDIX E-3

GRAVITY INITIAL FIRST PHASE SANITARY SERVICING ANALYSIS BRIEF



October 6, 2023 File: 1614-14394/29

DIGITAL SUBMISSION ONLY

Attention: Mr. Mike DiPaola, P.Eng.

Director of Public Works

Township of West Lincoln 318 Canborough St. Box 400 Smithville ON L0R 2A0

Dear Mr. DiPaola,

Reference: Smithville 3A - Gravity Initial First Phase Sanitary Servicing Analysis

Introduction

This narrative has been provided to prepare a brief synopsis of the functional sanitary analysis for the proposed initial first phase subject lands that will discharge by gravity to the existing Townline Road Sanitary Sewer System. Eventually, the flow will discharge to the existing Smithville Sanitary Pumping Station (SPS) via Anderson Crescent and Twenty Mile Creek Crossing. The analysis concentrates specifically on the initial "first phase" of the subject land flows and sanitary route system it takes to Smithville SPS.

Background

Smithville is expanding their urban boundary and the subject lands within Phase 3A. Per the Master Community Plan (MCP) produced by AECOM in April 2023, a portion of the Smithville Phase 3A Lands can discharge by gravity to Smithville SPS rather than to the proposed new pumping station on Port Davidson Road.

Sanitary Pumping Station and Sanitary Sewer Capacity

A MCP was completed for the expansion of Smithville's Urban Boundary in April 2023. A portion of the subject lands can discharge by gravity to the existing Smithville SPS located on 226 Saint Catharines Street, just North of Twenty Mile Creek. From the 2017 Region of Niagara's Master Servicing Plan, the available capacity is 120 L/s.

The initial "first phase" of the subject lands will discharge eventually to the existing Smithville SPS by using the existing sanitary sewers along Townline Road, Anderson and a creek crossing under Twenty Mile Creek. The existing sanitary sewers range from 200-250 mm dia. sewers. The sanitary sewer that was installed under Twenty Mile Creek is 250 mm PVC dia. sewer completed with a +/- 500 mm dia. steel casing pipe at a grade/slope of 0.28%. The capacity of the sewer running under the creek is 31.47m³/s.

AECOM has noted through Landsmith's correspondence (see appendix A) that the existing creek crossing can be surcharged to up to 100% capacity and that this is better for the pipe performance based on better scouring of the pipe.



October 6, 2023 Mr. Mike DiPaola, P.Eng. Page 2 of 3

Reference: Smithville 3A – Initial First Phase Gravity Sanitary Servicing Analysis

Sanitary Servicing Flow

To determine the initial "first phase" design flow within Smithville 3A, we used the West Lincoln Municipal Engineering Standards 2022. Sanitary Sewer design is a "population per area" based on an approximation of zoning with different densities per an assumed zoning.

The following densities are included within the Development Manual:

LAND USE	DENSITY (ppha)
Single Houses	60
Semi-Detached Houses	75
Low Density (Townhouses, Maisonettes, etc.)	110
Medium Density	250
Parks	12 – 25
Schools and Institutional Uses	75 – 125
Commercial/Industrial	120 - 750

The above table could be used to ensure a conservative design sizing within the proposed initial first phase lands and existing lands discharging to the Smithville SPS via existing sanitary sewers.

Reviewing the Township of West Lincoln and Region of Niagara Design Standards, the sanitary flow is calculated using 275L/c/day. As noted in AECOM's and Landsmith's correspondence email (Appendix A), the Region changed their per capita flow generation for sanitary to 255L/c/d. For the purpose of this analysis, we used 275L/c/day to be conservative.

The sanitary design and the design area plans for the subject lands and existing lands that discharge south of the Smithville SPS are designed with discrete areas for the right-of-ways such that these areas could be used for the infiltration calculations without adding sanitary flow to the design. See Drawing C-110 and attached design sheet (Appendix B).

Using this method for the existing lands and proposed interim subject land (approximately 7.36 ha), creates a discharge of 31.38 L/s and produces a population of 1736 people under the creek. As previously mentioned, the total peak to the pumping sanitary is 120 L/s and pipe capacity of the 250 mm dia. sewer crossing under the creek is 31.47 L/s. The projected flow is 99.7% of the pipe capacity, which is in accordance with AECOM allowing the crossing under the creek to surcharge up to 100% capacity of the pipe.

Conclusions

Based on the above analysis, proposed zoning for the initial first phase of the subject lands generates a sanitary flow that can be accommodated to the newly updated Smithville SPS and sewer under the Twenty Mile Creek.

7.36 ha of the subject lands can discharge by gravity to the existing sewer without surcharging the sewers and following the recommendations of MCP.

Please contact the undersigned if there are any questions.

Design with community in mind



October 6, 2023 Mr. Mike DiPaola, P.Eng. Page 3 of 3

Reference: Smithville 3A - Initial First Phase Gravity Sanitary Servicing Analysis

Sincerely,

STANTEC CONSULTING LTD.

Stephen Kapolnas, P.Eng.

Steplen Kapolona

Project Manager

Community Development Phone: 519.585.7365 stephen.kapolnas@stantec

Attachments: Appendix A – AECOM's and Landsmith's Email Correspondence

Appendix B – Sanitary Design Calculations and Design Area Plan C-110

c. Mr. Don Manson, Samper Developments
Ms. Suzanne Mammel, Stantec Consulting Ltd.

APPENDIX A

AECOM'S AND LANDSMITH'S EMAIL CORRESPONDENCE

From: Andrew Smith

To: 38timberlee@gmail.com; Fred vanderVelde

Subject: Smithville South Lands -

Date: Friday, March 3, 2023 10:14:00 AM

Attachments: <u>image001.png</u>

Guys,

There was a question as to how much land could be accommodated by the current sanitary system.

Our analysis contained in the FSR was based on using the existing sanitary sewers on Townline Road and Anderson Crescent and the existing creek crossing. Based on not exceeding 85% capacity of the sanitary sewer pipe, 18 acres of land (7.59 hectares) could be serviced immediately.

Since the time of my original FSR better information has become available through the work of AECOM.

First – the Region has changed their per capita flow generation for sanitary to 255 L/Cap/D – based on this lower flow rate and same criteria 27.2 acres (11.2 hectares) could be developed immediately.

Second – AECOM have noted that the existing creek crossing can be surcharged to up to 100% capacity and that this is better for the pipe performance based on better scouring of the pipe – based on the ability to surcharge this run of sanitary sewer up to 69 acres (28 hectares) could be added to the Townline road sanitary sewer immediately.

These are the options for using the existing sewers, however our strategy of providing a new gravity connection across the creek and through Rock Street park to Townline road is still on the table, and is now being promoted by other developers in the south as their preferred option. This would open up the balance of the lands without the need for a pumping station in the south.

AECOM notes an areas of the south lands being servicing immediately through the existing system, however they are noting upgrades to be required on the Townline Road and Anderson Crescent sanitary sewers at a cost of $^{8800,000.00}$ – however based on our analysis we do not think that would be necessary immediately unless you wanted to go beyond the 69 acres.

The question was raised regarding capacity at the sanitary pumping station, and this is a fair question – the Region and AECOM have been very guarded about the actual available capacity. The Region's Wastewater Master Servicing Plan in 2016 notes that the firm capacity of the SPS is 120 L/s while the peak wet weather flow is 200 L/s. However, the analysis of the Region did not account for the fact that there is a 600 cubic meter holding tank which cuts the peaks off the flows being received by the station.

AECOM uses a different method of calculation and determines that the peak wet weather flow is 145.7 Lps – which is greater than the firm capacity of the station. However the report does not account for how the holding tank cuts off the peak flows.

This is something we can look into further with the Region. There is capacity at the station, but it is unclear how much capacity is available. They continue to do infill development in other areas, and the north-west quadrant continues to move forward in advance of any further upgrades to the pumping station.

The Township is also working on an inflow and infiltration reduction program which is intended to significantly decrease the wet weather flows to the SPS. Note that AECOM notes the dry weather flows to the SPS to be only 20 L/s for the whole community – the rest is from rainfall events.

The proposed flows from the south lands based strictly on using the existing system would be between 10-15 Lps depending on how large the area is included.

The forcemain to Grimsby has 175 L/s capacity – so well above the sanitary pump station capacity at present.

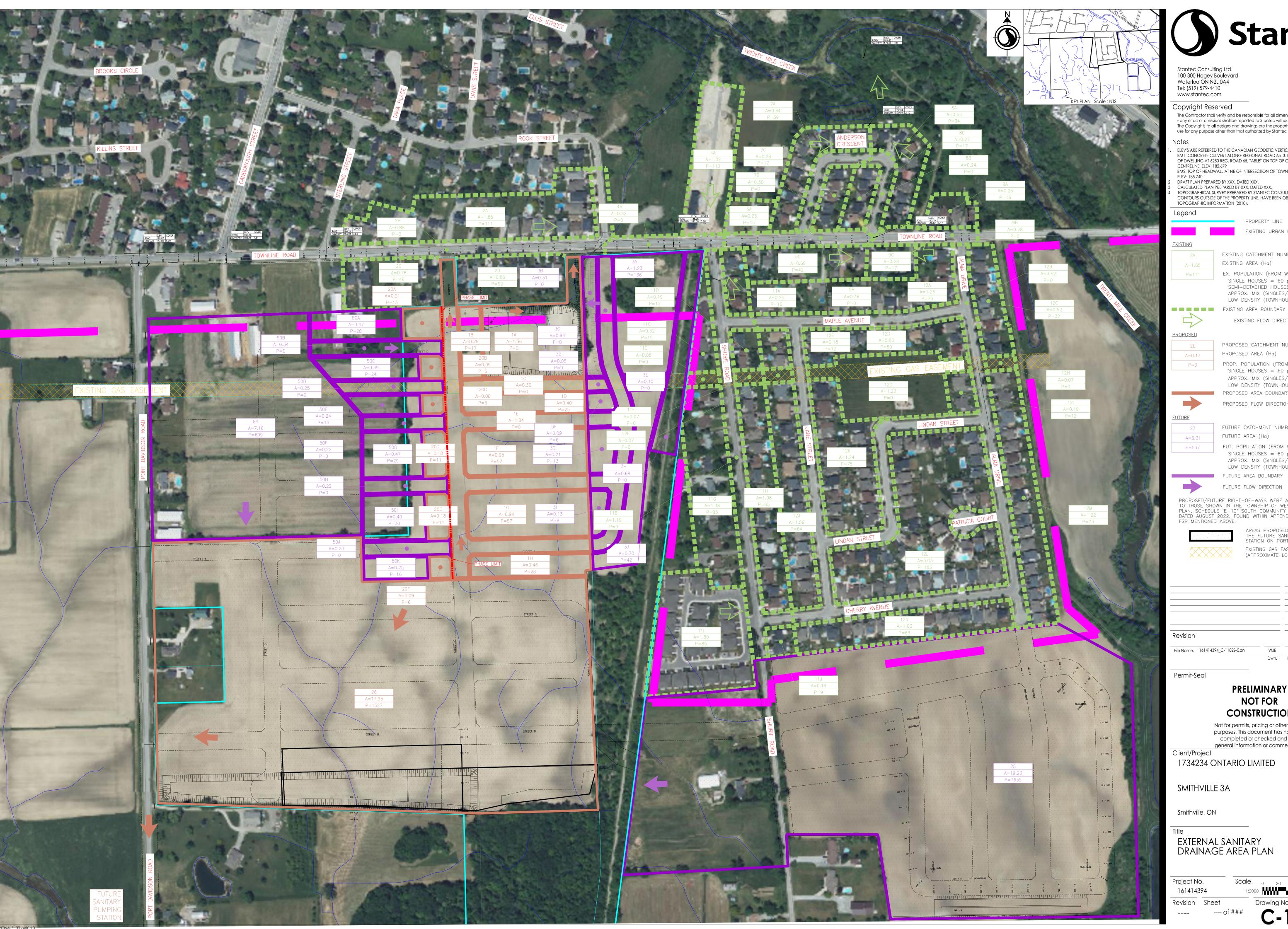
Some additional research with the Region regarding the actual performance of the SPS may be in order.

I have attached the latest AECOM report to this email together with some of the scenarios for use of the existing sanitary system to get flows to the sanitary pump station.

Best Regards,

Andrew Smith, P. Eng.
LandSmith Engineering & Consulting Ltd.
1059 Upper James Street, Unit 207
Hamilton, ON L9C 3A6
289-309-3632 (Office)
289-775-9374 (Cell)

APPENDIX B SANITARY DESIGN CALCULATIONS AND DESIGN AREA PLAN C-110





Stantec Consulting Ltd. 100-300 Hagey Boulevard Waterloo ON N2L 0A4 Tel: (519) 579-4410 www.stantec.com

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ELEV'S ARE REFERRED TO THE CANADIAN GEODETIC VERTICAL DATUM (CGVD-1928:1978) BM1: CONCRETE CULVERT ALONG REGIONAL ROAD 65, 3.1 km WEST OF BISMARK, 80m ÉAST OF DWELLING AT 6250 REG. ROAD 65, TABLET ON TOP OF CULVERT 7.3m SW OF ROAD CENTRELINE, ELEV: 182.679 BM2: TOP OF HEADWALL AT NE OF INTERSECTION OF TOWNLINE ROAD AND ROCK STREET

DRAFT PLAN PREPARED BY XXX, DATED XXX. CALCULATED PLAN PREPARED BY XXX, DATED XXX.

TOPOGRAPHICAL SURVEY PREPARED BY STANTEC CONSULTING LTD.?????, DATED XXX.

CONTOURS OUTSIDE OF THE PROPERTY LINE, HAVE BEEN OBTAINED FROM M.N.R.

PROPERTY LINE

TOPOGRAPHIC INFORMATION (2010).

EXISTING URBAN BOUNDARY

EXISTING CATCHMENT NUMBER EXISTING AREA (Ha)

EX. POPULATION (FROM WEST LINCOLN MANUAL) SINGLE HOUSES = 60 p/ha

SEMI-DETACHED HOUSES = 75 p/ha APPROX. MIX (SINGLES/TOWNHOUSES)= 85 p/ha LOW DENSITY (TOWNHOUSES) = 110 p/ha

EXISTING FLOW DIRECTION

PROPOSED CATCHMENT NUMBER PROPOSED AREA (Ha)

> PROP. POPULATION (FROM WEST LINCOLN MANUAL) SINGLE HOUSES = 60 p/haAPPROX. MIX (SINGLES/TOWNHOUSES)= 85 p/ha LOW DENSITY (TOWNHOUSES) = 110 p/ha

PROPOSED AREA BOUNDARY PROPOSED FLOW DIRECTION

FUTURE CATCHMENT NUMBER FUTURE AREA (Ha)

> FUT. POPULATION (FROM WEST LINCOLN MANUAL) SINGLE HOUSES = 60 p/ha APPROX. MIX (SINGLES/TOWNHOUSES)= 85p /ha LOW DENSITY (TOWNHOUSES) = 110 p/ha

FUTURE AREA BOUNDARY



PROPOSED/FUTURE RIGHT-OF-WAYS WERE APPROXIMATELY MATCHED TO THOSE SHOWN IN THE TOWNSHIP OF WEST LINCOLN OFFICIAL PLAN, SCHEDULE 'E-10' SOUTH COMMUNITY AREA LAND USE PLAN, DATED AUGUST 2022, FOUND WITHIN APPENDIX A OF THE LANDSMITH FSR MENTIONED ABOVE.



AREAS PROPOSED TO DRAIN TO THE FUTURE SANITARY PUMPING STATION ON PORT DAVIDSON ROAD. EXISTING GAS EASEMENT (APPROXIMATE LOCATION)

By Appd YYYY.MM.DD

File Name: 161414394_C-110SS-Con WJE WJE SAK 2023.10.05 Dwn. Dsgn. Chkd. YYYY.MM.DD

Permit-Seal

PRELIMINARY NOT FOR CONSTRUCTION

Not for permits, pricing or other official purposes. This document has not been completed or checked and is for general information or comment only.

1734234 ONTARIO LIMITED

SMITHVILLE 3A

Smithville, ON

EXTERNAL SANITARY DRAINAGE AREA PLAN

Project No. 161414394 Revision Sheet

Stantec

1734234 Ontario Limited Smithville 3A Initial First Phase

People/Hectare (p/ha)

 DATE:
 October 6, 2023

 DESIGNED BY:
 WJE
 FILE NUMBER:
 N/A

SANITARY SEWER
DESIGN SHEET

Design Parameters Residential: 275 L/day/Person

Mininum Velocity= 0.600 m/s

n= 0.013 Comercial:

Max Peak Factor= 5.000 Industrial: 1.000 L/s/Ha
Min Peak Factor= 2.000 Institutional: 0.375 L/s/Ha
Infiltration: 0.286 L/s/Ha

0.0032 L/s/Person

1.500 L/s/Ha

CHECKED BY: SAK Project Number 161414394 0.286 L/s/Ha LOCATION RESIDENTIAL AREA AND POPULATION COMMERCIAL INDUSTRIAL INSTITUTIONAL INFILTRATION PIPE SELECTION Total Peak Total Full Actual Residentia Population Cummulative Accumula Length Cumulative Accumula Street U/S D/S Area ID Population Peak Flow Area ID Area Area Area ID C+I+I Flow Design Size Q_A/Q_C Area ID Area Area Density Area Population Factor ted Area ted Area ted Area Area ted Area Flow Design Design Capacity Velocity Velocity Flow (P/ha) (ha) (P) (ha) (ha) (ha) (ha) (L/s) (ha) (ha) (L/s) (L/s) (m) (%) (L/s) (m/s) (m/s) (%) (mm) Townline Road 2A 1.85 111 2B 0.88 Ω 2C 0.78 60 48 2D 0.86 60 4.37 4.03 49.1 25.41 0.81 0.92 15.9% 72 183 211 4.37 211 4.14 2.78 0.00 0.00 0.00 0.00 4.37 4.37 1.250 200 0.60 183 0.00 4.37 211 0.00 0.00 0.00 Our Site 1A 1.36 0.28 60 17 1C 0.30 0 0.40 60 1D 25 1E 1.84 1F 0.95 60 57 1G 0.94 60 57 1H 0.46 60 28 20A 0.21 60 13 20B 0.09 60 6 20C 0.08 60 20D 0.18 60 11 20E 0.18 11 60 20F 0.09 60 94 142 7.36 236 7.36 236 4.12 3.10 0.00 0.00 0.00 0.00 7.36 7.36 2.105 5.20 154.6 200 0.50 23.19 0.74 0.84 22.4% 142 0.00 7.36 236 0.00 0.00 0.00 Outlet from Our Site 142 183 7.36 236 4.12 3.10 0.00 0.00 0.00 7.36 2.105 75.9 200 0.50 23.19 0.74 0.84 22.4% 183 11.73 447 4.00 5.69 0.00 0.00 0.00 0.00 0.00 11.73 3.355 25.41 0.81 0.92 35.6% Townline Road 71 9.04 46.6 200 0.60 Townline Road 4A 1.02 110 113 4B 0.32 0 1.34 113 13.07 560 3.95 7.04 0.00 0.00 0.00 0.00 1.34 3.738 10.78 68.9 200 25.41 0.81 0.92 42.4% 70 69 13.07 3.95 7.04 0.00 0.00 13.07 3.738 10.78 67.5 200 1.70 42.76 1.36 1.55 25.2% 560 0.00 0.00 0.00 69 13.07 560 0.00 0.00 0.00 0.00 Shurie Road 11A 0.25 60 16 11B 1.19 11C 0.32 60 19 11D 0.19 60 12 11E 0.08 0 11F 0.07 0 0 11G 1.38 60 83 11H 1.08 60 65 111 1.80 75 135 60 11J 0.14 93 69 6.50 339 6.50 339 4.06 4.38 0.00 0.00 0.00 0.00 6.50 6.50 1.859 6.23 85.5 200 0.55 24.32 0.77 0.88 25.6% 69 6.50 339 0.00 0.00 0.00 0.00

1

Stantec

1734234 Ontario Limited Smithville 3A Initial First Phase

People/Hectare (p/ha)

October 6, 2023 DATE: DESIGNED BY: FILE NUMBER: N/A WJE CHECKED BY: SAK

SANITARY SEWER DESIGN SHEET

Design Parameters Residential: 275 L/day/Person

Mininum Velocity= 0.600 m/s 0.0032 L/s/Person n= 0.013 Comercial: 1.500 L/s/Ha Max Peak Factor= 5.000 Industrial: 1.000 L/s/Ha

Min Peak Factor= 2.000 0.375 L/s/Ha Institutional: Infiltration: 0.286 L/s/Ha

	DESIGNED		WJE			FILE NUMBER:														Min i	Peak Factor=	2.000		Institutional:		L/s/Ha			
	CHECKED E	SY:	SAK			Project Number					1		1		1			1				1	1	Infiltration:		L/s/Ha			
LOC	ATION				RE	SIDENTIAL AREA	AND POPULA	TION			COMMERC	CIAL		NDUSTR	IAL II	NSTITUTIO	ONAL			INFILTRATIO	N				PIPE SE	LECTION	1	1	
Street	u/s	D/S	Area ID	Residential Area (ha)	Population Density (P/ha)	Population (P)	Cummulativ Area (ha)	e Cumulative Population (min)	Peak Factor	Peak Flow L/s	Area ID Area	Accumula ted Area (ha)	Area ID	Area (ha)	Accumula ted Area ID (ha)	Area (ha)	Accumula ted Area (ha)		Total Area (ha)	Accumula ted Area (ha)	Flow (L/s)	Total Flow (L/s)	Length Design (m)	Design Size (mm)	Slope Design (%)	Full Capacity (L/s)	Full Velocity (m/s)	Actual Velocity (m/s)	Q _A /Q _C (%)
Tarrellina Dand			F.4	0.25	60	45																							-
Townline Road			5A	0.25	60	15																							
			5B 5C	0.36 0.69	0 60	0 42																							
	69	77	3C	1.30	60	57	20.87	956	3.81	11.60		0.00			0.00		0.00	0.00	1.30	20.87	5.969	17.57	122.7	200	0.49	22.96	0.73	0.83	76.5%
	77	76		1.30		37	20.87	956	3.81	11.60		0.00			0.00		0.00	0.00	0.00		5.969	17.57	85.2	200	1.09	34.24		1.24	51.3%
	76	70					20.87	956	3.61	11.00		0.00			0.00		0.00	0.00	0.00	20.67	3.909	17.57	83.2	200	1.03	34.24	1.03	1.24	31.370
Townline Road			9A	0.25	60	16																							
			9B	0.28	0	0																							
			9C	0.28	60	17																							
			12A	1.26	60	76																							
			12B	3.62	0	0																							
			12C	0.52	60	32																							
			12D	0.83	60	50																							
			12E	0.18	60	12																							
			12F	0.07	0	0																							
			12G	1.23	0	0																							
			12H	0.07	0	0																							
			121	0.19	60	12																							
			12J	1.06	60	64																							
			12K	1.24	60	75																							
			12L 12M	3.03 1.22	60 60	183 73																							-
			12N	1.03	60	63																							
	78	76	1211	16.36	00	673	16.36	673	3.90	8.36		0.00			0.00		0.00	0.00	16.36	16.36	4.679	13.04	35.4	200	0.49	22.96	0.73	0.83	56.8%
	76	70		10.50		0/3	16.36	673	3.50	0.50		0.00			0.00		0.00	0.00	10.50	10.50	4.073	13.04	33.4	200	0.45	22.50	0.75	0.03	30.070
	7.0						20.00	0.0				0.00			0.00		0.00	0.00											
Anderson Crescent			8A	0.56	60	34																							
			8B	0.24	0	0																							
			8C	0.27	60	<u>17</u>																							
	76	85		1.07		51	38.30	1680	3.64	19.48		0.00			0.00		0.00	0.00	1.07	38.30	10.954	30.44	96.2	250	0.36	35.68	0.73	0.83	85.3%
	85	84					38.30	1680	3.64	19.48		0.00			0.00		0.00	0.00	0.00		10.954	30.44	16.5	250	0.63	47.20	0.96	1.10	64.5%
	84	83					38.30	1680	3.64	19.48		0.00			0.00		0.00	0.00	0.00	38.30	10.954	30.44	10.3	250	0.87	55.47	1.13	1.29	54.9%
	83						38.30	1680				0.00			0.00		0.00	0.00											
Anderson Crescent			7A	0.64	60	39																							
			7B	0.30	0	0									 					1		ļ					ļ		<u> </u>
	07	0.0	7C	0.28	60	<u>17</u>	1 22	5.0	4 30	0.77		0.00			0.00		0.00	0.00	1 22	1.33	0.240	1.12	90.3	200	1.40	25.62	1.12	1 20	2.40/
	87 86	86 83	1	1.22		56	1.22 1.22	56 56	4.30 4.30	0.77 0.77		0.00			0.00		0.00	0.00	1.22 0.00	1.22	0.349	1.12 1.12	80.2 56.8	200	1.18 0.69	35.63 27.24	1.13 0.87	1.29 0.99	3.1% 4.1%
	83	03					1.22	56	4.30	0.77		0.00			0.00		0.00	0.00	0.00	1.22	0.549	1.12	30.8	200	0.09	27.24	0.67	0.99	4.170
N									2.55	20.00									0.00	20.72	44.000	24.22	40.7	252	0.55	24:5	0 ==	0 ==	04.55
North to SPS	83	82	1				39.52	1736	3.63	20.07		0.00			0.00		0.00	0.00	0.00	_	11.303	31.38	42.7	250	0.33	34.16		0.79	91.8%
	82 81	81 80	1				39.52 39.52	1736 1736	3.63 3.63	20.07		0.00			0.00		0.00	0.00	0.00		11.303 11.303	31.38 31.38	87.4 104.7	250 250	0.35 0.28	35.18 31.47		0.82 0.73	89.2% 99.7%
	80	79	1				39.52	1736	3.63	20.07		0.00			0.00		0.00	0.00	0.00	39.52	11.303	31.38	15.0	250	1.20	65.14		1.51	48.2%
	79	, ,	+				39.52	1736	3.03	20.07		0.00			0.00		0.00	0.00	0.00	33.32	11.303	31.30	13.0	230	1.20	03.14	1.33	1.71	70.270
	,,,						33.32	1/30				0.00			0.00		0.00	0.00		1									+
L					1	<u> </u>	1		·	1	L	1			·	·	<u> </u>	1		1		1			L	·	1		

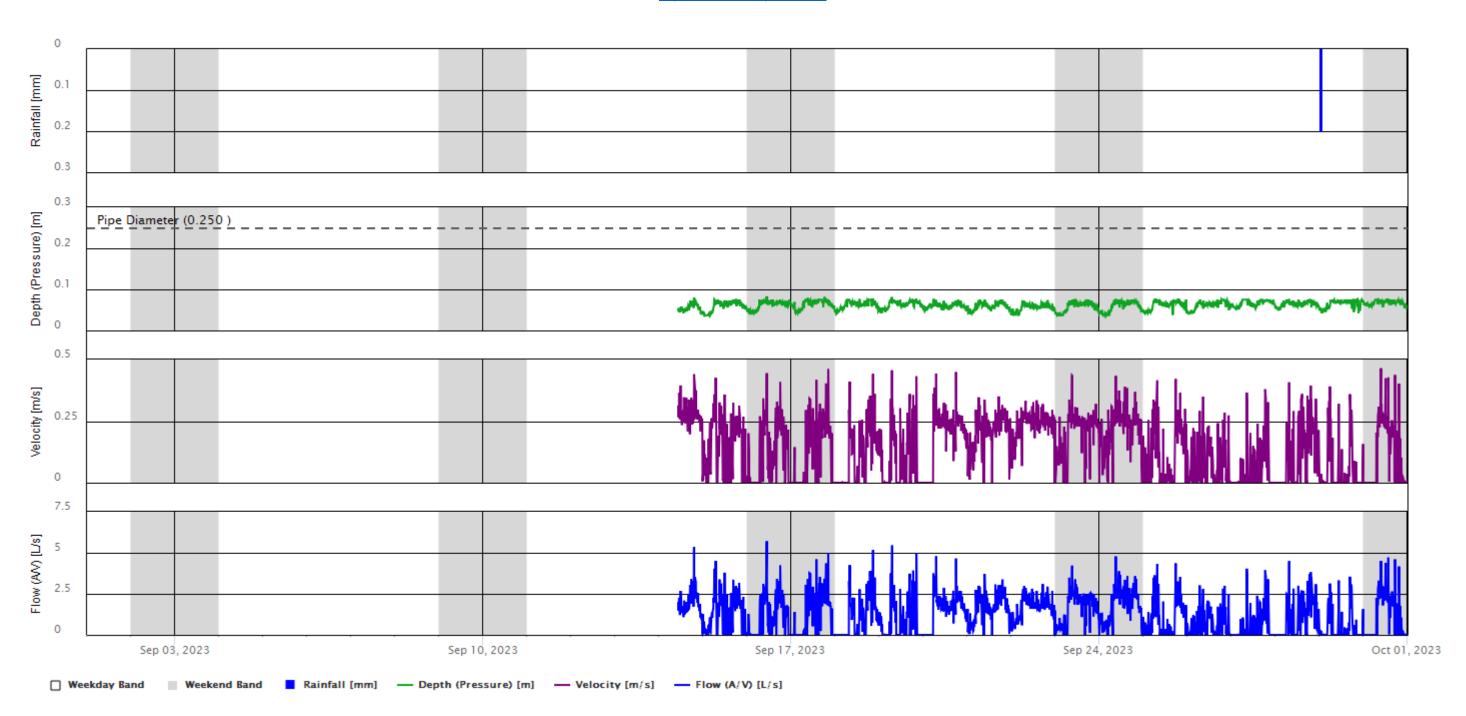
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APPENDIX E-4

CIV 09 DATA CHART AND FLOW MONITORING

Station: CIV_09 (MH DY06345)

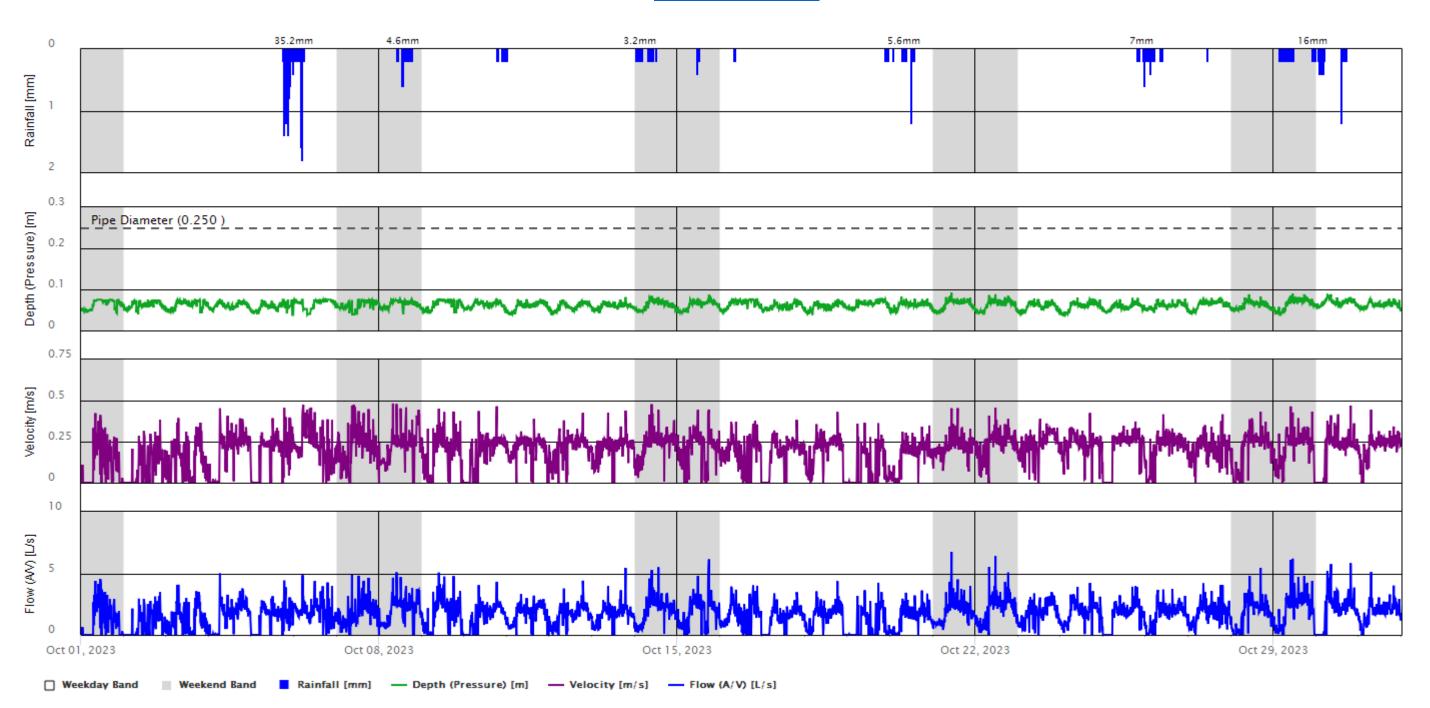
Sep 01, 2023 – Sep 30, 2023





Station: CIV_09 (MH DY06345)

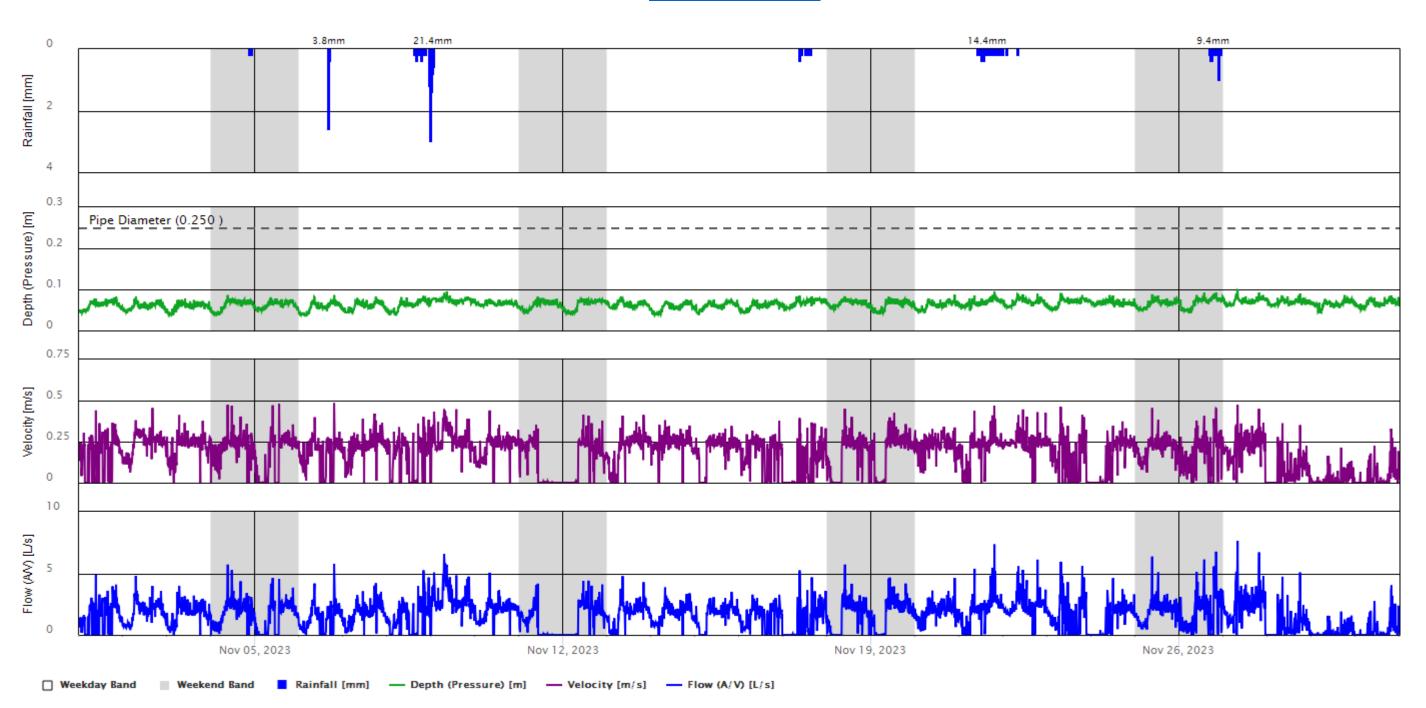
Oct 01, 2023 – Oct 31, 2023





Station: CIV_09 (MH DY06345)

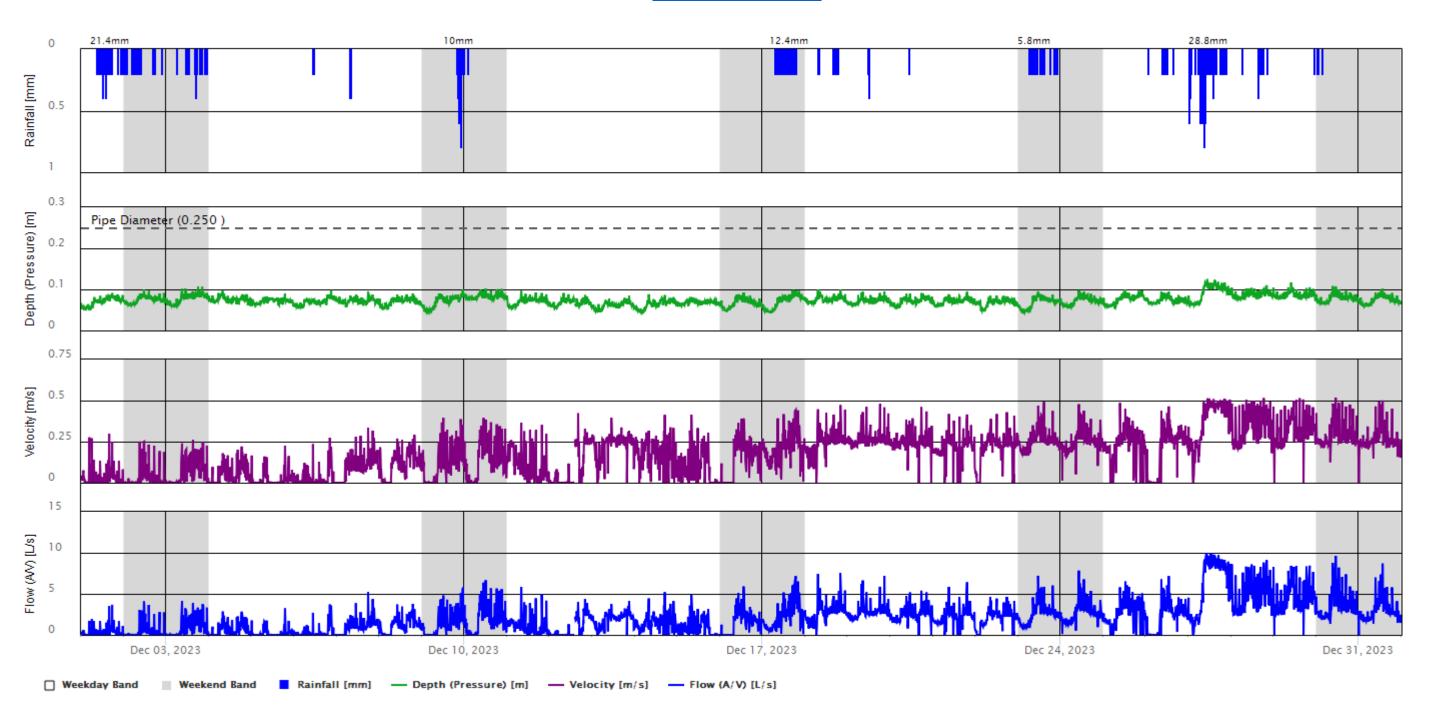
Nov 01, 2023 - Nov 30, 2023





Station: CIV_09 (MH DY06345)

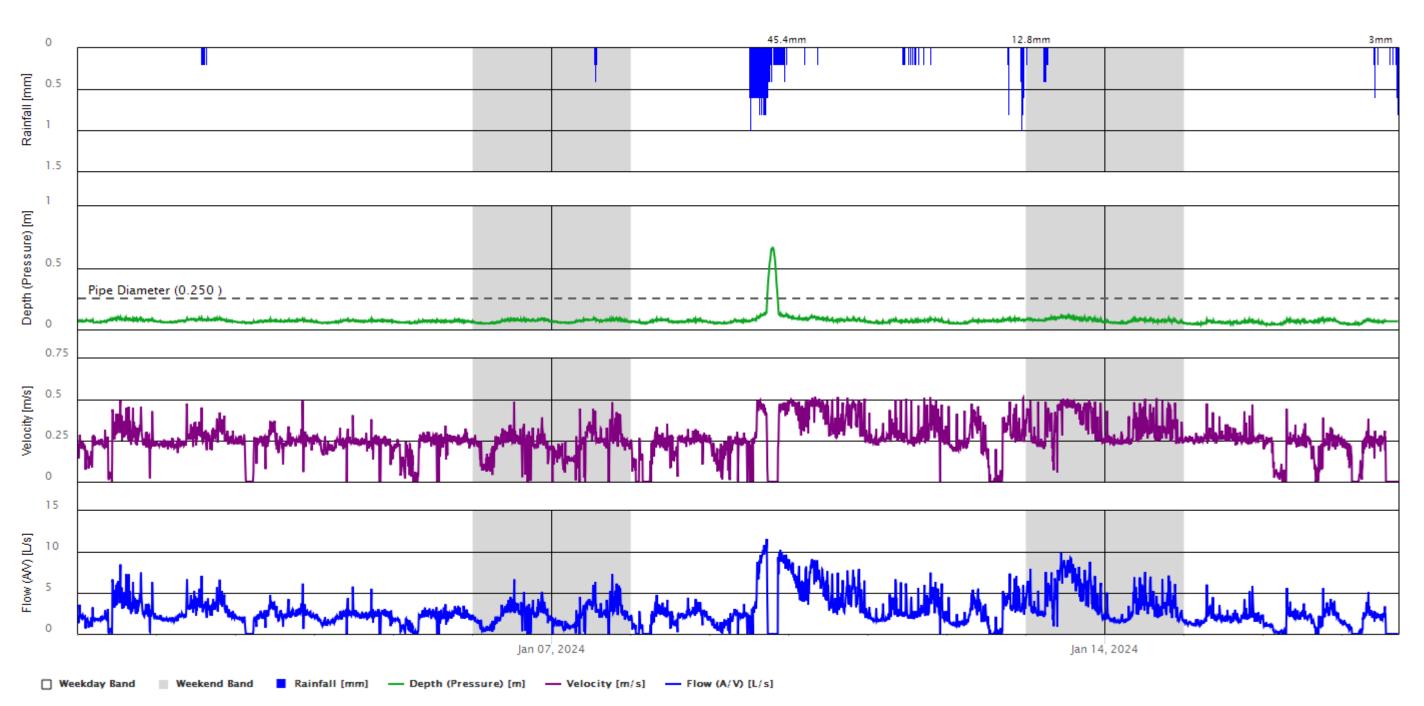
Dec 01, 2023 – Dec 31, 2023





Station: CIV_09 (MH DY06345)

<u>Jan 01, 2024 – Jan 17, 2024</u>





Sanitary Report

Station: CIV_09 (MH DY06345)

Average Dry Weather Flow (L/s)	Average Dry Weather Flow (L/c/d)	Average Daily Minimum Dry Weather Flow (L/s)	Average Daily Peak Dry Weather Flow (L/s)
1.742	364.370	0.070	4.746
Peaking Factor	Groundwater Infiltration (L/s) ¹	Groundwater Infiltration (L/ha/d)	% of GWI in Average DWF
2.725	0.059	142.618	3.402





¹ Groundwater infiltration (GWI) is assumed as 85% of the daily minimum flow averaged over the monitoring period



I/I Analysis Table

Station: CIV_09 (MH DY06345)

				Peak Intensity Over Tc at			CIV_09 (MH DY06345)	
	Event ¹	Total Precipitation (mm)	Duration (hours)	Station (mm/hr)		Peak I/I Flow (L/s)	Peak I/I Rate (L/s/ha)	Volumetric Runoff Coefficient (CV%)
	Oct 05, 2023	35.20	11.75	10.80		4.39	0.12	0.61 %
	Oct 29, 2023	16.00	37.42	4.80	-	3.49	0.10	1.27 %
ms	Nov 08, 2023	21.40	10.50	12.80		4.63	0.13	1.30 %
Storms	Nov 21, 2023	14.40	22.25	3.60	KPIs	4.94	0.14	2.81 %
ured	Dec 01, 2023	21.40	62.00	2.80		2.14	0.06	0.24 %
Measu	Dec 17, 2023	12.40	11.50	2.00	Flow	4.67	0.13	1.50 %
Σ	Dec 26, 2023	28.80	66.67	6.40		7.97	0.22	7.22 %
	<u>Jan 09, 2024</u>	45.40	20.50	8.00		9.12	0.25	2.75 %
	<u>Jan 12, 2024</u>	12.80	12.00	10.40		6.53	0.18	4.92 %
	Average	23.09	28.29	6.84		5.32	0.15	2.51 %
	Maximum	45.40	66.67	12.80		9.12	0.25	7.22 %

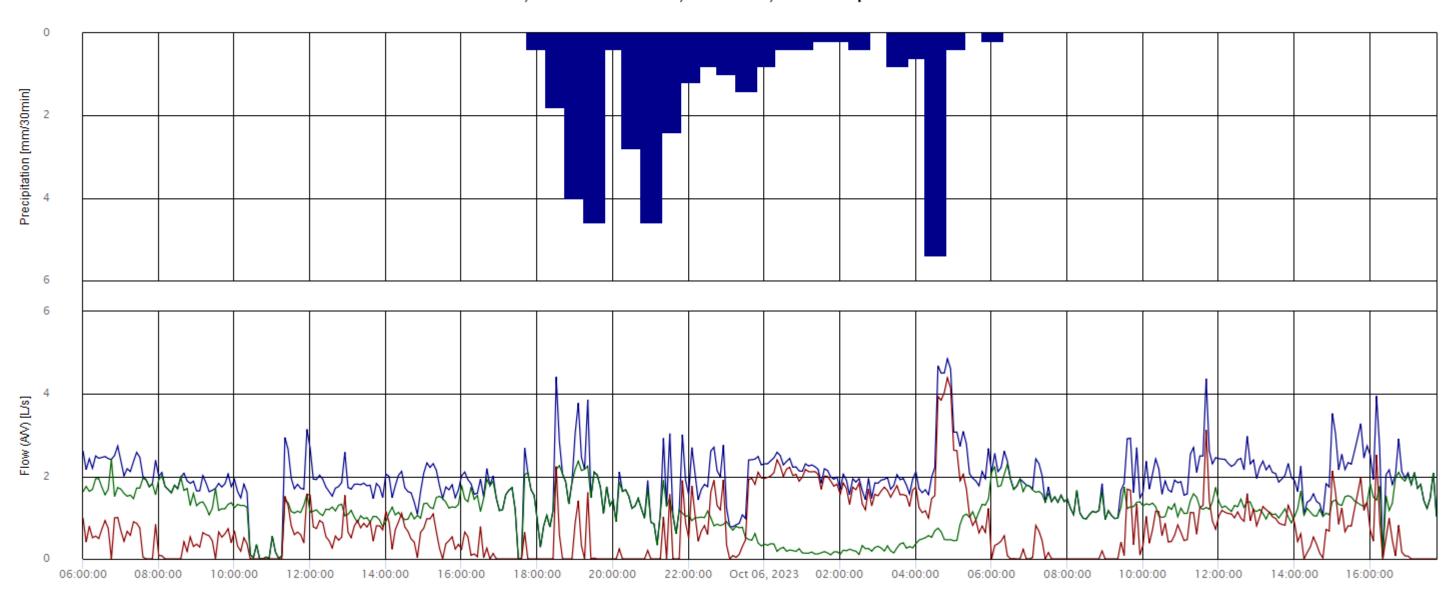
¹ An event is a storm with a minimum volume of 15mm and a minimum inter-event dry period of 12 hours



I/I Analysis Graph

Station: CIV_09 (MH DY06345)

Infiltration/Inflow Event Analysis
Oct 05, 2023 06:00 – Oct 06, 2023 17:45, Total Precipitation: 35.2 mm







Infiltration/Inflow Event Analysis Station: CIV_09 (MH DY06345)

Oct 05, 2023 06:00 - Oct 06, 2023 17:45, Total Precipitation: 35.20 mm (12,636,794.30 L)

Station	Details	Storm Details									
Catchment Area	35.90 ha	Total Precipitation	35.20 mm (12,636,794.30 L)	Duration of Storm	11.75 hr						
Time of Concentration (Tc) ¹	30 min	Peak Precipitation Intensity Over Tc ²	10.80 mm/hr	Return Period over Tc ³	< 2 Yr						
Measur	red Flow	I/I Flow									
Time of Peak Measured Flow	Oct 06, 2023 04:50	Time of Peak I/I Flow (TD)	Oct 06, 2023 04:50	Estimated Dry Weather Flow at TD	0.46 L/s						
Peak Measured Flow	4.85 L/s	Peak I/I Flow ⁴	4.39 L/s	Peak I/I Rate ⁵	0.12 L/s/ha						
Peak Measured Depth	0.08 m	Total I/I Flow Volume during event	76,792.60 L	Volumetric Coefficient (Cv%) ⁶	0.61%						
Total Measured Flow Volume during Event	170,469.40 L	Peak I/I Coefficient ⁷	0.0041	Hourly Wet-Weather Peaking Factor ⁸	3.22						
		Instantaneous Wet-Weather Peaking Factor ⁹	4.44								

¹ Time of Concentration (Tc): The estimated time for the flow to travel from the furthest point in the upstream area to the point of monitoring, assume flow is travelling at 1.00 m/s



² Peak Precipitation Intensity Over Tc: The peak rainfall intensity for the duration of the storm with the time interval defined by time of concentration

³ Return Period over Tc: The estimated time to elapse before a storm of equal or greater intensity will likely occur again, based on design storm criteria

⁴ Peak I/I Flow: The greatest difference captured between measured flow and estimated dry weather flow, Peak I/I Flow = Maximum (Measured Flow – Estimated Dry Weather Flow)

⁵ Peak I/I Rate: A normalized peak I/I flow based on catchment area size, Peak I/I Rate = Peak I/I Flow / Catchment Area

⁶ Volumetric Coefficient (Cv%): The ratio of total I/I volume and total rainfall volume, Cv% = Total I/I Flow Volume / Total Precipitation Volume * 100%

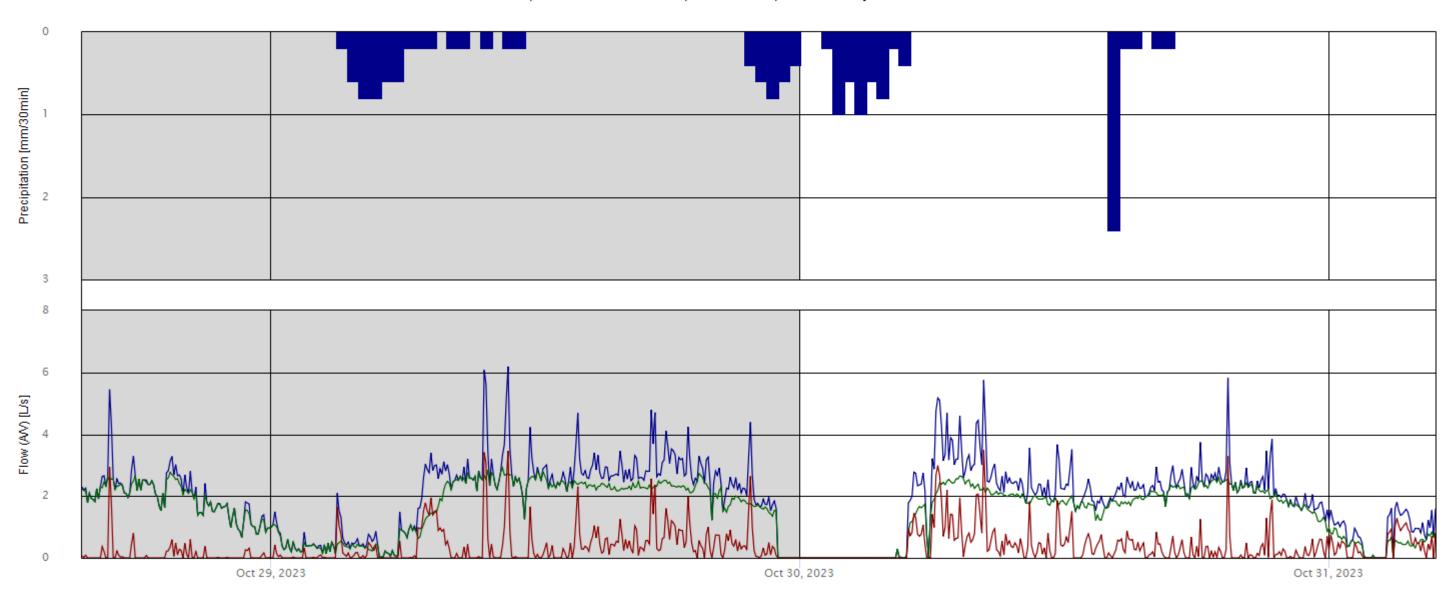
⁷ Peak I/ I Coefficient: The ratio of peak I/I flow and peak rainfall intensity, Peak I/ I Coefficient = Peak I/I Flow / (Peak Rainfall Intensity over Tc * Catchment Area)

⁸ Hourly Wet-Weather Peaking Factor: The ratio of peak hourly wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Hourly Wet-Weather Measured Flow / Average Dry-Weather Flow

⁹ Instantaneous Wet-Weather Peaking Factor: The ratio of peak wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Wet-Weather Measured Flow / Average Dry-Weather Flow

Station: CIV_09 (MH DY06345)

Infiltration/Inflow Event Analysis
Oct 28, 2023 15:25 – Oct 31, 2023 04:50, Total Precipitation: 16 mm







Oct 28, 2023 15:25 - Oct 31, 2023 04:50, Total Precipitation: 16.00 mm (5,743,999.30 L)

Station	Details	Storm Details										
Catchment Area	35.90 ha	Total Precipitation	16.00 mm (5,743,999.30 L)	Duration of Storm	37.42 hr							
Time of Concentration (Tc) ¹	30 min	Peak Precipitation Intensity Over Tc ²	4.80 mm/hr	Return Period over Tc ³	< 2 Yr							
Measur	ed Flow		I/I Flow									
Time of Peak Measured Flow	Oct 29, 2023 10:45	Time of Peak I/I Flow (TD)	Oct 30, 2023 08:20	Estimated Dry Weather Flow at TD	2.26 L/s							
Peak Measured Flow	6.19 L/s	Peak I/I Flow ⁴	3.49 L/s	Peak I/I Rate ⁵	0.10 L/s/ha							
Peak Measured Depth	0.09 m	Total I/I Flow Volume during event	72,989.40 L	Volumetric Coefficient (Cv%) ⁶	1.27%							
Total Measured Flow Volume during Event	350,752.30 L	Peak I/I Coefficient ⁷	0.0073	Hourly Wet-Weather Peaking Factor ⁸	2.54							
		Instantaneous Wet-Weather Peaking Factor ⁹	3.97									

¹ Time of Concentration (Tc): The estimated time for the flow to travel from the furthest point in the upstream area to the point of monitoring, assume flow is travelling at 1.00 m/s



² Peak Precipitation Intensity Over Tc: The peak rainfall intensity for the duration of the storm with the time interval defined by time of concentration

³ Return Period over Tc: The estimated time to elapse before a storm of equal or greater intensity will likely occur again, based on design storm criteria

⁴ Peak I/I Flow: The greatest difference captured between measured flow and estimated dry weather flow, Peak I/I Flow = Maximum (Measured Flow – Estimated Dry Weather Flow)

⁵ Peak I/I Rate: A normalized peak I/I flow based on catchment area size, Peak I/I Rate = Peak I/I Flow / Catchment Area

⁶ Volumetric Coefficient (Cv%): The ratio of total I/I volume and total rainfall volume, Cv% = Total I/I Flow Volume / Total Precipitation Volume * 100%

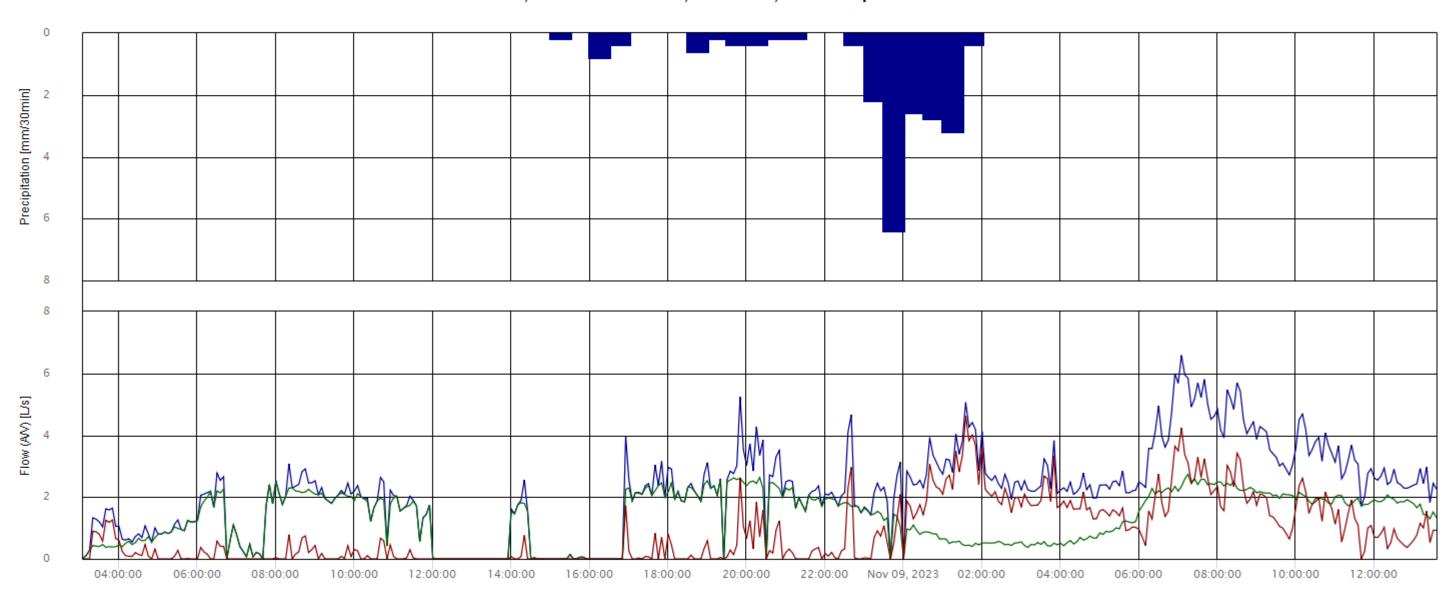
⁷ Peak I/ I Coefficient: The ratio of peak I/I flow and peak rainfall intensity, Peak I/ I Coefficient = Peak I/I Flow / (Peak Rainfall Intensity over Tc * Catchment Area)

⁸ Hourly Wet-Weather Peaking Factor: The ratio of peak hourly wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Hourly Wet-Weather Measured Flow / Average Dry-Weather Flow

⁹ Instantaneous Wet-Weather Peaking Factor: The ratio of peak wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Wet-Weather Measured Flow / Average Dry-Weather Flow

Station: CIV_09 (MH DY06345)

Infiltration/Inflow Event Analysis
Nov 08, 2023 03:05 – Nov 09, 2023 13:35, Total Precipitation: 21.4 mm



Precipitation [mm/30min] — Measured Flow — Estimated Dry Weather Flow — I/I Flow



Nov 08, 2023 03:05 - Nov 09, 2023 13:35, Total Precipitation: 21.40 mm (7,682,598.60 L)

Station	Details	Storm Details										
Catchment Area	35.90 ha	Total Precipitation	21.40 mm (7,682,598.60 L)	Duration of Storm	10.50 hr							
Time of Concentration (Tc) ¹	30 min	Peak Precipitation Intensity Over Tc ²	12.80 mm/hr	Return Period over Tc ³	< 2 Yr							
Measur	red Flow		I/I Flow									
Time of Peak Measured Flow	Nov 09, 2023 07:05	Time of Peak I/I Flow (TD)	Nov 09, 2023 01:35	Estimated Dry Weather Flow at TD	0.43 L/s							
Peak Measured Flow	6.58 L/s	Peak I/I Flow ⁴	4.63 L/s	Peak I/I Rate ⁵	0.13 L/s/ha							
Peak Measured Depth	0.09 m	Total I/I Flow Volume during event	99,756.80 L	Volumetric Coefficient (Cv%) ⁶	1.30%							
Total Measured Flow Volume during Event	220,739.10 L	Peak I/I Coefficient ⁷	0.0036	Hourly Wet-Weather Peaking Factor ⁸	3.73							
		Instantaneous Wet-Weather Peaking Factor ⁹	4.42									

¹ Time of Concentration (Tc): The estimated time for the flow to travel from the furthest point in the upstream area to the point of monitoring, assume flow is travelling at 1.00 m/s



² Peak Precipitation Intensity Over Tc: The peak rainfall intensity for the duration of the storm with the time interval defined by time of concentration

³ Return Period over Tc: The estimated time to elapse before a storm of equal or greater intensity will likely occur again, based on design storm criteria

⁴ Peak I/I Flow: The greatest difference captured between measured flow and estimated dry weather flow, Peak I/I Flow = Maximum (Measured Flow – Estimated Dry Weather Flow)

⁵ Peak I/I Rate: A normalized peak I/I flow based on catchment area size, Peak I/I Rate = Peak I/I Flow / Catchment Area

⁶ Volumetric Coefficient (Cv%): The ratio of total I/I volume and total rainfall volume, Cv% = Total I/I Flow Volume / Total Precipitation Volume * 100%

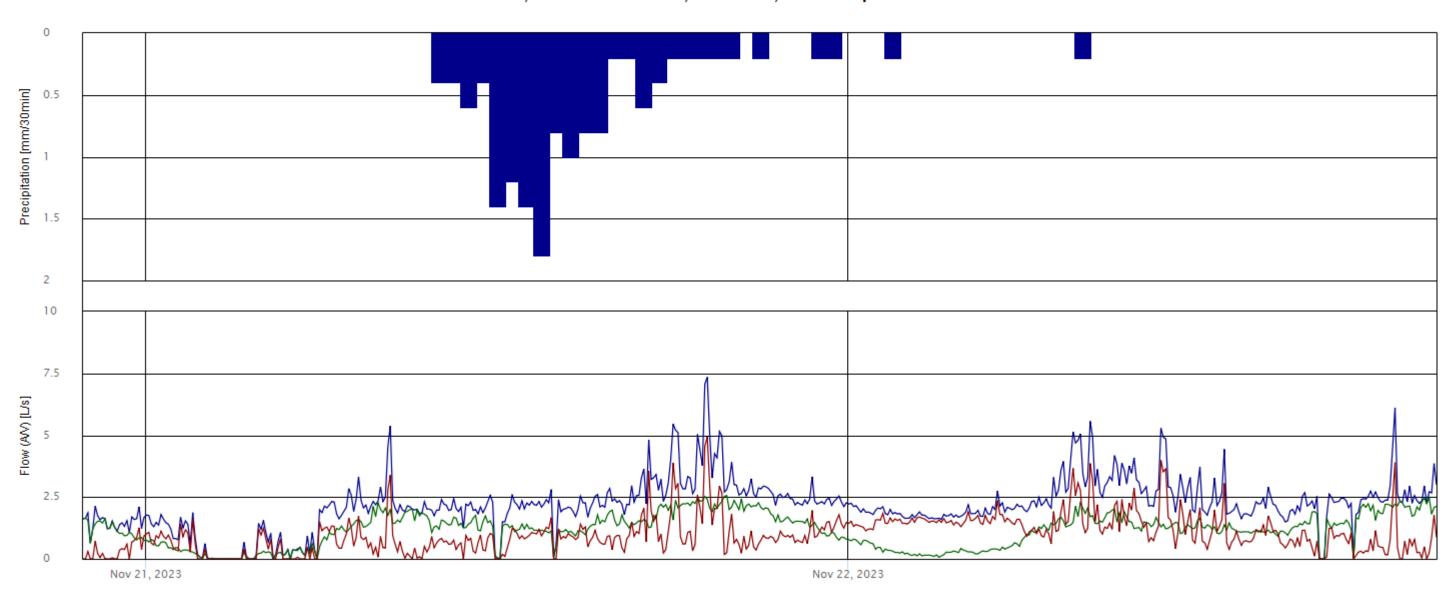
⁷ Peak I/ I Coefficient: The ratio of peak I/I flow and peak rainfall intensity, Peak I/ I Coefficient = Peak I/I Flow / (Peak Rainfall Intensity over Tc * Catchment Area)

⁸ Hourly Wet-Weather Peaking Factor: The ratio of peak hourly wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Hourly Wet-Weather Measured Flow / Average Dry-Weather Flow

⁹ Instantaneous Wet-Weather Peaking Factor: The ratio of peak wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Wet-Weather Measured Flow / Average Dry-Weather Flow

Station: CIV_09 (MH DY06345)

Infiltration/Inflow Event Analysis
Nov 20, 2023 21:50 – Nov 22, 2023 20:05, Total Precipitation: 14.4 mm



Precipitation [mm/30min] — Measured Flow — Estimated Dry Weather Flow — I/I Flow



Nov 20, 2023 21:50 - Nov 22, 2023 20:05, Total Precipitation: 14.40 mm (5,169,600.00 L)

Station	Details	Storm Details										
Catchment Area	35.90 ha	Total Precipitation	14.40 mm (5,169,600.00 L)	Duration of Storm	22.25 hr							
Time of Concentration (Tc) ¹	30 min	Peak Precipitation Intensity Over Tc ²	3.60 mm/hr	Return Period over Tc ³	< 2 Yr							
Measur	ed Flow		I/I Flow									
Time of Peak Measured Flow	Nov 21, 2023 19:10	Time of Peak I/I Flow (TD)	Nov 21, 2023 19:10	Estimated Dry Weather Flow at TD	2.41 L/s							
Peak Measured Flow	7.35 L/s	Peak I/I Flow ⁴	4.94 L/s	Peak I/I Rate ⁵	0.14 L/s/ha							
Peak Measured Depth	0.09 m	Total I/I Flow Volume during event	145,026.30 L	Volumetric Coefficient (Cv%) ⁶	2.81%							
Total Measured Flow Volume during Event	306,943.40 L	Peak I/I Coefficient ⁷	0.0138	Hourly Wet-Weather Peaking Factor ⁸	3.64							
		Instantaneous Wet-Weather Peaking Factor ⁹	5.61									

¹ Time of Concentration (Tc): The estimated time for the flow to travel from the furthest point in the upstream area to the point of monitoring, assume flow is travelling at 1.00 m/s



² Peak Precipitation Intensity Over Tc: The peak rainfall intensity for the duration of the storm with the time interval defined by time of concentration

³ Return Period over Tc: The estimated time to elapse before a storm of equal or greater intensity will likely occur again, based on design storm criteria

⁴ Peak I/I Flow: The greatest difference captured between measured flow and estimated dry weather flow, Peak I/I Flow = Maximum (Measured Flow – Estimated Dry Weather Flow)

⁵ Peak I/I Rate: A normalized peak I/I flow based on catchment area size, Peak I/I Rate = Peak I/I Flow / Catchment Area

⁶ Volumetric Coefficient (Cv%): The ratio of total I/I volume and total rainfall volume, Cv% = Total I/I Flow Volume / Total Precipitation Volume * 100%

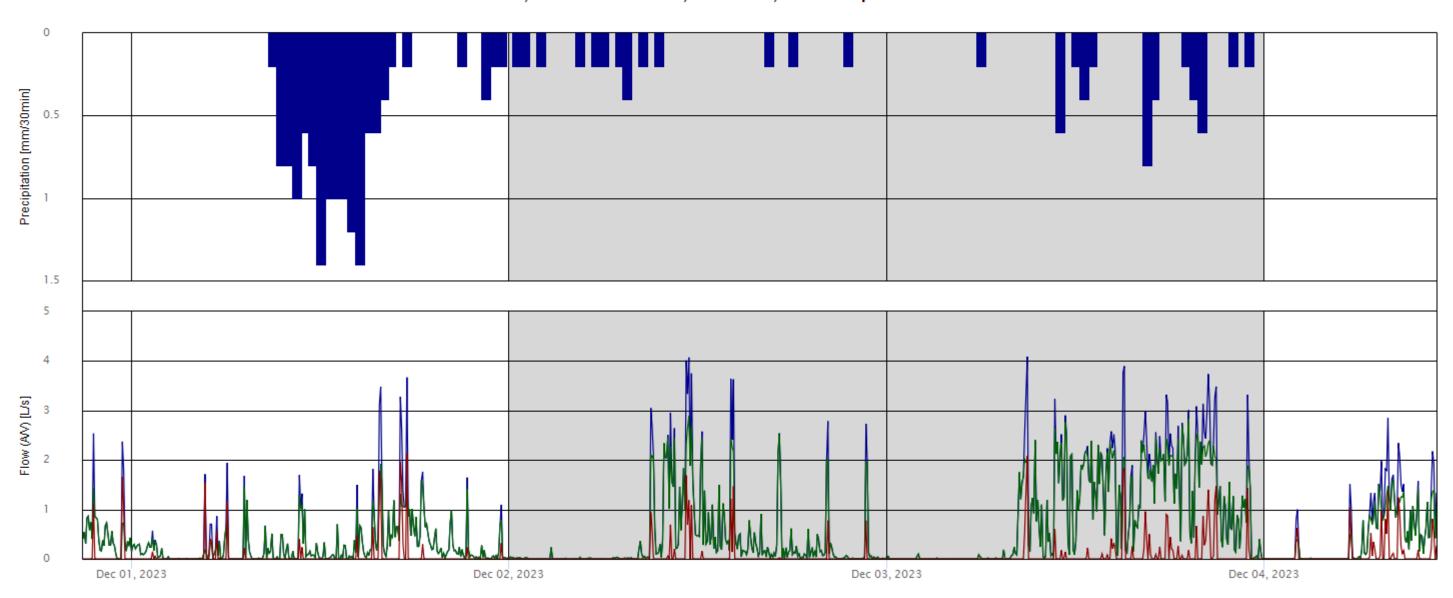
⁷ Peak I/ I Coefficient: The ratio of peak I/I flow and peak rainfall intensity, Peak I/ I Coefficient = Peak I/I Flow / (Peak Rainfall Intensity over Tc * Catchment Area)

⁸ Hourly Wet-Weather Peaking Factor: The ratio of peak hourly wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Hourly Wet-Weather Measured Flow / Average Dry-Weather Flow

⁹ Instantaneous Wet-Weather Peaking Factor: The ratio of peak wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Wet-Weather Measured Flow / Average Dry-Weather Flow

Station: CIV_09 (MH DY06345)

Infiltration/Inflow Event Analysis
Nov 30, 2023 20:55 – Dec 04, 2023 10:55, Total Precipitation: 21.4 mm



Precipitation [mm/30min] — Measured Flow — Estimated Dry Weather Flow — I/I Flow



Nov 30, 2023 20:55 – Dec 04, 2023 10:55, Total Precipitation: 21.40 mm (7,682,600.00 L)

Station	Details	Storm Details											
Catchment Area	35.90 ha	Total Precipitation	21.40 mm (7,682,600.00 L)	Duration of Storm	62.00 hr								
Time of Concentration (Tc) ¹	30 min	Peak Precipitation Intensity Over Tc ²	2.80 mm/hr	Return Period over Tc ³	< 2 Yr								
Measur	red Flow		1/1	Flow									
Time of Peak Measured Flow	Dec 03, 2023 08:55	Time of Peak I/I Flow (TD)	Dec 01, 2023 17:30	Estimated Dry Weather Flow at TD	1.53 L/s								
Peak Measured Flow	4.09 L/s	Peak I/I Flow ⁴	2.14 L/s	Peak I/I Rate ⁵	0.06 L/s/ha								
Peak Measured Depth	0.11 m	Total I/I Flow Volume during event	18,365.60 L	Volumetric Coefficient (Cv%) ⁶	0.24%								
Total Measured Flow Volume during Event	158,085.70 L	Peak I/I Coefficient ⁷	0.0077	Hourly Wet-Weather Peaking Factor ⁸	5.22								
		Instantaneous Wet-Weather Peaking Factor ⁹	7.81										

¹ Time of Concentration (Tc): The estimated time for the flow to travel from the furthest point in the upstream area to the point of monitoring, assume flow is travelling at 1.00 m/s



² Peak Precipitation Intensity Over Tc: The peak rainfall intensity for the duration of the storm with the time interval defined by time of concentration

³ Return Period over Tc: The estimated time to elapse before a storm of equal or greater intensity will likely occur again, based on design storm criteria

⁴ Peak I/I Flow: The greatest difference captured between measured flow and estimated dry weather flow, Peak I/I Flow = Maximum (Measured Flow – Estimated Dry Weather Flow)

⁵ Peak I/I Rate: A normalized peak I/I flow based on catchment area size, Peak I/I Rate = Peak I/I Flow / Catchment Area

⁶ Volumetric Coefficient (Cv%): The ratio of total I/I volume and total rainfall volume, Cv% = Total I/I Flow Volume / Total Precipitation Volume * 100%

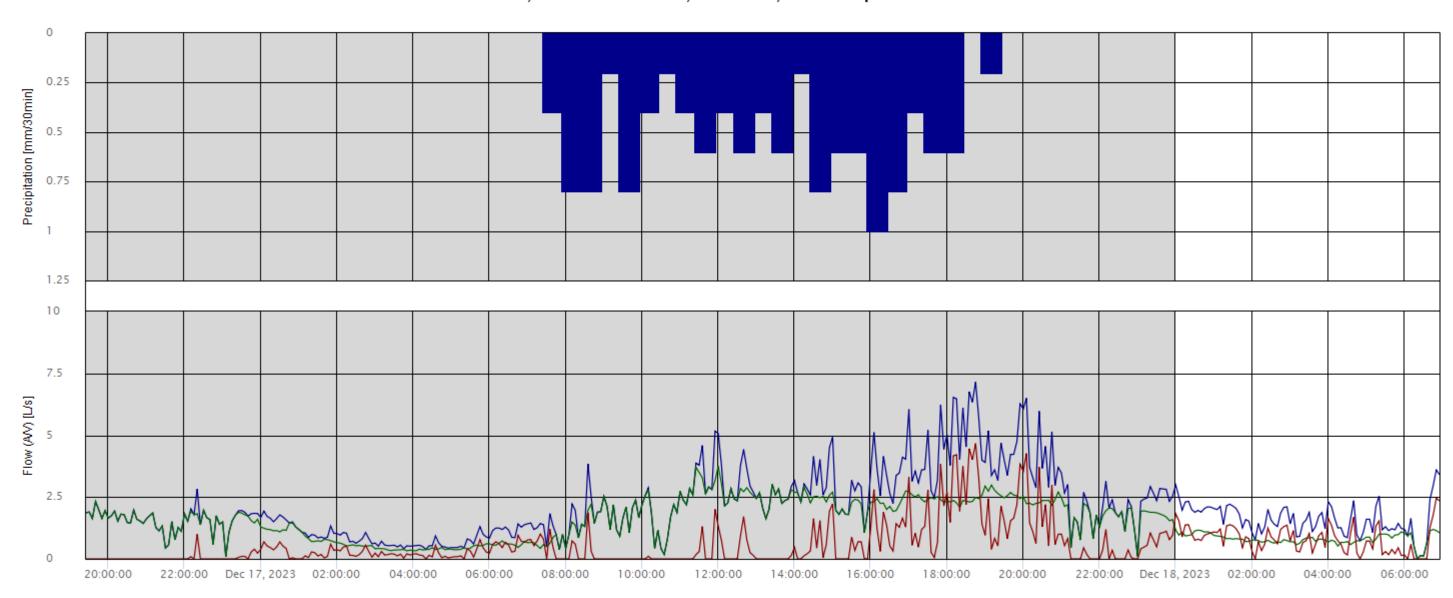
⁷ Peak I/ I Coefficient: The ratio of peak I/I flow and peak rainfall intensity, Peak I/ I Coefficient = Peak I/I Flow / (Peak Rainfall Intensity over Tc * Catchment Area)

⁸ Hourly Wet-Weather Peaking Factor: The ratio of peak hourly wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Hourly Wet-Weather Measured Flow / Average Dry-Weather Flow

⁹ Instantaneous Wet-Weather Peaking Factor: The ratio of peak wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Wet-Weather Measured Flow / Average Dry-Weather Flow

Station: CIV_09 (MH DY06345)

Infiltration/Inflow Event Analysis
Dec 16, 2023 19:25 – Dec 18, 2023 06:55, Total Precipitation: 12.4 mm



Precipitation [mm/30min] — Measured Flow — Estimated Dry Weather Flow — I/I Flow



Dec 16, 2023 19:25 – Dec 18, 2023 06:55, Total Precipitation: 12.40 mm (4,451,600.00 L)

Station	Details	Storm Details											
Catchment Area	35.90 ha	Total Precipitation	12.40 mm (4,451,600.00 L)	Duration of Storm	11.50 hr								
Time of Concentration (Tc) ¹	30 min	Peak Precipitation Intensity Over Tc ²	2.00 mm/hr	Return Period over Tc ³	< 2 Yr								
Measur	red Flow		ı/ı	Flow									
Time of Peak Measured Flow	Dec 17, 2023 18:45	Time of Peak I/I Flow (TD)	Dec 17, 2023 18:45	Estimated Dry Weather Flow at TD	2.49 L/s								
Peak Measured Flow	7.15 L/s	Peak I/I Flow ⁴	4.67 L/s	Peak I/I Rate ⁵	0.13 L/s/ha								
Peak Measured Depth	0.10 m	Total I/I Flow Volume during event	66,712.80 L	Volumetric Coefficient (Cv%) ⁶	1.50%								
Total Measured Flow Volume during Event	212,634.30 L	Peak I/I Coefficient ⁷	0.0234	Hourly Wet-Weather Peaking Factor ⁸	3.27								
		Instantaneous Wet-Weather Peaking Factor ⁹	4.16										

¹ Time of Concentration (Tc): The estimated time for the flow to travel from the furthest point in the upstream area to the point of monitoring, assume flow is travelling at 1.00 m/s



² Peak Precipitation Intensity Over Tc: The peak rainfall intensity for the duration of the storm with the time interval defined by time of concentration

³ Return Period over Tc: The estimated time to elapse before a storm of equal or greater intensity will likely occur again, based on design storm criteria

⁴ Peak I/I Flow: The greatest difference captured between measured flow and estimated dry weather flow, Peak I/I Flow = Maximum (Measured Flow – Estimated Dry Weather Flow)

⁵ Peak I/I Rate: A normalized peak I/I flow based on catchment area size, Peak I/I Rate = Peak I/I Flow / Catchment Area

⁶ Volumetric Coefficient (Cv%): The ratio of total I/I volume and total rainfall volume, Cv% = Total I/I Flow Volume / Total Precipitation Volume * 100%

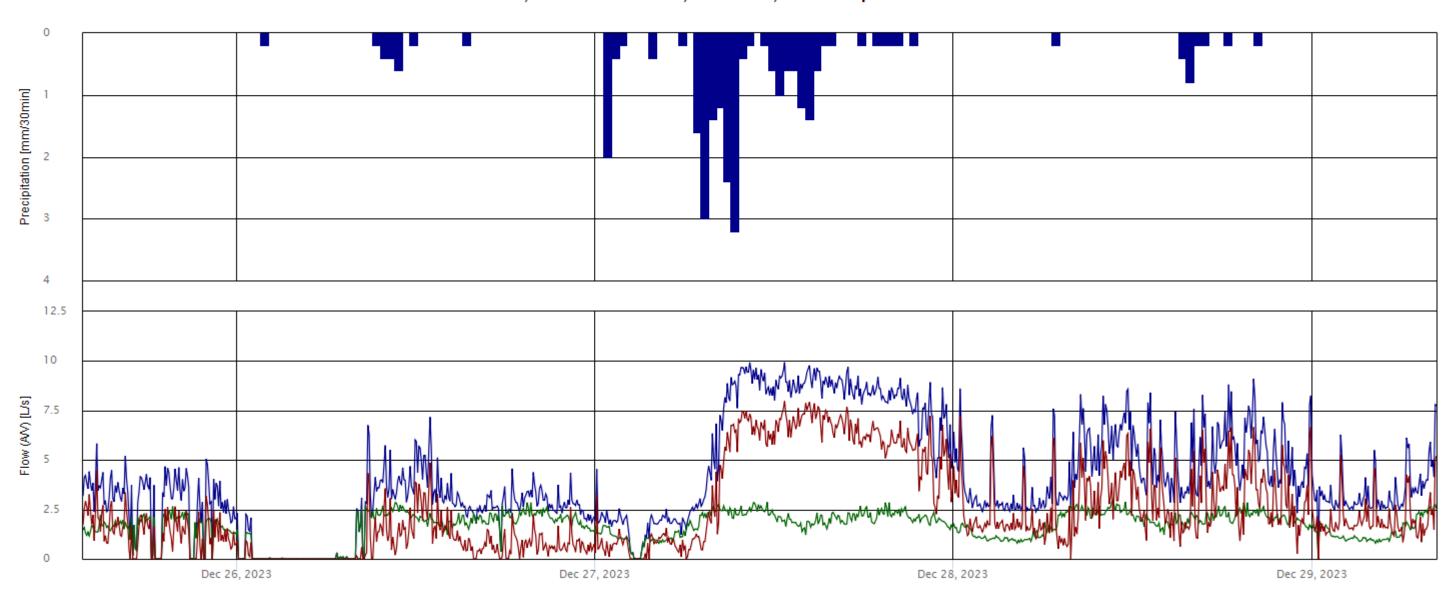
⁷ Peak I/ I Coefficient: The ratio of peak I/I flow and peak rainfall intensity, Peak I/ I Coefficient = Peak I/I Flow / (Peak Rainfall Intensity over Tc * Catchment Area)

⁸ Hourly Wet-Weather Peaking Factor: The ratio of peak hourly wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Hourly Wet-Weather Measured Flow / Average Dry-Weather Flow

⁹ Instantaneous Wet-Weather Peaking Factor: The ratio of peak wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Wet-Weather Measured Flow / Average Dry-Weather Flow

Station: CIV_09 (MH DY06345)

Infiltration/Inflow Event Analysis
Dec 25, 2023 13:40 – Dec 29, 2023 08:20, Total Precipitation: 28.8 mm







Dec 25, 2023 13:40 - Dec 29, 2023 08:20, Total Precipitation: 28.80 mm (10,339,196.80 L)

Station	Details	Storm Details											
Catchment Area	35.90 ha	Total Precipitation	28.80 mm (10,339,196.80 L)	Duration of Storm	66.67 hr								
Time of Concentration (Tc) ¹	30 min	Peak Precipitation Intensity Over Tc ²	6.40 mm/hr	Return Period over Tc ³	< 2 Yr								
Measur	red Flow		1/1	Flow									
Time of Peak Measured Flow	Dec 27, 2023 12:40	Time of Peak I/I Flow (TD)	Dec 27, 2023 12:40	Estimated Dry Weather Flow at TD	1.96 L/s								
Peak Measured Flow	9.93 L/s	Peak I/I Flow ⁴	7.97 L/s	Peak I/I Rate ⁵	0.22 L/s/ha								
Peak Measured Depth	0.13 m	Total I/I Flow Volume during event	746,552.80 L	Volumetric Coefficient (Cv%) ⁶	7.22%								
Total Measured Flow Volume during Event	1,229,330.60 L	Peak I/I Coefficient ⁷	0.0125	Hourly Wet-Weather Peaking Factor ⁸	5.58								
		Instantaneous Wet-Weather Peaking Factor ⁹	5.83										

¹ Time of Concentration (Tc): The estimated time for the flow to travel from the furthest point in the upstream area to the point of monitoring, assume flow is travelling at 1.00 m/s



² Peak Precipitation Intensity Over Tc: The peak rainfall intensity for the duration of the storm with the time interval defined by time of concentration

³ Return Period over Tc: The estimated time to elapse before a storm of equal or greater intensity will likely occur again, based on design storm criteria

⁴ Peak I/I Flow: The greatest difference captured between measured flow and estimated dry weather flow, Peak I/I Flow = Maximum (Measured Flow – Estimated Dry Weather Flow)

⁵ Peak I/I Rate: A normalized peak I/I flow based on catchment area size, Peak I/I Rate = Peak I/I Flow / Catchment Area

⁶ Volumetric Coefficient (Cv%): The ratio of total I/I volume and total rainfall volume, Cv% = Total I/I Flow Volume / Total Precipitation Volume * 100%

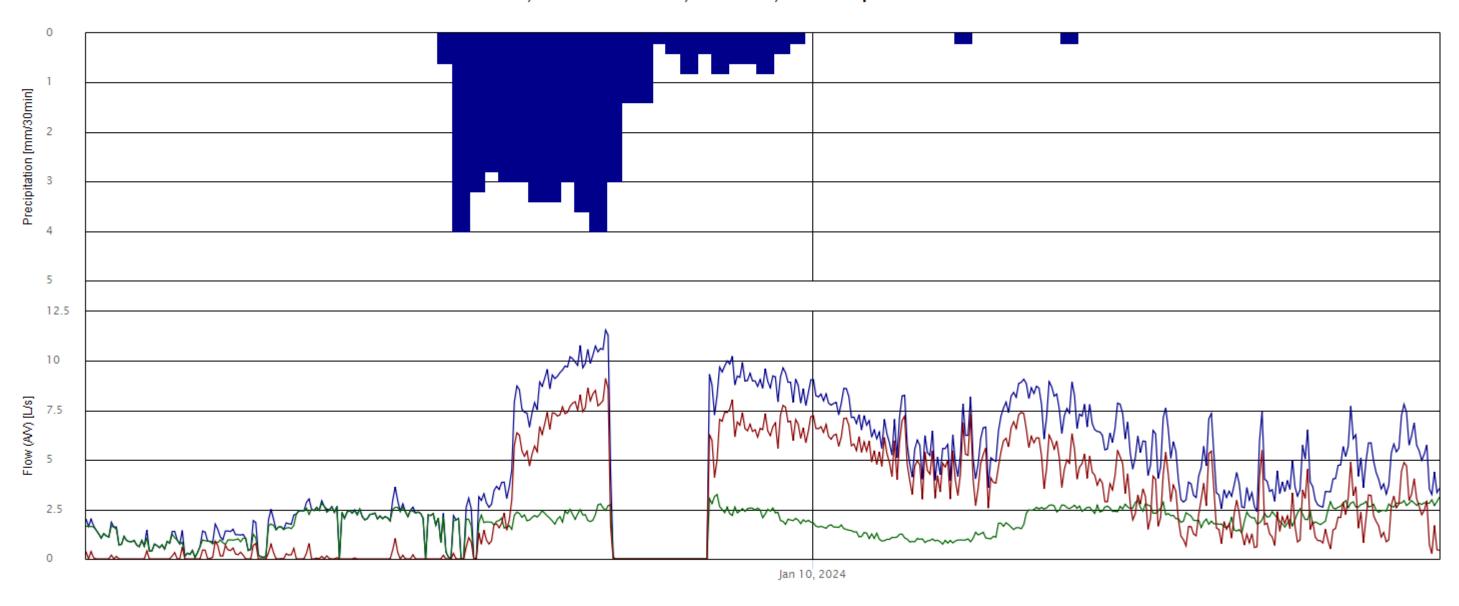
⁷ Peak I/ I Coefficient: The ratio of peak I/I flow and peak rainfall intensity, Peak I/ I Coefficient = Peak I/I Flow / (Peak Rainfall Intensity over Tc * Catchment Area)

⁸ Hourly Wet-Weather Peaking Factor: The ratio of peak hourly wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Hourly Wet-Weather Measured Flow / Average Dry-Weather Flow

⁹ Instantaneous Wet-Weather Peaking Factor: The ratio of peak wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Wet-Weather Measured Flow / Average Dry-Weather Flow

Station: CIV_09 (MH DY06345)

Infiltration/Inflow Event Analysis Jan 09, 2024 00:05 – Jan 10, 2024 20:35, Total Precipitation: 45.4 mm







Jan 09, 2024 00:05 – Jan 10, 2024 20:35, Total Precipitation: 45.40 mm (16,298,586.40 L)

Station	Details	Storm Details											
Catchment Area	35.90 ha	Total Precipitation	45.40 mm (16,298,586.40 L)	Duration of Storm	20.50 hr								
Time of Concentration (Tc) ¹	30 min	Peak Precipitation Intensity Over Tc ²	8.00 mm/hr	Return Period over Tc ³	< 2 Yr								
Measur	red Flow		1/1	Flow									
Time of Peak Measured Flow	Jan 09, 2024 17:10	Time of Peak I/I Flow (TD)	Jan 09, 2024 17:10	Estimated Dry Weather Flow at TD	2.45 L/s								
Peak Measured Flow	11.57 L/s	Peak I/I Flow ⁴	9.12 L/s	Peak I/I Rate ⁵	0.25 L/s/ha								
Peak Measured Depth	0.66 m	Total I/I Flow Volume during event	448,022.40 L	Volumetric Coefficient (Cv%) ⁶	2.75%								
Total Measured Flow Volume during Event	661,510.40 L	Peak I/I Coefficient ⁷	0.0114	Hourly Wet-Weather Peaking Factor ⁸	5.79								
		Instantaneous Wet-Weather Peaking Factor ⁹	6.35										

¹ Time of Concentration (Tc): The estimated time for the flow to travel from the furthest point in the upstream area to the point of monitoring, assume flow is travelling at 1.00 m/s



² Peak Precipitation Intensity Over Tc: The peak rainfall intensity for the duration of the storm with the time interval defined by time of concentration

³ Return Period over Tc: The estimated time to elapse before a storm of equal or greater intensity will likely occur again, based on design storm criteria

⁴ Peak I/I Flow: The greatest difference captured between measured flow and estimated dry weather flow, Peak I/I Flow = Maximum (Measured Flow – Estimated Dry Weather Flow)

⁵ Peak I/I Rate: A normalized peak I/I flow based on catchment area size, Peak I/I Rate = Peak I/I Flow / Catchment Area

⁶ Volumetric Coefficient (Cv%): The ratio of total I/I volume and total rainfall volume, Cv% = Total I/I Flow Volume / Total Precipitation Volume * 100%

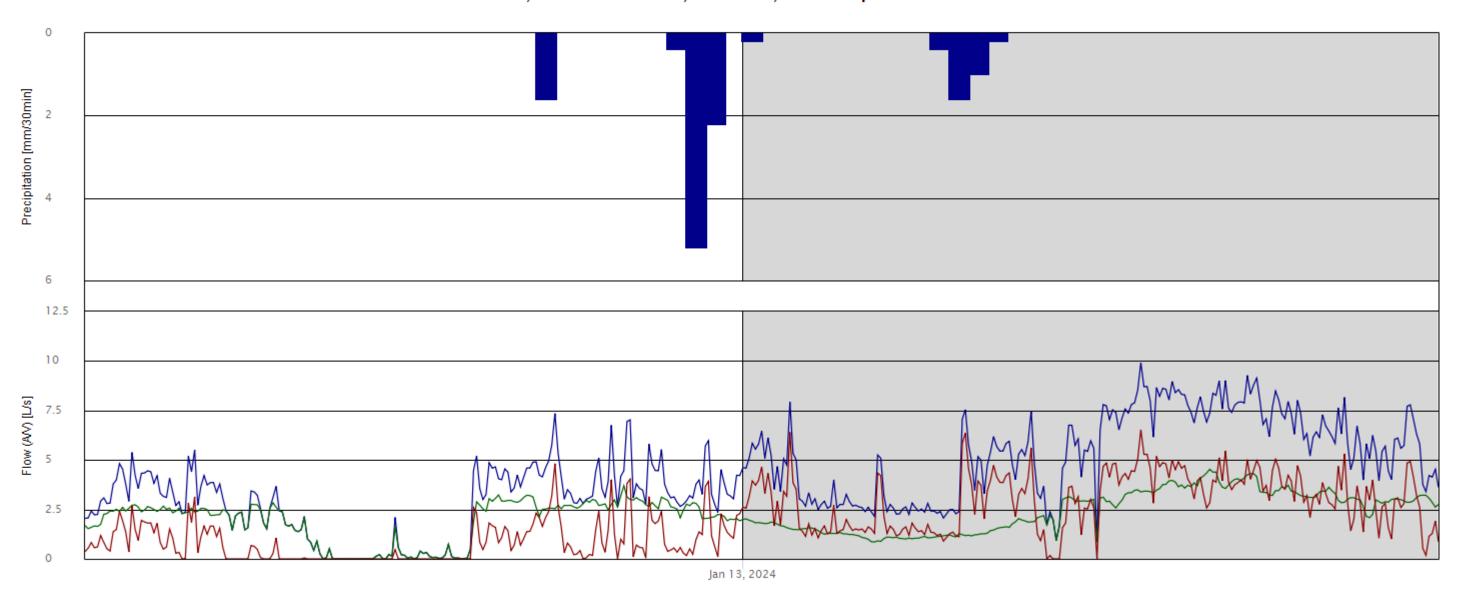
⁷ Peak I/ I Coefficient: The ratio of peak I/I flow and peak rainfall intensity, Peak I/ I Coefficient = Peak I/I Flow / (Peak Rainfall Intensity over Tc * Catchment Area)

⁸ Hourly Wet-Weather Peaking Factor: The ratio of peak hourly wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Hourly Wet-Weather Measured Flow / Average Dry-Weather Flow

⁹ Instantaneous Wet-Weather Peaking Factor: The ratio of peak wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Wet-Weather Measured Flow / Average Dry-Weather Flow

Station: CIV_09 (MH DY06345)

Infiltration/Inflow Event Analysis
Jan 12, 2024 06:30 – Jan 13, 2024 18:30, Total Precipitation: 12.8 mm



Precipitation [mm/30min] — Measured Flow — Estimated Dry Weather Flow — I/I Flow



Jan 12, 2024 06:30 – Jan 13, 2024 18:30, Total Precipitation: 12.80 mm (4,595,198.60 L)

Station	Details	Storm Details										
Catchment Area	35.90 ha	Total Precipitation	12.80 mm (4,595,198.60 L)	Duration of Storm	12.00 hr							
Time of Concentration (Tc) ¹	30 min	Peak Precipitation Intensity Over Tc ²	10.40 mm/hr	Return Period over Tc ³	< 2 Yr							
Measur	ed Flow		I/I Flow									
Time of Peak Measured Flow	Jan 13, 2024 10:35	Time of Peak I/I Flow (TD)	Jan 13, 2024 10:35	Estimated Dry Weather Flow at TD	3.38 L/s							
Peak Measured Flow	9.91 L/s	Peak I/I Flow ⁴	6.53 L/s	Peak I/I Rate ⁵	0.18 L/s/ha							
Peak Measured Depth	0.12 m	Total I/I Flow Volume during event	225,871.40 L	Volumetric Coefficient (Cv%) ⁶	4.92%							
Total Measured Flow Volume during Event	441,057.50 L	Peak I/I Coefficient ⁷	0.0063	Hourly Wet-Weather Peaking Factor ⁸	3.39							
		Instantaneous Wet-Weather Peaking Factor ⁹	3.99									

¹ Time of Concentration (Tc): The estimated time for the flow to travel from the furthest point in the upstream area to the point of monitoring, assume flow is travelling at 1.00 m/s



² Peak Precipitation Intensity Over Tc: The peak rainfall intensity for the duration of the storm with the time interval defined by time of concentration

³ Return Period over Tc: The estimated time to elapse before a storm of equal or greater intensity will likely occur again, based on design storm criteria

⁴ Peak I/I Flow: The greatest difference captured between measured flow and estimated dry weather flow, Peak I/I Flow = Maximum (Measured Flow – Estimated Dry Weather Flow)

⁵ Peak I/I Rate: A normalized peak I/I flow based on catchment area size, Peak I/I Rate = Peak I/I Flow / Catchment Area

⁶ Volumetric Coefficient (Cv%): The ratio of total I/I volume and total rainfall volume, Cv% = Total I/I Flow Volume / Total Precipitation Volume * 100%

⁷ Peak I/ I Coefficient: The ratio of peak I/I flow and peak rainfall intensity, Peak I/ I Coefficient = Peak I/I Flow / (Peak Rainfall Intensity over Tc * Catchment Area)

⁸ Hourly Wet-Weather Peaking Factor: The ratio of peak hourly wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Hourly Wet-Weather Measured Flow / Average Dry-Weather Flow

⁹ Instantaneous Wet-Weather Peaking Factor: The ratio of peak wet-weather measured flow and average dry-weather flow, Wet-Weather Peaking Factor = Peak Wet-Weather Measured Flow / Average Dry-Weather Flow



From: <u>Jennifer Bernard</u>
To: <u>Kapolnas, Stephen</u>

Subject: RE: 161414473_Smithville 3A_Sanitary Sewer Flow Monitor

Date: Tuesday, May 14, 2024 2:15:49 PM

Attachments: <u>image989067.PNG</u>

image4cb250.PNG imagea079a9.PNG imageee41d5.PNG

Pages from Appendix II - Dry and Wet Weather Flow Monitoring Analysis.pdf

Pages from Appendix III - Maps of Flow Monitoring Locations.pdf

Hi Steve,

We completed some sanitary sewer flow monitoring at the end of last year after some lining and other repair work was completed in the system to address I&I. This catchment area was included in the study and found to be below the Regional KPI for extraneous flow, I don't have the raw data but have attached the breakdown provided by our consultant, not sure if this is sufficient information for you? If you want to proceed with more flow monitoring please let me know and we can include our Operations Department.

Thanks, Jennifer

Our working hours may be different. Please do not feel obligated to reply outside of your working hours. Let's work together to help foster healthy work-life boundaries.



The information transmitted, including attachments, is intended only for the person(s) or entity to which it is addressed and may contain confidential and/or privileged material. Any review, retransmission, dissemination or other use of, or taking of any action in reliance upon this information by persons or entities other than the intended recipient is prohibited. If you received this in error, please contact the sender and destroy any copies of this information.

From: Kapolnas, Stephen <Steve.Kapolnas@stantec.com>

Sent: May 9, 2024 2:03 PM

To: Jennifer Bernard < jbernard@westlincoln.ca>

Subject: 161414473_Smithville 3A_Sanitary Sewer Flow Monitor

Hi Jennifer,

We would like to install a flow monitor in one of the sanitary sewers on Anderson Crescent.

Before we start coordinating the work to install a flow monitor, would the township have any flow monitors already installed or recent information on Anderson Crescent before it discharges to the pumping station or before it crosses under the creek.

Please let us know.

Regards

Steve Kapolnas, P.Eng.

Project Manager

Direct: 519 585-7365 Mobile: 548 255-4369

steve.kapolnas@stantec.com

Stantec

100-300 Hagey Boulevard Waterloo ON N2L 0A4

Caution: This email originated from outside of Stantec. Please take extra precaution.

Attention: Ce courriel provient de l'extérieur de Stantec. Veuillez prendre des précautions supplémentaires.

Atención: Este correo electrónico proviene de fuera de Stantec. Por favor, tome precauciones adicionales.

APPENDIX E-5

SANITARY DESIGN – CIV 09 MONITORING FLOW AND THEORETICAL SANITARY FLOW FROM THE PROPOSED SITE

Stantec

Lockbridge Development Inc Smithville 3A

People/Hectare (p/ha)

SANITARY SEWER DESIGN SHEET

Design Parameters Mininum Velocity=

0.00 0.00 15.29 4.372 19.70 43.8

19.70

0.00 0.00 0.00 15.29 4.372 19.70 87.5

0.00 | 0.00 | 0.00 | 15.29 | 4.372 | 19.70 | 113.5 |

0.00 0.00 0.00 15.29 4.372

Residential:

0.600 m/s

255 L/dav/Person

0.0030 L/s/Person

0.013 Comercial: 1.500 L/s/Ha 5.000 Industrial:

250

250

250

250

0.32

0.35

0.27

1.38

33.64

69.86

0.69 0.78 58.6%

1.42 1.62 28.2%

35.18 0.72 0.82 56.0%

30.90 0.63 0.72 63.8%

n= August 16, 2024 Max Peak Factor= 1.000 L/s/Ha DESIGNED BY: FILE NUMBER: N/A WJE Min Peak Factor= 2.000 Institutional: 0.375 L/s/Ha CHECKED BY: SAK Project Number 161414394 Infiltration: 0.286 L/s/Ha RESIDENTIAL AREA AND POPULATION LOCATION COMMERCIAL INDUSTRIAL INSTITUTIONAL INFILTRATION PIPE SELECTION Peak Length Q_A/Q_C Street U/S D/S Area ID Peak Flow Area ID Area Area **Total Flow** Design Size **Population** Area Area ID Area ID Total Area ted Area ted Area ted Area C+I+I Flow ted Area Design Capacity Velocity Design (L/s) (m/s) (P/ha) (ha) (ha) (ha) (ha) (ha) (ha) (L/s) (L/s) (%) (L/s) (m/s) (%) (ha) (ha) (ha) (mm) ing Sanitary Catchment Area Flowing to CIV 09 is 32.15 ha, Q=11.57L/s 0.00 0.00 3.43 3.43 0.980 11.57 54.0 CIV 09 940 940 3.82 10.59 0.00 0.73 28.02 0.89 1.02 41.3% Civ 09 83 3.43 3.43 0.00 200 60 83 3.43 940 0.00 0.00 0.00 0.00 pretical Flow fr Our Site 1A 0.82 3A (Subject Property 1B 0.50 60 30 1C 0.30 0 0 1D 0.40 60 25 1E 1.61 0 0 60 0.95 1G 0.45 60 28 1H 0.49 60 30 1l <u>0.55</u> 0 1J 0.47 60 29 60 Kingma 20A 0.21 13 20B 0.09 60 6 20C 0.08 20D 0.18 60 11 20E <u>0.18</u> 60 <u>11</u> 0.50 23.19 0.74 0.84 21.8% 284 142 245 7.28 245 4.11 2.98 0.00 0.00 0.00 0.00 7.28 7.28 2.082 5.06 52.7 200 142 7.28 245 0.00 0.00 0.00 0.00 Hendler 3A 0.12 10 3B 0.23 0 0 3C 0.84 110 93 3D 0.07 60 5 3E 0.05 0 0 0.10 60 3G 0.09 60 6 3H 0.99 0 0 0.15 60 0.57 3K 0.13 60 8 3L 0.67 60 41 3M 0.07 75 3N 0.26 20 75 3P 0.24 60 32.80 1.04 1.19 12.1% 267 142 4.58 219 4.58 219 4.13 2.67 0.00 0.00 0.00 0.00 4.58 4.58 1.310 3.98 65.4 200 1.00 4.58 0.00 0.00 0.00 Outlet from Our Site 142 464 3.99 5.47 0.00 0.00 0.00 0.00 0.00 11.86 3.392 8.86 77.0 200 0.49 22.96 0.73 0.83 38.6% 71 11 86 71 83 11.86 464 3.99 5.47 0.00 0.00 0.00 0.00 0.00 11.86 3.392 8.86 68.9 200 0.60 25.41 0.81 0.92 34.9% 83

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APPENDIX E-6

SANITARY DESIGN – EXISTING BUILT-UP AREA INTENSIFICATION

Stantec

1734234 Ontario Limited Smithville 3A People/Hectare (p/ha)

SANITARY SEWER
DESIGN SHEET

Design Parameters Residential: 255 L/day/Person

Mininum Velocity= 0.600 m/s 0.0030 L/s/Person

n= 0.013 Comercial: 1.500 L/s/Ha
Max Peak Factor= 5.000 Industrial: 1.000 L/s/Ha
Min Peak Factor= 2.000 Institutional: 0.375 L/s/Ha
Infiltration: 0.286 L/s/Ha

 DATE:
 August 16, 2024

 DESIGNED BY:
 WJE
 FILE NUMBER:
 N/A

 CHECKED BY:
 SAK
 Project Number
 161414394

	CHECKED B	Y:	SAK		Project Number 161414394								Infiltration: 0.286 L/s/Ha																	
LOCA	TION				RESIDENTIA	L AREA AND PO	PULATION	1		COMMERC	CIAL		INDUSTRI	AL	II	NSTITUTIO	NAL			INFILTRATIO	ON				PIPE S	ELECTION	ION			
Street	u/s	D/S	Area ID	Residential Area (ha)	Population (P)	Cummulative Area (ha)	Cumulative Population (min)		Peak Flow Area ID	Area (ha)	Accumula ted Area (ha)	Area ID	Area (ha)	Accumula ted Area (ha)	Area ID	Area (ha)	Accumula ted Area (ha)	Total C+I+I Flow (L/s)	Total Area (ha)	Accumula ted Area (ha)	Flow (L/s)	Total Flow	Length Design (m)	Design Size (mm)	Slope Design (%)	Full Capacity (L/s)	Full Velocity (m/s)			
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Townline Road			2A	1.85	120																							+	+	
			2B	0.88	0																									
			2C	0.78	36																							 		
	72	71	2D	<u>0.86</u> 4.37	<u>54</u> 210	4.37	210	4.14	2.57		0.00			0.00			0.00	0.00	4.37	4.37	1.250	3.82	95.7	200	0.60	25.41	0.81	0.92	15.0%	
	71					4.37	210				0.00			0.00			0.00	0.00												
Our Site			1A	0.82	0																							+	+	
3A (Subject Property)			1B	0.50	30																							+	+	
			1C	0.30	0																									
			1D	0.40	25																									
			1E 1F	1.61 0.95	0 57																<u> </u>						 	+	+	
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Kingma			20A	0.21	13																									
			20B	0.09	6																							₩		
			20C 20D	0.08 0.18	5 11																							+	+	
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	142					7.28	245				0.00			0.00			0.00	0.00										+	+	
Hendler			3A	0.12	10																									
			3B	0.23	0																									
			3C 3D	0.84 0.07	93 5																									
			3E	0.05	0																							 	+	
			3F	0.10	7																							<u> </u>		
			3G 3H	0.09	6 0																							+	4	
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Outlet from Our Site	142	71		 		11.86	464	3.99	5.47		0.00			0.00			0.00	0.00	0.00	11.86	3.392	8.86	//.0	200	0.49	22.96	0./3	0.83	38.6%	
Townline Road			4A		144																									
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Shurie Road			11A	0.25	18														1		 	1						+	+	
			11B	1.19	0																									
			11C		24	1																			· · · · · ·					
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			11F		0																									
			11G		60																									
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Stantec

1734234 Ontario Limited Smithville 3A People/Hectare (p/ha)

SANITARY SEWER
DESIGN SHEET

Design Parameters Residential: 255 L/day/Person

Mininum Velocity= 0.600 m/s 0.0030 L/s/Person

 n=
 0.013
 Comercial:
 1.500 L/s/Ha

 Max Peak Factor=
 5.000
 Industrial:
 1.000 L/s/Ha

 Min Peak Factor=
 2.000
 Institutional:
 0.375 L/s/Ha

DATE: August 16, 2024

DESIGNED BY: WJE FILE NUMBER: N/A

CHECKED BY: SAK Project Number: 16141428

Transference Part		CHECKED B	SY:	SAK		Project Number 161414394													Infiltration: 0.286 L/s/Ha												
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APPENDIX FStormwater Management Report



August 19, 2024

Prepared for:

Lockbridge Development Inc. 25 Sable Street North York ON M6M 3K8

Prepared by:

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Sign-off Sheet

This document entitled Smithville Phase 3A/Block Plan 9, Smithville, Ontario Stormwater Management Strategy was prepared by Stantec Consulting Ltd. ("Stantec") for the account of Lockbridge Development Inc. ("Client") to support the Block Plan Submission and Draft Plan Application Submission (the "Application") for a portion of Smithville Phase 3A/Block Plan Area 9 (the "Project"). In connection thereto, this document may be reviewed and used by the provincial and municipal government agencies participating in the permitting process in the normal course of their duties. Except as set forth in the previous sentence, any reliance on this document by any third party for any other purpose is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

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Introduction

1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) has been retained by Lockbridge Development (the "Client") to complete a Stormwater Management (SWM) strategy and design in conjunction with the Functional Servicing Report (FSR) in support of the Stage 1 Draft Plan and Block Plan Area 9 Approvals located in Smithville (Town), Township of West Lincoln (Township), Region of Niagara (Region). This Report provides the SWM Plan for the proposed development.

The purposes of this Report are to:

- Examine the existing drainage conditions and determine the applicable SWM criteria for the proposed site conditions to mitigate impacts of the proposed development.
- Provide a functional level SWM Plan to manage the runoff from the developed site.

1.1 BACKGROUND INFORMATION

The following data sources, background reports and technical guidelines were referenced while preparing this Report, the following should be read in conjunction with this report.

- Geotechnical Investigation, Smithville 3A/Block Plan Area 9 Smithville, ON, prepared by Stantec Consulting Ltd., July 2, 2024
- Smithville Subwatershed Study Phase 3: Management, Implementation, and Monitoring Plan, Wood Environment and Infrastructure Solutions, April 2023.
- Erosion and Sedimentation Control Guide for Urban Construction, Toronto and Region Conservation Authority, 2019
- Stormwater Management Planning and Design (SWMPD) Manual, Ministry of the Environment, Conservation and Parks (MECP), March 2003.
- MTO Drainage Management Manual, Ministry of Transportation Ontario, 1997

1.2 SITE DESCRIPTION

The entire total area of Block Plan 9, which is part of Phase 3A area, is 63.5 hectares (ha) and consists of multiple Owners/Developers. The land is primarily undeveloped in existing conditions and the primary land use is agricultural. The site is approximately split two portions, with the north portion generally sloping and draining northeast to an existing culvert beneath Townline Road, while the southern portion drains southeast towards a trail bordering the east portion of the site. The site is bounded by Townline Road to the north, Port Davidson Road to the West, Shurie Road to the east, and a woodlot with several residential properties to the south. A Site Location Plan can be found on Figure 1 in Appendix A.



Stormwater Management Criteria

1.3 GEOTECHNICAL CONDITIONS

The Site is located in the approximately 3,500 km² physiographic region of the Haldimand Clay Plain, which occupies the Niagara Peninsula between the Niagara Escarpment and Lake Erie. It is bounded by the Niagara River in the east and extends past Highway 6 connecting Hamilton on the Niagara Escarpment to Port Dover on Lake Erie. The Quaternary geology map shows that the general Site area is covered with glaciolacustrine silt and clay deposits, which have been described as poorly draining with low infiltration rates, resulting in surface ponding in poor drainage areas.

A Geotechnical Investigation was carried out onsite between February 27, 2024, to March 5, 2024. During this investigation, it was found that the subsurface stratigraphy could be summarized as an approximately 460 mm thick layer of topsoil which contained rootlets and comprised of silty sand, underlain by layer of silty clay, underlain by Dolostone bedrock. Within the bedrock, there were weathered rock cores, which are indicative of the karstic process. Karst formations were not confirmed but are known to be present in the general Site area and are potentially located onsite.

Monitoring wells were also installed onsite to aid in the measurement of groundwater level. Groundwater levels were varied and ranged from 181.7 mASL (metres above sea level) to 186.9 mASL. Existing grade elevations on site range from approximately 186.0 mASL to 191.0 mASL.

2.0 STORMWATER MANAGEMENT CRITERIA

The proposed SWM facilities shall be designed to provide the following levels of control as per the requirements of the Ministry of the Environment, Conservation, and Parks (MECP), the Niagara Peninsula Conservation Authority (NPCA), and the Township of West Lincoln. Additionally, criteria as outlined in the *Smithville Subwatershed Study Phase 3: Management, Implementation, and Monitoring Plan*, Wood Environment and Infrastructure Solutions, April 2023 were incorporated.

- Quality Control: The SWM facilities shall provide a sufficient permanent pool and extended detention volume to meet the MECP Enhanced (80% TSS removal) criteria to treat stormwater runoff and promote the at-source removal of contaminants. The 2023 Subwatershed Study (SWS) also provides guidance on the level of treatment to be provided by stormwater facilities (Wood, 2023), which also states 80% TSS removal for this site.
- **Erosion Control:** Stormwater runoff from the 25 mm storm event shall be stored and released over a minimum 24-hour period (48 hours preferred). Unitary discharge rates outlined in Table 2.2.3 of the SWS (Wood, 2023) shall be followed to mitigate erosion impacts at key locations throughout the watershed.
- **Infiltration and Water Balance**: Promote infiltration measures where possible and provide best efforts to match pre-development infiltration rates.



Stormwater Management Strategy

3.0 STORMWATER MANAGEMENT STRATEGY

Stormwater runoff from the site will be provided with onsite water quality and water quantity controls. The Stormwater management modelling software Visual OTTHYMO (VO) was used to simulate drainage conditions of the site under existing and proposed conditions.

Design storms were developed for the 2- ,5- ,10- ,25- ,50- , and 100-year events with IDF parameters from the Vineland Station, shown in Table 1 below. The 3-, 6-, and 12-hour Chicago storm distributions were developed and run to be consistent with the SWS (Wood, 2023). The 12-hour storm produced the highest peak flows and was used to determine the most conservative design. The Regional Storm (Hurricane Hazel) was also used to access the long-duration, high volume impacts on the end-of-pipe facilities. Each design storm up to the 100-year event will be controlled to equal or less than existing levels.

Table 1: IDF Parameters (Vineland Station)

Return	IDF Parameter			
Period	Α	В	С	
2-year	603.25	6.00	0.79	
5-year	785.59	6.00	0.79	
10-year	953.64	7.00	0.79	
25-year	1119.02	7.00	0.79	
50-year	1301.80	8.00	0.80	
100-year	1426.00	8.00	0.80	

IDF values were obtained from the vineland station historical data and interpolated using the GEV Method to obtain A, B, and C values for each design storm. All Chicago design storms use a time to peak ratio of 0.38 as per guidance from MTO Drainage Management Manual (MTO, 1997).



Drainage Conditions

4.0 DRAINAGE CONDITIONS

4.1 EXISTING DRAINAGE CONDITIONS

Under existing conditions, the majority of runoff is split between flowing north and south via uncontrolled overland flow. Some flow from the east portion of the site drains east but is ultimately conveyed northwards via a ditch located on the border of the site to an existing headwall that leads to a 600 mm storm sewer on Townline Road. Some flow from the west end of the site is conveyed off-site through an existing 600 mm culvert located at Port Davidson Road. Flow from the north portion of the site is conveyed through an existing 900 mm culvert under Townline Road, and ultimately to Twenty Mile Creek, located north of the site. Flow from the south portion of the site is directed offsite, and flows into north Creek, which eventually contributes flow to Twenty Mile Creek. The dominant land use is agricultural with the site containing some landscaped and forested portions. Several external areas that are predominantly landscaped areas east of the site contribute drainage towards the drainage ditch that conveys flow northwards in existing conditions. Figure 2, provided in Appendix A, illustrates the existing conditions drainage areas. The following catchments were delineated for the existing site:

- Catchment 100 10.57 ha of mostly agricultural land with some trees, draining north to the existing 900 mm culvert on Townline Road.
- Catchment 101 0.04 ha of mostly landscaped area, located directly adjacent to Townline Road, draining north to the existing 900 mm culvert on Townline Road.
- Catchment 102 7.24 ha of mostly agricultural land with some forested areas, draining eastward toward a ditch and conveyed north to the northeast outlet (existing 600 mm storm sewer).
- Catchment 103 1.41 ha of mostly agricultural land with some driveway and rooftop area, draining westward towards the existing 600 mm culvert on Port Davidson Road.
- Catchment 104 3.63 ha of mostly agricultural land with some rooftop, drive, and landscaped area, draining southwest off-site.
- Catchment 105 9.75 ha of agricultural land, draining south off-site.
- Catchment 106 1.27 ha of agricultural land and forested area, draining south off-site.
- Catchment 120 4.33 ha of agricultural, rooftops, driveways, and landscaped area, draining southeast towards catchment 100.
- Catchment 121 2.12 ha of mostly agricultural land, draining south towards catchment 105.
- Catchment 122 3.16 ha of mostly agricultural land, with some landscaped, rooftop, and driveway areas, draining southwest towards the existing 600 mm culvert on Port Davidson Road.
- Catchment 123 1.39 ha of landscaped, agricultural, rooftop, and driveway area, draining northwest off-site.
- Catchment 124 0.71 ha of external rooftop and landscaped area, draining west towards the drainage ditch and conveyed northwards to the northeast outlet (existing 600 mm storm sewer).
- Catchment 125 0.18 ha of external landscaped and paved area, draining to the northeast outlet (existing 600 mm storm sewer).
- Catchment 126 1.06 ha of external landscaped area, draining west towards the drainage ditch and conveyed northwards to the northeast outlet (existing 600 mm storm sewer).



Drainage Conditions

Peak flows for both existing and proposed conditions were generated using the hydrological modelling software, VO. Hydrologic modelling files and results can be found in Appendix C.

4.2 PROPOSED DRAINAGE CONDITIONS

Under proposed conditions, the Site is to be developed as a mix of single-family, semi-detached, and townhomes. Catchments in the proposed model have been graded to generally flow in the same directions as in existing, to aid in matching or reducing peak flows and runoff volumes. The existing outlets that were described in Section 4.1 will remain as-is with quality, quality, and erosion control provided through the use of the two proposed SWM ponds. Figure 3, provided in Appendix A, shows the proposed conditions drainage areas. The following catchments were delineated for the proposed site:

- **Catchment 200** 9.08 ha of residential area consisting of mostly single-family homes, landscaped area, and roadway, draining northwards towards the proposed north SWM pond.
- Catchment 201 0.68 ha of residential area, draining to the proposed north SWM pond.
- Catchment 202 0.36 of residential development fronting Townline Road, draining north off-site.
- Catchment 203 0.22 ha of future roadway draining north to the 900 mm culvert on Townline Road.
- Catchment 204 0.16 ha of future multiblock, draining north to the 900 mm culvert on Townline Road.
- Catchment 205 0.56 ha of mostly landscaped rear-lots, draining east to the existing ditch and subsequently the northeastern outlet.
- Catchment 206 2.57 ha of mostly forested area, draining north to the northeast outlet.
- Catchment 207 12.64 ha of residential development, landscaped area, and roadway, draining southwards towards the proposed south SWM pond.
- Catchment 208 1.03 ha of paved and landscaped area, draining south towards catchment 207 and ultimately the proposed south SWM pond.
- Catchment 209 1.84 ha area containing the future south SWM pond.
- Catchment 210 0.62 ha of mostly landscaped rear-lots, draining south off-site.
- Catchment 211 –1.01 ha area containing the proposed north SWM pond, maintenance path, and landscaped area.
- Catchment 212 4.77 ha of residential development, landscaped area, and roadway, draining west towards the existing 600 mm culvert located on Port Davidson Road.
- Catchment 213 0.12 ha of future roadway, draining north off-site.
- Catchment 220 1.58 ha of residential development, landscaped area, and roadway, draining east towards catchment 200 and ultimately the proposed north SWM pond.
- Catchment 221 4.96 ha of residential development, landscaped area, and roadway, draining south towards catchment 207, and ultimately the proposed south SWM pond.
- Catchment 222 1.38 ha of external landscaped, agricultural, rooftop, and driveway area, draining northwest off-site.
- Catchment 223 0.70 ha of landscaped, agricultural, rooftop, and driveway area, draining south towards catchment 200 and ultimately the proposed north SWM pond.
- Catchment 224 0.64 ha of rooftop and mostly landscaped rear-lots, draining south towards catchment 200 and ultimately the proposed north SWM pond.
- Catchment 226 0.05 ha of paved sidewalk and landscaped area, draining northeast to the existing 600 mm storm sewer.



Drainage Conditions

- Catchment 227 0.13 ha of landscaped and paved area, draining northeast to the existing 600 mm storm sewer.
- Catchment 228 0.71 ha of rooftop and landscaped area, draining west to the existing ditch and ultimately conveyed to the northeast existing 600 mm storm sewer.
- Catchment 229 1.06 ha of landscaped area, draining northwest to the existing ditch and ultimately conveyed to the northeast existing 600 mm storm sewer.



Stormwater Management Controls

5.0 STORMWATER MANAGEMENT CONTROLS

Stormwater Management controls are to be primarily provided by two proposed 'wet' SWM Facilities, with one located at the north end of the site and one at the south. Facilities were designed based on the MECP design manual (2003, MECP), with additional criteria guidance from the Smithville SWS (Wood, 2023). Details regarding their specifications can be found in the following sections.

5.1 NORTH SWM FACILITY

As mentioned, a wet pond is proposed to be installed in the north portion of the development to provide water quantity, quality, and erosion control prior to discharge to the 900 mm culvert under Townline Road. The proposed pond design has a bottom elevation of 184.00 mASL and a top of bank elevation at 187.00 mASL. The maximum 100-year ponding elevation is 186.60 mASL. One orifice plate and a 600 mm outlet pipe are included in the outlet design to attenuate peak flow rates to the required quantity and erosion control targets. A dual orifice configuration was selected for the outlet of the SWM pond such that the SWS unitary discharge requirements could be met for erosion control purposes, while keeping flows lower than existing conditions and without overtopping the berm. The pond is designed to retain and discharge the runoff volume resulting from up to and including 100-year rainfall event; however, in the event of an overflow due to clogging or a rainfall event in excess of the 100-year event, an emergency spillway is proposed to convey flow downstream, which will be directed towards Townline Road. To prevent untreated runoff from infiltrating out of the SWM pond, it is recommended at this stage to provide a liner within the facility; however, further details related to the design of the liner are recommended to be re-visited and explored at the detailed design stage by a Geotechnical Engineer. In Tables 2 and 3, the design and operating characteristics of the proposed wet pond can be found alongside a preliminary SWM Facility Drawing (C-800) located in Appendix A.



Stormwater Management Controls

Table 2: North SWM Facility Design Characteristics

Parameter	Characteristics
Total Contributing Area	13.9 ha
Total Percent Impervious	65%
Bottom Elevation of Forebay	184.00 m
Permanent Pool Elevation (Forebay)	185.50 m
Pond Top Elevation	187.00 m
100-year Water Level (based on the 100-year Chicago Storm)	186.60 m
Quality Control (Enhanced)	
Required Permanent Pool Volume (per hectare)	173 m³/ha
Required Permanent Pool Volume (+10%)	2,610 m ³
Provided Permanent Pool Volume	5,076 m ³
Erosion Control	
SWS Erosion Control Unitary Volume ¹	400 m³/imp.ha
Required Erosion Control Volume	3,559 m ³
Provided Erosion Control Volume	3,787 m ³
SWS Unitary Discharge ¹	0.001 m ³ /s/ha
Required Maximum Erosion Control Discharge Rate	0.014 m ³ /s
Provided Maximum Erosion Control Discharge Rate	0.014 m³/s
Outlet Structure Details	
Orifice #1 Invert	185.50 m
Orifice #1 Diameter	90 mm
DICB invert	186.20 m
DICB Pipe Outlet Invert	185.40 m
DICB Pipe Outlet Diameter	600 mm
Emergency Overflow Spillway invert	186.60 m
Emergency Overflow Spillway width	2.5 m
Emergency Overflow Spillway side slopes (H:V)	5:1

^{1.} Based on the Twenty Mile Creek SWS Table 2.2.3 Stormwater Facility Sizing Criteria



Stormwater Management Controls

Table 3: North SWM Facility Operating Characteristics

Design Storm	Max. Storage Volume	Max. Level	Max. Level Freeboard		Peak Outflow	
	(m^3)	(m)	(m)	(Hours)	(m^3/s)	
25 mm Event	1,890	185.87	1.13	91.1	0.01	
2-year	3,500	186.15	0.85	130.5	0.01	
5-year	4,080	186.25	0.75	137.4	0.09	
10-year	4,480	186.31	0.69	138.4	0.22	
25-year	5,030	186.40	0.60	138.9	0.49	
50-year	5,580	186.49	0.51	139.1	0.66	
100-year	6,300	186.60	0.40	139.4	0.73	
Hurricane Hazel	8,140	186.86	0.14	139.9	1.65	

In Table 4 below, the peak flow to the northern outlet is compared to the 25- and 100-year targets from the SWS (Wood, 2023), showing that the proposed flow rates from the SWM Facility are below target levels. Additionally, existing flow rate targets are maintained, which is discussed in subsequent sections.

Table 4: Comparison of Peak Flow Targets in SWS study

Design Storm	Drainage Area	Unitary Flow Rate	SWS Study Target Flow	Proposed Peak Flow Rate at the Townline Culvert
	(ha)	(m³/s/ha)	(m^3/s)	(m^3/s)
25-year	14.07	0.053	0.75	0.49
100-year	14.07	0.095	1.34	0.75

5.2 SOUTH SWM FACILITY

As mentioned, an additional wet pond is proposed at the south end of the block to provide the necessary water quantity, quality, and erosion controls for flows discharged to the south. No design for the south pond was completed as part of this study, with further design and details to be conducted at a future stage when the south portion of the block moves forward. The pond was conceptually modelled and included in this analysis to aid in the estimation of proposed condition peak flows as well as outline current requirements but is subject to change depending on future design and site conditions. The south pond design requirements can be found below in Table 5.



Stormwater Management Controls

Table 5: South Pond Design Requirements

Parameter	Characteristics
Total Contributing Area	20.5 ha
Total Percent Impervious	65%
Quality Control (Enhanced)	
Required Permanent Pool Volume (per hectare)	173 m³/ha
Required Permanent Pool Volume (+10%)	3,903 m ³
Erosion Control	
SWS Extended Detention ¹	400 m³/imp.ha
Required Extended Detention Volume	5,322 m ³
SWS Unitary Discharge ¹	0.001 m ³ /s/ha
Required Maximum Extended Detention Discharge Rate	0.020 m³/ha

5.3 PEAK FLOWS

The total peak flow rates to the site outlets have been used to compare to target rates for each rainfall event and are presented below in Table 6.

Table 6: Existing and Proposed Peak Flow Rates

Peak Flow Rates (m³/s)									
Storm event	North Outlet (Evicting			Northeast Outlet (600 mm Storm Sewer)		West Outlet (Existing 600 mm culvert)		South Outlet	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	
25 mm Event	0.08	0.05	0.08	0.06	0.03	0.39	0.10	0.02	
2-year	0.19	0.09	0.22	0.14	0.08	0.68	0.24	0.03	
5-year	0.34	0.11	0.41	0.24	0.14	0.92	0.43	0.05	
10-year	0.46	0.22	0.56	0.32	0.19	1.22	0.58	0.09	
25-year	0.64	0.49	0.78	0.44	0.26	1.50	0.81	0.18	
50-year	0.78	0.67	0.96	0.54	0.32	1.72	1.00	0.28	
100-year	0.95	0.75	1.16	0.65	0.39	1.96	1.20	0.40	
Hurricane Hazel	1.57	1.67	1.23	0.73	0.53	0.69	1.85	2.52	



Stormwater Management Controls

As shown in Table 6 above, the existing flow rates are met through the proposed SWM controls for all storm events up to and including the 100-year event for the north, northeast, and south outlets.

The west outlet currently shows increases in flow but as per the SWS (Wood, 2023), a future SWM pond is proposed to be constructed west of Port Davidson Road to aid in attenuating this flow, which has not been included in the model at this time. Details on the sizing and design of this future pond will be conducted at a future design stage. Furthermore, infrastructure crossing Port Davidson Road will need to be increased to accommodate this development.

Stormwater management design calculations are provided in Appendix B. Output for both the existing and proposed hydrological models are provided in Appendix C.

5.4 WATER QUALITY

Due to the size of the site and type of development proposed, an enhanced level of water quality control (minimum of 80% Total Suspended Solids removal) is required. Wet ponds are able to provide an enhanced level water quality control if sized appropriately and are the Township's preferred end-of-pipe facility, as per the SWS (Wood, 2023). Areas draining from rooftops and landscaped areas are considered 'clean' and do not require treatment before being conveyed off site. Paved areas such as parking lots are exposed to salt and other potential contaminants from the road and require treatment before being conveyed off site.

The North SWM pond provides sufficient permanent pool to achieve 80% TSS removal, as outlined in Table 2. Additionally, a forebay has been designed to provide isolated removal of sediment, with calculations presented in Appendix B.

Although the south SWM pond has not been designed, the required permanent pool volume to achieve 80% TSS removal has been outlined in Table 5. These values will need to be confirmed at the design stage for this facility.



Erosion and Sediment Conrol

6.0 EROSION AND SEDIMENT CONROL

The erosion and sediment control strategy has been developed and is discussed in the FSR (2024, Stantec). Note that this plan will be refined at the detailed design stage.



Monitoring and Maintenance Program

7.0 MONITORING AND MAINTENANCE PROGRAM

Monitoring and maintenance activities are an important part of a SWM Strategy to ensure the designed features continue to operate as intended. As such, inspections should take place at a regular frequency to observe any deficiencies within the system. This program will be refined during the detailed design phase of the project and will be done so in accordance with the criteria and recommendations outlined in the SWS (Wood, 2023).



Conclusions

8.0 CONCLUSIONS

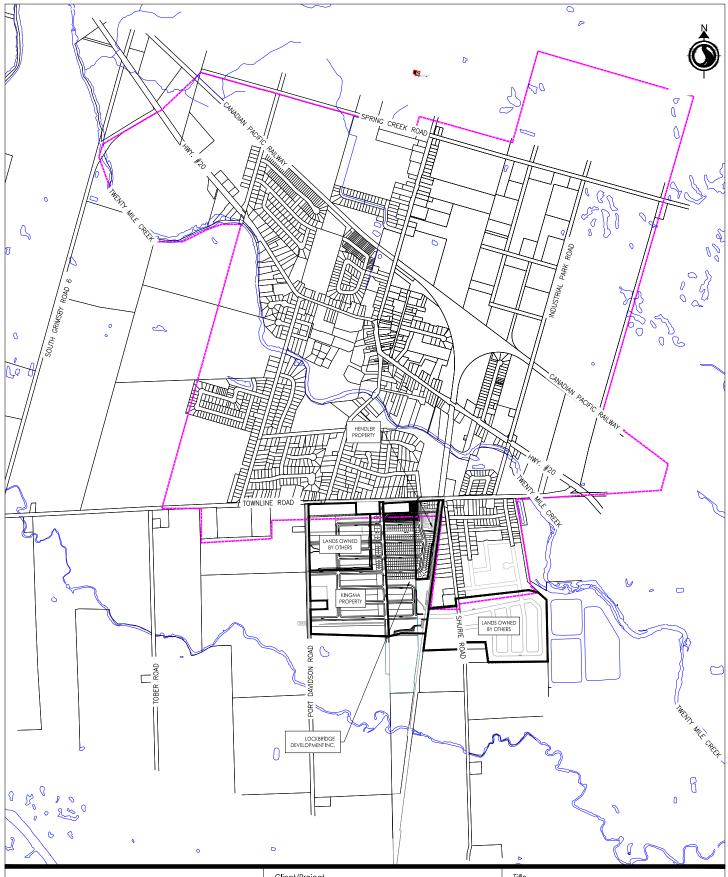
Based on the preceding documentation, the following conclusions are drawn:

- Water Quantity A 'wet' SWM pond for the north portion of the site has been proposed to be used to
 maintain the existing peak flow rates to the site's outlets and is shown to adequately meet the water
 quantity criteria of matching or improving peak flows when compared to existing conditions.
 Additionally, it meets the flow criteria outlined in the SWS (Wood, 2023). The south pond has been
 conceptually sized, but details of the pond will need to be determined and refined at a later stage.
- Water Quality The north SWM pond has been proposed to provide an enhanced level of quality
 control for the northern portion of the site to meet the water quality criteria of 80% TSS removal.
 Details for the south pond will need to be determined and refined at a later stage.
- **Erosion Control** The north SWM pond has been sized in accordance with the SWS (Wood, 2023) to adequately meet the outlined erosion control criteria for the northing portion of the site. Details for the south pond will need to be determined and refined at a later stage.



APPENDIX A FIGURES AND SWM FACILITY DRAWING

Site Location Plan, Figure 1.0
Existing Conditions Drainage Areas, Figure 2.0
Proposed Conditions Drainage Areas, Figure 3.0
Preliminary SWM Facility Plan - North, Drawing No. C-800



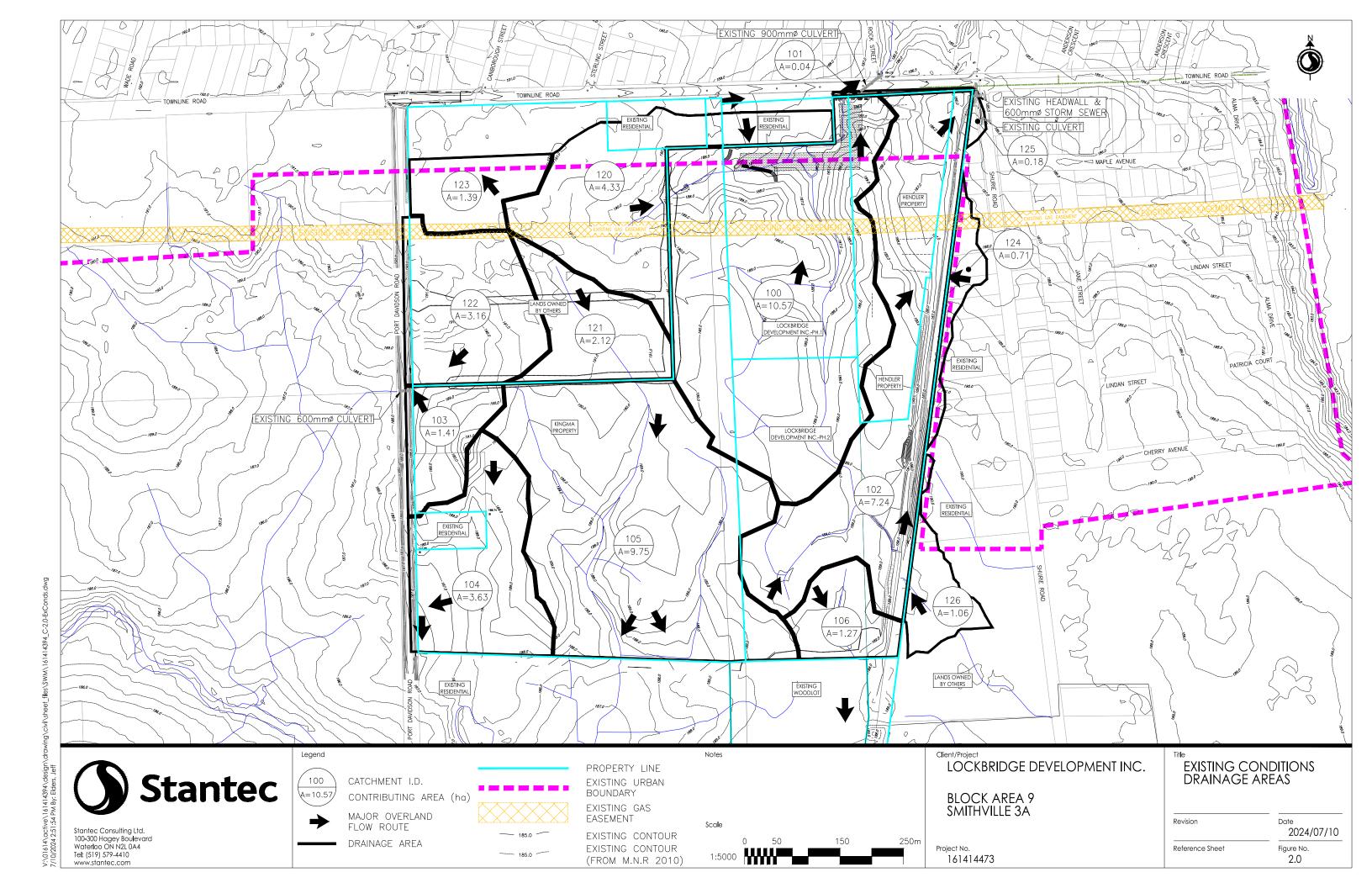


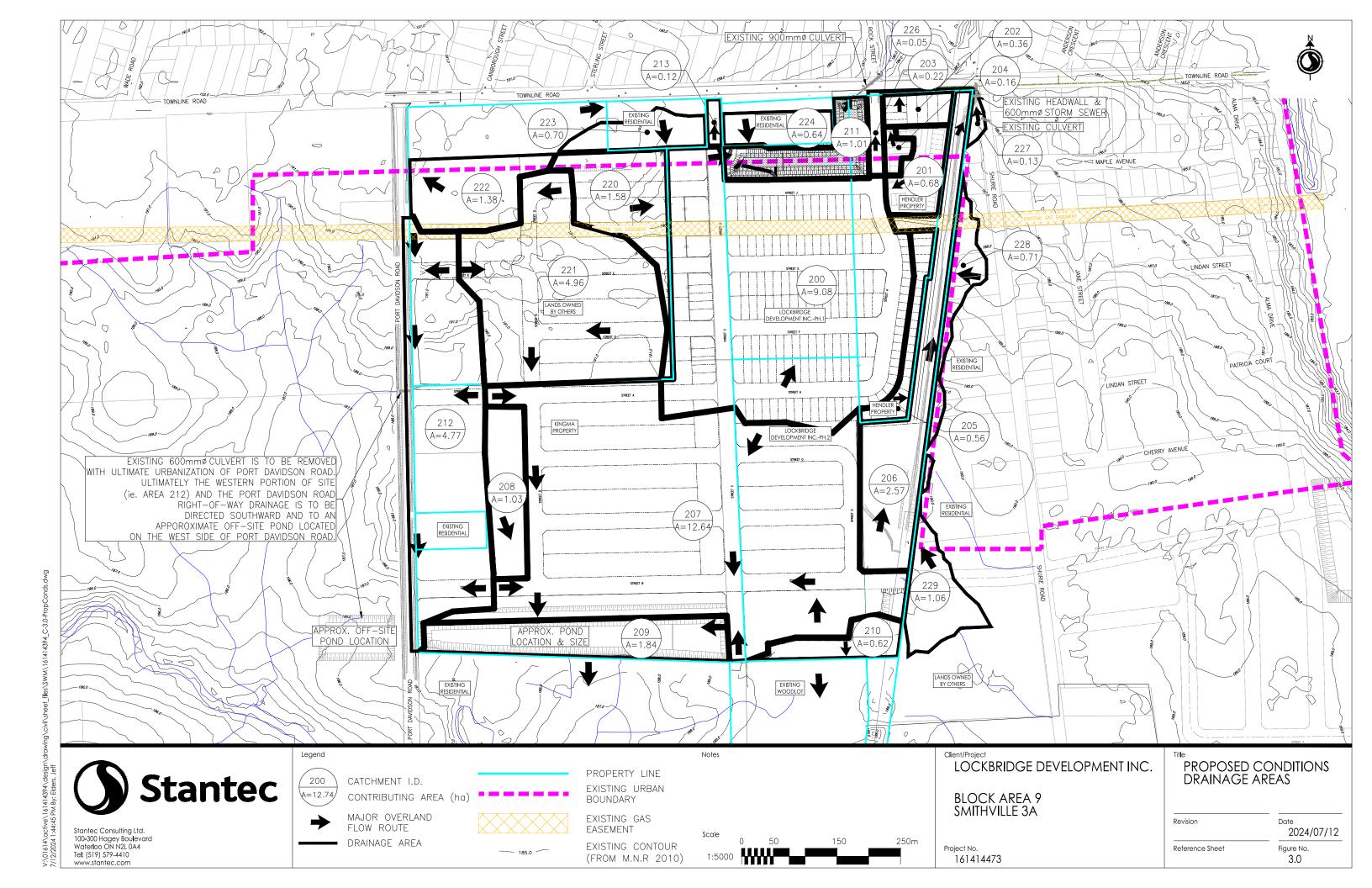
Stantec Consulting Ltd. 100-300 Hagey Boulevard Waterloo ON N2L 0A4 Tel: (519) 579-4410 www.stantec.com Client/Project LOCKBRIDGE DEVELOPMENT INC.

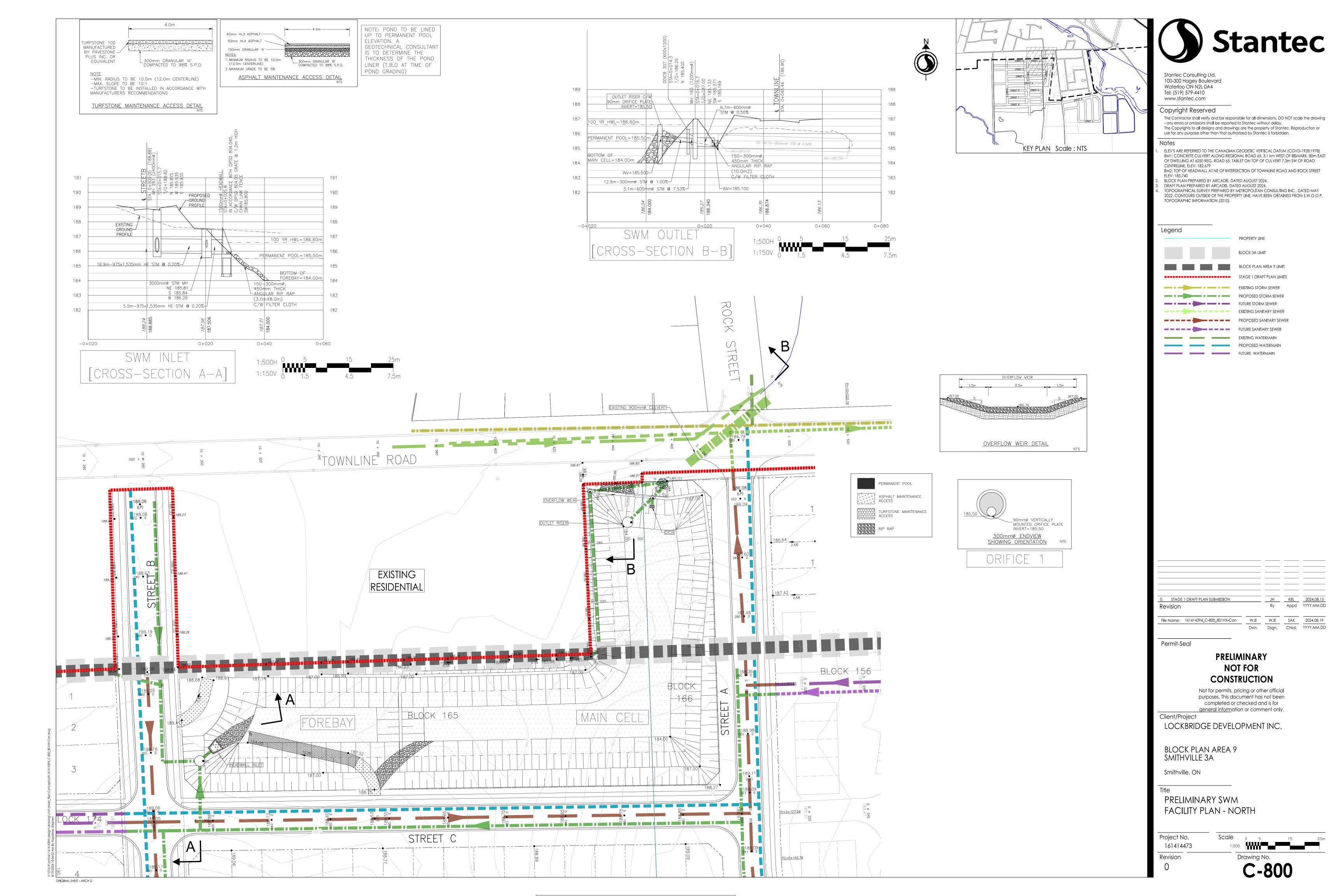
BLOCK PLAN AREA 9 SMITHVILLE 3A

Project No. 161414473 SITE LOCATION

Revision	Date 2024-08-16
Reference Sheet	Figure No.







APPENDIX B STORMWATER MANAGEMENT DESIGN CALCULATIONS

161414473 - Smithville Rainfall Data

IDF Storm Parameters			Time of Peak Ratio	Storm Duration	Total Depth	
Α	В	С	r	D (b)	(mm)	
				(11)	(111111)	
655.4	5.52	0.792	0.4	3	31.4	
991.5	6.84	0.816	0.4	3	41.7	
1288.5	8.04	0.835	0.4	3	48.8	
1785.8	9.90	0.860	0.4	3	58.8	
2279.6	11.58	0.880	0.4	3	67.1	
2928.4	13.62	0 901	0.4	3	76.4	
	A 655.4 991.5 1288.5 1785.8 2279.6	A B 655.4 5.52 991.5 6.84 1288.5 8.04 1785.8 9.90 2279.6 11.58	A B C 655.4 5.52 0.792 991.5 6.84 0.816 1288.5 8.04 0.835 1785.8 9.90 0.860 2279.6 11.58 0.880	A B C r 655.4 5.52 0.792 0.4 991.5 6.84 0.816 0.4 1288.5 8.04 0.835 0.4 1785.8 9.90 0.860 0.4 2279.6 11.58 0.880 0.4	A B C r D (h) 655.4 5.52 0.792 0.4 3 991.5 6.84 0.816 0.4 3 1288.5 8.04 0.835 0.4 3 1785.8 9.90 0.860 0.4 3 2279.6 11.58 0.880 0.4 3	

^{*}Information from the Unguaged Historical IDF from the project location (gridded dataset)

$$i = \frac{A}{(t+B)^C}$$

^{*}Obtained from: https://idf-cc-uwo.ca/idfgrid

^{*}Converted time period form hours to minutes

SCS Curve Number, Initial Abstraction, and Time of Concentration Reference Sheet

NRCS (SCS) Curve Number Data

CN (I)= 4.2CN(II)/(10-0.058CN(II)) CN (III)= 23CN(II)/(10+0.13CN(II))

(.)	714(11)/(10-0:050014(.,,(,	(11)/(1010.10014(11	, ,					
			TABLE O	F CURVE NUMBE	RS (CN's)				
Land Use	e		Hydrologic	Soil Type (AMC I	l Assumed)				Source
		Α	AB	В	BC	С	CD	D	
Meadow	"Good"	30	44	58	65	71	75	78	MTO
Woodlot	"Fair"	36	48	60	67	73	76	79	MTO
Lawns	"Good"	39	50	61	68	74	77	80	USDA
Pasture/Ran	ge	58	62	65	71	76	79	81	MTO
Crop		66	70	74	78	82	84	86	MTO
Bare Soil (Fa	allow)	77	82	86	89	91	93	94	MTO
Impervious		98	98	98	98	8	8	98	MTO
Water		100	100	100	100	100	100	100	MTO

NOTE: Standhyd commands - CN value is based solely on the pervious surfaces only.

Nashyd commands - On value is based on a composite of both the pervious and impervious surfaces MTO - Ministry of Transportation Ontario Drainage Manual (1997), Design Chart 1.09-Soil/Land Use Curve Numbers USDA - United States Department of Agriculture (2004), National Engineering Handbook, Part 630 Hydrology, Chapter 9 Hydrologic Soil Cover Complexes

Initial Rainfall Abstraction Data

	Initial Rainfall Abstraction, la (mm)							
Land Use	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water		
la	10	8	7	5	2	0		

Runoff Coefficient Data

Hydrologic	ologic Land Use, Crop, and Management									
Soil Group	Forest/	Meadow/	CULTIVATED	CULTIVATED	CULTIVATED	CULTIVATED	CULTIVATED	URBAN RES.	URBAN RES.	URBAN RES.
	Woodlot	Field	(RC, PM)	(RC, CM)	(SG, PM)	(SG, CM)	(M)	(30% Imp)	(55% lmp)	(70% lmp)
Α	0.060	0.100	0.550	0.500	0.350	0.200	0.300	0.300	0.425	0.500
AB	0.095	0.150	0.600	0.525	0.375	0.210	0.325	0.350	0.475	0.550
В	0.130	0.200	0.650	0.550	0.400	0.220	0.350	0.400	0.525	0.600
BC	0.145	0.225	0.675	0.600	0.425	0.235	0.375	0.425	0.566	0.650
С	0.160	0.250	0.700	0.650	0.450	0.250	0.400	0.450	0.606	0.700
CD	0.180	0.275	0.725	0.675	0.475	0.275	0.425	0.475	0.647	0.750
D	0.200	0.300	0.750	0.700	0.500	0.300	0.450	0.500	0.688	0.800

Legend	RC	SG	PM	М	СМ
	Row Crop	Small Grains	Poor Management	Meadow	Conservative Management

Estimating Travel Velocity Using Bransby Williams and Aiport Method

Bransby Williams Formula - For 'C' greater than or equal to 0.40		
$t_c = \frac{0.057 * L}{S^{0.2} * A^{0.1}}$	$t_{\scriptscriptstyle C}$ = Time of Concentration L = Length of Longest Flow Path S = Slope A = Catchment Area	

Airport Formula - For 'C' less than 0.40 t_{c =} Time of Concentration $t_c = \frac{3.26 * (1.1 - C) * L^{0.5}}{S^{0.33}}$ L = Length of Longest Flow Path S = Slope C = Runoff Coefficient

Estimating Travel Velocity Using Uplands Method

$V = (x)(S)^{0.5}$	(Refer to Fig 3.12 Velocities for Upland method for estimating travel time for overland flow)
V= Velocity	
S= Slope x = Land Cover Coe	fficient (see below)
x = 0.6	Forest with Heavy Ground Litter, hay meadow (overland flow)
1.5	Trash Fallow or Minimum Tillage cultivation, strip cropped woodland(overland flow)
2.3	Short grass pasture (overland flow)
2.7	Cultivated Straight row (overland flow)
3.0	Nearly bare untilled (overland flow) or alluvial fans located in the Western mountain Regions
4.6	Grassed Waterway
6.1	Paved Areas (sheet flow); small upland gullies

Time of Concentration for One Land Use on Flow Path

$Tc_1 = L_1 / V_1 $	$p_1 = 0.67 \times Tc_1$
---------------------	--------------------------

Total Time of Concentration for Multiple Land Uses on Flow Path

$$Tc_{total} = Tc_1 + Tc_2 + Tc_3 + Tc_4 + Tc_5$$
 $Tp_{total} = Tp_1 + Tp_2 + Tp_3 + Tp_4 + Tp_5$

161414473 - Smithville NRCS (SCS) Curve Number Determination

Soil Type	Hydrologic Soil Group
Gravel	A
Sand and Gravel	AB
Silty Sand, Loamy Sand, Sand Loam	В
Silt, Silt Loam	BC
Clay, Clay Loam, Silty Clay Loam	С
Bedrock, shallow soil over bedrock, organic	CD
Muck	D

	TABLE OF CURVE NUMBERS (CN's)											
Land Use				H	ydrologic Soil	Туре			Source			
		Α	AB	В	BC	С	CD	D				
Meadow	"Good"	30	44	58	65	71	75	78	MTO			
Woodlot	"Fair"	36	48	60	67	73	76	79	MTO			
Lawns	"Good"	39	50	61	68	74	77	80	USDA			
Pasture/Ran	nge	58	62	65	71	76	79	81	MTO			
Crop		66	70	74	78	82	84	86	MTO			
Bare Soil (Fallow) 77			82	86	89	91	93	94	MTO			
Impervious		98	98	98	98	98	98	98	MTO			

MTO - Ministry of Transportation Ontario Drainage Manual (1997), Design Chart 1.09-Soil/Land Use Curve Numbers USDA - United States Department of Agriculture (2004), National Engineering Handbook, Part 630 Hydrology, Chapter 9 Hydrologic Soil Cover Complexes

		HYDRO		L TYPE (%) -		onditions					
_	Hydrologic Soil Type										
Catchment	Α	AB	В	BC	С	CD	D	TOTAL			
100						100		100			
101						100		100			
102						100		100			
103						100		100			
104						100		100			
105						100		100			
106						100		100			
120						100		100			
121						100		100			
122						100		100			
123						100		100			
124						100		100			
125						100		100			
126						100		100			

			LAND USE	(%) - Existin	g Condition	S		
Catchment	Meadow	Woodlot	Lawns	Pasture Range	Crop	Bare Soil	Impervious	Total
100	0	0	10	0	90	0	0	100
101	0	0	50	0	0	0	50	100
102	0	25	10	0	60	0	5	100
103	0	0	25	0	65	0	10	100
104	0	0	30	0	65	0	5	100
105	0	2	0	0	98	0	0	100
106	0	40	0	0	60	0	0	100
120	0	0	35	0	50	0	15	100
121	0	0	10	0	90	0	0	100
122	0	5	35	0	50	0	10	100
123	0	0	40	0	20	0	40	100
124	0	0	60	0	0	0	40	100
125	0	5	10	0	75	0	10	100
126	0	0	90	0	0	0	10	100

Note: Where STANDHYD command used (shaded), impervious fraction is not considered in CN determination, since %Imp directly input in STANDHYD command

		CL	IRVE NUMB	ER (CN) - Ex	isting Cond	itions			
Catchment	Meadow	Woodlot	Lawns	Pasture Range	Crop	Bare Soil	Impervious	Weighted CN w/ imp area	Weighted CN w/o imp area
100			8		76			83.3	83.3
101			39				49	87.5	77.0
102		19	8		50		5	82.0	81.2
103			19		55		10	83.7	82.1
104			23		55		5	82.6	81.8
105		2			82			83.8	83.8
106		30			50			80.8	80.8
120			27		42		15	83.7	81.1
121			8		76			83.3	83.3
122		4	27		42		10	82.6	80.8
123			31		17		39	86.8	79.3
124			46				39	85.4	77.0
125		4	8		63		10	84.3	82.8
126			69.3				9.8	79	77.0

Notes:

AMC II assumed Hydrological Soil Groups taken from MTO Drainage Manual

161414473 - Smithville NRCS (SCS) Curve Number Determination

Soil Type	Hydrologic Soil Grou
Gravel	A
Sand and Gravel	AB
Silty Sand, Loamy Sand, Sand Loam	В
Silt, Silt Loam	BC
Clay, Clay Loam, Silty Clay Loam	С
Bedrock, shallow soil over bedrock, organic	CD
Muck	D

	TABLE OF CURVE NUMBERS (CN's)										
Land Use			Hydrologic Soil Type								
		Α	AB	В	BC	С	CD	D			
Meadow	"Good"	30	44	58	65	71	75	78	MTO		
Woodlot	"Fair"	36	48	60	67	73	76	79	MTO		
Lawns	"Good"	39	50	61	68	74	77	80	USDA		
Pasture/Ra	nge	58	62	65	71	76	79	81	MTO		
Crop		66	70	74	78	82	84	86	MTO		
Bare Soil (F	allow)	77	82	86	89	91	93	94	MTO		
Impervious		98	98	98	98	98	98	98	MTO		

	HYDROLOGIC SOIL TYPE (%) - Existing Conditions									
	Hydrologic Soil Type									
Catchment	A	AB	В	BC	С	CD	D	TOTAL		
200						100		100		
201						100		100		
202						100		100		
203						100		100		
204						100		100		
205						100		100		
206						100		100		
207						100		100		
208						100		100		
209						100		100		
210						100		100		
211						100		100		
212						100		100		
213						100		100		
220						100		100		
221						100		100		
222						100		100		
223						100		100		
224						100		100		
226						100		100		
227						100		100		
228						100		100		
229						100		100		

	LAND USE (%) - Existing Conditions												
Catchment	Meadow	Woodlot	Lawns	Pasture Range	Crop	Bare Soil	Impervious	Total					
200			35				65	100					
201			35				65	100					
202			35				65	100					
203			20				80	100					
204			25				75	100					
205			35				65	100					
206		90			5		5	100					
207			35				65	100					
208			35				65	100					
209			35				65	100					
210		60			40			100					
211			35				65	100					
212			35				65	100					
213			90				10	100					
220			35				65	100					
221			35				65	100					
222			35				65	100					
223			60		10		30	100					
224			75				25	100					
226			35				65	100					
227			75				25	100					
228			65				35	100					
229					90		10	100					

Note: Where STANDHYD command used (shaded), impervious fraction is not considered in CN determination, since %Imp directly input in STANDHYD command

				ER (CN) - Exi					
Catchment	Meadow	Woodlot	Lawns	Pasture Range	Crop	Bare Soil	Impervious	Weighted CN w/ imp area	Weighted CN w/o imp area
200			27				64	90.7	77.0
201			27				64	90.7	77.0
202			27				64	90.7	77.0
203			15				78	93.8	77.0
204			19				74	92.8	77.0
205			27				64	90.7	77.0
206		68			4		5	77.5	76.4
207			27				64	90.7	77.0
208			27				64	90.7	77.0
209			27				64	90.7	77.0
210		46			34			79.2	79.2
211			27				64	90.7	77.0
212			27				64	90.7	77.0
213			69				10	79.1	77.0
220			27				64	90.7	77.0
221			27				64	90.7	77.0
222			27				64	90.7	77.0
223			46		8		29	84.0	78.0
224			58				25	82.3	77.0
226			27				64	90.7	77.0
227			58				25	82.3	77.0
228			50				34	84.4	77.0
229					75.6		9.8	85	84.0

AMC II assumed Hydrological Soil Groups taken from MTO Drainage Manual

Visual OTTHYMO Parameters

Total

Time to Peak (hr)

Pre-Development Conditions

NasHvo

NasHyd							
Catchment ID	Area	CN	Slope	Length	Tc	TP	IA
	(ha)		(%)	(m)	(hrs)	(hrs)	(mm)
100	10.57	83.3	0.54%	651.0	1.531	1.021	7.00
101	0.04	87.5	1.25%	8.0	0.128	0.086	7.00
102	7.24	82.0	2.33%	150.0	0.453	0.302	7.00
103	1.41	83.7	2.82%	124.0	0.387	0.258	7.00
104	3.63	82.6	1.20%	374.6	0.891	0.594	7.00
105	9.75	83.8	0.57%	437.0	1.229	0.819	7.00
106	1.27	80.8	0.28%	181.1	1.006	0.671	7.00
120	4.33	83.7	0.81%	246.0	0.821	0.547	7.00
121	2.12	83.3	0.19%	268.1	1.393	0.929	7.00
122	3.16	82.6	0.42%	235.8	0.997	0.664	7.00
123	1.39	86.8	0.63%	160.0	0.722	0.482	7.00
124	0.71	85.4	0.91%	55.0	0.374	0.249	7.00
125	0.18	84.3	0.91%	30.0	0.276	0.184	7.00
126	1.06	79.1	0.30%	164.0	0.927	0.618	7.00
			•	•			

46.86

Notes: TIMP Total percent impervious XIMP Percent impervious directly connected $Tc = [3.26 (1.1-C) L^{0.5}] / S^{0.33}$ Time of Concentration calculated using the Airport Method Where: C = Runoff Coefficient according to (For areas less than 100 ha, and RC less than 0.4) MTO Design chart 1.07 for 'cultivated' on silt loam/loam soil L = Length of Overland Flow (m) S = Slope (%) Time of Concentration calculated using the Bransby Williams Method $Tc = 0.057*L/[(Sw^0.2)*(A^0.1)]$ (For areas less than 100 ha, and RC greater than 0.4) Where: tc = time of concentration, minutes L = catchment or watershed length, m Sw = catchment or watershed slope, % A = catchment or watershed area, ha

Tp = 0.6Tc (StandHyd), Tp = Flow Length/0.3 (NasHyd)

161414473 - Smithville Visual OTTHYMO Parameters

Post-Development Conditions

Catchment ID	Area	CN	Slope	Length	Tc	TP	IA
	(ha)		(%)	(m)	(hrs)	(hrs)	(mm)
206	2.57	77.5	2.30%	103.0	0.38	0.251	7.00
210	0.62	79.2	2.14%	70.0	0.32	0.212	7.00
213	0.12	79.1	0.50%	70.0	0.51	0.343	7.00
223	0.70	84.0	0.94%	53.0	0.36	0.242	7.00
224	0.64	82.3	0.50%	56.0	0.46	0.307	7.00
227	0.13	82.3	0.50%	30.0	0.34	0.224	7.00
228	0.71	84.4	0.50%	57.0	0.46	0.309	7.00
229	1.06	85.4	0.50%	153.0	0.76	0.507	7.00

/d						Perv.	Perv.	Imp.	Imp.
Catchment ID	Area	CN	TIMP	XIMP	Perv. la	Slope	Length	Slope	Length
	(ha)				(mm)	(%)	(m)	(%)	(m)
200	9.08	77.0	0.65	0.55	5.00	2.0	10.0	2.0	246.0
201	0.68	77.0	0.85	0.75	5.00	2.0	10.0	2.0	67.3
202	0.36	77.0	0.65	0.55	5.00	2.0	10.0	2.0	49.0
203	0.22	77.0	0.80	0.80	5.00	2.0	10.0	2.0	38.3
204	0.16	77.0	0.75	0.55	5.00	2.0	10.0	2.0	32.7
205	0.56	77.0	0.50	0.01	5.00	2.0	10.0	2.0	61.1
207	12.64	77.0	0.65	0.55	5.00	2.0	10.0	2.0	290.3
208	1.03	77.0	0.65	0.55	5.00	2.0	10.0	2.0	82.9
209	1.84	77.0	0.65	0.55	5.00	2.0	10.0	2.0	110.8
211	1.01	77.0	0.65	0.55	5.00	2.0	10.0	2.0	82.1
212	4.77	77.0	0.65	0.55	5.00	2.0	10.0	2.0	178.3
220	1.58	77.0	0.65	0.55	5.00	2.0	10.0	2.0	102.6
221	4.96	77.0	0.65	0.55	5.00	2.0	10.0	2.0	181.8
222	1.38	77.0	0.65	0.55	5.00	2.0	10.0	2.0	95.92
226	0.05	77.0	0.65	0.55	5.00	2.0	10.0	2.0	18.26

Total 46.87 ha
Total to North SWM 13.69 ha

Total percent impervious XIMP Percent impervious directly connected Tc = [3.26 (1.1-C) L 0.5] / S 0.33 Time of Concentration calculated using the Airport Method (For areas less than 100 ha, and RC less than 0.4) Where: C = Runoff Coefficient according to MTO Design chart 1.07 for 'cultivated' on silt loam/loam soil L = Length of Overland Flow (m) S = Slope (%) Time of Concentration calculated using the Bransby Williams Method $Tc = 0.057*L/[(Sw^0.2)*(A^0.1)]$ (For areas less than 100 ha, and RC greater than 0.4) Where: tc = time of concentration, minutes L = catchment or watershed length, m Sw = catchment or watershed slope, % A = catchment or watershed area, ha Time to Peak (hr) Tp = 0.6Tc (StandHyd), Tp = Flow Length/0.3 (NasHyd)

161414473 - Smithville Water Quality Parameters

h SWMF	
Required protection level:	Enhanced
Contributing drainage area ¹ :	13.7 ha
Impervious level:	65 %
Total required water quality storage volume per hectare:	213 m ³ /ha
Required permanent pool volume per hectare:	173 m ³ /ha
Required extended detention storage volume per hectare:	40 m ³ /ha
SWS Extended Detention ¹	400 m ³ / imp. h
SWS Unitary Discharge ¹	0.001 m ³ /s/ha
Required permanent pool volume (+10%):	2,610 m ³
Provided permanent pool volume:	5,076 m ³
Required extended detention storage volume:	3,559 m ³
Required maximum extended detention discharge rate:	0.014 m³/s
Provided extended detention volume during water quality event:	3,787 m ³
Provided maximum extended detention discharge rate:	0.014 m³/s
Total pond storage volume:	8,863 m ³

outh SWMF	
Required protection level:	Enhanced
Contributing drainage area ¹ :	20.5 ha
Impervious level:	65 %
Total required water quality storage volume per hectare:	213 m ³ /ha
Required permanent pool volume per hectare:	173 m ³ /ha
Required extended detention storage volume per hectare:	40 m ³ /ha
SWS Extended Detention ¹	400 m ³ / imp. ha
SWS Unitary Discharge ¹	0.001 m³/s/ha
Required permanent pool volume (+10%):	3,903 m ³
Provided permanent pool volume:	7,152 m ³
Required extended detention storage volume:	5,322 m ³
Required maximum extended detention discharge rate:	0.020 m³/s
Provided extended detention volume during water quality event:	6,406 m ³
Provided maximum extended detention discharge rate:	0.018 m³/s
Total pond storage volume:	13,558 m ³

MOE SWM D	esign Manual Table 3.2								
Protection Level	SWMP Type	Storage Volume (m³/ha) for Impervious Level							
Level		35%	55%	70%	85%				
Enhanced	Infiltration	25	30	35	40				
(80% long-	Wetlands	80	105	120	140				
term S.S.	Hybrid Wet Pond/Wetland	110	150	175	195				
removal)	Wet Pond	140	190	225	250				
Normal	Infiltration	20	20	25	30				
(70% long-	Wetlands	60	70	80	90				
term S.S.	Hybrid Wet Pond/Wetland	75	90	105	120				
removal)	Wet Pond	90	110	130	150				
	Infiltration	20	20	20	20				
Basic	Wetlands	60	60	60	60				
(60% long- term S.S.	Hybrid Wet Pond/Wetland	60	70	75	80				
removal)	Wet Pond	60	75	85	95				
,	Dry Pond (Continuous Flow)	90	150	200	240				

- Based on the Twenty Mile Creek SWS Table 2.2.3 Stormwater Facility Sizing Criteria
 Based on the Twenty Mile Creek SWS Table 2.2.4 Unitary Storage and Discharge Criteria for Flood Control

North SWMF - Smithville Stormwater Management Facility Design Calculations

		Rating Cu	ve	Estimated				Volume	Estimation										Outlet Structu	re Controls			
	Depth	/Disch.	Storage	Detention		Forebay	Forebay	Tota	l Pond	Active Storage	Total	Active Storage		Ext. Detention		DICB			Emergency		Outlet		
	Elevation	Discharge	Active Total	Time	Elevation	Area	Volume	Area	Volume	Volume	Volume (excl. sediment)	Depth	Elevation	Orifice #1	Orifice #2	Inlet	Orifice #3	Control	Spillway	Total Flow	Parameter	Parameters	
	(m)	(m³/s)	(m³) (m³	(hrs)	(m)	(m²)	(m³)	(m²)	(m³)	(m³)	(m³)	(m)	(m)	(m³/s)		(m³/s)	(m³/s)	(m³/s)	(m³/s)	(m³/s)	(m³/s)		
	184.00				184.0			1,981					184.00									Water Quality Extende	d Detention Orifice #1
	184.10		207		184.1		37	2,509	244		207		184.10									Orifice #1 Elev (m)	Orifice Coeff.
	184.20		423		184.2		78	2,658	502		423		184.20									185.50	0.600
	184.30		650		184.3		126	2,809	775		650		184.30									Orifice #1-Midpoint (m)	Perimeter (m)
	184.40		885		184.4		178	2,962	1,064		885		184.40									185.55	0.283
Max. Sed. Storage	184.50		1,13	l l	184.5		237	3,118	1,368		1,131		184.50									Orifice Diameter (mm)	Area (m²)
	184.60		1,45		184.6		302	3,277	1,687		1,450		184.60									90.00	0.006
	184.70		1,78		184.7		374	3,437	2,023		1,786		184.70									Weir Coeff. (Sharp)	Orientation
	184.80		2,13		184.8		452	3,601	2,375		2,138		184.80									1.80	Vertical
	184.90		2,50		184.9		537	3,767	2,743		2,506		184.90									DICB Ou	· ·
	185.00		2,89		185.0		630	3,935	3,128		2,891		185.00									Pipe Elev (m)	Orifice Coeff.
	185.10		3,29		185.1		731	4,106	3,530		3,293		185.10									185.40	0.600
	185.20		3,71		185.2		839	4,279	3,950		3,713		185.20									Pipe (m)	Perimeter (m)
	185.30		4,14		185.3		955	4,455	4,386		4,149		185.30									185.70	1.885
Down on the cl	185.40		4,60		185.4		1081	4,633	4,841		4,604		185.40 185.50									Pipe Diameter (mm)	Area (m²)
Permanent Pool	185.50 185.60	0.004	5,07 492 5,56		185.5 185.6		1214	4,815 4,998	5,313 5,805	492	5,076 5,568	0.1	185.50	0.004						0.004		600.00 Weir Coeff. (Sharp)	0.283 Orientation
	185.60	0.004	1,000 6,07		185.6			5,161	6,313	1000	6,076	0.1	185.70	0.004						0.004		Weir Coeff. (Snarp)	Vertical
	185.80	0.007	1,524 6,60		185.8			5,326	6.837	1524	6,600	0.3	185.80	0.007						0.007		Emergency O	
	185.90	0.010	2,065 7,14		185.9			5,492	7,378	2065	7,141	0.4	185.90	0.010						0.010		Spillway Invert (m)	Top of Berm (m)
	186.00	0.011	2,622 7,69		186.0			5,659	7,935	2622	7,698	0.5	186.00	0.011						0.011		186.60	186.90
	186.10	0.013	3,197 8,27		186.1			5,827	8,510	3197	8,273	0.6	186.10	0.013						0.013		Spillway Length @ Invert (m)	Max. Flow Depth (m)
	186.20	0.014	3,788 8,86		186.2			5,998	9,101	3788	8,864	0.7	186.20	0.014			0.531			0.014	0.014	2.5	0.30
	186.30	0.174	4,396 9,47		186.3			6,169	9,709	4396	9,472	0.8	186.30	0.015		0.160	0.582	0.160		0.174		Side Slopes (ratio of H:V)	Topwidth
	186.40	0.484	5,022 10,0		186.4			6,343	10,335	5022	10,098	0.9	186.40	0.016		0.468	0.629	0.468		0.484		5.00	5.50
	186.50	0.689	5,665 10,7		186.5			6,518	10,978	5665	10,741	1.0	186.50	0.017		0.983	0.672	0.672		0.689		Weir Coefficient (Rectangle)	Weir Coeff. (Triangle)
	186.60	0.730	6,325 11,4	1 139.4	186.6			6,695	11,639	6325	11,401	1.1	186.60	0.017		1.710	0.713	0.713		0.730		1.70	1.30
	186.70	0.925	7,004 12,0	0 139.7	186.7			6,874	12,317	7004	12,080	1.2	186.70	0.018		2.402	0.751	0.751	0.155	0.925		•	
	186.80	1.303	7,700 12,7	6 139.8	186.8			7,057	13,014	7700	12,776	1.3	186.80	0.019		2.962	0.788	0.788	0.496	1.303		DICB invert (m)	186.20
	186.90	1.862	8,415 13,4	1 140.0	186.9			7,243	13,729	8415	13,491	1.4	186.90	0.020		3.583	0.823	0.823	1.019	1.862			
Top of Active Storage	187.00	2.610	9,149 14,2	5 140.1	187.0			7,430	14,462	9149	14,225	1.5	187.00	0.020		4.229	0.857	0.857	1.733	2.610			
.,																							

Ext. Det storage

Drawdown Time Calculations Greater than 0.1 m above the permanent pool

 $T=[v_2-v_1]/[(Q_2+Q_1)/2]/3600$

where

T=drawdown time in hours

v₂=starting pond volume v₂=ending pond volume

Q₂=starting flow Q₁=ending flow

From 0.0 to 0.1 m above the permanent pool

 $T=[v_2-v_1]/[(Q_2)]/3600$

where T=drawdown time in hours

v₂=starting pond volume

v₂=starting pond volume v₂=ending pond volume Q₂=starting flow

Drawdown Time Calculations Greater than 0.1 m above the permanent pool

 $T=[v_2-v_1]/[(Q_2+Q_1)/2]/3600$ where T=drawdown time in hours

v₂=starting pond volume v₂=ending pond volume Q₂=starting flow

Q₁=ending flow

From 0.0 to 0.1 m above the permanent pool $T=[v_2-v_1]/[(Q_2)]/3600$

where T=drawdown time in hours v₂=starting pond volume

v₂=ending pond volume

Q₂=starting flow

Weir Equation Used: $Q = C_{wb} * L * H^{1.5} + C_{wt} * S * H^{2.5}$

L = bottom width of spillway H = head above weir invert

S = side slopes (ratio of H:V)

C_{wt} = weir coefficient (triangular)

C_{wb} = weir coefficient (broad-crested)

Sharp crested semi-circular weir equation

Sharp crested semi-circular weir equation Q=C*D^{2.5}*(H/D)^{1.88}

C = sharp crested semi-circular weir coefficient
D = diameter of orifice

H = head above orifice invert Note: used when water elevation is below 3/4 of the orifice diameter

Weir Equation Used: $Q = C_{wb}^*L^*H^{1.5} + C_{wt}^*S^*H^{2.5}$

where
L = bottom width of spillway H = head above weir invert S = side slopes (ratio of H:V)

C_{wt} = weir coefficient (triangular) C_{wb} = weir coefficient (broad-crested)

Sharp crested semi-circular weir equation $Sharp\ crested\ semi-circular\ weir\ equation$ $Q=C^*D^{2.5}_*(H/D)^{1.88}$

C = sharp crested semi-circular weir coefficient D = diameter of orifice

H = head above orifice invert

Note: used when water elevation is below 3/4 of the orifice diameter

Orifice Flow Calculations: Orifice flow equation

 $Q = C_*A_*(2_*g_*H)^{0.5}$

where C = orifice coefficient

A = area of orifice

g = acceleration due to gravity H = head above centre line of orifice

Note: used when water elevation is above 3/4 of the orifice diameter

Orifice Flow Calculations: Orifice flow equation

 $Q = C \cdot A \cdot (2 \cdot g \cdot H)^{0.5}$

where C = orifice coefficient A = area of orifice

g = acceleration due to gravity
H = head above centre line of orifice

Note: used when water elevation is above 3/4 of the orifice diameter

Ditch Inlet Capacity Calculation (OPSD Type 705.030, Grate Type 403.010) MTO Design Chart 4.20

Ditch Inlet Width: 1.2 m 5 :1 grate slope

		Capacity (m³/s) per n	neter width	1			Actua	I Inlet Flov	v m³/s	
Flow Depth	2:1	3:1	4:1	5:1	6:1	Head	2:1	3:1	4:1	5:1	6:1
0	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000
0.05	0.024	0.023	0.022	0.021	0.021	0.05	0.029	0.028	0.027	0.026	0.025
0.1	0.065	0.084	0.112	0.133	0.140	0.1	0.078	0.101	0.134	0.160	0.168
0.15	0.110	0.148	0.204	0.246	0.260	0.15	0.132	0.177	0.245	0.295	0.312
0.2	0.200	0.253	0.331	0.390	0.410	0.2	0.240	0.303	0.398	0.468	0.492
0.25	0.300	0.375	0.488	0.572	0.600	0.25	0.360	0.450	0.585	0.686	0.720
0.3	0.420	0.530	0.695	0.819	0.860	0.3	0.504	0.636	0.834	0.983	1.032
0.35	0.550	0.675	0.863	1.003	1.050	0.35	0.660	0.810	1.035	1.204	1.260
0.4	0.700	0.900	1.200	1.425	1.500	0.4	0.840	1.080	1.440	1.710	1.800
0.45	0.900	1.150	1.525	1.806	1.900	0.45	1.080	1.380	1.830	2.168	2.280
0.5	1.050	1.313	1.706	2.002	2.100	0.5	1.260	1.575	2.048	2.402	2.520
0.55	1.100	1.450	1.975	2.369	2.500	0.55	1.320	1.740	2.370	2.843	3.000
0.6	1.296	1.620	2.105	2.469	2.590	0.6	1.556	1.944	2.526	2.962	3.108
0.65	1.419	1.780	2.321	2.727	2.863	0.65	1.703	2.136	2.786	3.273	3.435
0.7	1.543	1.941	2.538	2.986	3.135	0.7	1.851	2.329	3.045	3.583	3.762
0.75	1.666	2.104	2.762	3.255	3.419	0.75	1.999	2.525	3.314	3.906	4.103
0.8	1.789	2.268	2.986	3.524	3.704	8.0	2.147	2.721	3.583	4.229	4.445
0.85	1.912	2.429	3.204	3.785	3.979	0.85	2.294	2.914	3.845	4.542	4.775
0.9	2.035	2.590	3.422	4.047	4.255	0.9	2.442	3.108	4.107	4.856	5.106
0.95	2.158	2.750	3.637	4.302	4.524	0.95	2.590	3.300	4.364	5.163	5.429
1	2.281	2.909	3.851	4.558	4.793	1	2.738	3.491	4.622	5.469	5.752
1.05	2.404	3.061	4.045	4.784	5.030	1.05	2.885	3.673	4.854	5.741	6.036
1.1	2.512	3.192	4.212	4.977	5.231	1.1	3.015	3.831	5.054	5.972	6.278
1.15	2.636	3.350	4.420	5.223	5.490	1.15	3.164	4.020	5.304	6.267	6.588
1.2	2.760	3.507	4.628	5.469	5.749	1.2	3.312	4.209	5.554	6.562	6.899
1.25	2.884	3.665	4.836	5.715	6.008	1.25	3.461	4.398	5.804	6.858	7.209
1.3	3.008	3.823	5.045	5.961	6.266	1.3	3.610	4.587	6.053	7.153	7.520
1.35	3.132	3.980	5.253	6.207	6.525	1.35	3.758	4.776	6.303	7.448	7.830
1.4	3.256	4.138	5.461	6.453	6.784	1.4	3.907	4.966	6.553	7.744	8.141

SMITHVILLE

Sediment Forebay Sizing Calculations (North Pond)

Using MOE - Stormwater Management Planning and Design Manual (2003)

STORMWATER MANAGEMENT FACILITY

Settling				
Dist = $sqrt(r^*Q_p/v_s)$	r : 1 = I to w ratio	r =	2.85	
= 9.7 m	Q _p = peak SWM outflow during quality storm	Q _p =	0.010	Note 1
	v _s = settling velocity for 0.15 mm particles (m/s)	v _s =	0.0003	
Dispersion Length	y _d = total depth of sediment in forebay (m)	y _d =	0.5	_
Dist = 8Q/dv	Q = 10 yr inlet flow (m ³ /s)	Q =	2.960	Note 2
= 47.4 m	d = depth of perm pool in forebay (m)	d =	1	
	v _f = desired vel in forebay (m/s)	$v_f =$	0.5	
Velocity	y = total depth of forebay from perm. pool (m)	y =	1.5	_
v = Q/A	b = bottom width (avg) of forebay (m)	b =	19.00	
= 0.090 m/s	Q = 10 yr inlet flow (m ³ /s)	Q =	2.960	Note 2
	A = cross-sectional area (m ²)	A =	33.00	
	Target velocity = 0.15	V _{targ} =	0.15	
Cleanout Frequency				_
Table 6.3 MOE SWMPD Manual	Water Quality Level		Enhanced	
Table 6.6 MGE 644M B Marian	A _{sew} = Contributing Sewer Area (ha)	A _{sew} =	13.69	
cleanout = Vol/(load*A _{sew} *effic)	Imp = Percent Impervious (%)	Imp =	75%	
= 8.6 years	load = Sediment Loading (m³/ha)	load =	3.1	Note 3
one yours	effic = Removal Efficiency (%) - Enhanced Level	effic =	80%	
	Targ = Cleanout Frequency Target (years)	Targ =	7	
	Vol = Sediment volume (m ³)	Vol =	293	Note 4
Therefore, Cleanout Frequency Satis	sfied			
mererore, Cleanout Frequency Saus				
Surface Area Check				_
	SA _f = Forebay Surface Area (m²)	SA _f =	1,225	_
Surface Area Check	SA _f = Forebay Surface Area (m ²)	· ·		-
Surface Area Check		SA _f = SA _{pp} = Targ =	1,225 3,717 33%	_

<u>Notes</u>

- 1. Based on max outflow from pond for extended detention volume
- 2. 10 year peak inlet flow to SWM facility based on Visual OTTHYMO Modelling
- 3. Interpolated from sediment loading table
- 4. Volume of bottom 0.5 m depth, the maximum sediment accumulation depth

South SWMF - Smithville

Bottom of Pond Elevation Permanent Pool Depth 184.00 m 1.50 m

					Stor	age			Discharge				
	Elevation	Depth	Footprint Area	Forebay Volume	Total Storage Volume	Live Storage	Live Storage	Orifice 1	Orifice 2	Weir 1	Total Flow	Outlet Parameter	Drawdown Time
	(m)	(m)	(m ²)	(m ³)	(m³)	(m³)	(ha-m)	(m ³ /s)	(m ³ /s)	(m³/s)	(m ³ /s)	(m³/s)	(h)
	184.00	0.00	4,800	0	0								
	184.10	0.10	5,035	123	492								
	184.20	0.20	5,270	252	1,007								
	184.30	0.30	5,506	386	1,546								
	184.40	0.40	5,741	527	2,108								
Max Sed. Storage	184.50	0.50	5,976	674	2,694								
	184.60	0.60	6,211	826	3,303								
	184.70	0.70	6,446	984	3,936								
	184.80	0.80	6,682	1,148	4,593								
	184.90	0.90	6,917	1,318	5,273								
	185.00	1.00	7,152	1,494	5,976								
	185.10	1.10	7,387	1,676	6,703								
	185.20	1.20	7,622	1,863	7,453								
	185.30	1.30	7,858	2,057	8,227								
	185.40	1.40	8,093	2,256	9,025								
Permanent Pool	185.50	1.50	8,328	2,462	9,846	0	0.0000	0.0000			0.000		0.0
	185.60	1.60	8,563		10,691	845	0.0845	0.0049			0.005		95.7
	185.70	1.70	8,798		11,559	1,713	0.1713	0.0085			0.008		131.8
	185.80	1.80	9,034		12,450	2,604	0.2604	0.0110			0.011		157.2
	185.90	1.90	9,269		13,365	3,519	0.3519	0.0130			0.013		178.5
	186.00	2.00	9,504		14,304	4,458	0.4458	0.0147			0.015		197.3
	186.10	2.10	9,739		15,266	5,420	0.5420	0.0163			0.016		214.6
Ext. Det.	186.20	2.20	9,974		16,252	6,406	0.6406	0.0177	0.0000		0.018	0.020	230.7
	186.30	2.30	10,210		17,261	7,415	0.7415	0.0190	0.0319		0.051		238.9
	186.40	2.40	10,445		18,294	8,448	0.8448	0.0202	0.0901		0.110		242.5
	186.50	2.50	10,680		19,350	9,504	0.9504	0.0214	0.1655		0.187		244.5
	186.60	2.60	10,915		20,430	10,584	1.0584	0.0225	0.2548		0.277		245.7
	186.70	2.70	11,150		21,533	11,687	1.1687	0.0235	0.3562	0.000	0.380		246.7
	186.80	2.80	11,386	I	22,660	12,814	1.2814	0.0245	0.4682	0.067	0.559	l	247.3
	186.90	2.90	11,621	I	23,810	13,964	1.3964	0.0255	0.5671	0.302	0.894		247.8
	187.00	3.00	11,856	I	24,984	15,138	1.5138	0.0264	0.6382	0.762	1.427		248.1
				I									
				I								l	

185.50 m Invert elevation Crown Elevation 185.60 m Diameter 0.100 m 0.008 m² Area 0.63 Cd 0.005 $Q_{weir} = C \times LxH^{3/2} + C_sxSxH^{5/2}$ Emergency Spillway 1 Elevation 186.70 m 0.50 m Length Discharge Coeff. 1.670 Discharge Coeff. 1.268 Height 0.3 m Side Slopes 10 m/m Orifice 2 Flow $Q_{orif} = C \times A \times (2gH)^{1/2}$ Invert Elevation 186.20 m Crown Elevation 186.85 m Diameter 0.650 m 0.332 m² Area Cd 0.63 0.528 Cw

Orifice 1 Flow

 $Q_{orif} = C \times A \times (2gH)^{1/2}$

Orifice Flow Calculations: Q_{orif} = C×A×(2gH)^{1/2} where

C = orifice coefficient

A = area of orifice

g = acceleration due to gravity
H = head above centreline of orifice
Note: used when water elevation is above 3/4 of the orifice diameter

Sharp crested semi-circular weir equation: Q = $C_w x (H/D)^{1.5}$ where

C_w = sharp-crested weir coefficient

D = diameter of orifice

Note: used when water elevation is below 3/4 of the orifice diameter

Broad Crested Weir Equation: $Q_{weir} = C \times LxH^{3/2} + C_s xSxH^{5/2}$ where

C = rectangular weir coefficient

C_s = triangular weir coefficient

L = bottom width of spillway

H = head above weir invert S = side slopes (ratio H:W)

Outlet Culvert (from pond)

Return Period	Pre- development Flows (m ³ /s)	Post- devlopment Flows (m ³ /s)	Percent of change
25 mm event	0.08	0.05	-37%
2 -Year, 12hr	0.19	0.09	-54%
5-Year, 12hr	0.34	0.11	-67%
10-Year, 12hr	0.46	0.22	-53%
25-Year, 12hr	0.64	0.49	-23%
50-Year, 12hr	0.78	0.67	-15%
100-Year, 12hr	0.95	0.75	-21%
Hurricane Hazel	1.57	1.67	6%

NE Outlet

Return Period	Pre- development Flows (m ³ /s)	Post- devlopment Flows (m ³ /s)	Percent of change
25 mm event	0.08	0.06	-22%
2 -Year, 12hr	0.22	0.14	-38%
5-Year, 12hr	0.41	0.24	-42%
10-Year, 12hr	0.56	0.32	-43%
25-Year, 12hr	0.78	0.44	-44%
50-Year, 12hr	0.96	0.54	-44%
100-Year, 12hr	1.16	0.65	-44%
Hurricane Hazel	1.23	0.73	-40%

South Outlet

Return Period	Pre- development Flows (m ³ /s)	Post- devlopment Flows (m ³ /s)	Percent of change
25 mm event	0.10	0.02	-84%
2 -Year, 12hr	0.24	0.03	-88%
5-Year, 12hr	0.43	0.05	-89%
10-Year, 12hr	0.58	0.09	-84%
25-Year, 12hr	0.81	0.18	-77%
50-Year, 12hr	1.00	0.28	-72%
100-Year, 12hr	1.20	0.40	-67%
Hurricane Hazel	1.85	2.52	36%

West Outlet

Return Period	Pre- development Flows (m³/s)	Post- devlopment Flows (m³/s)	Percent of change
25 mm event	0.03	0.39	1231%
2 -Year, 12hr	0.08	0.68	791%
5-Year, 12hr	0.14	0.92	572%
10-Year, 12hr	0.19	1.22	547%
25-Year, 12hr	0.26	1.50	474%
50-Year, 12hr	0.32	1.72	434%
100-Year, 12hr	0.39	1.96	404%
Hurricane Hazel	0.53	0.69	30%

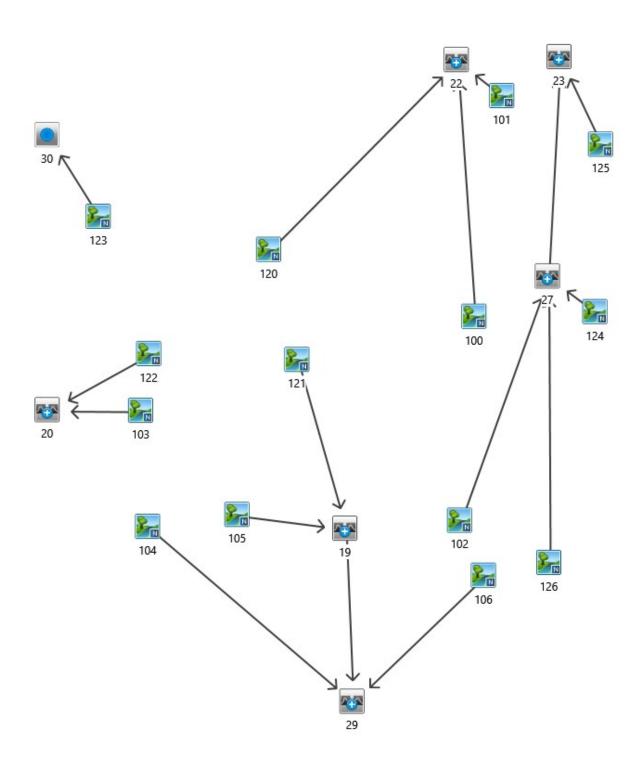
APPENDIX C VISUAL OTTHYMO MODELING OUTPUTS

➤ APPENDIX C1 Pre-Schematic
 ➤ APPENDIX C2 Existing Output
 ➤ APPENDIX C3 Post Schematic
 ➤ APPENDIX C4 Proposed Output

APPENDIX C-1

EXISTING CONDITIONS SCHEMATIC

VO Schematic - Existing Conditions



APPENDIX C-2

EXISTING OUTPUT

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V V I SSSSS U U A L
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 A L
                                                                                                                   (v 6.2.2015)
                  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 T H H H YY MM MM O O O O O T T T H H Y Y M M O O OOO T T T H H Y M M OOO
    Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
     All rights reserved.
                                 ***** DETAILED OUTPUT *****
        Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
    Output filename: C:\Users\bweersink\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\8a40acb8-7777-4f80-bed7-083b9e542c74\sc
        Summary filename: C:\Users\bweersink\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-
     f883467b2a44\8a40acb8-7777-4f80-bed7-083b9e542c74\sc
     DATE: 08/19/2024
                                                                                          TIME: 11:11:31
     USER:
    COMMENTS:
        **************
        | CHICAGO STORM | IDF curve parameters: A=2987.057 | Ptotal=96.22 mm | B= 15.200 | C= 0.897 | used in: INTENSITY = A / (t + B)^C
                                        Duration of storm = 12.00 hrs
Storm time step = 5.00 min
                                         Time to peak ratio = 0.38
                             TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt(8/19/2024 12:25:03 PM] \\ file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt(8/19/2024 12:25:03 PM] \\ file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt(8/19/2024 12:25:03 PM] \\ file://Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt(8/19/2024 12:25:03 PM]
            (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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```
1.03 | 3.17
1.05 | 3.25
                                                                                                                    3.81 | 6.17
4.12 | 6.25
                                                                                                                                                                       5.16 | 9.17
4.87 | 9.25
                                                                1.07 | 3.33 | 4.48 | 6.33 | 4.60 | 9.33
1.10 | 3.42 | 4.90 | 6.42 | 4.37 | 9.42
                                        0.33
                                                                                                                                                                                                                             1.53
                                                                 1.12 | 3.50 | 5.40 | 6.50
                                                                                                                                                                        4.15 9.50
                                        0.50
                                                                                                                                                                                                                             1.48
                                        0.58
0.67
                                                                1.14 | 3.58 | 6.02 | 6.58
1.17 | 3.67 | 6.77 | 6.67
                                                                                                                                                                       3.96 | 9.58
3.78 | 9.67
                                                                                                                                                                                                                             1.43
                                        0.75
                                                                1.20 | 3.75
1.23 | 3.83
                                                                                                                   7.73 | 6.75
8.96 | 6.83
                                                                                                                                                                        3.61 | 9.75
                                                                                                                                                                                                                            1.40
                                                            | 1.23 | 3.83 | 8.96 | 6.83 | 3.46 | 9.83 | 1

1.26 | 3.92 | 10.62 | 6.92 | 3.32 | 9.92 | 1

1.29 | 4.00 | 12.92 | 7.00 | 3.20 | 10.00 | 1.32 | 4.08 | 16.29 | 7.08 | 3.08 | 10.08 | 13.6 | 4.17 | 21.59 | 7.17 | 2.97 | 10.17 | 1.39 | 4.25 | 30.82 | 7.25 | 2.86 | 10.25 | 1.43 | 4.33 | 49.63 | 7.33 | 2.77 | 10.33 | 1.47 | 4.42 | 100.76 | 7.42 | 2.68 | 10.42 | 1.52 | 4.50 | 201.53 | 7.50 | 2.59 | 10.50 | 1.57 | 4.58 | 16.59 | 7.58 | 2.51 | 10.55 | 1.62 | 4.67 | 70.34 | 7.67 | 2.44 | 10.67 | 1.67 | 4.75 | 48.12 | 7.75 | 2.37 | 10.75 | 1.73 | 4.83 | 3.556 | 7.83 | 2.30 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.83 | 10.
                                        0.92
                                                                                                                                                                                                                                1.36
                                         1.00
                                         1.08
                                                                                                                                                                                                                                  1.31
                                         1.33
                                                                                                                                                                                                                                  1.25
                                         1.58
                                         1.75
                                                                1.73 | 4.83 | 35.56 | 7.83 | 2.30 | 10.83
1.79 | 4.92 | 27.69 | 7.92 | 2.24 | 10.92
                                         1.92
                                                                1.85 | 5.00 | 22.40 | 8.00 | 2.18 | 11.00 | 1.92 | 5.08 | 18.63 | 8.08 | 2.12 | 11.08
                                        2.00
                                        2.08
                                        2.17
2.25
2.33
                                                                2.00 | 5.17 | 15.85 | 8.17 | 2.07 | 11.17 | 2.08 | 5.25 | 13.73 | 8.25 | 2.02 | 11.25 | 2.17 | 5.33 | 12.06 | 8.33 | 1.97 | 11.33
                                                            2.71 5.42 10.73 8.42 1.92 11.43
2.27 5.42 10.73 8.42 1.92 11.45
2.38 5.50 9.64 8.50 1.88 11.50
2.50 5.58 8.73 8.58 1.84 11.58
2.63 5.67 7.97 8.67 1.80 11.67
2.77 5.75 7.32 8.75 1.76 11.75
                                        2.42
                                        2.58
                                                                                                                                                                                                                                1.02
                                        2.75
                                                                                                                                                                                                                              1.00
                                        2.83 2.93 5.83 6.77 8.83 1.72 11.83
2.92 3.11 5.92 6.28 8.92 1.69 11.92
                                                                                                                                                                        1.72 11.83 0.99
Unit Hyd Qpeak (cms)= 0.182
           PEAK FLOW (cms)= 0.251 (i)
TIME TO PEAK (hrs)= 5.333
           RUNOFF VOLUME (mm)= 55.770
TOTAL RAINFALL (mm)= 96.218
RUNOFF COEFFICIENT = 0.580
```

```
Unit Hyd Qpeak (cms)= 0.209
         \begin{array}{lll} PEAK FLOW & (cms) = & 0.216 \ (i) \\ TIME TO PEAK & (hrs) = & 4.833 \\ RUNOFF VOLUME & (mm) = & 57.356 \\ TOTAL RAINFALL & (mm) = & 96.218 \\ RUNOFF COEFFICIENT & = & 0.596 \\ \end{array}
          (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
ID = 3 ( 0020): 4.57 0.389 5.00 56.26
          NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| CALIB | NASHYD ( 0120)| Area (ha)= 4.33 Curve Number (CN)=83.7 | CN = 1 DT=5.0 min | la (mm)= 7.00 # of Linear Res.(N)=3.00 | CN = 1 DT=5.0 The CN = 0.55 | CN = 1 DT=5.0 The CN = 0.55 | CN = 0.55 
           Unit Hyd Qpeak (cms)= 0.302
          PEAK FLOW (cms)= 0.409 (i)
TIME TO PEAK (hrs)= 5.250
         RUNOFF VOLUME (mm)= 57.394
TOTAL RAINFALL (mm)= 96.218
RUNOFF COEFFICIENT = 0.596
          (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
Unit Hyd Qpeak (cms)= 0.395
     PEAK FLOW (cms)= 0.618 (i)
TIME TO PEAK (hrs)= 5.750
RUNOFF VOLUME (mm)= 56.799
TOTAL RAINFALL (mm)= 96.218
      RUNOFF COEFFICIENT = 0.590
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
   Unit Hvd Opeak (cms)= 0.018
      PEAK FLOW (cms)= 0.011 (i)
TIME TO PEAK (hrs)= 4.667
      RUNOFF VOLUME (mm)= 60.615
TOTAL RAINFALL (mm)= 96.218
RUNOFF COEFFICIENT = 0.630
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
   | ADD HYD ( 0022)|
    ADJ H1D (0022)]
1+2=3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
IDI=1 (0100): 10.57 0.618 5.75 56.80
+ ID2=2 (0101): 0.04 0.011 4.67 60.62
       ID = 3 ( 0022): 10.61 0.619 5.75 56.81
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
  ID = 1 ( 0022): 14.94 0.945 5.50 56.98
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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CALIB
     | CALID | | (10102) | Area (ha)= 7.24 Curve Number (CN)= 82.0 | | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 
               Unit Hyd Qpeak (cms)= 0.916
              \begin{array}{lll} PEAK FLOW & (cms) = & 0.962 \ (i) \\ TIME TO PEAK & (hrs) = & 4.917 \\ RUNOFF VOLUME & (mm) = & 54.885 \\ TOTAL RAINFALL & (mm) = & 96.218 \\ RUNOFF COEFFICIENT & = & 0.570 \\ \end{array}
               (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
      CALIB
     Unit Hyd Qpeak (cms)= 0.066
              PEAK FLOW (cms)= 0.080 (i)
TIME TO PEAK (hrs)= 5.333
RUNOFF VOLUME (mm)= 50.915
TOTAL RAINFALL (mm)= 96.218
RUNOFF COEFFICIENT = 0.529
               (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
      | NASHYD ( 0124)| Area (ha)= 0.71 Curve Number (CN)= 85.4
|ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
                                                         --- U.H. Tp(hrs)= 0.25
               Unit Hyd Opeak (cms)= 0.109
              PEAK FLOW (cms)= 0.118 (i)
TIME TO PEAK (hrs)= 4.833
RUNOFF VOLUME (mm)= 59.961
TOTAL RAINFALL (mm)= 96.218
RUNOFF COEFFICIENT = 0.623
               (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
    file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
               Unit Hyd Opeak (cms)= 0.087
```

```
ID = 3 ( 0027): 7.95 1.076 4.92 55.34
                NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
       ID = 1 ( 0027): 9.01 1.131 4.92 54.82
                NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
        Unit Hyd Qpeak (cms)= 0.037
                PEAK FLOW (cms)= 0.034 (i)
TIME TO PEAK (hrs)= 4.750
                RUNOFF VOLUME (mm)= 58.149
TOTAL RAINFALL (mm)= 96.218
RUNOFF COEFFICIENT = 0.604
                (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
      ID = 3 ( 0023): 9.19 1.159 4.92 54.88
                NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
        CALIB
        | CALID | | (ALID ) (ALid ))))))))))))))))))))))))))))))))))
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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```
(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
          | CALID | | (ANASHYD ( 0106)| Area (ha)= 1.27 Curve Number (CN)= 80.8 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia 
                   Unit Hyd Qpeak (cms)= 0.072
                 PEAK FLOW (cms)= 0.095 (i)
TIME TO PEAK (hrs)= 5.417
RUNOFF VOLUME (mm)= 53.215
TOTAL RAINFALL (mm)= 96.218
RUNOFF COEFFICIENT = 0.553
                   (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
          | ADD HYD ( 0029)|
         | 1 + 2 = 3 | AREA QPEAK TPEAK R.V. | (ha) (cms) (hrs) (mm) | IDI=1 (0 104): 3.63 0.312 5.25 55.77 | + ID2=2 (0106): 1.27 0.095 5.42 53.21
                        ID = 3 ( 0029): 4.90 0.406 5.33 55.11
                   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
          | ADD HYD ( 0029)|
         | 3 + 2 = 1 | AREA QPEAK TPEAK R.V. | 3 + 2 = 1 | AREA (sim) (cms) (hrs) (mm) | IDI=3 (0029): 4.90 0.406 | 5.33 | 55.11 | + ID2=2 ( 0019): 11.87 0.818 | 5.58 | 57.41
                         ID = 1 ( 0029): 16.77 1.201 5.50 56.74
                   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
          LCALIB
          Unit Hyd Qpeak (cms)= 0.110
                   PEAK FLOW (cms)= 0.157 (i)
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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TIME TO PEAK (hrs)= 5.167 RUNOFF VOLUME (mm)= 62.258 TOTAL RAINFALL (mm)= 96.218 RUNOFF COEFFICIENT = 0.647 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY Junction Command(0030) V V I SSSSS U U A L 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 A L (v 6.2.2015) I SSSSS UUUUU A A LLLLL OOO TTTTT TTTTT H H Y Y M M OOO TM
O O T T H H YY MM MM O O
O O T T H H Y M M O O
OOO T T H H Y M M OO
Developed and Distributed by Smart City Water Inc Copyright 2007 - 2022 Smart City Water Inc All rights reserved. ***** DETAILED OUTPUT***** Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\bweersink\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62f883467b2a44\6dccda19-53da-426f-b92a-44333e42c11c\sc Summary filename: C:\Users\bweersink\AppData\Loca\\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\6dccda19-53da-426f-b92a-44333e42c11c\sc DATE: 08/19/2024 TIME: 11:11:30 USER: COMMENTS: file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]

| CHICAGO STORM | IDF curve parameters: A=1303.567 | Ptotal= 65.32 mm | B= 9.700 ------ C= 0.831 used in: $INTENSITY = A/(t+B)^{C}$ Duration of storm = 12.00 hrs Storm time step = 5.00 min Time to peak ratio = 0.38 1.03 | 3.17 | 3.05 | 6.17 | 3.91 | 9.17 | 1.05 | 3.25 | 3.25 | 6.25 | 3.72 | 9.25 0.33 1.06 | 3.33 | 3.48 | 6.33 1.08 | 3.42 | 3.74 | 6.42 3.56 | 9.33 1.44 3.41 | 9.42 3.27 | 9.50 1.10 | 3.50 | 4.06 | 6.50 1.12 | 3.58 | 4.43 | 6.58 1.15 | 3.67 | 4.88 | 6.67 0.50 1.39 3.14 | 9.58 3.03 | 9.67 0.67 1.35
 1.15
 3.67
 4.88
 6.67
 3.03
 9.67

 1.17
 3.75
 5.44
 6.75
 2.92
 9.75

 1.19
 3.83
 6.15
 6.83
 2.82
 9.83

 1.22
 3.92
 7.08
 6.92
 2.73
 9.92

 1.24
 4.00
 8.35
 7.00
 2.64
 | 10.00

 1.27
 4.08
 10.19
 7.08
 2.56
 | 10.08

 1.30
 4.17
 13.04
 7.17
 2.48
 | 10.17

 1.33
 4.25
 18.00
 7.25
 2.44
 | 10.25

 1.36
 4.33
 28.38
 7.33
 2.25
 | 10.33

 1.20
 1.36
 4.33
 28.38
 7.33
 2.25
 | 10.33
 0.75 1 33 0.92 1.30 1.00 1.08 1.17 1.33 1.39 | 4.42 | 60.23 | 7.42 1.43 | 4.50 | 139.67 | 7.50 2.28 | 10.42 2.22 | 10.50 1.50 1.18 1.43 4.50 139.67 7.50 2.22 10.50 1.18 1.46 4.58 70.72 | 7.58 2.17 | 10.58 1.17 1.50 4.67 40.43 7.67 2.12 | 10.67 1.16 1.54 4.75 27.50 7.75 2.06 | 10.75 1.14 1.59 4.83 20.56 7.83 2.02 | 10.83 1.13 1.64 4.92 16.31 7.92 1.97 | 10.92 1.12 1.69 5.00 13.47 | 8.00 1.93 | 11.00 1.10 1.74 5.08 11.48 8.08 1.89 | 11.08 1.09 80 5.17 9.95 | 8.17 1.88 11.17 1.08 1.58 1.92 2.00 1.80 | 5.17 9.95 | 8.17 2.17 1.85 | 11.17 2.25 2.33 1.86 | 5.25 1.92 | 5.33 8.80 | 8.25 7.88 | 8.33 1.81 | 11.25 1.77 | 11.33 2 42 2 00 | 5 42 7.14 8.42 1.74 | 11.42 2.07 | 5.50 | 6.53 | 8.50 1.71 | 11.50 2.16 | 5.58 | 6.02 | 8.58 | 1.67 | 11.58 | 2.25 | 5.67 | 5.58 | 8.67 | 1.64 | 11.67 | 2.35 | 5.75 | 5.20 | 8.75 | 1.61 | 11.75 2.58 1.02 2.67 2.75 1.00 2.46 | 5.83 | 4.88 | 8.83 1.59 | 11.83 | 0.99 file: /// Ca0004-ppfss01/...61414473/ design/report/FSR/SWM%20 write up/Appendix%20 C%20-%20 VO%20 Modelling/Existing VO output.txt [8/19/2024 12:25:03 PM] and the properties of the properti

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---- U.H. Tp(hrs)= 0.55
                     Unit Hyd Qpeak (cms)= 0.302
                    PEAK FLOW (cms)= 0.199 (i)
TIME TO PEAK (hrs)= 5.250
RUNOFF VOLUME (mm)= 31.554
TOTAL RAINFALL (mm)= 65.319
RUNOFF COEFFICIENT = 0.483
                     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
          | CALID | | (ASHYD ( 0100)| Area (ha)= 10.57 Curve Number (CN)= 83.3 | | (ID=1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (N)= 1.02 | (N)
                     Unit Hyd Qpeak (cms)= 0.395
                    PEAK FLOW (cms)= 0.302 (i)
TIME TO PEAK (hrs)= 5.833
RUNOFF VOLUME (mm)= 31.134
TOTAL RAINFALL (mm)= 65.319
RUNOFF COEFFICIENT = 0.477
                     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
          | CALIB
          Unit Hyd Qpeak (cms)= 0.018
                    \begin{array}{ll} \mbox{PEAK FLOW} & \mbox{(cms)=} & 0.006 \mbox{ (i)} \\ \mbox{TIME TO PEAK} & \mbox{(hrs)=} & 4.667 \end{array}
                     RUNOFF VOLUME (mm)= 34.358
TOTAL RAINFALL (mm)= 65.319
RUNOFF COEFFICIENT = 0.526
                     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
          file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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ID = 3 ( 0022): 10.61 0.303 5.83 31.15
              NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
    ID = 1 ( 0022): 14.94 0.460 5.50 31.26
              NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
     | CALID | | (10102) | Area (ha)= 7.24 Curve Number (CN)= 82.0 | | (100 - 1) | T = 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100 - 1) | (100
               Unit Hyd Qpeak (cms)= 0.916
             PEAK FLOW (cms)= 0.462 (i)
TIME TO PEAK (hrs)= 4.917
RUNOFF VOLUME (mm)= 29.803
TOTAL RAINFALL (mm)= 65.319
RUNOFF COEFFICIENT = 0.456
              (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
      CALIB
     Unit Hyd Qpeak (cms)= 0.066
             PEAK FLOW (cms)= 0.037 (i)
TIME TO PEAK (hrs)= 5.333
RUNOFF VOLUME (mm)= 27.114
TOTAL RAINFALL (mm)= 65.319
RUNOFF COEFFICIENT = 0.415
              (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
       CALIB
      | NASHYD ( 0124)| Area (ha)= 0.71 Curve Number (CN)= 85.4
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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```
Unit Hyd Qpeak (cms)= 0.109
                PEAK FLOW (cms)= 0.058 (i)
TIME TO PEAK (hrs)= 4.833
RUNOFF VOLUME (mm)= 33.401
TOTAL RAINFALL (mm)= 65.319
RUNOFF COEFFICIENT = 0.511
                 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
        ID = 3 ( 0027): 7.95 0.518 4.92 30.12
                 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
        ID = 1 ( 0027): 9.01 0.544 4.92 29.77
                 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
         Unit Hyd Qpeak (cms)= 0.037
                PEAK FLOW (cms)= 0.017 (i)
TIME TO PEAK (hrs)= 4.750
RUNOFF VOLUME (mm)= 32.113
TOTAL RAINFALL (mm)= 65.319
                 RUNOFF COEFFICIENT = 0.492
                 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
file: /// Ca0004-ppfss01/... 61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-\%20VO\%20Modelling/Existing VOoutput.txt[8/19/2024 12:25:03 PM] and the file of the first of the fir
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ID = 3 ( 0019): 11.87 0.400 5.58 31.57
                  NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
         | CALIB | | (ALIB | NASHYD ( 0104)| Area (ha)= 3.63 Curve Number (CN)= 82.6 | | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | U.H. Tp(hrs)= 0.59 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (ID=1 DT=5.0 min | Ia (mm)= 7.00 # 
                  Unit Hyd Qpeak (cms)= 0.233
                 PEAK FLOW (cms)= 0.150 (i)
TIME TO PEAK (hrs)= 5.333
                  RUNOFF VOLUME (mm)= 30.414
TOTAL RAINFALL (mm)= 65.319
RUNOFF COEFFICIENT = 0.466
                  (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
         Unit Hyd Qpeak (cms)= 0.072
                  PEAK FLOW (cms)= 0.045 (i)
TIME TO PEAK (hrs)= 5.417
                  RUNOFF VOLUME (mm)= 28.657
TOTAL RAINFALL (mm)= 65.319
RUNOFF COEFFICIENT = 0.439
                  (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
         | ADD HYD ( 0029)|
             ID = 3 ( 0029): 4.90 0.195 5.33 29.96
                  NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
       | ADD HYD ( 0029)|
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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3 + 2 = 1
                                                                             AREA QPEAK TPEAK R.V.
                  | The control of the 
                  ID = 1 ( 0029); 16.77 0.583 5.50 31.10
           NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 CALIB
| CALIB | | NASHYD ( 0123)| Area (ha)= 1.39 Curve Number (CN)= 86.8 | | ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | ....... U.H. Tp(hrs)= 0.48
           Unit Hyd Qpeak (cms)= 0.110
          PEAK FLOW (cms)= 0.079 (i)
TIME TO PEAK (hrs)= 5.167
RUNOFF VOLUME (mm)= 35.080
TOTAL RAINFALL (mm)= 65.319
RUNOFF COEFFICIENT = 0.537
             (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
     | Junction Command(0030) |
                                                                    AREA QPEAK TPEAK R.V.
   (ha) (cms) (hrs) (mm)

INFLOW: ID=2( 0123) 1.39 0.08 5.17 35.08

OUTFLOW: ID=2( 0030) 1.39 0.08 5.17 35.08
               V V I SSSSS U U A L (V V V I SS U U AA L V V I SS U U AAAA L V V I SS U U AAAAA L V V I SS U U A A L V V I SSSSS UUUUU A A LLLLL
                                                                                                                                                                       (v 6.2.2015)
               OOO TTTTT TTTTT H H Y Y M M OOO TM O O T T H H H YY MM MM O O O O O T T H H H Y M M O O OOO T T H H Y M M OOO
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***** DETAILED OUTPUT *****
                                                                                                                                            Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
                                                                                                                                          Output filename: C:\Users\bweersink\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\157bc479-9c80-4749-8af1-6f650518548a\sc
Summary filename: C:\Users\bweersink\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-
                                                                                                                                          f883467b2a44\157bc479-9c80-4749-8af1-6f650518548a\sc
                                                                                                                                          DATE: 08/19/2024
                                                                                                                                                                               TIME: 11:11:31
                                                                                                                                          USER:
                                                                                                                                          COMMENTS:
                                                                                                                                            **************
                                                                                                                                            | CHICAGO STORM | IDF curve parameters: A= 425.000
                                                                                                                                          | Ptotal= 25.00 mm |
                                                                                                                                                                               B= 5.000
                                                                                                                                                         \begin{array}{ccc}
\text{O mm} & \text{B} - 3.000 \\
\text{---} & \text{C} = 0.767 \\
\text{used in: INTENSITY} = A / (t + B)^{\text{C}}
\end{array}
                                                                                                                                                         Duration of storm = 4.00 hrs
Storm time step = 10.00 min
                                                                                                                                                          Time to peak ratio = 0.40
                                                                                                                                                     TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
                                                                                                                                                     | CALIB
                                                                                                                                          | NASHYD ( 0122) | Area (ha)= 3.16 Curve Number (CN)= 82.6 | ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
                                                                                                                                                           -- U.H. Tp(hrs)= 0.66
                                                                                                                                                NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%;20writeup/Appendix%20C%20-%20VO%20Modelling/Existing/Vooutput.txt[8/19/2024 12:25:03 PM] file://Ca0004-ppfss01/...61414473/design/report/FSR/SWM%;20writeup/Appendix%20C%20-%20VO%20Modelling/Existing/Vooutput.txt[8/19/2024 12:25:03 PM]
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```
1.82 | 1.250 | 6.37 | 2.250

1.82 | 1.333 | 6.37 | 2.333

2.04 | 1.417 | 13.83 | 2.417

2.04 | 1.500 | 13.83 | 2.500

2.33 | 1.583 | 53.25 | 2.583

2.33 | 1.667 | 53.25 | 2.667
                                                                                                                                                  4.52 | 3.33
3.72 | 3.42
                                0.333
                                                                                                                                                      3.72 | 3.50
3.19 | 3.58
                                0.500
                                0.667
                                                                                                                                                      3.19 | 3.67
                                                                                                                                                                                                    1.79
                               1.68
                                                         3 31 | 1 917
                                                                                                     8.40 | 2.917
                                                                                                                                                    2 50 | 3 92
                                                                                                                                                                                                  1.58
                                1.000 3.31 | 2.000 8.40 | 3.000 2.50 | 4.00
         Unit Hyd Qpeak (cms)= 0.182
       \begin{array}{lll} PEAK FLOW & (cms) = & 0.019 \ (i) \\ TIME TO PEAK & (hrs) = & 2.583 \\ RUNOFF VOLUME & (mm) = & 4.531 \\ TOTAL RAINFALL & (mm) = & 25.000 \\ RUNOFF COEFFICIENT & = & 0.181 \\ \end{array}
        (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
  CALIB
 ID= 1 DT= 5.0 min | Ia
                 NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                 --- TRANSFORMED HYETOGRAPH -
                              TIME RAIN | TIME R
                                                       2.04 | 1.417 | 13.83 | 2.417
2.04 | 1.500 | 13.83 | 2.500
2.33 | 1.583 | 53.25 | 2.583
                                                                                                                                                      0.417
                                0.583
                                                     2.33 | 1.667 | 53.25 | 2.667 | 3.19 | 3.67 | 2.72 | 1.750 | 16.08 | 2.750 | 2.80 | 3.75
                                0.750
                                                                                                                                                                                                   1.68
                               0.833 2.72 | 1.833 | 16.08 | 2.833 | 2.80 | 3.83 | 0.917 | 3.31 | 1.917 | 8.40 | 2.917 | 2.50 | 3.92
                                1.000 3.31 2.000 8.40 3.000 2.50 4.00
```

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Unit Hvd Opeak (cms)= 0.209

- TRANSFORMED HYETOGRAPH -

```
\begin{array}{lll} \mbox{PEAK FLOW} & (\mbox{cms}) = & 0.016 \ (\mbox{i}) \\ \mbox{TIME TO PEAK} & (\mbox{hrs}) = & 2.000 \\ \mbox{RUNOFF VOLUME} & (\mbox{mm}) = & 4.799 \\ \mbox{TOTAL RAINFALL} & (\mbox{mm}) = & 25.000 \\ \mbox{RUNOFF COEFFICIENT} & = & 0.192 \\ \end{array}
                    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
          (ha) (cms) (hrs) (mm)

ID1=1 ( 0103): 1.41 0.016 2.00 4.80

+ ID2= 2 ( 0122): 3.16 0.019 2.58 4.53
                         ID = 3 ( 0020): 4.57 0.029 2.25 4.61
                    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
          NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                                    - TRANSFORMED HYETOGRAPH --
                                           TIME RAIN | TIME R
                                                                   1.82 | 1.333 | 6.37 | 2.333
2.04 | 1.417 | 13.83 | 2.417
2.04 | 1.500 | 13.83 | 2.500
                                           0.333
                                                                                                                                                                   4.52 | 3.33
3.72 | 3.42
                                           0.500
                                                                                                                                                                      3.72 | 3.50
                                                                   2.33 | 1.583 | 53.25 | 2.583
2.33 | 1.667 | 53.25 | 2.667
                                                                                                                                                                      3.19 | 3.58
3.19 | 3.67
                                            0.583
                                           0.667
                                                                                                                                                                                                                      1.79
                                          0.750 2.72 | 1.750 | 16.08 | 2.750 | 2.80 | 3.75 | 0.833 | 2.72 | 1.833 | 16.08 | 2.833 | 2.80 | 3.83
                                                                                                                                                                                                                     1.68
                                           0.917 3.31 | 1.917 8.40 | 2.917 2.50 | 3.92
1.000 3.31 | 2.000 8.40 | 3.000 2.50 | 4.00
                    Unit Hyd Qpeak (cms)= 0.302
                   \begin{array}{lll} PEAK FLOW & (cms) = & 0.031 \ (i) \\ TIME TO PEAK & (hrs) = & 2.417 \\ RUNOFF VOLUME & (mm) = & 4.802 \\ TOTAL RAINFALL & (mm) = & 25.000 \\ RUNOFF COEFFICIENT & = & 0.192 \\ \end{array}
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
```

```
    1.82 | 1.250
    6.37 | 2.250
    4.52 | 3.25

    1.82 | 1.333
    6.37 | 2.333
    4.52 | 3.33

    2.04 | 1.417
    13.83 | 2.417
    3.72 | 3.42

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4.52 | 3.33
3.72 | 3.42
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0.417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1.92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   13.83 | 2.500
53.25 | 2.583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3.72 | 3.50
3.19 | 3.58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2.04 | 1.500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2.33 | 1.667 | 53.25 | 2.667
        CALIB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0.667
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3.19 | 3.67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1.79
       | CALID | | NASHYD ( 0100)| Area (ha)= 10.57 Curve Number (CN)= 83.3 | | ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | | U.H. Tp(hrs)= 1.02
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0.750 2.72 | 1.750 | 16.08 | 2.750 | 2.80 | 3.75 | 0.833 | 2.72 | 1.833 | 16.08 | 2.833 | 2.80 | 3.83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1.68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3 31 1 917 8 40 2 917 2 50 3 92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1.58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1.000 3.31 | 2.000 8.40 | 3.000 2.50 | 4.00
                            NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Unit Hyd Qpeak (cms)= 0.018
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PEAK FLOW (cms)= 0.001 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 5.700
TOTAL RAINFALL (mm)= 25.000
RUNOFF COEFFICIENT = 0.228
                                                                                           - TRANSFORMED HYETOGRAPH -
                                             TIME RAIN | TIME R
                                                                        1.82 | 1.250 | 6.37 | 2.250
1.82 | 1.333 | 6.37 | 2.333
                                                                                                                                                                                 4.52 | 3.25
4.52 | 3.33
                                             0.333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                      2.04 | 1.417 | 13.83 | 2.417
2.04 | 1.500 | 13.83 | 2.500
2.33 | 1.583 | 53.25 | 2.583
                                             0.417
                                                                                                                                                                                    3.72 | 3.42
3.72 | 3.50
                                             0.583
                                                                                                                                                                                     3.19 | 3.58
                                                                                                                                                                                                                                          1.79
                                                                      2.33 | 1.667 | 53.25 | 2.667 | 3.19 | 3.67 | 2.72 | 1.750 | 16.08 | 2.750 | 2.80 | 3.75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ADD HYD ( 0022)|
                                             0.750
                                                                                                                                                                                                                                         1.68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2.72 | 1.833 | 16.08 | 2.833 | 2.80 | 3.83
3.31 | 1.917 | 8.40 | 2.917 | 2.50 | 3.92
                                             0.833
                                                                                                                                                                                                                                         1.68
                                             1.000 3.31 2.000 8.40 3.000 2.50 4.00
                  Unit Hyd Qpeak (cms)= 0.395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ID = 3 ( 0022); 10.61 0.051 3.08 4.70
                 PEAK FLOW (cms)= 0.051 (i)
TIME TO PEAK (hrs)= 3.083
RUNOFF VOLUME (mm)= 4.701
TOTAL RAINFALL (mm)= 25.000
RUNOFF COEFFICIENT = 0.188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ADD HYD ( 0022)|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3 + 2 = 1 | AREA QPEAK TPEAK R.V. |
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V. |
| 1D1 = 3 ( 0022): 10.61 0.051 3.08 4.70 |
+ ID2 = 2 ( 0120): 4.33 0.031 2.42 4.80
                  (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
        ID = 1 ( 0022): 14.94 0.076 2.83 4.73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                            NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | NASHYD ( 0102)| Area (ha)= 7.24 Curve Number (CN)= 82.0
|ID=1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
                                                                                          - TRANSFORMED HYETOGRAPH -
                                             TIME RAIN | TIME R
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -- U.H. Tp(hrs)= 0.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt(8/19/2024 12:25:03 PM] \\ file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt(8/19/2024 12:25:03 PM] \\ file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt(8/19/2024 12:25:03 PM] \\ file://Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt(8/19/2024 12:25:03 PM]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         \begin{array}{lll} \mbox{PEAK FLOW} & (\mbox{cms}) = 0.006 \ (\mbox{i}) \\ \mbox{TIME TO PEAK} & (\mbox{hrs}) = 2.500 \\ \mbox{RUNOFF VOLUME} & (\mbox{mm}) = 3.805 \\ \mbox{TOTAL RAINFALL} & (\mbox{mm}) = 25.000 \\ \mbox{RUNOFF COEFFICIENT} & = 0.152 \\ \end{array}
                                                                                          - TRANSFORMED HYETOGRAPH -

    0.083
    1.65 | 1.083
    4.31 | 2.083
    5.82 | 3.08

    0.167
    1.65 | 1.167
    4.31 | 2.167
    5.82 | 3.17

    0.250
    1.82 | 1.250
    6.37 | 2.250
    4.52 | 3.25

                                                                        1.82 | 1.230 | 0.37 | 2.230

1.82 | 1.333 | 6.37 | 2.333

2.04 | 1.417 | 13.83 | 2.417

2.04 | 1.500 | 13.83 | 2.500
                                                                                                                                                                                   4.52 | 3.33
3.72 | 3.42
                                             0.333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
                                             0.500
                                                                                                                                                                                       3.72 | 3.50
                                                                        2.33 | 1.583 | 53.25 | 2.583
2.33 | 1.667 | 53.25 | 2.667
                                             0.667
                                                                                                                                                                                      3.19 | 3.67
                                                                                                                                                                                                                                          1.79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | CALIB
                                            | NASHYD ( 0124)| Area (ha)= 0.71 Curve Number (CN)= 85.4
|ID=1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
                                                                                                                                                                                                                                          1.68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   --- U.H. Tp(hrs)= 0.25
                                             0.917
                                                                         3 31 | 1 917
                                                                                                                             8.40 | 2.917
                                                                                                                                                                                    2 50 | 3 92
                                                                                                                                                                                                                                        1.58
                                             1.000 3.31 | 2.000 8.40 | 3.000 2.50 | 4.00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                   Unit Hyd Qpeak (cms)= 0.916
                 \begin{array}{lll} \mbox{PEAK FLOW} & (\mbox{cms}) = 0.067 \ (\mbox{i}) \\ \mbox{TIME TO PEAK} & (\mbox{hrs}) = 2.083 \\ \mbox{RUNOFF VOLUME} & (\mbox{mm}) = 4.391 \\ \mbox{TOTAL RAINFALL} & (\mbox{mm}) = 25.000 \\ \mbox{RUNOFF COEFFICIENT} & = 0.176 \end{array}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -- TRANSFORMED HYETOGRAPH -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TIME RAIN | TIME R
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1.82 | 1.333 | 6.37 | 2.333
2.04 | 1.417 | 13.83 | 2.417
                  (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0.333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4.52 | 3.33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0.417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3.72 | 3.42
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0.500 2.04 | 1.500 13.83 | 2.500 
0.583 2.33 | 1.583 53.25 | 2.583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3.72 | 3.50
3.19 | 3.58

    0.667
    2.33
    1.667
    53.25
    2.667
    3.19
    3.67

    0.750
    2.72
    1.750
    16.08
    2.750
    2.80
    3.75

    0.833
    2.72
    1.833
    16.08
    2.833
    2.80
    3.83

         CALIB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1.79
         ID= 1 DT= 5.0 min | Ia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1.68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0.917 3.31 | 1.917 8.40 | 2.917 2.50 | 3.92
1.000 3.31 | 2.000 8.40 | 3.000 2.50 | 4.00
                            NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Unit Hyd Qpeak (cms)= 0.109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        \begin{array}{lll} PEAK FLOW & (cms) = & 0.009 \; (i) \\ TIME TO PEAK & (hrs) = & 2.000 \\ RUNOFF VOLUME & (mm) = & 5.270 \\ TOTAL RAINFALL & (mm) = & 25.000 \\ RUNOFF COEFFICIENT & = & 0.211 \\ \end{array}
                                                                                        -- TRANSFORMED HYETOGRAPH -
                                                TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
                                           | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAIN | Hiller | RAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                        2.04 | 1.417 | 13.83 | 2.417
2.04 | 1.500 | 13.83 | 2.500
2.33 | 1.583 | 53.25 | 2.583
                                                                                                                                                                                      3.72 | 3.42
3.72 | 3.50
3.19 | 3.58
                                             0.417
                                             0.583
                                                                        2.33 | 1.667 | 53.25 | 2.667 | 3.19 | 3.67 | 2.72 | 1.750 | 16.08 | 2.750 | 2.80 | 3.75
                                             0.750
                                                                                                                                                                                                                                          1.68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   H2 = 3 | AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) (IDI=1 ( 0102): 7.24 0.067 2.08 4.39 + ID2=2 ( 0124): 0.71 0.009 2.00 5.27
```

0.250

0.333

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

0.833 2.72 | 1.833 | 16.08 | 2.833 | 2.80 | 3.83 | 0.917 | 3.31 | 1.917 | 8.40 | 2.917 | 2.50 | 3.92

1.000 3.31 2.000 8.40 3.000 2.50 4.00

Unit Hvd Opeak (cms)= 0.066

1.68

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```
ID = 3 ( 0027): 7.95 0.076 2.00 4.47
             NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                                                                                                                                                                                                                                                                                                          ID = 3 ( 0023): 9.19 0.082 2.08 4.40
       NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                                                                                                                                                                                                                                                                                             ID = 1 ( 0027): 9.01 0.080 2.08 4.39
             NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                                                                                                                                                                                                                                                                                                             NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
     CALIB
    TRANSFORMED HYETOGRAPH -
                                                                                                                                                                                                                                                                                                                                                                                                                        --- TRANSFORMED HYETOGRAPH ---
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN |
hrs mm/hr | hrs mm/hr | hrs mm/hr |
0.083 | 1.65 | 1.083 | 4.31 | 2.083 | 5.82 | 3.08 | 2.27 |
0.250 | 1.82 | 1.250 | 6.37 | 2.250 | 4.52 | 3.17 | 2.27 |
0.250 | 1.82 | 1.250 | 6.37 | 2.250 | 4.52 | 3.25 | 2.08 |
0.333 | 1.82 | 1.333 | 6.37 | 2.333 | 4.52 | 3.33 | 2.08 |
0.417 | 2.04 | 1.417 | 13.83 | 2.417 | 3.72 | 3.42 | 1.92 |
0.500 | 2.04 | 1.500 | 13.83 | 2.450 | 3.72 | 3.50 | 1.92 |
0.500 | 2.04 | 1.500 | 13.83 | 2.500 | 3.72 | 3.50 | 1.92 |
0.500 | 2.04 | 1.500 | 13.83 | 2.500 | 3.72 | 3.70 |
0.500 | 2.04 | 1.500 | 13.83 | 2.500 | 3.72 | 3.70 |
0.500 | 2.04 | 1.500 | 13.83 | 2.500 | 3.72 | 3.70 |
0.500 | 2.04 | 1.500 | 13.83 | 2.500 | 3.72 | 3.70 |
0.500 | 2.04 | 1.500 | 13.83 | 2.500 | 3.72 | 3.70 |
0.500 | 2.04 | 1.500 | 13.83 | 2.500 | 3.72 | 3.70 |
0.500 | 2.04 | 1.500 | 13.83 | 2.500 | 3.72 | 3.70 |
0.500 | 2.04 | 1.500 | 13.83 | 2.500 | 3.72 | 3.70 |
0.500 | 2.04 | 1.500 | 13.83 | 2.500 | 3.72 | 3.70 |
0.500 | 2.04 | 1.500 | 13.83 | 2.500 |
0.500 | 2.04 | 1.500 | 13.83 | 2.500 |
0.500 | 2.04 | 1.500 | 13.83 | 2.500 |
0.500 | 2.04 | 1.500 | 13.83 | 2.500 |
0.500 | 2.04 | 1.500 | 13.83 | 2.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 | 1.500 |
0.500 | 2.04 |

                     NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                   ---- TRANSFORMED HYETOGRAPH ---- TIME RAIN |                                 | Hiller | RAIN | Hiller | RAI
                                                                                                                                                                                                                                                                                                                                                                                                                          0.583
0.667
                                                                                                                                                                                                                                                                                                                                                                                                                                              2.33 | 1.583 | 53.25 | 2.583
2.33 | 1.667 | 53.25 | 2.667
                                                                                                                                                                                                                                                                                                                                                                                                                         0.750 2.72 1.750 16.08 2.750 2.80 3.75
0.833 2.72 1.833 16.08 2.833 2.80 3.83
0.917 3.31 1.917 8.40 2.917 2.50 3.92
                                                      2.04 | 1.417 | 13.83 | 2.417
                                                                                                                                          3.72 | 3.42
3.72 | 3.50
3.19 | 3.58
                                  0.417
                                                     2.04 | 1.500 | 13.83 | 2.500
2.33 | 1.583 | 53.25 | 2.583
                                                                                                                                                                                                                                                                                                                                                                                                                          1.000 3.31 | 2.000 8.40 | 3.000 2.50 | 4.00
                                  0.583
                                                                                                                                                                                   1.79
                                                      2.33 | 1.667 | 53.25 | 2.667 | 3.19 | 3.67 | 2.72 | 1.750 | 16.08 | 2.750 | 2.80 | 3.75
                                  0.667
                                                                                                                                                                                    1 79
                                                                                                                                                                                                                                                                                                                                                                                                     Unit Hyd Qpeak (cms)= 0.087
                                                                                                                                                                                    1.68
                                                                                                                                                                                                                                                                                                                                                                                                    \begin{array}{lll} \mbox{PEAK FLOW} & (\mbox{cms}) = 0.011 \ (\mbox{i}) \\ \mbox{TIME TO PEAK} & (\mbox{hrs}) = 3.000 \\ \mbox{RUNOFF VOLUME} & (\mbox{mm}) = 4.700 \\ \mbox{TOTAL RAINFALL} & (\mbox{mm}) = 25.000 \\ \mbox{RUNOFF COEFFICIENT} & 0.188 \\ \end{array}
                                0.833 2.72 | 1.833 | 16.08 | 2.833 | 2.80 | 3.83 | 1.68 | 0.917 | 3.31 | 1.917 | 8.40 | 2.917 | 2.50 | 3.92 | 1.58 | 1.000 | 3.31 | 2.000 | 8.40 | 3.000 | 2.50 | 4.00 | 1.58
                                                                                                                                                                                   1.68
              Unit Hyd Qpeak (cms)= 0.037
             PEAK FLOW (cms)= 0.002 (i)
TIME TO PEAK (hrs)= 1.833
                                                                                                                                                                                                                                                                                                                                                                                                     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
             RUNOFF VOLUME (mm)= 4.946
TOTAL RAINFALL (mm)= 25.000
RUNOFF COEFFICIENT = 0.198
                                                                                                                                                                                                                                                                                                                                                                                             | CALIB
                                                                                                                                                                                                                                                                                                                                                                                             | NASHYD ( 0105)| Area (ha)= 9.75 Curve Number (CN)= 83.8

|ID=1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
             (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
                                                                                                                                                                                                                                                                                                                                                                                                                                          -- U.H. Tp(hrs)= 0.82
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%;20writeup/Appendix%20C%20-%20VO%20Modelling/Existing/Vooutput.txt[8/19/2024 12:25:03 PM] file://Ca0004-ppfss01/...61414473/design/report/FSR/SWM%;20writeup/Appendix%20C%20-%20VO%20Modelling/Existing/Vooutput.txt[8/19/2024 12:25:03 PM]
                                                                     - TRANSFORMED HYETOGRAPH -
                                0.417
                                                                                                                                         4.52 | 3.33
3.72 | 3.42
                                  0.333
```

```
NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                   2.04 | 1.417 | 13.83 | 2.417
2.04 | 1.500 | 13.83 | 2.500
                                                                                                                                            0.583 2.33 | 1.583 53.25 | 2.583
                                                                                                                                             3.19 | 3.58
                                                                                                                                                                                     1.79
                                   0.667 2.33 | 1.667 53.25 | 2.667 3.19 | 3.67 
0.750 2.72 | 1.750 16.08 | 2.750 2.80 | 3.75 
0.833 2.72 | 1.833 16.08 | 2.833 2.80 | 3.83
                                                                                                                                                                                     1.68
                                                                                                                                                                                    1.68
                                                                                                 8.40 | 2.917
                                   1.000 3.31 | 2.000 8.40 | 3.000 2.50 | 4.00
               Unit Hyd Qpeak (cms)= 0.233
               \begin{array}{ll} \mbox{PEAK FLOW} & \mbox{(cms)=} & 0.024 \mbox{(i)} \\ \mbox{TIME TO PEAK} & \mbox{(hrs)=} & 2.500 \end{array}
               RUNOFF VOLUME (mm)= 4.531
TOTAL RAINFALL (mm)= 25.000
RUNOFF COEFFICIENT = 0.181
               (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
      NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                      - TRANSFORMED HYETOGRAPH -
                                  TIME RAIN| 
                                   0.333
                                                       1.82 | 1.333 | 6.37 | 2.333
2.04 | 1.417 | 13.83 | 2.417
                                                                                                                                          4.52 | 3.33
3.72 | 3.42
                                   0.500
                                                       2.04 | 1.500 | 13.83 | 2.500
                                                                                                                                            3.72 | 3.50
                                                       2.33 | 1.583 | 53.25 | 2.583
2.33 | 1.667 | 53.25 | 2.667
                                                                                                                                            3.19 | 3.58
3.19 | 3.67
                                    0.583
                                   0.667
                                                                                                                                                                                     1.79
                                  0.750 2.72 | 1.750 | 16.08 | 2.750 | 2.80 | 3.75 | 0.833 | 2.72 | 1.833 | 16.08 | 2.833 | 2.80 | 3.83
                                                                                                                                                                                    1.68
                                   0.917 3.31 | 1.917 8.40 | 2.917 2.50 | 3.92
1.000 3.31 | 2.000 8.40 | 3.000 2.50 | 4.00
                                                                                                                                                                                    1.58
               Unit Hyd Qpeak (cms)= 0.072
              \begin{array}{lll} PEAK FLOW & (cms) = & 0.007 \ (i) \\ TIME TO PEAK & (hrs) = & 2.583 \\ RUNOFF VOLUME & (mm) = & 4.134 \\ TOTAL RAINFALL & (mm) = & 25.000 \\ RUNOFF COEFFICIENT & = & 0.165 \\ \end{array}
file: ///Ca0004-ppfss01/...61414473/design/report/FSR/SWM\%20writeup/Appendix\%20C\%20-\%20VO\%20Modelling/ExistingVOoutput.txt [8/19/2024 12:25:03 PM]
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3.19 | 3.58 3.19 | 3.67

1.68

1.58

```
1.82 | 1.250 | 6.37 | 2.250

1.82 | 1.333 | 6.37 | 2.333

2.04 | 1.417 | 13.83 | 2.417

2.04 | 1.500 | 13.83 | 2.500

2.33 | 1.583 | 53.25 | 2.583

2.33 | 1.667 | 53.25 | 2.667
                                                                                                                                                             3.72 | 3.50
3.19 | 3.58
                                       0.500
                                       0.583
                                       0.667
                                                                                                                                                             3.19 | 3.67
                                                                                                                                                                                                           1.79
                                     1.68
                                                               3 31 | 1 917
                                                                                                            8.40 | 2.917
                                                                                                                                                            2 50 | 3 92
                                                                                                                                                                                                         1.58
                                       1.000 3.31 | 2.000 8.40 | 3.000 2.50 | 4.00
                Unit Hyd Qpeak (cms)= 0.455
              \begin{array}{lll} PEAK FLOW & (cms) = & 0.055 \ (i) \\ TIME TO PEAK & (hrs) = & 2.833 \\ RUNOFF VOLUME & (mm) = & 4.828 \\ TOTAL RAINFALL & (mm) = & 25.000 \\ RUNOFF COEFFICIENT & = & 0.193 \\ \end{array}
               (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
      | ADD HYD ( 0019)|
         ABJ III S (0015)| 1+ 2= 3 | AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) ID1=1 (0105): 9.75 0.055 2.83 4.83 + ID2= 2 (0121): 2.12 0.011 3.00 4.70
                    ID = 3 ( 0019): 11.87 0.066 2.83 4.81
               NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
      CALIB
     NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                              - TRANSFORMED HYETOGRAPH -
                                    TIME RAIN | TIME R
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
         ID = 3 (0029); 4.90 0.030 2.50 4.43
               NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
     | ADD HYD ( 0029)|
| 3 + 2 = 1 | AREA QPEAK TPEAK R.V.
                  | TEAR | 
                     ID = 1 ( 0029): 16.77 0.095 2.75 4.70
               NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
      | CALIB
      | NASHYD ( 0123)| Area (ha)= 1.39 Curve Number (CN)= 86.8
|ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
                                                        --- U.H. Tp(hrs)= 0.48
                        NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                        ---- TRANSFORMED HYETOGRAPH -
                                       --- TRANSFORMED HYETOGRAPH ---
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN |
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr |
0.083 | 1.65 | 1.083 | 4.31 | 2.083 | 5.82 | 3.08 | 2.27 |
0.167 | 1.65 | 1.167 | 4.31 | 2.167 | 5.82 | 3.17 | 2.27 |
0.250 | 1.82 | 1.250 | 6.37 | 2.250 | 4.52 | 3.25 | 2.08 |
0.333 | 1.82 | 1.333 | 6.37 | 2.333 | 4.52 | 3.33 | 2.08 |
0.417 | 2.04 | 1.417 | 13.83 | 2.417 | 3.72 | 3.42 | 1.92 |
0.500 | 2.041 | 1.500 | 1.32 | 3.500 | 3.73 | 3.50 | 1.02 |
                                                                                                                                                                3.72 | 3.42
3.72 | 3.50
3.19 | 3.58
                                                             2.04 | 1.500 | 13.83 | 2.500
2.33 | 1.583 | 53.25 | 2.583
                                                                                                                                                                                                              1.92
1.79
                                       0.500

    0.667
    2.33
    1.667
    53.25
    2.667
    3.19
    3.67

    0.750
    2.72
    1.750
    16.08
    2.750
    2.80
    3.75

    0.833
    2.72
    1.833
    16.08
    2.833
    2.80
    3.83

                                                                                                                                                                                                               1.79
                                                                                                                                                                                                              1.68
                                      0.917 3.31 | 1.917 8.40 | 2.917 2.50 | 3.92 1.58
1.000 3.31 | 2.000 8.40 | 3.000 2.50 | 4.00 1.58
                Unit Hyd Qpeak (cms)= 0.110
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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PEAK FLOW (cms)= 0.013 (i)
TIME TO PEAK (hrs)= 2.333
RUNOFF VOLUME (mm)= 5.721
TOTAL RAINFALL (mm)= 25.000
RUNOFF COEFFICIENT = 0.229
                                 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                       | Junction Command(0030) |
                                                                                                        AREA QPEAK TPEAK R.V.
                       | Control | Cont
                                          V V I SSSSS U U A L
                                                                                                                                                                                                                                                        (v 6.2.2015)
                                          V V I SS U U AA L
V V I SS U U AAAAA L
V V I SS U U A A L
                                                                        I SSSSS UUUUU A A LLLLL
                                          OOO TTTTT TTTTT H H Y Y M M OOO TM
                O O T T H H YY MMMM O O
O O T T H H Y Y M M O O
OOO T T H H Y M M OOO
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                                                                               ***** DETAILED OUTPUT *****
                         Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
                  Output filename: C:\Users\bweersink\AppData\Loca\\Civica\\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\2475ce4b-1336-47fe-9e5f-e12c8bc7f29f\sc
                  Summary filename: C:\Users\bweersink\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\2475ce4b-1336-47fe-9e5f-e12c8bc7f29f\sc
                  DATE: 08/19/2024
                                                                                                                                                                                                    TIME: 11:11:31
file: /// Ca0004-ppfss01/...61414473/ design/report/FSR/SWM%20 write up/Appendix\%20 C\%20-\%20 VO\%20 Modelling/Existing VO output.txt [8/19/2024 12:25:03 PM] and the properties of the properti
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COMMENTS:
      **************
       | CHICAGO STORM | IDF curve parameters: A=1837.546
    used in: INTENSITY = A/(t+B)^{C}
                                    Duration of storm = 12.00 hrs
                                   Storm time step = 5.00 min
Time to peak ratio = 0.38
                          1.06 | 3.17 | 3.40 | 6.17 | 4.44 | 9.17 | 1.08 | 3.25 | 3.64 | 6.25 | 4.22 | 9.35 | 1.10 | 3.33 | 3.92 | 6.33 | 4.02 | 9.33 | 1.12 | 3.42 | 4.24 | 6.42 | 3.83 | 9.42 | 1.15 | 3.50 | 4.62 | 6.50 | 3.67 | 9.50 | 1.17 | 3.58 | 5.08 | 6.58 | 3.51 | 9.58 |
                           0.25
                                                                                                                                   1.54
                           0.42
                                                                                                                                  1.49
                           0.50
                                        | 1.17 | 3.58 | 5.08 | 6.58 | 3.51 | 9.58 | 1.45 |
| 1.19 | 3.67 | 5.65 | 6.67 | 3.37 | 9.67 | 1.42 |
| 1.22 | 3.75 | 6.35 | 6.75 | 3.24 | 9.75 | 1.40 |
| 1.24 | 3.83 | 7.25 | 6.83 | 3.12 | 9.83 | 1.38 |
| 1.27 | 3.92 | 8.44 | 6.92 | 3.01 | 9.92 | 1.36 |
| 1.30 | 4.00 | 10.07 | 7.00 | 2.91 | 10.00 | 1.34 |
| 1.33 | 4.08 | 12.45 | 7.08 | 2.82 | 10.08 | 1.32 |
| 1.36 | 4.17 | 16.17 | 7.17 | 2.73 | 10.17 | 1.30 |
| 1.40 | 4.25 | 22.65 | 7.25 | 2.64 | 10.25 | 1.29 |
| 1.43 | 4.33 | 36.11 | 7.33 | 2.56 | 10.33 | 1.27 |
| 1.47 | 4.42 | 7.542 | 7.42 | 2.49 | 10.42 | 1.25 |
| 1.51 | 4.50 | 163.74 | 7.50 | 2.42 | 10.50 | 1.24 |
| 1.55 | 4.58 | 88.04 | 7.58 | 2.36 | 10.58 | 1.22 |
| 1.59 | 4.67 | 5.142 | 7.67 | 2.29 | 10.67 | 1.20 |
| 1.64 | 4.75 | 34.99 | 7.75 | 2.23 | 10.75 | 1.19 |
| 1.69 | 4.83 | 25.99 | 7.83 | 2.18 | 10.83 | 1.74 |
| 1.44 | 4.92 | 20.44 | 7.92 | 2.13 | 10.92 | 1.16 |
                           0.58
                                                                                                                                    1.45
                           0.83
                           0.92
1.00
                           1.08
                            1.33
                           1.42
                           1.50
                           1.83
                                         1.74 | 4.92 | 20.44 | 7.92 | 2.13 | 10.92 | 1.16 | 1.80 | 5.00 | 16.73 | 8.00 | 2.08 | 11.00 | 1.15 | 1.86 | 5.08 | 14.09 | 8.08 | 2.03 | 11.08 | 1.13
                           1.92
                           2.17
2.25
                                         1.93 | 5.17 | 12.14 | 8.17 | 1.98 | 11.17 | 2.00 | 5.25 | 10.65 | 8.25 | 1.94 | 11.25
                                                                                                                                      1.11
                          2.33 2.07 5.33 9.47 8.33 1.90 11.33 1.09
2.42 2.15 5.42 8.51 8.42 1.86 11.42 1.08
2.50 2.24 5.50 7.73 8.50 1.82 11.50 1.07
2.58 2.34 5.58 7.08 8.58 1.79 11.58 1.06
                                         2.45 | 5.67 | 6.53 | 8.67 | 1.75 | 11.67 | 1.05
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CALIB
   |NASHYD ( 0122)| Area (ha)= 3.16 Curve Number (CN)= 82.6
|ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
                      U.H. Tp(hrs)= 0.66
      Unit Hyd Qpeak (cms)= 0.182
      PEAK FLOW (cms)= 0.168 (i)
TIME TO PEAK (hrs)= 5.333
RUNOFF VOLUME (mm)= 39.983
TOTAL RAINFALL (mm)= 77.381
RUNOFF COEFFICIENT = 0.517
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
   Unit Hyd Qpeak (cms)= 0.209
      PEAK FLOW (cms)= 0.146 (i)
TIME TO PEAK (hrs)= 4.833
RUNOFF VOLUME (mm)= 41.303
TOTAL RAINFALL (mm)= 77.381
RUNOFF COEFFICIENT = 0.534
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
   | ADD HYD ( 0020)|
     1 + 2 = 3 | AREA QPEAK TPEAK R.V.
       (ha) (cms) (hrs) (mm)

ID1=1 ( 0103): 1.41 0.146 4.83 41.30

+ ID2= 2 ( 0122): 3.16 0.168 5.33 39.98
        ID = 3 ( 0020): 4.57 0.261 5.08 40.39
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
  LCALIB
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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```
--- U.H. Tp(hrs)= 0.55
                       Unit Hyd Qpeak (cms)= 0.302
                     PEAK FLOW (cms)= 0.275 (i)
TIME TO PEAK (hrs)= 5.250
RUNOFF VOLUME (mm)= 41.330
TOTAL RAINFALL (mm)= 77.381
                       RUNOFF COEFFICIENT = 0.534
                       (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
        | CALID | | (ASHYD ( 0100)| Area (ha)= 10.57 Curve Number (CN)= 83.3 | | (ID=1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (N)= 1.02 | (N)
                         Unit Hyd Qpeak (cms)= 0.395
                         PEAK FLOW (cms)= 0.417 (i)
TIME TO PEAK (hrs)= 5.833
                     RUNOFF VOLUME (mm)= 40.835
TOTAL RAINFALL (mm)= 77.381
RUNOFF COEFFICIENT = 0.528
                       (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
             CALIB
        | CALID | | (101) | Area (ha)= 0.04 Curve Number (CN)= 87.5 | | (1D=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10.0 min | Linear Res.(N)= 3.0
                         Unit Hyd Qpeak (cms)= 0.018
                       \begin{array}{ll} \mbox{PEAK FLOW} & \mbox{(cms)=} & 0.008 \mbox{ (i)} \\ \mbox{TIME TO PEAK} & \mbox{(hrs)=} & 4.667 \end{array}
                     RUNOFF VOLUME (mm)= 44.382
TOTAL RAINFALL (mm)= 77.381
RUNOFF COEFFICIENT = 0.574
                       (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
      | ADD HYD ( 0022)|
               1 + 2 = 3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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ID1= 1 ( 0100): 10.57 0.417 5.83 40.84
+ ID2= 2 ( 0101): 0.04 0.008 4.67 44.38
                       ID = 3 ( 0022): 10.61 0.417 5.83 40.85
                  NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY
         | ADD HYD ( 0022)|
        ID = 1 ( 0022): 14.94 0.636 5.50 40.99
                  NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
         LCALIB
         | CALID | | (10102) | Area (ha)= 7.24 Curve Number (CN)= 82.0 | | (10=1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear
                  Unit Hyd Qpeak (cms)= 0.916
                 PEAK FLOW (cms)= 0.643 (i)
TIME TO PEAK (hrs)= 4.917
RUNOFF VOLUME (mm)= 39.256
TOTAL RAINFALL (mm)= 77.381
RUNOFF COEFFICIENT = 0.507
                  (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
         LCALIB
         Unit Hyd Qpeak (cms)= 0.066
                 PEAK FLOW (cms)= 0.053 (i)
TIME TO PEAK (hrs)= 5.333
RUNOFF VOLUME (mm)= 36.025
TOTAL RAINFALL (mm)= 77.381
RUNOFF COEFFICIENT = 0.466
                  (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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```
Unit Hyd Qpeak (cms)= 0.109
              PEAK FLOW (cms)= 0.080 (i)
TIME TO PEAK (hrs)= 4.833
RUNOFF VOLUME (mm)= 43.490
TOTAL RAINFALL (mm)= 77.381
RUNOFF COEFFICIENT = 0.562
               (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
    ID = 3 ( 0027): 7.95 0.721 4.92 39.63
               NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
      | ADD HYD ( 0027)|
        3 + 2 = 1 | AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) (ID1=3 ( 0027); 7.95 0.721 4.92 39.63 + ID2=2 ( 0126); 1.06 0.053 5.33 36.02
                    ID = 1 ( 0027): 9.01 0.756 4.92 39.21
               NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
      CALIB
     | CALID | | (ALID 
               Unit Hyd Qpeak (cms)= 0.037
              PEAK FLOW (cms)= 0.023 (i)
TIME TO PEAK (hrs)= 4.750
RUNOFF VOLUME (mm)= 41.978
TOTAL RAINFALL (mm)= 77.381
RUNOFF COEFFICIENT = 0.542
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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```
(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
        ID = 3 ( 0023): 9.19 0.775 4.92 39.26
                 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
         | CALIB
         | NASHYD ( 0121) | Area (ha)= 2.12 Curve Number (CN)= 83.3 | ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
                                                 --- U.H. Tp(hrs)= 0.93
                 Unit Hyd Qpeak (cms)= 0.087
                 PEAK FLOW (cms)= 0.090 (i)
TIME TO PEAK (hrs)= 5.667
                 RUNOFF VOLUME (mm)= 40.835
TOTAL RAINFALL (mm)= 77.381
                 RUNOFF COEFFICIENT = 0.528
                 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
         | CALIB | NASHYD ( 0105)| Area (ha)= 9.75 Curve Number (CN)= 83.8 | CN = 1 DT= 5.0 min | LN =
                 Unit Hyd Qpeak (cms)= 0.455
                 PEAK FLOW (cms)= 0.463 (i)
TIME TO PEAK (hrs)= 5.583
                 RUNOFF VOLUME (mm)= 41.457
TOTAL RAINFALL (mm)= 77.381
RUNOFF COEFFICIENT = 0.536
                 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
         | ADD HYD ( 0019)|
              1 + 2 = 3 | AREA QPEAK TPEAK R.V.
                                                                    (ha) (cms) (hrs) (mm)
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
```

```
ID1= 1 ( 0105): 9.75 0.463 5.58 41.46
+ ID2= 2 ( 0121): 2.12 0.090 5.67 40.83
                     ID = 3 ( 0019): 11.87 0.552 5.58 41.35
              NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
     | CALID | | (ALID 
               Unit Hyd Qpeak (cms)= 0.233
             \begin{array}{lll} PEAK FLOW & (cms) = & 0.209 \ (i) \\ TIME TO PEAK & (hrs) = & 5.250 \\ RUNOFF VOLUME & (mm) = & 39.982 \\ TOTAL RAINFALL & (mm) = & 77.381 \\ RUNOFF COEFFICIENT & = & 0.517 \\ \end{array}
               (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
    Unit Hyd Qpeak (cms)= 0.072
             PEAK FLOW (cms)= 0.063 (i)
TIME TO PEAK (hrs)= 5.417
RUNOFF VOLUME (mm)= 37.887
TOTAL RAINFALL (mm)= 77.381
RUNOFF COEFFICIENT = 0.490
               (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
     (ha) (cms) (hrs) (mm)

ID1=1 ( 0104): 3.63 0.209 5.25 39.98

+ ID2=2 ( 0106): 1.27 0.063 5.42 37.89
                    ID = 3 ( 0029): 4.90 0.271 5.33 39.44
              NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
```

All rights reserved. ***** DETAILED OUTPUT ***** Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat Output filename: C:\Users\bweersink\AppData\Loca\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\102a9324-992d-48ea-80e2-e5381487ff71\sc Summary filename: C:\Users\bweersink\AppData\Loca\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\102a9324-992d-48ea-80e2-e5381487ff71\sc DATE: 08/19/2024 TIME: 11:11:30 USER: COMMENTS: ***************************** | CHICAGO STORM | IDF curve parameters: A= 632.129 | Ptotal= 42.50 mm | B= 6.000 | C= 0.787 | used in: INTENSITY = A / (t + B)^C Duration of storm = 12.00 hrs Storm time step = 5.00 min Time to peak ratio = 0.38 TIME RAIN | TIME R 0.85 | 3.42 | 2.60 | 6.42 | 0.87 | 3.50 | 2.79 | 6.50 | 0.88 | 3.58 | 3.01 | 6.58 | 0.90 | 3.67 | 3.28 | 6.67 | 0.91 | 3.75 | 3.61 | 6.75 | 2.39 | 9.42 2.31 | 9.50 2.23 | 9.58 0.58 2.15 | 9.67 2.09 | 9.75 0.75 1.03 0.75 0.91 | 5.75 3.61 | 6.75 2.09 | 9.75 1.05 0.83 0.93 | 3.83 4.02 | 6.83 2.02 | 9.83 1.02 0.92 0.95 | 3.92 4.55 | 6.92 1.96 | 9.92 1.01 1.00 0.97 | 4.00 5.26 | 7.00 1.91 | 10.00 0.99 1.01 0.80 0.99 | 4.08 6.26 | 7.08 1.86 | 10.08 0.98 1.17 1.01 | 4.17 7.80 | 7.17 1.81 | 10.17 0.97 file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]

1.03 | 4.25 | 10.43 | 7.25 1.05 | 4.33 | 16.00 | 7.33 1.07 | 4.42 | 34.76 | 7.42 1.10 | 4.50 | 95.77 | 7.50 1.76 | 10.25 0.96 1.72 | 10.33 0.95 1 68 10 42 0 94 1.12 | 4.58 | 41.27 | 7.58 1.58 1.60 | 10.58 0.91 1.12 | 4.38 | 41.27 | 7.38 1.15 | 4.67 | 22.67 | 7.67 1.18 | 4.75 | 15.51 | 7.75 1.21 | 4.83 | 11.79 | 7.83 1.24 | 4.92 | 9.54 | 7.92 1.56 | 10.67 1.53 | 10.75 0.89 1.83 1.50 | 10.83 0.88 1.47 | 10.92 1.44 | 11.00 1.28 | 5.00 | 8.03 | 8.00 2.00 1.31 | 5.08 | 6.95 | 8.08 1.35 | 5.17 | 6.13 | 8.17 1.41 | 11.08 1.39 | 5.25 | 5.50 | 8.25 | 1.36 | 11.25 | 0.84 | 1.44 | 5.33 | 5.00 | 8.33 | 1.34 | 11.33 | 0.83 | 1.48 | 5.42 | 4.58 | 8.42 | 1.31 | 11.42 | 0.82 2.42 2.50 2.58 1.54 | 5.50 | 4.24 | 8.50 | 1.29 | 11.50 | 1.59 | 5.58 | 3.94 | 8.58 | 1.27 | 11.58 0.81 1.65 | 5.67 | 3.69 | 8.67 | 1.25 | 11.67 | 1.72 | 5.75 | 3.47 | 8.75 | 1.23 | 11.75 | 1.79 | 5.83 | 3.28 | 8.83 | 1.21 | 11.83 | 1.87 | 5.92 | 3.11 | 8.92 | 1.19 | 11.92 1.25 | 11.67 0.80 1.23 | 11.75 0.79 2.67 2.75 2.83 Unit Hyd Qpeak (cms)= 0.182 $\begin{array}{lll} PEAK FLOW & (cms) = & 0.049 \ (i) \\ TIME TO PEAK & (hrs) = & 5.417 \\ RUNOFF VOLUME & (mm) = & 14.161 \\ TOTAL RAINFALL & (mm) = & 42.504 \\ RUNOFF COEFFICIENT & = & 0.333 \\ \end{array}$ (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. Unit Hyd Qpeak (cms)= 0.209 $\begin{array}{lll} PEAK FLOW & (cms) = & 0.043 \ (i) \\ TIME TO PEAK & (hrs) = & 4.833 \\ RUNOFF VOLUME & (mm) = & 14.824 \\ TOTAL RAINFALL & (mm) = & 42.504 \\ RUNOFF COEFFICIENT & = & 0.349 \\ \end{array}$ file: ///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt [8/19/2024 12:25:03 PM]

```
(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
     | ADD HYD ( 0020)|
        ADD HYD ( 0020)|

1 + 2 = 3 | AREA QPEAK TPEAK R.V.

(ha) (cms) (hrs) (mm)

ID1=1 ( 0103): 1.41 0.043 4.83 14.82

+ ID2=2 ( 0122): 3.16 0.049 5.42 14.16
                    ID = 3 ( 0020): 4.57 0.076 5.08 14.37
              NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
      CALIB
     | CALID | | (ALID 
              Unit Hyd Qpeak (cms)= 0.302
             PEAK FLOW (cms)= 0.081 (i)
TIME TO PEAK (hrs)= 5.250
RUNOFF VOLUME (mm)= 14.834
TOTAL RAINFALL (mm)= 42.504
RUNOFF COEFFICIENT = 0.349
              (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
      CALIB
     Unit Hyd Qpeak (cms)= 0.395
             PEAK FLOW (cms)= 0.125 (i)
TIME TO PEAK (hrs)= 5.917
RUNOFF VOLUME (mm)= 14.585
TOTAL RAINFALL (mm)= 42.504
               RUNOFF COEFFICIENT = 0.343
              (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
     | NASHYD ( 0101)| Area (ha)= 0.04 Curve Number (CN)= 87.5
|ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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```
---- U.H. Tp(hrs)= 0.09
     Unit Hyd Opeak (cms)= 0.018
     PEAK FLOW (cms)= 0.003 (i)
TIME TO PEAK (hrs)= 4.667
     RUNOFF VOLUME (mm)= 16.774
TOTAL RAINFALL (mm)= 42.504
RUNOFF COEFFICIENT = 0.395
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
  ID = 3 ( 0022): 10.61 0.125 5.92 14.59
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 ID = 1 ( 0022): 14.94 0.189 5.58 14.66
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
  Unit Hyd Qpeak (cms)= 0.916
    PEAK FLOW (cms)= 0.185 (i)
TIME TO PEAK (hrs)= 4.917
RUNOFF VOLUME (mm)= 13.807
TOTAL RAINFALL (mm)= 42.504
RUNOFF COEFFICIENT = 0.325
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
      ID = 1 ( 0027): 9.01 0.218 4.92 13.80
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
Unit Hyd Qpeak (cms)= 0.037
      PEAK FLOW (cms)= 0.007 (i)
TIME TO PEAK (hrs)= 4.750
RUNOFF VOLUME (mm)= 15.179
TOTAL RAINFALL (mm)= 42.504
RUNOFF COEFFICIENT = 0.357
       (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
   | ADD HYD ( 0023)|
  | 1 + 2 = 3 | AREA QPEAK TPEAK R.V. | (ha) (cms) (hrs) (mm) | IDI=1 (0125): 0.18 0.007 4.75 15.18 | + ID2=2 (0027): 9.01 0.218 4.92 13.80
         ID = 3 ( 0023): 9.19 0.224 4.92 13.82
       NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
   Unit Hyd Qpeak (cms)= 0.087
      \begin{array}{lll} \mbox{PEAK FLOW} & (\mbox{cms}) = 0.027 \ (\mbox{i}) \\ \mbox{TIME TO PEAK} & (\mbox{hrs}) = 5.750 \\ \mbox{RUNOFF VOLUME} & (\mbox{mm}) = 14.584 \\ \mbox{TOTAL RAINFALL} & (\mbox{mm}) = 42.504 \\ \mbox{RUNOFF COEFFICIENT} & 0.343 \\ \end{array}
       (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
   CALIB
   | NASHYD ( 0105)| Area (ha)= 9.75 Curve Number (CN)= 83.8
| ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
file: ///Ca0004-ppfss01/...61414473/design/report/FSR/SWM\%20 writeup/Appendix\%20C\%20-\%20VO\%20 Modelling/Existing VO output.txt[8/19/2024~12:25:03~PM]
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```
---- U.H. Tp(hrs)= 0.82
             Unit Hyd Qpeak (cms)= 0.455
            PEAK FLOW (cms)= 0.138 (i)
TIME TO PEAK (hrs)= 5.667
RUNOFF VOLUME (mm)= 14.898
TOTAL RAINFALL (mm)= 42.504
RUNOFF COEFFICIENT = 0.351
             (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
     ID = 3 ( 0019): 11.87 0.165 5.67 14.84
             NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
     Unit Hyd Qpeak (cms)= 0.233
             PEAK FLOW (cms)= 0.061 (i)
TIME TO PEAK (hrs)= 5.333
            RUNOFF VOLUME (mm)= 14.161
TOTAL RAINFALL (mm)= 42.504
RUNOFF COEFFICIENT = 0.333
             (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
       CALIB
    | CALID | | (1016) | Area (ha)= 1.27 Curve Number (CN)= 80.8 | | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT=5.0 min | Ia (mm)= 7
              Unit Hyd Qpeak (cms)= 0.072
            PEAK FLOW (cms)= 0.018 (i)
TIME TO PEAK (hrs)= 5.417
             RUNOFF VOLUME (mm)= 13.148
TOTAL RAINFALL (mm)= 42.504
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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RUNOFF COEFFICIENT = 0.309 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. DB III (0029) AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) (1D1=1 (0104): 3.63 0.061 5.33 14.16 + 1D2=2 (0106): 1.27 0.018 5.42 13.15 ID = 3 (0029): 4.90 0.079 5.33 13.90 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | ADD HYD (0029)| ID = 1 (0029): 16.77 0.238 5.50 14.57 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. CALIB | NASHYD (0123)| Area (ha)= 1.39 Curve Number (CN)= 86.8 | ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 ------ U.H. Tp(hrs)= 0.48 Unit Hyd Qpeak (cms)= 0.110 $\begin{array}{lll} \mbox{PEAK FLOW} & (\mbox{cms}) = 0.033 \ (\mbox{i}) \\ \mbox{TIME TO PEAK} & (\mbox{hrs}) = 5.167 \\ \mbox{RUNOFF VOLUME} & (\mbox{mm}) = 17.002 \\ \mbox{TOTAL RAINFALL} & (\mbox{mm}) = 42.504 \\ \mbox{RUNOFF COEFFICIENT} & 0.400 \\ \end{array}$ PEAK FLOW (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | Junction Command(0030) | AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) INFLOW: ID= 2(0123) 1.39 0.03 5.17 17.00 file: /// Ca0004-ppfss01/... 61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]

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V I SSSSS U U A L
                                                      (v 6.2.2015)
       V V I SSSSS U U AA L
V V I SS U U AAAAA L
V V I SS U U A A L
               I SSSSS UUUUU A A LLLLL
      OOO TTTTT TTTTT H H Y Y M M OOO TM O O T T H H YY MM MM O 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
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All rights reserved.
                ***** DETAILED OUTPUT *****
 Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat Output filename: C:\Users\bweersink\AppData\Loca\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\c9e5f5ab-2126-4329-9a34-062992913feb\sc
 Summary filename: C:\Users\bweersink\App)Data\Loca\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\c9e5f5ab-2126-4329-9a34-062992913feb\sc
  DATE: 08/19/2024
                                          TIME: 11:11:33
  USER:
  COMMENTS:
   | CHICAGO STORM | IDF curve parameters: A=2353.333
  | Ptotal= 86.68 mm | B= 13.500
------ C= 0.877
                   used in: INTENSITY = A / (t + B)^C
                   Duration of storm = 12.00 hrs
Storm time step = 5.00 min
                   Time to peak ratio = 0.38
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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OUTFLOW: ID= 2(0030) 1.39 0.03 5.17 17.00

TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN hrs mm/hr | 0.00 1.02 | 3.00 3.18 | 6.00 5.43 | 9.00 1.66 0.08 1.04 | 3.08 3.39 | 6.08 | 5.10 | 9.08 | 1.62 1.04 | 3.08 | 3.39 | 6.08 | 5.10 | 9.08 | 1.09 | 6.08 | 1.00 | 3.17 | 3.63 | 6.17 | 4.81 | 9.17 | 1.08 | 3.25 | 3.90 | 6.25 | 4.56 | 9.25 | 1.10 | 3.33 | 4.21 | 6.33 | 4.33 | 9.33 | 1.12 | 3.42 | 4.58 | 6.42 | 4.12 | 9.17 | 4.15 | 3.50 | 5.03 | 6.50 | 3.93 | 9.50 | 0.33 1 54 0.50 1.49 0.58 0.67 1.17 | 3.58 | 5.56 | 6.58 1.19 | 3.67 | 6.21 | 6.67 3.75 | 9.58 3.59 | 9.67 0.75 1.42 0.92 1.37 1.00 1.08 1.33 1 33 1.58 1.75 1.92
 1.78
 4.92
 23.92
 7.92
 2.20
 10.92

 1.84
 5.00
 19.45
 8.00
 2.15
 11.00

 1.91
 5.08
 16.28
 8.08
 2.09
 11.08

 1.98
 5.17
 13.94
 8.17
 2.04
 11.17

 2.06
 5.25
 12.14
 8.25
 2.00
 11.25

 2.14
 5.33
 10.73
 8.33
 1.95
 11.33
 2.00 2.08 2.17 2.33
 2,33
 2,14
 5,33
 10,73
 8,33
 1,95
 11,13

 2,42
 2,23
 5,42
 9,60
 8,42
 1,91
 11,42

 2,50
 2,33
 5,50
 8,67
 8,50
 1,87
 11,50

 2,58
 2,44
 5,58
 7,90
 8,58
 1,83
 11,58

 2,67
 2,56
 5,67
 7,25
 8,67
 1,79
 11,67

 2,75
 2,69
 5,75
 6,69
 8,75
 1,76
 11,75

 2,83
 2,84
 5,83
 6,21
 8,83
 1,72
 11,83

 2,92
 3,00
 5,92
 5,79
 8,92
 1,69
 11,92
 1.05 1.03 Unit Hyd Qpeak (cms)= 0.182 PEAK FLOW (cms)= 0.207 (i) TIME TO PEAK (hrs)= 5.333 RUNOFF VOLUME (mm)= 47.666 TOTAL RAINFALL (mm)= 86.678 file: ///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt [8/19/2024 12:25:03 PM]

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RUNOFF COEFFICIENT = 0.550
              (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
     | CALIB | | (AND | CALIB | (AND | CALIB | (AND | CALIB | CALIB | (AND | CALIB | (AND | CALIB | CALIB | (AND | CALIB | (AND | CALIB | CALIB | (AND | CALIB | (AND | CALIB | CALIB | (AND | CALIB | (AND | CALIB | (AND | CALIB | CALIB | (AND | CALIB | (AND | CALIB | (AND | CALIB | CALIB | CALIB | (AND | CALIB | CALIB | (AND | CALIB | CALIB | CALIB | CALIB | (AND | CALIB | CALIB | CALIB | CALIB | (AND | CALIB | CALIB | CALIB | CALIB | CALIB | CALIB | (AND | CALIB                Unit Hyd Qpeak (cms)= 0.209
               PEAK FLOW (cms)= 0.179 (i)
TIME TO PEAK (hrs)= 4.833
             RUNOFF VOLUME (mm)= 49.124
TOTAL RAINFALL (mm)= 86.678
RUNOFF COEFFICIENT = 0.567
              (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
     | ADD HYD ( 0020)|
         ABJ 11 ( 0020)|

1 + 2 = 3 | AREA QPEAK TPEAK R.V.

(ha) (cms) (hrs) (mm)

ID1=1 ( 0103): 1.41 0.179 4.83 49.12

+ ID2=2 ( 0122): 3.16 0.207 5.33 47.67
                   ID = 3 ( 0020): 4.57 0.322 5.00 48.12
              NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
      CALIB
     Unit Hyd Qpeak (cms)= 0.302
             PEAK FLOW (cms)= 0.339 (i)
TIME TO PEAK (hrs)= 5.250
RUNOFF VOLUME (mm)= 49.157
TOTAL RAINFALL (mm)= 86.678
RUNOFF COEFFICIENT = 0.567
              (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
       CALIB
      | NASHYD ( 0100)| Area (ha)= 10.57 Curve Number (CN)= 83.3
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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|ID=1\ DT=5.0\ min \ | \ Ia \ (mm)=\ 7.00\ \#\ of\ Linear\ Res. (N)=3.00 \\ ------ U.H.\ Tp(hrs)=\ 1.02
      Unit Hyd Qpeak (cms)= 0.395
      PEAK FLOW (cms)= 0.513 (i)
TIME TO PEAK (hrs)= 5.833
RUNOFF VOLUME (mm)= 48.610
TOTAL RAINFALL (mm)= 86.678
RUNOFF COEFFICIENT = 0.561
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
   LCALIB
   | CALIDD | (101) | Area (ha) = 0.04 Curve Number (CN) = 87.5 | ID=1 DT=5.0 min | Ia (mm) = 7.00 # of Linear Res.(N) = 3.00 | ...... U.H. Tp(hrs) = 0.09
      Unit Hyd Qpeak (cms)= 0.018
      PEAK FLOW (cms)= 0.009 (i)
TIME TO PEAK (hrs)= 4.667
RUNOFF VOLUME (mm)= 52.322
TOTAL RAINFALL (mm)= 86.678
RUNOFF COEFFICIENT = 0.604
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
  ID = 3 ( 0022): 10.61 0.514 5.83 48.62
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
   (ha) (cms) (hrs) (mm)

ID1= 3 ( 0022): 10.61 0.514 5.83 48.62

+ ID2= 2 ( 0120): 4.33 0.339 5.25 49.16
        ID = 1 ( 0022): 14.94 0.784 5.50 48.78
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
file: ///Ca0004-ppfss01/...61414473/design/report/FSR/SWM\%20writeup/Appendix\%20C\%20-\%20VO\%20Modelling/ExistingVOoutput.txt [8/19/2024 12:25:03 PM]
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```
ID = 3 ( 0027): 7.95 0.890 4.92 47.28
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 ID = 1 ( 0027): 9.01 0.935 4.92 46.80
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 Unit Hyd Qpeak (cms)= 0.037
    PEAK FLOW (cms)= 0.028 (i)
TIME TO PEAK (hrs)= 4.750
    RUNOFF VOLUME (mm)= 49.861
TOTAL RAINFALL (mm)= 86.678
RUNOFF COEFFICIENT = 0.575
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 | ADD HYD ( 0023)|
   ADJ H1D (0023)|
1+2=3 | AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
IDI=1 (0125): 0.18 0.028 4.75 49.86
+ ID2=2 (0027): 9.01 0.935 4.92 46.80
     ID = 3 ( 0023): 9.19 0.958 4.92 46.86
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
  CALIB
 | NASHYD ( 0121)| Area (ha)= 2.12 Curve Number (CN)= 83.3
file: ///Ca0004-ppfss01/...61414473/design/report/FSR/SWM\%20writeup/Appendix\%20C\%20-\%20VO\%20Modelling/ExistingVOoutput.txt[8/19/2024~12:25:03~PM]
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```
Unit Hyd Qpeak (cms)= 0.087
             PEAK FLOW (cms)= 0.111 (i)
TIME TO PEAK (hrs)= 5.667
RUNOFF VOLUME (mm)= 48.610
TOTAL RAINFALL (mm)= 86.678
RUNOFF COEFFICIENT = 0.561
                (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
       CALIB
     | CALID | | (ALID 
              Unit Hyd Qpeak (cms)= 0.455
             PEAK FLOW (cms)= 0.569 (i)
TIME TO PEAK (hrs)= 5.583
RUNOFF VOLUME (mm)= 49.297
TOTAL RAINFALL (mm)= 86.678
RUNOFF COEFFICIENT = 0.569
                (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
    ID = 3 ( 0019): 11.87 0.679 5.58 49.17
              NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
       CALIB
     | NASHYD ( 0104)| Area (ha)= 3.63 Curve Number (CN)= 82.6
|ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
                                                       -- U.H. Tp(hrs)= 0.59
              Unit Hyd Opeak (cms)= 0.233
              PEAK FLOW (cms)= 0.258 (i)
TIME TO PEAK (hrs)= 5.250
RUNOFF VOLUME (mm)= 47.666
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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TOTAL RAINFALL (mm)= 86.678 RUNOFF COEFFICIENT = 0.550 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY CALIB Unit Hyd Qpeak (cms)= 0.072 PEAK FLOW (cms)= 0.078 (i) TIME TO PEAK (hrs)= 5.417RUNOFF VOLUME (mm)= 45.334TOTAL RAINFALL (mm)= 86.678RUNOFF COEFFICIENT = 0.523(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. $\mid \mbox{ADD HYD (0029)} \mid \mbox{ } 1+\mbox{ } 2=\mbox{ } 3 \ \mid \mbox{ } \mbox{AREA} \mbox{ } \mbox{ } \mbox{QPEAK} \mbox{ } \mbox{TPEAK} \mbox{ } \mbox{ } \mbox{R.V.}$ ID = 3 (0029): 4.90 0.336 5.33 47.06 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ID = 1 (0029): 16.77 0.995 5.50 48.56 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. Unit Hyd Qpeak (cms)= 0.110 file: ///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt [8/19/2024 12:25:03 PM]

file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]

DATE: 08/19/2024 TIME: 11:11:31 USER: COMMENTS: ************* | CHICAGO STORM | IDF curve parameters: A= 983.699 | Ptotal= 55.97 mm | B= 8.100 C = 0.812used in: INTENSITY = $A/(t+B)^{C}$ Duration of storm = 12.00 hrs Storm time step = 5.00 min Time to peak ratio = 0.38 TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN | TIME hrs mm/hr | hrs mr/hr | h | 1.05 | 3.58 | 3.87 | 6.58 | 2.80 | 9.58 | 1.27 |
1.07	3.67	4.24	6.67	2.70	9.67	1.25
1.09	3.75	4.70	6.75	2.61	9.75	1.24
1.11	3.83	5.28	6.83	2.52	9.83	1.22
1.13	3.92	6.03	6.92	2.45	9.92	1.20
1.15	4.00	7.05	7.00	2.37	10.00	1.19
1.18	4.08	8.52	7.08	2.30	10.08	1.17
1.20	4.17	10.78	7.17	2.24	10.17	1.16
1.23	4.25	14.69	7.25	2.18	10.25	1.16
1.24	4.24	49.28	7.42	2.07	10.42	1.12
1.32	4.50	121.80	7.50	2.02	10.50	1.19
1.35	4.58	58.14	7.58	1.97	10.58	1.09
1.39	4.67	32.66	7.67	1.92	10.67	1.08
1.42	4.75	22.23	7.75	1.88	10.75	1.06
1.46	4.83	16.72	7.83	1.84	10.83	1.05
1.59	5.08	9.52	8.08	1.72	11.08	1.02
1.64	5.17	8.33	8.17	1.69	11.17	1.01
1.70	5.25	7.41	8.25	1.66	11.25	1.00

```
2.50
                                           2.58
2.67
                                                                 1.96 | 5.58 | 5.17 | 8.58
2.04 | 5.67 | 4.82 | 8.67
                                                                                                                                                               1.54 | 11.58
1.51 | 11.67
                                          2.75 2.12 | 5.75 4.51 | 8.75 1.48 | 11.75 0.94 2.83 2.22 | 5.83 4.24 | 8.83 1.46 | 11.83 0.93
                                                               2.33 | 5.92 | 4.00 | 8.92 | 1.44 | 11.92 | 0.92
        CALIB
      | CALID | | (ALID 
                 Unit Hyd Qpeak (cms)= 0.182
                PEAK FLOW (cms)= 0.089 (i)
TIME TO PEAK (hrs)= 5.417
RUNOFF VOLUME (mm)= 23.399
TOTAL RAINFALL (mm)= 55.968
RUNOFF COEFFICIENT = 0.418
                 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
        CALIB
        | NASHYD ( 0103)| Area (ha)= 1.41 Curve Number (CN)= 83.7
|ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
                                                        ---- U.H. Tp(hrs)= 0.26
                 Unit Hyd Qpeak (cms)= 0.209
                \begin{array}{lll} PEAK FLOW & (cms) = & 0.078 \ (i) \\ TIME TO PEAK & (hrs) = & 4.833 \\ RUNOFF VOLUME & (mm) = & 24.343 \\ TOTAL RAINFALL & (mm) = & 55.968 \\ RUNOFF COEFFICIENT & = & 0.435 \\ \end{array}
                 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
      ID = 3 ( 0020): 4.57 0.137 5.08 23.69
file: /// Ca0004-ppfss01/...61414473/design/report/FSR/SWM\%20writeup/Appendix\%20C\%20-\%20VO\%20Modelling/Existing VOoutput.txt\\ [8/19/2024 12:25:03 PM]
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(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
   Unit Hyd Qpeak (cms)= 0.109
      \begin{array}{lll} \mbox{PEAK FLOW} & (\mbox{cms}) = 0.043 \ (\mbox{i}) \\ \mbox{TIME TO PEAK} & (\mbox{hrs}) = 4.833 \\ \mbox{RUNOFF VOLUME} & (\mbox{mm}) = 25.932 \\ \mbox{TOTAL RAINFALL} & (\mbox{mm}) = 55.968 \\ \mbox{RUNOFF COEFFICIENT} & 0.463 \end{array}
       (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
   | 1 + 2 = 3 | AREA QPEAK TPEAK R.V.

| 10 + 2 = 3 | AREA QPEAK TPEAK R.V.

| 10 + 2 = 3 | (ha) (cms) (hrs) (mm)

| 10 + 1 = 1 ( 0102): 7.24 0.337 4.92 22.89

| 10 + 102 = 2 ( 0124): 0.71 0.043 4.83 25.93
         ID = 3 ( 0027): 7.95 0.380 4.92 23.16
       NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
  ID = 1 ( 0027): 9.01 0.398 4.92 22.87
       NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
   | NASHYD ( 0125)| Area (ha)= 0.18 Curve Number (CN)= 84.3
|ID=1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
                    --- U.H. Tp(hrs)= 0.18
       Unit Hyd Opeak (cms)= 0.037
       PEAK FLOW (cms)= 0.012 (i)
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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TIME TO PEAK (hrs)= 4.750
RUNOFF VOLUME (mm)= 24.840
TOTAL RAINFALL (mm)= 55.968
RUNOFF COEFFICIENT = 0.444
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
 (ha) (cms) (hrs) (mm)

ID1=1 ( 0125): 0.18 0.012 4.75 24.84

+ ID2=2 ( 0027): 9.01 0.398 4.92 22.87
      ID = 3 ( 0023): 9.19 0.408 4.92 22.90
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 Unit Hyd Qpeak (cms)= 0.087
    PEAK FLOW (cms)= 0.048 (i)
TIME TO PEAK (hrs)= 5.750
    RUNOFF VOLUME (mm)= 24.004
TOTAL RAINFALL (mm)= 55.968
RUNOFF COEFFICIENT = 0.429
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 Unit Hyd Qpeak (cms)= 0.455
    PEAK FLOW (cms)= 0.247 (i)
TIME TO PEAK (hrs)= 5.583
   RUNOFF VOLUME (mm)= 24.450
TOTAL RAINFALL (mm)= 55.968
    RUNOFF COEFFICIENT = 0.437
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
      ID = 3 ( 0029): 4.90 0.143 5.33 23.02
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DB/HD (6015)]

AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)

ID1=1 (0105): 9.75 0.247 5.58 24.45

+ ID2=2 (0121): 2.12 0.048 5.75 24.00 ID = 3 (0019): 11.87 0.294 5.58 24.37 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | CALID | | (1014) | Area (ha)= 3.63 Curve Number (CN)= 82.6 | | (10=1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Res.(N)= 3.00 | (10=1 DT= 5.0 min | Linear Unit Hyd Qpeak (cms)= 0.233 PEAK FLOW (cms)= 0.110 (i) TIME TO PEAK (hrs)= 5.333 RUNOFF VOLUME (mm)= 23.399 TOTAL RAINFALL (mm)= 55.968 RUNOFF COEFFICIENT = 0.418 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. CALIB | NASHYD (0106)| Area (ha)= 1.27 Curve Number (CN)= 80.8 | ID=1 DT=5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 ------ U.H. Tp(hrs)= 0.67 Unit Hyd Qpeak (cms)= 0.072 $\begin{array}{lll} \mbox{PEAK FLOW} & (\mbox{cms}) = 0.033 \ (\mbox{i}) \\ \mbox{TIME TO PEAK} & (\mbox{hrs}) = 5.417 \\ \mbox{RUNOFF VOLUME} & (\mbox{mm}) = 21.932 \\ \mbox{TOTAL RAINFALL} & (\mbox{mm}) = 55.968 \\ \mbox{RUNOFF COEFFICIENT} & 0.392 \\ \end{array}$ (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | ADD HYD (0029)| 1 + 2 = 3 | AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) ID1=1 (0104): 3.63 0.110 5.33 23.40 + ID2= 2 (0106): 1.27 0.033 5.42 21.93 file: /// Ca0004-ppfss01/... 61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/Existing VOoutput.txt[8/19/2024 12:25:03 PM] and the file of the first of the fir

file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]

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 Copyright 2007 - 2022 Smart City Water Inc All rights reserved. ***** DETAILED OUTPUT ***** Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat Output filename: C:\Users\bweersink\AppData\Loca\\Civica\\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\974b1075-440f-41a6-b927-769d3356253d\sc Summary filename: C:\Users\bweersink\appData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\974b1075-440f-41a6-b927-769d3356253d\sc DATE: 08/19/2024 TIME: 11:11:32 USER: COMMENTS: READ STORM | Filename: C:\Users\bweersink\AppD ata\Local\Temp\
13796ace-156a-407f-a703-6c4af299ca3b\17cacc8e Ptotal=285.00 mm | Comments: Huricane Hazel- 48hr 0.75 2.00 | 12.75 | 2.00 | 24.75 | 2.00 | 36.75 | 2.00 | 13.00 | 2.00 | 25.00 | 2.00 | 37.00 6.00 2.00 | 13.25 | 2.00 | 25.25 | 2.00 | 37.25 | 2.00 | 13.50 | 2.00 | 25.50 | 2.00 | 37.50 1.50 2.00 | 13.75 2.00 | 25.75 1.75 2.00 | 37.75 2.00 2.00 | 14.00 | 2.00 | 26.00 | 2.00 | 38.00 | 6.00 2.25 2.00 | 14.25 2.00 | 26.25 2.00 | 38.25 6.00 2.50 2.00 | 14.50 2.00 | 26.50 2.00 | 38.50 6.00 2.75 2.00 | 14.75 | 2.00 | 26.75 | 2.00 | 38.75 | 6.00 | 2.00 | 15.00 | 2.00 | 27.00 | 2.00 | 39.00 | 13.00

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2.00 | 15.25
                                                                                2 00 | 27 25
                                                                                                                   2 00 | 39 25 | 13 00
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                                                                                                                                                                                                                                                                                                                                                                          2.00 | 12.417
                                                                                                                                                                                                                                                                                                                                                                                                              2.00 | 24.417
                                3 25
                                               2.00 | 15.25
2.00 | 15.50
2.00 | 15.75
                                                                                 2.00 | 27.25
2.00 | 27.50
2.00 | 27.75
                                                                                                                   2.00 | 39.50 | 13.00
2.00 | 39.75 | 13.00
                                                                                                                                                                                                                                                                                                                                                       0.500
0.583
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2.00 |12.583
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2.00 |24.583
                               3.50
3.75
                                4.00
4.25
                                               2.00 | 16.00
2.00 | 16.25
                                                                                 2.00 | 28.00
2.00 | 28.25
                                                                                                                   2.00 | 40.00
2.00 | 40.25
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                                                                                                                                                                                                                                                                                                                                                                                                              2.00 | 24.667
                                                                                                                                                                                                                                                                                                                                                                                                              2.00 |24.750
2.00 |24.833
                                4 50
                                               2 00 | 16 50
                                                                                 2 00 | 28 50
                                                                                                                   2 00 | 40 50 17 00
                                                                                                                                                                                                                                                                                                                                                       0.833
                                                                                                                                                                                                                                                                                                                                                                          2.00 112.833
                               4.75
5.00
                                               2.00 | 16.75
2.00 | 17.00
                                                                                  2.00 | 28.75
                                                                                                                     2.00 | 40.75
                                                                                                                                                                                                                                                                                                                                                                          2.00 |12.917
2.00 |13.000
                                                                                                                                                                                                                                                                                                                                                                                                              2.00 |24.917
2.00 |25.000
                                                                                  2.00 | 29.00
                                                                                                                    2.00 | 41.00 | 13.00
                                                                                                                                                                                                                                                                                                                                                        1.000
                                5.25
5.50
                                               2.00 | 17.25
2.00 | 17.50
                                                                                 2.00 | 29.25
2.00 | 29.50
                                                                                                                   2.00 | 41.25 | 13.00
2.00 | 41.50 | 13.00
                                                                                                                                                                                                                                                                                                                                                        1.083
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                                                                                                                                                                                                                                                                                                                                                                           2.00 |13.167
                                                                                                                                                                                                                                                                                                                                                                                                              2.00 |25.167
                                5.75
                                               2.00 | 17.75
                                                                                 2.00 | 29.75
                                                                                                                   2.00 | 41.75 | 13.00
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2.00 |14.833
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2.00 |15.083
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2.00 |27.083
                                               2.00 | 23.25
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2.00 |27.250
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2.00 |27.667
      CALIB
      | NASHYD ( 0122)| Area (ha)= 3.16 Curve Number (CN)= 82.6
|ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
                                                                                                                                                                                                                                                                                                                                                       3 750
                                                                                                                                                                                                                                                                                                                                                                          2 00 115 750
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2.00 |15.917
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2.00 |27.917
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3.917
                                        ---- U.H. Tp(hrs)= 0.66
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2.00 |28.083
                                                                                                                                                                                                                                                                                                                                                       4.000
                   NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                                                                                                                                                                                                                                                                                                       4.083
                                                                                                                                                                                                                                                                                                                                                       4 167
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                                                         -- TRANSFORMED HYETOGRAPH -
                                                                                                                                                                                                                                                                                                                                                       4.333
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                               TIME RAIN | TIME R
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2.00 |28.500
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                              0.167
                                               2.00 | 12.250 | 2.00 | 24.250 | 2.00 | 36.25 | 2.00 | 12.333 | 2.00 | 24.333 | 2.00 | 36.33
                                                                                                                                                                                                                                                                                                                                                                                                              2.00 |28.750
                              0.250
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                                                                                                                                                                                                                                                                                                                                                                          2.00 |16.833 | 2.00 |28.833
file /// Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20 writeup/Appendix%20C%20-%20VO%20Modelling/Existing/Ooutput.txt[8/19/2024 12:25:03 PM] \\ file /// Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20 writeup/Appendix%20C%20-%20VO%20Modelling/Existing/Ooutput.txt[8/19/2024 12:25:03 PM] \\ file /// Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20 writeup/Appendix%20C%20-%20VO%20Modelling/Existing/Ooutput.txt[8/19/2024 12:25:03 PM] \\ file // Ca0004-ppfss01/...6141473/design/report/FSR/SWM%20 writeup/Appendix%20C%20-%20VO%20Modelling/Existing/Ooutput.tx
                                                                                   2.00 |28.917 | 2.00 | 40.92 | 17.00 | 2.00 |29.000 | 2.00 | 41.00 | 17.00
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               11.917 2.00 |23.917 2.00 |35.917 3.00 | 47.92
12.000 2.00 |24.000 2.00 |36.000 3.00 | 48.00
       Unit Hyd Qpeak (cms)= 0.182
        PEAK FLOW (cms)= 0.364 (i)
TIME TO PEAK (hrs)= 46.583
       RUNOFF VOLUME (mm)= 233.126
TOTAL RAINFALL (mm)= 285.000
RUNOFF COEFFICIENT = 0.818
       (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
    NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                          ---- TRANSFORMED HYETOGRAPH ----
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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2.00 | 36.42

2.00 | 36.50 2.00 | 36.58

2.00 | 36.67 2.00 | 36.75

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2.00 | 37.75 2.00 | 37.83

2.00 | 37.92 2.00 | 38.00

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2.00 | 41.67 | 13.00
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2.00 | 41.75 | 13.00
2.00 | 41.83 | 13.00
2.00 | 41.92 | 13.00
2.00 | 42.00 | 13.00
                             2.00 | 17.750
2.00 | 17.833
                                                     2.00 |29.750
2.00 |29.833
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                               2.00 | 18.167
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                               2.00 | 19.833
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                                                     2.00 |32.583
2.00 |32.667
                                                                                                   13.00
                  8.667
                  8.750
                                                      2.00 32.750
                                                                                                   13.00
                              2.00 |20.833
2.00 |20.917
                                                     2.00 |32.833
2.00 |32.917
                                                                             2.00 | 44.83 | 2.00 | 44.92
                  8.833
                                                                                                    13.00
                  8.917
                  9 000
                              2 00 21 000
                                                      2.00 33.000
                                                                             2.00 | 45.00
                                                                                                   13.00
                                                                            2.00 | 45.08 52.95
2.00 | 45.17 53.00
                  9.083
                              2.00 |21.083
                                                      2.00 |33.083
                  9.167
                              2 00 21 167
                                                     2.00 33.167
                                                                             2.00 | 45.25
                              2.00 |21.250
                                                      2.00 |33.250
                  9.333
                             2.00 | 21.333 | 2.00 | 33.333 | 2.00 | 45.33 | 53.00
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1.833
                          2.00 |13.833
2.00 |13.917
                                             2.00 |25.833
2.00 |25.917
                                                                2.00 | 37.83
                1.917
                                                                                   4.00
                                             2.00 |26.000
2.00 |26.083
                                                                2.00 | 38.00
2.00 | 38.08
                2.000
                          2.00 114.000
                                                                                   4.00
                2.083
                           2.00 | 14.083
                                                                                   6.00
                          2.00 | 14.167
2.00 | 14.250
2.00 | 14.333
                                                                2.00 | 38.17
2.00 | 38.25
2.00 | 38.33
                2.167
                                             2.00 | 26.167
                                                                                   6.00
                                             2.00 |26.250
2.00 |26.333
                2.250
                2.333
                                                                                   6.00
                2.417
                          2.00 114.417
                                             2.00 | 26.417
                                                                2.00 | 38.42
                                                                                   6.00
                          2.00 | 14.500
2.00 | 14.583
                                             2.00 |26.500
                                                                 2.00 | 38.50
                                             2.00 | 26.583
                2.583
                                                                 2.00 | 38.58
                                                                                   6.00
                                             2.00 |26.667
2.00 |26.750
                                                                2.00 | 38.67
2.00 | 38.75
                          2.00 |14.667
                2.750
                          2.00 | 14.750
                                                                                   6.00
                2 833
                          2.00 14.833
                                             2.00 | 26.833
                                                                2.00 | 38.83
                                                                                   6.00
                2.917
                          2.00 | 14.917
                                             2.00 |26.917
                                                                 2.00 | 38.92
                                                                                   6.00
                3.000
                          2 00 115 000
                                             2 00 27 000
                                                                 2 00 | 39 00
                                                                                   6.00
                                             2.00 |27.000
2.00 |27.083
2.00 |27.167
                                                                2.00 | 39.08
2.00 | 39.17
                          2.00 | 15.083
                          2.00 15.167
                3.167
                                                                                   13.00
                3.250
                          2.00 |15.250
2.00 |15.333
                                             2.00 |27.250
2.00 |27.333
                                                                 2.00 | 39.25
2.00 | 39.33
                3.417
                          2.00 | 15.417
                                             2.00 | 27.417
                                                                 2.00 | 39.42
                                                                                   13.00
                          2.00 |15.500
2.00 |15.583
                                             2.00 |27.500
2.00 |27.583
                                                                2.00 | 39.50
2.00 | 39.58
                3.500
3.583
                                                                                   13.00
                                             2.00 |27.667
2.00 |27.750
                3.667
                          2.00 15.667
                                                                 2.00 | 39.67
                                                                                   13.00
                           2.00 | 15.750
                                                                 2.00 | 39.75
                3.750
                3.833
                          2.00 | 15.833
                                             2.00 |27.833
                                                                 2.00 | 39.83
                                                                                   13.00
                                            2.00 |27.917
2.00 |28.000
                                                                 2.00 | 39.92
                                                                2.00 | 40.00
                4.000
                          2.00 116.000
                                                                                   13.00
                                            2.00 |28.083
2.00 |28.167
                                                                2.00 | 40.08
2.00 | 40.17
                4 083
                          2.00 |16.083
2.00 |16.167
                                                                                   17.00
                                                                                   17.00
                4.167
                4 250
                          2 00 116 250
                                             2 00 28 250
                                                                2 00 | 40 25
                                                                                   17.00
                          2.00 | 16.333
                                            2.00 |28.333
                                                                2.00 | 40.33 17.00
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                                                                2.00 | 44.92 13.00
2.00 | 45.00 13.00
                8.917
                          2.00 | 20.917
                                             2.00 | 32.917
                         2.00 21.000
                                             2.00 |33.000
                9.000
                          2.00 |21.083
2.00 |21.167
                                             2.00 |33.083
2.00 |33.167
                                                                2.00 | 45.08 52.95
2.00 | 45.17 53.00
                9.083
                9.167
                                                                2.00 | 45.17 | 53.00

2.00 | 45.25 | 53.00

2.00 | 45.33 | 53.00

2.00 | 45.42 | 53.00

2.00 | 45.50 | 53.00

2.00 | 45.58 | 53.00
                9.250
                          2.00 21.250
                                             2.00 |33.250
                          2.00 |21.230
2.00 |21.333
2.00 |21.417
                                             2.00 |33.333
2.00 |33.417
                9.417
                          2.00 |21.500
2.00 |21.583
                                             2.00 |33.500
2.00 |33.583
                9.500
                9.583
                9.667
                          2.00 21.667
                                             2.00 33.667
                                                                 2.00 | 45.67
                                                                                   53.00
                                             2.00 |33.750
2.00 |33.833
                                                                2.00 | 45.75 53.00
2.00 | 45.83 53.00
                          2.00 |21.750
                9.833
                          2.00 21.833
                9 917
                          2.00 21.917
                                             2.00 |33.917
2.00 |34.000
                                                                2.00 | 45.92
2.00 | 46.00
                                                                                  53.00
53.00
                           2.00 |22.000
                10.000
                10.083
                           2 00 22 083
                                              2 00 34 083
                                                                 2 00 | 46 08
                                                                                   38.02
                          2.00 |22.167
2.00 |22.250
                                              2.00 |34.167
                                                                  2.00 | 46.17
                10.167
                                                                 2.00 | 46.25 | 38.00
               10.250
                                              2.00 | 34.250
                          2.00 |22.333
2.00 |22.417
                                              2.00 |34.333
2.00 |34.417
                                                                 2.00 | 46.33
2.00 | 46.42
                10.333
                                                                                   38.00
               10.417
                                                                                   38.00
               10 500
                           2 00 22 500
                                              2 00 34 500
                                                                 2 00 | 46 50 38 00
                10.583
                          2.00 |22.583
2.00 |22.667
                                              2.00 |34.583
2.00 |34.667
                                                                 2.00 | 46.58
2.00 | 46.67
               10.667
                                                                                   38.00
               10.750
                                              2.00 |34.750
2.00 |34.833
                                                                 2.00 | 46.75 38.00
2.00 | 46.83 38.00
                           2.00 | 22.750
                           2.00 |22.833
               10.833
               10.917
                           2.00 22.917
                                              2.00 34.917
                                                                 2.00 | 46.92 | 38.00
                          2.00 |23.000
2.00 |23.083
                                             2.00 |35.000
2.00 |35.083
                                                                 2.00 | 47.00
3.00 | 47.08
                11.000
               11.083
                                                                                   13.04
               11.167
                           2.00 |23.167
2.00 |23.250
                                              2.00 |35.167
2.00 |35.250
                                                                 3.00 | 47.17
3.00 | 47.25
               11.250
                                                                                   13.00
               11 333
                           2.00 23.333
                                              2.00 | 35.333
                                                                  3.00 | 47.33
                           2.00 |23.417
                                              2.00 |35.417
                                                                  3.00 | 47.42
               11.417
               11.500
                          2.00 23.500
                                              2.00 35.500
                                                                 3.00 47.50 13.00
               11.583
                          2.00 |23.583
2.00 |23.667
                                              2.00 |35.583
2.00 |35.667
                                                                 3.00 | 47.58
                                                                                   13.00
               11.667
               11 750
                           2.00 23.750
                                              2 00 35 750
                                                                 3 00 | 47 75
                                                                                   13.00
                          2.00 |23.833
                                              2.00 |35.833
                                                                 3.00 | 47.83
                          2.00 23.917
               11.917
                                              2.00 | 35.917
                                                                 3.00 | 47.92 | 13.00
               12.000 2.00 | 24.000 2.00 | 36.000 3.00 | 48.00 13.00
      Unit Hyd Qpeak (cms)= 0.209
      \begin{array}{lll} \text{PEAK FLOW} & (\text{cms}) = 0.198 \ (\text{i}) \\ \text{TIME TO PEAK} & (\text{hrs}) = 46.000 \\ \text{RUNOFF VOLUME} & (\text{mm}) = 235.841 \\ \text{TOTAL RAINFALL} & (\text{mm}) = 285.000 \\ \text{RUNOFF COEFFICIENT} & = 0.828 \\ \end{array}
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
   | ADD HYD ( 0020)|
     1 + 2 = 3
                             AREA OPEAK TPEAK R.V.
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
```

TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN

2.00 |24.167 2.00 |24.250

2 00 24 333

2.00 |24.417 2.00 |24.500

2.00 |24.583 2.00 |24.667

2.00 |24.750

2.00 |24.833

2.00 24.917

2.00 |25.000 2.00 |25.083

2.00 | 25.167

2.00 |25.250 2.00 |25.333

2.00 |25.417 2.00 |25.500

2 00 25 583

2.00 |25.667 2.00 |25.750

hrs mm/hi

6.00

6.00

6.00

6.00

6.00

6.00

6.00

6.00

4.00

4.00

4.00

4 00

4.00

2.00 | 36.08

2.00 | 36.17 2.00 | 36.25

2 00 | 36 33

2.00 | 36.42

2.00 | 36.50

2.00 | 36.58

2.00 | 36.75

2.00 | 36.83

2.00 | 36.92

2.00 | 37.00 2.00 | 37.08

2.00 | 37.17 2.00 | 37.25

2.00 | 37.33

2.00 | 37.42 2.00 | 37.50

2.00 | 37.58

2.00 | 37.67

2.00 | 37.75

hrs mm/hr | hrs mm/hr | hrs mm/hr | 0.083 | 2.00 | 12.083 | 2.00 | 24.083 | 2.00 | 3

2.00 |12.167 2.00 |12.250

2 00 112 333

2.00 | 12.417

2.00 | 12.500

2.00 |12.583 2.00 |12.667

2.00 12.750

2.00 |12.833

2.00 12.917

2.00 |13.000 2.00 |13.083

2.00 13.167

2.00 |13.250

2.00 113.333

2.00 |13.417 2.00 |13.500

2 00 113 583

2.00 | 13.667

2.00 13.750

0.083

0.333

0.500

0.583

0.667

0.750

0.917

1.000

1.083

1.167

1.333

1.417 1.500

1 583

1.667

1.750

```
6.583
                         2.00 |18.583
                                           2.00 |30.583
                                                             2.00 | 42.58
               6.667
                         2.00 | 18.667
                                           2.00 | 30.667
                                                             2.00 42.67
                                                                             23.00
               6.750
                         2.00 |18.750
2.00 |18.833
                                           2.00 |30.750
2.00 |30.833
                                                            2.00 | 42.75
2.00 | 42.83
               6.917
                         2.00 18.917
                                           2.00 30.917
                                                            2.00 42.92 23.00
                         2.00 |19.000
2.00 |19.083
                                           2.00 |31.000
2.00 |31.083
                                                            2.00 | 43.00
2.00 | 43.08
                                                                             23.00
                7.083
                                                                             13.01
                         2.00 |19.167
2.00 |19.250
                                           2.00 |31.167
2.00 |31.250
                                                            2.00 | 43.17
2.00 | 43.25
                                                                             13.00
13.00
                7.167
                                                            2.00 | 43.33
2.00 | 43.42
               7.333
                         2.00 119.333
                                           2.00 31.333
                                                                             13.00
                         2.00 |19.417
                                           2.00 |31.417
                         2.00 119.500
                                           2.00 | 31.500
                                                            2.00 | 43.50
                7.500
                                                                             13.00
               7.583
7.667
                         2.00 |19.583
2.00 |19.667
                                           2.00 |31.583
2.00 |31.667
                                                            2.00 | 43.58
2.00 | 43.67
                                                                             13.00
                7.750
                         2 00 119 750
                                           2 00 31 750
                                                            2.00 | 43.75
                                                                             13.00
                         2.00 | 19.833
2.00 | 19.917
                                           2.00 |31.833
2.00 |31.917
                                                            2.00 | 43.73
2.00 | 43.83
2.00 | 43.92
               7.833
7.917
                                                                             13.00
                         2.00 |20.000
2.00 |20.083
                                                            2.00 | 44.00
2.00 | 44.08
                8.000
                                           2.00 32.000
                                                                             13.00
               8.083
                                           2.00 |32.083
                                                                             13.00
               8 167
                         2 00 20 167
                                           2 00 32 167
                                                            2 00 | 44 17
                                                                             13.00
                         2.00 |20.250
                                           2.00 |32.250
                                                             2.00 | 44.25
               8.333
                         2.00 | 20.333
                                           2.00 | 32.333
                                                            2.00 | 44.33
                                                                             13.00
                         2.00 |20.417
2.00 |20.500
                                           2.00 |32.417
2.00 |32.500
                                                            2.00 | 44.42
2.00 | 44.50
                8.417
                                                                             13.00
13.00
               8.500
               8.583
                         2.00 | 20.583
                                           2.00 | 32.583
                                                            2.00 | 44.58
                                                                             13.00
                         2.00 |20.667
                                           2.00 |32.667
                                                             2.00 | 44.67
               8.667
                                                                              13.00
                                           2.00 | 32.750
               8.750
                         2.00 20.750
                                                            2.00 44.75
                                                                             13.00
                         2.00 |20.833
                                          2.00 |32.833
                                                            2.00 | 44.83 | 13.00
        ......(ha) (cms) (hrs) (mm)
ID1= 1 ( 0103): 1.41 0.198 46.00 235.84
+ ID2= 2 ( 0122): 3.16 0.364 46.58 233.13
         ID = 3 ( 0020): 4.57 0.529 46.25 233.96
       NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
    CALIB
   | NASHYD ( 0120) | Area (ha)= 4.33 Curve Number (CN)= 83.7 | ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
                    ---- U.H. Tp(hrs)= 0.55
          NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                              -- TRANSFORMED HYETOGRAPH --
                 TIME RAIN | TIME RAIN | TIME RAIN | TIME
                0.083 2.00 | 12.083 2.00 | 24.083 2.00 | 36.08 6.00 | 0.167 2.00 | 12.167 2.00 | 24.167 2.00 | 36.17 6.00
               0.083
               0.167
               0.250
                        2.00 | 12.250 | 2.00 | 24.250
                                                            2.00 | 36.25
                                                                              6.00
                         2.00 |12.333
                                           2.00 |24.333
               0.417
                         2.00 | 12.417
                                           2.00 |24.417
                                                            2.00 | 36.42
                                                                              6.00
                        2.00 |12.500
2.00 |12.583
                                           2.00 |24.500
2.00 |24.583
                                                            2.00 | 36.50
2.00 | 36.58
               0.500
0.583
                                                                              6.00
                                                                              6.00
               0.667
                         2.00 12.667
                                           2.00 |24.667
2.00 |24.750
                                                            2.00 | 36.67
2.00 | 36.75
                                                                              6.00
                         2.00 |12.750
               0.833
                         2.00 112.833
                                           2.00 | 24.833
                                                            2.00 | 36.83
                                                                              6.00
                         2.00 |12.917
                                          2.00 |24.917
2.00 |25.000
                                                            2.00 | 36.92
2.00 | 37.00
                1.000
                         2.00 | 13.000
                                                                             6.00
                         2.00 |13.083
2.00 |13.167
                                           2.00 |25.083
2.00 |25.167
                                                            2.00 | 37.08
2.00 | 37.17
                                                                              4 00
                1.083
                1.250
                         2.00 113.250
                                           2.00 |25.250
                                                            2.00 | 37.25
                                                                              4.00
                         2.00 |13.230
2.00 |13.333
2.00 |13.417
                                           2.00 |25.230
2.00 |25.333
2.00 |25.417
                                                            2.00 | 37.33
2.00 | 37.42
                1.333
                1.417
                                                                              4.00
                1 500
                         2.00 13.500
                                           2.00 |25.500
                                                            2.00 | 37.50
                                                                              4 00
                         2.00 |13.583
                                           2.00 |25.583
                                                             2.00 | 37.58
                1.583
                1 667
                         2 00 113 667
                                           2 00 25 667
                                                            2 00 | 37 67
                                                                              4 00
                                           2.00 |25.750
2.00 |25.833
                         2.00 |13.750
                1.833
                         2.00 | 13.833
                                                            2.00 | 37.83
                                                                              4.00
                         2.00 |13.917
2.00 |14.000
                                           2.00 |25.917
2.00 |26.000
                                                            2.00 | 37.92
2.00 | 38.00
                1.917
                                                                              4.00
                                                                              4.00
                2.000
               2.083
                         2.00 14.083
                                           2.00 | 26.083
                                                            2.00 | 38.08
                                                                              6.00
                         2.00 |14.167
                                           2.00 |26.167
                                                             2.00 | 38.17
               2.250
                         2.00 114.250
                                           2.00 | 26.250
                                                            2.00 | 38.25
                                                                              6.00
                                           2.00 |26.333
2.00 |26.417
                                                            2.00 | 38.33
2.00 | 38.42
               2 333
                         2.00 14.333
                                                                              6.00
                         2.00 |14.417
                2.417
               2.500
                         2.00 114.500
                                           2.00 | 26.500
                                                            2.00 | 38.50
                                                                              6.00
                2.583
                         2.00 |14.583
                                           2.00 |26.583
                                           2.00 |26.667
                                                            2.00 | 38.67
               2.667
                         2.00 | 14.667
                                                                              6.00
               2 750
                         2 00 114 750
                                           2.00 |26.750
                                                            2 00 | 38 75
                                                                              6.00
                        2.00 | 14.833 | 2.00 | 26.833 | 2.00 | 38.83
               2.833
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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4.417

4.500 4.583

4 667

4.833

4 917

5.000

5.083

5.250

5.333

5.417

5 500

5.583

5.667

5.833

5.917

6.000

6.083

6.250

6 3 3 3

6.417

6.500

2.00 | 16.417

2.00 |16.500 2.00 |16.583

2.00 16.667

2.00 | 16.833

2.00 |16.917 2.00 |17.000

2.00 17.083

2.00 | 17.167

2.00 17.250

2.00 | 17.333

2.00 17.417

2.00 |17.500 2.00 |17.583

2.00 117.667

2.00 |17.750 2.00 |17.833

2.00 17.917

2.00 |17.517

2.00 | 18.083

2.00 |18.167 2.00 |18.250

2.00 |18.333 2.00 |18.417

2 00 118 500

2.00 | 28.417

2.00 |28.500 2.00 |28.583

2.00 | 28.667

2.00 | 28.833

2.00 |28.917 2.00 |29.000

2 00 29 083

2.00 |29.167

2.00 | 29.250

2.00 |29.333 2.00 |29.417

2.00 |29.500 2.00 |29.583

2.00 | 29.667

2.00 |29.750 2.00 |29.833

2.00 | 29.917

2.00 |30.000

2.00 30.083

2.00 |30.167 2.00 |30.250

2.00 30.333

2.00 |30.417

2 00 30 500

2.00 | 40.42

2.00 | 40.50 2.00 | 40.58

2.00 | 40.67 2.00 | 40.75

2.00 | 40.83

2.00 | 40.92 2.00 | 41.00

2.00 41.08

2.00 | 41.17

2.00 41.25

2.00 | 41.33 2.00 | 41.42

2.00 | 41.50 2.00 | 41.58

2.00 | 41.67

2.00 | 41.75 2.00 | 41.83

2.00 | 41.92 2.00 | 42.00

2.00 42.08 22.99

2.00 | 42.17 23.00 2.00 | 42.25 23.00

2.00 | 42.33 23.00 2.00 | 42.42 23.00

2.00 42.50 23.00

17.00

17.00

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17.00

17.00

17.00

13.00

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13.00

13.00 13.00

13.00

13.00

13.00

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2.00 |27.833
2.00 |27.917
                                     2.00 |15.833
                      3.917
                                    2.00 115.917
                                                                                            2.00 | 39.92
                                                                                                                     13.00
                      4.000
                                   2.00 | 16.000
2.00 | 16.083
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                                    2.00 |16.167
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                                                                2.00 | 28.167
                                                                                           2.00 | 40.17
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                                                               2.00 |28.250
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                                    2.00 | 16.333
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                                     2.00 |16.667
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                                                                2.00 | 28.750
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                                    2.00 | 16.750
                                                                                           2.00 | 40.75
                                                                                                                     17.00
                                                                                          2.00 | 40.73 | 17.00
2.00 | 40.83 | 17.00
2.00 | 40.92 | 17.00
2.00 | 41.00 | 17.00
2.00 | 41.08 | 13.00
                      4.833
                                    2.00 | 16.833
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                                                               2.00 |29.167
2.00 |29.250
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                                    2.00 117.417
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                                    2.00 117.583
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2.00 | 41.67 | 13.00

2.00 | 41.75 | 13.00

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                                                                2.00 | 30.417
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2.00 | 43.17 | 13.00
                                                                2.00 |30.917
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                                    2.00 | 19.167
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                                                                                                                     13.00
                                    2.00 | 19.333
                                                              2.00 |31.333 | 2.00 | 43.33 | 13.00
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%;20writeup/Appendix%20C%20-%20VO%20Modelling/Existing/Vooutput.txt[8/19/2024 12:25:03 PM] file://Ca0004-ppfss01/...61414473/design/report/FSR/SWM%;20writeup/Appendix%20C%20-%20VO%20Modelling/Existing/Vooutput.txt[8/19/2024 12:25:03 PM]
                    Unit Hyd Qpeak (cms)= 0.302
        PEAK FLOW (cms)= 0.529 (i)
TIME TO PEAK (hrs)= 46.333
        RUNOFF VOLUME (mm)= 235.999
TOTAL RAINFALL (mm)= 285.000
RUNOFF COEFFICIENT = 0.828
         (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
    CALIB
   NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                            -- TRANSFORMED HYETOGRAPH -
                      TIME RAIN | TIME R
                                   2.00 | 12.333
2.00 | 12.417
                                                                                           2.00 | 36.33
2.00 | 36.42
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                                                               2.00 24.500
                                                                                           2.00 | 36.50
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                      0.583
                                   2.00 |12.583
2.00 |12.667
                                                               2.00 |24.583
2.00 |24.667
                                                                                           2.00 | 36.58
                                                                                                                      6.00
                      0.667
                                                                                                                      6.00
                      0.750
                                    2 00 112 750
                                                                2 00 24 750
                                                                                           2.00 | 36.75
                                                               2.00 |24.833
2.00 |24.917
                                    2.00 | 12.833
                                                                                           2.00 | 36.83
                                    2.00 12.917
                      0.917
                                                                                           2.00 | 36.92
                                                                                                                      6.00
                                    2.00 | 13.000
                                                               2.00 |25.000
2.00 |25.083
                                                                                           2.00 | 37.00
2.00 | 37.08
                      1.000
                      1.083
                                    2.00 13.083
                                                                                                                      4.00
                                                               2.00 |25.167
2.00 |25.250
                                                                                           2.00 | 37.17
2.00 | 37.25
                      1.167
                                    2.00 13.167
                                     2.00 | 13.107
                      1.333
                                    2.00 113.333
                                                                2.00 | 25.333
                                                                                           2.00 | 37.33
                                                                                                                      4.00
                                                               2.00 |25.417
2.00 |25.500
                                                                                           2.00 | 37.42
2.00 | 37.50
                                     2.00 |13.417
                      1.500
                                    2.00 | 13.500
                                                                                                                      4.00
                                                               2.00 |25.583
2.00 |25.667
2.00 |25.750
                                                                                           2.00 | 37.58
2.00 | 37.67
2.00 | 37.75
                      1 583
                                    2.00 |13.583
2.00 |13.667
                       1.667
                      1.750
                                    2.00 113.750
                                                                                                                      4.00
                      1.833
                                    2.00 |13.833
2.00 |13.917
                                                               2.00 |25.833
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                      1.917
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                      2 000
                                    2 00 114 000
                                                                2.00 | 26.000
                                                                                           2.00 | 38.00
                                                                                                                      4.00
                      2.083
                                    2.00 | 14.083
                                                                2.00 |26.083
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                      2.167
                                    2.00 14.167
                                                               2 00 26 167
                                                                                           2 00 | 38 17
                                                                                                                      6.00
                                    2.00 | 14.250
                                                                2.00 |26.250
                      2.333
                                   2.00 | 14.333 | 2.00 | 26.333 | 2.00 | 38.33 | 6.00
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2 917

3.000

3.083

3 333

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3.583

3.667

3.750

2 00 114 917

2.00 | 15.000

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2.00 |15.167 2.00 |15.250

2 00 115 333

2.00 | 15.417

2.00 | 15.500

2.00 |15.583 2.00 |15.667

2.00 | 15.750

2 00 |26 917

2.00 |20.917 2.00 |27.000 2.00 |27.083

2.00 |27.167 2.00 |27.250

2 00 27 333

2.00 |27.417 2.00 |27.500

2.00 |27.583 2.00 |27.667

2.00 |27.750

2 00 | 38 92

2.00 | 39.00

2.00 | 39.08

2.00 | 39.17 2.00 | 39.25

2 00 | 39 33

2.00 | 39.42

2.00 | 39.50

2.00 | 39.58

2.00 | 39.75

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7.417
          2.00 | 19.417
                             2.00 | 31.417
                                                2.00 | 43.42 | 13.00
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          2.00 |19.500
2.00 |19.583
                             2.00 |31.500
2.00 |31.583
                                                2.00 | 43.50
2.00 | 43.58
                                                                  13.00
                             2.00 |31.667
2.00 |31.750
                                                2.00 | 43.67
2.00 | 43.75
 7.667
           2.00 19.667
                                                2.00 | 43.83
 7.833
          2.00 119.833
                             2.00 31.833
                                                                  13.00
          2.00 |19.917
2.00 |20.000
                             2.00 |31.917
2.00 |32.000
                                                2.00 | 43.92
2.00 | 44.00
                                                                  13.00
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           2.00 |20.167
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          2.00 |20.333
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                                                2.00 | 44.67
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          2.00 |20.750
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                             2.00 |32.750
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                             2.00 |33.167
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                                                2.00 | 45.17 53.00
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          2.00 |21.333
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                             2.00 33.333
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           2.00 |21.583
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          2.00 |21.750
2.00 |21.833
                             2.00 |33.750
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                                                2.00 | 45.75
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                                                2.00 45.92 53.00
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           2.00 |22.000
2.00 |22.083
                              2.00 |34.000
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10.083
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                              2.00 | 34.333
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           2.00 |22.417
                              2.00 |34.417
                                                 2.00 | 46.42
           2.00 |22.500
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                              2.00 34.500
                                                 2.00 | 46.50
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           2.00 |22.583
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2.00 |35.083
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         2.00 | 18.750 | 2.00 | 30.750 | 2.00 | 42.75 | 23.00 | 2.00 | 18.833 | 2.00 | 30.833 | 2.00 | 42.83 | 23.00 |
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                                                   2 00 | 42 92 23 00
           2.00 | 19.000
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                                                   2.00 | 43.08 | 13.01
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7 3 3 3
           2 00 119 333
                               2 00 31 333
                                                   2.00 | 43.33 | 13.00
           2.00 | 19.417
                               2.00 |31.417
                                                   2.00 | 43.42
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           2.00 | 19.500
                               2.00 | 31.500
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           2.00 |19.583
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                               2.00 31.917
                                                   2.00 | 43.92
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                                                   2.00 | 43.92

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          2.00 |20.000 |2.00 |20.083
                               2.00 |32.000
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           2.00 20.167
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           2.00 |20.107
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                                                   2.00 | 44.42
2.00 | 44.50
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           2.00 |20.417
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           2.00 |20.667
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                                                  2.00 | 45.17 | 53.00

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            2.00 |23.167
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            2 00 23 250
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                                                    3.00 | 47.25
           2.00 |23.333
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2.00 |36.000 | 3.00 | 48.00
                                                                                                                                                                                                                                                                                                                             12.000
                                                                                                                                                                                                                                                                                                               Unit Hyd Qpeak (cms)= 0.395
                                                                                                                                                                                                                                                                                                               PEAK FLOW
                                                                                                                                                                                                                                                                                                              PEAK FLOW (cms)= 1.097 (i)
TIME TO PEAK (hrs)= 47.167
                                                                                                                                                                                                                                                                                                              RUNOFF VOLUME (mm)= 234.961
TOTAL RAINFALL (mm)= 285.000
                                                                                                                                                                                                                                                                                                               RUNOFF COEFFICIENT = 0.824
                                                                                                                                                                                                                                                                                                              (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                                                                                                                                                                                                       NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                                                                                                                                                                                                                                                                                                          TRANSFORMED HYETOGRAPH -
                                                                                                                                                                                                                                                                                                                             TIME RAIN | TIME R
                                                                                                                                                                                                                                                                                                                             0.333
                                                                                                                                                                                                                                                                                                                                              2.00 | 12.333 | 2.00 | 24.333
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                                                                                                                                                                                                                                                                                                                                                                                2.00 |24.583
2.00 |24.667
                                                                                                                                                                                                                                                                                                                                                                                                                 2.00 | 36.58
2.00 | 36.67
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                                                                                                                                                                                                                                                                                                                             0.667
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                                                                                                                                                                                                                                                                                                                                               2.00 |12.730
2.00 |12.833
2.00 |12.917
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2.00 |24.917
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2.00 | 36.92
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2.00 |25.083
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2.00 | 37.08
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                                                                                                                                                                                                                                                                                                                                                                                                                2.00 | 37.67
2.00 | 37.75
                                                                                                                                                                                                                                                                                                                                                                                2.00 |25.750
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                                                                                                                                                                                                                                                                                                                                               2.00 |13.833 | 2.00 |25.833
                                                                                                                                                                                                                                                                                                                                                                                                                2.00 | 37.83
file:///Ca0004-ppfss01/...61414473/design/report/FR/SWM%20writeup/Appendix%20V020-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM] file://Ca0004-ppfss01/...61414473/design/report/FR/SWM%20writeup/Appendix%20V0%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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2.00 14.000
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                                                  2.00 | 38.00
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2.00 | 38.17
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          2.00 114.250
                               2.00 | 26.250
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          2.00 | 14.333
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2.00 | 38.42
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          2.00 |14.500
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2 917
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          2.00 |15.333
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          2.00 |15.750
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                              2.00 |34.583
                                                2.00 | 46.58
                             2.00 |34.667
                                                2.00 | 46.67
10.667
                                                                 38.00
10.750
           2 00 22 750
                             2 00 |34 750
                                                2 00 | 46 75 38 00
          2.00 |22.833 | 2.00 |34.833 | 2.00 | 46.83 | 38.00
10.833
```

```
10 917
                                               2 00 22 917 2 00 34 917
                                                                                                                      2 00 | 46 92 38 00
                                                2.00 |23.000
                                                                                    2.00 |35.000
                                                                                                                       2.00 | 47.00 38.00
                           11.000
                           11.083
                                               2.00 |23.083
                                                                                    2.00 | 35.083
                                                                                                                       3.00 | 47.08
                                                                                                                                                       13.04
                                               2.00 |23.167
2.00 |23.250
                                                                                    2.00 |35.167
2.00 |35.250
                                                                                                                       3.00 | 47.17
3.00 | 47.25
                           11 333
                                               2 00 23 333
                                                                                    2 00 35 333
                                                                                                                       3.00 | 47.33
                                                                                                                                                       13.00
                                              2.00 |23.417
2.00 |23.500
                                                                                    2.00 |35.417
                                                                                                                        3.00 | 47.42
                                                                                    2.00 35.500
                           11.500
                                                                                                                       3.00 | 47.50
                                                                                                                                                       13.00
                                               2.00 |23.583
2.00 |23.667
                                                                                   2.00 |35.583
2.00 |35.667
                                                                                                                      3.00 | 47.58
                            11.583
                           11.667
                                                                                                                                                       13.00
                           11.750
                                              2.00 |23.750
                                                                                 2.00 | 35.750
                                                                                                                      3.00 | 47.75 | 13.00
                                               2.00 |23.833
                                                                                    2.00 |35.833
                                                                                                                       3.00 | 47.83
                           11.917
                                               2.00 23.917
                                                                                    2.00 35.917
                                                                                                                      3.00 | 47.92 | 13.00
                            12.000 2.00 24.000 2.00 36.000 3.00 48.00 13.00
           Unit Hyd Qpeak (cms)= 0.018
          \begin{array}{ll} \text{PEAK FLOW} & \text{(cms)=} & 0.006 \text{ (i)} \\ \text{TIME TO PEAK} & \text{(hrs)=} & 46.000 \\ \text{RUNOFF VOLUME} & \text{(mm)=} 235.028 \\ \text{TOTAL RAINFALL} & \text{(mm)=} & 285.000 \\ \text{RUNOFF COEFFICIENT} & = & 0.825 \\ \end{array}
           (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
    | ADD HYD ( 0022)|
       1 + 2 = 3 | AREA QPEAK TPEAK R.V.
             The component of the co
               ID = 3 ( 0022): 10.61 1.098 47.17 234.96
           NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
      ADD HYD ( 0022)|
3 + 2 = 1 | AREA QPEAK TPEAK R.V.
             ID = 1 ( 0022): 14.94 1.573 47.00 235.26
           NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
    | NASHYD ( 0102)| Area (ha)= 7.24 Curve Number (CN)= 82.0
|ID=1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%;20writeup/Appendix%20C%20-%20VO%20Modelling/Existing/Vooutput.txt[8/19/2024 12:25:03 PM] file://Ca0004-ppfss01/...61414473/design/report/FSR/SWM%;20writeup/Appendix%20C%20-%20VO%20Modelling/Existing/Vooutput.txt[8/19/2024 12:25:03 PM]
```

```
NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP
                    - TRANSFORMED HYETOGRAPH --
     TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN hrs mm/hr |              2.00 |12.083 | 2.00 |24.083
2.00 |12.167 | 2.00 |24.167
2.00 |12.250 | 2.00 |24.250
                                                  2.00 | 36.08
     0.083
                                                  2.00 | 36.17
     0.250
                                                  2.00 | 36.25
                                                                    6.00
                                2.00 |24.333
2.00 |24.417
     0.333
              2.00 | 12.333
                                                   2.00 | 36.33
              2.00 12.417
                                                   2.00 | 36.42
     0.417
                                                                    6.00
     0.500
             2.00 |12.500
2.00 |12.583
                                2.00 |24.500
2.00 |24.583
                                                  2.00 | 36.50
2.00 | 36.58
     0.583
                                                                    6.00
     0.667
              2.00 12.667
                                2.00 |24.667
                                                   2.00 | 36.67
                                                                    6.00
              2.00 | 12.750
2.00 | 12.833
                                2.00 |24.750
2.00 |24.833
                                                  2.00 | 36.75
2.00 | 36.83
     0.833
                                                                    6.00
     0.917
              2.00 12.917
                                2.00 |24.917
                                                   2.00 | 36.92
                                                                    6.00
               2.00 |12.917
                                2.00 |25.000
2.00 |25.083
                                                   2.00 | 37.00
     1.083
              2.00 113.083
                                                  2.00 | 37.08
                                                                     4.00
                                2.00 |25.167
2.00 |25.250
               2.00 |13.167
                                                   2.00 | 37.17
              2.00 | 13.250
                                                   2.00 | 37.25
     1.250
     1 333
              2.00 13.333
                                2.00 | 25.333
                                                  2.00 | 37.33
2.00 | 37.42
               2.00 |13.417
                                2.00 |25.417
     1.500
              2 00 113 500
                                2 00 25 500
                                                  2.00 | 37.50
                                                                    4 00
      1.583
               2.00 |13.583
                                2.00 |25.583
     1.667
               2.00 | 13.667
                                2.00 | 25.667
                                                   2.00 | 37.67
                                                                     4.00
      1.750
              2.00 |13.750
2.00 |13.833
                                2.00 |25.750
2.00 |25.833
                                                   2.00 | 37.75
2.00 | 37.83
     1.917
              2.00 13.917
                                2.00 | 25.917
                                                   2.00 | 37.92
                                                                    4.00
               2.00 |14.000
                                2.00 |26.000
2.00 |26.083
                                                   2.00 | 38.00
2.00 | 38.08
     2.083
              2.00 14.083
                                                                    6.00
     2.167
2.250
              2.00 |14.167
2.00 |14.250
                                2.00 |26.167
2.00 |26.250
                                                  2.00 | 38.17
2.00 | 38.25
                                                                    6.00
                                                                    6.00
     2.333
              2.00 114.333
                                2.00 | 26.333
                                                  2.00 | 38.33
                                                                    6.00
               2.00 |14.417
                                2.00 |26.417
                                2.00 |26.500
     2.500
              2.00 114.500
                                                  2.00 | 38.50
                                                                    6.00
     2.583
2.667
              2.00 |14.583
2.00 |14.667
                                2.00 |26.583
2.00 |26.667
                                                  2.00 | 38.58
2.00 | 38.67
                                                                    6.00
     2.750
              2 00 114 750
                                2.00 | 26.750
                                                  2.00 | 38.75
                                                                    6.00
              2.00 |14.833
2.00 |14.917
                                2.00 |26.833
2.00 |26.917
                                                   2.00 | 38.83
2.00 | 38.92
     2.917
              2.00 |15.000
2.00 |15.083
                                2.00 |27.000
2.00 |27.083
                                                  2.00 | 39.00
2.00 | 39.08
     3 000
                                                                     6.00
     3.083
                                                                    13.00
     3 167
              2 00 115 167
                                2.00 | 27.167
                                                   2 00 | 39 17
                                                                    13.00
               2.00 |15.250
                                2.00 |27.250
               2.00 15.333
     3.333
                                2.00 | 27.333
                                                   2.00 | 39.33
                                                                    13.00
              2.00 |15.417
2.00 |15.500
                                2.00 |27.417
2.00 |27.500
                                                  2.00 | 39.42
2.00 | 39.50
     3.417
                                                                   13.00
13.00
     3.500
                                2.00 |27.583
2.00 |27.667
2.00 |27.750
     3.583
              2.00 | 15.583
                                                  2.00 | 39.58
                                                                    13.00
               2.00 |15.667
                                                   2.00 | 39.67
                                                                    13.00
     3.667
     3.750
              2.00 115.750
                                                  2.00 | 39.75
                                                                    13.00
              2.00 |15.833 | 2.00 |27.833
```

----- U.H. Tp(hrs)= 0.30

```
3.917
                           2.00 | 15.917
                                              2.00 |27.917
                          2.00 16.000
                                               2.00 28.000 2.00 40.00 13.00
                4.000
                          2.00 |16.083
2.00 |16.167
                                               2.00 |28.083
2.00 |28.167
                                                                    2.00 | 40.08
2.00 | 40.17
                                                                                       17.00
17.00
                4.083
                4.167
                4.250
                          2.00 | 16.250
                                                2.00 | 28.250
                                                                    2.00 | 40.25
                                                                                        17.00
                          2.00 | 16.333
2.00 | 16.417
                                               2.00 |28.333
2.00 |28.417
                                                                    2.00 | 40.23
2.00 | 40.42
                4.417
                                                                                       17.00
                          2.00 |16.500
2.00 |16.583
                                                                    2.00 | 40.50 17.00
2.00 | 40.58 17.00
                4.500
                                                2.00 | 28.500
                4.583
                                                2.00 |28.583
                4.667
                           2.00 116.667
                                                2.00 |28.667
                                                                     2.00 | 40.67
                                                                                        17.00
                                               2.00 |28.750
2.00 |28.833
                                                                    2.00 | 40.75 | 17.00
2.00 | 40.83 | 17.00
                           2.00 |16.750
                4.833
                          2.00 | 16.833
                4 917
                           2.00 |16.917
2.00 |17.000
                                               2.00 |28.917
2.00 |29.000
                                                                    2.00 | 40.92 17.00
2.00 | 41.00 17.00
                5.000
                5.083
                           2 00 117 083
                                                2 00 29 083
                                                                    2 00 | 41 08
                                                                                        13.00
                                               2.00 |29.167
2.00 |29.250
                                                                    2.00 | 41.17 | 13.00
2.00 | 41.25 | 13.00
                           2.00 | 17.167
                5.250
                          2.00 | 17.250
                                               2.00 |29.333
2.00 |29.417
                                                                    2.00 | 41.33 | 13.00
2.00 | 41.42 | 13.00
2.00 | 41.50 | 13.00
                5.333
                           2.00 | 17.333
                           2.00 17.417
                5.417
                5 500
                          2 00 17 500
                                                2 00 29 500
                 5.583
                           2.00 | 17.583
                                               2.00 |29.583
2.00 |29.667
                                                                    2.00 | 41.58 | 13.00
2.00 | 41.67 | 13.00
                           2.00 17.667
                5.667
                          2.00 | 17.750
2.00 | 17.833
                                               2.00 |29.750
2.00 |29.833
                                                                    2.00 | 41.75 | 13.00
2.00 | 41.83 | 13.00
                5.750
                5.833
                                                                   2.00 | 41.83 | 13.00

2.00 | 41.92 | 13.00

2.00 | 42.00 | 13.00

2.00 | 42.08 | 22.99

2.00 | 42.17 | 23.00

2.00 | 42.25 | 23.00
                5.917
                           2.00 117.917
                                                2.00 29.917
                           2.00 |18.000
                                                2.00 |30.000
                6.083
                          2.00 | 18.083
                                               2.00 30.083
                6.167
                           2.00 | 18.167
2.00 | 18.250
                                               2.00 |30.167
2.00 |30.250
                6.250
                                                                   2.00 | 42.25 | 23.00

2.00 | 42.33 | 23.00

2.00 | 42.42 | 23.00

2.00 | 42.50 | 23.00

2.00 | 42.67 | 23.00

2.00 | 42.67 | 23.00
                6 3 3 3
                          2.00 18.333
                                                2.00 30.333
                           2.00 | 18.417
                                                2.00 |30.417
                6.417
                6.500
                          2.00 18.500
                                               2.00 30.500
                6.583
                          2.00 | 18.583 | 2.00 | 18.667
                                               2.00 |30.583
2.00 |30.667
                6.667
                6.750
                           2 00 118 750
                                                2 00 30 750
                                                                    2.00 42.75 23.00
                                                                    2.00 | 42.83 | 23.00
2.00 | 42.92 | 23.00
                           2.00 | 18.833
                                                2.00 |30.833
                6.917
                           2.00 | 18.917
                                                2.00 | 30.917
                7.000
                           2.00 |19.000
2.00 |19.083
                                               2.00 |31.000
2.00 |31.083
                                                                    2.00 | 43.00 23.00
2.00 | 43.08 13.01
                7.083
                                                                   2.00 | 43.17 | 13.00
2.00 | 43.25 | 13.00
2.00 | 43.33 | 13.00
2.00 | 43.42 | 13.00
2.00 | 43.50 | 13.00
                                               2.00 |31.167
2.00 |31.250
                7.167
                           2.00 19.167
                           2.00 | 19.250
                7.333
                           2.00 119.333
                                                2.00 31.333
                 7.417
                           2.00 | 19.417
                                                2.00 |31.417
                7.500
                           2.00 19.500
                                                2.00 | 31.500
                                                                    2.00 | 43.58
2.00 | 43.67
2.00 | 43.75
                 7.583
                          2.00 | 19.583
2.00 | 19.667
                                               2.00 |31.583
2.00 |31.667
                 7.667
                7.750
                           2.00 119.750
                                                2.00 31.750
                                                                                        13.00
                                               2.00 |31.833
2.00 |31.917
                                                                    2.00 | 43.83
2.00 | 43.92
                 7.833
                           2.00 |19.833
                                                                                        13.00
                7.917
                           2.00 19.917
                                                                   2.00 | 44.00
2.00 | 44.08
2.00 | 44.17
                8 000
                           2.00 20.000
                                                2.00 32.000
                                                                                        13.00
                8.083
                           2.00 |20.083
                                                2.00 |32.083
                8.167
                          2 00 20 167
                                               2.00 32.167
                                                                                       13.00
                                                                    2.00 | 44.25
                           2.00 |20.250
                                                2.00 |32.250
                8.333
                          2.00 | 20.333 | 2.00 | 32.333 | 2.00 | 44.33 | 13.00
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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```
2.00 |20.417
2.00 |20.500
                             2.00 |32.417 | 2.00 | 44.42 | 13.00 | 2.00 |32.500 | 2.00 | 44.50 | 13.00
8 4 1 7
8.500
8 583
          2 00 20 583
                               2 00 32 583
                                                  2.00 44.58 13.00
                               2.00 |32.667
           2.00 | 20.667
8.750
           2.00 | 20.750
                               2.00 | 32,750
                                                  2.00 | 44.75
                                                                     13.00
                                                 2.00 | 44.75 | 13.00

2.00 | 44.83 | 13.00

2.00 | 44.92 | 13.00

2.00 | 45.00 | 13.00

2.00 | 45.08 | 52.95

2.00 | 45.17 | 53.00
 8.833
           2.00 |20.833
2.00 |20.917
                               2.00 |32.833
2.00 |32.917
8.917
9.000
          2 00 21 000
                               2 00 33 000
           2.00 |21.083
                               2.00 |33.083
                               2.00 33.167
9.167
           2.00 | 21.167
          2.00 |21.250
2.00 |21.333
                               2.00 |33.250
2.00 |33.333
                                                  2.00 | 45.25 53.00
2.00 | 45.33 53.00
9.250
9.333
9.417
          2.00 21.417
                               2.00 | 33.417
                                                  2.00 | 45.42 53.00
2.00 | 45.50 53.00
           2.00 |21.500
                               2.00 |33.500
                                                  2.00 | 45.58
9.583
          2.00 21.583
                               2.00 33.583
                                                                     53.00
          2.00 |21.667
2.00 |21.750
                              2.00 |33.667
2.00 |33.750
                                                  2.00 | 45.67 53.00
2.00 | 45.75 53.00
 9.667
9.750
          2.00 |21.833
2.00 |21.917
                                                  2.00 | 45.83 53.00
2.00 | 45.92 53.00
9.833
                               2.00 33.833
                               2.00 |33.917
10 000
           2 00 22 000
                               2 00 34 000
                                                    2 00 | 46 00
                                                                     53.00
10.083
           2.00 |22.000
2.00 |22.083
2.00 |22.167
                                2.00 |34.083
2.00 |34.167
                                                   2.00 | 46.08
2.00 | 46.17
                                                                     38.02
38.00
10.167
10.250
           2 00 22 250
                                2.00 34.250
                                                    2.00 | 46.25 38.00
            2.00 |22.333
                                2.00 |34.333
                                                    2.00 | 46.33
10.417
            2.00 | 22.417
                                2.00 | 34.417
                                                    2.00 | 46.42
                                                                     38.00
10.500
10.583
           2.00 |22.500
2.00 |22.583
                               2.00 |34.500
2.00 |34.583
                                                   2.00 | 46.50
2.00 | 46.58
                                                                     38.00
10.667
           2.00 |22.667
2.00 |22.750
                               2.00 |34.667
2.00 |34.750
                                                   2.00 | 46.67 38.00
2.00 | 46.75 38.00
10.833
            2.00 | 22.833
                                2.00 34.833
                                                    2.00 | 46.83
           2.00 |22.917
2.00 |23.000
                               2.00 |34.917
2.00 |35.000
                                                   2.00 | 46.92 38.00
2.00 | 47.00 38.00
11.000
11.083
           2.00 |23.083
2.00 |23.167
                                2.00 |35.083
2.00 |35.167
                                                   3.00 | 47.08
3.00 | 47.17
11.250
            2.00 | 23.250
                                2.00 | 35.250
                                                    3.00 | 47.25
                                                                      13.00
           2.00 |23.333
2.00 |23.417
                                2.00 |35.333
2.00 |35.417
                                                   3.00 | 47.23
3.00 | 47.42
11.333
11.417
                                                                     13.00
11 500
           2.00 23.500
                                2.00 35.500
                                                    3.00 47.50 13.00
            2.00 |23.583
                                2.00 |35.583
                                                    3.00 | 47.58
11.583
11 667
            2 00 23 667
                                2 00 35 667
                                                    3 00 | 47 67
                                                                      13.00
           2.00 |23.750
2.00 |23.833
                              2.00 |35.750
2.00 |35.833
                                                    3.00 | 47.75
11.833
                                                   3.00 | 47.83
                                                                     13.00
11.917 2.00 |23.917 2.00 |35.917 3.00 | 47.92
12.000 2.00 |24.000 2.00 |36.000 3.00 | 48.00
```

Unit Hyd Qpeak (cms)= 0.916

PEAK FLOW (cms)= 0.993 (i) TIME TO PEAK (hrs)= 46.000 RUNOFF VOLUME (mm)= 231.471 TOTAL RAINFALL (mm)= 285.000 RUNOFF COEFFICIENT = 0.812

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

```
NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                         - TRANSFORMED HYETOGRAPH
           2.00 | 12.417
2.00 | 12.500
                                     2.00 |24.417
2.00 |24.500
                                                      2.00 | 36.42
2.00 | 36.50
            0.417
            0.500
                                                                      6.00
            0.583
                    2 00 112 583
                                     2 00 24 583
                                                      2.00 | 36.58
                                                                      6.00
                     2.00 | 12.667
                                     2.00 |24.667
                                                      2.00 | 36.67
            0.667
                                     2.00 24.750
            0.750
                    2.00 | 12.750
                                                      2.00 | 36.75
                                                                      6.00
            0.833
                    2.00 |12.833
2.00 |12.917
                                     2.00 |24.833
2.00 |24.917
                                                      2.00 | 36.83
            0.917
                                                      2.00 | 36.92
                                                                      6.00
                                     2.00 |25.000
2.00 |25.083
                                                      2.00 | 37.00
2.00 | 37.08
            1.000
                    2.00 13.000
            1.083
                     2.00 | 13.083
                                     2.00 |25.167
2.00 |25.250
2.00 |25.333
                                                      2.00 | 37.17
2.00 | 37.25
2.00 | 37.33
            1.167
                    2.00 13.167
                    2.00 |13.250
2.00 |13.333
            1.333
                                                                      4.00
            1.417
                    2.00 13.417
                                     2.00 |25.417
                                                      2.00 | 37.42
                     2.00 | 13.500
                                     2.00 |25.500
                                                      2.00 | 37.50
                                     2.00 |25.583
            1.583
                    2.00 113.583
                                                                      4.00
                                     2.00 |25.667
2.00 |25.750
                                                      2.00 | 37.67
2.00 | 37.75
                     2.00 |13.667
            1.750
                    2.00 | 13.750
                                                                      4.00
                                                      2.00 | 37.83
2.00 | 37.92
            1.833
                    2.00 13.833
                                     2.00 | 25.833
                                                                      4.00
            1.917
                     2.00 | 13.917
                                     2.00 |25.917
            2 000
                    2 00 114 000
                                     2 00 26 000
                                                      2 00 | 38 00
                                                                      4 00
                     2.00 | 14.083
                                     2.00 |26.083
                    2.00 14.167
                                                      2.00 | 38.17
            2.167
                                     2.00 | 26.167
                                                                      6.00
                    2.00 |14.250
2.00 |14.333
                                     2.00 |26.250
2.00 |26.333
                                                      2.00 | 38.25
2.00 | 38.33
            2 250
            2.417
                    2.00 | 14.417
                                     2.00 | 26.417
                                                      2.00 | 38.42
                                                                      6.00
                    2.00 |14.500
2.00 |14.583
                                     2.00 |26.500
2.00 |26.583
                                                      2.00 | 38.50
2.00 | 38.58
            2.500
            2.583
                                                                      6.00
                                     2.00 |26.667
2.00 |26.750
                                                      2.00 | 38.67
2.00 | 38.75
            2.667
                    2.00 14.667
                     2.00 | 14.750
            2.750
            2.833
                    2.00 114.833
                                     2.00 | 26.833
                                                      2.00 | 38.83
                                                                      6.00
                                     2.00 |26.917
2.00 |27.000
                                                      2.00 | 39.00
            3.000
                    2.00 115.000
                                                                      6.00
                    2.00 |15.083
2.00 |15.167
            3.083
                                     2.00 |27.083
2.00 |27.167
                                                      2.00 | 39.08
2.00 | 39.17
                                                                      13.00
13.00
            3.167
            3 250
                    2 00 115 250
                                     2 00 27 250
                                                      2 00 | 39 25
                    2.00 | 15.333
                                    2.00 |27.333
                                                     2.00 | 39.33 | 13.00
                                                     2.00 | 43.92 13.00
2.00 | 44.00 13.00
                    2.00 | 19.917
            8.000
                    2.00 | 20.000
                                     2.00 | 32.000
                                     2.00 |32.083
2.00 |32.167
                                                      2.00 | 44.08
2.00 | 44.17
                                                                      13.00
13.00
            8.083
                    2.00 | 20.083
                     2.00 |20.167
            8.167
            8.250
                    2.00 | 20.250
                                     2.00 |32.250
                                                      2.00 | 44.25
                                                                      13.00
                    2.00 |20.333
2.00 |20.417
                                     2.00 |32.333
2.00 |32.417
                                                      2.00 | 44.33 | 2.00 | 44.42
                                                                      13.00
            8.417
                                                      2.00 | 44.50 | 13.00
2.00 | 44.58 | 13.00
            8.500
                    2.00 20.500
                                     2.00 | 32.500
            8.583
                     2.00 |20.583
                                     2.00 |32.583
            8.667
                    2.00 20.667
                                     2.00 32.667
                                                      2.00 | 44.67
                                                                      13.00
                    2.00 |20.750
2.00 |20.833
                                     2.00 |32.750
2.00 |32.833
                                                      2.00 | 44.75 | 13.00
2.00 | 44.83 | 13.00
            8.833
            8 917
                    2.00 |20.917
2.00 |21.000
                                     2.00 |32.917
2.00 |33.000
                                                      2.00 | 44.92 | 13.00
2.00 | 45.00 | 13.00
            9.000
            9.083
                    2 00 21 083
                                     2 00 33 083
                                                      2 00 | 45 08
                                                                      52 95
                                                      2.00 | 45.17 53.00
2.00 | 45.25 53.00
                     2.00 |21.167
                                     2.00 |33.167
            9.250
                    2.00 | 21.250
                                     2.00 | 33,250
                                                      9.333
                    2.00 |21.333
                                     2.00 |33.333
                     2.00 21.417
                                     2.00 33.417
            9.417
            9 500
                    2 00 21 500
                                     2 00 33 500
            9.583
                    2.00 |21.583
                                     2.00 |33.583
                                                      2.00 | 45.58 53.00
2.00 | 45.67 53.00
                    2.00 21.667
                                     2.00 33.667
            9.667
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2.00 |29.583
2.00 |29.667
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                                                                                                                                                                          5.750
                                                                                                                                                                                   2.00 |17.750
2.00 |17.833
                                                                                                                                                                                                     2.00 |29.750
2.00 |29.833
                                                                                                                                                                                                                       2.00 | 41.75
2.00 | 41.83
                                                                                                                                                                          5.917
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                                                                                                                                                                                                                       2.00 41.92 13.00
                                                                                                                                                                                   2.00 |18.000
                                                                                                                                                                                                     2.00 |30.000
2.00 |30.083
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2.00 | 42.08
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                                                                                                                                                                                                                                        22.99
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                                                                                                                                                                          6.167
6.250
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2.00 |18.250
                                                                                                                                                                                                     2.00 |30.167
2.00 |30.250
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2.00 | 42.25
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2.00 | 42.42 23.00
2.00 | 42.50 23.00
                                                                                                                                                                          6.333
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2.00 |18.667
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2.00 |30.667
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2.00 | 42.67 23.00
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2.00 | 42.83 | 23.00
2.00 | 42.92 | 23.00
                                                                                                                                                                          6.750
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                                                                                                                                                                                                     2 00 30 750
                                                                                                                                                                                   2.00 |18.833
2.00 |18.917
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2.00 |30.917
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2.00 |19.083
                                                                                                                                                                                                     2.00 |31.000
2.00 |31.083
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2.00 | 43.08 13.01
                                                                                                                                                                          7.000
                                                                                                                                                                          7.083
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                                                                                                                                                                                                     2.00 |31.250
                                                                                                                                                                          7.333
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2.00 |19.500
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2.00 |31.500
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2.00 | 43.50
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13.00
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                                                                                                                                                                                                     2.00 |31.667
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                                                                                                                                                                                   2.00 119.750
                                                                                                                                                                                                                       2.00 | 43.75
                                                                                                                                                                                                                                        13.00
                                                                                                                                                                                   2.00 |19.833 | 2.00 |31.833
                                                                                                                                                                                                                      2.00 | 43.83 | 13.00
file:///Ca0004-ppfss01/...61414473/design/report/FR/SWM%20writeup/Appendix%20V020-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM] file://Ca0004-ppfss01/...61414473/design/report/FR/SWM%20writeup/Appendix%20V0%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
                                                                                                                                                                  TIME TO PEAK (hrs)= 46.417
RUNOFF VOLUME (mm)= 223.933
TOTAL RAINFALL (mm)= 285.000
RUNOFF COEFFICIENT = 0.786
                                                                                                                                                                  (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                                                                                                                                                               CALIB
                                                                                                                                                              NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                                                                                                                                        -- TRANSFORMED HYETOGRAPH --
                                                                                                                                                                           TIME RAIN | TIME RAIN | TIME RAIN | TIME
                                                                                                                                                                           0.083 2.00 | 12.083 2.00 | 24.083 2.00 | 36.08 6.00 | 0.167 2.00 | 12.167 2.00 | 24.167 2.00 | 36.17 6.00
                                                                                                                                                                          0.083
                                                                                                                                                                          0.167
                                                                                                                                                                          0.250
                                                                                                                                                                                  2.00 | 12.250 | 2.00 | 24.250 | 2.00 | 36.25
                                                                                                                                                                                                                                        6.00
                                                                                                                                                                                   2.00 |12.333
                                                                                                                                                                                                     2.00 |24.333
                                                                                                                                                                          0.417
                                                                                                                                                                                   2.00 | 12.417
                                                                                                                                                                                                     2.00 |24.417
                                                                                                                                                                                                                       2.00 | 36.42
                                                                                                                                                                                                                                        6.00
                                                                                                                                                                                   2.00 |12.500
2.00 |12.583
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2.00 |24.583
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2.00 | 36.58
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0.583
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                                                                                                                                                                          0.667
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2.00 |12.750
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2.00 |24.750
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2.00 | 36.75
                                                                                                                                                                                                                                        6.00
                                                                                                                                                                          0.833
                                                                                                                                                                                   2.00 112.833
                                                                                                                                                                                                     2.00 | 24.833
                                                                                                                                                                                                                       2.00 | 36.83
                                                                                                                                                                                                                                        6.00
                                                                                                                                                                                   2.00 |12.917
                                                                                                                                                                                                     2.00 |24.917
2.00 |25.000
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2.00 | 37.00
                                                                                                                                                                          1.000
                                                                                                                                                                                   2.00 | 13.000
                                                                                                                                                                                                                                        6.00
                                                                                                                                                                                   2.00 |13.083
2.00 |13.167
                                                                                                                                                                                                     2.00 |25.083
2.00 |25.167
                                                                                                                                                                                                                       2.00 | 37.08
2.00 | 37.17
                                                                                                                                                                           1.083
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                                                                                                                                                                                   2.00 113.250
                                                                                                                                                                                                     2.00 |25.250
                                                                                                                                                                                                                       2.00 | 37.25
                                                                                                                                                                                                                                        4.00
                                                                                                                                                                                   2.00 |13.230
2.00 |13.333
2.00 |13.417
                                                                                                                                                                                                     2.00 |25.230
2.00 |25.333
2.00 |25.417
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2.00 | 37.42
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2.00 |25.833
                                                                                                                                                                                    2.00 |13.750
                                                                                                                                                                          1.833
                                                                                                                                                                                   2.00 | 13.833
                                                                                                                                                                                                                       2.00 | 37.83
                                                                                                                                                                                                                                        4.00
                                                                                                                                                                                   2.00 |13.917
2.00 |14.000
                                                                                                                                                                                                     2.00 |25.917
2.00 |26.000
                                                                                                                                                                                                                       2.00 | 37.92
2.00 | 38.00
                                                                                                                                                                          1.917
                                                                                                                                                                                                                                        4.00
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                                                                                                                                                                          2.000
                                                                                                                                                                          2.083
                                                                                                                                                                                   2.00 14.083
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                                                                                                                                                                                                                       2.00 | 38.08
                                                                                                                                                                                                                                        6.00
                                                                                                                                                                                    2.00 |14.167
                                                                                                                                                                                                     2.00 |26.167
                                                                                                                                                                                                                       2.00 | 38.17
                                                                                                                                                                          2.250
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                                                                                                                                                                                                     2.00 | 26.250
                                                                                                                                                                                                                       2.00 | 38.25
                                                                                                                                                                                                                                        6.00
                                                                                                                                                                                                     2.00 |26.333
2.00 |26.417
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2.00 | 38.42
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                                                                                                                                                                                    2.00 |14.417
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                                                                                                                                                                                                                                        6.00
                                                                                                                                                                                                     2.00 |26.583
2.00 |26.667
                                                                                                                                                                          2.583
                                                                                                                                                                                    2.00 |14.583
                                                                                                                                                                                                                       2.00 | 38.67
                                                                                                                                                                          2.667
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                                                                                                                                                                                   2.00 | 14.833 | 2.00 | 26.833 | 2.00 | 38.83
                                                                                                                                                                          2.833
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3.417

3.500 3.583

3.833

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4.417

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5 3 3 3

5 500

2.00 | 15.417

2.00 |15.500 2.00 |15.583

2 00 115 667

2.00 | 15.833

2.00 |15.917

2.00 | 16.000

2.00 16.083

2.00 |16.167

2.00 16.250

2.00 | 16.333

2.00 16.417

2.00 |16.500 2.00 |16.583

2.00 116.667

2.00 |16.750 2.00 |16.833

2.00 |16.917 2.00 |17.000

2.00 117.083

2.00 |17.167 2.00 |17.250

2.00 |17.333 2.00 |17.417

2 00 117 500

2.00 | 27.417

2.00 |27.500 2.00 |27.583

2.00 |27.667 2.00 |27.750 2.00 |27.833

2.00 |27.917 2.00 |28.000

2 00 28 083

2.00 |28.167

2.00 | 28.250

2.00 |28.333 2.00 |28.417

2.00 |28.500 2.00 |28.583

2.00 | 28.667

2.00 |28.750 2.00 |28.833

2.00 |28.917

2.00 |29.000 2.00 |29.083

2.00 |29.167 2.00 |29.250

2.00 |29.333 2.00 |29.417

2 00 29 500

2.00 | 39.42

2.00 | 39.50 2.00 | 39.58

2.00 | 39.67 2.00 | 39.75

2.00 | 39.83

2.00 | 39.92

2.00 | 40.08

2.00 | 40.17

2.00 | 40.25

2.00 | 40.33 2.00 | 40.42

2.00 | 40.50 2.00 | 40.58

2.00 | 40.67

2.00 | 40.75 2.00 | 40.83

2.00 | 40.92 2.00 | 41.00

2.00 | 41.08

2.00 | 41.17 2.00 | 41.25

2.00 | 41.33 2.00 | 41.42

2.00 | 41.50

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12.000 2.00 24.000
                                  2.00 | 36.000 | 3.00 | 48.00 | 13.00
    Unit Hyd Qpeak (cms)= 0.066
    PEAK FLOW (cms)= 0.122 (i)
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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2.00 |21.750 2.00 |21.833

2.00 21.917

2.00 |21.017 2.00 |22.000 2.00 |22.083

2.00 |22.167 2.00 |22.250

2 00 22 333

2.00 |22.417

2.00 22.500

2 00 22 583

2.00 |22.565

2 00 22 750

2.00 |22.833 2.00 |22.917

2.00 |23.000 2.00 |23.083

2.00 |23.167 2.00 |23.250

2.00 | 23.333

2.00 |23.417

2.00 |23.500

2.00 |23.583 2.00 |23.667

2.00 |23.750

2.00 |23.833 2.00 |23.917

9.750

9.833 9.917

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10.083

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10.250 10 333

10.417 10.500

10.583

10.667 10.750

10.917

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11.333

11.417

11.500

11 583

11.750

11.833

11.917

2.00 |33.750 2.00 |33.833

2.00 |33.917

2.00 |34.000 2.00 |34.083

2.00 |34.167 2.00 |34.250

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2.00 |34.417

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2.00 |34.583 2.00 |34.667

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2.00 | 34.917

2.00 |35.000 2.00 |35.083

2.00 | 35.167

2.00 |35.250

2.00 35.333

2.00 |35.417

2.00 |35.500

2.00 |35.583 2.00 |35.667

2.00 | 35.750

2.00 |35.833 2.00 |35.917

2.00 | 45.75 53.00 2.00 | 45.83 53.00

2.00 | 45.92 53.00

2.00 | 46.33 | 38.00

2.00 46.50 38.00

2.00 | 46.92 38.00

2.00 | 47.00 38.00 3.00 | 47.08 13.04

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2.00 | 46.00 2.00 | 46.08

2.00 | 46.17 2.00 | 46.25

2.00 | 46.42

2.00 | 46.58

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2.00 | 46.83

3.00 | 47.17

3.00 | 47.17

3.00 | 47.33

3.00 | 47.42

3.00 | 47.50

3.00 | 47.58 3.00 | 47.67

3.00 | 47.83

3.00 | 47.92

3.00 | 47.75 | 13.00

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2.00 |27.833
2.00 |27.917
                                                      2.00 |15.833
                                3.917
                                                     2.00 | 15.917
                                                                                                                                     2.00 | 39.92
                                                                                                                                                                         13.00
                                4.000
                                                   2.00 | 16.000 | 2.00 | 16.083
                                                                                            2.00 |28.000
2.00 |28.083
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2.00 | 40.08
                                4.083
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                                                    2.00 | 16.167
2.00 | 16.250
                                4 167
                                                                                             2.00 | 28.167
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2.00 |28.333
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                                4.333
                                                    2.00 | 16.333
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2.00 | 40.42 | 17.00
2.00 | 40.50 | 17.00
2.00 | 40.58 | 17.00
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2.00 |28.500
                                4 417
                                4.500
                                4 583
                                                    2 00 116 583
                                                                                             2 00 28 583
                                                      2.00 | 16.667
                                                                                             2.00 |28.667
                                4.667
                                                                                            2.00 | 28,750
                                4.750
                                                     2.00 | 16.750
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2.00 | 40.83 | 17.00
2.00 | 40.92 | 17.00
2.00 | 41.00 | 17.00
2.00 | 41.08 | 13.00
                                4.833
                                                     2.00 | 16.833
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2.00 |28.917
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                                5.083
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2.00 | 41.17 | 13.00

2.00 | 41.25 | 13.00

2.00 | 41.33 | 13.00

2.00 | 41.42 | 13.00

2.00 | 41.50 | 13.00

2.00 | 41.58 | 13.00
                                                                                            2.00 |29.167
2.00 |29.250
2.00 |29.333
                                5.167
                                                     2.00 17.167
                                                    2.00 | 17.250
2.00 | 17.333
                                5.333
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                                                                                            2.00 | 29.417
                                                   2.00 | 17.500
2.00 | 17.583
                                                                                             2.00 |29.500
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2.00 | 41.67 | 13.00

2.00 | 41.75 | 13.00

2.00 | 41.83 | 13.00

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2.00 | 42.17 | 23.00
                                                     2.00 | 18.083
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                              11.917 2.00 |23.917 2.00 |35.917 3.00 | 47.92 13.00 | 12.000 2.00 |24.000 2.00 |36.000 3.00 | 48.00 13.00
              Unit Hyd Qpeak (cms)= 0.109
             PEAK FLOW (cms)= 0.101 (i)
TIME TO PEAK (hrs)= 46.000
             RUNOFF VOLUME (mm)= 240.248
TOTAL RAINFALL (mm)= 285.000
RUNOFF COEFFICIENT = 0.843
              (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
      | ADD HYD ( 0027)|
          1 + 2 = 3 | AREA QPEAK TPEAK R.V.

------ (ha) (cms) (hrs) (mm)

ID1=1 ( 0102): 7.24 0.993 46.00 231.47
                 + ID2= 2 ( 0124): 0.71 0.101 46.00 240.25
                 ID = 3 ( 0027): 7.95 1.093 46.00 232.25
             NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
     ID = 1 ( 0027): 9.01 1.201 46.00 231.28
             NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
     | CALID | | (ALID 
                    NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                                 - TRANSFORMED HYETOGRAPH
                               TIME RAIN | TIME R
                                0.333 2.00 | 12.333 2.00 | 24.333 2.00 | 36.33 6.00
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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2.00 | 26.917

2.00 |20.917 2.00 |27.000 2.00 |27.083

2.00 |27.167 2.00 |27.250

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2.00 |27.583 2.00 |27.667

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                             2.00 |31.667
2.00 |31.750
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                                                2.00 | 43.83
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                             2.00 |31.917
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2.00 | 42.50 | 23.00

2.00 | 42.58 | 23.00

2.00 | 42.67 | 23.00
                6.417
6.500
                          2.00 | 18.417
2.00 | 18.500
                                              2.00 |30.417
2.00 |30.500
                                                                                                                                                                                                                               2.00 |34.917
2.00 |35.000
                                                                                                                                                                                                                                                   2.00 | 46.92
2.00 | 47.00
                                                                                                                                                                                               10.917
                                                                                                                                                                                                           2.00 22.917
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                                                                                                                                                                                                11.000
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                6 583
                          2 00 118 583
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                                                                                                                                                                                               11.083
                                                                                                                                                                                                           2.00 | 23.083
                                                                                                                                                                                                                               2.00 | 35.083
                                                                                                                                                                                                                                                   3.00 | 47.08
                                                                                                                                                                                                                                                                     13.04
                                                                                                                                                                                                           2.00 |23.167
2.00 |23.250
                                                                                                                                                                                                                               2.00 |35.167
2.00 |35.250
                           2.00 | 18.667
                                               2.00 |30.667
                                                                                                                                                                                                                                                   3.00 | 47.17
                6.667
                                               2.00 30.750
                                                                  2.00 | 42.75 23.00
                                                                                                                                                                                                                                                   3.00 | 47.25
                6.750
                          2.00 | 18.750
                                                                                                                                                                                               11.250
                                                                  2.00 | 42.73 | 23.00

2.00 | 42.83 | 23.00

2.00 | 42.92 | 23.00

2.00 | 43.00 | 23.00

2.00 | 43.08 | 13.01
                6.833
                          2.00 |18.833
2.00 |18.917
                                              2.00 |30.833
2.00 |30.917
                                                                                                                                                                                               11.333
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2.00 |23.417
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3.00 | 47.42
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                6.917
                                              2.00 |31.000
2.00 |31.083
                7.000
                          2.00 119.000
                                                                                                                                                                                               11 500
                                                                                                                                                                                                           2 00 23 500
                                                                                                                                                                                                                              2 00 35 500
                                                                                                                                                                                                                                                   3 00 | 47 50 13 00
                7.083
                           2.00 | 19.083
                                                                                                                                                                                                           2.00 |23.583
                                                                                                                                                                                                                                2.00 |35.583
                                                                                                                                                                                                                                                    3.00 | 47.58
                                                                  2.00 | 43.17 | 13.00
2.00 | 43.25 | 13.00
2.00 | 43.33 | 13.00
2.00 | 43.42 | 13.00
2.00 | 43.50 | 13.00
                7.167
7.250
                          2.00 119.167
                                               2.00 | 31.167
                                                                                                                                                                                               11.667
                                                                                                                                                                                                           2.00 23.667
                                                                                                                                                                                                                               2.00 | 35.667
                                                                                                                                                                                                                                                   3.00 | 47.67
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                          2.00 | 19.250
2.00 | 19.333
                                              2.00 |31.250
2.00 |31.333
                                                                                                                                                                                                           2.00 |23.750
2.00 |23.833
                                                                                                                                                                                                                              2.00 |35.750
2.00 |35.833
                                                                                                                                                                                                                                                   3.00 | 47.75
3.00 | 47.83
                                                                                                                                                                                                11.750
                7.333
                                                                                                                                                                                                11.833
                7.417
                          2.00 119.417
                                               2.00 31.417
                                                                                                                                                                                               11.917
                                                                                                                                                                                                           2.00 23.917
                                                                                                                                                                                                                              2.00 | 35.917
                                                                                                                                                                                                                                                   3.00 | 47.92
                                                                                                                                                                                                                                                                     13.00
                           2.00 | 19.500
                                               2.00 |31.500
                                                                                                                                                                                               12.000 2.00 |24.000 2.00 |36.000 3.00 | 48.00
                                               2.00 31.583
                                                                  2.00 | 43.58 | 13.00
                7.583
                          2.00 119.583
                                                                  2.00 | 43.58 | 13.00

2.00 | 43.67 | 13.00

2.00 | 43.75 | 13.00

2.00 | 43.83 | 13.00

2.00 | 43.92 | 13.00
                          2.00 | 19.667
2.00 | 19.750
                                              2.00 |31.667
2.00 |31.750
                                                                                                                                                                                      Unit Hyd Qpeak (cms)= 0.037
                7.750
                                                                                                                                                                                      PEAK FLOW (cms)= 0.026 (i)
TIME TO PEAK (hrs)= 46.000
RUNOFF VOLUME (mm)= 236.948
TOTAL RAINFALL (mm)= 285.000
                7 833
                          2.00 19.833
                                               2.00 31.833
                           2.00 | 19.917
                                               2.00 |31.917
                8 000
                          2 00 20 000
                                               2 00 32 000
                                                                  2 00 | 44 00 13 00
                                                                  2.00 | 44.08
2.00 | 44.17
                           2.00 |20.083
                                               2.00 |32.083
                                                                                                                                                                                       RUNOFF COEFFICIENT = 0.831
                          2.00 20.167
                                               2.00 32.167
                8.167
                                                                                     13.00
                 8.250
                          2.00 |20.250
2.00 |20.333
                                              2.00 |32.250
2.00 |32.333
                                                                  2.00 | 44.25
2.00 | 44.33
                                                                                                                                                                                      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
                8.417
                          2.00 | 20.417
                                               2.00 | 32.417
                                                                  2.00 | 44.42
                                                                                     13.00
                          2.00 |20.500
2.00 |20.583
                                              2.00 |32.500
2.00 |32.583
                                                                  2.00 | 44.50
2.00 | 44.58
                 8.500
                8.583
                                                                                     13.00
                                              2.00 |32.667
2.00 |32.750
                                                                  2.00 | 44.67
2.00 | 44.75
                8.667
                          2.00 20.667
                                                                                     13.00
                8.750
                           2.00 |20.750
                                                                                                                                                                                  | ADD HYD ( 0023)|
                                                                                                                                                                                    ABJ III S (025)|

1+ 2 = 3 | AREA QPEAK TPEAK R.V.

(ha) (cms) (hrs) (mm)

IDI=1 (0125): 0.18 0.026 46.00 236.95

+ ID2= 2 (0027): 9.01 1.201 46.00 231.28
                8.833
                          2.00 | 20.833
                                               2.00 32.833
                                                                  2.00 | 44.83
                                                                                     13.00
                                                                  2.00 | 44.92 | 13.00
2.00 | 45.00 | 13.00
                           2.00 |20.917
                                               2.00 |32.917
                          2.00 21.000
                9.000
                                              2.00 |33.000
                          2.00 |21.083
2.00 |21.167
                                              2.00 |33.083
2.00 |33.167
                9.083
                                                                  2.00 | 45.08
2.00 | 45.17
                                                                                     52 95
                                                                                     53.00
                9.167
                                                                                                                                                                                         ID = 3 (0023): 9.19 1.226 46.00 231.39
                9 250
                          2 00 21 250
                                               2 00 33 250
                                                                  2 00 | 45 25
                          2.00 |21.333
                                              2.00 |33.333 | 2.00 | 45.33 | 53.00
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                                                                                                                                                                                                3,417
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NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                                                                                                                                                                        2.00 |15.417 | 2.00 |27.417 | 2.00 |15.500 | 2.00 |27.500
                                                                                                                                                                                                                             2.00 | 39.42 | 13.00
2.00 | 39.50 | 13.00
                                                                                                                                                                               3.500
                                                                                                                                                                               3 583
                                                                                                                                                                                        2 00 115 583
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                                                                                                                                                                                                                             2 00 | 39 58
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                                                                                                                                                                                         2.00 |15.667
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  3.750
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                                                                                                                                                                                                                              2.00 | 39.75
                                                                                                                                                                                                                                               13.00
                                                                                                                                                                                                           2.00 |27.833
2.00 |27.917
2.00 |28.000
                                                                                                                                                                                         2.00 |15.833
2.00 |15.917
                                                                                                                                                                                                                              2.00 | 39.83
2.00 | 39.92
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                                                                                                                                                                                                                                               13.00
                                                                                                                                                                               3.917
                                                                                                                                                                                                                             2.00 | 40.00
                                                                                                                                                                               4 000
                                                                                                                                                                                         2 00 16 000
                                                                                                                                                                                                                                               13.00
                                                                                                                                                                                         2.00 |16.083
                                                                                                                                                                                                           2.00 |28.083
                                                                                                                                                                                                                              2.00 | 40.08
         NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP
                                                                                                                                                                               4.167
                                                                                                                                                                                         2.00 | 16.167
                                                                                                                                                                                                           2.00 | 28.167
                                                                                                                                                                                                                              2.00 | 40.17
                                                                                                                                                                                                                                               17.00
                                                                                                                                                                                         2.00 |16.250
2.00 |16.333
                                                                                                                                                                                                           2.00 |28.250
2.00 |28.333
                                                                                                                                                                                                                             2.00 | 40.25
                                                                                                                                                                               4.250
                                                                                                                                                                                                                                               17.00
                             -- TRANSFORMED HYETOGRAPH --
                                                                                                                                                                               4.333
                                                                                                                                                                                                                                               17.00
              TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr
                                                                                                                                                                               4.417
                                                                                                                                                                                         2.00 16.417
                                                                                                                                                                                                           2.00 |28.417
                                                                                                                                                                                                                             2.00 | 40.42
2.00 | 40.50
                                                                                                                                                                                                                                              17.00
                                                                                                                                                                                         2.00 |16.500
                                                                                                                                                                                                           2.00 |28.500
                                         2.00 |24.083 | 2.00 | 36.08
2.00 |24.167 | 2.00 | 36.17
2.00 |24.250 | 2.00 | 36.25
              0.083
                       2.00 12.083
                                                                                                                                                                               4.583
                                                                                                                                                                                         2.00 | 16.583
                                                                                                                                                                                                           2.00 | 28.583
                                                                                                                                                                                                                              2.00 | 40.58
                                                                                                                                                                                                                                               17.00
                                                                              6.00
                                                                                                                                                                                         2.00 |16.667
2.00 |16.750
                                                                                                                                                                                                           2.00 |28.667
2.00 |28.750
                                                                                                                                                                                                                             2.00 | 40.67
2.00 | 40.75
                       2.00 | 12.167
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              0.250
                       2.00 | 12.250
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                       2.00 | 12.333
2.00 | 12.417
2.00 | 12.500
                                         2.00 |24.333
2.00 |24.417
2.00 |24.500
                                                                                                                                                                                        2.00 |16.833
2.00 |16.917
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2.00 | 40.92
                                                            2.00 | 36.33
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2.00 | 42.00 | 13.00
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2.00 |25.917
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                       2.00 | 15.333 | 2.00 | 27.333 | 2.00 | 39.33 | 13.00
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               8.000
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                         2.00 |20.417
                                           2.00 |32.417
                                                              2.00 | 44.42
2.00 | 44.50
                        2.00 20.500
               8.500
                                           2.00 | 32.500
                                                                               13.00
                        2.00 |20.583
2.00 |20.667
                                           2.00 |32.583
2.00 |32.667
                                                             2.00 | 44.58
                                                                               13.00
13.00
               8.583
               8.667
               8.750
                        2.00 | 20.750
                                           2.00 32.750
                                                             2.00 | 44.75
2.00 | 44.83
                                                                               13.00
                         2.00 |20.833
                                           2.00 |32.833
                        2.00 20.917
                                                              2.00 | 44.92
               8.917
                                           2.00 32.917
                                                                               13.00
                                                             2.00 | 44.92 | 13.00

2.00 | 45.00 | 13.00

2.00 | 45.08 | 52.95

2.00 | 45.17 | 53.00

2.00 | 45.25 | 53.00

2.00 | 45.33 | 53.00
               9.000
                         2.00 |21.000
                                           2.00 |33.000
2.00 |33.083
                        2.00 | 21.083
               9.083
               9.167
                        2.00 21.167
                                           2.00 33.167
                         2.00 |21.250
                                           2.00 |33.250
               9.333
                        2.00 21.333
                                           2.00 33.333
                                                             2.00 | 45.42 | 53.00
2.00 | 45.42 | 53.00
2.00 | 45.50 | 53.00
2.00 | 45.58 | 53.00
2.00 | 45.67 | 53.00
                        2.00 |21.417
2.00 |21.500
                                           2.00 |33.417
2.00 |33.500
               9 417
               9.500
               9 583
                        2.00 21.583
                                           2 00 33 583
                         2.00 |21.667
                                           2.00 |33.667
               9.667
                                           2.00 33.750
                                                             2.00 45.75 53.00
               9.750
                        2.00 | 21.750
               9.833
                        2.00 |21.833
2.00 |21.917
                                           2.00 |33.833
                                                             2.00 | 45.83 53.00
2.00 | 45.92 53.00
               9.917
                                           2.00 33.917
                        2.00 |22.000
2.00 |22.083
                                           2.00 |34.000
2.00 |34.083
                                                              2.00 | 46.00 53.00
2.00 | 46.08 38.02
               10.000
               10.083
                        2.00 |22.167
2.00 |22.250
2.00 |22.333
                                           2.00 |34.167
2.00 |34.250
2.00 |34.333
               10.167
                                                              2.00 | 46.17
                                                                               38.00
              10.250
10.333
                                                              2.00 | 46.25 38.00
2.00 | 46.33 38.00
              10.417
                         2.00 22.417
                                            2.00 34.417
                                                              2.00 | 46.42 | 38.00
               10.500
                         2.00 |22.500
                                            2.00 |34.500
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                         2.00 |22.583
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                                            2.00 34.583
                                                              2.00 | 46.58 | 38.00
                        2.00 |22.667
2.00 |22.750
                                           2.00 |34.667
2.00 |34.750
                                                              2.00 | 46.67 38.00
2.00 | 46.75 38.00
               10.667
              10.750
              10.833
                         2 00 22 833
                                            2.00 34.833
                                                              2.00 | 46.83 | 38.00
              10.917
                         2.00 |22.917
                                            2.00 |34.917
                                                               2.00 | 46.92
                                                                               38.00
              11 000
                         2 00 23 000
                                            2 00 35 000
                                                              2 00 | 47 00 38 00
                         2.00 |23.083
2.00 |23.167
                                                              3.00 | 47.08
3.00 | 47.17
                                            2.00 |35.083
                                            2.00 | 35.167
              11.167
                                                                                13.00
                         2.00 |23.250
2.00 |23.333
                                            2.00 |35.250
2.00 |35.333
                                                              3.00 | 47.25
3.00 | 47.33
              11.417
                         2.00 | 23.417
                                            2.00 | 35.417
                                                              3.00 | 47.42
                                                                               13.00
                        2.00 |23.500
2.00 |23.583
                                           2.00 |35.500
2.00 |35.583
                                                              3.00 | 47.50
3.00 | 47.58
               11.500
              11.583
                                                                               13.00
              11.667
11.750
                         2.00 23.667
                                            2.00 | 35.667
                                                              3.00 | 47.67
                                                                               13.00
                         2.00 |23.750
                                            2.00 |35.750
                                                               3.00 | 47.75
                                                                                13.00
              11.833
                         2.00 |23.833
                                           2.00 |35.833
                                                              3.00 | 47.83 | 13.00
                                            2.00 |35.917
              12.000
                        2.00 | 24.000 | 2.00 | 36.000 | 3.00 | 48.00 | 13.00
      Unit Hyd Qpeak (cms)= 0.087
      PEAK FLOW
                           (cms)= 0.226 (i)
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%;20writeup/Appendix%20C%20-%20VO%20Modelling/Existing/Vooutput.txt[8/19/2024 12:25:03 PM] file://Ca0004-ppfss01/...61414473/design/report/FSR/SWM%;20writeup/Appendix%20C%20-%20VO%20Modelling/Existing/Vooutput.txt[8/19/2024 12:25:03 PM]
                                          2.00 |26.917
2.00 |27.000
                                                             2.00 | 38.92
                       2.00 | 15.000
                                                             2.00 39.00 6.00
               3.000
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```
TIME TO PEAK (hrs)= 47.083
      RUNOFF VOLUME (mm)= 234.960
TOTAL RAINFALL (mm)= 285.000
RUNOFF COEFFICIENT = 0.824
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
CALIB
NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                                     -- TRANSFORMED HYETOGRAPH --
                       TIME RAIN | TIME R
                                                                              2.00 |24.333
2.00 |24.417
2.00 |24.500
                       0.333
                                         2.00 |12.333
2.00 |12.417
                                                                                                                  2.00 | 36.33
2.00 | 36.42
                                                                                                                                                        6.00
                       0.417
                                                                                                                                                        6.00
                       0.500
                                         2 00 112 500
                                                                                                                  2.00 | 36.50
                                                                                                                                                      6.00
                                                                               2.00 |24.583
2.00 |24.667
                        0.583
                                           2.00 |12.583
                       0.667
                                           2.00 | 12.667
                                                                                                                     2.00 | 36.67
                                                                                                                                                       6.00
                                                                              2.00 |24.750
2.00 |24.833
2.00 |24.917
                        0.750
                                          2.00 |12.750
2.00 |12.833
                                                                                                                    2.00 | 36.75
2.00 | 36.83
                       0.917
                                          2.00 12.917
                                                                                                                    2.00 | 36.92
                                                                                                                                                      6.00
                                          2.00 |13.000
                                                                               2.00 |25.000
2.00 |25.083
                                                                                                                    2.00 | 37.00
2.00 | 37.08
                                          2.00 13.083
                       1.083
                                                                                                                                                        4.00
                                          2.00 |13.167
2.00 |13.250
                                                                               2.00 |25.167
2.00 |25.250
                                                                                                                   2.00 | 37.17
2.00 | 37.25
                        1.167
                        1.333
                                         2.00 113.333
                                                                               2.00 | 25.333
                                                                                                                   2.00 | 37.33
                                                                                                                                                       4.00
                                                                              2.00 |25.417
2.00 |25.500
                                           2.00 |13.417
                                          2.00 13.500
                                                                                                                    2.00 | 37.50
                        1.500
                                                                                                                                                       4.00
                                         2.00 |13.583
                                                                               2.00 |25.583
2.00 |25.667
                                                                                                                   2.00 | 37.58
2.00 | 37.67
                         1.583
                        1.667
                                                                                                                                                        4.00
                        1.750
                                          2 00 113 750
                                                                               2 00 25 750
                                                                                                                   2.00 | 37.75
                                                                                                                                                       4 00
                                          2.00 |13.833
2.00 |13.917
                                                                               2.00 |25.833
2.00 |25.917
                                                                                                                    2.00 | 37.73
2.00 | 37.83
2.00 | 37.92
                       1.833
                                                                                                                                                        4.00
                                         2.00 |14.000
2.00 |14.083
                                                                              2.00 |26.000
2.00 |26.083
                                                                                                                  2.00 | 38.00
2.00 | 38.08
                        2 000
                                                                                                                                                       4.00
                       2.083
                                                                                                                                                       6.00
                       2 167
                                          2 00 14 167
                                                                               2 00 26 167
                                                                                                                    2 00 | 38 17
                                                                                                                                                       6.00
                                            2.00 |14.250
                                                                               2.00 |26.250
                       2.333
                                           2.00 | 14.333
                                                                               2.00 | 26.333
                                                                                                                    2.00 | 38.33
                                                                                                                                                       6.00
                                          2.00 |14.417
2.00 |14.500
                                                                               2.00 |26.417
2.00 |26.500
                                                                                                                  2.00 | 38.42
2.00 | 38.50
                       2.417
                       2.500
                                                                                                                                                       6.00
                       2.583
                                          2.00 114.583
                                                                               2.00 |26.583
                                                                                                                   2.00 | 38.58
                                                                                                                                                       6.00
                                           2.00 |14.667
                                                                              2.00 |26.667
2.00 |26.750
                                                                                                                     2.00 | 38.67
                       2.667
                       2.750
                                          2.00 114.750
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                                                                                                                                                       6.00
                                          2.00 |14.833 | 2.00 |26.833
                                                                                                                  2.00 | 38.83
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2.00 |15.083
2.00 |15.167
                                                  2.00 |27.083
2.00 |27.167
                                                                        2.00 | 39.08
2.00 | 39.17
                                                                                             13.00
13.00
                 3.083
                 3.167
                                                  2.00 |27.250
2.00 |27.333
2.00 |27.417
                 3.250
                             2.00 115.250
                                                                         2.00 | 39.25
                                                                                             13.00
                             2.00 |15.230
2.00 |15.333
2.00 |15.417
                                                                        2.00 | 39.33
2.00 | 39.42
                                                                                             13.00
                 3.417
                            2.00 |15.500
2.00 |15.583
                                                  2.00 |27.500
2.00 |27.583
                                                                        2.00 | 39.50
2.00 | 39.58
                 3 500
                                                                                             13.00
                 3.583
                 3.667
                             2.00 115.667
                                                   2.00 | 27.667
                                                                         2.00 | 39.67
                                                                                             13.00
                            2.00 | 15.750
2.00 | 15.833
                                                  2.00 |27.750
2.00 |27.833
                                                                        2.00 | 39.75
                 3.833
                                                                                             13.00
                 3 917
                             2.00 |15.917
2.00 |16.000
                                                  2.00 |27.917
2.00 |28.000
                                                                        2.00 | 39.92
2.00 | 40.00
                                                                                             13.00
                 4.000
                 4 083
                             2 00 116 083
                                                   2 00 28 083
                                                                         2 00 | 40 08
                                                                                              17.00
                                                                        2.00 | 40.08
2.00 | 40.17
2.00 | 40.25
                             2.00 |16.167
                                                   2.00 |28.167
                 4.250
                             2.00 | 16.250
                                                   2.00 | 28.250
                                                                                             17.00
                                                  2.00 |28.333
2.00 |28.417
                                                                        2.00 | 40.33
2.00 | 40.42
                 4.333
                             2.00 | 16.333
                                                                                             17.00
                             2.00 116.417
                 4.417
                 4 500
                            2 00 16 500
                                                   2 00 28 500
                                                                        2 00 | 40 50
                                                                                             17.00
                 4.583
                             2.00 | 16.583
                                                   2.00 |28.583
                                                                        2.00 | 40.58
2.00 | 40.67
                                                   2.00 28.667
                 4.667
                             2.00 | 16.667
                                                                                             17.00
                 4.750
                             2.00 |16.750
2.00 |16.833
                                                  2.00 |28.750
2.00 |28.833
                                                                        2.00 | 40.75
2.00 | 40.83
                                                                                             17.00
17.00
                 4.833
                 4.917
                             2.00 | 16.917
                                                   2.00 | 28.917
                                                                        2.00 | 40.92 17.00
                                                                       2.00 | 40.92 | 17.00
2.00 | 41.00 | 17.00
2.00 | 41.08 | 13.00
2.00 | 41.17 | 13.00
2.00 | 41.25 | 13.00
                            2.00 | 17.000 | 2.00 | 17.083
                                                  2.00 |29.000
2.00 |29.083
                 5.083
                 5.167
                             2.00 | 17.167
2.00 | 17.250
                                                  2.00 |29.167
2.00 |29.250
                 5.250
                                                                       2.00 | 41.25 | 13.00

2.00 | 41.33 | 13.00

2.00 | 41.42 | 13.00

2.00 | 41.50 | 13.00

2.00 | 41.58 | 13.00

2.00 | 41.67 | 13.00
                 5 3 3 3
                             2.00 17.333
                                                   2.00 | 29.333
                             2.00 | 17.417
                                                   2.00 |29.417
                 5.500
                            2.00 17.500
                                                  2.00 | 29.500
                 5.583
                            2.00 | 17.583 | 2.00 | 17.667
                                                  2.00 |29.583
2.00 |29.667
                 5.667
                                                                        2.00 | 41.87 | 13.00
2.00 | 41.83 | 13.00
2.00 | 41.92 | 13.00
                 5.750
                             2 00 117 750
                                                   2 00 29 750
                                                  2.00 |29.833
2.00 |29.917
                             2.00 | 17.833
                             2.00 17.917
                 5.917
                             2.00 |18.000
2.00 |18.083
                                                  2.00 |30.000
2.00 |30.083
                                                                        2.00 | 42.00 | 13.00
2.00 | 42.08 | 22.99
                 6.000
                 6.083
                                                                       2.00 | 42.08 | 22.99

2.00 | 42.17 | 23.00

2.00 | 42.25 | 23.00

2.00 | 42.33 | 23.00

2.00 | 42.42 | 23.00

2.00 | 42.50 | 23.00
                             2.00 |18.167
2.00 |18.250
                                                  2.00 |30.167
2.00 |30.250
                 6.167
                 6.333
                             2.00 | 18.333
                                                   2.00 30.333
                             2.00 |18.417
                                                   2.00 |30.417
                 6.500
                             2.00 | 18.500
                                                   2.00 | 30.500
                                                                        2.00 | 42.58 23.00
2.00 | 42.67 23.00
2.00 | 42.75 23.00
                 6 583
                             2.00 |18.583
2.00 |18.667
                                                  2.00 |30.583
2.00 |30.667
                 6.667
                 6.750
                             2.00 118.750
                                                   2.00 30.750
                 6.833
                                                  2.00 |30.833
2.00 |30.917
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2.00 | 42.92 23.00
                             2.00 |18.833
                 6.917
                             2.00 | 18.917
                                                                        2.00 | 43.00 23.00
2.00 | 43.08 13.01
2.00 | 43.17 13.00
                 7 000
                             2.00 19.000
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                 7.083
                             2.00 | 19.083
                                                   2.00 |31.083
                 7.167
                            2 00 19 167
                                                  2.00 31.167
                                                                        2.00 | 43.25
                             2.00 | 19.250
                                                   2.00 |31.250
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                            2.00 | 19.333 | 2.00 | 31.333 | 2.00 | 43.33 | 13.00
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7,417
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2.00 |19.500
                                         2.00 |31.417
2.00 |31.500
                                                           2.00 | 43.42 | 13.00
2.00 | 43.50 | 13.00
                7.500
                7 583
                        2 00 119 583
                                          2 00 31 583
                                                            2.00 43.58 13.00
                         2.00 |19.667
                                          2.00 |31.667
                                                             2.00 | 43.67
                7.750
                        2.00 | 19.750
                                          2.00 | 31.750
                                                            2.00 | 43.75
                                                                             13.00
                                                           2.00 | 43.73
2.00 | 43.83
2.00 | 43.92
2.00 | 44.00
2.00 | 44.08
                        2.00 |19.833
2.00 |19.917
                                          2.00 |31.833
2.00 |31.917
                7.833
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                7.917
               8 000
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                                          2 00 32 000
                                                                             13.00
                         2.00 |20.083
                                          2.00 |32.083
                                                            2.00 44.17
               8.167
                         2.00 | 20.167
                                          2.00 | 32.167
                                                                             13.00
                        2.00 |20.250
2.00 |20.333
                                          2.00 |32.250
2.00 |32.333
                                                            2.00 | 44.25
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                8.250
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               8.417
                        2.00 20.417
                                          2.00 | 32.417
                                                            2.00 | 44.42
2.00 | 44.50
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                                          2.00 |32.500
                         2.00 |20.500
                                                            2.00 | 44.58
               8.583
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                                          2.00 32.583
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                                          2.00 |32.667
2.00 |32.750
                                                            2.00 | 44.67
                8.667
               8.750
                                                                             13.00
                                                            2.00 | 44.83
2.00 | 44.92
               8 833
                        2.00 20.833
                                          2 00 32 833
                                                                             13.00
                         2.00 |20.917
                                          2.00 |32.917
               9.000
                        2 00 21 000
                                          2 00 33 000
                                                            2 00 | 45 00
                                                                             13.00
               9.083
                        2.00 |21.000
2.00 |21.083
2.00 |21.167
                                          2.00 |33.083
2.00 |33.167
                                                            2.00 | 45.08
2.00 | 45.17
                                                                            52.95
53.00
               9.167
                                                           9 250
                        2 00 21 250
                                          2 00 33 250
                         2.00 |21.333
                                          2.00 |33.333
                                                            2.00 45.42 53.00
               9.417
                        2.00 | 21.417
                                          2.00 | 33.417
               9.500
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2.00 | 45.58 53.00
               9 667
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                                           2.00 |34.083
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2.00 | 46.17
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38.00
               10.250
                         2.00 | 22.250
                                           2.00 | 34.250
                                                             2.00 | 46.25
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                         2.00 |22.333
2.00 |22.417
                                           2.00 |34.333
2.00 |34.417
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               10.333
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                                                                             38.00
               10.500
                         2 00 22 500
                                           2.00 34.500
                                                             2.00 | 46.50 38.00
2.00 | 46.58 38.00
                          2.00 |22.583
                                           2.00 |34.583
               10.583
               10.667
                         2 00 22 667
                                           2 00 34 667
                                                             2 00 | 46 67
                                                                              38.00
                         2.00 |22.750
2.00 |22.833
                                           2.00 |34.750
2.00 |34.833
                                                             2.00 | 46.75
               10.833
                                                             2.00 | 46.83
                                                                             38.00
                         2.00 |22.917
2.00 |23.000
                                           2.00 |34.917
2.00 |35.000
                                                             2.00 | 46.92  38.00
2.00 | 47.00  38.00
               10.917
               11.000
               11.083
                         2.00 | 23.083
                                           2.00 |35.083
                                                             3.00 | 47.08
                                                                              13.04
               11.167
                          2.00 |23.167
                                            2.00 |35.167
                                                              3.00 | 47.17
                         2.00 23.250
               11.250
                                           2.00 | 35.250
                                                             3.00 | 47.25
                          2.00 |23.230
               11.333
                                            2.00 |35.333
                                                             3.00 | 47.33
                          2.00 |23.417
                                            2.00 |35.417
                                                             3.00 | 47.42
               11.417
               11.500
                         2.00 | 23.500
                                           2.00 | 35.500
                                                             3.00 | 47.50
                                                                             13.00
                        2.00 |23.583
2.00 |23.667
                                           2.00 |35.583
                                                             3.00 | 47.58
                                           2.00 | 35.667
                                                             3.00 | 47.67
               11.667
                                                                             13.00
               11.750
                         2 00 23 750
                                           2 00 |35 750
                                                             3 00 | 47 75
                         2.00 |23.833 | 2.00 |35.833 | 3.00 | 47.83 | 13.00
               11.833
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11.917 2.00 |23.917 2.00 |35.917 3.00 | 47.92 13.00 | 12.000 2.00 |24.000 2.00 |36.000 3.00 | 48.00 13.00
      Unit Hyd Opeak (cms)= 0.455
     PEAK FLOW (cms)= 1.073 (i)
TIME TO PEAK (hrs)= 46.917
RUNOFF VOLUME (mm)= 236.266
TOTAL RAINFALL (mm)= 285.000
RUNOFF COEFFICIENT = 0.829
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
  | 1 + 2 = 3 | AREA QPEAK TPEAK R.V.

| (ha) (cms) (hrs) (mm)

| ID1 = 1 ( 0105): 9.75 1.073 46.92 236.27

+ ID2 = 2 ( 0121): 2.12 0.226 47.08 234.96
        ID = 3 ( 0019): 11.87 1.297 47.00 236.03
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
    NASHYD (0104)| Area (ha)= 3.63 Curve Number (CN)= 82.6

ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
  ID= 1 DT= 5.0 min |
                    ---- U.H. Tp(hrs)= 0.59
         NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                              -- TRANSFORMED HYETOGRAPH -
                TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
                0.083 2.00 | 12.083 2.00 | 24.083 2.00 | 36.08 6.00  
0.167 2.00 | 12.167 2.00 | 24.167 2.00 | 36.17 6.00
               0.167
                         2.00 |12.250
2.00 |12.333
                                            2.00 |24.250
2.00 |24.333
                                                               2.00 | 36.25
2.00 | 36.33
               0.250
                                            2.00 24.417
               0.417
                        2.00 | 12.417
                                                               2.00 | 36.42
                                                                                  6.00
                        2.00 | 12.500
2.00 | 12.583
                                            2.00 |24.500
2.00 |24.583
                                                               2.00 | 36.50
               0.583
                                                               2.00 | 36.58
                                                                                  6.00
                         2.00 | 12.667
2.00 | 12.750
                                                               2.00 | 36.67
2.00 | 36.75
               0.667
                                            2.00 |24.667
                                            2.00 |24.750
               0.833
                         2.00 112.833
                                            2.00 | 24.833
                                                               2.00 | 36.83
                                            2.00 |24.917
2.00 |25.000
                                                               2.00 | 37.00
               1.000
                        2.00 | 13.000
                                                                                 6.00
                                            2.00 |25.083
2.00 |25.167
               1.083
                        2.00 |13.083
2.00 |13.167
                                                               2.00 | 37.08
2.00 | 37.17
               1.167
               1 250
                         2 00 113 250
                                            2.00 |25.250
                                                               2 00 | 37 25
                         2.00 | 13.333 | 2.00 | 25.333 | 2.00 | 37.33
file:///Ca0004-ppfss01/...61414473/design/report/FR/SWM%20writeup/Appendix%20V020-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM] file://Ca0004-ppfss01/...61414473/design/report/FR/SWM%20writeup/Appendix%20V0%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
                        2.00 | 17.917 | 2.00 | 29.917 | 2.00 | 41.92 | 13.00 | 2.00 | 18.000 | 2.00 | 30.000 | 2.00 | 42.00 | 13.00
               6.000
                        2.00 | 18.083
2.00 | 18.167
                                            2.00 |30.083
2.00 |30.167
                                                               2.00 | 42.08 22.99
2.00 | 42.17 23.00
               6.083
               6.167
               6.250
                         2.00 | 18.250
                                            2.00 |30.250
                                                               2.00 | 42.25 | 23.00
                         2.00 | 18.333
2.00 | 18.417
                                            2.00 |30.333
2.00 |30.417
               6.417
```

```
1.417
         2.00 | 13.417
                            2.00 | 25.417
                                               2.00 | 37.42
         2.00 |13.500
2.00 |13.583
                            2.00 |25.500
2.00 |25.583
                                               2.00 | 37.50
2.00 | 37.58
1.500
1.583
                            2.00 |25.667
2.00 |25.750
2.00 |25.833
                                                2.00 | 37.67
2.00 | 37.75
         2 00 13 667
1.833
         2.00 | 13.833
                                                2.00 | 37.83
                                                                   4.00
          2.00 |13.917
                             2.00 |25.917
2.00 |26.000
                                                2.00 | 37.92
2.00 | 38.00
          2.00 |14.000
2.000
                                                                   4.00
2.083
         2.00 14.083
                             2.00 | 26.083
                                                2.00 | 38.08
                                                                   6.00
          2.00 | 14.167
                             2.00 |26.167
                                                2.00 | 38.17
2.250
         2.00 14.250
                             2.00 |26.250
                                                2.00 | 38.25
                                                                  6.00
                             2.00 |26.333
2.00 |26.417
2.333
         2.00 |14.333
                                                2.00 | 38.33
          2.00 14.417
                                                2.00 | 38.42
2.417
2.500
         2.00 |14.500
2.00 |14.583
                            2.00 |26.500
2.00 |26.583
                                                2.00 | 38.50
2.00 | 38.58
2.583
2.667
         2.00 114.667
                             2.00 | 26.667
                                                2.00 | 38.67
                                                                   6.00
         2.00 | 14.750
2.00 | 14.833
                             2.00 |26.750
2.00 |26.833
                                                2.00 | 38.75
2.00 | 38.83
2.833
                            2.00 |26.917
2.00 |27.000
2.00 |27.083
         2.00 |14.917
2.00 |15.000
2.917
                                                2.00 | 38.92
                                                                   6.00
                                                2.00 | 39.00
3.083
         2.00 115.083
                                                2.00 | 39.08
                                                                  13.00
         2.00 |15.167
2.00 |15.250
                            2.00 |27.167
2.00 |27.250
                                                2.00 | 39.17
3.250
                                                2.00 | 39.25
3 333
         2.00 |15.333
2.00 |15.417
                            2.00 |27.333
2.00 |27.417
                                                2.00 | 39.33
2.00 | 39.42
3 500
         2 00 115 500
                             2 00 27 500
                                               2.00 | 39.50
                                                                  13.00
3.583
          2.00 |15.583
                             2.00 |27.583
3.667
          2.00 15.667
                             2.00 | 27.667
                                                2.00 | 39.67
                                                                  13.00
         2.00 |15.750
2.00 |15.833
                             2.00 |27.750
2.00 |27.833
                                                2.00 | 39.75
2.00 | 39.83
3.750
3.917
         2.00 15.917
                             2.00 27.917
                                                2.00 39.92 13.00
          2.00 |16.000
                            2.00 |28.000
2.00 |28.083
                                                2.00 | 40.00
2.00 | 40.08
         2.00 16.083
4.083
                                                                  17.00
4.167
4.250
         2.00 |16.167
2.00 |16.250
                            2.00 |28.167
2.00 |28.250
                                               2.00 | 40.17
2.00 | 40.25
4.333
         2.00 | 16.333
                             2.00 | 28.333
                                                2.00 | 40.33
                                                                  17.00
                            2.00 |28.417
2.00 |28.500
          2.00 |16.417
                                                2.00 | 40.42
                                                2.00 | 40.50
4.500
         2.00 116.500
                                                                  17.00
         2.00 |16.583
2.00 |16.667
                            2.00 |28.583
2.00 |28.667
                                               2.00 | 40.58
2.00 | 40.67
4.583
4.667
                                                                  17.00
                                               2.00 | 40.75
2.00 | 40.83
2.00 | 40.92
4 750
         2.00 16.750
                             2 00 28 750
                                                                  17.00
         2.00 | 16.833
2.00 | 16.917
                             2.00 |28.833
2.00 |28.917
         2.00 |17.000
2.00 |17.083
                            2.00 |29.000
2.00 |29.083
                                               2.00 | 41.00
2.00 | 41.08
5.000
5.083
5 167
         2 00 117 167
                             2 00 29 167
                                                2.00 41.17
                                                                  13.00
                             2.00 |29.250
2.00 |29.333
          2.00 |17.250
         2.00 17.333
5.333
                                                2.00 | 41.33
                                                                  13.00
         2.00 |17.417
2.00 |17.500
                            2.00 |29.417
2.00 |29.500
                                               2.00 | 41.42
2.00 | 41.50
5.417
                                                                  13.00
13.00
5.583
         2.00 117.583
                             2.00 |29.583
                                               2.00 | 41.58 | 13.00
2.00 | 41.67 | 13.00
         2.00 | 17.667
2.00 | 17.750
                            2.00 |29.667
2.00 |29.750
5.750
                                               2.00 | 41.75
                                                                  13.00
         2.00 | 17.833 | 2.00 | 29.833 | 2.00 | 41.83 | 13.00
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2.00 | 42.25 | 23.00

2.00 | 42.33 | 23.00

2.00 | 42.42 | 23.00

2.00 | 42.50 | 23.00

2.00 | 42.58 | 23.00
                           2.00 | 18.500
2.00 | 18.583
                 6.500
                                                 2.00 | 30.500
                 6.583
                                                 2.00 |30.583
                 6.667
                            2.00 118.667
                                                 2.00 30.667
                                                                      2.00 42.67 23.00
                                                                     2.00 | 42.67 | 23.00

2.00 | 42.75 | 23.00

2.00 | 42.83 | 23.00

2.00 | 42.92 | 23.00

2.00 | 43.00 | 23.00
                            2.00 |18.750
                                                 2.00 |30.750
                 6.833
                           2.00 | 18.833
                                                 2.00 |30.833
                 6.917
                            2.00 |18.917
2.00 |19.000
                                                 2.00 |30.917
2.00 |31.000
                 7.000
                 7.083
                           2 00 119 083
                                                 2 00 31 083
                                                                      2 00 | 43 08 13 01
                                                                      2.00 | 43.17 | 13.00
2.00 | 43.25 | 13.00
                            2.00 | 19.167
                                                 2.00 |31.167
                 7.250
                           2.00 | 19.250
                                                 2.00 | 31.250
                           2.00 | 19.333 | 2.00 | 19.417
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2.00 | 43.42 | 13.00
                 7.333
                                                 2.00 |31.333
                 7.417
                                                 2.00 31.417
                                                                      2 00 | 43 50 13 00
                 7 500
                           2 00 119 500
                                                 2 00 31 500
                 7.583
                           2.00 | 19.583
2.00 | 19.667
                                                 2.00 |31.583
                                                                      2.00 | 43.58
2.00 | 43.67
                 7.667
                                                 2.00 | 31.667
                                                                                          13.00
                           2.00 | 19.750
2.00 | 19.833
                                                2.00 |31.750
2.00 |31.833
                                                                      2.00 | 43.75
2.00 | 43.83
                                                                                          13.00
13.00
                 7.750
                 7.833
                                                2.00 |31.917
2.00 |32.000
                 7.917
                            2.00 19.917
                                                                      2.00 | 43.92 | 13.00
                           2.00 |20.000 | 2.00 |20.083
                                                                      2.00 | 44.00 | 13.00
2.00 | 44.08 | 13.00
                                                 2.00 | 32.083
                 8.083
                 8.167
                            2.00 |20.167
2.00 |20.250
                                                 2.00 |32.167
2.00 |32.250
                                                                      2.00 | 44.17
2.00 | 44.25
                                                                                          13.00
                 8.250
                                                                     2.00 | 44.25 | 13.00

2.00 | 44.42 | 13.00

2.00 | 44.50 | 13.00

2.00 | 44.58 | 13.00

2.00 | 44.67 | 13.00
                 8 333
                           2.00 20.333
                                                 2.00 32.333
                            2.00 |20.417
                                                 2.00 |32.417
                 8.500
                           2.00 20.500
                                                 2.00 32,500
                 8 583
                           2.00 |20.583
2.00 |20.667
                                                 2.00 |32.583
2.00 |32.667
                 8.667
                 8 750
                            2 00 20 750
                                                 2 00 32 750
                                                                      2.00 | 44.75
                                                                                          13.00
                                                                      2.00 | 44.83 | 13.00
2.00 | 44.92 | 13.00
                            2.00 |20.833
                                                 2.00 |32.833
                 8.917
                            2.00 | 20.917
                                                 2.00 | 32.917
                            2.00 |21.000
                                                 2.00 |33.000
2.00 |33.083
                                                                      2.00 | 45.00 13.00
2.00 | 45.08 52.95
                 9.000
                 9.083
                            2.00 21.083
                                                                     2.00 | 45.08 | 32.93

2.00 | 45.17 | 53.00

2.00 | 45.25 | 53.00

2.00 | 45.33 | 53.00

2.00 | 45.42 | 53.00

2.00 | 45.50 | 53.00
                           2.00 |21.167
2.00 |21.250
                 9.167
                                                 2.00 | 33.167
                                                 2.00 |33.107
                 9.333
                           2.00 | 21.333
                                                 2.00 33.333
                                                 2.00 |33.417
2.00 |33.500
                            2.00 |21.417
                 9.500
                            2.00 21.500
                                                                      2.00 | 45.58 53.00
2.00 | 45.67 53.00
2.00 | 45.75 53.00
                 9 583
                           2.00 |21.583
2.00 |21.667
                                                 2.00 |33.583
2.00 |33.667
                 9.750
                           2.00 | 21.750
                                                 2.00 33.750
                            2.00 |21.833
2.00 |21.917
                                                 2.00 |33.833
2.00 |33.917
                                                                      2.00 | 45.83
2.00 | 45.92
                 9.833
                 9.917
                                                 2.00 |34.000 | 2.00 | 46.00
2.00 |34.083 | 2.00 | 46.08
                10 000
                            2 00 22 000
                                                                                          53.00
                 10.083
                            2.00 |22.083
                                                                                           38.02
                10.167
                            2.00 22.167
                                                 2.00 34.167
                                                                       2.00 | 46.17 38.00
                                                  2.00 |34.250
                10.333
                            2.00 | 22.333 | 2.00 | 34.333 | 2.00 | 46.33 | 38.00
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10.417 2.00 | 22.417 2.00 | 34.417 2.00 | 46.42 38.00 
10.500 2.00 | 22.500 2.00 | 34.500 2.00 | 46.50 38.00
               10.583
                         2 00 22 583
                                           2 00 34 583
                                                              2.00 46.58 38.00
                          2.00 |22.667
                                            2.00 |34.667
                                                              2.00 | 46.67
               10.750
                         2.00 | 22.750
                                            2.00 | 34.750
                                                              2.00 | 46.75
                         2.00 |22.833
2.00 |22.917
                                            2.00 |34.833
2.00 |34.917
                                                              2.00 | 46.83
2.00 | 46.92
                10.833
               10.917
                                                                              38.00
                                           2 00 35 000
               11 000
                         2 00 23 000
                                                              2 00 | 47 00 38 00
                          2.00 |23.083
                                            2.00 |35.083
                                                              3.00 | 47.08
                                                              3.00 | 47.17
               11.167
                          2.00 | 23.167
                                            2.00 | 35.167
                         2.00 |23.250
2.00 |23.333
                                           2.00 |35.250
2.00 |35.333
                                                             3.00 | 47.25
3.00 | 47.33
                11.250
               11.333
               11.417
                         2.00 |23.417
                                           2.00 |35.417
                                                             3.00 | 47.42 | 13.00
                          2.00 |23.500
                                            2.00 |35.500
                                                              3.00 | 47.58
               11.583
                          2.00 | 23.583
                                            2.00 | 35.583
                                                                              13.00
                         2.00 |23.667 | 2.00 |35.667 | 2.00 |23.750 | 2.00 |35.750
                11.667
                                                              3.00 | 47.67
               11.750
                                                             3.00 | 47.75 | 13.00
                         2.00 |23.833 | 2.00 |35.833 | 2.00 |23.917 | 2.00 |35.917
               11.833
                                                             3.00 | 47.83 | 13.00
                                                              3.00 | 47.92
               12.000 2.00 24.000 2.00 36.000 3.00 48.00 13.00
       Unit Hyd Opeak (cms)= 0.233
       PEAK FLOW (cms)= 0.432 (i)
TIME TO PEAK (hrs)= 46.417
        RUNOFF VOLUME (mm)= 233.124
TOTAL RAINFALL (mm)= 285.000
       RUNOFF COEFFICIENT = 0.818
       (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
    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 |
               0.83 2.00 | 12.083 2.00 | 24.083 2.00 | 36.08 6.00 0.167 2.00 | 12.167 2.00 | 24.167 2.00 | 36.17 6.00 0.250 2.00 | 12.250 2.00 | 24.252 2.00 | 36.25 6.00 0.333 2.00 | 12.333 2.00 | 24.333 2.00 | 36.33 6.00 0.417 2.00 | 12.417 2.00 | 24.417 2.00 | 36.42 6.00
                0.500
                         2.00 112.500
                                           2.00 |24.500
                                                             2.00 | 36.50
                                                                               6.00
                        2.00 | 12.583 | 2.00 | 24.583 | 2.00 | 36.58 | 2.00 | 12.667 | 2.00 | 24.667 | 2.00 | 36.67
                0.583
                0.667
                                                                              6.00
               0.750 2.00 | 12.750 2.00 | 24.750 2.00 | 36.75 6.00 
0.833 2.00 | 12.833 2.00 | 24.833 2.00 | 36.83 6.00
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2.00 |14.833
2.00 |14.917
                                         2.00 |26.833
2.00 |26.917
                                                          2.00 | 38.83
2.00 | 38.92
              2.917
                                                                            6.00
                                         2.00 |27.000
2.00 |27.083
                                                                            6.00
              3.000
                       2.00 115.000
                                                           2.00 | 39.00
              3.083
                        2.00 | 15.083
                                                            2.00 | 39.08
                                         2.00 |27.167
2.00 |27.250
2.00 |27.333
              3.167
                        2.00 115.167
                                                           2.00 | 39.17
                                                                            13.00
                       2.00 |15.250
2.00 |15.333
                                                          2.00 | 39.25
              3.333
              3.417
                       2.00 115.417
                                         2.00 27.417
                                                           2.00 | 39.42
                                                                           13.00
                       2.00 | 15.500
2.00 | 15.583
                                         2.00 |27.500
2.00 |27.583
                                                            2.00 | 39.50
              3.583
                                                           2.00 | 39.58
                                                                            13.00
                       2.00 |15.565
2.00 |15.667
2.00 |15.750
                                         2.00 |27.667
2.00 |27.750
                                                          2.00 | 39.67
              3.750
                                                                            13.00
                                         2.00 |27.833
2.00 |27.917
              3 833
                       2 00 115 833
                                                           2.00 | 39.83
                                                                            13.00
              3.917
                        2.00 | 15.917
                                                           2.00 | 39.92
              4 000
                       2 00 116 000
                                         2 00 28 000
                                                           2 00 | 40 00
                                                                            13.00
                                         2.00 |28.083
2.00 |28.167
                                                           2.00 | 40.00
2.00 | 40.08
2.00 | 40.17
                        2.00 |16.083
              4.167
                       2.00 | 16.167
                                                                            17.00
              4.250
4.333
                       2.00 |16.250
2.00 |16.333
                                         2.00 |28.250
2.00 |28.333
                                                           2.00 | 40.25
2.00 | 40.33
              4.417
                       2.00 | 16.417
                                         2.00 | 28.417
                                                           2.00 | 40.42
                                                                            17.00
                       2.00 |16.500
2.00 |16.583
                                         2.00 |28.500
2.00 |28.583
                                                          2.00 | 40.50
2.00 | 40.58
              4.500
              4.583
                                                                            17.00
                       2.00 |16.667
2.00 |16.750
                                         2.00 |28.667
2.00 |28.750
                                                           2.00 | 40.67
2.00 | 40.75
              4.667
                                                                            17.00
              4.750
              4.833
                       2.00 | 16.833
                                         2.00 | 28.833
                                                           2.00 | 40.83
                                                                            17.00
                                        2.00 |28.917
2.00 |29.000
                                                          2.00 | 40.92
                       2.00 | 17.000
              5.000
                                                                            17.00
                                        2.00 |29.083
2.00 |29.167
                                                          2.00 | 41.08
              5.083
                       2.00 | 17.083
2.00 | 17.167
                                                                            13.00
              5.167
                                                                            13.00
              5 250
                       2 00 117 250
                                         2 00 29 250
                                                          2 00 | 41 25
                                                                            13.00
                       2.00 | 17.333
                                        2.00 |29.333 | 2.00 | 41.33 | 13.00
file:///Ca0004-ppfss01/...61414473/design/report/FR/SWM%20writeup/Appendix%20V020-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM] file://Ca0004-ppfss01/...61414473/design/report/FR/SWM%20writeup/Appendix%20V0%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
                       2.00 | 21.917 | 2.00 | 33.917 | 2.00 | 45.92 | 53.00 | 2.00 | 22.000 | 2.00 | 34.000 | 2.00 | 46.00 | 53.00
              9.917
                                                           2.00 | 46.00 53.00
             10.000
                                          2.00 |34.083
2.00 |34.167
                                                           2.00 | 46.08
2.00 | 46.17
                                                                           38.02
38.00
              10.083
                        2.00 |22.083
                         2.00 |22.167
              10.167
              10.250
                        2.00 | 22.250
                                          2.00 |34.250
                                                            2.00 | 46.25
                                                                            38.00
                        2.00 |22.333
2.00 |22.417
                                          2.00 |34.333
2.00 |34.417
                                                           2.00 | 46.33
2.00 | 46.42
              10.417
                                                                            38.00
                                          2.00 |34.500
2.00 |34.583
              10.500
                        2.00 22.500
                                                            2.00 | 46.50 | 38.00
                         2.00 |22.583
                                                            2.00 | 46.58
              10.667
                        2.00 22.667
                                          2.00 34.667
                                                            2.00 | 46.67
                                                                            38.00
                       2.00 |22.750
2.00 |22.833
                                         2.00 |34.750
2.00 |34.833
                                                           2.00 | 46.75 38.00
2.00 | 46.83 38.00
              10.833
              10.917
                        2.00 |22.917
                                          2.00 |34.917
2.00 |35.000
                                                           2.00 | 46.92 38.00
2.00 | 47.00 38.00
              11.000
                         2.00 |23.000
              11 083
                        2 00 23 083
                                          2 00 35 083
                                                            3 00 | 47 08
                                                                            13 04
                       2.00 |23.167
2.00 |23.250
                                          2.00 |35.167
                                                            3.00 | 47.17
                                          2.00 35.250
              11.250
                                                            3.00 | 47.25
                                                                            13.00
                                          2.00 |35.333
2.00 |35.417
                                                            3.00 | 47.33
3.00 | 47.42
              11.333
                        2.00 |23.333
                         2.00 23.417
              11.417
              11 500
                        2 00 23 500
                                          2 00 35 500
                                                            3 00 | 47 50
                        2.00 |23.583
                                          2.00 |35.583
                                                            3.00 | 47.58
                        2.00 23.667
                                          2.00 35.667
                                                            3.00 | 47.67
              11.667
                                                                            13.00
                       2.00 |23.750
2.00 |23.833
                                          2.00 |35.750
2.00 |35.833
                                                           3.00 | 47.75
3.00 | 47.83
              11.750
                                                                            13.00
              11.833
                                                                            13.00
              11.917
                        2.00 23.917
                                          2.00 35.917
                                                           3.00 | 47.92
                                                                            13.00
                       2.00 |24.000 | 2.00 |36.000 | 3.00 | 48.00 | 13.00
      Unit Hyd Qpeak (cms)= 0.072
     PEAK FLOW (cms)= 0.145 (i)
TIME TO PEAK (hrs)= 46.583
RUNOFF VOLUME (mm)= 228.405
TOTAL RAINFALL (mm)= 285.000
RUNOFF COEFFICIENT = 0.801
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY
  | ADD HYD ( 0029)|
       1 + 2 = 3
        ID = 3 (0029): 4.90 0.575 46.42 231.90
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
  | ADD HYD ( 0029)|
    3 + 2 = 1 |
                          AREA QPEAK TPEAK R.V.
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
```

0.917

1.000 1.083

1 333

1.500

1.583

1.667

1.750

1.917

2.000

2.083

2.167

2.333

2 417

2.500

2 583

2.667

2.750

2.833

2 00 112 917

2.00 |13.000

2.00 | 13.083

2.00 |13.167 2.00 |13.250

2 00 113 333

2.00 |13.417

2.00 | 13.500

2.00 |13.583 2.00 |13.667

2.00 113.750

2.00 |13.833

2.00 13.917

2.00 |14.000 2.00 |14.083

2.00 | 14.167 2.00 | 14.250

2.00 114.333

2.00 |14.417 2.00 |14.500

2 00 114 583

2.00 | 14.667

2.00 | 14.750

2 00 |24 917

2.00 |25.000 2.00 |25.083

2.00 |25.167 2.00 |25.250

2 00 25 333

2.00 |25.417

2.00 | 25.500

2.00 |25.583 2.00 |25.667

2.00 |25.750

2.00 |25.833

2.00 |25.917

2.00 |26.000 2.00 |26.083

2.00 |26.167 2.00 |26.250

2.00 | 26.333

2.00 |26.417 2.00 |26.500

2.00 | 26.583

2.00 |26.667

2.00 | 26,750

2 00 | 36 92

2.00 | 37.00

2.00 | 37.08

2 00 | 37 33

2.00 | 37.42

2.00 | 37.50

2.00 | 37.58

2.00 | 37.75

2.00 | 37.92

2.00 | 38.00 2.00 | 38.08

2.00 | 38.17

2.00 | 38.33

2.00 | 38.42 2.00 | 38.50

2.00 | 38.58

2.00 | 38.67

2.00 | 38.75

4.00

4.00

4.00

4.00

4.00

4.00

6.00

6.00

6.00

6.00

6.00

6.00

```
2.00 |19.333
2.00 |19.417
                                           2.00 |31.333
2.00 |31.417
                                                             2.00 | 43.33
2.00 | 43.42
                7.417
                                                                               13.00
                7 500
                         2 00 119 500
                                           2 00 31 500
                                                             2.00 | 43.50
                                                                               13.00
                7.583
                          2.00 |19.583
                                           2.00 |31.583
                                                              2.00 | 43.58
                7.667
                         2.00 19.667
                                           2.00 | 31.667
                                                              2.00 | 43.67
                                                                               13.00
                7.750
7.833
                         2.00 |19.750
2.00 |19.833
                                           2.00 |31.750
2.00 |31.833
                                                              2.00 | 43.75
2.00 | 43.83
                7.917
                         2.00 19.917
                                           2.00 31.917
                                                              2.00 | 43.92
                                                                              13.00
                         2.00 |20.000
                                           2.00 |32.000
2.00 |32.083
                                                              2.00 | 44.00
2.00 | 44.08
                         2.00 20.083
                8.083
                                                                               13.00
                8.167
8.250
                         2.00 |20.167
2.00 |20.250
                                           2.00 |32.167
2.00 |32.250
                                                             2.00 | 44.17
2.00 | 44.25
                                                                              13.00
13.00
                8.333
                         2.00 | 20.333
                                           2.00 | 32.333
                                                              2.00 | 44.33
                                                                               13.00
                                           2.00 |32.417
2.00 |32.500
                          2.00 |20.417
                                                              2.00 | 44.42
                                                              2.00 | 44.50
                8.500
                         2.00 20.500
                                                                               13.00
                8.583
8.667
                         2.00 |20.583
2.00 |20.667
                                           2.00 |32.583
2.00 |32.667
                                                             2.00 | 44.58 | 2.00 | 44.67
                                                                               13.00
                8 750
                         2 00 20 750
                                           2 00 32 750
                                                             2.00 | 44.75
                                                                               13.00
                         2.00 |20.833
2.00 |20.917
                                           2.00 |32.833
2.00 |32.917
                                                              2.00 | 44.83
2.00 | 44.92
                8.917
                         2.00 |21.000
2.00 |21.083
                                           2.00 |33.000
2.00 |33.083
                                                             2.00 | 45.00
2.00 | 45.08
                9.000
                9.083
                9 167
                         2 00 21 167
                                           2 00 33 167
                                                              2 00 | 45 17
                                                                               53.00
                          2.00 |21.250
                                            2.00 |33.250
                                           2.00 33.333
                                                              2.00 | 45.33
                9.333
                         2.00 | 21.333
                                                                              53.00
                         2.00 |21.417
2.00 |21.500
                                           2.00 |33.417
2.00 |33.500
                                                             2.00 | 45.42 53.00
2.00 | 45.50 53.00
                9.417
                9.583
                         2.00 21.583
                                           2.00 |33.583
                                                             2.00 | 45.58 53.00
2.00 | 45.67 53.00
                         2.00 |21.667
                                           2.00 |33.667
                9.667
                         2.00 21.750
                                           2.00 | 33.750
                9.750
                                                             2.00 | 45.75
                                                                               53.00
                         2.00 |21.833
                                          2.00 |33.833
                                                             2.00 | 45.83 | 53.00
        ID = 1 (0029): 16.77 1.851 46.75 234.83
       NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY
    | NASHYD ( 0123)| Area (ha)= 1.39 Curve Number (CN)= 86.8
| ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
                     ---- U.H. Tp(hrs)= 0.48
          NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                              -- TRANSFORMED HYETOGRAPH --
                 TIME RAIN | TIME RAIN | TIME RAIN | TIME
                 0.083 2.00 | 12.083 2.00 | 24.083 2.00 | 36.08 6.00 | 0.167 2.00 | 12.167 2.00 | 24.167 2.00 | 36.17 6.00
                0.083
                0.167
                        2.00 | 12.250 | 2.00 | 24.250 | 2.00 | 36.25 | 2.00 | 12.333 | 2.00 | 24.333 | 2.00 | 36.33
                0.250
                                                                               6.00
                                           2.00 24.417
                0.417
                         2.00 | 12.417
                                                              2.00 | 36.42
                                                                               6.00
                0.500
0.583
                         2.00 |12.500
2.00 |12.583
                                           2.00 |24.500
2.00 |24.583
                                                             2.00 | 36.50
2.00 | 36.58
                                                                               6.00
                                                                               6.00
                0.667
                         2.00 |12.667
2.00 |12.750
                                           2.00 |24.667
2.00 |24.750
                                                             2.00 | 36.67
2.00 | 36.75
                                                                               6.00
                0.833
                         2.00 | 12.833
                                           2.00 |24.833
                                                              2.00 | 36.83
                                                                               6.00
                          2.00 |12.917
                                           2.00 |24.917
2.00 |25.000
                                                             2.00 | 36.92
2.00 | 37.00
                1.000
                         2.00 | 13.000
                                                                               6.00
                         2.00 |13.083
2.00 |13.167
                                           2.00 |25.083
2.00 |25.167
                                                             2.00 | 37.08
2.00 | 37.17
                                                                               4 00
                 1.083
                1.250
                         2.00 113.250
                                           2.00 |25.250
                                                              2.00 | 37.25
                                                                               4.00
                         2.00 |13.230
2.00 |13.333
2.00 |13.417
                                           2.00 |25.230
2.00 |25.333
2.00 |25.417
                                                              2.00 | 37.33
2.00 | 37.42
                1.417
                                                                               4.00
                 1 500
                         2.00 13.500
                                           2.00 |25.500
                                                             2.00 | 37.50
                                                                               4 00
                         2.00 |13.583
                                           2.00 |25.583
                                                              2.00 | 37.58
                1.583
                1 667
                         2 00 113 667
                                           2 00 25 667
                                                              2 00 | 37 67
                                                                               4 00
                                           2.00 |25.750
2.00 |25.833
                          2.00 |13.750
                1.833
                         2.00 | 13.833
                                                              2.00 | 37.83
                                                                               4.00
                         2.00 |13.917
2.00 |14.000
                                           2.00 |25.917
2.00 |26.000
                                                              2.00 | 37.92
2.00 | 38.00
                 1.917
                                                                               4.00
                                                                               4.00
                2.000
                2.083
                         2.00 114.083
                                           2.00 |26.083
                                                              2.00 | 38.08
                                                                               6.00
                          2.00 |14.167
                                            2.00 |26.167
                                           2.00 |26.250
                2.250
                         2.00 114.250
                                                              2.00 | 38.25
                                                                               6.00
                                           2.00 |26.333
2.00 |26.417
                                                              2.00 | 38.33
2.00 | 38.42
                2.333
                         2.00 14.333
                                                                               6.00
                          2.00 |14.417
                2.417
                2.500
                         2.00 114.500
                                           2.00 | 26.500
                                                              2.00 | 38.50
                                                                               6.00
                                           2.00 |26.583
2.00 |26.667
                2.583
                          2.00 |14.583
                                                             2.00 | 38.67
                2.667
                         2.00 | 14.667
                                                                               6.00
                2 750
                        2.00 | 14.750 | 2.00 | 26.750 | 2.00 | 38.75 | 2.00 | 14.833 | 2.00 | 26.833 | 2.00 | 38.83
                2.833
file:///Ca0004-ppfss01/...61414473/design/report/FSR/SWM%20writeup/Appendix%20C%20-%20VO%20Modelling/ExistingVOoutput.txt[8/19/2024 12:25:03 PM]
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5.417

5.500 5.583

5 667

5.833

5 917

6.000

6.083

6.250

6.333

6.417

6.500

6.583

6.667

6.833

6.917

7.083

7.250

7.333

2.00 | 17.417

2.00 |17.500 2.00 |17.583

2.00 |17.667 2.00 |17.750

2.00 17.833

2.00 |17.917 2.00 |18.000

2.00 18.083

2.00 | 18.167

2.00 18.250

2.00 | 18.333

2.00 18.417

2.00 |18.500 2.00 |18.583

2.00 118.667

2.00 |18.750 2.00 |18.833

2.00 18.917

2.00 |19.000

2.00 119.083

2.00 |19.167 2.00 |19.250

2.00 | 29.417

2.00 |29.500 2.00 |29.583

2.00 |29.667 2.00 |29.750 2.00 |29.833

2.00 |29.917 2.00 |30.000

2 00 30 083

2.00 |30.167

2.00 30.250

2.00 |30.333 2.00 |30.417

2.00 |30.500 2.00 |30.583

2.00 30.667

2.00 |30.750 2.00 |30.833

2.00 | 30.917

2.00 |30.017

2.00 31.083

2.00 |31.167 2.00 |31.250

2.00 | 41.42

2.00 | 41.50 2.00 | 41.58

2.00 | 41.67 2.00 | 41.75

2.00 | 41.83

2.00 | 41.92 2.00 | 42.00

2.00 | 42.08 2.00 | 42.17

2.00 42.25 23.00

2.00 | 42.33 23.00 2.00 | 42.42 23.00

2.00 | 42.50 23.00 2.00 | 42.58 23.00

2.00 | 42.67 23.00

2.00 | 42.92 23.00 2.00 | 43.00 23.00

2.00 | 43.08 | 13.01

2.00 | 42.75 2.00 | 42.83

2.00 | 43.17 2.00 | 43.25

13.00

13.00

13.00

13.00

13.00

22 99

23.00

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2.00 |26.917
2.00 |27.000
2.00 |27.083
2 917
            2 00 114 917
                                                              2 00 | 38 92
            2.00 | 15.000 | 2.00 | 15.083
                                                               2.00 | 39.00
3.000
3.083
                                                              2.00 | 39.08
                                                                                      13.00
            2.00 | 15.167
2.00 | 15.250
                                     2.00 |27.167
2.00 |27.250
                                                              2.00 | 39.17
2.00 | 39.25
3 333
            2 00 115 333
                                     2.00 | 27.333
                                                              2 00 | 39 33
                                                                                     13.00
             2.00 | 15.417
                                     2.00 |27.417
2.00 |27.500
                                                              2.00 | 39.42
2.00 | 39.50
             2.00 15.500
3.500
                                                                                      13.00
3.583
3.667
            2.00 | 15.583
2.00 | 15.667
                                     2.00 |27.583
2.00 |27.667
                                                              2.00 | 39.58
3.750
            2.00 | 15.750
                                     2.00 |27.750
2.00 |27.833
2.00 |27.917
                                                              2.00 | 39.75
                                                                                      13.00
3.917
             2.00 | 15.917
                                                              2.00 | 39.92
                                                                                      13.00
                                                             2.00 | 39.92

2.00 | 40.00

2.00 | 40.08

2.00 | 40.17

2.00 | 40.25

2.00 | 40.33
4.000
4.083
            2.00 | 16.000 | 2.00 | 16.083
                                     2.00 |28.000
2.00 |28.083
                                                                                      17.00
            2.00 |16.167
2.00 |16.250
4.167
                                     2.00 | 28.167
                                     2.00 |28.250
2.00 |28.333
4.333
            2.00 | 16.333
                                                                                      17.00
                                                             2.00 | 40.42 | 17.00
2.00 | 40.42 | 17.00
2.00 | 40.50 | 17.00
2.00 | 40.58 | 17.00
2.00 | 40.67 | 17.00
4.417
4.500
            2.00 | 16.417 | 2.00 | 16.500
                                     2.00 |28.417
2.00 |28.500
4 583
            2.00 16.583
                                     2.00 | 28.583
             2.00 | 16.667
                                      2.00 |28.667
4.667
                                     2.00 | 28,750
                                                              2.00 | 40.75
4.750
            2.00 | 16.750
                                                                                      17.00
                                                             2.00 | 40.73 | 17.00
2.00 | 40.83 | 17.00
2.00 | 40.92 | 17.00
2.00 | 41.00 | 17.00
2.00 | 41.08 | 13.00
4.833
            2.00 | 16.833 | 2.00 | 16.917
                                     2.00 |28.833
2.00 |28.917
4.917
5.000
                                     2.00 |29.000
2.00 |29.083
             2.00 17.000
5.083
             2.00 | 17.083
                                                             2.00 | 41.08 | 13.00

2.00 | 41.17 | 13.00

2.00 | 41.25 | 13.00

2.00 | 41.33 | 13.00

2.00 | 41.42 | 13.00

2.00 | 41.50 | 13.00

2.00 | 41.58 | 13.00
                                     2.00 |29.167
2.00 |29.250
2.00 |29.333
5.167
5.250
             2.00 17.167
            2.00 | 17.250
2.00 | 17.333
5.333
5.417
            2.00 17.417
                                     2.00 |29.417
            2.00 | 17.500
2.00 | 17.583
                                     2.00 |29.500
2.00 |29.583
5.583
                                                             2.00 | 41.58 | 13.00
2.00 | 41.67 | 13.00
2.00 | 41.75 | 13.00
2.00 | 41.83 | 13.00
2.00 | 41.92 | 13.00
            2.00 | 17.667
2.00 | 17.750
                                     2.00 |29.667
2.00 |29.750
5.750
                                     2.00 |29.833
2.00 |29.917
5.833
            2.00 17.833
             2.00 | 17.917
                                                              2 00 | 42 00 13 00
6.000
            2 00 118 000
                                     2 00 30 000
                                                              2.00 | 42.00 | 13.00
2.00 | 42.08 | 22.99
2.00 | 42.17 | 23.00
             2.00 | 18.083
                                      2.00 |30.083
             2.00 18.167
                                      2.00 30.167
6.167
6.250
6.333
             2.00 |18.250
2.00 |18.333
                                     2.00 |30.250
2.00 |30.333
                                                              2.00 | 42.25 | 23.00
2.00 | 42.33 | 23.00
                                                              2.00 42.42 23.00
6.417
            2.00 | 18.417
                                     2.00 | 30.417
6.500
6.583
            2.00 | 18.500
2.00 | 18.583
                                     2.00 |30.500
2.00 |30.583
                                                              2.00 | 42.50 23.00
2.00 | 42.58 23.00
6.667
            2.00 | 18.667
2.00 | 18.750
                                     2.00 |30.667
2.00 |30.750
                                                              2.00 | 42.67 23.00
2.00 | 42.75 23.00
6.750
6.833
            2.00 | 18.833
                                     2.00 30.833
                                                              2.00 | 42.83 23.00
                                                             2.00 | 42.83 | 23.00

2.00 | 42.92 | 23.00

2.00 | 43.00 | 23.00

2.00 | 43.08 | 13.01

2.00 | 43.17 | 13.00
                                      2.00 |30.917
                                     2.00 |31.000
7.000
            2.00 119.000
7.083
            2.00 | 19.083
2.00 | 19.167
                                     2.00 |31.083
2.00 |31.167
7.167
            2.00 | 19.250 | 2.00 | 31.250 | 2.00 | 43.25 | 13.00 | 2.00 | 19.333 | 2.00 | 31.333 | 2.00 | 43.33 | 13.00
 7 250
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11.917 2.00 |23.917 2.00 |35.917 3.00 | 47.92 13.00 | 12.000 2.00 |24.000 2.00 |36.000 3.00 | 48.00 13.00

Unit Hyd Qpeak (cms)= 0.110

PEAK FLOW (cms)= 0.178 (i) TIME TO PEAK (hrs)= 46.250 RUNOFF VOLUME (mm)= 244.071 TOTAL RAINFALL (mm)= 285.000 RUNOFF COEFFICIENT = 0.856

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

| Junction Command(0030) |

AREA OPEAK TPEAK R.V.

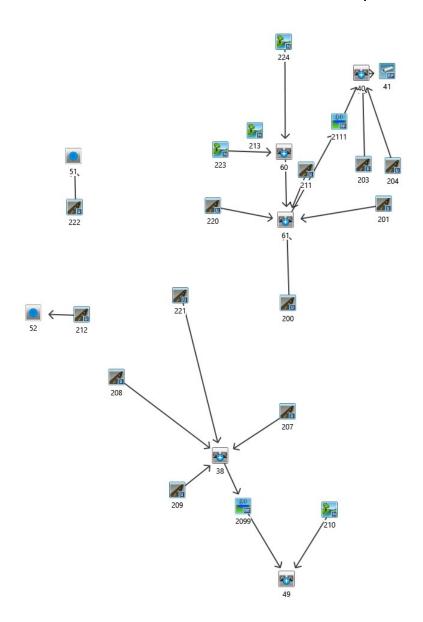
(ha) (cms) (hrs) (mr) INFLOW: ID= 2(0123) 1.39 0.18 46.25 244.07 OUTFLOW: ID= 2(0030) 1.39 0.18 46.25 244.07

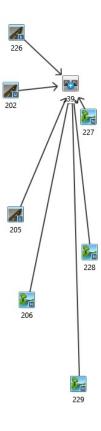
2.00 |31.417 2.00 |31.500 2.00 |31.583 2.00 | 43.42 | 13.00 7.417 2.00 | 19.417 7.500 7.583 2.00 |19.500 2.00 |19.583 2.00 | 43.50 | 13.00 2.00 | 43.58 | 13.00 7.667 7.750 2.00 |19.667 2.00 |19.750 2.00 |31.667 2.00 |31.750 2.00 | 43.67 2.00 | 43.75 2.00 19.833 2.00 | 31.833 2.00 | 43.83 7.833 13.00 7 917 2.00 |19.917 2.00 |20.000 2.00 |31.917 2.00 |32.000 2.00 | 43.92 2.00 | 44.00 13.00 8.000 13.00 2.00 | 44.08 2.00 | 44.17 8.083 2.00 20.083 2.00 32.083 13.00 2.00 |20.167 2.00 |32.167 8.250 2.00 20.250 2.00 32.250 2.00 | 44.25 13.00 2.00 |20.333 2.00 |20.417 2.00 |32.333 2.00 |32.417 2.00 | 44.33 2.00 | 44.42 8.333 8.417 13.00 8.500 2.00 |20.500 2.00 |20.583 2.00 |32.500 2.00 |32.583 2.00 | 44.50 2.00 | 44.58 13.00 13.00 8.583 8.667 2.00 20.667 2.00 32.667 2.00 | 44.67 13.00 2.00 |20.667 2.00 |20.750 2.00 |20.833 2.00 |20.917 2.00 |21.000 2.00 |32.750 2.00 |32.833 2.00 | 44.75 2.00 | 44.83 8.833 13.00 2.00 | 44.92 | 13.00 2.00 | 45.00 | 13.00 2.00 | 45.08 | 52.95 8.917 2.00 | 32.917 2.00 |32.017 9.083 2.00 21.083 2.00 |33.083 2.00 |21.167 2.00 |21.250 2.00 |33.167 2.00 |33.250 2.00 | 45.17 53.00 2.00 | 45.25 53.00 9.250 9 3 3 3 2.00 |21.333 2.00 |21.417 2.00 |33.333 2.00 |33.417 2.00 | 45.33 53.00 2.00 | 45.42 53.00 9.417 9 500 2 00 21 500 2 00 33 500 9.583 2.00 |21.583 2.00 |21.667 2.00 |33.583 2.00 |33.667 9.667 2.00 |21.750 2.00 |21.833 2.00 |33.750 2.00 |33.833 2.00 | 45.75 2.00 | 45.83 9.750 2.00 | 45.92 53.00 9.917 2.00 21.917 2.00 33.917 10.000 2.00 |22.000 2.00 |22.083 2.00 |34.000 2.00 |34.083 2.00 | 46.00 53.00 2.00 | 46.08 38.02 10.083 10.167 10.250 2.00 |22.167 2.00 |22.250 2.00 |34.167 2.00 |34.250 2.00 | 46.17 38.00 2.00 | 46.25 38.00 10.333 2.00 | 22.333 2.00 | 34.333 2.00 | 46.33 | 38.00 2.00 |22.417 2.00 |22.500 2.00 |34.417 2.00 | 46.42 2.00 |34.500 10.500 2.00 | 46.50 | 38.00 2.00 |22.583 2.00 |22.667 2.00 |34.583 2.00 |34.667 2.00 | 46.58 2.00 | 46.67 10.583 10.667 38.00 10.750 2 00 22 750 2.00 | 34,750 2.00 | 46.75 38.00 2.00 |22.833 2.00 |22.917 2.00 |34.833 2.00 |34.917 2.00 | 46.83 2.00 | 46.92 10.917 2.00 |23.000 2.00 |23.083 2.00 |35.000 2.00 |35.083 2.00 | 47.00 38.00 3.00 | 47.08 13.04 11.000 11.083 11 167 2 00 23 167 2 00 35 167 3 00 | 47 17 13.00 2.00 |23.250 2.00 |23.333 2.00 |35.250 2.00 | 35.333 3.00 | 47.33 11.333 13.00 2.00 |23.417 2.00 |23.500 2.00 |35.417 2.00 |35.500 3.00 | 47.42 | 13.00 3.00 | 47.50 | 13.00 11.417 11.500 2.00 |23.583 2.00 |23.667 2.00 |23.750 2.00 |35.583 2.00 |35.667 2.00 |35.750 11.583 3.00 | 47.58 | 13.00 11.667 11.750 3.00 | 47.67 13.00 2.00 |23.833 2.00 |35.833 3.00 | 47.83 | 13.00

APPENDIX C-3

PROPOSED CONDITIONS SCHEMATIC

VO Schematic - Proposed Conditions





APPENDIX C-4

PROPOSED OUTPUT

```
______
                   SSSSS U U
                                                     (v 6.2.2015)
                 SS U U AAAAA L
SS U U AAAAA L
SS U U A A L
            I SS U U A A L
I SSSSS UUUUU A A LLLLL
        vv
       000 TTTTT TTTTT H H Y Y M M 000
0 0 T T H H Y Y M MM 0 0
0 0 T T H H Y M M 0 0
000 T T H H Y M M 000
      0 0
Developed and Distributed by Smart City Water Inc
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All rights reserved.
                 ***** DETAILED OUTPUT *****
 Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output filename:
C:\Users\mornat\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\3971d9
92-ac90-4848-a995-f8d8bbe38e1d\scena
  Summary filename:
C:\Users\mornat\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\3971d9
92-ac90-4848-a995-f8d8bbe38e1d\scena
DATE: 08/19/2024
                                       TIME: 12:07:49
USER:
COMMENTS:
  *********************************
  CHICAGO STORM
                     IDF curve parameters: A=2987.057
CHICAGO STORM
Ptotal= 96.22 mm
                                           B= 15.200
C= 0.897
```

```
Duration of storm = 12.00 hrs
                         Storm time step = 5.00
Time to peak ratio = 0.38
                TIME
                         RAIN
                                  TIME
                                           RAIN
                                                     TIME
                                                             RAIN | TIME
mm/hr | hrs
                                                                               RAIN
                        mm/hr
0.99
                                          mm/hr
3.32
                                                    hrs
6.00
                                                             mm/hr
5.86
                                                                               mm/hr
1.65
                0.08
                         1.01
                                  3.08
                                           3.55
                                                    6.08
                                                             5.49
                                                                      9.08
                                                                               1.62
                0.17
                         1.03
                                  3.17
                                           3.81
                                                    6.17
                                                             5.16
                                                                      9.17
                                                                               1.59
                0.25
0.33
                                  3.25
                                                                      9.25
9.33
                                           4.12
                         1.07
                                                    6.33
                                                             4.60
                                                                               1.53
                0.42
                         1.10
                                  3.42
                                           4.90
                                                    6.42
                                                             4.37
                                                                      9.42
                                                                               1.50
                                           5.40
                 0.50
                         1.12
                                  3.50
                                                    6.50
                                                             4.15
                                                                      9.50
                                                                               1.48
                0.67
                         1.17
                                  3.67
                                           6.77
                                                    6.67
                                                             3.78
                                                                      9.67
                                                                               1.43
                0.75
                                  3.75
                                           7.73
                                                    6.75
                                                             3.61
                                                                     9.75
                                                                               1.40
                                  3.83
                                                                     9.83
                                  3.92
                                          10.62
                0.92
                         1.26
                                                    6.92
                                                             3.32
                                                                               1.36
                1.00
                         1.29
                                  4.00
                                          12,92
                                                    7.00
                                                             3.20
                                                                     10.00
                                                                               1.33
                1.08
                                  4.08
4.17
                                          16.29
21.59
                                                    7.08
7.17
                                                             3.08
2.97
                                                                     10.08
10.17
                         1.32
                         1.39
                                                    7.25
                1.25
                                  4.25
                                          30.82
                                                             2.86
                                                                     10.25
                                                                               1.27
                                                    7.33
7.42
7.50
                1.33
                         1.43
                                  4.33
                                          49.63
                                                             2.77
                                                                     10.33
                                                                               1.25
                                                             2.68
                1.50
                         1.52
                                  4.50
                                         201.53
                                                             2.59
                                                                     10.50
                                                                               1.22
                1.58
                         1.57
                                  4.58
                                        116.59
                                                    7.58
                                                             2.51
                                                                     10.58
                                                                               1.20
                                                    7.67
7.75
7.83
                1.67
                         1.62
                                  4.67
                                          70.34
48.12
                                                             2.44
                                                                     10.67
10.75
                                                                               1.18
                                                             2.37
                1.83
                         1.73
                                  4.83
                                          35.56
                                                             2.30
                                                                     10.83
                                                                               1.15
                1.92
                         1.79
                                  4.92
                                          27.69
                                                    7.92
                                                             2.24
                                                                     10.92
                                                                               1.13
                2.00
                                          22.40
                                  5.08
                                          18.63
                                                             2.12
                                                                     11.08
                                                                               1.10
                         1.92
                                                    8.08
                2.17
                         2.00
                                  5.17
                                          15.85
                                                    8.17
                                                             2.07
                                                                     11.17
                                                                               1.09
                         2.08
                                  5.25
                                          13.73
12.06
                                                                     11.25
11.33
                2.25
                                                    8.25
                                                             2.02
                                                                               1.08
                                                                                1.06
                2.42
                         2.27
                                  5.42
                                          10.73
                                                    8.42
                                                             1.92
                                                                     11.42
                                                                               1.05
                2.50
                         2.38
                                 5.50
5.58
                                           9.64
8.73
7.97
                                                    8.50
                                                             1.88
                                                                     11.50
11.58
                                                                               1.04
                2.67
                         2.63
                                                             1.80
                                                                     11.67
                                  5.67
                                                    8.67
                                                                               1.01
                2.75
                                  5.75
                                           7.32
                                                    8.75
                                                             1.76 | 11.75
                                                                               1.00
                         2.93 | 5.83
3.11 | 5.92
                                           6.77
6.28
                                                             1.72 | 11.83
1.69 | 11.92
                 2.83
                                                    8.83
                                                    8.92
                2.92
CALIB
NASHYD ( 0213) Area (ha)= 0.12 Curve Number (CN)= 79.1
```

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

```
|ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
----- U.H. Tp(hrs)= 0.34
      Unit Hyd Qpeak (cms)= 0.013
       PEAK FLOW
                                       0.013 (i)
      TIME TO PEAK (
RUNOFF VOLUME
TOTAL RAINFALL
                           (hrs)= 5.000
(mm)= 50.899
(mm)= 96.218
      RUNOFF COFFFICIENT
                                  = 0.529
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
  CALIB
| CALIB
| NASHYD ( 0227)
|ID= 1 DT= 5.0 min
                           Area (ha)= 0.13 Curve Number (CN)= 82.3

Ia (mm)= 7.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.22
      Unit Hyd Qpeak (cms)= 0.022
      PEAK FLOW (cms)= 0.021 (i)
      TIME TO PEAK (hrs)= 4.833
RUNOFF VOLUME (mm)= 55.264
TOTAL RAINFALL (mm)= 96.218
RUNOFF COEFFICIENT = 0.574
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
______
  CALIB
| CALIB | NASHYD ( 0228) | Area (ha)= 0.71 Curve Number (CN)= 84.4 | ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.31
      Unit Hyd Qpeak (cms)= 0.088
      PEAK FLOW (cms)=
                                       0.100 (i)
      TIME TO PEAK (hrs)= 4.917
RUNOFF VOLUME (mm)= 58.436
TOTAL RAINFALL (mm)= 96.218
RUNOFF COEFFICIENT = 0.607
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| CALIB
```

```
Unit Hyd Qpeak (cms)=
                                 0.080
     PEAK FLOW (cms)= 0.111
TIME TO PEAK (hrs)= 5.167
RUNOFF VOLUME (mm)= 60.006
TOTAL RAINFALL (mm)= 96.218
RUNOFF COEFFICIENT = 0.624
                                 0.111 (i)
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
-----
 CALTB
Unit Hyd Qpeak (cms)= 0.391
     PEAK FLOW (cms)= 0.330
TIME TO PEAK (hrs)= 4.833
RUNOFF VOLUME (mm)= 48.807
TOTAL RATNFALL (mm)= 96.507
                                0.330 (i)
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
-----
LCALTB
STANDHYD ( 0205)
ID= 1 DT= 5.0 min
                        Area (ha)= 0.56
Total Imp(%)= 50.00 Dir. Conn.(%)= 1.00
                                 TMPERVTOUS
                                                PERVIOUS (i)
                                     1.00
                                                    5.00
     Dep. Storage
                        (mm)=
     Average Slope
Length
                         (%)=
(m)=
                                     2.00
                                                    2.00
                                                   0.250
     Mannings n
                                    0.013
     Max.Eff.Inten.(mm/hr)=
                                   201 53
                                                  239.10
     over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                     5.00
1.17 (ii)
                                                   5.00
3.33 (ii)
                                     5.00
                                     0.34
                                                                  *TOTALS*
```

PEAK FLOW	(cms)=	0.00	0.19	0.198 (iii	L)
TIME TO PEAK	(hrs)=	4.58	4.58	4.58	
RUNOFF VOLUME	(mm)=	95.22	66.50	66.78	
TOTAL RAINFAL	L (mm)=	96.22	96.22	96.22	
RUNOFF COEFFI	CIENT =	0.99	0.69	0.69	
** WARNING: STO ** WARNING:FOR YOU		MPERVIOUS RA	TIOS BELOW 20%		

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 77.0 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.

CALIB STANDHYD (022 ID= 1 DT= 5.0 mi			0.05	Conn.(%)= 55.	aa
I D = 1 D = 3.0	III I IOCAI	Imp(%)= 0	5.00 DIF. (Joini. (%)= 33.	00
		IMPERVIOU	S PERVIOUS	5 (i)	
Surface Area	(ha)=	0.03	0.02		
Dep. Storage	e (mm)=	1.00	5.00		
Average Slop	e (%)=	2.00	2.00		
Length	(m)=	18.26	10.00		
Mannings n	=	0.013	0.250		
Max.Eff.Inte					
	over (min)		5.00		
			(ii) 2.50	(ii)	
Unit Hyd. Tr		5.00	5.00		
Unit Hyd. pe	eak (cms)=	0.34	0.29		
				*TOTAL	-
PEAK FLOW		0.02	0.01	0.02	2 (iii)
TIME TO PEAK		4.58	4.58	4.5	8
RUNOFF VOLUM					
TOTAL RAINFA		96.22			
RUNOFF COEFF	ICIENT =	0.99	0.59	0.8	1

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 77.0 Ia = Dep. Storage (Above)

 (ii) TIME STEP (OT) SHOULD BE SMALLER OR EQUAL

 THAN THE STORAGE COEFFICIENT.

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

STANDHYD (0202) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)= 6	0.36 55.00 Dir.	Conn.(%)=	55.00
CC A	(1)	TWLEKATOR	JS PERVIC		
Surface Area Dep. Storage	(mm)=	1 00	0.1 5.0		
Average Slope					
Length	(m)=	2.00 48.99	10.0		
Mannings n	=	0.013	0.25	50	
Max.Eff.Inten.	(mm/hr)=	201.53	129.8	80	
ove	er (min)	5.00	5.0	90	
ove Storage Coeff. Unit Hyd. Tpea	(min)=	1.02	(ii) 2.9	6 (ii)	
Unit Hyd. Tpea	k (min)=	5.00	5.0	10	
Unit Hyd. peak	(cms)=	0.34	0.2	28	
					TOTALS*
PEAK FLOW	(cms)=	0.11	0.0	95	0.158 (iii)
TIME TO PEAK	(hrs)=	4.58	4.5	8	4.58
TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL	(mm)=	95.22	56.3		77.71
ΤΟΤΔΙ ΒΔΤΝΕΔΙΙ	. (mm)=	96.22	96.2		96.22
RUNOEE COEFETO	TENT =	0.99	0.5	9	0.81
RUNOFF COEFFIC ***** WARNING: STOR (i) CN PROCE CN* =	EIENT = RAGE COEFF DURE SELECTOR 77.0	0.99 . IS SMALLE CTED FOR PE Ia = Dep. S	0.5 ER THAN TIME ERVIOUS LOSS Storage (Ab	STEP! SES: nove)	0.81
RUNOFF COEFFIC ***** WARNING: STOR (i) CN PROCE CN* = (ii) TIME STE	AGE COEFF DURE SELECTORY 77.0 :: P (DT) SHO	0.99 IS SMALLE TED FOR PE Ta = Dep. S DULD BE SMA COEFFICIENT	0.5 ER THAN TIME ERVIOUS LOSS Storage (Ab ALLER OR EQU	ESTEP! SES: pove) JAL	0.81
RUNOFF COEFFIC ***** WARNING: STOR (i) CN PROCE CN* = (ii) TIME STE THAN THE	AGE COEFF DURE SELECTORY 77.0 :: P (DT) SHO	0.99 IS SMALLE TED FOR PE Ta = Dep. S DULD BE SMA COEFFICIENT	0.5 ER THAN TIME ERVIOUS LOSS Storage (Ab ALLER OR EQU	ESTEP! SES: pove) JAL	0.81
RUNOFF COEFFIC ***** WARNING: STOR (i) CN PROCE CN* = (ii) TIME STE THAN THE (iii) PEAK FLC	AGE COEFF COURE SELECT TO TO SHOT STORAGE OF THE SELECT TO TO THE SELECT TO	0.99 . IS SMALLE CTED FOR PE Ia = Dep. S DULD BE SMA COEFFICIENT T INCLUDE E	0.5 ER THAN TIME ERVIOUS LOSS Storage (Ab ALLER OR EQL I. BASEFLOW IF	ESTEP! SES: LOVE) JAL ANY.	
RUNOFF COEFFIC ***** WARNING: STOR (i) CN PROCE CN* = (ii) TIME STE THAN THE (iii) PEAK FLC	AGE COEFF COURE SELECT TO TO SHOT STORAGE OF THE SELECT TO TO THE SELECT TO	0.99 . IS SMALLE CTED FOR PE Ia = Dep. S DULD BE SMA COEFFICIENT T INCLUDE E	0.5 ER THAN TIME ERVIOUS LOSS Storage (Ab ALLER OR EQL I. SASEFLOW IF	ESTEP! SES: LOVE) JAL ANY.	
RUNOFF COEFFIC ***** WARNING: STOR (i) CN PROCE CN* = (ii) TIME STE THAN THE (iii) PEAK FLC	AGE COEFF COURE SELECT TO TO SHOT STORAGE OF THE SELECT TO TO THE SELECT TO	0.99 . IS SMALLE CTED FOR PE Ia = Dep. S DULD BE SMA COEFFICIENT T INCLUDE E	0.5 ER THAN TIME ERVIOUS LOSS Storage (Ab ALLER OR EQL I. SASEFLOW IF	ESTEP! SES: LOVE) JAL ANY.	
RUNOFF COEFFIC ***** WARNING: STOR (i) CN PROCE CN* = (ii) TIME STE THAN THE (iii) PEAK FLC	AGE COEFF COURE SELECT TO TO SHOT STORAGE OF THE SELECT TO TO THE SELECT TO	0.99 . IS SMALLE CTED FOR PE Ia = Dep. S DULD BE SMA COEFFICIENT T INCLUDE E	0.5 ER THAN TIME ERVIOUS LOSS Storage (Ab ALLER OR EQL I. SASEFLOW IF	ESTEP! SES: LOVE) JAL ANY.	
RUNOFF COEFFIC ***** WARNING: STOR (i) CN PROCE CN* = (ii) TIME STE THAN THE (iii) PEAK FLC ADD HYD (0039) 1 + 2 = 3 ID1= 1 (0 + ID2= 2 (0	AGE COEFF DURE SELEC TO DIT SHU STORAGE W DOES NO L L L L L L L L L L L L L	0.99 . IS SMALLE TED FOR PE TA = Dep. S DULD BE SMA COEFFICIENT T INCLUDE E AREA QF (ha) (c 0.36 0.1	0.5 ER THAN TIME ERVIOUS LOSS Storage (Ab ALLER OR EQU F. ASSEFLOW IF DEAK TPEA ms) (hrs LS8 4.58 4.58	SESTEP! SES: SOOVE) JAL ANY. ANY. (MR R.V. (S) (mm) (S) 77.71 (S) 66.78	
RUNOFF COEFFIC ***** WARNING: STOR (i) CN PROCE CN* = (ii) TIME STE THAN THE (iii) PEAK FLC ADD HYD (0039) 1 + 2 = 3 ID1= 1 (0 + ID2= 2 (0	AGE COEFF COURT SELECT TO SELEC	0.99 . IS SMALLE CTED FOR PE Ia = Dep. S OULD BE SMA COEFFICIENT T INCLUDE E	0.5 ER THAN TIME ERVIOUS LOSS Storage (Ab ALLER OR EQL I. SASEFLOW IF	ESTEP! ESS: IOVE) JAL ANY. ANY. INC. ANY. ANY. ANY. ANY. ANY. ANY. BY THE PROPERTY OF THE PROPERT	
RUNOFF COEFFIC ***** WARNING: STOR (i) CN PROCE CN* = (ii) TIME STE THAN THE (iii) PEAK FLC ADD HYD (0039) 1 + 2 = 3 ID1= 1 (0 + ID2= 2 (0 ID = 3 (0	AGE COEFF AGE COEFF AGE COEFF AGE AGE AGE AGE AGE AGE AGE	0.99 . IS SMALLE CTED FOR PE Ea = Dep. S OULD BE SMA OEFFICZENT T INCLUDE E AREA QF (ha) (c 0.36 0.1 0.92 0.3	0.5 ER THAN TIME ERVIOUS LOSS Storage (Ab ALLER OR EQU T. SASSEFLOW IF	STEP! SES: SOVE) JAL ANY. ANY. (mm) 77.71 8 66.78 8 71.06	
RUMOFF COEFFIC ***** WARNING: STOR (i) CN PROCE CN* = (ii) TIME STE THAN THE (iii) PEAK FLC ADD HYD (0039) 1 + 2 = 3 ID1= 1 (0 + ID2= 2 (0	AGE COEFF AGE COEFF AGE COEFF AGE AGE AGE AGE AGE AGE AGE	0.99 . IS SMALLE CTED FOR PE Ea = Dep. S OULD BE SMA OEFFICZENT T INCLUDE E AREA QF (ha) (c 0.36 0.1 0.92 0.3	0.5 ER THAN TIME ERVIOUS LOSS Storage (Ab ALLER OR EQU T. SASSEFLOW IF	STEP! SES: SOVE) JAL ANY. ANY. (mm) 77.71 8 66.78 8 71.06	
RUNOFF COEFFIC ***** WARNING: STOR (i) CN PROCE CN* = (ii) TIME STE THAN THE (iii) PEAK FLC ADD HYD (0039) 1 + 2 = 3 ID1= 1 (0 + ID2= 2 (0 ID = 3 (0	AGE COEFF AGE COEFF AGE COEFF AGE AGE AGE AGE AGE AGE AGE	0.99 . IS SMALLE CTED FOR PE Ea = Dep. S OULD BE SMA OEFFICZENT T INCLUDE E AREA QF (ha) (c 0.36 0.1 0.92 0.3	0.5 ER THAN TIME ERVIOUS LOSS Storage (Ab ALLER OR EQU T. SASSEFLOW IF	STEP! SES: SOVE) JAL ANY. ANY. (mm) 77.71 8 66.78 8 71.06	
RUNOFF COEFFIC ***** WARNING: STOR (i) CN PROCE CN* = (ii) TIME STE THAN THE (iii) PEAK FLC ADD HYD (0039) 1 + 2 = 3 ID1= 1 (0 + ID2= 2 (0 ID = 3 (0	IENT	0.99 . IS SMALLE CTED FOR PE Ta = Dep. S DULD BE SMC COEFFICIENT T INCLUDE E AREA OF (ha) (c 0.36 0.1 0.56 0.1	0.5 R THAN TIME ERVIOUS LOSS Storage (Abt ALLER OR EQ. F. SASSEFLOW IF	STEP! SES: SOVE) IAL ANY (mm) 3 77.71 3 77.71 3 77.71 6 66.78 7 71.06	
RUNOFF COEFFIC ***** WARNING: STOR (i) CN PROCE CN* = (ii) TIME STE THAN THE (iii) PEAK FLC ADD HYD (0039) 1 + 2 = 3 ID1= 1 (0 + ID2= 2 (0	IENT	0.99 . IS SMALLE CTED FOR PE Ta = Dep. S DULD BE SMC COEFFICIENT T INCLUDE E AREA OF (ha) (c 0.36 0.1 0.56 0.1	0.5 ER THAN TIME ERVIOUS LOSS Storage (Ab ALLER OR EQU T. SASSEFLOW IF	STEP! SES: SOVE) IAL ANY (mm) 3 77.71 3 77.71 3 77.71 6 66.78 7 71.06	

ID1= 3 (0 + ID2= 2 (0	039): 6	.92	0.356	4.58	71.06	
+ ID2= 2 (0						
ID = 1 (0			0.486			
NOTE: PEAK FL	OWS DO NOT	TNCLUD	E BASELION	S TE ANV		
					· 	
	_					
ADD HYD (0039)	I					
ID1= 1 (0 + ID2= 2 (0	l 4	REA	QPEAK	TPEAK	R.V.	
TD1- 1 (A	- (ha)	(CMS)	(hrs)	(mm)	
+ TD2= 2 (0	226)	9 05	0.400 0.022	4.07	54.67 77 71	
ID = 3 (0	039): 3	3.54	0.505	4.58	55.00	
NOTE: PEAK FL	OWS DO NOT	INCLUD	E BASEFLOW	S IF ANY		
	_					
ADD HYD (0039)	I					
3 + 2 = 1	į s	REA	QPEAK	TPEAK	R.V.	
	- (ha)	(cms)	(hrs)	(mm)	
ID1= 3 (0	039): 3	3.54	0.505	4.58	55.00	
+ 102= 2 (0	227):	7.13	0.021 =======	4.83	55.26	
ID = 1 (0						
NOTE: PEAK FL	OWS DO NOT	TNCLLID	F BASEFION	IS TE ANY		
					· 	
	_					
ADD HYD (0039)	ı					
1 + 2 = 3 ID1= 1 (0 + ID2= 2 (0	į A	REA	QPEAK	TPEAK	R.V.	
	- (ha)	(cms)	(hrs)	(mm)	
ID1= 1 (0	039): 3	3.67	0.516	4.67	55.01	
+ 102= 2 (0	228): (=======	7./1	0.100 	4.92	58.44	
ID = 3 (0						
NOTE: PEAK FL	JWS DO NOT	TNCLUD	E BASEFLOW	S IF ANY		
	-					
ADD HYD (0039)	!					
3 + 2 = 1	I 4	REA	QPEAK	TPEAK	R.V.	
3 + 2 = 1 ID1= 3 (0 + ID2= 2 (0	- (na)	(CMS)	(nrs)	(mm)	
+ ID5= 5 (0	229): 4 229): 1	96	0.580 0.111	4./5 5.17	55.56 60 01	
1 102- 2 (0	22).		0.111	J.11	00.01	

```
ID = 1 ( 0039): 5.44 0.647 4.83 56.43
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----
Unit Hyd Qpeak (cms)= 0.110
    PEAK FLOW (cms)= 0.113 (i)
TIME TO PEAK (hrs)= 4.833
RUNOFF VOLUME (mm)= 57.796
TOTAL RAINFALL (mm)= 96.218
RUNOFF COEFFICIENT = 0.661
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
-----
Unit Hyd Qpeak (cms)= 0.080
    PEAK FLOW (cms)= 0.085 (i)
TIME TO PEAK (hrs)= 4.917
RUNOFF VOLUME (mm)= 55.316
RUNOFF COEFFICIENT = 0.575
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
                             AREA QPEAK
(ha) (cms)
0.70 0.113
0.64 0.085
                                               TPEAK
                                                       R.V.
                                               (hrs) (mm)
4.83 57.80
4.92 55.32
      ID1= 1 ( 0223):
+ ID2= 2 ( 0224):
       ID = 3 ( 0060):
                            1.34 0.194
                                              4.83
                                                       56.61
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

| STANDHYD (0200) | ID= 1 DT= 5.0 min Area (ha)= 9.08 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) (ha)= (mm)= (%)= (m)= = Surface Area 5.90 1.00 2.00 3.18 5.00 2.00 Dep. Storage Average Slope Length Mannings n 246.94 10.00 0.013 0.250 201.53 129.80 Max.Eff.Inten.(mm/hr)= over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 5.00 2.69 (ii) 4.63 (ii) 5.00 5.00 0.29 0.22 *TOTALS* 3.606 (iii) 4.58 PEAK FLOW (cms)= 1.05 TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 4.58 95.22 96.22 4.58 56.33 96.22 77.72 96.22 0.99 0.59 0.81 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: (1) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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. -----IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 0.58 1.00 2.00 67.33 0.10 5.00 2.00 10.00 Dep. Storage Average Slope Length (mm)= (%)= (m)= Mannings n 0.013 0.250 201.53 188.89 5.00 5.00 1.24 (ii) 2.46 (ii) 5.00 5.00 Max.Eff.Inten.(mm/hr)= over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=

Unit Hyd. peak (cms) = 0.33 0.30 **TOTALS* PEAK FLOW (cms) = 0.28 0.06 0.343 (iii) TIME TO PEAK (hrs) = 4.58 4.58 4.58 RINDFF VOLUME (mm) = 95.22 62.63 87.07 TOTAL RAINFALL (mm) = 96.22 96.22 96.22 RUNDFF COEFFICIENT = 0.99 0.65 0.90 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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. ***** ***** ***** ***** ***** Unit Hyd. peak (m) = 0.66 0.35 Dep. Storage (mm) = 1.00 Length (m) = 82.06 10.00 Max.Eff.Inten.(mm/hr) = 201.53 129.80 Over (min) 5.00 5.00 Unit Hyd. Tpeak (min) = 1.39 (ii) 3.33 (ii) Unit Hyd. Tpeak (min) = 5.00 5.00 Unit Hyd. Tpeak (min) = 5.00 5.00 Unit Hyd. Tpeak (min) = 5.00 5.00 Unit Hyd. Tpeak (ms) = 0.33 0.26 ***** PEAK FLOW (cms) = 0.31 0.13 0.437 (iii) TIME TO PEAK (hrs) = 4.58 4.58 RUNOFF VOLUME (mm) = 95.22 56.33 77.72 TOTAL RAINFALL (mm) = 96.22 96.22 96.22 RUNOFF COEFFICIENT = 0.99 0.59 0.81 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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.						
PEAK FLOW		Unit Hyd. peak	(cms)=	0.33	0.30	
TIME TO PEAK (hrs)= 4.58 4.58 4.58 RUNDFY FOULIME (mm)= 95.22 62.63 87.07 TOTAL RAINFALL (mm)= 96.22 96.22 96.22 RUNDFF COEFFICIENT = 0.99 0.65 0.90 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:			, .			
RINDOFF VOLUME (mm)= 95.22 62.63 87.07 TOTAL RAINFALL (mm)= 96.22 96.22 96.22 RINDOFF COEFFICIENT = 0.99 6.65 0.90 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:						
RUNOFF COEFFICIENT = 0.99 0.65 0.90 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:		TIME TO PEAK	(nrs)=	4.58		
RUNOFF COEFFICIENT = 0.99 0.65 0.90 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:		KUNUFF VULUME	(mm)=	95.22		
**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:						
(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:		KUNUFF CUEFFICI	ENI =	0.99	0.65	0.90
CN* = 77.0 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. CALIB STANDHYD (0211)	****	* WARNING: STORA	GE COEFF.	IS SMALLER TH	AN TIME STEP!	
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. CALIB STANDHYD (0211) Area (ha)= 1.01 ID= 1 DT= 5.0 min Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 SUrface Area (ha)= 0.66 0.35 Dep. Storage (mm)= 1.00 5.00 Average Slope (%)= 2.00 2.00 Length (m)= 82.06 10.00 Mannings n = 0.013 0.250 Max.Eff.Inten.(mm/hr)= 201.53 129.80 Over (min) 5.00 5.00 Storage Coeff. (min)= 1.39 (ii) 3.33 (ii) Unit Hyd. Tpeak (min)= 5.00 5.00 Unit Hyd. Tpeak (min)= 9.00 Unit Hyd						
THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. CALIB STANDHYD(0211) Area (ha)= 1.01 ID= 1 DT= 5.0 min Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 0.66 0.35 Dep. Storage (mm)= 1.00 5.00 Average Slope (%)= 2.00 2.00 Length (n)= 82.06 10.00 Mannings n = 0.013 0.250 Max.Eff.Inten.(mm/hr)= 201.53 129.80 Over (min) 5.00 5.00 Storage Coeff. (min)= 1.39 (ii) 3.33 (ii) Unit Hyd. Tpeak (min)= 5.00 5.00 Unit Hyd. Tpeak (min)= 5.00 5.00 Unit Hyd. Peak (cms)= 0.33 0.26 PEAK FLOW (cms)= 0.31 0.13 0.437 (iii) TIME TO PEAK (hrs)= 4.58 4.58 4.58 RUNOFF VOLUME (mm)= 95.22 56.33 77.72 TOTAL RAINFALL (mm)= 95.22 56.33 77.72 TOTAL RAINFALL (mm)= 96.22 96.22 96.22 RUNOFF COEFFICIENT = 0.99 0.59 0.81 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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. CALIB STANDHYD (0211) Area (ha)= 1.01 ID= 1 DT= 5.0 min Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 Surface Area (ha)= 0.66 0.35 Dep. Storage (mm)= 1.00 5.00 Average Slope (%)= 2.00 2.00 Length (m)= 82.06 10.00 Mannings n = 0.013 0.250 Max.Eff.Inten.(mm/hr)= 201.53 129.80 over (min) 5.00 5.00 Storage Coeff. (min)= 1.39 (ii) 3.33 (ii) Unit Hyd. Tpeak (min)= 5.00 5.00 Unit Hyd. Tpeak (min)= 9.02 5.03 **TOTALS* PEAK FLOW (cms)= 0.31 0.13 0.437 (iii) IMM TO PEAK (hrs)= 4.58 4.58 RUNOFF VOLUME (mm)= 95.22 56.33 77.72 TOTAL RAINFALL (mm)= 96.22 96.22 RUNOFF COEFFICIENT = 0.99 0.59 0.81 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFTCIENT.					OR EQUAL	
CALIB CALIB ID= 1 DT= 5.0 min					LOW TE ANY	
STANDHYD (0211)		(111) PEAK FLOW	DOES NOT	INCLUDE BASEF	LOW IF ANY.	
STANDHYD (0211)						
STANDHYD (0211)		I				
ID= 1 DT= 5.0 min Total Imp(%)= 65.00			Area	(ha)= 1.01		
IMPERVIOUS PERVIOUS (i)	ID=	1 DT= 5.0 min	Total	Imp(%)= 65.00	Dir. Conn.(%)= 55.00
Surface Area (ha)= 0.66 0.35 Dep. Storage (mm)= 1.00 5.00 Average Slope (%)= 2.00 2.00 Length (m)= 82.06 10.00 Mannings n = 0.013 0.250 Max.Eff.Inten.(mm/hr)= 201.53 129.80 over (min) 5.00 5.00 Storage Coeff. (min)= 1.39 (ii) 3.33 (ii) Unit Hyd. Tpeak (min)= 5.00 5.00 Unit Hyd. peak (cms)= 0.33 0.26 PEAK FLOW (cms)= 0.31 0.13 0.437 (iii) TIME TO PEAK (hrs)= 4.58 4.58 RUNOFF VOLUME (mm)= 95.22 56.33 77.72 TOTAL RAINFALL (mm)= 96.22 96.22 96.22 RUNOFF COEFFICIENT = 0.99 0.59 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFTICIENT.						-,
Dep. Storage (mm)= 1.00 5.00 Average Slope (%)= 2.00 2.00 Length (m)= 82.06 10.00 Mannings n = 0.013 0.250 Max.Eff.Inten.(mm/hr)= 201.53 129.80 over (min) 5.00 5.00 Storage Coeff. (min)= 1.39 (ii) 3.33 (ii) Unit Hyd. Tpeak (min)= 5.00 5.00 Unit Hyd. Tpeak (min)= 5.00 5.00 PEAK FLOW (cms)= 0.33 0.26 PEAK FLOW (cms)= 0.31 0.13 0.437 (iii) TIME TO PEAK (hrs)= 4.58 4.58 4.58 RUNDFF VOLUME (mm)= 95.22 56.33 77.72 TOTAL RAINFALL (mm)= 96.22 96.22 RUNOFF COEFFICIENT = 0.99 0.59 0.81 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SWALLER OR EQUAL THAN THE STORAGE COEFFICIENT.					PERVIOUS (i)	
Length (m)= 82.06 10.00 Mannings n = 0.013 0.250 Max.Eff.Inten.(mm/hr)= 201.53 129.80		Surface Area	(ha)=	0.66		
Length (m)= 82.06 10.00 Mannings n = 0.013 0.250 Max.Eff.Inten.(mm/hr)= 201.53 129.80		Dep. Storage	(mm)=	1.00	5.00	
Length (m)= 82.06 10.00 Mannings n = 0.013 0.250 Max.Eff.Inten.(mm/hr)= 201.53 129.80		Average Slope	(%)=	2.00	2.00	
Max.Eff.Inten.(mm/hr)= 201.53 129.80 voer (min) 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.0		Length	(m)=	82.06	10.00	
PEAK FLOW (cms)= 0.31 0.13 (0.13) TIME TO PEAK (hrs)= 4.58 4.58 4.58 RINDOFF VOLUME (mm)= 95.22 56.33 77.72 TOTAL RAINFALL (mm)= 96.22 96.22 96.22 RUNDFF COEFFICIENT = 0.99 0.59 0.81 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:		Mannings n	=	0.013	0.250	
PEAK FLOW (cms)= 0.31 0.13 (0.13) TIME TO PEAK (hrs)= 4.58 4.58 4.58 RINDOFF VOLUME (mm)= 95.22 56.33 77.72 TOTAL RAINFALL (mm)= 96.22 96.22 96.22 RUNDFF COEFFICIENT = 0.99 0.59 0.81 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:			mm/hr)=	201.53	129.80	
PEAK FLOW (cms)= 0.31 0.13 (0.13) TIME TO PEAK (hrs)= 4.58 4.58 4.58 RINDOFF VOLUME (mm)= 95.22 56.33 77.72 TOTAL RAINFALL (mm)= 96.22 96.22 96.22 RUNDFF COEFFICIENT = 0.99 0.59 0.81 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:			(min)	5.00	5.00	
PEAK FLOW (cms)= 0.31 0.13 (0.13) TIME TO PEAK (hrs)= 4.58 4.58 4.58 RINDOFF VOLUME (mm)= 95.22 56.33 77.72 TOTAL RAINFALL (mm)= 96.22 96.22 96.22 RUNDFF COEFFICIENT = 0.99 0.59 0.81 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:			(min)=	1.39 (ii)	3.33 (ii)	
PEAK FLOW (cms)= 0.31 0.13 (0.13) TIME TO PEAK (hrs)= 4.58 4.58 4.58 RINDOFF VOLUME (mm)= 95.22 56.33 77.72 TOTAL RAINFALL (mm)= 96.22 96.22 96.22 RUNDFF COEFFICIENT = 0.99 0.59 0.81 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:			(min)=	5.00	5.00	
PEAK FLOW		Unit Hyd. peak	(cms)=	0.33	0.26	
1.10 IO FANA						
1.10 IO FANA		PEAK FLOW	(cms)=	0.31		
RUNOFF COEFFICIENT = 0.99 0.59 0.81 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:		TIME TO PEAK	(hrs)=			
RUNOFF COEFFICIENT = 0.99 0.59 0.81 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:		RUNOFF VOLUME	(mm)=	95.22		
**** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: (N* = 77.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.						
(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.		RUNOFF COEFFICI	ENT =	0.99	0.59	0.81
CN* = 77.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.	***	* WARNING: STORA	GE COEFF.	IS SMALLER THA	AN TIME STEP!	
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.		(i) CN PROCED	URE SELEC	TED FOR PERVIO	US LOSSES:	
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.		CN* =	77.0 I	a = Dep. Stora	ge (Above)	
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.		THAN THE	STORAGE C	OEFFICIENT.	-	
		(iii) DEAK ELOW	DOES NOT	INCLUDE BASEF	LOW IF ANY.	
		(III) FLAK I LOW				
		(III) FLAK TEOM				

ID= 1 DT= 5		iotai	-mp(///)-	05.00	D11.		
			IMPERV	IOUS	PERVIOU:	S (i)	
Surface	Area orage	(ha)=	1.	03	0.55		
Dep. St	orage	(mm)=	7.	00	5.00		
Average	Slope	(%)=	2.	00	2.00		
Length		(m)=	102.	63	10.00		
Manning	corage Slope gs n	=	0.0	13	0.250		
Max.Eff	Inten.(mm/hr)=	201.	53	129.80		
	over	(min)	5.	00	5.00		
Storage	Coeff.	(min)=	1.	59 (ii)	3.53	(ii)	
Unit Hy	over Coeff. /d. Tpeak /d. peak	(min)=	5.	00	5.00		
Unit Hy	/d. peak	(cms)=	0.	33	0.26		
DEAK 51	011	()	_	40	0.00	*	TOTALS*
PEAK FL	LUW	(cms)=	0.	48 F0	0.20		0.676 (iii)
I TWE TO	VOLUME	(nrs)=	90	20	4.58		4.58 74.42
TOTAL S	OW PEAK VOLUME RAINFALL COEFFICI	(mm)=	96	22	96 22		96.22
TOTAL	COFFETCT	FNT =	эо. я	02	0.50		
**** WARNIN (i) C (ii) T	NG: STORAG CN PROCEDI CN* = T TIME STEP	GE COEFF URE SELE 77.0 (DT) SH	. IS SMA CTED FOR Ia = Dep OULD BE	PERVIOU Storag	N TIME :	STEP! S: ve)	0.77
**** WARNIN (i) ((ii) T	NG: STORAG ON PROCEDI ON* = 1	GE COEFF URE SELE 77.0 (DT) SH STORAGE	. IS SMA CTED FOR Ia = Dep OULD BE COEFFICI	PERVIOU Storag SMALLER ENT.	N TIME : S LOSSE: e (Abo	STEP! S: ve) L	0.77
**** WARNIN (i) C (ii) T (iii) F ADD HYD (1 + 2 = ID1= + ID2=	IG: STORAGEN PROCEDIC CN* =	GE COEFF URE SELE 77.0 (DT) SH STORAGE DOES NO	. IS SMA CTED FOR Ia = Dep OULD BE COEFFICI T INCLUD AREA (ha) 9.08 0.68	PERVIOU. Storag SMALLER ENT. E BASEFL 	N TIME : S LOSSE: E (Abo OR EQUA OW IF AI TPEAK (hrs) 4.58 4.58	STEP! S: ve) L NY. R.V. (mm) 77.72 87.07	
**** WARNIN (i) C (ii) T (iii) F ADD HYD (1 + 2 = ID1= + ID2= - ====	IG: STORAGEN PROCEDIC CN* =	GE COEFF URE SELE 77.0 (DT) SH STORAGE DOES NO	. IS SMA CTED FOR Ia = Dep OULD BE COEFFICI T INCLUD AREA (ha) 9.08 0.68	PERVIOU Storag SMALLER ENT. E BASEFL QPEAK (cms) 3.606 0.343	IS LOSSE: e (Aboron EQUAL OW IF AI TPEAK (hrs) 4.58 4.58	STEP! S: ve) L NY. R.V. (mm) 77.72 87.07	
**** WARNIN (i) C (ii) T (iii) F ADD HYD (1 + 2 = 101 + 102 - 102 +	IG: STORAM EN PROCEDID CN* = TIME STEP THAN THE ! PEAK FLOW (0061) = 3 = 1 (020 = 2 (020 PEAK FLOW PEAK FLOW	GE COEFF URE SELE 77.0 (DT) SH STORAGE DOES NO 90): 21): 61): WS DO NO	. IS SMA CTED FOR IA = Dep OULD BE COEFFICI T INCLUD AREA (ha) 9.08 9.76 T INCLUD	PERVIOU. Storag STMALLER ENT. E BASEFL QPEAK ((cms) 3.0443 3.948 E BASEFL	IN TIME : IS LOSSE: E (Abo' OR EQUA OW IF AI TPEAK (hrs) 4.58 4.58 OWS IF AI	STEP! S: ve) L NY. R.V. (mm) 77.72 87.07 78.37	
**** WARNIN (i) (i) (ii) 1 (iii) F ADD HYD (1 + 2 = = = = = = = = = = = = = = = = = =	IG: STORAM IN PROCEDITION IN PROCEDI	GE COEFF URE SELE 77.0 (DT) SH STORAGE DOES NO 00): 01): 01): ws DO NO	. IS SMA CTED FOR Ia = Dep OULD BE COEFFICIT T INCLUD AREA (ha) 9.08 9.76 T INCLUD	PERVIOU Storage SMALLER ENT. E BASEFL QPEAK ((ms) 3.606 0.343 ======3.948 E BASEFL	IN TIME: IS LOSSE: IN (Abo) OR EQUAL OW IF AI TPEAK (hrs) 4.58 4.58 OWS IF AI	STEP! S: ve) L NY. R.V. (mm) 77.72 87.07	
**** WARNIN (i) C (ii) T (iii) F ADD HYD (1 + 2 = ID1 = NOTE:	IG: STORAM IN PROCEDITION IN PROCEDI	GE COEFF URE SELE 77.0 (DT) SH STORAGE DOES NO 00): 01): 01): ws DO NO	. IS SMA CTED FOR Ia = Dep OULD BE COEFFICIT T INCLUD AREA (ha) 9.08 9.068 9.76 T INCLUD	PERVIOU Storage SMALLER ENT. E BASEFL QPEAK ((ms) 3.606 0.343 ======3.948 E BASEFL	IN TIME: IS LOSSE: IN (Abo) OR EQUAL OW IF AI TPEAK (hrs) 4.58 4.58 OWS IF AI	STEP! S: ve) L NY. R.V. (mm) 77.72 87.07 78.37	

+ ID2= 2 (0211):		3.948 0.437			
ID = 1 (0061):	======				=
NOTE: PEAK FLOWS DO N					
ADD HYD (0061)	ARFA	OPFAK	TPFAK	R.V	
ID1= 1 (0061): + ID2= 2 (0220):	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0061):	10.77	4.385	4.58	78.31	
+ ID2= 2 (0220):	1.58	0.676	4.58	74.42	
ID = 3 (0061):					=
NOTE: PEAK FLOWS DO N	OT INCL	JDE BASEFLOW	S IF ANY	<i>/</i> .	
ADD HYD (0061)					
3 + 2 = 1	AREA	ODEAK	TDEAK	P V	
3 + 2 - 1	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0061):	12.35	5.061	4.58	77.81	,
3 + 2 = 1 ID1= 3 (0061): + ID2= 2 (0060):	1.34	0.194	4.83	56.61	
ID = 1 (0061):					=
	o= =1161				
NOTE: PEAK FLOWS DO N	OI TMCF	JUE BASEFLOW	IS IF AN	· .	
NOTE: PEAK FLOWS DO N	OI INCL	TOE BASELLON	IS IF AN	/. 	
			IS IF AN	/. 	
RESERVOIR(2111) OV IN= 2> OUT= 1	ERFLOW :	IS OFF			
RESERVOIR(2111) OV IN= 2> OUT= 1 OT= 5.0 min OU	ERFLOW :	IS OFF STORAGE	OUTF	.OW	STORAGE
RESERVOIR(2111) OV IN= 2> OUT= 1 DT= 5.0 min OU	ERFLOW : TFLOW cms)	IS OFF STORAGE (ha.m.)	OUTFI	.OW	STORAGE (ha.m.)
RESERVOIR(2111) OV IN= 2> OUT= 1 OT= 5.0 min OU ***** WARNING : FIRST O	ERFLOW : TFLOW cms) UTFLOW :	IS OFF STORAGE (ha.m.) IS NOT ZERO.	OUTFI (cms	_OW 5)	(ha.m.)
RESERVOIR(2111)	ERFLOW : TFLOW cms) UTFLOW : .0040	STORAGE (ha.m.) IS NOT ZERO 0.0492	OUTFL (cms	.OW 5) 340	(ha.m.) 0.5022 0.5665
RESERVOIR(2111)	ERFLOW : TFLOW cms) UTFLOW : .0040	STORAGE (ha.m.) IS NOT ZERO 0.0492	OUTFL (cms	.OW 5) 340	(ha.m.) 0.5022
RESERVOIR(2111) OV IN= 2> OUT= 1 DT= 5.0 min OU (**** WARNING : FIRST O	ERFLOW : TFLOW cms) UTFLOW : .004000700090 .	STORAGE (ha.m.) IS NOT ZERO 0.0492 0.1000 0.1524 0.2065	OUTFI (cms 0.48 0.68	_OW 5) 340 390 800	(ha.m.) 0.5022 0.5665 0.6325 0.7004
RESERVOIR(2111) OV IN= 2> OUT= 1 DT= 5.0 min OU (**** WARNING : FIRST O	ERFLOW : TFLOW cms) UTFLOW : .004000700090 .	STORAGE (ha.m.) IS NOT ZERO 0.0492 0.1000 0.1524 0.2065	OUTFI (cms 0.48 0.68	_OW 5) 340 390 800	(ha.m.) 0.5022 0.5665 0.6325 0.7004
RESERVOIR(2111) OV IN= 2> OUT= 1 DT= 5.0 min OU **** WARNING : FIRST O 0 0 0 0 0 0 0	TFLOW cms) UTFLOW .0040 .0070 .0090 .0100 .0110 .0130	STORAGE (ha.m.) IS NOT ZERO. 0.0492 0.1000 0.1524 0.2065 0.26622 0.3197	OUTFI (cms 0.48 0.68	_OW 5) 340 390 800	(ha.m.) 0.5022 0.5665 0.6325 0.7004
RESERVOIR(2111)	TFLOW : TFLOW cms) UTFLOW : .0040 .0070 .0099 .0100 .0110 .0130 .0140	STORAGE (ha.m.) IS NOT ZERO. 0.0492 0.1000 0.1524 0.2065 0.2622 0.3197 0.3788	OUTFI (cms 0.48 0.68 0.73 0.92 1.36	COW 5) 340 390 390 250 330 520 L00	(ha.m.) 0.5022 0.5665 0.6325 0.7004 0.7700 0.8415 0.9149
RESERVOIR(2111)	TFLOW : cms) UTFLOW: .0040 .0070 .0090 .0110 .0130 .0140 .1740	STORAGE (ha.m.) IS NOT ZERO. 0.0492 0.1000 0.1524 0.2065 0.2622 0.3197 0.3788 0.4396	OUTFI (cms) 0.48 0.68 0.73 0.99 1.36 1.86 2.66	.OW 5) 340 390 300 250 330 520 100	(ha.m.) 0.5022 0.5665 0.6325 0.7004 0.7700 0.8415 0.9149 0.0000
RESERVOIR(2111)	TFLOW : cms) UTFLOW: .0040 .0070 .0090 .0110 .0130 .0140 .1740	STORAGE (ha.m.) IS NOT ZERO. 0.0492 0.1000 0.1524 0.2065 0.2622 0.3197 0.3788 0.4396	OUTFI (cms) 0.48 0.68 0.73 0.99 1.36 1.86 2.66	.OW 5) 340 390 300 250 330 520 100	(ha.m.) 0.5022 0.5665 0.6325 0.7004 0.7700 0.8415 0.9149 0.0000
RESERVOIR(2111)	TFLOW : cms) UTFLOW: .0040 .0070 .0090 .0110 .0130 .0140 .1740	STORAGE (ha.m.) IS NOT ZERO. 0.0492 0.1000 0.1524 0.2065 0.2622 0.3197 0.3788 0.4396	OUTFI (cms) 0.48 0.68 0.73 0.99 1.36 1.86 2.66	.OW 5) 340 390 300 250 330 520 100	(ha.m.) 0.5022 0.5665 0.6325 0.7004 0.7700 0.8415 0.9149 0.0000

PEAK FLOW REDUCTION [Qout/Qin](%)= 14.12 TIME SHIFT OF PEAK FLOW (min)= 35.00 MAXIMUM STORAGE USED (ha.m.)= 0.6249

CALIB | STANDHYD (0203)| |ID= 1 DT= 5.0 min Area (ha)= 0.22 Total Imp(%)= 80.00 Dir. Conn.(%)= 80.00 IMPERVIOUS PERVIOUS (i) Surface Area 0.18 5.00 0.04 5.00 Dep. Storage Average Slope Length (mm)= (%)= (m)= 2.00 38.30 2.00 10.00 Mannings n 0.013 0.250 Max.Eff.Inten.(mm/hr)= 201.53 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 0.88 (ii) 5.00 2.21 (ii) 5.00 0.34 5.00 *TOTALS* PEAK FLOW (cms)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 0.10 4.58 91.22 0.01 4.58 49.80 0.110 (iii) 4.58 82.93 96.22 96.22 96.22 0.95

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.

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

______ CALIB | CALIB | STANDHYD (0204) |ID= 1 DT= 5.0 min Area (ha)= 0.16 Total Imp(%)= 75.00 Dir. Conn.(%)= 55.00Area PERVIOUS (i) IMPERVIOUS (ha)= (mm)= (%)= (m)= = 0.12 1.00 2.00 Surface Area Dep. Storage Average Slope 2.00 Length Mannings n 32.66 10.00 0.013 0.250

Max.Eff.Inten.(mm/hr)= 5.00 2.49 (ii) over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 0.80 (ii) 5.00 0.34 0.29 *TOTALS* PEAK FLOW (cms)= (hrs)= 0.05 0.03 0.075 (iii) 4.58 81.34 TIME TO PEAK RUNOFF VOLUME 4.58 95.22 4.58 64.39 (mm)= (mm)= NT = ΤΟΤΔΙ ΒΔΤΝΕΔΙΙ 96.22 96.22 96.22 RUNOFF COEFFICIENT ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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. | ADD HYD (0040)| | 1 + 2 = 3 AREA QPEAK (ha) (cms) (hrs) 4.58 (mm) 82.93 ID1= 1 (0203): + ID2= 2 (0204): 0.22 0.110 0.16 0.075 4.58 81.34 ID = 3 (0040): 0.38 0.185 4.58 82.26 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | ADD HYD (0040)| | 3 + 2 = 1 QPEAK AREA TPEAK R.V. (ha) 0.38 (cms) 0.185 (hrs) 4.58 (mm) 82.26 74.97 ID = 1 (0040): 14.07 0.745 75.16 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ROUTEPIPE(0041) IN= 2---> OUT= 1 DT= 5.0 min PIPE Number Diameter (mm)= 900.00 Length (m)= 50.00

			Slope Manning n		0.005 0.013			
	<		TRAVEL TIME	TABLE -			>	
	DEPTH	VOLUME	FLOW RA			TRAV.TI		
	(m)	(cu.m.)	(cms)		(m/s)	min		
	0.05	.642E+00			0.53	1.5	5	
	0.09	.178E+01	0.0		0.83	1.00	Э	
	0.14	.322E+01	0.1		1.07	0.7	3	
	0.19	.487E+01	0.1		1.28	0.6		
	0.24	.668E+01	0.2		1.45	0.5	7	
	0.28	.862E+01	0.3		1.61	0.5	2	
	0.33	.106E+02	0.4		1.74	0.4		
	0.38	.127E+02	0.5		1.86	0.4		
	0.43	.148E+02	0.6		1.97	0.4	2	
	0.47	.170E+02	0.7		2.06	0.4	1	
	0.52	.191E+02	0.8		2.13	0.39		
	0.57	.212E+02	0.9		2.20	0.3	3	
	0.62	.232E+02	1.0		2.24	0.3	7	
	0.66	.251E+02	1.1		2.28	0.3	7	
		.269E+02			2.29	0.3		
		.286E+02			2.29	0.3	5	
	0.81	.300E+02			2.27	0.3		
	0.85	.312E+02	1.4		2.21	0.3	3	
	0.90	.318E+02	1.3		2.01	0.4		
				< h	ydrograph		<-pipe / c	hannel->
			AREA		TPEAK		MAX DEPTH	
			(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
I	NFLOW : ID=	2 (004	a) 14.07	0.75	5.08	75.16	0.49	2.09
0	JTFLOW: ID=	1 (004	1) 14.07	0.76			0.50	2.10
I CA	TR	1						
		210) A	rea (ha)	= 0.62	Curve	Number	(CN)= 79.2	
	1 DT= 5.0 r						s.(N)= 3.00	
			.H. Tp(hrs)				. ,	
	Unit Hyd Q							
		,						
	PEAK FLOW	(cm						
	TIME TO PE							
	RUNOFF VOLU		n)= 50.971					
	TOTAL RAIN		n)= 96.218					
	RUNOFF COE	-FICIENT	= 0.530					
	(i) PEAK FI	_OW DOES	NOT INCLUDE	BASEFLO	W IF ANY.			

CALIB						
STANDHYD (0207)	Area	(ha)=	12.64			
D= 1 DT= 5.0 min					onn.(%)=	55.00
		IMPERVIO		PERVIOUS	(i)	
Surface Area	(ha)=			4.42		
Dep. Storage		1.00		5.00		
Average Slope Length	(%)=	290.29	9	2.00 10.00		
Mannings n	(111)=	0.013	3	0.250		
ŭ						
Max.Eff.Inten.(129.80		
	(min)	5.00	3	5.00		
Storage Coeff.		2.97	(11)	4.91	(11)	
Unit Hyd. Tpeak		5.00	,	5.00 0.22		
Unit Hyd. peak	(cms)=	0.28	3	0.22	**	TOTALS*
PEAK FLOW	(cms)=	3.49	2	1.42		4.917 (iii)
TIME TO PEAK	(hrs)=	4.58		4.58		4.58
				56.33		77.72
TOTAL RAINFALL				96.22		96.22
TOTAL RAINFALL RUNOFF COEFFICI *** WARNING: STORA	(mm)= ENT = GE COEFF	96.22 0.99	2 9 LER TH	0.59 AN TIME S	TEP!	96.22 0.81
TOTAL RAINFALL RUNOFF COEFFICI *** WARNING: STORA (i) CN PROCED CN* = (ii) IIME STEP THAN THE	(mm)= ENT = GE COEFF URE SELECTOR 77.0 : (DT) SHO STORAGE (96.22 0.99 IS SMALL CTED FOR F Ia = Dep. DULD BE SM COEFFICIEN	ER TH ERVIO Stora MALLER	0.59 AN TIME S US LOSSES ge (Abov OR EQUAL	TEP! : e)	
TOTAL RAINFALL RUNOFF COEFFICI **** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALIB STANDHYD (0209)	(mm)= ENT = GE COEFF URE SELE(77.0 : (DT) SHG STORAGE (DOES NO	96.22 0.99 IS SMALL TED FOR F Ta = Dep. N COEFFICIEN T INCLUDE (ha)=	PERVIO Stora MALLER NT. BASEF	0.59 AN TIME S US LOSSES ge (Abov OR EQUAL LOW IF AN	TEP! : e) Y.	0.81
TOTAL RAINFALL RUNOFF COEFFICI **** WARNING: STORA (i) CN PROCEE CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALLB STANDHYD (0209)	(mm)= ENT = GE COEFF URE SELE(77.0 : (DT) SHG STORAGE (DOES NO	96.22 0.99 IS SMALL TED FOR F Ta = Dep. N COEFFICIEN T INCLUDE (ha)=	PERVIO Stora MALLER NT. BASEF	0.59 AN TIME S US LOSSES ge (Abov OR EQUAL LOW IF AN	TEP! : e) Y.	0.81
TOTAL RAINFALL RUNOFF COEFFICI **** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALIB	(mm)= ENT = GE COEFF URE SELE(77.0 : (DT) SHG STORAGE (DOES NO	96.22 0.99 IS SMALL TED FOR F Ta = Dep. N COEFFICIEN T INCLUDE (ha)=	PERVIO Stora MALLER NT. BASEF	0.59 AN TIME S US LOSSES ge (Abov OR EQUAL LOW IF AN	TEP! : e) Y. onn.(%)=	0.81
TOTAL RAINFALL RUNOFF COEFFICI **** WARNING: STORA (i) CN PROCEE CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALIB STANDHYD (0209)	(mm)= ENT = GE COEFF URE SELEG 77.0 : (DT) SHG STORAGE G DOES NO' Area Total	96.22 0.99 IS SMALL TED FOR F Ta = Dep. DULD BE SN COEFFICIEN T INCLUDE (ha)= Imp(%)=	PERVIO Stora MALLER NT. BASEF	0.59 AN TIME S US LOSSES ge (Abov OR EQUAL LOW IF AN	TEP! : e) Y. onn.(%)=	0.81
TOTAL RAINFALL RUNOFF COEFFICI *** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALIB STANDHYD (0209) D= 1 DT= 5.0 min Surface Area Dep. Storage	(mm)= ENT = GE COEFF URE SELE(77.0 : (DT) SHH SSTORAGE (DOES NO' Area Total (ha)= (mm)=	96.22 0.99 IS SMALL TTED FOR F T T T T T T T T T T T T T T T T T T T	PERVIO Stora MALLER NT. BASEF	0.59 AN TIME S US LOSSES ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS	TEP! : e) Y. onn.(%)=	0.81
TOTAL RAINFALL RUNOFF COEFFICI **** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALIB (209) ED = 1 DT = 5.0 min Surface Area Dep. Storage Average Slope	(mm)= ENT = GE COEFF URE SELE(77.0 :	96.22 0.99 IS SMALL TED FOR F Ia = Dep. DULD BE SN COEFFICIEN T INCLUDE (ha)= Imp(%)= IMPERVIC 1.26 1.00	PERVIO Stora MALLER NT. BASEF	0.59 AN TIME S US LOSSES ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.64 5.00 2.00	TEP! : e) Y. onn.(%)=	0.81
TOTAL RAINFALL RUNOFF COEFFICI *** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALIB STANDHYD (0209) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length	(mm)= ENT = GE COEFF URE SELE(77.0 : (DT) SH(ST) DOES NO: Area Total (ha)= (mm)= (%)= (m)=	96.22 0.99 IS SMALL TED FOR F Ta = Dep. DULD BE SK COEFFICIEN T INCLUDE (ha)= Imp(%)= IMPERVIC 1.06 2.06 110.72	PERVIO Stora MALLER NT. BASEF	0.59 AN TIME S US LOSSES GE (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.64 5.00 2.00 10.00	TEP! : e) Y. onn.(%)=	0.81
TOTAL RAINFALL RUNOFF COEFFICI **** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALIB STANDHYD (0209) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope	(mm)= ENT = GE COEFF URE SELE(77.0 :	96.22 0.99 IS SMALL TED FOR F Ia = Dep. DULD BE SN COEFFICIEN T INCLUDE (ha)= Imp(%)= IMPERVIC 1.26 1.00	PERVIO Stora MALLER NT. BASEF	0.59 AN TIME S US LOSSES ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.64 5.00 2.00	TEP! : e) Y. onn.(%)=	0.81
TOTAL RAINFALL RUNOFF COEFFICI **** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALIB STANDHYD (0209) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length	(mm)= ENT = GE COEFF URE SELE(77.0 : (DT) SH(STORAGE (DOES NO' Area Total (ha)= (mm)= (%)= (%)=	96.22 96.99 . IS SMALL ETED FOR F IS = Dep. DULD BE SN COEFFICIEN T INCLUDE (ha)= IMP(%)= IMPERVIO 1.06 2.06 110.75 9.015	2 2 9 EER TH PERVIO STORM THE PERVIO STO	0.59 AN TIME S US LOSSES GE (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.64 5.00 2.00 10.00 0.250	TEP! : e) Y. onn.(%)=	0.81
TOTAL RAINFALL RUNOFF COEFFICI **** WARNING: STORA (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALIB STANDHYD (0209) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.((mm)= ENT = GE COEFF URE SELE(77.0 : (DT) SH(STORAGE (DOES NO' Area Total (ha)= (mm)= (%)= (%)=	96.22 96.99 . IS SMALL ETED FOR F IS = Dep. DULD BE SN COEFFICIEN T INCLUDE (ha)= IMP(%)= IMPERVIO 1.06 2.06 110.75 9.015	2 2 9 EER TH PERVIO STORM THE PERVIO STO	0.59 AN TIME S US LOSSES ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.64 5.00 10.00 0.250	TEP! : e) Y. onn.(%)=	0.81

	Unit Hyd. pea	ak (cms)=	0.32	0.25	
					TOTALS
	PEAK FLOW	(cms)=	0.55	0.23	0.783 (iii)
	TIME TO PEAK	(hrs)=	4.58	4.58	4.58
	RUNOFF VOLUME	(mm)=	95.22	56.33	77.72
	TOTAL RAINFAL	L (mm)=	96.22	96.22	96.22
	RUNOFF COEFFI	ICIENT =	0.99	0.59	0.81
***	WARNING: STO	DRAGE COEFF.	IS SMALLER	THAN TIME STEP!	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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.

CALIB							
STANDHYD (0221)	Area		4.96				
ID= 1 DT= 5.0 min	Total	Imp(%)=	65.00	Dir.	Conn.(%)=	55.00	
		TMPERVTO	IIS	PERVIOU	s (i)		
Surface Area	(ha)=	3.22		1.74			
	(mm)=			5.00			
Dep. Storage							
Average Slope	(%)=			2.00			
Length	(m)=			10.00			
Mannings n	=	0.013		0.250			
Max.Eff.Inten.(mm/hr)=	201.53		129.80			
	(min)	5.00		5.00			
Storage Coeff.							
Unit Hyd. Tpeak				5.00			
Unit Hyd. peak	(cms)=	0.30		0.24			
					T	OTALS	
PEAK FLOW	(cms)=	1.44		0.59		2.034 (iii	i)
TIME TO PEAK	(hrs)=	4.58		4.58		4.58	
RUNOFF VOLUME	(mm)=	89.22		56.33		74.42	
TOTAL RAINFALL	(mm)=	96.22		96.22		96.22	
RUNOFF COEFFICI		0.93		0.59		0.77	
		0.00		0.00			

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 Ia = Dep. Storage (Above)

(ii) TIME STEP (OT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

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

STANDHYD (0208) Ar	oo (ba)-	- 1 02			
	tal Imp(%)=		Dir.	Conn. (%)=	55.00
		/IOUS	PERVIOU	S (i)	
Surface Area (ha		.67	0.36		
Dep. Storage (mm	n)= 7.	.00	5.00		
Average Slope (% Length (m	6)= 2.	.00	2.00		
Length (n	n)= 82.	.87	10.00		
Mannings n	= 0.6	913	0.250		
Max.Eff.Inten.(mm/hr	r)= 201.	.53	129.80		
over (mir	1) 5.	.00	5.00		
over (mir Storage Coeff. (mir Unit Hyd. Tpeak (mir	1)= 1.	.40 (ii)	3.34	(ii)	
Unit Hyd. Tpeak (mir	1)= 5.	.00	5.00		
Unit Hyd. peak (cms	s)= 0.	. 33	0.26		
DEAK FLOW		24	0.55		TOTALS*
PEAK FLOW (cms	5)= 0.	.31 .58	0.13		0.445 (iii)
TIME TO PEAK (hrs	5)= 4.	.58	4.58		4.58
RUNOFF VOLUME (mm TOTAL RAINFALL (mm	n)= 89.	22	56.33 96.22		74.42 96.22
RUNOFF COEFFICIENT	- 96. - 9	. 22	0.59		0.77
***** WARNING: STORAGE CO					
	Ia = Dep SHOULD BE	R PERVIOL Storag SMALLER	JS LOSSE ge (Abo OR EQUA	S: ve) L	
(ii) TIME STEP (DT) THAN THE STORK (iii) PEAK FLOW DOES	SELECTED FOR Ia = Dep O SHOULD BE AGE COEFFICE O NOT INCLUE	R PERVIOL D. Storag SMALLER LENT. DE BASEFL	JS LOSSE ge (Abo OR EQUA .OW IF A	S: ve) L NY.	
(i) CN PROCEDURE S CN* = 77.0 (ii) TIME STEP (DT) THAN THE STORA (iii) PEAK FLOW DOES	SELECTED FOR Ia = Dep O SHOULD BE AGE COEFFICE O NOT INCLUE	R PERVIOL D. Storag SMALLER LENT. DE BASEFL	JS LOSSE ge (Abo OR EQUA .OW IF A	S: ve) L NY.	
(i) CN PROCEDURE S CN* = 77.0 (ii) TIME STEP (DT) THAN THE STORA (iii) PEAK FLOW DOES	SELECTED FOR Ia = Dep O SHOULD BE AGE COEFFICE O NOT INCLUE	R PERVIOL D. Storag SMALLER LENT. DE BASEFL	JS LOSSE ge (Abo OR EQUA .OW IF A	S: ve) L NY.	
(i) CN PROCEDURE S CN* = 77.0 (ii) TIME STEP (DT) THAN THE STORA (iii) PEAK FLOW DOES	SELECTED FOR Ia = Dep O SHOULD BE AGE COEFFICE O NOT INCLUE	R PERVIOL D. Storag SMALLER LENT. DE BASEFL	JS LOSSE ge (Abo OR EQUA .OW IF A	S: ve) L NY.	
(i) CN PROCEDURE S CN* = 77.0 (ii) TIME STEP (DI) THAN THE STORM (iii) PEAK FLOW DOES ADD HYD (0038) 1 + 2 = 3 ID1= 1 (0207): + ID2= 2 (0208):	AREA (ha) 12.64 1.03	R PERVIOL D. Storag SMALLER TENT. DE BASEFL QPEAK (cms) 4.917 0.445	US LOSSE THE COMMENT OF THE COMMENT OF T	S: ve) L NY. 	
(i) CN PROCEDURE S CN* = 77.0 (ii) TIME STEP (DT) THAN THE STORA (iii) PEAK FLOW DOES	SELECTED FOR Ia = Dep SHOULD BE AGE COEFFICE S NOT INCLUE AREA (ha) 12.64 1.03	R PERVIOL D. Storage SMALLER TENT. DE BASEFL QPEAK (cms) 4.917 0.445	IS LOSSE RE (Abo OR EQUA OW IF A TPEAK (hrs) 4.58 4.58	S: ve) L NY. R.V. (mm) 77.72 74.42	
(i) CN PROCEDURE S CN* = 77.0 (ii) TIME STEP (DT) HANN THE STORK (iii) PEAK FLOW DOES ADD HYD (0038) 1 + 2 = 3 ID1= 1 (0207): + ID2= 2 (0208):	AREA (ha) 12.64 1.367	QPEAK (cms) 4.917 0.445	US LOSSE GE (Abo OR EQUA OW IF A TPEAK (hrs) 4.58 4.58	R.V. (mm) 77.72 74.42 77.47	
(i) CN PROCEDURE S (N* = 77.0 (ii) TIME STEP (DT) THAN THE STORK (iii) PEAK FLOW DOES ADD HYD (0038) 1 + 2 = 3 ID1= 1 (0207): + ID2= 2 (0208): ID = 3 (0038): NOTE: PEAK FLOWS DO	AREA (ha) 12.64 1.367	QPEAK (cms) 4.917 0.445	US LOSSE GE (Abo OR EQUA OW IF A TPEAK (hrs) 4.58 4.58	R.V. (mm) 77.72 74.42 77.47	
(i) CN PROCEDURE S CN* = 77.0 (ii) TIME STEP (DT) THAN THE STOR (iii) PEAK FLOW DOES ADD HYD (0038) 1 + 2 = 3 ID1= 1 (0207): + ID2= 2 (0208): ID = 3 (0038): NOTE: PEAK FLOWS DO	SELECTED FOR IA = Dep SHOULD BE SHOU	R PERVIOL D. Storag SMALLER SMALLER TENT. QPEAK (cms) 4.917 0.445 DE BASEFL	IS LOSSE IS (Abo OR EQUA OW IF A TPEAK (hrs) 4.58 4.58 4.58 OWS IF	R.V. (mm) 77.72 74.42 77.47 ANY.	
(i) CN PROCEDURE S (N* = 77.0 (ii) TIME STEP (DT) THAN THE STORK (iii) PEAK FLOW DOES ADD HYD (0038) 1 + 2 = 3 ID1= 1 (0207): + ID2= 2 (0208): ID = 3 (0038): NOTE: PEAK FLOWS DO	AREA AREA AREA AREA AREA AREA AREA AREA	R PERVIOL D. Storag SMALLER EINT. DE BASEFL QPEAK (cms) 4.917 6.445 5.362 DE BASEFL	TPEAK (hrs) 4.58 4.58	R.V. (mm) 77.72 74.42 77.47	

ID1= 3 (0038) + ID2= 2 (0209)	: 1.84	0.783	4.58	77.72	
ID = 1 (0038)					•
NOTE: PEAK FLOWS					
ADD HYD (0038)	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 1 (0038) + ID2= 2 (0221)	: 4.96	2.034	4.58	74.42	
ID = 3 (0038)					
NOTE: PEAK FLOWS				NY.	
RESERVOIR(2099) IN= 2> OUT= 1	OVERFLOW	IS OFF			
DT= 5.0 min	OUTFLOW	STORAGE	OUT		STORAGE
	(cms)		(ci	ms)	(ha.m.)
	0.0000	0.0000		0508	0.7415 0.8448
		0.0845		1103	
	0.0085	0.1713 0.2604	0.1	1869	0.9504
	0.0110	0.2504	0.	2//3	1.0584
	0.0130	0.3519 0.4458	0.	3797 5592	1.1687 1.2814
	0.0147	0.4436		0010 0010	1.3964
	0.0103	0.5420 0.6406	1.	8940 4269	1.5138
	0.01//	0.0400	1	4203	1.5150
	AR	EA OPE	AK T	PEAK	R.V.
	(h	a) (cn	s) (hrs)	(mm)
INFLOW : ID= 2 (00	38) 20.	470 8	.179	4.58	76.75
INFLOW : ID= 2 (00 OUTFLOW: ID= 1 (20	99) 20.	470 e	.383	5.83	73.05
TIME	FLOW R SHIFT OF P MUM STORAG	EAK FLOW	(1	nin)= 75	.00
			-		
L ADD UND (0040)					
ADD HYD (0049) 1 + 2 = 3	ADEA	QPEAK	TDEAK	P 1/	
1 1 + 2 = 3		(cms)			
TD1= 1 (2000)	. 20.47	(CIIIS)	(1113)	72 05	

(cms) 0.383 0.092

ID1= 1 (2099): + ID2= 2 (0210):

R.V. (mm) 73.05

(hrs) 5.83 4.83

```
ID = 3 ( 0049): 21.09 0.396 5.75 72.40
       NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----
| CALIB
| STANDHYD ( 0222)
|ID= 1 DT= 5.0 min
                                Area (ha)= 1.38
Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00
                                                               PERVIOUS (i)
0.48
5.00
2.00
10.00
                                           IMPERVIOUS
       Surface Area
                                (ha)=
                                                0.90
7.00
2.00
95.92
       Dep. Storage
Average Slope
Length
                                (mm)=
(%)=
(m)=
       Mannings n
                                                0.013
                                                                   0.250
       Max.Eff.Inten.(mm/hr)=
                                                                   5.00
3.47 (ii)
      over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                                5.00
1.53 (ii)
                                                 5.00
                                                                     0.26
                                                                                       *TOTALS*
      PEAK FLOW (cms)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT =
                                                                   0.18
4.58
56.33
                                                                                         0.592 (iii)
4.58
74.42
                                                 0.42
                                                4.58
89.22
                                                96.22
0.93
                                                                   96.22
                                                                                         96.22
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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.
______
  | Junction Command(0051) |
                                       AREA
                                                    OPEAK TPEAK
                                                                               R.V.
 INFLOW: ID= 2( 0222) 1.38
OUTFLOW: ID= 2( 0051) 1.38
                                                                 (hrs)
4.58
                                                                 4.58
                                                                              74.42
                                                      0.59
```

CALTR | STANDHYD (0212) | ID= 1 DT= 5.0 min Area (ha)= 4.77 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 3.10 1.67 Dep. Storage Average Slope (mm)= 7.00 5.00 (%)= (m)= 2.00 2.00 Length Mannings n 0.013 0.250 Max.Eff.Inten.(mm/hr)= 201.53 129.80 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 5.00 4.16 (ii) 2.22 (ii) 5 00 0.30 *TOTALS* 1.959 (iii) 4.58 74.42 PEAK FLOW 1.39 0.57 TIME TO PEAK (cms)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 56.33 89.22 96.22 96.22 96.22 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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. _____ | Junction Command(0052) | AREA QPEAK TPEAK R.V. INFLOW: ID= 2(0212) 4.77 OUTFLOW: ID= 2(0052) 4.77 (cms) 1.96 (hrs) 4.58 (mm) 74.42 74.42 4.58 1.96 -----_____ SSSSS U U A L SS U U A A L SS U U AAAAA L SS U U A A L v v I

w I SSSSS UUUUU A A LLLLL TTTTT TTTTT H 000 000 H YY MM MM O O
H Y M M O O
H Y M M OOO 0 0 0 0 000 Developed and Distributed by Smart City Water Inc Copyright 2007 - 2022 Smart City Water All rights reserved. ***** DETAILED OUTPUT ***** Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat Output filename: $\label{lem:c:substance} C: \begin{tabular}{l} C: \begin{tabular$ Summary filename: C:\Users\mornat\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9h62-f883467b2a44\52bc21 e5-d135-407e-a6a7-8c215a5fb66e\scena DATE: 08/19/2024 TIME: 12:07:49 USER: COMMENTS: ************* CHICAGO STORM IDF curve parameters: A=1303.567 CHICAGO STORM
Ptotal= 65.32 mm $\begin{array}{ccc} B=&9.700\\ C=&0.831\\ used in: & INTENSITY=&A/(t+B)^C \end{array}$ Duration of storm = 12.00 hrs Storm time step = 5.00 min Time to peak ratio = 0.38 TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN

```
6.00
                                                       9.00
0.00
         0.99
                  3.00
                           2.72
                                              4.34
                                                                1.53
0 08
         1.01
                  3.08
                           2 88
                                     6 98
                                              4.11
                                                       9.08
                                                                1.51
0.17
                   3.17
0.25
         1.05
                  3.25
                            3.25
                                     6.25
                                              3.72
                                                       9.25
                                                                 1.46
0.33
         1.06
                  3.33
                            3.48
                                     6.33
                                              3.56
                                                       9.33
                                                                 1.44
0.42
0.50
                  3.42
3.50
                           3.74
4.06
         1.10
0.58
         1.12
                  3.58
                           4.43
                                     6.58
                                              3.14
                                                       9.58
                                                                 1.37
0.67
0.75
         1.15
                  3.67
3.75
                           4.88
                                     6.67
                                              3.03
                                                       9.67
                                                                 1.35
         1.19
                           6.15
                                     6.83
                                              2.82
                                                       9.83
0.83
                  3.83
                                                                 1.32
                  3.92
4.00
4.08
0.92
         1.22
                           7.08
                                     6.92
                                              2.73
                                                       9.92
                                                                 1.30
1.00
         1.24
                          8.35
10.19
                                    7.00
7.08
                                              2.64
                                                      10.00
1.17
         1.30
                  4.17
                           13.04
                                     7.17
                                              2.48
                                                      10.17
                                                                 1.25
1.25
         1.33
                  4.25
                           18.00
                                     7.25
                                              2.41
                                                      10.25
                                                                 1.23
                  4.33
                                    7.33
7.42
1.42
         1.39
                           60.23
                                              2.28
                                                      10.42
                                                                 1.20
                 4.50
4.58
4.67
1.50
         1.43
                         139.67
                                    7.50
                                              2.22
                                                      10.50
                                                                1.18
1.58
                          70.72
40.43
                                    7.58
7.67
                                              2.17
                                                      10.58
10.67
1.67
1.75
         1.54
                  4.75
                          27.50
                                     7.75
                                              2.06
                                                      10.75
                                                                1.14
                  4.83
4.92
                          20.56
16.31
                                    7.83
7.92
                                              2.02
1.97
                                                                1.13
1.83
         1.59
                                                      10.83
         1.69
                  5.00
2.00
                           13.47
                                     8.00
                                              1.93
                                                      11.00
                                                                 1.10
                          11.45
9.95
2.08
         1.74
                  5.08
                                     8.08
                                              1.89
                                                      11.08
                                                                 1.09
                                              1.85
         1.86
                  5.25
                           8.80
                                     8.25
                                                      11.25
2.25
                                                                 1.07
2.33
         1.92
                  5.33
                           7.88
                                     8.33
                                              1.77
                                                      11.33
                                                                 1.06
2.42
         2.00
                  5.42
5.50
                            7.14
                                     8.42
                                              1.74
                                                      11.42
                                                                 1.04
                                              1.71
2.58
         2.16
                  5.58
                           6.02
                                    8.58
                                                      11.58
                                                                 1.02
                  5.67
5.75
5.83
2.67
         2.25
                           5.58
                                    8.67
                                              1.64
                                                      11.67
                                                                 1.01
2.75
         2.35
                           5.20
4.88
                                    8.75
8.83
                                              1.61
1.59
                                                      11.75
11.83
                                                                 1.00
         2.59 5.92
2.92
                           4.59
                                    8.92
                                              1.56
                                                      11.92
                                                                 0.98
```

Unit Hyd Qpeak (cms)= 0.013

PEAK FLOW (cms)= 0.006 (
TIME TO PEAK (hrs)= 5.000

PEAK FLOW (cms)= 0.010 (i)
TIME TO PEAK (hrs)= 4.833
RUMOFF VOLUME (mm)= 30.072
TOTAL RAINFALL (mm)= 65.319
RUNOFF COEFFICIENT = 0.460

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

CALTB
| NASHYD (0228) | Area (ha)= 0.71 Curve Number (CN)= 84.4
|ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.088

PEAK FLOW (cms)= 0.049 (i)
TIME TO PEAK (hrs)= 4.917
RUMOFF VOLUME (mm)= 32.298
TOTAL RAINFALL (mm)= 65.319
RUNOFF COEFFICIENT = 0.494

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

CALIB NASHYD (0227) ID= 1 DT= 5.0 min

Unit Hyd Qpeak (cms)=

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

0.022

Area (ha)= 0.13 Curve Number (CN)= 82.3 Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.080
PEAK FLOW (cms)= 0.055 (i)

```
(hrs)= 5.167
(mm)= 33.426
(mm)= 65.319
CIENT = 0.512
TIME TO PEAK
RUNOFF VOLUME
TOTAL RAINFALL
RUNOFF COEFFICIENT
```

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

______ CALIB Area (ha)= 2.57 Curve Number (CN)= 77.5 Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.25 NASHYD (0206) Unit Hyd Qpeak (cms)= 0.391 PEAK FLOW (cms)= 0.153 (i) TIME TO PEAK (hrs)= 4.833
RUNOFF VOLUME (mm)= 25.734
TOTAL RAINFALL (mm)= 65.319
RUNOFF COEFFICIENT = 0.394 (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB | STANDHYD (0205) | ID= 1 DT= 5.0 min Area (ha)= 0.56 Total Imp(%)= 50.00 Dir. Conn.(%)= 1.00 IMPERVIOUS PERVIOUS (i) (ha)= (mm)= (%)= (m)= 0.28 1.00 2.00 0.28 5.00 2.00 Surface Area Dep. Storage Average Slope Length Mannings n 61.10 10.00 0.013 0.250 Max.Eff.Inten.(mm/hr)= 139.67 134.40 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 1.35 (ii) 5.00 4.08 (ii) 5.00 0.33 0.24 0.106 (iii) TIME TO PEAK (hrs)= 4.58 4.58 4.58 RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 64.32 65.32 39.25 0.98 0.60 0.60

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 77.0 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.

| CALIB | STANDHYD (0226) |ID= 1 DT= 5.0 min Area (ha)= 0.05 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) Surface Area 0.03 0.02 (mm)= (%)= (m)= Dep. Storage Average Slope 1.00 5.00 Length Mannings n 0.013 0.250 Max.Eff.Inten.(mm/hr)= over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 5.00 0.65 (ii) 5.00 0.34 2.90 (ii) 0.28 *TOTALS* PEAK FLOW TIME TO PEAK RUNOFF VOLUME (cms)= (hrs)= 0.01 9.99 0.014 (iii) 4.58 4.58 64.32 RUNOFF VOLUME (mm)= TOTAL RAINFALL (mm)= RUNOFF COEFFICIENT = 31.33 49.47 65.32 65.32

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 77.0 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.

CALIB | STANDHYD (0202) | ID= 1 DT= 5.0 min (ha)= 0.36 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) Surface Area

Dep. Stor	age	(mm)=	1.00		5.00			
Average S	lope	(%)=	2.00		2.00			
Length		(m)=	48.99		10.00			
Mannings	n	=	0.013		0.250			
Max.Eff.I	nten.(ı	nm/hr)=	139.67		68.18			
	over	(min)	5.00		5.00			
Storage C	oeff.	(min)=	1.18	(ii)	3.43	(ii)		
Unit Hyd.	Tpeak	(min)=	5.00		5.00			
Unit Hyd.	peak	(cms)=	0.33		0.26			
-							*TOTALS	k
PEAK FLOW		(cms)=	0.08		0.02		0.101	(iii)
TIME TO P	EAK	(hrs)=	4.58		4.58		4.58	
RUNOFF VO	LUME	(mm)=	64.32		31.33		49.47	
TOTAL RAI	NFALL	(mm)=	65.32		65.32		65.32	
RUNOFF CO	EFFICI	ENT =	0.98		0.48		0.76	
*** WARNING:	STORAG	GE COEFF.	IS SMALLE	R THAN	TIME S	STEP!		

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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.

ADD HYD (0039)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V.
ID1= 1 (0202): + ID2= 2 (0205):	0.36	0.101	4.58	49.47 39.25
ID = 3 (0039):	0.90	0.100 0.207	4.58	43.25

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0039)	AREA	QPEAK	TPEAK	R.V.	
3 + 2 = 1	(ha)	(cms)	(hrs)	(mm)	
ID1= 3 (0039):	0.92	0.207	4.58	43.25	
+ ID2= 2 (0206):	2.57	0.153	4.83	25.73	
ID = 1 (0039):	3.49	0.262	4.58	30.35	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0039) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V.
ID1= 1 (0039):	3.49	0.262	4.58	30.35
+ ID2= 2 (0226):	0.05	0.014	4.58	49.47
ID = 3 (0039):	3.54	0.276	4.58	30.62
NOTE: PEAK FLOWS DO N	OT INCL	UDE BASEFL	OWS IF A	NY.

ADD HYD (0039)	AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1	(ha)	(cms)	(hrs)	
ID1= 3 (0039):	3.54	0.276	4.58	30.62
+ ID2= 2 (0227):	0.13	0.010	4.83	30.07
ID = 1 (0039):	3.67	0.280	4.58	30.60

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0039)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0039):	3.67	0.280	4.58	30.60
+ ID2= 2 (0228):	0.71	0.049	4.92	32.30
===============				
ID = 3 (0039):	4.38	0.294	4.58	30.88

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0039) 3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V.
ID1= 3 (0039):	4.38	0.294	4.58	30.88
+ ID2= 2 (0229):	1.06	0.055	5.17	33.43
	=======			
ID = 1 (0039):	5.44	0.315	4.83	31.37

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB

```
NASHYD ( 0223)
ID= 1 DT= 5.0 min
                                (ha)=
(mm)=
                                           0.70
7.00
                                                   Curve Number (CN)= 84.0
# of Linear Res.(N)= 3.00
                         Area
                         Ia (mm)=
U.H. Tp(hrs)=
                                            0.24
     Unit Hyd Qpeak (cms)=
                                 0.110
     PEAK FLOW
                                 0.055 (i)
     TIME TO PEAK (hrs)= 4.833

RUNOFF VOLUME (mm)= 31.846

TOTAL RAINFALL (mm)= 65.319

RUNOFF COEFFICIENT = 0.488
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
_____
 CALIB
            ( 0224)
                         Area (ha)= 0.64 Curve Number (CN)= 82.3
Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.31
 NASHYD
ID= 1 DT= 5.0 min
     Unit Hyd Qpeak (cms)=
                                 0.080
     PEAK FLOW
                       (cms)=
                                 0.041 (i)
     TIME TO PEAK (hrs)= 4.917
RUNOFF VOLUME (mm)= 30.101
TOTAL RAINFALL (mm)= 65.319
RUNOFF COEFFICIENT = 0.461
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
_____
| ADD HYD ( 0060)|
| 1 + 2 = 3
                                                             R.V.
(mm)
31.85
                                ΔRFΔ
                                          QPEAK
(cms)
                                                    TPEAK
                                (ha)
                                                    (hrs)
      ID1= 1 ( 0223): 6
+ ID2= 2 ( 0224): 6
                                        0.055
                                0.70
                                                    4.83
                                0.64
                                        0.041
                                                    4.92
                                                              30.10
        ID = 3 ( 0060):
                              1.34 0.094
                                                   4.92
                                                             31.01
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----
 CALTB
STANDHYD ( 0200)
ID= 1 DT= 5.0 min
                         Area (ha)= 9.08
Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00
                                 IMPERVIOUS PERVIOUS (i)
```

(ha)= (mm)= (%)= 3.18 5.00 2.00 Surface Area 1.00 Dep. Storage Average Slope Length Mannings n (m)= = 246.04 10.00 0.013 0.250 Max.Eff.Inten.(mm/hr)= 139.67 68.18 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 3.12 (ii) 10.00 5.36 (ii) 5.00 10.00 0.27 0.16 *TOTALS* 0.51 2.001 (iii) PEAK FLOW (cms)= TIME TO PEAK (hrs)= 4.58 4.67 4.58 RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 64.32 65.32 31.33 65.32 49 47 0.98 0.48 0.76 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: (1) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

(N* = 77.0 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. CALTR | STANDHYD (0201) | ID= 1 DT= 5.0 min Area (ha)= 0.68 Total Imp(%)= 85.00 Dir. Conn.(%)= 75.00 IMPERVIOUS PERVIOUS (i) Surface Area 0.58 0.10 Dep. Storage Average Slope Length (mm)= (%)= (m)= 1.00 5.00 2.00 67.33 2.00 Mannings n 0.013 0.250 Max.Eff.Inten.(mm/hr)= 139.67 5.00 1.43 (ii) over (min) Storage Coeff. (min)= Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)= 5.00 2.84 (ii) 5.00 0.28 *TOTALS* 0.227 (iii) 4.58 PEAK FLOW (cms)= (hrs)= 0.19 0.03 TIME TO PEAK
RUNOFF VOLUME (mm)= (mm)= NT = 57.24 64.32 36.01 TOTAL RAINFALL 65.32 65.32 65.32 RUNOFF COEFFICIENT

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: (Above)

(i) TIME STEP (OT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. ______ CALIB STANDHYD (0211) (ha)= 1.01 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) Surface Area 0.66 1.00 0.35 5.00 Dep. Storage Average Slope (mm)= (%)= 2.00 2.00 Length (m)= = 82.06 10.00

Mannings n 0.013 0.250 Max.Eff.Inten.(mm/hr)= 139.67 68.18 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)= 5.00 1.61 (ii) 5.00 3.86 (ii) 5.00 5.00 Unit Hyd. peak (cms)= 0.32 0.25 PEAK FLOW (cms)= 0.21 0.276 (iii) TIME TO PEAK (hrs)= 4.58 4.58 4.58 RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 64.32 65.32 31.33 65.32 49.47

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

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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.

CALIB Area (ha)= 1.58 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 ID= 1 DT= 5.0 min IMPERVIOUS PERVIOUS (i) Surface Area (ha)=

1.03

0.98

0.48

0.55

0.76

Dep. Storage Average Slope (%)= 2.00 2.00 Length Mannings n (m)= 102 63 10 00 Max.Eff.Inten.(mm/hr)= 139.67 68.18 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 1.84 (ii) 5.00 4.09 (ii) 5.00 5.00 0.32 0.24 *TOTALS* 0.425 (iii) PEAK FLOW (cms)= 0.10 TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 4.58 4.58 4.58 58.32 65.32 31.33 0.89 0.48 0.71 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 77.0$ 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.

| ADD HYD (0061) | 1 + 2 = 3 AREA **QPEAK** TPEAK R.V. (ha) 9.08

(cms) 2.001 (hrs) 4.58 ID1= 1 (0200): + ID2= 2 (0201): 0.68 0.227 4.58 57.24 ID = 3 (0061): 9.76 2.228 4.58 50.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0061) AREA QPEAK TPEAK R.V. (mm) (hrs) 4.58 (ha) (cms) ID1= 3 (0061): + ID2= 2 (0211): 9.76 2.228 50.02 1.01 0.276 4.58 49.47 ID = 1 (0061): 10.77 2.504 4.58 49.96

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
ADD HYD ( 0061)
                                    QPEAK
(cms)
2.504
                              AREA
                                               TPEAK
                                                         R.V.
                                               (hrs)
4.58
                                                       (mm)
49.96
                            (ha)
10.77
     ID1= 1 ( 0061):
+ ID2= 2 ( 0220):
                             1.58
                                     0.425
                                               4.58
                                                        46.17
     ID = 3 ( 0061): 12.35 2.929
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS TE ANY.
| ADD HYD ( 0061)|
| 3 + 2 = 1
                             AREA
(ha)
                                    QPEAK
(cms)
                                               (hrs)
4.58
4.92
                                                        (mm)
49.48
     ID1= 3 ( 0061):
+ ID2= 2 ( 0060):
                           12.35
1.34
                                    2,929
                                     0.094
      ID = 1 ( 0061): 13.69 2.963
                                              4.58 47.67
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 RESERVOIR( 2111)
IN= 2---> OUT= 1
                        OVERFLOW IS OFF
                      OUTFLOW STORAGE (cms) (ha.m.)
 DT= 5.0 min
                                                  OUTFLOW
                                                              STORAGE
    ----- (cms) (ha.m.)
**** WARNING : FIRST OUTFLOW IS NOT ZERO.
                                                                0.5022
                                                    0.4840
                          0.0040
                                      0.0492
                          0.0070
                                      9.1999
                                                    0.6890
                                                                 9.5665
                           0.0070
0.0090
0.0100
                                      0.1524
0.2065
                                                    0.7300
0.9250
                                                                0.6325
0.7004
                           0.0110
                                      0.2622
                                                    1.3030
                                                                 0.7700
                           0.0130
0.0140
                                      0.3197
0.3788
                                                    1.8620
                                                                 0.8415
                           0.1740
                                      0.4396
                                                    0.0000
                                                                 0.0000
                               AREA QPEAK (ha) (cms) 13.690 2.963 0.211
                                                     TPEAK
                                                     (hrs)
                                                                  (mm)
  INFLOW: ID= 2 ( 0061) 13.690
OUTFLOW: ID= 1 ( 2111) 13.690
                                                   4.58
5.67
                                                                   47.67
                   _____
```

	.IB .NDHYD (0203)	Area	(ha)= 0.22		
ID=	1 DT= 5.0 min	Total	Imp(%)= 80.00	Dir. Conn.(S	%)= 80.00
			IMPERVIOUS	PERVIOUS (i)	
	Surface Area	(ha)=	0.18	0.04	
	Dep. Storage	(mm)=	5.00	5.00	
	Average Slope	(%)=	2.00	2.00	
	Length	(m)=	38.30	10.00	
	Mannings n	-	0.013	0.250	
	Max.Eff.Inten.(ı	mm/hr)=	139.67	44.18	
	over	(min)	5.00	5.00	
	Storage Coeff.		1.02 (ii)	2.56 (ii)	
	Unit Hyd. Tpeak		5.00	2.56 (ii) 5.00	
	Unit Hyd. peak		0.34	0.29	
		/			*TOTALS*
	PEAK FLOW	(cms)=	0.07	0.01	0.074 (iii)
	TIME TO PEAK	(hrs)=	4.58	4.58	4.58
		(mm)=		26.72	53.60
	TOTAL RAINFALL		60.32 65.32	65.32	65.32
					0.00
	CN* =	GE COEFF URE SELE 77.0		JS LOSSES: ge (Above)	0.82
****	(i) CN PROCEDU CN* = (ii) TIME STEP THAN THE :	GE COEFF URE SELE 77.0 (DT) SH STORAGE	. IS SMALLER THA CTED FOR PERVIOL Ia = Dep. Storag	AN TIME STEP! US LOSSES: ge (Above) OR EQUAL	0.82
«**** CAL STA ID=	(i) CN PROCEDI CN* = (ii) TIME STEP THAN THE: (iii) PEAK FLOW	GE COEFF URE SELE 77.0 (DT) SH STORAGE DOES NO	. IS SMALLER THACTED FOR PERVIOUS IA = Dep. Storag OULD BE SMALLER COEFFICIENT. T INCLUDE BASEFU	AN TIME STEP! JS LOSSES: ge (Above) OR EQUAL OW IF ANY.	
«**** CAL STA ID=	(i) CN PROCEDI CN* = ' (ii) TIME STEP THAN THE : (iii) PEAK FLOW	GE COEFF URE SELE 77.0 (DT) SH STORAGE DOES NO	. IS SMALLER THACTED FOR PERVIOUS IA = Dep. Storag OULD BE SMALLER COEFFICIENT. T INCLUDE BASEFU	AN TIME STEP! JS LOSSES: ge (Above) OR EQUAL OW IF ANY.	
CAL STA ID=	(i) CN PROCEDI CN* = (ii) TIME STEP THAN THE: (iii) PEAK FLOW	GE COEFF URE SELE 77.0 (DT) SH STORAGE DOES NO	. IS SMALLER THA CTED FOR PERVIOU IA = Dep. Storag OULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 0.16 Imp(%)= 75.00	US LOSSES: Se (Above) OR EQUAL OW IF ANY.	
***** CAL STA ID=	(i) CN PROCEDI CN* = (ii) TIME STEP THAN THE: (iii) PEAK FLOW IB	GE COEFF URE SELE 77.0 (DT) SH STORAGE DOES NO	. IS SMALLER THA CTED FOR PERVIOU Ia = Dep. Storag OULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 0.16 Imp(%)= 75.00 IMPERVIOUS 0.12	AN TIME STEP! US LOSSES: Re (Above) OR EQUAL OW IF ANY. Dir. Conn.()	
***** CAL STA ID=	(i) CN PROCEDICN* = (ii) TIME STEP THAN THE: (iii) PEAK FLOW	GE COEFF URE SELE 77.0 (DT) SH STORAGE DOES NO Area Total (ha)= (mm)= (%)=	. IS SMALLER THA CTED FOR PERVIOU Ia = Dep. Storag OULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 0.16 Imp(%)= 75.00 IMPERVIOUS 0.12 1.00 2.00	AN TIME STEP! US LOSSES: GE (Above) OR EQUAL OW IF ANY. Dir. Conn.() PERVIOUS (i) 0.04	
CAL STA ID=	(i) CN PROCEDI CN* = (ii) TIME STEP THAN THE: (iii) PEAK FLOW IB NOHYD (0204) 1 DT= 5.0 min Surface Area Dep. Storage	GE COEFF URE SELE 77.0 (DT) SH STORAGE DOES NO Area Total (ha)= (mm)= (%)=	. IS SMALLER THA CTED FOR PERVIOU IA = Dep. Storag OULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 0.16 Imp(%)= 75.00 IMPERVIOUS 0.12 1.00	AN TIME STEP! US LOSSES: QE (Above) OR EQUAL OW IF ANY. Dir. Conn.(; PERVIOUS (i) 0.04 5.00	
 CAL STA ID=	(i) CN PROCEDI CN* = (ii) TIME STEP THAN THE: (iii) PEAK FLOW LIB (NOHYD (0204) 1 DT= 5.0 min Surface Area Dep. Storage Average Slope	GE COEFF URE SELE 77.0 (DT) SH STORAGE DOES NO Area Total (ha)= (mm)= (%)=	. IS SMALLER THA CTED FOR PERVIOU Ia = Dep. Storag OULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 0.16 Imp(%)= 75.00 IMPERVIOUS 0.12 1.00 2.00	AN TIME STEP! US LOSSES: Ge (Above) OR EQUAL .OW IF ANY. Dir. Conn.() PERVIOUS (i) 0.04 5.00 2.00	
 CAL STA ID=	(i) CN PROCEDI CN* = (ii) TIME STEP THAN THE: (iii) PEAK FLOW IB NDHYD (0204) 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length	GE COEFF JRE SELE 77.0 (DT) SH STORAGE DOES NO Area Total (ha)= (mm)= (%)= (m)= =	. IS SMALLER THA CTED FOR PERVIOU Ia = Dep. Storag OULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 0.16 Imp(%)= 75.00 IMPERVIOUS 0.12 1.00 2.00 32.66 0.013	NAN TIME STEP! US LOSSES: GE (Above) OR EQUAL LOW IF ANY. Dir. Conn.() PERVIOUS (i) 0.04 5.00 10.00 0.250	
CAL STA ID=	(i) CN PROCEDING TO THE STEP THAN THE: (iii) PEAK FLOW IB	JRE SELE JRE	. IS SMALLER THA CTED FOR PERVIOU Ia = Dep. Storag OULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 0.16 Imp(%)= 75.00 IMPERVIOUS 0.12 1.00 2.00 32.66 0.013 139.67 5.00	NAN TIME STEP! US LOSSES: Ye (Above) OR EQUAL LOW IF ANY. Dir. Conn.() PERVIOUS (i) 0.04 5.00 10.00 0.250 116.48 5.00	
CAL STA ID=	(i) CN PROCEDI CN* = (ii) TIME STEP THAN THE: (iii) PEAK FLOW IB NOHYD (0204) 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(i	JRE SELE JRE	. IS SMALLER THA CTED FOR PERVIOU Ia = Dep. Storag OULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 0.16 Imp(%)= 75.00 IMPERVIOUS 0.12 1.00 2.00 32.66 0.013 139.67	NAN TIME STEP! US LOSSES: Ye (Above) OR EQUAL LOW IF ANY. Dir. Conn.() PERVIOUS (i) 0.04 5.00 10.00 0.250 116.48 5.00	
CAL STA ID=	(i) CN PROCEDING TO THE STEP THAN THE: (iii) PEAK FLOW IB	GE COEFF URE SELE 77.0 (DT) SH STORAGE DOES NO Area Total (ha)= (mm)= (%)= = mm/hr)= (min)=	. IS SMALLER THA CTED FOR PERVIOU Ia = Dep. Storag OULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 0.16 Imp(%)= 75.00 IMPERVIOUS 0.12 1.00 2.00 2.00 32.66 0.013 139.67 5.00 0.93 (ii)	NAN TIME STEP! US LOSSES: Ye (Above) OR EQUAL LOW IF ANY. Dir. Conn.() PERVIOUS (i) 0.04 5.00 10.00 0.250 116.48 5.00	

#### WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:	0.048 (iii) 4.58
(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SWALLER OR EQUAL THAN THE STORAGE COEFTCIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. ADD HYD (0040) 1 + 2 = 3	52.18 65.32
(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SWALLER OR EQUAL THAN THE STORAGE COEFTCIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. ADD HYD (0040) 1 + 2 = 3	
(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:	0.80
CN* = 77.0	
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. ADD HYD (0040) 1	
THAN THE STORAGE COFFTCIENT. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. ADD HYD (0040) 1 + 2 = 3	
ADD HYD (0040) 1 + 2 = 3	
ADD HYD (0040) AREA QPEAK TPEAK R.V	
ADD HYD (0040) AREA QPEAK TPEAK R.V	
ADD HYD (0040) AREA QPEAK TPEAK R.V	
1 + 2 = 3	
ID = 3 (0040): 0.38 0.122 4.58 53.00	
TRAVEL TIME TABLE TABLE	
ID = 3 (0040): 0.38 0.122 4.58 53.00	
ID = 3 (0040): 0.38 0.122 4.58 53.00	
ADD HYD (0040) 3 + 2 = 1 AREA	
ADD HYD (0040) 3 + 2 = 1 AREA	
3 + 2 = 1	
3 + 2 = 1	
3 + 2 = 1	
ID = 1 (0040): 14.07 0.217 5.67 47.07	
ID = 1 (0040): 14.07 0.217 5.67 47.07	
ID = 1 (0040): 14.07 0.217 5.67 47.07	
ID = 1 (0040): 14.07 0.217 5.67 47.07	
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ROUTEPIPE(0041)	
ROUTEPIPE(0041) PIPE Number = 1.00 IN= 2> OUT= 1 Diameter (mm)= 900.00 DT= 5.0 min Length (m)= 50.00 Slope (m/m)= 0.005 Manning n = 0.013	
ROUTEPIPE(0041)	
ROUTEPIPE(0041)	
IN= 2> OUT= 1 Diameter (mm)= 900.00 DT= 5.0 min	
Manning n	
Manning n	
Manning n	
	>
DEPTH VOLUME FLOW RATE VELOCITY TRAV.T	
(m) (cu.m.) (cms) (m/s) min 0.05 .642E+00 0.0 0.53 1.	
0.05 .642E+00 0.0 0.53 1.	

```
0.14
                   .322E+01
                                      0.1
                                                      1.07
                                                                      0.78
                                     0.1
0.2
0.3
        a 19
                   487F+01
                                                      1.28
                                                                      0 65
        0.24
        0.28
                   .862E+01
                                                      1.61
                                                                      0.52
        0.33
                   .106E+02
                                      0.4
                                                      1.74
                                                                      0.48
                                      0.5
0.6
0.7
       0.38
0.43
                   .127E+02
        0.47
                   .170E+02
                                                      2.06
                                                                      0.41
       0.52
0.57
                   .191F+02
                                      0.8
0.9
                                                      2.13
                                                                      0.39
                                      1.0
       0.62
                   .232E+02
                                                      2.24
                                                                      0.37
        0.66
                   .251F+02
                                      1.1
                                                      2.28
                                                                      0.37
       0.71
0.76
                   .269E+02
                                     1.2
                                                      2.29
                                                                      0.36
0.36
       0.81
                   .300E+02
                                     1.4
                                                      2.27
                                                                      0.37
        0.85
                   .312F+02
                                     1.4
                                                      2.21
                                                                      0.38
                                              ---- hydrograph ----> <-pipe / channel->
QPEAK TPEAK R.V. MAX DEPTH MAX VEL
(cms) (hrs) (mm) (m) (m/s)
0.22 5.67 47.07 0.25 1.49
                                    AREA
  INFLOW: ID= 2 ( 0040) 14.07
OUTFLOW: ID= 1 ( 0041) 14.07
                                               0.22 5.67 47.07
                                                                               0.25
                                                                                           1.49
______
 CALIB
| CALIB | NASHYD ( 0210) | Area (ha)= 0.62 Curve Number (CN)= 79.2 | ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.21
    Unit Hyd Qpeak (cms)= 0.112
     PEAK FLOW (cms)= 0.043
TIME TO PEAK (hrs)= 4.833
RUNOFF VOLUME (mm)= 27.161
TOTAL RAINFALL (mm)= 65.319
RUNOFF COEFFICIENT = 0.416
                                    0.043 (i)
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
.....
| CALLB
| STANDHYD ( 0207) | Area (ha)= 12.64
| ID= 1 DT= 5.0 min | Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00
                                    IMPERVIOUS PERVIOUS (i)
```

Surface Area	(ha)=	8.22	4.42	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	290.29	10.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	139.67	68.18	
over	(min)	5.00	10.00	
Storage Coeff.	(min)=	3.44 (ii) 5.68 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	10.00	
Unit Hyd. peak	(cms)=	0.26	0.15	
				TOTALS
PEAK FLOW	(cms)=	2.30	0.69	2.716 (iii)
TIME TO PEAK	(hrs)=	4.58	4.67	4.58
RUNOFF VOLUME	(mm)=	64.32	31.33	49.47
TOTAL RAINFALL	(mm)=	65.32	65.32	65.32
RUNOFF COEFFICI	ENT =	0.98	0.48	0.76
** WARNING: STORA	GE COEFE	TS SMALLER T	HAN TIME STED!	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- (1) LN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 77.0 Ia = Dep. Storage (Above)

 (ii) TIME STEP (OT) SHOULD BE SMALLER OR EQUAL

 THAN THE STORAGE COEFFICIENT.

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

CALIB STANDHYD (ID= 1 DT= 5		Area Total	(ha)= Imp(%)=	1.84 65.00	Dir.	Conn.(%)=	55.00)
			IMPERVIO	US	PERVIOU:	S (i)		
Surface	Area	(ha)=	1.20		0.64			
Dep. Sto	rage	(mm)=	1.00		5.00			
Average	Slope	(%)=	2.00		2.00			
Length		(m)=	110.75		10.00			
Mannings	n	=	0.013		0.250			
Max.Eff.	Inten.(mm/hr)=	139.67		68.18			
	over	(min)	5.00		5.00			
Storage	Coeff.	(min)=	1.93	(ii)	4.17	(ii)		
Unit Hyd	i. Tpeak	(min)=	5.00		5.00			
Unit Hyd	1. peak	(cms)=	0.31		0.24			
						7	OTALS	
PEAK FLO	W	(cms)=	0.38		0.12		0.492	(iii)
TIME TO	PEAK	(hrs)=	4.58		4.58		4.58	
RUNOFF \	/OLUME	(mm)=	64.32		31.33		49.47	
TOTAL RA	INFALL	(mm)=	65.32		65.32		65.32	
RUNOFF (OEFFICI	ENT =	0.98		0.48		0.76	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 Ia = Dep. Storage (Above)

(ii) TIME STOR (OT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | CALIB | STANDHYD (0221) | ID= 1 DT= 5.0 min Area (ha)= 4.96 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) 3.22 7.00 Surface Area 1.74 5.00 (mm)= (%)= (m)= Dep. Storage Average Slope Length Mannings n 0.250 0.013 Max.Eff.Inten.(mm/hr)= 5.00 4.84 (ii) over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 2.60 (ii) 5.00 0.29 5.00 *TOTALS* PEAK FLOW (cms)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 1.262 (iii) 4.58 46.17 0.97 0.30 4.58 58.32 65.32 4.58 31.33 65.32 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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.

| STANDHYD (0208) | Area (ha)= 1.03 | ID= 1 DT= 5.0 min | Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00

IMPERVIOUS PERVIOUS (i)

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

CALIB

Surface Area

	Dep. Storage Average Slope Length	(%)= (m)=	7.00 2.00 82.87	5.00 2.00 10.00		
	Mannings n	=	0.013	0.250		
	Max.Eff.Inten.(mm	n/hr)=	139.67	68.18		
	over (Storage Coeff. (Unit Hyd. Tpeak (Unit Hyd. peak (min)	5.00	5.00		
	Storage Coeff. (min)= min)=	1.62 (1	1) 3.8/((11)	
	Unit Hyd. neak (cms)=	0.32	0.25		
					*	TOTALS*
	PEAK FLOW (TIME TO PEAK (cms)=	0.21	0.07		0.281 (iii)
	TIME TO PEAK (hrs)=	4.58	4.58		4.58
	RUNOFF VOLUME TOTAL RAINFALL	(mm)=	58.32	31.33		46.17
	RUNOFF COEFFICIEN	(mm)= IT -	05.32	65.32 0.48		65.32 0.71
			5.05	0.40		
****	* WARNING: STORAGE	COEFF. I	S SMALLER	THAN TIME ST	TEP!	
	(i) CN PROCEDUR	E SELECTE	D FOR PERV	TOUS LOSSES		
				rage (Above		
	(ii) TIME STEP (,	
	THAN THE ST	ORÁGE COE	FFICIENT.			
		OFC NOT T	NCLUDE DAG	FELOW TE ANY	<i>(</i> .	
	(iii) PEAK FLOW D	DE2 NOT I	NCEODE BAS			
	(111) PEAK FLOW D					
 AC						
 AC 						
 AC 	DD HYD (0038) 1 + 2 = 3	AR (h '): 12.	EA QPEA a) (cms 64 2.716	K TPEAK) (hrs) 4.58	R.V. (mm) 49.47	
 AC 	D HYD (0038) 1 + 2 = 3 TD1= 1 (0207 + ID2= 2 (0208	AR (h '): 12.	EA QPEA a) (cms 64 2.716 03 0.281	K TPEAK) (hrs) 4.58 4.58	R.V. (mm) 49.47 46.17	
 AC 	D HYD (0038) 1 + 2 = 3 ID1= 1 (0207 + ID2= 2 (0208	AR (h '): 12. 3): 1.	EA QPEA a) (cms 64 2.716 03 0.281	K TPEAK) (hrs) 4.58 4.58	R.V. (mm) 49.47 46.17	
 AE 	ID HYD (0038) 1 + 2 = 3 ID1= 1 (0207 + ID2= 2 (0208 	AR (h (h : 12.8): 1.	EA QPEA a) (cms 64 2.716 03 0.281	K TPEAK) (hrs) 4.58 4.58	R.V. (mm) 49.47 46.17 	
 AC 	DD HYD (0038) 1 + 2 = 3 ID1= 1 (0207 + ID2= 2 (0208 ID = 3 (0038 NOTE: PEAK FLOWS	AR (h (h : 12. i): 1. : 1. : 13. iii	EA QPEA a) (cms 64 2.716 03 0.281 ======67 2.997 NCLUDE BAS	K TPEAK) (hrs) 4.58 4.58	R.V. (mm) 49.47 46.17 	
 AC 	ID HYD (0038) 1 + 2 = 3 ID1= 1 (0207 + ID2= 2 (0208 	AR (h (h : 12. i): 1. : 1. : 13. iii	EA QPEA a) (cms 64 2.716 03 0.281 ======67 2.997 NCLUDE BAS	K TPEAK) (hrs) 4.58 4.58	R.V. (mm) 49.47 46.17 	
i 	D HYD (0038) 1 + 2 = 3 ID1= 1 (0207 + ID2= 2 (0208 ID = 3 (0038 NOTE: PEAK FLOWS	AR (h (h : 12. i): 1. : 1. : 13. iii	EA QPEA a) (cms 64 2.716 03 0.281 ======67 2.997 NCLUDE BAS	K TPEAK) (hrs) 4.58 4.58	R.V. (mm) 49.47 46.17 	
 	DD HVD (0038) 1 + 2 = 3 ID1= 1 (0207 + ID2= 2 (0208 ID = 3 (0038 NOTE: PEAK FLOWS	AR (h (h: 12.): 12.): 13. ; DO NOT I	EA QPEA a) (cms 64 2.716 03 0.281 ======67 2.997 NCLUDE BAS	K TPEAK) (hrs) 4.58 4.58 4.58 EFLOWS IF AN	R.V. (mm) 49.47 46.17 	
 AC	DD HVD (0038) 1 + 2 = 3 ID1= 1 (0207 + ID2= 2 (0208 ID = 3 (0038 NOTE: PEAK FLOWS	AR (h (h: 12.): 12.): 13. ; DO NOT I	EA QPEA a) (cms 64 2.716 03 0.281 ======67 2.997 NCLUDE BAS	K TPEAK) (hrs) 4.58 4.58 4.58 EFLOWS IF AN	R.V. (mm) 49.47 46.17 	
 AC	DD HVD (0038) 1 + 2 = 3 ID1= 1 (0207 + ID2= 2 (0208 ID = 3 (0038 NOTE: PEAK FLOWS	AR (h (h: 12.): 12.): 13. ; DO NOT I	EA QPEA a) (cms 64 2.716 03 0.281 ======67 2.997 NCLUDE BAS	K TPEAK) (hrs) 4.58 4.58 4.58 EFLOWS IF AN	R.V. (mm) 49.47 46.17 	
 AC	DD HYD (0038) 1 + 2 = 3 ID1= 1 (0207 + ID2= 2 (0208 ID = 3 (0038 NOTE: PEAK FLOWS ID HYD (0038) 3 + 2 = 1 ID1= 3 (0038	AR (h(): 12. (h): 13.	EA QPEA a) (cms def 2.716 do 2.726 ea 2.997 NCLUDE BAS- EA QPEA a) (cms def 2.997	K TPEAK) (hrs) 4.58 4.58 4.58 EFLOWS IF APPLICATION (hrs) 4.58	R.V. (mm) 49.47 46.17 49.23 YY.	
 AC	DD HVD (0038) 1 + 2 = 3 ID1= 1 (0207 + ID2= 2 (0208 ID = 3 (0038 NOTE: PEAK FLOWS	AR (h (h 12. i)): 13. iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	EA QPEA a) (cms dol 2.716 dol 2.716 dol 3.0.281 en 67 2.997 NCLUDE BAS EA QPEA a) (cms dol 2.997 84 0.492	K TPEAK) (hrs) 4.58 4.58 4.58 EFLOWS IF AN K TPEAK) (hrs) 4.58 4.58	R.V. (mm) 49.47 46.17 49.23 49.23 R.V. (mm) 49.23	
 AC	D HYD (0038) 1 + 2 = 3 ID1= 1 (0207 + ID2= 2 (0208 ID = 3 (0038) NOTE: PEAK FLOWS D HYD (0038) 3 + 2 = 1 ID1= 3 (0038 + ID2= 2 (0208	AR (h '): 12. '): 13. 'S DO NOT I AR (h (h): 13.	EA QPEA a) (cms 64 2.716 03 0.281 ====================================	K TPEAK) (hrs) 4.58 4.58 4.58 EFLOWS IF AP K TPEAK) (hrs) 4.58 4.58	R.V. (mm) 49.47 46.17 49.23 NY. R.V. (mm) 49.23 49.47	
 AC	DD HYD (0038) 1 + 2 = 3 ID1= 1 (0207 + ID2= 2 (0208 ID = 3 (0038 NOTE: PEAK FLOWS DD HYD (0038) 3 + 2 = 1 ID1= 3 (0038 + ID2= 2 (0208	AR (h '): 12. s): 1. s): 13. AR (h '): 13.	EA QPEAA a) (cms 64 2.716 33 0.281 34 0.297 NCLUDE BAS 51 2.997 NCLUDE BAS 51 3.490	K TPEAK) (hrs) 4.58 4.58 4.58 EFLOWS IF AN K TPEAK V (hrs) 4.58 4.58	R.V. (mm) 49.47 46.17 49.23 NY. R.V. (mm) 49.23 49.47	

DD HYD (0038) 1 + 2 = 3	AREA	OPEAK	TPEAK	R.V.		
<u>.</u>	(ha)	QPEAK (cms)	(hrs)	(mm)		
ID1= 1 (0038) + ID2= 2 (0221)	: 15.51	3.490	4.58	49.26		
			4.58 4.58			
ID = 3 (0038)		4.752				
NOTE: PEAK FLOWS	DO NOT INCL	UDE BASEFL	OWS IF AM	NY.		
RESERVOIR(2099)	OVERFLOW	IS OFF				
OT= 5.0 min	OUTFLOW (cms)	STORAGE	OUTF	LOW	STORAGE	
· · · · · · · · · · · · · · · · · · ·	(cms)	(ha.m.)	(cn		(ha.m.)	
	0.0000	0.0000 0.0845	0.6	9508	0.7415 0.8448	
	0.0085	0.1713	0.1	1869	0.9504	
	0.0110	0.2604	0.2	2773	1.0584	
	0.0130	0.3519	0.3	3797	1.1687	
	0.0147	0.4458 0.5420	0.5 0.8	5592	1.2814	
	0.0163	0.5420	0.8	3940	1.3964	
		0.6406				
INFLOW : ID= 2 (00	AR	EA QPE	AK TE	PEAK	R.V.	
	(h	a) (cm	s) (h	ırs)	(mm)	
INFLOW : ID= 2 (06 OUTFLOW: ID= 1 (26	138) 20.	470 4	.752	4.58	48.51	
OUTFLOW: ID= 1 (26	199) 20.	4/0 0	.092	8.33	45.00	
	FLOW R					
	SHIFT OF P					
MAXI	MUM STORAG	E USED	(ha.	.m.)= 0	8124	
ADD 18/D (0040)						
ADD HYD (0049) 1 + 2 = 3	ADEA	QPEAK	TDEAV	D 1/		
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)		
ID1= 1 (2099)	: 20.47	(cms) 0.092	8.33	45.00		
+ ID2= 2 (0210)			4.83	27.16		
+ 102- 2 (0210)						
ID = 3 (0049)						
	DO NOT INCL		OUC TE AL	.DV		

STANDHYD (0222) Area (ha)= 1.38 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00		Area	(ha)- 1	38		
Surface Area (ha)= 0.90 0.48 Dep. Storage (mm)= 7.00 5.00 Average Slope (%)= 2.00 2.00 Length (m)= 95.92 10.00 Mannings n = 0.013 0.250 Max.Eff.Inten.(mm/hr)= 139.67 68.18	D= 1 DT= 5.0 min				onn.(%)=	55.00
Surface Area (ha)= 0.90 0.48 Dep. Storage (mm)= 7.00 5.00 Average Slope (%)= 2.00 2.00 Length (m)= 95.92 10.00 Mannings n = 0.013 0.250 Max.Eff.Inten.(mm/hr)= 139.67 68.18		-	IMPERVIOUS	PERVIOUS	(i)	
Dep. Storage (mm)= 7.00 5.00 Average Slope (%)= 2.00 2.00 Length (m)= 95.92 10.00 Mannings n = 0.013 0.250 Max.Eff.Inten.(mm/hr)= 139.67 68.18	Surface Area	(ha)=			(-)	
Length (m)= 95.92 10.00 Mannings n = 0.013 0.250 Max.Eff.Inten.(mm/hr)= 139.67 68.18	Dep. Storage	(mm)=	7.00			
Mannings n = 0.013 0.250 Max.Eff.Inten.(mm/hr)= 139.67 68.18	Average Slope	(%)=	2.00	2.00		
Max.Eff.Inten.(mm/hr)= 139.67 68.18	Length			10.00		
over (min) 5.00 5.00 Storage Coeff. (min)= 1.77 (ii) 4.01 (ii) Unit Hyd. Tpeak (min)= 5.00 5.00 Unit Hyd. peak (cms)= 0.32 0.24 **TOTALS* PEAK FLOW (cms)= 0.28 0.09 0.373 (iii) TIME TO PEAK (hrs)= 4.58 4.58 4.58 RUNOFF VOLUME (mm)= 58.32 31.33 46.17 TOTAL RAINFALL (mm)= 65.32 65.32 65.32 RUNOFF COEFFICIENT = 0.89 0.48 0.71 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:	Mannings n	=	0.013	0.250		
Storage Coeff. (min)= 1.77 (ii) 4.01 (ii) Unit Hyd. Tpeak (min)= 5.00 5.00 Unit Hyd. peak (cms)= 0.32 0.24 **TOTALS* PEAK FLOW (cms)= 0.28 0.09 0.373 (iii) TIME TO PEAK (hrs)= 4.58 4.58 4.58 RUNOFF VOLUME (mm)= 58.32 31.33 46.17 TOTAL RAINFALL (mm)= 65.32 65.32 65.32 RUNOFF COEFFICIENT = 0.89 0.48 0.71 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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. Junction Command(0051) AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) INFLOW: ID= 2(022) 1.38 0.37 4.58 46.17 OUTFLOW: ID= 2(0851) 1.38 0.37 4.58 46.17 CALIB STANDHYD (0212) Area (ha)= 4.77 CD= 1 DT= 5.0 min Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00	Max.Eff.Inten.	(mm/hr)=	139.67	68.18		
Unit Hyd. peak (cms) = 0.32 0.24 PEAK FLOW (cms) = 0.28 0.09 0.373 (iii) TIME TO PEAK (hrs) = 4.58 4.58 4.58 RUNOFF VOLUME (mm) = 58.32 31.33 46.17 TOTAL RAINFALL (mm) = 65.32 65.32 65.32 RUNOFF COEFFICIENT = 0.89 0.48 0.71 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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. AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) INFLOW : ID= 2(0222) 1.38 0.37 4.58 46.17 OUTFLOW: ID= 2(0212) Area (ha) = 4.77 CD= 1 DT= 5.0 min Total Imp(%) = 65.00 Dir. Conn.(%) = 55.00 IMPERVIOUS PERVIOUS (i)			5.00	5.00		
Unit Hyd. peak (cms) = 0.32 0.24 PEAK FLOW (cms) = 0.28 0.09 0.373 (iii) TIME TO PEAK (hrs) = 4.58 4.58 4.58 RUNOFF VOLUME (mm) = 58.32 31.33 46.17 TOTAL RAINFALL (mm) = 65.32 65.32 65.32 RUNOFF COEFFICIENT = 0.89 0.48 0.71 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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. AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) INFLOW : ID= 2(0222) 1.38 0.37 4.58 46.17 OUTFLOW: ID= 2(0212) Area (ha) = 4.77 CD= 1 DT= 5.0 min Total Imp(%) = 65.00 Dir. Conn.(%) = 55.00 IMPERVIOUS PERVIOUS (i)			1.77 (ii) 4.01	(ii)	

PEAK FLOW (cms)= 0.28 0.09 0.373 (iii) TIME TO PEAK (hrs)= 4.58 4.58 4.58 RUNDFF VOLUME (mm)= 58.32 31.33 46.17 TOTAL RAINFALL (mm)= 65.32 65.32 65.32 RUNOFF COEFFICIENT = 0.89 0.48 0.71 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:	Unit Hyd. peak	(cms)=	0.32	0.24		
TIME TO PEAK (hrs)= 4.58 4.58 4.58 RUNOFF VOLUME (mm)= 58.32 31.33 46.17 TOTAL RAINFALL (mm)= 65.32 65.32 65.32 RUNOFF COEFFICIENT = 0.89 0.48 0.71 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:						
RUNOFF VOLUME (mm)= 58.32 31.33 46.17 TOTAL RAINFALL (mm)= 65.32 65.32 RUNOFF COEFFICIENT = 0.89 0.48 0.71 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:						
TOTAL RAINFALL (mm)= 65.32 65.32 65.32 RUNOFF COEFFICIENT = 0.89 0.48 0.71 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:			4.58			
RUNOFF COEFFICIENT = 0.89 0.48 0.71 **** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:						
*** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:	DINOLE COLLETC.	(mm)=	00.32			
Junction Command(0051)						
INFLOW: ID= 2(0222) 1.38 0.37 4.58 46.17 OUTFLOW: ID= 2(0065) 1.38 0.37 4.58 46.17	(ii) TIME STER THAN THE	P (DT) SHO STORAGE O	OULD BE SMALE OEFFICIENT.	LER OR EQUAL		
INFLOW: ID= 2(0222) 1.38 0.37 4.58 46.17 OUTFLOW: ID= 2(0051) 1.38 0.37 4.58 46.17 CALIB CALIB	(ii) TIME STEF THAN THE (iii) PEAK FLOW	P (DT) SHO STORAGE (W DOES NOT	OULD BE SMALE OEFFICIENT.	LER OR EQUAL		
CALIB	(ii) TIME STEF THAN THE (iii) PEAK FLOW	P (DT) SHC STORAGE (W DOES NOT	OULD BE SMALI	LER OR EQUAL	Υ.	
CALIB	(ii) TIME STEF THAN THE (iii) PEAK FLOW	P (DT) SHC STORAGE (W DOES NOT d(0051)	DULD BE SMALI COEFFICIENT. T INCLUDE BAS REA QPEAL	LER OR EQUAL SEFLOW IF AN K TPEAK	Y. R.V.	
CALIB	(ii) TIME STEF THAN THE (iii) PEAK FLOW	P (DT) SHC STORAGE (W DOES NOT d(0051)	DULD BE SMALI COEFFICIENT. T INCLUDE BAS REA QPEAL	LER OR EQUAL SEFLOW IF AN K TPEAK	Y. R.V.	
CALIB	(ii) TIME STEF THAN THE (iii) PEAK FLOW	P (DT) SHC STORAGE (W DOES NOT d(0051)	DULD BE SMALI COEFFICIENT. T INCLUDE BAS REA QPEAL	LER OR EQUAL SEFLOW IF AN K TPEAK	Y. R.V.	
IMPERVIOUS PERVIOUS (i)	(ii) TIME STEE THAN THE (iii) PEAK FLOW Junction Command INFLOW : ID= 2(6 OUTFLOW: ID= 2(6	P (DT) SHC STORAGE (W DOES NOT d(0051) AF (P 02222) 1	DULD BE SMALL COEFFICIENT. FINCLUDE BAS CREA QPEAL TABLE (CMS) L.38 0.33 L.38 0.33	K TPEAK) (hrs) 7 4.58	R.V. (mm) 46.17 46.17	
	(ii) TIME STEE THAN THE (iii) PEAK FLOW Junction Command INFLOW : ID= 2(@ OUTFLOW: ID= 2(@ STANDHYD (@212) ID= 1 DT= 5.0 min	P (DT) SHC STORAGE (W DOES NOT) dd(0051) AR (h 02222) 1 00051) 1 Area Area Total	DULD BE SMALL COEFFICIENT. INCLUDE BA: REA QPEAI (a) (cms; 1.38 0.3; 1.38 0.3;	LER OR EQUAL SEFLOW IF AN K TPEAK () (hrs) 7 4.58 7 4.58	R.V. (mm) 46.17 46.17	
Surface Area (ha)= 3.10 1.67	(ii) TIME STEE THAN THE (iii) PEAK FLOW Junction Command INFLOW : ID= 2(@ OUTFLOW: ID= 2(@ STANDHYD (@212) ID= 1 DT= 5.0 min	P (DT) SHC STORAGE (W DOES NOT) dd(0051) AR (h 02222) 1 00051) 1 Area Area Total	DULD BE SMALL COEFFICIENT. INCLUDE BA: REA QPEAI (ha) (cms. 1.38 0.3: 1.38 0.3: (ha)= 4 Imp(%)= 65	K TPEAK) (hrs) 7 4.58 7 4.58	R.V. (mm) 46.17 46.17	
Dep. Storage (mm)= 7.00 5.00	(ii) TIME STEE THAN THE (iii) PEAK FLOW Junction Command INFLOW : ID= 2(@ OUTFLOW: ID= 2(@ STANDHYD (@212) ID= 1 DT= 5.0 min	P (DT) SHC STORAGE (W DOES NOT W DOES NOT d(0051) AR (H 20222) 1 20051) 1 AR (H 20222) 1 1 AR (H 20222) 1	DULD BE SMALL COEFFICIENT. INCLUDE BASE REA QPEAL (a) (cms) (.38 0.3) (.38 0.3) (ha)= 4 Imp(%)= 65 IMPERVIOUS	K TPEAK) (hrs) 7 4.58 7 4.58	R.V. (mm) 46.17 46.17	

```
Average Slope
Length
                       (%)=
(m)=
     Mannings n
                                  0.013
                                                0.250
                                 139.67
     Max.Eff.Inten.(mm/hr)=
                                                68.18
     over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                   5.00
2.57 (ii)
                                                 4.81 (ii)
                                    5.00
                                                               *TOTALS*
     PEAK FLOW
                      (cms)=
                                   0.93
                                                 0.29
                                                                1.217 (iii)
     TIME TO PEAK
RUNOFF VOLUME
                     (hrs)=
(hrs)=
(mm)=
(mm)=
ENT =
                                  4.58
58.32
                                                4.58
                                                                4.58
     TOTAL RAINFALL
                                  65.32
                                                65.32
                                                                65.32
                                                                 0.71
     RUNOFF COEFFICIENT
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
     CN* = 77.0 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.
  | Junction Command(0052) |
                                     OPEAK TPEAK
                            AREA
                                                        R.V.
 INFLOW: ID= 2( 0212) 4.77
OUTFLOW: ID= 2( 0052) 4.77
                                      (cms)
1.22
1.22
                                               (hrs)
4.58
4.58
                                                        46.17
  _____
 -----
-----
              I SSSSS U U A L
I SS U U A A L
I SS U U AAAAA L
I SS U U A A L
I SSSSS UUUUU A A LLLLL
         vv
       Developed and Distributed by Smart City Water Inc
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                   ***** DETAILED OUTPUT *****
  Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output filename:
C:\Users\mornat\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\c978e0
Summary filename:
C:\Users\mornat\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\c978e0
44-33d5-428f-afbf-d947e6e52f7f\scena
DATE: 08/19/2024
                                          TIME: 12:07:50
USER:
COMMENTS: _
  *******************
  | CHICAGO STORM
| Ptotal= 25.00 mm
                       IDF curve parameters: A= 425.000
                       used in: INTENSITY = A / (t + B)^C
                        Duration of storm = 4.00 hrs
Storm time step = 10.00 min
                        Time to peak ratio = 0.40
                         RAIN
                                TIME
                                         RAIN '
                 TIME
                                                  TIME
                                                         RAIN TIME
                                                                         RAIN
                                hrs
1.00
1.17
                  hrs
                        mm/hr
                                        mm/hr
                                                  hrs
                                                         mm/hr
                                                                         mm/hr
```

4.31 6.37

13.83 53.25 16.08 8.40

2.00

2.33

2.50

2.83

0.00 0.17

0.33

0.50

1.65

2.04

2.33

1.33 1.50 1.67 1.83

5.82 4.52 3.72

3.19

2.50

3.00

3.33

3.50 3.67

2.27 2.08

1.92

```
_____
| CALLB | NASHYD ( 0213) | Area (ha)= 0.12 Curve Number (CN)= 79.1 | ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.34
         NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                     - TRANSFORMED HYETOGRAPH ----
                        RAIN | TIME
mm/hr | hrs
1.65 | 1.083
                 TIME
                                         RAIN | TIME
                                                            RAIN | TIME
mm/hr | hrs
                                                                               RAIN
                                                                              mm/hr
                                           4.31 2.083
                                                                     3.08
                0.083
                                                             5.82
                                                                              2.27
                                 1.167
1.250
1.333
                0.167
0.250
                          1.65
                                           4.31
                                                  2.167
                                                            5.82
4.52
                                                                     3.17
                                                                              2.27
                0.333
                          1.82
                                           6.37
                                                   2.333
                                                             4.52
                                                                     3.33
                                                                              2.08
                0.417
                          2.04
                                 1.417
                                          13.83
                                                   2.417
                                                            3.72
                                                                     3.42
                                                                              1.92
                0.500
0.583
                          2.04
                                 1.500
                                          13.83
53.25
                                                   2.500
                                                             3.72
                                                                              1.92
1.79
                0.667
                          2.33
                                 1.667
                                          53.25 I
                                                   2,667
                                                             3.19
                                                                     3.67
                                                                              1.79
                          2.72
                                 1.750
                                          16.08
16.08
                                                   2.750
                0.750
                                                            2.80
                                                                     3.75
                                                                              1.68
                          3.31
                                                                              1.58
                0.917
                                 1.917
                                           8.40
                                                   2.917
                                                             2.50
                                                                     3.92
                1.000
                          3.31 2.000
                                           8.40
                                                   3.000
                                                             2.50
                                                                     4.00
                                                                              1.58
    Unit Hyd Qpeak (cms)= 0.013
     PEAK FLOW (cms)= 0.001
TIME TO PEAK (hrs)= 2.083
RUNOFF VOLUME (mm)= 3.798
TOTAL RAINFALL (mm)= 25.000
RUNOFF COEFFICIENT = 0.152
                               0.001 (i)
    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
-----
CALIB
NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                 ---- TRANSFORMED HYETOGRAPH ----
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
```

```
mm/hr
5.82
5.82
          mm/hr
                             mm/hr
                             4.31
4.31
0.083
          1.65
                                                          3.08
                                                                    2.27
                   1.167
                                                                    2.27
0.167
                                      2.167
0.250
           1.82
                   1.250
                              6.37
                                      2.250
                                                 4.52
                                                                    2.08
0.333
                   1.333
           2.04
                             13.83
                                      2.417
                                                 3.72
                                                                    1.92
0.500
          2.04
                   1.500
                             13.83
                                      2.500
                                                 3.72
                                                          3.50
                                                                    1.92
0.583
          2.33
                   1.583
                             53.25
                                      2.583
                                                 3.19
                                                          3.58
                                                                    1.79
1.79
          2.33 | 1.667
2.72 | 1.750
2.72 | 1.833
                                      2.667
2.750
                                                 3.19
0.750
                            16.08
                                                 2.80
                                                          3.75
                                                                    1.68
0.833
                            16.08
                                      2.833
                                                2.80
                                                          3.83
                                                                    1.68
0.917
          3.31 | 1.917
3.31 | 2.000
                             8.40
8.40
                                                2.50
                                      3.000
```

Unit Hyd Qpeak (cms)= 0.022

PEAK FLOW (cms)= 0.001 (i) RUNOFF VOLUME TOTAL RAINFALL RUNOFF COSSES TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 4.452
TOTAL RAINFALL (mm)= 25.000
RUNOFF COEFFICIENT = 0.178

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

| CALIB | NASHYD (0228) |ID= 1 DT= 5.0 min Area (ha)= 0.71 Curve Number (CN)= 84.4 Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.31

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

		TD	ANCEODME	HYFTOGRA	ADII		
						_	
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	1.65	1.083	4.31	2.083	5.82	3.08	2.27
0.167	1.65	1.167	4.31	2.167	5.82	3.17	2.27
0.250	1.82	1.250	6.37	2.250	4.52	3.25	2.08
0.333	1.82	1.333	6.37	2.333	4.52	3.33	2.08
0.417	2.04	1.417	13.83	2.417	3.72	3.42	1.92
0.500	2.04	1.500	13.83	2.500	3.72	3.50	1.92
0.583	2.33	1.583	53.25	2.583	3.19	3.58	1.79
0.667	2.33	1.667	53.25	2.667	3.19	3.67	1.79
0.750	2.72	1.750	16.08	2.750	2.80	3.75	1.68
0.833	2.72	1.833	16.08	2.833	2.80	3.83	1.68
0.917	3.31	1.917	8.40	2.917	2.50	3.92	1.58
1.000	3.31	2.000	8.40	3.000	2.50	4.00	1.58

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.007 (i) (hrs)= 2.083 (mm)= 4.986 (mm)= 25.000 2.083 4.986 TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICIENT 0.199

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

CALIB | CALIB | NASHYD (0229) | Area (ha)= 1.06 Curve Number (CN)= 85.4 | ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.51

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

- TRANSFORMED HYETOGRAPH ----RAIN | TIME mm/hr | hrs RAIN | TIME mm/hr | hrs RAIN | TIME mm/hr | hrs TIME mm/hr 1.65 mm/hr hrs 4.31 2.083 1.083 3.08 0.083 5.82 2.27 4.31 2.167 2.250 0.167 1.65 1.167 5.82 3.17 2.27 0.333 1.82 1.333 6.37 2.333 4.52 3.33 2.08 0.417 2.04 1.417 13.83 2.417 3.72 3.42 1.92 2.04 2.33 2.33 0.500 1.500 1.583 13.83 53.25 2.500 3.72 3.50 1.92 0.667 1.667 53.25 2.667 3.19 3.67 1.79 2.72 | 1.750 2.72 | 1.833 0.750 16.08 2.750 2.80 3.75 1.68 2.72 | 1.736 2.72 | 1.833 3.31 | 1.917 0.833 2.50 8.40 | 2.917 8.40 | 3.000 0.917 1.58 1.000 3.31 2.000 1.58

Unit Hyd Qpeak (cms)= 0.080

PEAK FLOW (cms)= 0.009
TIME TO PEAK (hrs)= 2.333
RUNOFF VOLUME (mm)= 5.274
TOTAL RAINFALL (mm)= 25.000
RUNOFF COEFFICIENT = 0.211 0.009 (i)

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

..... -----CALIB NASHYD (0206) Area (ha)= 2.57 Curve Number (CN)= 77.5

|ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 ------ U.H. Tp(hrs)= 0.25

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

TRANSFORMED HYETOGRAPH -RAIN TIME RAIN TIME RAIN ' TIME hrs mm/hr hrs mm/hr hrs mm/hr 0.083 1.65 1.65 1.083 4.31 2.083 5.82 2.27 0.250 1.82 1.250 6.37 2.250 4.52 3.25 2.08 0.333 1.82 1.333 6.37 2.333 4.52 3.33 2.08 0.417 0.500 2.04 1.417 13.83 13.83 2.417 1.92 0.583 2.33 1.583 53.25 2.583 3.19 3.58 1.79 2.33 | 1.667 2.72 | 1.750 2.72 | 1.833 3.31 | 1.917 0.667 53.25 2.667 2.750 3.19 3.67 1.79 0.833 16.08 2.833 2.80 3.83 1.68 0.917 8.40 2.917 2.50 3.92 1.58 3.31 2.000

Unit Hvd Opeak (cms)= 0.391

TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 3.529
TOTAL RAINFALL (mm)= 25.000
RUNOFF COEFFICIENT = 0.141

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

| STANDHYD (0205) | ID= 1 DT= 5.0 min Area (ha)= 0.56 Total Imp(%)= 50.00 Dir. Conn.(%)= 1.00

IMPERVIOUS PERVIOUS (i) Surface Area 0.28 0.28 5.00 Dep. Storage Average Slope (mm)= (%)= (m)= 1.00 61.10 Length 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

mm/hr | hrs mm/hr | hrs 4.31 | 2.083 4.31 | 2.167 1.083 0.083 1.65 2.27 1.167 1.250 1.333 0.167 1 65 5 82 3 17 2 27 0.250 0.333 2.250 1.82 6.37 4.52 3.33 2.08 0.417 2.04 1,417 13.83 2,417 3.72 3.42 1.92 0.500 0.583 2.04 1.500 2.500 0.667 2.33 1.667 53.25 2.667 3.19 3.67 1.79 0.750 2.72 1.750 16.08 2.750 2.80 3.75 1.68 0.833 2.917 0.917 3.31 1.917 8.40 2.50 3.92 1.58 1.000 3.31 2.000 8.40 3.000 2.50 4.00 1.58 Max.Eff.Inten.(mm/hr)= 33.58

over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 10.00 1.99 (ii) 5.00 6.74 (ii) 0.31 0.14 *TOTALS* PEAK FLOW (cms)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 0.02 0.020 (iii) 1.75 1.67 1.75 24.00 8.31 8.46 25.00 0.96 25 00

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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.

STANDHYD (0226) (ha)= 0.05 ID= 1 DT= 5.0 min Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00

PERVIOUS (i) IMPERVIOUS Surface Area (ha)= 0.03 0.02 Dep. Storage Average Slope 1.00 5.00 Length (m)= 18.26 10.00 Mannings n 0.013 0.250

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

		TRA	NSFORME	D HYETOGRA	рн		
TIME	E RAIN		RAIN	' TIME	RAIN	TIME	RAIN
hrs		hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083		1.083	4.31	2.083	5.82	3.08	2.27
0.167		1.167	4.31	2.167	5.82	3.17	2.27
0.256		1.250	6.37	2.250	4.52	3.25	2.08
0.33	3 1.82	1.333	6.37	2.333	4.52	3.33	2.08
0.417	7 2.04	1.417	13.83	2.417	3.72	3.42	1.92
0.500	2.04	1.500	13.83	2.500	3.72	3.50	1.92
0.583		1.583	53.25	2.583	3.19	3.58	1.79
0.667	7 2.33	1.667	53.25	2.667	3.19	3.67	1.79
0.756	2.72	1.750	16.08	2.750	2.80	3.75	1.68
0.833	3 2.72	1.833	16.08	2.833	2.80	3.83	1.68
0.917	7 3.31	1.917	8.40	2.917	2.50	3.92	1.58
1.000	3.31	2.000	8.40	3.000	2.50	4.00	1.58
		•		•			
Max.Eff.Inten.(r	mm/hr)=	53.25		13.41			
over	(min)	5.00		5.00			
Storage Coeff.	(min)=	0.96	(ii)	4.26 (ii)			
Unit Hyd. Tpeak	(min)=	5.00		5.00			
Unit Hyd. peak	(cms)=	0.34		0.23			
					T01	TALS	
PEAK FLOW	(cms)=	0.00		0.00	0.	005 (iii)	
TIME TO PEAK	(hrs)=	1.67		1.67	1	1.67	
RUNOFF VOLUME	(mm)=	24.00		5.56	15	.69	
ΤΟΤΔΙ ΒΔΤΝΕΔΙΙ	(mm)=	25 00		25 00	25	. 00	

25.00

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

TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT =

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- (n) = 77.0 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.

CALIB	Area Total	(ha)= 0.36 Imp(%)= 65.00		55.00
		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.23	0.13	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	48.99	10.00	
Mannings n	=	0.013	0.250	

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

		T	RANSFORME	D HYETOGRA	PH		
	TIME RA	AIN TIME	RAIN	' TIME	RAIN	TIME	RAIN
	hrs mm/	hr hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0	.083 1.	.65 1.083	4.31	2.083	5.82	3.08	2.27
0	.167 1.	.65 1.167	4.31	2.167	5.82	3.17	2.27
0	.250 1.	.82 1.250	6.37	2.250	4.52	3.25	2.08
0	.333 1.	.82 1.333	6.37	2.333	4.52		2.08
0	.417 2.	.04 1.417	13.83	2.417	3.72	3.42	1.92
0	.500 2.	.04 1.500	13.83	2.500	3.72	3.50	1.92
0	.583 2.	.33 1.583	53.25	2.583	3.19	3.58	1.79
0	.667 2.	.33 1.667	53.25	2.667	3.19	3.67	1.79
0	.750 2.	72 1.750	16.08	2.750	2.80	3.75	1.68
0	.833 2.	.72 1.833	16.08	2.833	2.80	3.83	1.68
0	.917 3.	31 1.917	8.40	2.917	2.50	3.92	1.58
1	.000 3.	31 2.000	8.40	3.000	2.50	4.00	1.58
Max.Eff.Inte	n (mm/hn)-	53.2	ie.	13.41			
	ver (min)	5.0		10.00			
Storage Coef							
				5.04 (ii) 10.00			
Unit Hyd. Tp				0.16			
Unit Hyd. pe	ak (cms)=	= 0.3	12	0.16	****		
DEAK FLOW	/ N			0.00		ALS*	
PEAK FLOW	(cms)=			0.00		032 (iii))
TIME TO PEAK				1.75		. 67	
RUNOFF VOLUM				5.56		.69	
TOTAL RAINFA				25.00		.00	
RUNOFF COEFF	ICIENT =	0.9	16	0.22	e	.63	
**** WARNING: ST	OBAGE COEE	E TC CMAI	LED THAN	TTME CTED!			
MUNITING: 21	OWNER COFF	I . IJ JIML	LLN IIIMN	TALL DILLE			

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- (1) THE STORAGE COEFFICIENT OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0039)| | 1 + 2 = 3 R.V. (mm) 15.69 AREA QPEAK TPEAK (ha) 0.36 0.56 ID1= 1 (0202): + ID2= 2 (0205): 1.75 8.46 0.020 ID = 3 (0039): 0.92 0.049 11.29

```
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
ADD HYD ( 0039)|
3 + 2 = 1
                                                  ( R.V.
) (mm)
11.29
                           AREA
(ha)
0.92
2.57
                                  QPEAK
(cms)
0.049
                                             TPEAK
(hrs)
1.67
     ID1= 3 ( 0039): 6
+ ID2= 2 ( 0206): 2
                                   0.021
                                             2.00 3.53
     ID = 1 ( 0039):
                           3.49 0.056
                                                     5.57
                                            1.67
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0039)|
| 1 + 2 = 3 |
                            AREA
                                  QPEAK
                                             TPEAK
                                                      R.V.
                                             (hrs)
1.67
1.67
                                                   (mm)
5.57
15.69
                            (ha)
                                    (cms)
     ID1= 1 ( 0039):
+ ID2= 2 ( 0226):
                                 0.056
                            0.05
                                                    5.72
      ID = 3 ( 0039):
                          3.54 0.061
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0039)|
| 3 + 2 = 1
                                  QPEAK
(cms)
0.061
                            ARFA
                                             TPFAK
                                                      R.V.
                            (ha)
3.54
                                             (hrs)
                                                      (mm)
5.72
    ID1= 3 ( 0039):
+ ID2= 2 ( 0227):
                            0.13
                                   0.001
                                             1.92
                                                      4.45
      ID = 1 ( 0039):
                            3.67
                                   0.061
                                             1.67
                                                      5.67
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0039)|
| 1 + 2 = 3
                            AREA QPEAK
                                             TPEAK
                                                      R.V.
                            (ha)
3.67
0.71
                                             (hrs)
1.67
2.08
                                                      (mm)
5.67
4.99
                                    (cms)
     ID1= 1 ( 0039):
+ ID2= 2 ( 0228):
                                  0.061
       ID = 3 ( 0039):
                           4.38 0.063
                                             1.67
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

ADD HYD (3 + 2 =		ļ	AREA	QPEAK	TPEAK (hrs)	R.V.		
		((ha)	(cms)	(hrs)	(mm)		
ID1= 3 + ID2= 2	(0039): 4	1.38 (0.063	1.67	5.56		
					2.33	5.27		
					1.67			
NOTE: PE	AK FLOWS	DO NOT	INCLUDE	BASEFLO	WS IF ANY			
CALIB NASHYD (a223)	Area	(ha)=	0.70	Curve Nu	mber ((N)= 84.0	
ID= 1 DT= 5.0	min	Ia	(mm)=	7.00	# of Lin	ear Res.	(N)= 3.00	
ID= 1 DT= 5.0		U.H. Tp	o(hrs)=	0.24			,	
NOTE:	RAINFA	LL WAS 1	ransfor	RMED TO	5.0 MIN.	TIME STE	Ρ.	
					ED HYETOG			
	TIME hrs		IIIME	: RAIN	' TIME			
					2.083		hrs	2.2
	0.167	1.65	1 16	7 4.31	2.003	5.02	3 17	2.2
	0.250	1 82	1 250	9 6 37	2.167 2.250	4 52	3 25	2.0
	0.333	1.82	1.333	6.37	2.333	4.52	3.33	2.0
				7 13.83	2.417	3.72		1.9
	0.500	2.04	1.500	13.83	2.417	3.72	3.50	1.9
	0.583	2.33	1.583	3 53.25	2.583	3.19	3.58	1.7
	0.667	2.33	1.667	7 53.25	2.667 2.750	3.19	3.67	1.7
	0.750	2.72	1.756	16.08	2.750	2.80	3.75	1.6
	0.833	2.72	1.833	16.08	2.833	2.80	3.83	1.6
	0.917	3.31	1.917	8.40	2.833 2.917	2.50	3.92	1.5
	1.000	3.31	2.000	8.40	3.000	2.50	4.00	1.5
Unit Hyd	Qpeak (cms)=	0.110					
PEAK FLOW	(cms)=	0.008	(i)				
PEAK FLOW TIME TO P	EAK (hrs)=	1.917					
RUNOFF VO	LUME	(mm)=	4.876					
TOTAL RAI	VFALL	(mm)=2	25.000					
RUNOFF CO	EFFICIEN	IT =	0.195					
				BASEFLOW				

```
CALIB
NASHYD ( 0224)
ID= 1 DT= 5.0 min
                                 Area (ha)= 0.64
Ia (mm)= 7.00
U.H. Tp(hrs)= 0.31
                                                                  Curve Number (CN)= 82.3
# of Linear Res.(N)= 3.00
             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	1.65	1.083	4.31	2.083	5.82	3.08	2.27			
0.167	1.65	1.167	4.31	2.167	5.82	3.17	2.27			
0.250	1.82	1.250	6.37	2.250	4.52	3.25	2.08			
0.333	1.82	1.333	6.37	2.333	4.52	3.33	2.08			
0.417	2.04	1.417	13.83	2.417	3.72	3.42	1.92			
0.500	2.04	1.500	13.83	2.500	3.72	3.50	1.92			
0.583	2.33	1.583	53.25	2.583	3.19	3.58	1.79			
0.667	2.33	1.667	53.25	2.667	3.19	3.67	1.79			
0.750	2.72	1.750	16.08	2.750	2.80	3.75	1.68			
0.833	2.72	1.833	16.08	2.833	2.80	3.83	1.68			
0.917	3.31	1.917	8.40	2.917	2.50	3.92	1.58			
1.000	3.31	2.000	8.40	3.000	2.50	4.00	1.58			

Unit Hyd Qpeak (cms)= 0.080

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

ADD HYD (0060)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0223):	0.70	0.008	1.92	4.88
+ ID2= 2 (0224):	0.64	0.006	2.08	4.46
				======
ID = 3 (0060):	1.34	0.014	2.00	4.68

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB | STANDHYD (0200) | Area (ha)= 9.08

STANDHYD (0201) (ha)= 0.68 Total Imp(%)= 85.00 Dir. Conn.(%)= 75.00

		IMPERVIOUS	PERVIOUS	(1)
Surface Area	(ha)=	0.58	0.10	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	67.33	10.00	
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	1.65	1.083	4.31	2.083	5.82	3.08	2.27				
0.167	1.65	1.167	4.31	2.167	5.82	3.17	2.27				
0.250	1.82	1.250	6.37	2.250	4.52	3.25	2.08				
0.333	1.82	1.333	6.37	2.333	4.52	3.33	2.08				
0.417	2.04	1.417	13.83	2.417	3.72	3.42	1.92				
0.500	2.04	1.500	13.83	2.500	3.72	3.50	1.92				
0.583	2.33	1.583	53.25	2.583	3.19	3.58	1.79				
0.667	2.33	1.667	53.25	2.667	3.19	3.67	1.79				
0.750	2.72	1.750	16.08	2.750	2.80	3.75	1.68				
0.833	2.72	1.833	16.08	2.833	2.80	3.83	1.68				
0.917	3.31	1.917	8.40	2.917	2.50	3.92	1.58				
1.000	3.31	2.000	8.40	3.000	2.50	4.00	1.58				

Max.Eff.Inten.(mm/hr)= over (min)	53.25 5.00	23.70 5.00	
Storage Coeff. (min)=	2.11 (ii)	4.18 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.31	0.24	
			TOTALS
PEAK FLOW (cms)=	0.07	0.01	0.082 (iii)
TIME TO PEAK (hrs)=	1.67	1.67	1.67
RUNOFF VOLUME (mm)=	24.00	7.17	19.79
TOTAL RAINFALL (mm)=	25.00	25.00	25.00
RUNOFF COEFFICIENT =	0.96	0.29	0.79

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 77.0 Ia = Dep. Storage (Above)

 (ii) TIME STOR (DT) SHOULD BE SMALLER OR EQUAL

 THAN THE STORAGE COEFFICIENT.

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

|ID= 1 DT= 5.0 min | Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) Surface Area Dep. Storage Average Slope 5.90 1.00 2.00 3.18 5.00 2.00 (mm)= (%)= (m)= = Length Mannings n 246.04 10.00 0.013 0.250

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

		TRA	ANSFORME	D HYETOGRA	PH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	s mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3 1.65	1.083	4.31	2.083	5.82	3.08	2.27
0.167	7 1.65	1.167	4.31	2.167	5.82	3.17	2.27
0.256	1.82	1.250	6.37	2.250	4.52	3.25	2.08
0.333	3 1.82	1.333	6.37	2.333	4.52	3.33	2.08
0.417	7 2.04	1.417	13.83	2.417	3.72	3.42	1.92
0.500	2.04	1.500	13.83	2.500	3.72	3.50	1.92
0.583	3 2.33	1.583	53.25	2.583	3.19	3.58	1.79
0.667	7 2.33	1.667	53.25	2.667	3.19	3.67	1.79
0.756	2.72	1.750	16.08	2.750	2.80	3.75	1.68
0.833	3 2.72	1.833	16.08	2.833	2.80	3.83	1.68
0.917	7 3.31	1.917	8.40	2.917	2.50	3.92	1.58
1.000	3.31	2.000	8.40	3.000	2.50	4.00	1.58
Max.Eff.Inten.(n	nm/hr)=	53.25	:	13.41			
over	(min)	5.00		10.00			
Storage Coeff.	(min)=	4.58	(ii)	7.88 (ii)			
Unit Hyd. Tpeak	(min)=	5.00		10.00			
Unit Hyd. peak	(cms)=	0.23		0.13			
					TOT	ALS	
PEAK FLOW	(cms)=	0.68		0.09	0.	739 (iii))
TIME TO PEAK	(hrs)=	1.67		1.75	1	67	
RUNOFF VOLUME	(mm)=	24.00		5.56	15	.70	
TOTAL RAINFALL	(mm)=	25.00		25.00	25	.00	
RUNOFF COEFFICIE	ENT =	0.96		0.22	e	.63	

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 77.0 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.

.....

CALIB STANDHYD (0211) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)=	1.01 65.00	Dir. Conn.(%)=	55.00
		IMPERVI	OUS	PERVIOUS (i)	
Surface Area	(ha)=	0.6	6	0.35	
Dep. Storage	(mm)=	1.0	0	5.00	
Average Slope	(%)=	2.0	0	2.00	
Length	(m)=	82.0	6	10.00	
Mannings n	=	0.01	3	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 1.65	1.083	4.31	2.083	5.82	3.08	2.27		
0.167 1.65	1.167	4.31	2.167	5.82	3.17	2.27		
0.250 1.82	1.250	6.37	2.250	4.52	3.25	2.08		
0.333 1.82	1.333	6.37	2.333	4.52	3.33	2.08		
0.417 2.04	1.417	13.83	2.417	3.72	3.42	1.92		
0.500 2.04	1.500	13.83	2.500	3.72	3.50	1.92		
0.583 2.33	1.583	53.25	2.583	3.19	3.58	1.79		
0.667 2.33	1.667	53.25	2.667	3.19	3.67	1.79		
0.750 2.72	1.750	16.08	2.750	2.80	3.75	1.68		
0.833 2.72	1.833	16.08	2.833	2.80	3.83	1.68		
0.917 3.31	1.917	8.40	2.917	2.50	3.92	1.58		
1.000 3.31	2.000	8.40	3.000	2.50	4.00	1.58		
Max.Eff.Inten.(mm/hr)=	53.25		13.41					
over (min)	5.00		10.00					
Storage Coeff. (min)=	2.37	(ii)	5.67 (ii)					
Unit Hyd. Tpeak (min)=	5.00		10.00					
Unit Hyd. peak (cms)=	0.30		0.15					
				TOT	ALS			
PEAK FLOW (cms)=	0.08		0.01	0.	090 (iii))		
TIME TO PEAK (hrs)=	1.67		1.75	1	.67			
RUNOFF VOLUME (mm)=	24.00		5.56	15	.70			
TOTAL RAINFALL (mm)=	25.00		25.00	25	.00			
RUNOFF COEFFICIENT =	0.96		0.22	e	.63			

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 77.0 Ia = Dep. Storage (Above)

 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COFFICIENT.

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

CALIB STANDHYD (6 ID= 1 DT= 5.0	3220) Area min Total	(ha)= 1.5 Imp(%)= 65.0		55.00
		IMPERVIOUS	PERVIOUS (i)	
Surface Ar	rea (ha)=	1.03	0.55	
Dep. Stora	age (mm)=	7.00	5.00	
Average SI	lope (%)=	2.00	2.00	
Length	(m)=	102.63	10.00	
Mannings r	n =	0.013	0.250	

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

		TRA	ANSFORME	D HYETOGRA	PH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	1.65	1.083	4.31	2.083	5.82	3.08	2.27
0.167	1.65	1.167	4.31	2.167	5.82	3.17	2.27
0.250	1.82	1.250	6.37	2.250	4.52	3.25	2.08
0.333	1.82	1.333	6.37	2.333	4.52	3.33	2.08
0.417	2.04	1.417	13.83	2.417	3.72	3.42	1.92
0.500	2.04	1.500	13.83	2.500	3.72	3.50	1.92
0.583	2.33	1.583	53.25	2.583	3.19	3.58	1.79
0.667	2.33	1.667	53.25	2.667	3.19	3.67	1.79
0.750	2.72	1.750	16.08	2.750	2.80	3.75	1.68
0.833	2.72	1.833	16.08	2.833	2.80	3.83	1.68
0.917	3.31	1.917	8.40	2.917	2.50	3.92	1.58
1.000	3.31	2.000	8.40	3.000	2.50	4.00	1.58
Max.Eff.Inten.(mm,	/hr)=	53.25		13.41			
over (ı	min)	5.00		10.00			
Storage Coeff. (min)=	2.71	(ii)	6.01 (ii)			
Unit Hyd. Tpeak (min)=	5.00		10.00			
Unit Hyd. peak (cms)=	0.29		0.15			

0.136 (iii) 1.67 12.40 25.00 0.50

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

 PEAK FLOW
 (cms)=
 0.12
 0.02

 TIME TO PEAK
 (hrs)=
 1.67
 1.75

 RUNDFF VOLUME
 (mm)=
 18.00
 5.56

 TOTAL RATNAELL
 (mm)=
 25.00
 25.00

 RUNOFF COEFFICIENT
 =
 0.72
 0.22

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 77.0$ 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.

| ADD HYD (0061)| | 1 + 2 = 3 AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
9.08 0.739 1.67 15.70
0.68 0.082 1.67 19.79 ID1= 1 (0200): + ID2= 2 (0201): ID = 3 (0061): 9.76 0.821 1.67 15.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0061)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0061):	9.76	0.821	1.67	15.99
+ ID2= 2 (0211)	1.01	0.090	1.67	15.70
ID = 1 (0061):	10.77	0.911	1.67	15.96

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0061) 1 + 2 = 3		QPEAK (cms) 0.911 0.136	TPEAK (hrs) 1.67 1.67	R.V. (mm) 15.96 12.40
ID = 3 (0061)	: 12.35	1.047	1.67	15.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0061)	4054	ODEAK	TDEAK	D. 1/
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0061):	12.35	1.047	1.67	15.51
+ ID2= 2 (0060):	1.34	0.014	2.00	4.68
TD = 1 (0061):	13.69	1.051	1.67	14.45

NOTE:	PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(2111) IN= 2> OUT= 1	OVERFLOW 1	IS OFF			
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE	
**** WARNING : F]	(cms) RST OUTFLOW :	(ha.m.) [S NOT ZERO.	(cms)	(ha.m.)	
	0.0040	0.0492	0.4840	0.5022	
	0.0070	0.1000	0.6890	0.5665	
	0.0090	0.1524	0.7300	0.6325	
	0.0100	0.2065	0.9250	0.7004	
	0.0110	0.2622	1.3030	0.7700	
	0.0130	0.3197	1.8620	0.8415	
	0.0140	0.3788	2.6100	0.9149	
	0.1740	0.4396	0.0000	0.0000	
	ARE	A QPEAK	TPEAK	R.V.	
	(ha	a) (cms)	(hrs)	(mm)	
INFLOW : ID= 2 (6	061) 13.6	90 1.09	1.67	14.45	
OUTFLOW: ID= 1 (2	2111) 13.6	90 0.01	10 4.17	14.22	

CALIB				
STANDHYD (0203)	Area	(ha)=	0.22	
ID= 1 DT= 5.0 min	Total	Imp(%) = 8	<pre>0.00 Dir. Conn.(%)=</pre>	80.00
		,	, ,	
		IMPERVIOU	S PERVIOUS (i)	
Surface Area	(ha)=	0.18	0.04	
Dep. Storage	(mm)=	5.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	38.30	10.00	
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	1.65	1.083	4.31	2.083	5.82	3.08	2.27		
0.167	1.65	1.167	4.31	2.167	5.82	3.17	2.27		
0.250		1.250		2.250	4.52	3.25	2.08		
0.333	1.82	1.333	6.37	2.333	4.52	3.33	2.08		

	0.41	7 2.04	1.417	13.83	2.417	3.72	3.42	1.92
	0.50	0 2.04	1.500	13.83	2.500	3.72	3.50	1.92
	0.58	3 2.33	1.583	53.25	2.583	3.19	3.58	1.79
	0.66	7 2.33	1.667	53.25	2.667	3.19	3.67	1.79
	0.75	0 2.72	1.750	16.08	2.750	2.80	3.75	1.68
	0.83	3 2.72	1.833	16.08	2.833	2.80	3.83	1.68
	0.91	7 3.31	1.917	8.40	2.917	2.50	3.92	1.58
	1.00	0 3.31	2.000	8.40	3.000	2.50	4.00	1.58
	Max.Eff.Inten.(53.25		7.20			
		(min)	5.00		5.00			
	Storage Coeff.		1.50	(ii)	3.77 (ii)			
	Unit Hyd. Tpeak	(min)=	5.00		5.00			
	Unit Hyd. peak	(cms)=	0.33		0.25			
						TO	TALS	
	PEAK FLOW	(cms)=	0.03		0.00	0	.027 (iii)	
	TIME TO PEAK	(hrs)=	1.67		1.67		1.67	
	RUNOFF VOLUME	(mm)=	20.00		4.17	10	5.83	
	TOTAL RAINFALL	(mm)=	25.00		25.00	2	5.00	
	RUNOFF COEFFICI	ENT =	0.80		0.17	(a.67	
*:	* WARNING · STORA	GE COEFE	TS SMALLE	R THAN	TIME STEP!			

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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.

CALIB	Area	(ha)= 0.1	c	
STANDHYD (0204) ID= 1 DT= 5.0 min		(ha) = 0.1 Imp(%) = 75.0		55 00
10- 1 01- 3.0 11	TOCAL	Imp(%)- 75.0	0 D11. COIII.(%)=	33.00
		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.12	0.04	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	32.66	10.00	
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	1.65	1.083	4.31	2.083	5.82	3.08	2.27			
0.167	1.65	1.167	4.31	2.167	5.82	3.17	2.27			

```
0.250
0.333
0.417
                                     1.82
1.82
2.04
                                                1.250
1.333
1.417
                                                            6.37
6.37
13.83
                                                                                      4.52
4.52
3.72
                                                                                                  3.25
3.33
3.42
                                                                        2,250
                                                                        2.333
                                                                                                              2.08
1.92
                                     2.04 | 1.500
2.33 | 1.583
2.33 | 1.667
                                                                        2.500
2.583
2.667
                                                                                                  3.50
3.58
3.67
                                                            13.83
53.25
                        0.500
                                                                                       3.72
                                                                                                               1.92
                        0.583
0.667
                                                                                      3.19
                                                                                                               1.79
                                                            53.25
                                   2.72 | 1.750
2.72 | 1.833
3.31 | 1.917
3.31 | 2.000
                                                            16.08 | 2.750
16.08 | 2.833
8.40 | 2.917
                        0.750
                                                                                      2.80
                                                                                                  3.75
                                                                                                              1.68
                        0.833
0.917
                                                                                      2.80
                                                                                                  3.83
                                                                                                              1.68
                                                              8.40 3.000
                                                                                      2.50
                                                                                                  4.00
                       1.000
                                                                                                              1.58
       Max.Eff.Inten.(mm/hr)=
                                                                     27.77
      over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                                  5.00 5.00
1.36 (ii) 4.25 (ii)
                                                  5.00
                                                                                          *TOTALS*
                                                 0.01
1.67
24.00
                                                                                            0.016 (iii)
1.67
16.64
       PEAK FLOW
                                                                       0.00
      TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT =
                                                                      1.67
7.67
                                                 25.00
                                                                     25.00
                                                                                            25.00
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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.
_____
ADD HYD ( 0040)
                                                                             ( R.V.
(mm)
16.83
                                           AREA QPEAK
(ha) (cms)
0.22 0.027
                                                                     TPEAK
                                                                     (hrs)
       | ID1= 1 ( 0203): 0.22 0.027
+ ID2= 2 ( 0204): 0.16 0.016
| ID = 3 ( 0040): 0.38 0.043
                                                                  1.67
------
1.67
                                                                                  16.64
                                                                                16.75
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0040)|
| 3 + 2 = 1
                                           AREA QPEAK
(ha) (cms)
                                                                     TPEAK
                                                                                   R.V.
                                           (ha) (cms)
0.38 0.043
                                                                     (hrs)
           ID1= 3 ( 0040):
```

+ ID2= 2 (2111): 13.69 0.010 4.17 14.22 4.17 14.22 ID = 1 (0040): 14.07 0.048 1.67 14.29

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTEPIPE(0041)	PIPE Number	= 1.00		
IN= 2> OUT= 1	Diameter (mm)	900.00		
DT= 5.0 min	Length (m)	= 50.00		
	Slope (m/m)	= 0.005		
	Manning n	= 0.013		
	TRAVEL TIME TABLE			
DEPTH VOLUME		VELOCITY		
(m) (cu.m.)		(m/s)	min	
0.05 .642E+00		0.53	1.56	
0.09 .178E+01		0.83	1.00	
0.14 .322E+01		1.07	0.78	
0.19 .487E+01		1.28	0.65	
0.24 .668E+01		1.45	0.57	
0.28 .862E+01	0.3	1.61	0.52	
0.33 .106E+02		1.74	0.48	
0.38 .127E+02	0.5	1.86	0.45	
0.43 .148E+02	0.6	1.97	0.42	
0.47 .170E+02	0.7	2.06	0.41	
0.52 .191E+02	0.8	2.13	0.39	
0.57 .212E+02	0.9	2.20	0.38	
0.62 .232E+02	1.0	2.24	0.37	
0.66 .251E+02		2.28	0.37	
0.71 .269E+02		2.29	0.36	
0.76 .286E+02		2.29	0.36	
0.81 .300E+02	1.4	2.27	0.37	
0.85 .312E+02	1.4	2.21	0.38	
0.90 .318E+02	1.3	2.01	0.41	
				.pe / channel->
				DEPTH MAX VEL
		s) (hrs)		(m/s)
INFLOW : ID= 2 (004				0.12 0.93
OUTFLOW: ID= 1 (004	1) 14.07 0.	a5 1.67	14.28	0.12 0.97

-----I CALTB

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

		TR	ANSFORME) HYETOGR	APH		
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	1.65	1.083	4.31	2.083	5.82	3.08	2.27
0.167	1.65	1.167	4.31	2.167	5.82	3.17	2.27
0.250	1.82	1.250	6.37	2.250	4.52	3.25	2.08
0.333	1.82	1.333	6.37	2.333	4.52	3.33	2.08
0.417	2.04	1.417	13.83	2.417	3.72	3.42	1.92
0.500	2.04	1.500	13.83	2.500	3.72	3.50	1.92
0.583	2.33	1.583	53.25	2.583	3.19	3.58	1.79
0.667	2.33	1.667	53.25	2.667	3.19	3.67	1.79
0.750	2.72	1.750	16.08	2.750	2.80	3.75	1.68
0.833	2.72	1.833	16.08	2.833	2.80	3.83	1.68
0.917	3.31	1.917	8.40	2.917	2.50	3.92	1.58
1.000	3.31	2.000	8.40	3.000	2.50	4.00	1.58

Unit Hyd Qpeak (cms)= 0.112

PEAK FLOW (cms)= 0.006
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 3.819
TOTAL RAINFALL (mm)= 25.000
RUNOFF COEFFICIENT = 0.153 0.006 (i)

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

CALIB STANDHYD (0207) ID= 1 DT= 5.0 min	Area Total	(ha)= Imp(%)=	12.64 65.00		= 55.00
		IMPERVI	ous	PERVIOUS (i)	
Surface Area	(ha)=	8.2	2	4.42	
Dep. Storage	(mm)=	1.00	Э	5.00	
Average Slope	(%)=	2.00	9	2.00	
Length	(m)=	290.29	9	10.00	
Mannings n		0.01	3	0.250	

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

		TD.		LIVETOCE			
) HYETOGRA			
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	1.65	1.083	4.31	2.083	5.82	3.08	2.27
0.167	1.65	1.167	4.31	2.167	5.82	3.17	2.27

0.256	0 1.82	1.250	6.37	2.250	4.52	3.25	2.08
0.33	3 1.82	1.333	6.37	2.333	4.52	3.33	2.08
0.41	7 2.04	1.417	13.83	2.417	3.72	3.42	1.92
0.500	2.04	1.500	13.83	2.500	3.72	3.50	1.92
0.58	3 2.33	1.583	53.25	2.583	3.19	3.58	1.79
0.66	7 2.33	1.667	53.25	2.667	3.19	3.67	1.79
0.75	2.72	1.750	16.08	2.750	2.80	3.75	1.68
0.83	3 2.72	1.833	16.08	2.833	2.80	3.83	1.68
0.91	7 3.31	1.917	8.40	2.917	2.50	3.92	1.58
1.000	3.31	2.000	8.40	3.000	2.50	4.00	1.58
Max.Eff.Inten.(r		53.25		13.41			
	(min)	5.00		10.00			
Storage Coeff.		5.06	(ii)	8.36 (ii)			
Unit Hyd. Tpeak		5.00	:	10.00			
Unit Hyd. peak	(cms)=	0.21		0.12			
					T0	ΓALS	
PEAK FLOW	(cms)=	0.92		0.12	1	.006 (iii)	
TIME TO PEAK	(hrs)=	1.67		1.75		1.67	
RUNOFF VOLUME	(mm)=	24.00		5.56	1	5.70	
TOTAL RAINFALL	(mm)=	25.00		25.00	2	5.00	
RUNOFF COEFFICIE	ENT =	0.96		0.22	(0.63	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 77.0 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.

CALIB STANDHYD (0209) ID= 1 DT= 5.0 min	Area Total	(ha)= 1 Imp(%)= 65	.84 .00 Dir. Conn.(%)=	55.00
		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.20	0.64	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	110.75	10.00	
Mannings n	=	0.013	0.250	

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

				D HYETOGR			
TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	1.65	1.083	4.31	2.083	5.82	3.08	2.27

0.167	1.65	1.167	4.31	2.167	5.82	3.17	2.27
0.250	1.82	1.250	6.37	2.250	4.52	3.25	2.08
0.333	1.82	1.333	6.37	2.333	4.52	3.33	2.08
0.417	2.04	1.417	13.83	2.417	3.72	3.42	1.92
0.500	2.04	1.500	13.83	2.500	3.72	3.50	1.92
0.583	2.33	1.583	53.25	2.583	3.19	3.58	1.79
0.667	2.33	1.667	53.25	2.667	3.19	3.67	1.79
0.756	2.72	1.750	16.08	2.750	2.80	3.75	1.68
0.833	2.72	1.833	16.08	2.833	2.80	3.83	1.68
0.917	3.31	1.917	8.40	2.917	2.50	3.92	1.58
1.000	3.31	2.000	8.40	3.000	2.50	4.00	1.58
Max.Eff.Inten.(m	m/hr)=	53.25		13.41			
	(min)	5.00		10.00			
Storage Coeff.	(min)=	2.84	(ii)	6.14 (ii)			
Unit Hyd. Tpeak	(min)=	5.00		10.00			
Unit Hyd. peak	(cms)=	0.28		0.15			
					T0	TALS	
PEAK FLOW	(cms)=	0.15		0.02	0	.161 (iii)	
TIME TO PEAK	(hrs)=	1.67		1.75		1.67	
RUNOFF VOLUME	(mm)=	24.00		5.56	15	5.70	
TOTAL RAINFALL	(mm)=	25.00		25.00	2	5.00	
RUNOFF COEFFICIE	NT =	0.96		0.22		ð.63	
** !!********							

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 77.0 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.

-----IMPERVIOUS PERVIOUS (i) (ha)= (mm)= (%)= (m)= 3.22 7.00 2.00 181.84 0.013 1.74 5.00 2.00 10.00 0.250 Dep. Storage Average Slope Length Mannings n

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

---- TRANSFORMED HYETOGRAPH ---TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN

hr:	s mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.083	3 1.65	1.083	4.31	2.083	5.82	3.08	2.27
0.16	7 1.65	1.167	4.31	2.167	5.82	3.17	2.27
0.25	1.82	1.250	6.37	2.250	4.52	3.25	2.08
0.33	3 1.82	1.333	6.37	2.333	4.52	3.33	2.08
0.41	7 2.04	1.417	13.83	2.417	3.72	3.42	1.92
0.500	2.04	1.500	13.83	2.500	3.72	3.50	1.92
0.583	3 2.33	1.583	53.25	2.583	3.19	3.58	1.79
0.66	7 2.33	1.667	53.25	2.667	3.19	3.67	1.79
0.75	2.72	1.750	16.08	2.750	2.80	3.75	1.68
0.83	3 2.72	1.833	16.08	2.833	2.80	3.83	1.68
0.91	7 3.31	1.917	8.40	2.917	2.50	3.92	1.58
1.000	3.31	2.000	8.40	3.000	2.50	4.00	1.58
Max.Eff.Inten.(r		53.25		13.41			
	(min)	5.00		10.00			
Storage Coeff.				7.12 (ii)			
Unit Hyd. Tpeak		5.00		10.00			
Unit Hyd. peak	(cms)=	0.25		0.14			
						TALS*	
PEAK FLOW	(cms)=	0.36		0.05		.400 (iii)	
TIME TO PEAK	(hrs)=	1.67		1.75		1.67	
RUNOFF VOLUME	(mm)=	18.00		5.56		2.40	
TOTAL RAINFALL	(mm)=	25.00		25.00		5.00	
RUNOFF COEFFICIE	ENT =	0.72		0.22	6	9.50	

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 77.0 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.

CALIB				
STANDHYD (0208)	Area	(ha)=	1.03	
ID= 1 DT= 5.0 min	Total	Imp(%) = 6	5.00 Dir. Conn.(%)=	= 55.00
		IMPERVIOU	S PERVIOUS (i)	
Surface Area	(ha)=	0.67	0.36	
Dep. Storage	(mm)=	7.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	82.87	10.00	
Mannings n	=	0.013	0.250	

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

	TRANSFOR	MED HYETOGRAP		
TIME RAIN		N I' TIME		RAIN
	hrs mm/h			mm/hr
0 083 1 65	1 083 4	1 2 083	5.82 3.08	2.27
0.083 1.65 0.167 1.65	1.167 4.3	1 2.167	5.82 3.17	2.27
0.250 1.82	1.250 6.3	7 2.250		2.08
0.333 1.82	1.333 6.3	7 2.333	4.52 3.33	2.08
0.333 1.82 0.417 2.04	1.417 13.8	3 2.417	3.72 3.42	1.92
0.500 2.04	1.500 13.8			1.92
0.583 2.33	1.583 53.3	5 2.583		1.79
0.667 2.33			3.19 3.67	1.79
0.750 2.72	1.750 16.6	8 2.750		1.68
0.833 2.72	I 1.833 16.6	8 I 2.833	2.80 3.83	1.68
			2.50 3.92	
1.000 3.31	2.000 8.4	0 3.000	2.50 4.00	1.58
Max.Eff.Inten.(mm/hr)=	53 25	13 41		
over (min)				
Storage Coeff. (min)=	2.39 (ii)	10.00 5.68 (ii)		
Unit Hyd. Tpeak (min)=	5.00	10.00		
Unit Hyd. peak (cms)=				
,			*TOTALS*	
PEAK FLOW (cms)=	0.08	0.01	0.090 (iii)	
TIME TO PEAK (hrs)=	1 67	1.75	1.67	
RUNOFF VOLUME (mm)=		5.56	12.40	
TOTAL RAINFALL (mm)=		25.00	25.00	
RUNOFF COEFFICIENT =	0.72	0.22	0.50	
**** WARNING: STORAGE COEFF. 3	TC CMALLED TU	N TIME CTED!		
WARNING. STORAGE COEFF.	IS SMALLER INF	IN ITHE SIEP!		
(i) CN PROCEDURE SELECTI	ED FOR PERVIOL	IS LOSSES:		
CN* = 77.0 Ia	= Dep. Storag	ge (Above)		
(ii) TIME STEP (DT) SHOUL	LD BE SMALLER	OR EQUAL		
THAN THE STORAGE COL	EFFICIENT.			
(iii) PEAK FLOW DOES NOT :	INCLUDE BASEFL	OW IF ANY.		
ADD HYD (0038)				
	REA OPEAK	TPEAK R	.V.	
(I	ha) (cms)	(hrs) (
ID1= 1 (0207): 12	.64 1.006	1.67 15.	70 [°]	
+ ID2= 2 (0208): 1	.03 0.090	1.67 12.	40	

ID = 3 (0038): 13.67 1.096 1.67 15.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ID = 1 (0038) NOTE: PEAK FLOWS ADD HYD (0038) 1 + 2 = 3 ID1= 1 (0038)	: 15.51	1.257	1.67	15.48	-
ADD HYD (0038) 1 + 2 = 3	DO NOT INCL	UDE BASEF	LOWS IF AN		
1 + 2 = 3				ıy. 	
1 + 2 = 3					
	AREA	OPEAK	TPEAK	R.V.	
TD1= 1 (0039)					
101-1 (0030)	: 15.51	1.257	1.67	15.48	
+ ID2= 2 (0221)	: 4.96	0.400	1.67	12.40	
ID = 3 (0038)					:
NOTE: PEAK FLOWS	DO NOT INCL				
RESERVOIR(2099)	OVERFLOW :	TS OFF			
IN= 2> OUT= 1					
DT= 5.0 min	OUTFLOW	STORAGE	OUTF	LOW	STORAGE
	(cms)		(cn		(ha.m.)
	0.0000	0.0000	0.6	508	0.7415
	0.0049	0.0845		.103	0.8448
		0.1713		.869	0.9504
	0.0110	0.2604	0.2	773	1.0584
	0.0130	0.3519	0.3	797	1.1687
	0.0147	0.4458 0.5420	0.5	592 1940	1.2814
					1.3964
	0.01/7	0.6406	1.4	269	1.5138
	ΔR	FA OP	FAK TE	PEAK	R.V.
	(h	a) (c	ms) (h	ırs)	(mm)
INFLOW : ID= 2 (00	38) 20.	470	1.657	1.67	14.74
INFLOW: ID= 2 (00 OUTFLOW: ID= 1 (20	99) 20.	470	0.012	4.17	14.14
PEAK	FLOW R	EDUCTION	[Qout/Qin]	(%)=	3.70
TIME	SHIFT OF P	EAK FLOW	(n	nin)=150	3.00
IXAM	MUM STORAG	E USED	(ha.	m.)= 6	3.2912
ADD HYD (0049)					

```
1 + 2 = 3
                                          QPEAK
(cms)
                                ΔΡΕΔ
                                                    TΡΕΔΚ
                                                               R.V.
                                                            (mm)
14.14
                               (ha)
20.47
                                                    (hrs)
      ID1= 1 ( 2099): 20
+ ID2= 2 ( 0210): 0
                                        0.012
                                0.62
                                        0.006
                                                    1.92
                                                              3.82
        ID = 3 ( 0049):
                              21.09 0.015
                                                   2.00
                                                             13.83
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 CALTR
| STANDHYD ( 0222)
| ID= 1 DT= 5.0 min
                         Area (ha)= 1.38
Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00
                                 IMPERVIOUS PERVIOUS (i)
                                                    0.48
5.00
                                      0.90
7.00
                        (mm)=
(%)=
(m)=
     Dep. Storage
     Average Slope
Length
                                      2.00
                                                     2.00
                                    95.92
0.013
                                                    10.00
     Mannings n
         NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                   --- TRANSFORMED HYETOGRAPH ---
                           RAIN TIME
                    hrs
                         mm/hr
1.65
                                      hrs
                                             mm/hr
                                                         hrs
                                                                                   mm/hr
                                    1.083
                                                      2.083
                 0.083
                                              4.31
                                                                 5.82
                                                                          3.08
                                                                                   2.27
                                    1.167
1.250
1.333
                                                                5.82
4.52
4.52
                 0.167
0.250
                            1.65
1.82
                                              4.31
6.37
                                                      2.167
2.250
                                                                          3.17
                                                                                   2.27
                                              6.37
                                                      2.333
                                                                          3.33
                 0.333
                            1.82
                                                                                   2.08
                 9.417
                            2.04
                                    1.417
                                             13.83
                                                      2.417
                                                                3.72
                                                                          3.42
                                                                                   1.92
                 0.500
0.583
                            2.04
                                   1.500
                                             13.83
53.25
                                                      2.500
                                                                         3.50
                                                                 3.19
                                                                                   1.79
```

0.667

0.750 0.833

0.917

1.000

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

over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=

Unit Hyd. peak (cms)=

PEAK FLOW TIME TO PEAK

RUNOFF VOLUME

TOTAL RAINFALL

2.33

2.72

(hrs)=

(mm)= (mm)= 1.667

1.750 1.833

53.25

0.29

0.11

1.67

18.00

5.00 2.60 (ii) 5.00

3.31 1.917 3.31 2.000 53.25

16.08 16.08

8.40

2,667

2.750

2.917

10.00 5.90 (ii) 10.00

8.40 3.000

13.41

0.15

0.01

1.75

5.56

3.19

2.80

2.50

3,67

3.75

3.92

TOTALS

1.67

12.40

0.119 (iii)

1.79

1.68

1.58

RUNOFF COEFFICIENT = 0.72 0.22 0.50 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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. | Junction Command(0051) | AREA QPEAK R.V. INFLOW: ID= 2(0222) 1.38 OUTFLOW: ID= 2(0051) 1.38 (mm) 12.40 12.40 (cms) 0.12 (hrs) 1.67 0.12 1.67 CALIB | STANDHYD (0212) | ID= 1 DT= 5.0 min (ha) = 4.77Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) (ha)= (mm)= (%)= Surface Area 3.10 7.00 1.67 Dep. Storage Average Slope 2.00 2.00 Length Mannings n (m)= = 178.33 10.00 NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP. --- TRANSFORMED HYETOGRAPH ---TIME RAIN TIME hrs 1.083 RAIN ' TIME mm/hr ' hrs RAIN TIME mm/hr hrs hrs 0.083 mm/hr 1.65 2.083 3.08 4.31 | 2.083 4.31 | 2.167 5.82 0.167 1.65 1.167 5.82 3.17 6.37 6.37 13.83 4.52 4.52 3.72 0.250 0.333 1.250 1.333 2.250 3.25 1.82 1.82 0.417 2.04 1.417 2.417 3.42 2.04 2.33 2.33 1.500 1.583 13.83 53.25 2.500 3.50 0.500 3.72 1.667 2.667 0.667 53.25 3.19 3.67 0.750 2.72 1.750 16.08 2.750 2.80 3.75 0.833 2.72 | 1.833

RAIN

mm/hr 2.27

2.27

2.08

1.92

1.92

1.79

1.68

	F.C.C. T		((l)		-	3 35								
Max	.Ett.1		(mm/hr)=		_	3.25		13.41						
Cha			r (min)			5.00		10.00	/223					
			(min): k (min):			3.78 (i		7.08 10.00	(11)					
			(cms):			5.00 0.25		0.14						
OUT	с нуа.	реак	(CIIIS)=	-		0.25		0.14		**	ОТА	c*		
DEA	K FLOW		(cms):			0.35		0.05		'		B6 (i	:::\	
	E TO P					1.67		1.75			1.0		,	
	OFF VO		(mm)=			8.00		5.56			12.4			
	AL RAI					5.00		25.00			25.0			
			IENT :			0.72		0.22			0.			
*** WA	RNING:	STOR	AGE COEI	FF. :	IS S	MALLER	THAN 1	TIME S	TEP!					
(i) CN		DURE SEI											
			77.0											
(i			P (DT) 9				LER OR	EQUAL						
,			STORAGE											
 Junc	 tion C	 omman	d(0052)	 . <u>.</u>	INCL	ODE BAS	SEFLOW	IF AN	IY. 					
 Junc	 tion C	 omman		I AREA		QPEAK	С ТРЕ	EAK	R.V					
Junc	tion C	omman	d(0052)		 A)	QPEAk (cms)	 (TPE	EAK	R.V (mm	1)				
Junc	tion C	omman	d(0052)	AREA (ha)	Δ) 77	QPEAk (cms) 0.39	(TPE	EAK nrs)	R.V (mm	ı) 10				
Junc	tion C	omman	d(0052)		Δ) 77	QPEAk (cms)	(TPE	EAK	R.V (mm	ı) 10				
Junc	tion C : ID=	2(2(0212) 0052)	AREA (ha) 4.1	A) 77 77	QPEAk (cms) 0.39 0.39	(TPP) (K) 1.	EAK nrs) .67	R.V (mr 12.4 12.4	1) 10 10				
Junc	tion C : ID=	2(2(0212) 0052)	AREA (ha) 4.1	A) 77 77	QPEAk (cms) 0.39 0.39	(TPP) (K) 1.	EAK nrs) .67	R.V (mr 12.4 12.4	1) 10 10				
Junc	: ID= w: ID=	2(2(2(0212) 0052) 	AREA (ha: 4.:	4) 77 77 	QPEAk (cms) 0.39 0.39	(TPE) (Y) 1.	EAK nrs) .67	R.V (mm 12.4 12.4	1) 40 40				
Junc	: ID=	2(2(2(0212) 0052) 	ARE <i>A</i> (ha) 4	A) 77 77 	QPEAk (cms) 0.39 0.39	(TPE) ()) 1.) 1.	EAK nrs) .67	R.V (mm 12.4 12.4	1) 40 40				
INFLOW OUTFLOI	: ID=	2(2(2(I I	0212) 0052) 	ARE/ (ha) 4.: 4.: U	A) 77 77 U U U	QPEAK (cms) 0.39 0.39	(TPF) () () () () () () () () () () () () ()	EAK nrs) .67	R.V (mm 12.4 12.4	1) 40 40				
INFLOW OUTFLOI	: ID= W: ID= V V V V	2(2(2(I I I	0212) 0052) 	AREA (ha: 4.: 4.: U U U	A) 77 77 U U U	QPEAk (cms) 0.39 0.39 A A AAAAA	(TPF () () () 1. () 1. () 1.	EAK nrs) 67 67	R.V (mm 12.4 12.4	1) 40 40				
INFLOW OUTFLOI	: ID=	2(2(2(I I	0212) 0052) 	AREA (ha: 4.: 4.: U	A) 77 77 U U U	QPEAK (cms) 0.39 0.39	(TPF) () () () () () () () () () () () () ()	EAK nrs) 67 67	R.V (mm 12.4 12.4	1) 40 40				
INFLOW OUTFLOI	: ID= w: ID= V V V V V V V V V V V V V V V V V V V	2(2(2(I I I I	0212) 0052) 	AREA (ha) 4	4) 77 77 U U U U U U U	QPEAk (cms) 0.39 0.39 A A A AAAAA A A A	(TPF) ()) 1.) 1. L L L L	EAK ors) 67 67 67 	R.V. (mm 12.4 12.4	1) 40 40				
INFLOW OUTFLOI	: ID=	2(2(2(I I I I	0212) 0052) SSSSS SS SS SS TITITT T	ARE/ (ha) 4 4 U U U U U U U U U U U U U U U	4) 77 77 U U U U U U U U U H H	QPEAk (cms) 0.39 0.39 A A A AAAAA A A A Y Y Y	(TPE) ()) 1.) 1. L L L L L L L L L MMM MM	EAK nrs) 67 67 	R.W. (mm 12.4 12.4 12.4 12.4 000 00 00 0	(v 6				
INFLOW OUTFLOW V V	: ID= w: ID= V V V V V V V V V V V V V V V V V V V	2(2(2(I I I I	0212) 0052) 0052) SSSSS SS SS SS SS SS SS TITITI T	AREA (ha) 4	4) 77 77 U U U U U U U	QPEAk (cms) 0.39 0.39 A A A AAAAA A A A	(TPF) ()) 1.) 1. L L L L	EAK nrs) 67 67 1	R.V. (mm 12.4 12.4 12.4 000 000 000 000 000 000 000 000 000 0	(v 6				

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***** DETAILED OUTPUT *****	
<pre>Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat</pre>	
Output filename:	
$ \label{lem:condition} C:\Users\mbox{\sc of } 47c6-4df2-b34b-ee7e2da1ba7b\sc on a lem of the condition of $	2c5
Summary filename: C:\Users\mornat\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\2fc:	2c5
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DATE: 08/19/2024 TIME: 12:07:50	
USER:	
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1.17
1.19
1.22
                                      3.58
3.67
3.75
                                                5.08
5.65
6.35
7.25
                                                         6.58
6.67
6.75
                                                                   3.51
3.37
3.24
                                                                            9.58
9.67
9.75
                   0.56
0.67
0.75
                                                                                      1.40
                                                                            9.83
9.92
                   0.83
                             1.24
                                      3.83
                                                          6.83
                                                                   3.12
                                                                                      1.38
                            1.27
                                      3.92
4.00
                                                         6.92
7.00
                                                                                      1.36
1.34
                                               10.07
                   1.00
                                                                   2.91
                                                                           10.00
                   1.08
                             1.33
                                      4.08
                                               12.45
                                                         7.08
                                                                   2.82
                                                                           10.08
                                                                                      1.32
                   1.17
                            1.36
                                      4.17
4.25
4.33
                                               16.17
                                                         7.17
7.25
7.33
                                                                   2.73
                                                                           10.17
                                                                                      1.30
                   1.33
                             1.43
                                               36.11
                                                                   2.56
                                                                           10.33
                                                                                      1.27
                                      4.42
4.50
4.58
                   1.42
                             1.47
                                               75.42
                                                         7.42
                                                                   2.49
                                                                           10.42
                                                                                      1.25
                   1.50
1.58
                                             163.74
88.04
                                                         7.50
7.58
                                                                   2.42
                                                                           10.50
10.58
                                                                                      1.22
                                      4.67
4.75
4.83
                   1.67
                             1.59
                                               51.42
                                                         7.67
                                                                   2.29
                                                                           10.67
                                                                                      1.20
                            1.64
1.69
1.74
                                                         7.75
7.83
7.92
                   1.75
                                               34.99
                                                                   2.23
                                                                           10.75
                                                                                      1.19
                   1.92
                                      4.92
                                               20.44
                                                                   2.13
                                                                           10.92
                                                                                      1.16
                                               16.73
14.09
12.14
                   2.00
                             1.80
                                      5.00
                                                         8.00
                                                                   2.08
                                                                           11.00
                                                                                      1.15
                                      5.08
                   2.17
                             1.93
                                                                   1.98
                                                                           11.17
                                                                                      1.12
                   2.25
                             2.00
                                      5.25
                                               10.65
                                                         8.25
                                                                   1.94
                                                                           11.25
                                                                                      1.11
                            2.07
2.15
2.24
                                                9.47
8.51
7.73
                   2.33
                                      5.33
5.42
                                                         8.33
8.42
                                                                   1.90
1.86
                                                                           11.33
11.42
                                                                                      1.09
                                                                   1.82
                   2.50
                                      5.50
                                                         8.50
                                                                           11.50
                                                                                      1.07
                                                                   1.79
1.75
1.72
                                      5.58
5.67
                   2.58
                            2.34
                                                7.08
                                                         8.58
                                                                           11.58
                                                                                      1.06
                            2.45
                                                6.53
                   2.75
                                      5.75
                                                         8.75
                                                                           11.75
                                                                                      1.03
                   2.83
                            2.70
                                      5.83
                                                5.64
                                                         8.83
                                                                   1.69
                                                                           11.83
                                                                                      1.02
                            2.85 5.92
                                                5.28
                                                                   1.65
_____
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CALIB | CALIB | NASHYD (0213) |ID= 1 DT= 5.0 min Area (ha)= 0.12 Curve Number (CN)= 79.1 Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.34

Unit Hyd Qpeak (cms)= 0.013 PEAK FLOW (cms)= 0.009 (i) TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 36.013
TOTAL RAINFALL (mm)= 77.381
RUNOFF COEFFICIENT = 0.465

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

```
CALIB
| NASHYD ( 0227)
| ID= 1 DT= 5.0 min
                            Area (ha)= 0.13 Curve Number (CN)= 82.3 Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
                            U.H. Tp(hrs)= 0.22
     Unit Hyd Qpeak (cms)= 0.022

        PEAK FLOW
        (cms)=
        0.014

        TIME TO PEAK
        (hrs)=
        4.833

        RUNOFF VOLUME
        (mm)=
        39.572

        TOTAL RAINFALL
        (mm)=
        77.381

        RUNOFF COEFFICIENT
        =
        0.511

                                     0.014 (i)
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
Unit Hyd Qpeak (cms)= 0.088
     PEAK FLOW (cms)= 0.068
TIME TO PEAK (hrs)= 4.917
RUNOFF VOLUME (mm)= 42.203
TOTAL RAINFALL (mm)= 77.31
RUNOFF COEFFICIENT = 0.545
                                     0.068 (i)
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
.....
Unit Hyd Qpeak (cms)= 0.080
      PEAK FLOW (cms)= 0.076
TIME TO PEAK (hrs)= 5.167
RUNOFF VOLUME (mm)= 43.523
TOTAL RATNFALL (mm)= 77.31
RUNOFF COEFFICIENT = 0.562
                                     0.076 (i)
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
_____
```

```
CALIB
NASHYD ( 0206)
                             Area (ha)= 2.57 Curve Number (CN)= 77.5
Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.25
    Unit Hyd Qpeak (cms)=
                                           0.391
     PEAK FLOW
                            (cms)=
                                          0.217 (i)
    TIME TO PEAK (hrs)= 4.833
RUNOFF VOLUME (mm)= 34.343
TOTAL RAINFALL (mm)= 77.381
RUNOFF COEFFICIENT = 0.444
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB STANDHYD (0205) ID= 1 DT= 5.0 min		(ha)= Tmp(%)=		Dir.	Conn.(%)	= 1.06	3
		IMPERVIO	US	PERVIOU	S (i)		
Surface Area	(ha)=	0.28		0.28			
Dep. Storage	(mm)=	1.00)	5.00			
Average Slope	(%)=	2.00)	2.00			
Length	(m)=	61.16)	10.00	1		
Mannings n	=	0.013		0.250			
Max.Eff.Inten.(mm	/hr)=	163.74	L	173.90			
over (i							
Storage Coeff. (
Unit Hyd. Tpeak (5.00			
Unit Hyd. peak (0.25			
, , ,	•					*TOTALS	k
PEAK FLOW (cms)=	0.00)	0.14		0.141	(iii)
TIME TO PEAK (I	hrs)=	4.58		4.58		4.58	
RUNOFF VOLUME	(mm)=	76.38		49.51		49.77	
TOTAL RAINFALL	(mm)=	77.38		77.38		77.38	
RUNOFF COEFFICIEN	T =	0.99		0.64		0.64	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 77.0 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.

CALIB				
STANDHYD (0226)	Area	(ha)= 0.05		
		Imp(%) = 65.00	Dir. Conn.(%)= 55.00
·				
		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.03	0.02	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	18.26	10.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	163.74	91.00	
over	(min)	5.00	5.00	
Storage Coeff.	(min)=	0.61 (ii)	2.72 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00	
Unit Hyd. peak	(cms)=	0.34	0.29	
				TOTALS
PEAK FLOW	(cms)=	0.01	0.00	0.017 (iii)
TIME TO PEAK	(hrs)=	4.58	4.58	4.58
RUNOFF VOLUME				60.35
TOTAL RAINFALL			77.38	77.38
RUNOFF COEFFICI	ENT =	0.99	0.53	0.78

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 77.0 Ia = Dep. Storage (Abov (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE	STORAGE	COEFFICIEN	т.		
(iii) PEAK FLO	W DOES NO	T INCLUDE	BASEFLOW IF A	NY.	
	_				
CALIB	1				
STANDHYD (0202)	Area	(ha)=	0.36		
ID= 1 DT= 5.0 min				Conn (%)=	EE 00
ID- 1 DI- 3.0 IIIII	I locar	TIIIb(%)-	05.00 DII.	COIIII. (%)=	33.00
	=	IMPERVIO	UC DEDVITOUS	c (:)	
Surface Area	(ha)=	0.23	0.13		
Dep. Storage	(mm)=	1.00	5.00		
Average Slope	(%)=	2.00	2.00		
Length	(m)=	48.99	10.00		
Mannings n	` =	0.013	0.250		
Max.Eff.Inten.	(mm/hr)-	163.74	91.00		
			5.00		
Storage Coeff.	(min)=	1.11	(11) 3.22	(11)	

```
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                                                                                                                                     *TOTALS*

        PEAK FLOW
        (cms)=

        TIME TO PEAK
        (hrs)=

        RUNOFF VOLUME
        (mm)=

        TOTAL RAINFALL
        (mm)=

                                                                                                                    0.03
4.58
                                                                                                                                                        0.123 (iii)
4.58
                                                                                     0.09
                                                                                                                   40.76
                                                                                  76.38
                                                                                                                                                         60.34
                                                                                  77.38
                                                                                                                   77.38
                                                                                                                                                         77.38
            RUNOFF COEFFICIENT
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
            (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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.
```

ADD HYD (0039) QPEAK (cms) TPEAK ΔΡΕΔ R.V. (mm) (hrs) 4.58 (ha) ID1= 1 (0202): + ID2= 2 (0205): ============ 0.123 60.34 0.36 0.56 0.141 4.58 49.77 ID = 3 (0039): 0.92 0.263 4.58 53.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0039)| | 3 + 2 = 1 | AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) 4.58 (mm) 53.91 ID1= 3 (0039): + ID2= 2 (0206): 0.263 0.217 2.57 34.34 4.83 ID = 1 (0039): 3.49 0.343 4.58 39.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0039)| | 1 + 2 = 3 | ARFA QPEAK TPFAK R.V. (cms) 0.343 (mm) 39.50 (ha) 3.49 (hrs) 4.58 ID1= 1 (0039): + ID2= 2 (0226): 0.05 0.017 4.58 60.35

ID = 3 (0039): 3.54 0.361 4.58

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0039)| | 3 + 2 = 1 ARFA QPEAK (cms) TPEAK R.V. (mm) (ha) 3.54 (hrs) 4.58 ID1= 3 (0039): + ID2= 2 (0227): 0.361 39.80 0.13 9.914 4.83 39.57 ID = 1 (0039): 3.67 0.367 4.58 39.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0039)| | 1 + 2 = 3 AREA QPEAK TPEAK R.V. (ha) 3.67 (cms) 0.367 0.068 (hrs) 4.58 (mm) 39.79 ID1= 1 (0039): + ID2= 2 (0228): 0.71 4.92 ID = 3 (0039): 4.38 0.395 4.67 40.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0039) 3 + 2 = 1 | ID1= 3 (0039): + ID2= 2 (0229): QPEAK (cms) ΔRFΔ TΡΕΔΚ (ha) 4.38 (hrs) 4.67 0.395 1.06 0.076 5.17 43.52 ID = 1 (0039): 5.44 0.435 4.83

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB | NASHYD (0223) |ID= 1 DT= 5.0 min Area (ha)= 0.70 Curve Number (CN)= 84.0 Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.24

Unit Hyd Qpeak (cms)=

PEAK FLOW (cms)= 0.076 (i) TIME TO PEAK

RUNOFF VOLUME (mm)= 41.671 TOTAL RAINFALL (mm)= 77.381 RUNOFF COEFFICIENT = 0.539

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

CALIB NASHYD (0224) Area (ha)= 0.64 Curve Number (CN)= 82.3 Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.31 ID= 1 DT= 5.0 min

0.080 Unit Hyd Qpeak (cms)=

PEAK FLOW (cms)= 0.057 (i) TIME TO PEAK (hrs)= 4.917
RUNOFF VOLUME (mm)= 39.610
TOTAL RAINFALL (mm)= 77.381
RUNOFF COEFFICIENT = 0.512

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

| ADD HYD (0060)| | 1 + 2 = 3 AREA (ha) (hrs) (mm) 41.67 (cms) ID1= 1 (0223): + ID2= 2 (0224): 0.70 0.076 4.83 0.64 0.057 4.92 39.61 ID = 3 (0060): 1.34 0.130 4.83 40.69

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALTR | STANDHYD (0200)| |ID= 1 DT= 5.0 min Area (ha)= 9.08 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) Surface Area 5.90 1.00 3.18 5.00 (mm)= (%)= (m)= Dep. Storage Average Slope 2.00 246.04 2.00 Length Mannings n 0.013 0.250 Max.Eff.Inten.(mm/hr)= over (min) 10.00

Storage Coeff. (m	in)= 2	.92 (ii)	5.03 (ii)	
Unit Hyd. Tpeak (m	in)= 5	.00 1	10.00	
Unit Hyd. peak (c	ms)= 0	.28	0.16	
				TOTALS
PEAK FLOW (c	ms)= 2	.03	0.69	2.458 (iii)
TIME TO PEAK (h	rs)= 4	.58	4.67	4.58
RUNOFF VOLUME (mm)= 76	.38	40.76	60.35
TOTAL RAINFALL (mm)= 77	.38 7	77.38	77.38
RUNOFF COEFFICIENT	= 0	.99	0.53	0.78

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 77.0$ 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.

CALIB STANDHYD (0201) ID= 1 DT= 5.0 min		(ha)= Imp(%)=		Conn.(%)	= 75.00	ð
		THRERVITO	 DEDVITOU	- (1)		
		IMPERVIO	 PERVIOUS			
Surface Area			0.10			
Dep. Storage	(mm)=	1.00	5.00			
Average Slope	(%)=	2.00	2.00			
Length	(m)=	67.33	10.00			
Mannings n	. =	0.013	0.250			
Max.Eff.Inten.(nm/hr)=	163.74	135.50			
	(min)					
Storage Coeff.						
Unit Hvd. Tpeak			5.00			
Unit Hyd. peak			0.29			
onit nya. peak	(Cilis)-	0.55	0.25		*TOTALS*	*
DEAK FLOW	/\	0.23	0.04			
PEAK FLOW					0.271	(111)
TIME TO PEAK			4.58		4.58	
RUNOFF VOLUME	(mm)=	76.38	46.14		68.82	
TOTAL RAINFALL	(mm)=	77.38	77.38		77.38	
RUNOFF COEFFICI	ENT =	0.99	0.60		0.89	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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.

| CALIB | STANDHYD (0211) | ID= 1 DT= 5.0 min Area (ha)= 1.01 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS (1) 0.66 0.35 1.00 5.00 2.00 2.00 82.06 10.00 0.013 0.250 (ha)= (mm)= (%)= (m)= Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mm/hr)=
over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 163.74 91.00 5.00 1.51 (ii) 5.00 3.62 (ii) 5.00 0.33 PEAK FLOW (cms)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 0.337 (iii) 4.58 60.35 77.38 0.25 4.58 76.38 77.38 0.09 4.58 40.76 77.38 0.99 0.53 0.78 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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. ______ | CALIB | STANDHYD (0220) |ID= 1 DT= 5.0 min Area (ha)= 1.58 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) 1.03 7.00 2.00 102.63 0.55 5.00 2.00 10.00 Surface Area (mm)= (%)= (m)= = Dep. Storage Average Slope Length

0.013

163.74

0.250

91.00

5.00 5.00 1.73 (ii) 3.84 (ii)

Mannings n

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

over (min) Storage Coeff. (min)=

		ak (cms)		5.00 0.32	0.25			
25.41	51.011	, ,					OTALS*	
PEAK	. FLOW	(cms) (hrs)	-	0.38	0.14 4.58		0.521 4.58	(111)
RINO	FE VOLUM	. (III-S) IE (mm)	= 7	4.30 0.38	40.76		57.05	
TOTA	I RATNEA	IE (mm)	- , = 7	7.38	77.38		77.38	
RUNO	FF COEFF	ICIENT		0.91	0.53		0.74	
**** WAR	NING: ST	ORAGE COE	FF. IS S	MALLER THA	AN TIME S	ΓΕΡ!		
(i) CN PRO	CEDURE SE	LECTED F	OR PERVIOU	JS LOSSES:	:		
,	ĆN*	= 77.0	Ia = D	ep. Storag	ge (Above	2)		
(ii				E SMALLER	OR EQUAL			
,		HE STORAG						
(111) PEAK F	LOW DOES	NOT INCL	UDE BASEFI	OW IF AN	<i>7</i> .		
ADD HYD								
1 +			AREA	QPEAK (cms)	TPEAK	R.V.		
			(ha)	(cms)	(hrs)	(mm)		
		0200):	5.00	2.430	4.50	00.33		
			0.68	0.271				
				2.730				
1	D = 3 (0001):	9.76	2.730	4.58	00.94		
NOTE	: PEAK	FLOWS DO	NOT INCL	UDE BASEFI	OWS IF A	NY.		
ADD HYD	(006	1)						
3 +	2 = 1		AREA	QPEAK	TPEAK	R.V.		
			(ha)	QPEAK (cms) 2.730	(hrs)	(mm)		
I	D1= 3 (0061):	9.76	2.730	4.58	60.94		
		0211):		0.337 				
				3.067				
NOTE	: PEAK	FLOWS DO	NOT INCL	UDE BASEFI	_OWS IF AN	NY.		
ADD HYD	(006	51)						
1 +			AREA	QPEAK	TPEAK	R.V.		
			(ha)	QPEAK (cms) 3.067	(hrs)	(mm)		
		0061):	10.77	3.067	4.58	60.89		
		0220):	1.58	0.521	4.58	57.05		
+ I								
+ I								

ID = 3 (0061):	12.35 3	.588 4	.58 60.4	9
NOTE: PEAK FLOWS DO	NOT INCLUDE	BASEFLOWS	IF ANY.	
ADD HYD (0061)				
3 + 2 = 1 ID1= 3 (0061):	AREA	QPEAK T	PEAK R.'	V. \
TD1= 3 (9961):	(IId) 12 35 3	(CIIIS) (11°5) (III 58 60.4	m) a
+ ID2= 2 (0060):	1.34 0	.130 4	.83 40.6	9
ID = 1 (0061):	13.69 3	.636 4	.58 58.4	7
NOTE: PEAK FLOWS DO	NOT INCLUDE	BASEFLOWS	IF ANY.	
	OVERFLOW IS	OFF		
IN= 2> OUT= 1	OUTELON 6	TODACE I	OUTELOW	STORAGE
DT= 5.0 min	OUTFLOW S (cms) (ha.m.)	OUTFLOW (cms)	(ha.m.)
**** WARNING : FIRST		NOT ZERO.	(C 3)	()
	0.0040		0.4840	0.5022
	0.0070	0.1000	0.6890	0.5665
	0.0090	0.1524	0.7300	0.6325
	0.0090 0.0100	0.2065	0.9250	0.7004
	0.0110	0.2622	1.3030	0.7700
	0.0130 0.0140	0.3197	1.8620 2.6100	0.8415
	0.1740	0.4396	0.0000	0.0000
	AREA	OPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0061) 13.690	3.63	5 4.58	58.47
OUTFLOW: ID= 1 (2111) 13.690	0.47	5.25	57.70
PFΔK	FLOW REDU	ICTION [Oou	t/Oin1(%)=	13.15
	HIFT OF PEAK	FLOW	(min)=	40.00
MAXIMU	M STORAGE	USED	(hà.m.)=	0.5010
CALIB				
STANDHYD (0203) Ar	ea (ha)-	0 22		
ID= 1 DT= 5.0 min To	tal Imp(%)=	80.00 D	ir. Conn.(%)= 80.00
	Imp(///)-	23.00	z com. (70	, 50.00
	IMPERVI	OUS PER	VIOUS (i)	
Surface Area (ha)= 0.1	8	a.04	
Dep. Storage (mm Average Slope (%)= 5.0)= 2.0	10	5.00 2.00	

		0.013		
Max.Eff.Inten.(r	nm/hr)=	163.74	60.20	
over	(min)	5.00	5.00	
Storage Coeff.	(min)=	0.96 (ii)	2.41 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00	
over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak	(cms)=	0.34	0.30	
DEVK ELUM	(cms)=	0 08	0 01	*TOTALS* 0.088 (iii)
PEAK FLOW TIME TO PEAK	(hrs)=	4.58	4.58	4.58
RUNOFF VOLUME TOTAL RAINFALL	(mm)=	72 38	35.34	64.97
TOTAL RATNEALL	(mm)=	77.38	77.38	77.38
RUNOFF COEFFICI	ENT =	0.94		
**** WARNING: STORAG	GE COEFF.	IS SMALLER THA	AN TIME STEP!	
(i) CN PROCEDI	IRE SELEC	TED FOR PERVIOL	IS LOSSES:	
		a = Dep. Storag		
(ii) TIME STEP				
		DEFFICIENT.		
(iii) PEAK FLOW			OW TE ANY.	
CALIB	Anna	(ha)= 0.16		
		(ha)= 0.16 Imp(%)= 75.00	Dir. Conn.(%	s)= 55.00
STANDHYD (0204) D= 1 DT= 5.0 min		IMPERVIOUS	PERVIOUS (i)	(j) = 55.00
STANDHYD (0204) ID= 1 DT= 5.0 min Surface Area	(ha)=	IMPERVIOUS 0.12	PERVIOUS (i) 0.04	(s) = 55.00
STANDHYD (0204) ID= 1 DT= 5.0 min Surface Area Dep. Storage	(ha)= (mm)=	IMPERVIOUS 0.12 1.00	PERVIOUS (i) 0.04 5.00	(s)= 55.00
STANDHYD (0204) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope	(ha)= (mm)=	IMPERVIOUS 0.12 1.00	PERVIOUS (i) 0.04 5.00 2.00	s)= 55.00
STANDHYD (0204) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length	(ha)= (mm)=	IMPERVIOUS 0.12 1.00	PERVIOUS (i) 0.04 5.00 2.00	ś)= 55.00
STANDHYD (0204) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope	(ha)= (mm)=	IMPERVIOUS 0.12 1.00 2.00	PERVIOUS (i) 0.04 5.00	(s) = 55.00
STANDHYD (0204) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.((ha)= (mm)= (%)= (m)= =	IMPERVIOUS 0.12 1.00 2.00 32.66 0.013 163.74	PERVIOUS (i) 0.04 5.00 2.00 10.00 0.250	ś)= 55.00
STANDHYD (0204) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.((ha)= (mm)= (%)= (m)= =	IMPERVIOUS 0.12 1.00 2.00 32.66 0.013 163.74	PERVIOUS (i) 0.04 5.00 2.00 10.00 0.250	ś)= 55.00
STANDHYD (0204) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.((ha)= (mm)= (%)= (m)= =	IMPERVIOUS 0.12 1.00 2.00 32.66 0.013 163.74	PERVIOUS (i) 0.04 5.00 2.00 10.00 0.250	ś)= 55.00
STANDHYD (0204) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.((ha)= (mm)= (%)= (m)= =	IMPERVIOUS 0.12 1.00 2.00 32.66 0.013	PERVIOUS (i) 0.04 5.00 2.00 10.00 0.250	ś)= 55.00
STANDHYD (0204) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n	(ha)= (mm)= (%)= (m)= =	IMPERVIOUS 0.12 1.00 2.00 32.66 0.013	PERVIOUS (i) 0.04 5.00 2.00 10.00 0.250	
STANDHYD (0204) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(r over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak	(ha)= (mm)= (%)= (m)= = mm/hr)= (min) (min)= (min)= (cms)=	IMPERVIOUS 0.12 1.00 2.00 32.66 0.013 163.74 5.00 0.87 (ii) 5.00 0.34	PERVIOUS (i) 0.04 5.00 2.00 10.00 0.250 151.69 5.00 2.71 (ii) 5.00 0.29	*TOTALS*
STANDHYD (0204) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(r over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak	(ha)= (mm)= (%)= (m)= = mm/hr)= (min) (min)= (min)= (cms)=	IMPERVIOUS 0.12 1.00 2.00 32.66 0.013 163.74 5.00 0.87 (ii) 5.00 0.34	PERVIOUS (i) 0.04 5.00 2.00 10.00 0.250 151.69 5.00 2.71 (ii) 5.00 0.29	*TOTALS* 0.059 (iii)
STANDHYD (0204) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(r over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK	(ha)= (mm)= (%)= (m)= = mm/hr)= (min) (min)= (cms)= (cms)=	IMPERVIOUS 0.12 1.00 2.00 32.66 0.013 163.74 5.00 0.87 (ii) 5.00 0.34 0.04 4.58	PERVIOUS (i) 0.04 5.00 2.00 10.00 0.250 151.69 5.00 2.71 (ii) 5.00 0.29 0.02 4.58	*TOTALS* 0.059 (iii) 4.58
STANDHYD (0204) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(r over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK	(ha)= (mm)= (%)= (m)= = mm/hr)= (min) (min)= (cms)= (cms)=	IMPERVIOUS 0.12 1.00 2.00 32.66 0.013 163.74 5.00 0.87 (ii) 5.00 0.34 0.04 4.58 76.38	PERVIOUS (i) 0.04 5.00 2.00 10.00 0.250 151.69 5.00 2.71 (ii) 5.00 0.29 0.02 4.58 47.67	*TOTALS* 0.059 (iii) 4.58 63.45
STANDHYD (0204) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(r over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak	(ha) = (mm) = (%) = (m) = (min) (min) = (cms) = (cms) = (mm) = (mm) =	IMPERVIOUS 0.12 1.00 2.00 32.66 0.013 163.74 5.00 0.87 (ii) 5.00 0.34 0.04 4.58 76.38 77.38	PERVIOUS (i) 0.04 5.00 2.00 10.00 0.250 151.69 5.00 2.71 (ii) 5.00 0.29 0.02 4.58	*TOTALS* 0.059 (iii) 4.58
STANDHYD (0204) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(r over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL	(ha) = (mm) = (%) = (mi) = (min) (min) = (cms) = (cms) = (mm) = (mm) = (mm) =	IMPERVIOUS 0.12 1.00 2.00 32.66 0.013 163.74 5.00 0.87 (ii) 5.00 0.34 0.04 4.58 76.38 77.38 0.99	PERVIOUS (i) 0.04 5.00 2.00 10.00 0.250 151.69 5.00 2.71 (ii) 5.00 0.29 0.02 4.58 47.67 77.38 0.62	*TOTALS* 0.059 (iii) 4.58 63.45 77.38
STANDHYD (0204) [D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(r over Storage Coeff. Unit Hyd. Peak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL RUNOFF COEFFICI	(ha) = (mm) = (%) = (mi) = (min) (min) = (cms) = (cms) = (mm) = (mm) = (mm) =	IMPERVIOUS 0.12 1.00 2.00 32.66 0.013 163.74 5.00 0.87 (ii) 5.00 0.34 0.04 4.58 76.38 77.38 0.99	PERVIOUS (i) 0.04 5.00 2.00 10.00 0.250 151.69 5.00 2.71 (ii) 5.00 0.29 0.02 4.58 47.67 77.38 0.62	*TOTALS* 0.059 (iii) 4.58 63.45 77.38

Length

(m)=

38.30

10.00

```
(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 Ia = Dep. Storage (Above)

(ii) TIME STOR (OT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
AREA QPEAK
(ha) (cms)
0.22 0.088
                                                                                     R.V.
(mm)
64.97
                                                                        TPFAK
                                                                        (hrs)
4.58
                                             0.16
                                                      0.059
                                                                        4.58
                                                                                      63.45
          ID = 3 ( 0040): 0.38 0.147
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0040)|
| 3 + 2 = 1
                                                      QPEAK
(cms)
0.147
0.478
                                             AREA
(ha)
                                                                                     (mm)
64.33
57.70
                                                                        (hrs)
4.58
5.25
         ID1= 3 ( 0040): 0.38 0.147
+ ID2= 2 ( 2111): 13.69 0.478
ID = 1 ( 0040): 14.07 0.490
                                                                        5.25
                                                                                     57.88
        NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                       PIPE Number = 1.00
Diameter (mm)= 900.00
Length (m)= 50.00
Slope (m/m)= 0.005
Manning n = 0.013
| ROUTEPIPE( 0041)
| IN= 2---> OUT= 1
| DT= 5.0 min
        (m)
0.05
0.09
0.14
0.19
                                                                   (m/s)
0.53
0.83
1.07
                                                                                       min
1.56
1.00
0.78
                          .642F+00
                                                0.0
0.0
0.1
0.1
0.2
0.3
0.4
                         .178E+01
                          .487E+01
                                                                     1.28
                                                                                           0.65
           0.24
0.28
                          .668E+01
.862E+01
                                                                     1.45
                                                                                          0.57
0.52
                          .106E+02
                                                                     1.74
                                                                                          0.48
           0.33
           0.38
                          .127F+02
                                                                     1.86
                                                                                          0.45
```

0.47	.170	F+02	0.7		2.06	0.4	1	
0.52		E+02	0.8		2.13	0.3		
0.57		E+02	0.9		2.20	0.3		
0.62	.232	E+02	1.0		2.24	0.3	7	
0.66	.251	E+02	1.1		2.28	0.3	7	
0.71	.269	E+02	1.2	:	2.29	0.3	6	
0.76	.286	E+02	1.3		2.29	0.3	6	
0.81		E+02	1.4	:	2.27	0.3	7	
0.85	.312	E+02	1.4		2.21	0.3	8	
0.90	.318	E+02	1.3		2.01	0.4		
							<-pipe / c	
			AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	
THE T			(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW : I	D= 2 (0040)	14.07	0.49	5.25	57.88	0.39	1.88
OUTFLOW: 1	D= 1 (0041)	14.0/	0.49	5.25	57.88	0.39	1.88
ID= 1 DT= 5.		U.H.	Tp(hrs)=	0.21	# 01 L	illeal Ne	s.(N)= 3.00	
Unit Hyd		0		0.21				
OHIE Hyu	Qpeak	(Cilis)-	0.112					
PEAK FLO	W	(cms)=	0.061	(i)				
TIME TO								
RUNOFF V			36.078					
TOTAL RA			77.381					
	OEFFICI	ENT =	0.466					
RUNOFF C		OES NOT	TNCLUDE E	BASEFLOW	IF ANY.			
RUNOFF C	FLOW D	OLD NO!						
	FLOW D							
(i) PEAK	 !							
(i) PEAK	 (0207)	Area	(ha)=					
(i) PEAK	 (0207)	Area			Dir. C	onn.(%)=	55.00	
(i) PEAK	 (0207)	Area	(ha)= . Imp(%)=	65.00			55.00	
(i) PEAK CALIB STANDHYD (ID= 1 DT= 5.	0207) 0 min	Area Total	(ha)= . Imp(%)= . IMPERVI	65.00 [OUS	PERVIOUS		55.00	
(i) PEAK CALIB STANDHYD (ID= 1 DT= 5.	0207) 0 min 0 mrea	Area Total (ha)=	(ha)= . Imp(%)= . IMPERVI 8.2	65.00 IOUS I 22	PERVIOUS 4.42		55.00	
(i) PEAK CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto	0207) 0 min Area rage	Area Total (ha)= (mm)=	(ha)= . Imp(%)= . IMPERVI 8.2	65.00 IOUS I 22 30	PERVIOUS 4.42 5.00		55.00	
(i) PEAK CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto Average	0207) 0 min Area rage	Area Total (ha)= (mm)= (%)=	(ha)= . Imp(%)= . IMPERVI 8.2	65.00 IOUS I 22 30 30	PERVIOUS 4.42 5.00 2.00		55.00	
(i) PEAK CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto Average Length	0207) 0 min 0 min Area rage Slope	Area Total (ha)= (mm)= (%)= (m)=	(ha)= Imp(%)= IMPERVI 8.2 1.6 2.6 290.2	65.00 10US 1 22 90 90 29	PERVIOUS 4.42 5.00 2.00 10.00		55.00	
(i) PEAK CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto Average	0207) 0 min 0 min Area rage Slope	Area Total (ha)= (mm)= (%)=	(ha)= Imp(%)= IMPERVI 8.2 1.6 2.6 290.2	65.00 10US 1 22 90 90 29	PERVIOUS 4.42 5.00 2.00		55.00	
(i) PEAK CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto Average Length Mannings	0207) 0 min Area rage Slope	Area Total (ha)= (mm)= (%)= (m)=	(ha)= Imp(%)= IMPERVI 8.2 1.6 2.6 290.2	65.00 10US 1 22 80 80 80 29 13	PERVIOUS 4.42 5.00 2.00 10.00		55.00	

Storage Coeff.	(min)=	3.23 (ii)	5.33 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	10.00	
Unit Hyd. peak	(cms)=	0.27	0.16	
				TOTALS
PEAK FLOW	(cms)=	2.76	0.94	3.345 (iii)
TIME TO PEAK	(hrs)=	4.58	4.67	4.58
RUNOFF VOLUME	(mm)=	76.38	40.76	60.35
TOTAL RAINFALL	(mm)=	77.38	77.38	77.38
RUNOFF COEFFICIE	NT =	0.99	0.53	0.78
** LIADNITHE. CTODAC	COFFE	TO CHALLED THAN	L TIME CTED!	

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW		T INCLUDE		_OW IF A	NY.			
								-
CALIB								
STANDHYD (0209)	Area	(ha)=	1.84					
ID= 1 DT= 5.0 min					Conn.(%)=	55.00)	
		IMPERVIO	US	PERVIOUS	5 (i)			
Surface Area	(ha)=	1.20		0.64				
Dep. Storage								
Average Slope								
Length		110.75						
Mannings n	=	0.013		0.250				
Max.Eff.Inten.(
		5.00						
Storage Coeff.								
Unit Hyd. Tpeak								
Unit Hyd. peak	(cms)=	0.32		0.25				
BEAK ELOU				0.46		OTALS*		
PEAK FLOW				0.16		0.603	(111)	
TIME TO PEAK						4.58		
RUNOFF VOLUME						60.35		
TOTAL RAINFALL						77.38		
RUNOFF COEFFICI	ENI =	0.99		0.53		0.78		
***** WARNING: STORA	GE COEFF	. IS SMALL	ER TH	AN TIME S	STEP!			

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 77.0 Ia = Dep. Storage (Above)

 (ii) TIME STEP (OT) SHOULD BE SMALLER OR EQUAL

 THAN THE STORAGE COEFFICIENT.

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

IB ANDHYD (0221)	Area	(ha)= 4.	96		
1 DT= 5.0 min		Imp(%)= 65.0		Conn.(%)=	55.00
		IMPERVIOUS	PERVIOUS	5 (i)	
Surface Area	(ha)=	3.22	1.74	` '	
Dep. Storage	(mm)=	7.00	5.00		
Average Slope	(%)=	2.00	2.00		
Length	(m)=	181.84	10.00		
Mannings n	` =	0.013	0.250		
Max.Eff.Inten.(r	nm/hr)=	163.74	91.00		
over	(min)	5.00	5.00		
Storage Coeff.	(min)=	2.44 (i	i) 4.54	(ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00		
Unit Hyd. peak	(cms)=	0.30	0.23		
				T	OTALS
PEAK FLOW	(cms)=	1.15	0.41		1.555 (iii)
TIME TO PEAK	(hrs)=	4.58	4.58		4.58
RUNOFF VOLUME	(mm)=	70.38	40.76		57.05
TOTAL RAINFALL	(mm)=	77.38	77.38		77.38
RUNOFF COEFFICII	ENT =	0.91	0.53		0.74

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 77.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFECTENT

THAN THE S	TORAGE	COEFFICIENT.		
(iii) PEAK FLOW	DOES NO	T INCLUDE BASEF	LOW IF ANY.	
CALIB				
STANDHYD (0208)		(ha)= 1.03		
ID= 1 DT= 5.0 min	Total	Imp(%) = 65.00	Dir. Conn.(%)=	55.00
		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.67	0.36	
Dep. Storage	(mm)=	7.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	82.87	10.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(n	m/hr)=	163.74	91.00	
over	(min)	5.00	5.00	
Storage Coeff.			3.63 (ii)	

Unit Hyd. Tpeak Unit Hyd. peak			5.00 0.25			
PEAK FLOW	(cms)=	0.25	0.09		OTALS* 0.344 (iii)
PEAK FLOW TIME TO PEAK	(hrs)=	0.25 4.58	0.09 4.58 40.76		4.58	/
RUNOFF VOLUME TOTAL RAINFALL	(mm)= 7	0.38	40.76		57.05	
TOTAL RAINFALL RUNOFF COEFFICI			77.38 0.53		77.38 0.74	
KUNUFF CUEFFICII	ENI =	0.91	0.55		0.74	
**** WARNING: STORAG	GE COEFF. IS S	MALLER THAN	TIME ST	EP!		
(i) CN PROCEDU						
	77.0 Ia = D)		
(ii) TIME STEP	STORAGE COEFFI		K EQUAL			
(iii) PEAK FLOW			W IF ANY			
ADD HYD (0038)						
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.		
TD1= 1 / 020	(ha)	(CMS)	(hrs)	(mm)		
ID1= 1 (026 + ID2= 2 (026	08): 1.03	0.344	4.58	57.05		
ID = 3 (003	38): 13.67	3.689	4.58	60.10		
NOTE: PEAK FLOW	WS DO NOT INCL	UDE BASEFLO	WS IF AN	۲.		
ADD HYD (0038)						
3 + 2 = 1	AREA	QPEAK	(bpc)	R.V.		
TD1= 3 (00:	38): 13.67	3.689	4.58	60.10		
ID1= 3 (003 + ID2= 2 (026	99): 1.84	0.603	4.58	60.35		
ID = I (00:	38): 15.51	4.292	4.58	60.13		
NOTE: PEAK FLOW	WS DO NOT INCL	UDE BASEFLO	WS IF AN	۲.		
ADD HYD (0038)						
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.		
TD1= 1 / 00	(ha)	(cms)	(hrs)	(mm)		
ID1= 1 (003 + ID2= 2 (023	21): 4.96	1.555	4.58	57.05		
	,		-			

0.250

ID = 3 (0038): 20.47 5.846 4.58 59.39 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. RESERVOIR(2099) OVERFLOW IS OFF IN= 2---> OUT= 1 DT= 5.0 min OUTFLOW STORAGE OUTFLOW STORAGE (cms) 0.0000 (ha.m.) 0.0000 (ha.m.) 0.7415 (cms) 0.0508 9.9949 0.0845 0.1103 0.8448 0.0045 0.0085 0.0110 0.1713 0.2604 0.1869 0.2773 0.9504 1.0584 0.0130 0.3519 0.3797 1.1687 0.0147 0.0163 0.4458 0.5420 0.5592 1.2814 0.0177 0.6406 1.4269 1.5138 AREA QPEAK TPEAK (hrs) 4.58 6.75 (cms) (mm) (ha) INFLOW: ID= 2 (0038) 20.470 OUTFLOW: ID= 1 (2099) 20.470 5.846 0.179 59.39
 PEAK
 FLOW
 REDUCTION
 [Qout/Qin](%)=
 3.06

 TIME SHIFT OF PEAK
 FLOW
 (min)=130.00

 MAXIMUM
 STORAGE
 USED
 (ha.m.)=
 0.939
 (min)=130.00 (ha.m.)= 0.9398 | ADD HYD (0049)| | 1 + 2 = 3 | | ID1= 1 (2099): + ID2= 2 (0210): QPEAK (cms) 0.179 ΔRFΔ TΡΕΔΚ R.V. (hrs) 6.75 (mm) 55.76 0.62 0.061 4.83 36.08 ID = 3 (0049): 21.09 0.184 6.58 55.19 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. .____ LCALTB STANDHYD (0222) Area (ha)= 1.38 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) (ha)= (mm)= (%)= (m)= 0.90 7.00 0.48 5.00 Dep. Storage Average Slope Length 2.00 2.00

Max.Eff.Inten.(mm/hr)= 163.74 91.6 over (min) 5.00 5.6 Storage Coeff. (min)= 1.66 (iii) 3.1 Unit Hyd. Tpeak (min)= 5.00 5.6	
over (min) 5.00 5.6 Storage Coeff. (min)= 1.66 (ii) 3.3	
Storage Coeff. (min)= 1.66 (ii) 3.7	
	77 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.0	99
Unit Hyd. peak (cms)= 0.32 0.3	
	TOTALS
PEAK FLOW (cms)= 0.34 0.3	12 0.457 (iii)
TIME TO PEAK (hrs)= 4.58 4.5	58 4.58
RUNOFF VOLUME (mm)= 70.38 40.3	76 57.05
TOTAL RAINFALL (mm)= 77.38 77.3	
RUNOFF COEFFICIENT = 0.91 0.5	53 0.74
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME	E STEP!
(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSS	ere.
CN* = 77.0 Ia = Dep. Storage (Al	
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQL	
THAN THE STORAGE COEFFICIENT.	VAL.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF	ΔNV.
(111) TENN TEON BOLD NOT INCLUDE BASETEON IT	
Junction Command(0051) ARFA OPFAK TPFAK	R.V.
Junction Command(0051)	R.V.) (mm) 57.05
Junction Command(0051)	R.V.) (mm) 57.05 57.05
Junction Command(0051)	R.V.) (mm) 57.05 57.05
Junction Command(0051)	R.V.) (mm) 57.05 57.05
Junction Command(0051)	
Junction Command(0051)	
Junction Command(0051)	. Conn.(%)= 55.00
Junction Command(0051)	. Conn.(%)= 55.00
Junction Command(0051) AREA QPEAK TPEAK (ha) (cms) (hrs: INFLOW: ID= 2(0222) 1.38 0.46 4.58 OUTFLOW: ID= 2(0051) 1.38 0.46 4.58 CALIB CALIB STANDHYD (0212) Area (ha)= 4.77 ID= 1 DT= 5.0 min Total Imp(%)= 65.00 Dir Surface Area (ha)= 3.10 1.6	. Conn.(%)= 55.00 DUS (i) 67
Junction Command(0051) AREA QPEAK TPEAK (ha) (cms) (hrs: INFLOW: ID= 2(0222) 1.38 0.46 4.58 OUTFLOW: ID= 2(0051) 1.38 0.46 4.58 CALIB CALIB STANDHYD (0212) Area (ha)= 4.77 ID= 1 DT= 5.0 min Total Imp(%)= 65.00 Dir Surface Area (ha)= 3.10 1.6	. Conn.(%)= 55.00 DUS (i) 67 60
Junction Command(0051) AREA QPEAK TPEAK (ha) (cms) (hrs: INFLOW: ID= 2(0222) 1.38 0.46 4.58 OUTFLOW: ID= 2(0051) 1.38 0.46 4.58 CALIB	. Conn.(%)= 55.00 OUS (i) 67 00
Junction Command(0051)	. Conn.(%)= 55.00 0US (i) 67 90 00 00
Junction Command(0051)	. Conn.(%)= 55.00 OUS (1) 67 00 00 00 00 50
Junction Command(0051)	. Conn.(%)= 55.00 OUS (1) 67 00 00 00 00 50
Junction Command(0051)	. Conn.(%)= 55.00 OUS (1) 67 00 00 00 00 50
Junction Command(0051)	. Conn.(%)= 55.00 OUS (1) 67 00 00 00 00 50

0.013

Mannings n

```
Unit Hyd. peak (cms)=
                                       0.30
                                                                      *TOTALS*
                                       1 11
                                                       0.39
                                                                        1.498 (iii)
4.58
57.05
      PEAK FLOW
      PEAK FLOW (cms)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT =
                                       4.58
70.38
                                                      4.58
40.76
                                       77.38
                                                      77.38
                                                                        77.38
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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.
_____
  | Junction Command(0052) |
                                AREA
                                          OPEAK TPEAK
                                                                R.V.
 INFLOW: ID= 2( 0212) 4.77
OUTFLOW: ID= 2( 0052) 4.77
                                          (cms)
1.50
                                                   (hrs)
4.58
4.58
                                           1.50
                                                              57.05
-----
_____
       V V I SSSSS U U AAA L
V V I SS U U AAAAA L
V V I SS U U AAAAA L
V V I SS U U AA
       Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.
                      ***** DETAILED OUTPUT *****
  Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
```

C:\Users\mornat\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\d2c3d4 09-c081-418d-9f73-412897c41257\scena C:\Users\mornat\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\d2c3d4 09-c081-418d-9f73-412897c41257\scena DATE: 08/19/2024 TIME: 12:07:49 USER: **************** CHICAGO STORM
Ptotal= 42.50 mm IDF curve parameters: A= 632.129 B= 6.000 C= 0.787 used in: INTENSITY = A / (t + B)^C Duration of storm = 12.00 hrs

Storm time step = 5.00 Time to peak ratio = 0.38 = 5.00 min RAIN RAIN TIME TIME RAIN | TIME mm/hr | hrs RAIN mm/hr 1.96 mm/hr 2.96 mm/hr 0.79 hrs 3.00 hrs 6.00 mm/hr 1.17 2.82 0.80 3.08 2.06 6.08 9.08 1.15 0.81 3.17 2.17 6.17 2.70 9.17 2.44 2.49 0.84 3.33 6.33 9.33 1.10 0.85 3.42 2.60 6.42 2.39 9.42 1.09 3.50 3.58 2.79 3.01 6.50 6.58 2.31 9.50 9.58 0.87 1.07 0.88 1.06 0.90 3.67 3.28 6.67 2.15 9.67 1.04

6.75

6.92

7.00

2.09

2.02

1.96

1.91

9.75

9.92

10.00

1.03

1.01

0.99

3.61

4.55

5.26

7.17 7.25 7.33 1.81 1.76 1.72 1.01 1.03 7.80 10.43 10 17 4.25 10.25 1.25 0.96 1.33 1.05 10.33 0.95 16.00 1.42 1.07 4.42 34.76 7.42 1.68 10.42 0.94 1.50 4.50 7.50 7.58 1.12 41.27 1.60 10.58 0.91 1.67 1.15 4.67 22.67 7.67 1.56 10.67 0.90 1.75 1.18 4.75 15.51 11.79 7.75 7.83 7.92 1.53 10.75 0.89 9.54 1.92 1.24 4.92 1.47 10.92 0.88 2.00 1.28 5.00 8.03 8.00 1.44 11.00 0.87 2.08 11.08 11.17 1.35 5.17 6.13 1.39 0.85 8.17 2.25 1.39 5.25 5.50 8.25 1.36 11.25 0.84 5.00 2.33 1 44 5.33 8.33 1.34 11.33 0.83 1.48 2.50 5.50 4.24 8.50 1.29 11.50 0.82 2.58 1.59 5.58 3.94 8.58 1.27 11.58 11.67 0.81 5.67 5.75 0.80 0.79 1.72 3.47 8.75 1.23 11.75 2.75 2.83 1.79 5.83 3.28 8.83 1.21 11.83 0.79

Unit Hyd Qpeak (cms)= 0.013 PEAK FLOW (cms)= 0.002 (i) TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 12.273
TOTAL RAINFALL (mm)= 42.504
RUNOFF COEFFICIENT = 0.289

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

.....

Unit Hyd Qpeak (cms)= 0.022

```
        PEAK FLOW
        (cms)=
        0.004 (1)

        TIME TO PEAK
        (hrs)=
        4.833

        RUNOFF VOLUME
        (mm)=
        13.964

        TOTAL RAINFALL
        (mm)=
        42.504

        RUNOFF COEFFICIENT
        =
        0.329
```

TIME

hrs 0.00

0.08

0.17

0.33

0.42

0.50 0.58

0.67

0.75

0.92

1.00

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

______ -----

3.75

3.92

4.00

0.91

0.95

0.97

Unit Hvd Opeak (cms)= 0.088

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

Unit Hyd Opeak (cms)= 0.080 PEAK FLOW (cms)= 0.023 (i)
TIME TO PEAK (hrs)= 5.167
RUNOFF VOLUME (mm)= 15.969
TOTAL RAINFALL (mm)= 42.504
RUNOFF COEFFICIENT = 0.376

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

CALTR

Unit Hyd Opeak (cms)= 0.391

PEAK FLOW (cms)= 0.059 (i) TIME TO PEAK (hrs)= 4.833
RUNOFF VOLUME (mm)= 11.529
TOTAL RAINFALL (mm)= 42.504
RUNOFF COEFFICIENT = 0.271

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

______ CALIB | STANDHYD (0205) | ID= 1 DT= 5.0 min Area (ha)= 0.56 Total Imp(%)= 50.00 Dir. Conn.(%)= 1.00 IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 0.28 1.00 0.28 5.00 (mm)= (%)= Dep. Storage Average Slope 2.00 2.00 Length Mannings n (m)= = 61.10 10.00 0.013 0.250 Max.Eff.Inten.(mm/hr)= 95.77 68.11 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)= 5.00 1.57 (ii) 5.00 10.00 Unit Hyd. peak (cms)= 0.33 0.16 *TOTALS* PEAK FLOW (cms)= 0.046 (iii) PEAK FLOW (cms)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 4.58 4.67 4.67 41.50 42.50 20.41 20.62 0.98 0.48 0.49

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 77.0 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.

CALIB | CALLD | STANDHYD (0226) | Area (ha)= 0.05 | ID= 1 DT= 5.0 min | Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS		
	(ha)=		0.02	
	(mm)=	1.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	18.26	10.00 0.250	
Mannings n	=	18.26 0.013	0.250	
Max.Eff.Inten.(mm/hr)=		31.63	
over	(min)			
Storage Coeff. Unit Hyd. Tpeak	(min)=	0.76 (ii)	3.37 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00	
Unit Hyd. peak	(cms)=	0.34	0.26	
				TOTALS
PEAK FLOW	(cms)=	0.01	0.00	0.009 (iii)
TIME TO PEAK	(hrs)=	4.58	4.58	4.58
RUNOFF VOLUME TOTAL RAINFALL	(mm)=	41.50	15.27 42.50	29.07
				42.50
RUNOFF COEFFICI	ENT =	0.98	0.36	0.68
**** WARNING: STORA	GE COEFF	. IS SMALLER TH	AN TIME STEP!	
(i) CN PROCED	URE SELE	CTED FOR PERVIO	US LOSSES:	
CN* =	77.0	Ia = Dep. Stora	ge (Above)	
(ii) TIME STEP	(DT) SH	OULD BE SMALLER	OR EQUAL	
THAN THE	STORAGE	COEFFICIENT.		
(iii) PEAK FLOW	DOES NO	T INCLUDE BASEF	LOW IF ANY.	
CALIB				
STANDHYD (0202)	Area	(ha)= 0.36		
STANDHYD (0202) ID= 1 DT= 5.0 min	Total	Tmp(%)= 65.00	Dir. Conn.	(%)= 55.00
				(,
		IMPERVIOUS		
Surface Area Dep. Storage	(ha)=	0.23	0.13	
			5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	48.99	10.00	
Mannings n	=	48.99 0.013	0.250	
Max.Eff.Inten.(mm/hr)=		31.63	
Max.Eff.Inten.(over	(min)	5.00	5.00	
Storage Coeff	(min)=	1 38 (ii)	3.98 (ii)	
Storage Coeff. Unit Hyd. Tpeak	(min)=	5 00	5 00	
Unit Hyd. peak	(cms)=	0.33	0.24	
II .iyu. pcuk	() -	2.33		*TOTALS*
PEAK FLOW	(cms)=	0.05	0.01	0.063 (iii)
TIME TO PEAK	(hrs)=		4.58	4.58
RUNOFF VOLUME	(mm)=	41.50	15.27	29.69
TOTAL RAINFALL	(mm)=	4.58 41.50 42.50	15.27 42.50	42.50
	()	50		

RUNOFF COEFFICIENT = 0.70 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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. | ADD HYD (0039) | 1 + 2 = 3 R.V. (mm) 29.69 QPEAK (cms) ΔRFΔ TΡΕΔΚ (ha) (hrs) ID1= 1 (0202): + ID2= 2 (0205): 0.063 0.36 0.56 0.046 4.67 20.62 ID = 3 (0039): 0.92 0.091 4.58 24.17 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. QPEAK AREA TPEAK R.V. (ha) (cms) (hrs) (mm) 24.17 0.091 ID = 1 (0039): 3.49 0.116 4.67 14.86 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | ADD HYD (0039)| | 1 + 2 = 3 AREA QPEAK (cms) 0.116 TPEAK R.V. (mm) (hrs) 4.67 ID1= 1 (0039): + ID2= 2 (0226): 14.86 0.05 0.009 4.58 29.07 3.54 0.121 ID = 3 (0039): 15.06 4.67 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | ADD HYD (0039)

```
y + 2 = 1
                                                     QPEAK
                                          (ha)
                                                      (cms)
                                                                   (hrs)
                                                                                  (mm)
        ID1= 3 ( 0039):
+ ID2= 2 ( 0227):
                                                    a 121
                                                                   4 67
                                                                               15 06
          ID = 1 (0039):
                                         3.67
                                                    0.124
                                                                   4.67
                                                                               15.02
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0039)|
| 1 + 2 = 3 |
                                                    QPEAK
(cms)
0.124
                                          ARFA
                                                                   TPFAK
                                                                                  R.V.
        ID1= 1 ( 0039):
+ ID2= 2 ( 0228):
                                          0.71
                                                    0.020
                                                                   4.92
                                                                               15.28
      NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0039)|
| 3 + 2 = 1
                                          AREA
(ha)
                                                     QPEAK
(cms)
                                                                              (mm)
15.07
                                                                   (hrs)
        ID1= 3 ( 0039):
+ ID2= 2 ( 0229):
                                                    0.134
                                                                   4.67
          ID = 1 (0039):
                                      5.44 0.140
                                                                 4.75
                                                                              15.24
       NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
                                Area (ha)= 0.70 Curve Number (CN)= 84.0
Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.24
| NASHYD ( 0223)
| ID= 1 DT= 5.0 min
      Unit Hyd Qpeak (cms)= 0.110

    PEAK FLOW
    (cms)=
    0.023 (1)

    TIME TO PEAK
    (hrs)=
    4.833

    RUNOFF VOLUME
    (mm)=
    15.012

    TOTAL RAINFALL
    (mm)=
    42.504

    RUNOFF COEFFICIENT
    =
    0.353

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

```
| CALIB
| NASHYD ( 0224)
|ID= 1 DT= 5.0 min
                           Area (ha)= 0.64 Curve Number (CN)= 82.3
Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.31
     Unit Hyd Qpeak (cms)=
                                     0.080
     PEAK FLOW
                         (cms)=
                                     0.016 (i)
     TIME TO PEAK (hrs)= 4.917
RUNOFF VOLUME (mm)= 13.979
TOTAL RAINFALL (mm)= 42.504
RUNOFF COEFFICIENT = 0.329
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
______
| ADD HYD ( 0060)|
| 1 + 2 = 3
                                    AREA
                                             QPEAK
                                                         TPEAK
                                                                     R.V.
(mm)
                                   (ha)
0.70
                                              (cms)
                                                         (hrs)
      ID1= 1 ( 0223):
+ ID2= 2 ( 0224):
                                          0.023
                                                         4.83
                                                                  15.01
                                   0.64
                                            0.016
                                                         4.92
                                                                   13.98
       ID = 3 ( 0060):
                                  1.34 0.038
                                                        4.92
                                                                  14.52
NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----
LCALTB
| STANDHYD ( 0200) |
| ID= 1 DT= 5.0 min |
                            Area (ha)= 9.08
Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00
                                     IMPERVIOUS
                                                      PERVIOUS (i)
      Surface Area
                                         5.90
1.00
                                                         3.18
5.00
     Dep. Storage
Average Slope
Length
                          (mm)=
(%)=
(m)=
                                                          2.00
     Mannings n
                                        0.013
                                                         0.250
      Max.Eff.Inten.(mm/hr)=
                                        95.77
      over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)=
                                         5.00
3.62 (ii)
                                                          6.23 (ii)
                                                                          *TOTALS*
      PEAK FLOW
TIME TO PEAK
RUNOFF VOLUME
                         (cms)=
(hrs)=
                                         1.10
                                                         0.22
4.67
                                                                           1.220 (iii)
4.58
                           (mm)=
                                        41.50
                                                         15.27
                                                                            29.70
```

TOTAL RAINFALL (mm)= RUNOFF COEFFICIENT = ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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. CALIB | STANDHYD (0201) | ID= 1 DT= 5.0 min Area (ha)= 0.68 Total Imp(%)= 85.00 Dir. Conn.(%)= 75.00 IMPERVIOUS PERVIOUS (i) 0.10 5.00 2.00 0.58 (mm)= (%)= (m)= Dep. Storage Average Slope Length 2.00 10.00 Mannings n 0.013 Max.Eff.Inten.(mm/hr)= 95.77 50.73 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 1.67 (ii) 3.31 (ii) 5.00 *TOTALS* 0.147 (iii) 0.13 4.58 41.50 42.50 PEAK FLOW 0.02 (cms)= TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = RUNOFF VOLUME
TOTAL RAINFALL 4.58 4.58 0.98 0.43 0.84 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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.

			IMPERVIOUS	PERVIOUS	(i)	
Surface .		(ha)=	0.66	0.35		
Dep. Sto		(mm)=	1.00	5.00		
Average	Slope	(%)=	2.00	2.00		
Length		(m)=		10.00		
Mannings	n	=	0.013	0.250		
Max.Eff.			95.77	31.63		
		(min)	5.00	5.00		
Storage			1.88 (ii)		(11)	
Unit Hyd			5.00	5.00		
Unit Hyd	. реак	(cms)=	0.32	0.23		TOTALS*
PEAK FLO	LI.	(cms)=	0.14	0.03		0.170 (iii)
TIME TO		(hrs)=	4.58	4.58		4.58
RUNOFF V		(mm)=		15.27		29.70
TOTAL RA		(mm)=		42.50		42.50
RUNOFF C				0.36		0.70
C (ii) TI TH	N* = : ME STEP AN THE S	77.0 (DT) SH STORAGE	CTED FOR PERVIO Ia = Dep. Stora DULD BE SMALLER COEFFICIENT. T INCLUDE BASEF	ge (Abov OR EQUAL	e)	
CALIB	N* = : ME STEP AN THE S AK FLOW	77.0 : (DT) SHe STORAGE DOES NO	Ia = Dep. Storaj DULD BE SMALLER COEFFICIENT. T INCLUDE BASEF	ge (Abov OR EQUAL LOW IF AN	e) Y.	
CALIB	N* = : ME STEP AN THE S AK FLOW 0220) 0 min	77.0 : (DT) SHe STORAGE DOES NO	Ia = Dep. Storaj DULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 1.58 Imp(%)= 65.00	ge (Abov OR EQUAL LOW IF AN Dir. C	e) Y. onn.(%)=	55.00
(ii) TI TH (iii) PE CALIB STANDHYD (ID= 1 DT= 5.	N* = : ME STEP AN THE S AK FLOW 0220) 0 min	77.0 (DT) SHOTOLOGY STORAGE OF THE DOES NOT	Ia = Dep. Stora; DULD BE SMALLER COEFFICIENT. T INCLUDE BASEF: (ha)= 1.58 Imp(%)= 65.00	ge (Abov OR EQUAL LOW IF AN Dir. C	e) Y. onn.(%)=	55.00
(ii) TI TH (iii) PE CALIB STANDHYD (ID= 1 DT= 5.	N* = : ME STEP AN THE S AK FLOW 0220) min Area	(DT) SHOTORAGE OF DOES NOT Area Total (ha)=	Ia = Dep. Storaj DULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 1.58 Imp(%)= 65.00 IMPERVIOUS 1.03	ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.55	e) Y. onn.(%)=	55,00
CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto	N* = : ME STEP AN THE S AK FLOW 0220) 0 min Area rage	(DT) SHE STORAGE DOES NO Area Total	Ia = Dep. Storaj DULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 1.58 Imp(%)= 65.00 IMPERVIOUS 1.03 7.00	ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.55 5.00	e) Y. onn.(%)=	55.00
C (ii) TI TH (iii) PE CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto Average	N* = : ME STEP AN THE S AK FLOW 0220) 0 min Area rage	(DT) SHI STORAGE DOES NO Area Total (ha)= (mm)= (%)=	Ia = Dep. Stona DULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 1.58 Imp(%)= 65.00 IMPERVIOUS 1.03 7.00 2.00	ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.55 5.00 2.00	e) Y. onn.(%)=	55.00
C (ii) TI TH (iii) PE CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto Average Length	N* = : ME STEP AN THE S AK FLOW 0220) 0 min Area rage Slope	(DT) SHI STORAGE (DOES NO) Area Total (ha)= (mm)= (%)= (m)=	Ia = Dep. Stora, DULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 1.58 Imp(%)= 65.00 IMPERVIOUS 1.03 7.00 2.00 102.63	ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.55 5.00 2.00 10.00	e) Y. onn.(%)=	55.00
(ii) TI (iii) PE CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto Average	N* = : ME STEP AN THE S AK FLOW 0220) 0 min Area rage Slope	(DT) SHI STORAGE DOES NO Area Total (ha)= (mm)= (%)=	Ia = Dep. Stona DULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 1.58 Imp(%)= 65.00 IMPERVIOUS 1.03 7.00 2.00	ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.55 5.00 2.00	e) Y. onn.(%)=	55.00
C (ii) TI TH (iii) PE CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto Average Length	N* = TME STEP AN THE SAK FLOW 0220) 0 min Area rage Slope	Area Total (ha)= (mm)= (%)= (m)=	Ia = Dep. Stora, DULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 1.58 Imp(%)= 65.00 IMPERVIOUS 1.03 7.00 2.00 102.63	ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.55 5.00 2.00 10.00	e) Y. onn.(%)=	55.00
C (ii) TI TH (iii) PE CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto Average Length Mannings Max.Eff.	N* = TME STEP AN THE SAK FLOW 0220) 0 min Area rage Slope n Inten.(r	77.0 (DT) SHI SHI STORAGE DOES NO TOTAL (Ma)= (mm)= (%)= (mm/hr)= (min)	Ia = Dep. Stora, DULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 1.58 Imp(%)= 65.00 IMPERVIOUS 1.03 7.00 2.00 102.63 0.013 95.77 5.00	ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.55 5.00 2.00 10.00 0.250	e) Y. conn.(%)= (i)	55.00
C (ii) TI TH (iii) PE CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto Average Length Mannings Max.Eff. Storage	N* = TME STEP ME STEP AN THE S AK FLOW 0220) 0 min Area rage Slope n Inten.(r over Coeff.	77.0 (DT) SHING STORAGE (DOES NO) Area Total (ha)= (mm)= (%)= (m)= = (min) (min)= (m	Ia = Dep. Stora, DULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 1.58 Imp(%)= 65.00 IMPERVIOUS 1.03 7.00 2.00 102.63 0.013 95.77 5.00 2.14 (ii)	ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.55 5.00 10.00 0.250 31.63 5.00 4.75	e) Y. conn.(%)= (i)	55.00
C (ii) TII TH (iii) PE CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto Average Length Mannings Max.Eff. Storage Unit Hyd	N* = TME STEP AN THE SAK FLOW 0220) 0 min Area rage Slope n Inten.(r over coeff Tpeak	77.0 (DT) SHUSTORAGE DOES NO DOES NO TOTAL (Ma)= (mm)= (mi)= (min)= (min	Ia = Dep. Stora, DULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 1.58 Imp(%)= 65.00 IMPERVIOUS 1.03 7.00 2.00 102.63 0.013 95.77 5.00 2.14 (ii) 5.00	ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 5.500 2.00 10.00 0.250 31.63 5.00 4.75 5.00	e) Y. conn.(%)= (i)	55.00
C (ii) TI TH (iii) PE CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto Average Length Mannings Max.Eff. Storage	N* = TME STEP AN THE SAK FLOW 0220) 0 min Area rage Slope n Inten.(r over coeff Tpeak	77.0 (DT) SHUSTORAGE DOES NO DOES NO TOTAL (Ma)= (mm)= (mi)= (min)= (min	Ia = Dep. Stora, DULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 1.58 Imp(%)= 65.00 IMPERVIOUS 1.03 7.00 2.00 102.63 0.013 95.77 5.00 2.14 (ii)	ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.55 5.00 10.00 0.250 31.63 5.00 4.75	e) Y. onn.(%)= (i)	
C(ii) TI TH (iii) PE CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto Average Length Mannings Max.Eff. Storage Unit Hyd	N* = TME STEP SAK FLOW 0220) 0 min 0220) 1 min 0210 0 min 0 min	77.0 (DT) SHISTORAGE (DOES NO DOES NO	Ia = Dep. Stora, DULD BE SWALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 1.58 Imp(%)= 65.00 IMPERVIOUS 1.03 7.00 2.00 102.63 0.013 95.77 5.00 2.14 (ii) 5.00 0.31	ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.55 5.00 2.00 0.250 31.63 5.00 4.75 5.00 0.25	e) Y. onn.(%)= (i)	rotals*
C (ii) TI TH (iii) PE CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto Average Length Mannings Max.Eff. Storage Unit Hyd Unit Hyd	N* = TME STEP AN THE S AK FLOW 0220) 0 min Area rage Slope n Inten.(r over. coefr. T peak W	77.0 : (DT) SHI STORAGE DOES NO Area Total (ha)= (mm)= (%)= (mi)= (min)= (min)= (cms)= (cms)=	Ia = Dep. Stora, DULD BE SMALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 1.58 Imp(%)= 65.00 IMPERVIOUS 1.03 7.00 2.00 102.63 0.013 95.77 5.00 2.14 (ii) 5.00 0.31	ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.55 5.00 10.00 0.250 31.63 5.00 4.75 5.00 0.22	e) Y. onn.(%)= (i)	TOTALS* 0.261 (iii)
C(ii) TI TH (iii) PE CALIB STANDHYD (ID= 1 DT= 5. Surface Dep. Sto Average Length Mannings Max.Eff. Storage Unit Hyd	N* = TME STEP SAK FLOW O220) O min O220) O min Inten.(r over Coeff. Tpeak W PEAK	77.0 (DT) SHISTORAGE (DOES NO DOES NO	Ia = Dep. Stora, DULD BE SWALLER COEFFICIENT. T INCLUDE BASEFI (ha)= 1.58 Imp(%)= 65.00 IMPERVIOUS 1.03 7.00 2.00 102.63 0.013 95.77 5.00 2.14 (ii) 5.00 0.31	ge (Abov OR EQUAL LOW IF AN Dir. C PERVIOUS 0.55 5.00 2.00 0.250 31.63 5.00 4.75 5.00 0.25	e) Y. onn.(%)= (i)	rotals*

RUNOFF COEFFICIENT = ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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. ADD HYD (0061) 1 + 2 = 3 QPEAK (mm) 29.70 35.72 (ha) (cms) (hrs) ID1= 1 (0200): + ID2= 2 (0201): 1.220 4.58 ID = 3 (0061): 9.76 1.367 4.58 30.12 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0061)| 3 + 2 = 1 QPEAK (cms) 1.367 R.V. (mm) 30.12 AREA TPEAK ID1= 3 (0061): + ID2= 2 (0211): 1.01 0.170 4.58 29.70 10.77 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0061) | 1 + 2 = 3 AREA (ha) 10.77 (cms) (mm) 30.08 (hrs) ID1= 1 (0061): + ID2= 2 (0220): 1.538 4.58 ID = 3 (0061): 12.35 1.799 4.58 29.61 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0061)

OUTFLOW: ID= 1 (2111) 13.690 0. PEAK FLOW REDUCTION [(4.58 28.13 IS IF ANY. OUTFLOW STORAGE (cms) (ha.m.) 0.4840 0.5022 0.6890 0.5665 0.7300 0.6325 0.9250 0.7004 1.3030 0.7700 1.8620 0.8415 2.6100 0.9149 0.0000 0.0000
RESERVOIR(2111) OVERFLOW IS OFF IN=2> OUT= 1 OUTFLOW STORAGE (cms) (ha.m.) **** WARNING : FIRST OUTFLOW IS NOT ZERG 0.0040 0.0090 0.1524 0.0100 0.2052 0.0130 0.3197 0.0140 0.3788 0.1740 0.3788 0.	OUTFLOW STORAGE (cms) (ha.m.) 0.4840 0.5022 0.6890 0.5665 0.7300 0.6325 0.9250 0.7004 1.3030 0.7700 1.8620 0.8415 2.6100 0.9149 0.0000 (TPEAK R.V. (hrs) (mm)
RESERVOIR(2111) OVERFLOW IS OFF IN= 2> OUT= 1 OUTFLOW STORAGE (cms) (ha.m.) **** WARNING : FIRST OUTFLOW IS NOT ZERG 0.0040 0.0492 0.0070 0.1000 0.0090 0.1524 0.0110 0.2652 0.0110 0.2652 0.0110 0.2652 0.0110 0.2652 0.0110 0.3705 0.0140 0.3705 0.0140 0.3705 0.0140 0.3705 0.0140 0.3705 0.0140 0.3705 0.0140 0.3705 0.0140 0.3705 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000 0.000000 0.0000000 0.00000000	OUTFLOW STORAGE (ms) (ha.m.) 0.48440
RESERVOIR(2111) OVERFLOW IS OFF IN=2> OUT= 1 DT= 5.0 min OUTFLOW STORAGE (na.m.) ***** WARNING: FIRST OUTFLOW IS NOT ZERG (na.m.) 0.0040 0.0492 0.0697 0.1690 0.2652 0.0100 0.2652 0.0100 0.3788 0.0110 0.3788 0.0140 0.3788 0.0140 0.3788 0.0740 0.4396 0.3788 0.0740 0.4396 0.0740 0.3788 0.0740 0.4396 0.0740 0.3788 0.0740 0.3788 0.0740 0.3788 0.0740 0.3788 0.0740 0.3788 0.0740 0.3788 0.0740 0.3788 0.0740 0.3788 0.0740 0.0788 0.0	(cms) (ha.m.) 0.4840 0.5022 0.6890 0.5665 0.7300 0.6325 0.9250 0.7004 1.3030 0.7700 1.8620 0.8415 2.6100 0.9149 0.0000 (TPEAK R.V. (hrs) (mm)
DT= 5.0 min OUTFLOW STORAGE (ha.m.) **** WARNING : FIRST OUTFLOW IS NOT ZERG 0.0040 0.4092 0.0070 0.1000 0.0070 0.1000 0.0070 0.1000 0.0070 0.1000 0.0070 0.1000 0.0070 0.1000 0.0070 0.1000 0.0005 0.1010 0.2622 0.0130 0.3197 0.0140 0.4396 0.1740 0.4396 AREA OPEA (ha) (cms INFLOW: ID= 2 (0061) 13.690 0.1001 0.0010 0.001	(cms) (ha.m.) 0.4840 0.5022 0.6890 0.5665 0.7300 0.6325 0.9250 0.7004 1.3030 0.7700 1.8620 0.8415 2.6100 0.9149 0.0000 (TPEAK R.V. (hrs) (mm)
(cms) (ha.m.) **** WARNING: FIRST OUTFLOW IS NOT ZERC 0.0040 0.0492 0.0070 0.1000 0.0090 0.1524 0.0100 0.2052 0.0110 0.2652 0.0110 0.3252 0.0130 0.3197 0.0140 0.3788 0.1740 0.4396 AREA OPEA (ha) (cms INFLOW: ID= 2 (0061) 13.690 1. OUTFLOW: ID= 1 (2111) 13.690 0. PEAK FLOW REDUCTION [TIME SHIFT OF PEAK FLOW MAXIMUM STORAGE USED CALIB PEAK FLOW REDUCTION [TIME SHIFT OF PEAK FLOW MAXIMUM STORAGE USED CALIB STANDHYD (0203) Area (ha)= 0.22 ID= 1 DT= 5.0 min Total Imp(%)= 80.00 Surface Area (ha)= 0.18 Dep. Storage (mm)= 5.00	(cms) (ha.m.) 0.4840 0.5022 0.6890 0.5665 0.7300 0.6325 0.9250 0.7004 1.3030 0.7700 1.8620 0.8415 2.6100 0.9149 0.0000 (TPEAK R.V. (hrs) (mm)
**** WARNING : FIRST OUTFLOW IS NOT ZERC 0.0040 0.0492 0.0070 0.1000 0.00970 0.1000 0.00970 0.1524 0.0100 0.2065 0.0110 0.2652 0.0130 0.3197 0.0140 0.3788 0.1740 0.4396 AREA QPE/(ha) (cms INFLOW : ID= 2 (0061) 13.690 1. OUTFLOW: ID= 1 (2111) 13.690 0. PEAK FLOW REDUCTION [CMS INTERSHIPT OF PEAK FLOW MAXIMUM STORAGE USED CALIB STANDHYD (0203) Area (ha)= 0.22 ID= 1 DT= 5.0 min Total Imp(%)= 80.00 IMPERVIOUS F Surface Area (ha)= 0.18 Dep. Storage (mm)= 5.00	0.4840 0.5022 0.6890 0.5665 0.7300 0.6325 0.9250 0.7004 1.3030 0.7700 1.8620 0.8415 2.6100 0.9149 0.0000 0.0000 CTPEAK R.V.
0.0040 0.0492 0.0070 0.1000 0.0090 0.1524 0.0100 0.2052 0.01100 0.2052 0.0110 0.2655 0.0110 0.2652 0.0130 0.3197 0.0140 0.3788 0.1740 0.4396 0.1740 0.4396 0.1740 0.4396 0.1740 0.4396 0.1740 0.4396 0.1740 0.4396 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000	0.4840 0.5022 0.6890 0.5665 0.7300 0.6325 0.9250 0.7004 1.3030 0.7700 1.8620 0.8415 2.6100 0.9149 0.0000 0.0000
0.0070	0.6890 0.5665 0.7300 0.6325 0.9250 0.7004 1.3030 0.7700 1.8620 0.8415 2.6100 0.9149 0.0000 0.0000
0.0090	0.7300 0.6325 0.9250 0.7004 1.3030 0.7700 1.8620 0.8415 2.6100 0.9149 0.0000 0.0000 (C TPEAK R.V. (hrs) (mm)
0.0100 0.2065 0.0110 0.2652 0.0130 0.3197 0.0140 0.3788 0.1740 0.4396 AREA QPEA (ha) (cms 13.690 1.10000000000000000000000000000000000	0.9250 0.7004 1.3030 0.7700 1.8620 0.8415 2.6100 0.9149 0.0000 0.0000 C TPEAK R.V. (hrs) (mm)
0.0110 0.2622 0.0130 0.3197 0.0140 0.3788 0.1740 0.4396 0.4740 0.4396 0.4740 0.4396 0.4740 0.4396 0.4740 0.4396 0.4740 0.4396 0.4740 0.4396 0.4740 0	1.3030 0.7700 1.8620 0.8415 2.6100 0.9149 0.0000 0.0000 (C TPEAK R.V. (hrs) (mm)
0.0130	1.8620 0.8415 2.6100 0.9149 0.0000 0.0000 (TPEAK R.V. (hrs) (mm)
0.1740 0.4396 AREA QPEA (ha) (cms (ha) (cms (ha) (cms (ha) (ha	2.6100 0.9149 0.0000 0.0000 C TPEAK R.V. (hrs) (mm)
0.1740 0.4396 AREA QPEA (ha) (cms 1.509 1.1 (1.509 1.1 1.509 1.1 (1.509 1.1 1.509 1.1 (1.509 1.1 1.509 1.1 (1.509 1.1 1.509 1.1 (1.509 1.1 1.509 1.1 (1.509 1.1 1.509 1.1 (1.509 1	0.0000 0.0000 (TPEAK R.V. (hrs) (mm)
Canal Cana	(hrs) (mm)
INFLOW: ID= 2 (0061) 13.690 1. OUTFLOW: ID= 1 (2111) 13.690 0. PEAK FLOW REDUCTION [(TIME SHIFT OF PEAK FLOW MAXIMUM STORAGE USED CALIB STANDHYD (0203) Area (ha)= 0.22 ID= 1 DT= 5.0 min Total Imp(%)= 80.00 IMPERVIOUS F Surface Area (ha)= 0.18 Dep. Storage (mm)= 5.00	
OUTFLOW: ID= 1 (2111) 13.690 0. PEAK FLOW REDUCTION [GITTME SHIFT OF PEAK FLOW MAXIMUM STORAGE USED CALIB STANDHYD (0203) Area (ha)= 0.22 ID= 1 DT= 5.0 min Total Imp(%)= 80.00 Surface Area (ha)= 0.18 Dep. Storage (mm)= 5.00	310 4.58 28.13
PEAK FLOW REDUCTION [C TIME SHIFT OF PEAK FLOW MAXIMUM STORAGE USED	13 12.08 27.51
STANDHYD (0203)	(ha.m.)= 0.3490
IMPERVIOUS F Surface Area (ha)= 0.18 Dep. Storage (mm)= 5.00	
Surface Area (ha)= 0.18 Dep. Storage (mm)= 5.00	Dir. Conn.(%)= 80.00
Dep. Storage (mm)= 5.00	ERVIOUS (i)
	0.04
Average Slope (%)= 2.00	5.00
	2.00
Length (m)= 38.30 Mannings n = 0.013	
	10.00 0.250
over (min) 5.00	0.250 19.27
Storage Coeff. (min)= 1.19 (ii)	0.250 19.27
Unit Hyd. Tpeak (min)= 5.00	0.250 19.27

(ha)

(cms)

1 799

(hrs)

4 58

(mm) 29.61

3 + 2 = 1

ID1= 3 (0061):

(cms)=	0.33	0.28	
			TOTALS
(cms)=	0.05	0.00	0.049 (iii)
(hrs)=	4.58	4.58	4.58
(mm)=	37.50	12.41	32.48
(mm)=	42.50	42.50	42.50
ENT =	0.88	0.29	0.76
	(cms)= (hrs)= (mm)= (mm)=	(cms)= 0.05 (hrs)= 4.58 (mm)= 37.50 (mm)= 42.50	(cms)= 0.05 0.00 (hrs)= 4.58 4.58 (mm)= 37.50 12.41 (mm)= 42.50 42.50

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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.

CALIB					
STANDHYD (0204)	Area	(ha)= 0			
ID= 1 DT= 5.0 min	Total	Imp(%) = 75	.00 Dir. Conn.(%)= 55.00	
		IMPERVIOUS			
Surface Area		0.12	0.04		
Dep. Storage	(mm)=	1.00	5.00		
Average Slope	(%)=	2.00	2.00		
Length	(m)=	32.66	10.00		
Mannings n	=	0.013	0.250		
Max.Eff.Inten.(ı	nm/hr)=	95.77	57.97		
over	(min)	5.00	5.00		
Storage Coeff.	(min)=	1.08 (ii) 3.36 (ii)		
Unit Hyd. Tpeak	(min)=	5.00	5.00		
Unit Hyd. peak	(cms)=	0.34	0.26		
				TOTALS	
PEAK FLOW	(cms)=	0.02	0.01	0.030 (iii)	
TIME TO PEAK	(hrs)=	4.58	4.58	4.58	
RUNOFF VOLUME	(mm)=	41.50	19.28	31.49	
		42.50		42.50	
RUNOFF COEFFICI			0.45	0.74	
***** WARNING: STORAG	SE COFFE	TS SMALLER	THAN TIME STED!		

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 Ia = Dep. Storage (Above)

(ii) TIME STEP (OT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

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

1 + 2 =				TPEAK	
		(ha)	(cms)	(hrs) 4.58	(mm)
	(0203):				
	(0204): ======	0.16			
	(0040):				32.07
NOTE: PE	AK FLOWS DO	NOT INCLUD	E BASEF	LOWS IF A	NY.
ADD HYD (
3 + 2 =	1 İ	AREA	QPEAK	TPEAK	R.V.
	(0040):	(ha)	(cms)	(hrs)	(mm)
ID1= 3	(0040):	0.38	0.079	4.58	32.07
+ ID2= 2	(2111): 	13.69	0.013	12.08	27.51
	(0040):				
ROUTEPIPE(PIPE Number	=	1.00	
		PIPE Number Diameter Length Glope	= (mm)= (m)= (m/m)=	1.00 900.00 50.00 0.005	
ROUTEPIPE(IN= 2> OU DT= 5.0 min	0041) F T= 1 C L	Manning n	=	0.013	
ROUTEPIPE(IN= 2> OU DT= 5.0 min	P	Manning n	= TABLE -	0.013	
ROUTEPIPE(IN= 2> OU DT= 5.0 min	PR VOLUME	Manning n RAVEL TIME FLOW RAT	TABLE -	0.013	TRAV.TIME
ROUTEPIPE(IN= 2> OU DT= 5.0 min PEPTH (m)	FR VOLUME (cu.m.)	Manning n RAVEL TIME FLOW RAT (cms)	= TABLE - E VE	0.013 LOCITY (m/s)	TRAV.TIME min
ROUTEPIPE(IN= 2> OU DT= 5.0 min Compared to the state of the stat	0041) F T= 1	Manning n RAVEL TIME FLOW RAT (cms) 0.0	= TABLE - E VE	0.013 LOCITY (m/s) 0.53	TRAV.TIME min 1.56
ROUTEPIPE(IN= 2> OU DT= 5.0 min	0041) F T= 1 C C C VOLUME (cu.m.) .642E+00 .178E+01	Manning n RAVEL TIME FLOW RAT (cms) 0.0 0.0 0.1	= TABLE - E VE	0.013 LOCITY (m/s)	TRAV.TIME min
ROUTEPIPE(IN= 2> OU DT= 5.0 min	0041) F T= 1	Manning n RAVEL TIME FLOW RAT (cms) 0.0 0.0 0.1	TABLE - E VE	0.013 ELOCITY (m/s) 0.53 0.83	TRAV.TIME min 1.56 1.00
ROUTEPIPE(IN= 2> OU DT= 5.0 min	0041) F T= 1 C C C VOLUME (cu.m.) .642E+00 .178E+01	Manning n RAVEL TIME FLOW RAT (cms) 0.0 0.0 0.1 0.1	TABLE - E VE	0.013 ELOCITY (m/s) 0.53 0.83 1.07	TRAV.TIME min 1.56 1.00 0.78
ROUTEPIPE(IN= 2> OU DT= 5.0 min	VOLUME (CU.M.) .642E+00 .178E+01 .437E+01 .437E+01	Manning n RAVEL TIME FLOW RAT (cms) 0.0 0.0 0.1 0.1 0.2	TABLE - E VE	0.013 ELOCITY (m/s) 0.53 0.83 1.07 1.28	TRAV.TIME min 1.56 1.00 0.78 0.65
ROUTEPIPE(IN= 2> OU DT= 5.0 min	O041) F T= 1	Manning n RAVEL TIME FLOW RAT (cms) 0.0 0.0 0.1 0.1 0.2 0.3	TABLE - E VE	0.013 ELOCITY (m/s) 0.53 0.83 1.07 1.28 1.45	TRAV.TIME min 1.56 1.00 0.78 0.65 0.57
ROUTEPIPE(IN= 2> OU DT= 5.0 min DEPTH (m) 0.05 0.09 0.14 0.19 0.24 0.28 0.33 0.38	7F 1 C C C C C C C C C	RAVEL TIME FLOW RAT (cms) 0.0 0.0 0.1 0.1 0.2 0.3 0.4	= TABLE - E VE	0.013 CLOCITY (m/s) 0.53 0.83 1.07 1.28 1.45 1.61 1.74 1.86	TRAV.TIME min 1.56 1.00 0.78 0.65 0.57 0.52 0.48 0.45
ROUTEPIPE(The property of t	0941) F T= 1 L VOLUME ((u.m.) 642E+00 1.78E+01 .642E+01 .18E2E+01 .166E+02 .127E+02 .127E+02	RAVEL TIME FLOW RAT (cms) 0.0 0.0 0.1 0.1 0.2 0.3 0.4 0.5	= TABLE - E VE	0.013 CLOCITY (m/s) 0.53 0.83 1.07 1.28 1.45 1.61 1.74	TRAV.TIME min 1.56 1.00 0.78 0.65 0.57 0.52 0.48
ROUTEPIPE(IN= 2> OU DT= 5.0 min Cm) 0.05 0.09 0.14 0.19 0.24 0.28 0.33 0.38 0.43	0041) F T= 1 C C VOLUME (cu.m.) .642E+00 .178E+01 .322E+01 .487E+01 .862E+01 .862E+01 .106E+02 .127E+02 .148E+02 .127E+02	RAVEL TIME FLOW RAT (cms) 0.0 0.1 0.1 0.2 0.3 0.4 0.5 0.6	= TABLE - E VE	0.013 CLOCITY (m/s) 0.53 0.83 1.07 1.28 1.45 1.61 1.74 1.86 1.97 2.06	TRAV.TIME min 1.56 1.00 0.78 0.65 0.57 0.52 0.48 0.45 0.45
ROUTEPIPE(The property of t	0941) F T= 1 C T= 1 C VOLUME (cu.m.) .642E+00 .178E+01 .322E+01 .487E+01 .106E+02 .127E+02 .148E+02 .179E+02 .179E+02	RAVEL TIME FLOW RAT (cms) 0.0 0.1 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8	= TABLE - E VE	0.013 ELOCITY (m/s) 0.53 0.83 1.07 1.28 1.45 1.61 1.74 1.86 1.97 2.06 2.13	TRAV. TIME min 1.56 1.00 0.78 0.65 0.57 0.52 0.48 0.45 0.42 0.41 0.39
ROUTEPIPE(IN= 2> OU DT= 5.0 min	0041) F T= 1 C C VOLUME (cu.m.) .642E+00 .178E+01 .322E+01 .487E+01 .862E+01 .862E+01 .1668E+02 .148E+02 .17E+02 .17E+02 .17E+02 .17E+02 .17E+02	Manning n RAVEL TIME FLOW RAT (cms) 0.0 0.1 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8	= TABLE - E VE	0.013 CLOCITY (m/s) 0.53 0.83 1.07 1.28 1.45 1.61 1.74 1.86 1.97 2.06 2.13 2.20	TRAV. TIME min 1.56 1.00 0.78 0.65 0.57 0.52 0.48 0.45 0.45 0.41 0.39 0.38
COUTEPIPE(IN= 2> OU DT= 5.0 min	0041) F T= 1 C C C C C C C C C C	Manning n RAVEL TIME FLOW RAT (cms) 0.0 0.0 0.1 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9	= TABLE - E VE	0.013 CLOCITY (m/s) 0.53 1.07 1.28 1.45 1.61 1.74 1.86 1.97 2.06 2.13 2.20 2.24	TRAV. TIME min 1.56 1.60 0.78 0.65 0.57 0.52 0.48 0.45 0.42 0.41 0.39 0.38 0.37
ROUTEPIPE(The property of t	0941) F T= 1 L VOLUME (cu.m.) 642E+00 1.78E+01 3.22E+01 487E+01 1.668E+01 1.96E+02 1.27E+02 1.27E+02 1.27E+02 1.27E+02 2.12E+02 2.12E+02 2.12E+02 2.22E+02	Manning n RAVEL TIME FLOW RAT (cms) 0.0 0.1 0.1 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9	= TABLE - E VE	0.013 LOCITY (m/s) 0.53 0.83 1.07 1.28 1.45 1.61 1.74 1.86 1.97 2.06 2.13 2.20 2.24 2.28	TRAV. TIME min 1.56 1.60 1.80 0.78 0.65 0.57 0.52 0.48 0.45 0.42 0.41 0.39 0.38 0.37 0.37
NOUTEPIPE(IN= 2> OU DT= 5.0 min	0041) F T= 1 C C C C C C C C C C	RAVEL TIME FLOW RAT (cms) 0.0 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.1 1.1	= TABLE - E VE	0.013 CLOCITY (m/s) 0.53 1.07 1.28 1.45 1.61 1.74 1.86 1.97 2.06 2.13 2.20 2.24	TRAV. TIME min 1.56 1.60 0.78 0.65 0.57 0.52 0.48 0.45 0.42 0.41 0.39 0.38 0.37

0.81	.30	30E+02	1.4	2	2.27	0.	37	
0.85	.3:	12E+02	1.4	- 2	2.21	0.	38	
0.90	.3:	18E+02	1.3	- 2	2.01	0.	41	
				< hyd	drograph	>	<-pipe / c	:hannel->
			AREA	QPEAK	TPEAK	R.V.	MAX DEPTH	MAX VEL
			(ha)	(cms)	(hrs)	(mm)	(m)	(m/s)
INFLOW :	ID= 2	(0040)	14.07	0.09	4.58	27.63	0.16	1.13
OUTFLOW:	ID= 1	(0041)	14.07	0.08	4.58	27.63	0.15	1.10

Unit Hyd Qpeak (cms)= 0.112

PEAK FLOW (cms)= 0.017 (1)
TIME TO PEAK (hrs)= 4.833
RUNOFF VOLUME (mm)= 12.313
TOTAL RAINFALL (mm)= 42.504
RUNOFF COEFFICIENT = 0.290

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

CALIB								
STANDHYD (0207)	Area	(ha)= :	12.64					
ID= 1 DT= 5.0 min	Total	Imp(%)= 6	55.00	Dir. 0	Conn.(%)=	55.00	3	
		IMPERVIO	JS	PERVIOUS	5 (i)			
Surface Area	()	8.22		4.42				
Dep. Storage	(mm)=			5.00				
Average Slope	(%)=			2.00				
Length	(m)=	290.29		10.00				
Mannings n	=	0.013		0.250				
Max.Eff.Inten.(31.63				
	(min)							
Storage Coeff.					(ii)			
Unit Hyd. Tpeak		5.00		10.00				
Unit Hyd. peak	(cms)=	0.24		0.14				
						OTALS		
PEAK FLOW	(cms)=	1.48		0.30			(iii)	
TIME TO PEAK	(hrs)=	4.58		4.67		4.58		
RUNOFF VOLUME	(mm)=	41.50		15.27		29.70		

```
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT =
                                       0.98
                                                         0.36
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***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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.

CALIB STANDHYD (0209)	Area	(ha)=	1.84		
D= 1 DT= 5.0 min				Conn.(%)= 55.00	Э
		IMPERVIOU	S PERVIOU	S (i)	
Surface Area	(ha)=	1.20	0.64		
Dep. Storage	(mm)=	1.00	5.00		
Average Slope	(%)=	2.00	2.00		
Length	(m)=	110.75	10.00		
Mannings n	=	0.013	0.250		
Max.Eff.Inten.(mm/hr)=	95.77	31.63		
over	(min)	5.00	5.00		
Storage Coeff.	(min)=	2.24	(ii) 4.85	(ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00		
Unit Hyd. peak	(cms)=	0.30	0.22		
				TOTALS	k
PEAK FLOW	(cms)=	0.25	0.05	0.302	(iii)
TIME TO PEAK	(hrs)=	4.58	4.58	4.58	
RUNOFF VOLUME	(mm)=			29.70	
TOTAL RAINFALL	(mm)=	42.50	42.50	42.50	
RUNOFF COEFFICI	ENT =	0.98	0.36	0.70	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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.

(ha)=	4.96		
		Conn (%)=	55 00
		(ha)= 4.96 Imp(%)= 65.00 Dir.	(ha)= 4.96 Imp(%)= 65.00 Dir. Conn.(%)=

		IMPERVIOUS	PERVIOUS (i)	
Surface Area Dep. Storage Average Slope Length Mannings n	(ha)=	3.22	1.74	
Dep. Storage	(mm)=	7.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	181.84	10.00	
Length Mannings n	` =	0.013	10.00 0.250	
-				
Max.Eff.Inten.(mm/hr)=	95.77	31.63	
over	(min)	5 00	10 00	
Storage Coeff.		3.02 (ii)	5.63 (ii) 10.00	
Unit Hyd. Tpeak	(min)=	5.00	10.00	
Unit Hyd. peak	(cms)=	0.27	0.15	
				TOTALS
PEAK FLOW	(cms)=	0.63	0.12	0.702 (iii)
TIME TO PEAK	(hrs)=	0.63 4.58 35.50	4.67	4.58
RUNOFF VOLUME TOTAL RAINFALL	(mm)=	35.50	15.27 42.50	26.40
			42.50	42.50
RUNOFF COEFFICI	ENT =	0.84	0.36	0.62
CN* = (ii) TIME STEP	77.0 (DT) SHO STORAGE	CTED FOR PERVIO Ia = Dep. Stora OULD BE SMALLER COEFFICIENT. T INCLUDE BASEF	ge (Above) OR EQUAL	
STANDHYD (0208)	Area	(ha)= 1.03		
STANDHYD (0208) ID= 1 DT= 5.0 min	Total	Imp(%)= 65.00	Dir. Conn.(%)= 55.00
		IMPERVIOUS		
Surface Area Dep. Storage	(ha)=	0.67	0.36	
Dep. Storage	(mm)=	7.00	5.00	
Average Slope Length	(%)=	2.00	2.00 10.00	
Length	(m)=	82.87	10.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/bm\-	05 77	21 62	
	(min)	55.77	51.05	
Stonago Cooff	(min)=	1 00 (ii)	4.49 (ii)	
Unit Hyd Theak	(min)-	5 00	5.00 4.49 (ii) 5.00	
Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak	(mill)-	5.00 0.32	0.23	
onit nyu. peak	(= =) -	0.32	0.23	*TOTALS*
PEAK FLOW	(cms)=	0 14	0.03	0.174 (iii)
TIME TO PEAK	(hrs)=		4.58	4.58
RUNOFF VOLUME	(mm)=	35.50	15.27	26.40
TOTAL RAINFALL	(mm)=	42.50	42.50	42.50
. O IC INATINI ALL	(i) -	50	50	

RUNOFF COEFFICIENT = 0.84 0.36 0.62 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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. (R.V. (mm) 29.70 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | ADD HYD (0038)| | 3 + 2 = 1 AREA QPEAK (ha) (cms) 13.67 1.819 1.84 0.302 TPEAK R.V. (ha) 13.67 1.84 (hrs) 4.58 4.58 (mm) 29.45 29.70 ID = 1 (0038): 15.51 2.121 4.58 29.48 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. AREA QPEAK
(ha) (cms)
15.51 2.121
4.96 0.702 TPEAK R.V. (hrs) (mm) 4.58 29.48 4.58 26.40 4.58 28.73

DT= 5.0 min			RAGE	OUTFLOW		
	· (cms) (ha.	.m.)	(cms) 0.0508	(ha.m.)	
		00 0.6	3000 I			
	0.00		2845	0.1103		
	0.00	85 0.1	1713 2604	0.1869		
	0.01			0.2773		
	0.01		3519	0.3797 0.5592		
	0.01	47 0.4 63 0.5	1438	0.8940		
	0.01	77 0.6	5406			
		AREA	OPEAK	TPEAK	R.V.	
		(ha)	(cms)	(hrs)	(mm)	
INFLOW : ID= 2 (0038)	20.470	2.822	2 4.5	8 28.73	
INFLOW : ID= 2 (OUTFLOW: ID= 1 (2099)	20.470	0.016	5 12.6	8 26.71	
	PEAK FLOW					
	IME SHIFT					
M	NAXIMUM ST	ORAGE US	SED	(ha.m.)=	0.5449	
ADD HYD (0049)						
1 + 2 = 3						
	A	REA QPI	EAK T	PEAK F	R.V.	
	. (nea QPI ha) (cr	EAK TI ms) (I	PEAK F nrs) (R.V. [mm)	
ID1= 1 (20	· (999): 20	ha) (cr .47 0.01	EAK TI ms) (i 16 12	PEAK F nrs) (.08 26.	mm) 71	
ID1= 1 (20 + ID2= 2 (02	210): 0	.62 0.03	17 4.	.83 12.	mm) 71 31	
+ ID2= 2 (02	!10): 0 	.62 0.0	17 4. 	.83 12.	mm) 71 31	
+ ID2= 2 (02	!10): 0 	.62 0.0	17 4. 	.83 12.	mm) 71 31	
+ ID2= 2 (02	210): 0 949): 21	.62 0.03 .09 0.03	17 4. ======= 29 4.	.83 12. .83 26.	mm) 71 31	
+ ID2= 2 (02 ======= ID = 3 (00 NOTE: PEAK FLC	210): 0	.62 0.01 .09 0.02 INCLUDE BA	17 4 ======= 29 4 ASEFLOWS	.83 12. .83 26. IF ANY.	mm) 71 31	
+ ID2= 2 (02 ======= ID = 3 (00 NOTE: PEAK FLC	210): 0	.62 0.01 .09 0.02 INCLUDE BA	17 4 ======= 29 4 ASEFLOWS	.83 12. .83 26. IF ANY.	mm) 71 31	
+ ID2= 2 (02 ========= ID = 3 (06 NOTE: PEAK FLC	210): 0	.62 0.01 ====== .09 0.02 INCLUDE BA	17 4. ======= 29 4. ASEFLOWS	.83 12. .83 26. IF ANY.	mm) 71 31	
+ ID2= 2 (62	210): 0 21049): 21 DWS DO NOT	.62 0.01 ======= .09 0.02 INCLUDE BA	17 4. ======= 29 4. ASEFLOWS	.83 12. .83 26. IF ANY.	mm) 71 31 === 29	
+ ID2= 2 (02 ID = 3 (00 NOTE: PEAK FLC CALIB STANDHYD (0222) ID= 1 DT= 5.0 min	210): 0 210): 21 210 DWS DO NOT 	.62 0.01 ======= .09 0.02 INCLUDE BA	17 4. ======= 29 4. ASEFLOWS	.83 12. .83 26. IF ANY.	mm) 71 31 === 29	
+ ID2= 2 (62	110): 0 149): 21 DWS DO NOT Area Total I	.62 0.05 ===================================	17 4. 29 4. ASEFLOWS 1.38 5.00 D:	.83 12. 	mm) 71 31 === 29	
+ ID2= 2 (02 	10): 0	.62 0.03	17 4. ====================================	.83 12. 	mm) 71 31 === 29	
+ ID2= 2 (02	110): 0 ======== 1449): 21 WWS DO NOT Area Total I (ha)=	.62 0.01 ======== .09 0.02 INCLUDE BA (ha)= : mp(%)= 6! IMPERVIOUS 0.90	17 4. ====================================	.83 12. .83 26. 	mm) 71 31 === 29	
+ ID2= 2 (02	110): 0 ======== 1449): 21 WWS DO NOT Area Total I (ha)=	.62 0.03 ========= .09 0.03 INCLUDE BA	1.38 5.00 D:	.83 12. 	mm) 71 31 === 29	
+ ID2= 2 (02 	110): 0 ======== 1449): 21 WWS DO NOT Area Total I (ha)=	.62 0.03 ========= .09 0.03 INCLUDE BA	1.38 5.00 D:	.83 12. .83 26. IF ANY. 	mm) 71 31 === 29	
IDZ= 2 (02 	110): 0 110):	.62 0.01 ======== .09 0.02 INCLUDE BA (ha)= : mp(%)= 6! IMPERVIOUS 0.90	17 4	.83 12. 	mm) 71 31 === 29	
ID2= 2 (02 	110): 0 ====================================	(ha)= : mp(%)= 6! IMPERVIOUS 0.90 7.00 2.00 0.013	1.38 5.00 D: 5 PERI 1.38	12. 83 12. 83 26. IF ANY. ir. Conn.(/IOUS (1) 3.48 5.60 2.00 2.00	mm) 71 31 === 29	
IDZ= 2 (02 ID = 3 (08 NOTE: PEAK FLC CALIB STANDHYD (0222) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n	10): 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0:	(ha)= (mp(%)= 6!) IMPERVIOUS 0.90 7.00 2.00 95.92 0.013	1.7 4. 29 4. ASEFLOWS 1.38 5.00 D: S PERN 6	83 26. IF ANY. ir. Conn.(/IOUS (i) 3.48 2.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00	mm) 71 31 === 29	
IDZ= 2 (02 ID = 3 (08 NOTE: PEAK FLC CALIB STANDHYD (0222) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n	10): 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0:	(ha)= (mp(%)= 6!) IMPERVIOUS 0.90 7.00 2.00 95.92 0.013	1.7 4. 29 4. ASEFLOWS 1.38 5.00 D: S PERN 6	83 26. IF ANY. ir. Conn.(/IOUS (i) 3.48 2.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00	mm) 71 31 === 29	
HIDZ= 2 (02	10): 0 1 10 1 10 1 10 1 10 1 10 1 10 1 1	(ha)= : mp(%)= 69	1.38 1.38 5.00 D: 5 PER: (0	83 26. IF ANY. ir. Conn.(//IOUS (i) 2.48 5.00 2.00 2.50 1.63 5.00 4.67 (ii) 5.00	mm) 71 31 === 29	
IDZ= 2 (02 ID = 3 (08 NOTE: PEAK FLC CALIB STANDHYD (0222) ID= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n	10): 0 1 10 1 10 1 10 1 10 1 10 1 10 1 1	(ha)= : mp(%)= 69	1.38 1.38 5.00 D: 5 PER: (0	83 26. IF ANY. ir. Conn.(/IOUS (i) 3.48 2.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00	mm) 71 31 === 29	

	DEAK FLOW	, ,					*TOTALS*		
	PEAK FLOW TIME TO PEAK	(cms)=	0.19		0.04 4.58		0.230 4.58	(111)	
	TIME TO PEAK	(nrs)=	4.58		15.27		26.40		
	RUNOFF VOLUME TOTAL RAINFALL	(mm)=	33.30 42.50		42.50		42.50		
	RUNOFF COEFFICI	FNT =	0.84		0.36		0.62		
	NONOTT COLITICE		0.04		0.50		0.02		
****	* WARNING: STORA	GE COEFF	. IS SMALLE	ER TH	AN TIME S	STEP!			
	(i) CN PROCED								
	CN* = (ii) TIME STEP		Ia = Dep. 9						
			COEFFICIEN		OK EQUAL	-			
	(iii) PEAK FLOW				_OW IF AN	WY.			
	(,								
1 -	Junction Command								
		Α	REA QPE	EAK	TPEAK	R.V.			
			hal (ar	nc \	(hrs)	(mm)			
		(iia) (ci	115)	· · · · · · /	()			
INF	FLOW : ID= 2(0	222)	1.38 0.	.23	4.58	26.40			
	FLOW : ID= 2(0	222) 051)	1.38 0. 1.38 0.	.23	4.58 4.58	26.40 26.40			
CAL STA	LIB	Area	(ha)=	4.77			= 55.00		
CAL STA	LIB	Area Total	(ha)= . Imp(%)= 6	4.77 55.00	Dir. (Conn.(%)	= 55.00		
CAL STA ID=	LIB ANDHYD (0212) 1 DT= 5.0 min	Area Total	(ha)= . Imp(%)= 6	4.77 55.00	Dir. (Conn.(%)	= 55.00		
CAL STA ID=	LIB ANDHYD (0212) 1 DT= 5.0 min	Area Total	(ha)= . Imp(%)= 6	4.77 55.00	Dir. (PERVIOUS 1.67	Conn.(%)	= 55.00		
CAL STA ID=	LIB ANDHYD (0212) 1 DT= 5.0 min	Area Total	(ha)= . Imp(%)= 6	4.77 55.00	Dir. (PERVIOUS 1.67 5.00	Conn.(%)	= 55.00		
CAL STA ID=	LIB ANDHYD (0212) 1 DT= 5.0 min	Area Total	(ha)= . Imp(%)= 6	4.77 55.00	Dir. (PERVIOUS 1.67 5.00 2.00	Conn.(%)	= 55.00		
CAL ST/ ID=	JIB (0212) 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length	Area Total (ha)= (mm)= (%)= (m)=	(ha)= . Imp(%)= (IMPERVIOL 3.10 7.00 2.00 178.33	4.77 55.00 JS	Dir. (PERVIOUS 1.67 5.00 2.00 10.00	Conn.(%)	= 55.00		
CAL ST/ ID=	LIB ANDHYD (0212) 1 DT= 5.0 min	Area Total (ha)= (mm)= (%)= (m)=	(ha)= . Imp(%)= (IMPERVIOU 3.10 7.00 2.00 178.33	4.77 55.00 JS	Dir. (PERVIOUS 1.67 5.00 2.00 10.00	Conn.(%)	= 55.00		
CAL ST/ ID=	JIB (0212) 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length	Area Total (ha)= (mm)= (%)= (m)=	(ha)= . Imp(%)= (IMPERVIOU 3.10 7.00 2.00 178.33 0.013	4.77 55.00 JS	Dir. (PERVIOUS 1.67 5.00 2.00 10.00 0.250 31.63	Conn.(%)	= 55.00		
CAL STA ID=	LIB ANDHYD (0212) 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(Area Total (ha)= (mm)= (%)= (m)= =	(ha)= . Imp(%)= @ . IMPERVIOL 3.10 7.00 2.00 178.33 0.013	4.77 55.00 JS	Dir. (0 PERVIOUS 1.67 5.00 2.00 10.00 0.250 31.63	Conn.(%)	= 55.00		
CAL STA ID=	LIB ANDHYD (0212) 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(over Storage Coeff.	Area Total (ha)= (mm)= (%)= (m)= (mi)=	(ha)= Imp(%)= (IMPERVIOL 3.10 7.00 2.00 178.33 0.013 95.77 5.00 2.99	4.77 55.00 JS	Dir. (0 PERVIOUS 1.67 5.00 2.00 10.00 0.250 31.63	Conn.(%)	= 55.00		
CAL STA ID=	LIB ANDHYD (0212) 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(over Storage Coeff.	Area Total (ha)= (mm)= (%)= (m)= (mi)=	(ha)= Imp(%)= (IMPERVIOL 3.10 7.00 2.00 178.33 0.013 95.77 5.00 2.99	4.77 55.00 JS	Dir. (0 PERVIOUS 1.67 5.00 2.00 10.00 0.250 31.63	Conn.(%)	= 55.00		
CAL STA ID=	LIB ANDHYD (0212) 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(Area Total (ha)= (mm)= (%)= (m)= (mi)=	(ha)= Imp(%)= (IMPERVIOL 3.10 7.00 2.00 178.33 0.013 95.77 5.00 2.99	4.77 55.00 JS	Dir. (0 PERVIOUS 1.67 5.00 2.00 10.00 0.250 31.63	Conn.(%) S (i) (ii)			
CAL STA ID=	LIB ANDHYD (0212) 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak	Area Total (ha)= (mm)= (%)= (m)= = mm/hr)= (min) (min)= (cms)=	(ha)= Imp(%)= (IMPERVIOL 3.10 7.00 2.00 178.33 0.013 95.77 5.00 2.99 5.00 0.28	4.77 55.00 JS (ii)	Dir. (0 PERVIOUS 1.67 5.00 2.00 10.00 0.250 31.63 10.00 0.15	Conn.(%) 5 (i) (ii)	*TOTALS*		
CAL STA ID=	ANDHYD (0212) 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW	Area Total (ha)= (mm)= (%)= (m)= = mm/hr)= (min)= (cms)= (cms)=	(ha)= Imp(%)= 6 IMPERVIOL 7.00 2.00 178.33 0.013 95.77 5.00 2.99 5.00 0.28	4.77 55.00 JS	Dir. (0 PERVIOUS 1.67 5.00 2.00 10.00 0.250 31.63 10.00 0.15 0.12	Conn.(%)	*TOTALS* 0.677		
CAL STA ID=	LIB ANDHYD (0212) 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK	Area Total (ha)= (mm)= (%)= (mi)= (min)= (min)= (cms)= (cms)=	(ha)= Imp(%)= (IMPERVIOL 3.110 7.00 2.00 178.33 0.013 95.77 5.00 2.99 5.00 0.28	4.77 55.00 JS	Dir. (PERVIOUS 1.67 5.00 2.00 10.00 0.250 31.63 10.00 5.60 10.00 0.15	Conn.(%) 5 (i) (ii)	*TOTALS* 0.677 4.58		
CAL STA ID=	LIB ANDHYD (0212) 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK RUMOFF VOLUME	Area Total (ha)= (mm)= (%)= (mi)= (min)= (min)= (min)= (cms)= (cms)= (hrs)= (mm)=	(ha)= Imp(%)= (IMPERVIOL 7.00 2.00 178.33 0.013 95.77 5.00 2.99 5.00 0.28 0.61 4.58	4.77 55.00 JS	Dir. (PERVIOUS 1.67 5.00 2.00 10.00 0.250 31.63 10.00 5.60 10.00 0.15	Conn.(%) 5 (i) (ii)	*TOTALS* 0.677 4.58 26.40		
CAL STA ID=	LIB ANDHYD (0212) 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak PEAK FLOW TIME TO PEAK	Area Total (ha)= (mm)= (%)= = mm/hr)= (min)= (cms)= (cms)= (hrs)= (mm)= (mm)=	(ha)= Imp(%)= (IMPERVIOU 3.1.10 7.00 2.00 178.33 0.013 95.77 5.00 0.28 0.28 0.61 4.58 35.50	4.77 555.00 JS	Dir. (0 PERVIOUS 1.67 5.00 2.00 10.00 0.250 31.63 10.00 0.15 0.12	Conn.(%) 5 (i) (ii)	*TOTALS* 0.677 4.58		

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 77.0$ 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. | Junction Command(0052) | (ha) (cms) (hrs) 4.58 (mm) INFLOW: ID= 2(0212) 4.77 OUTFLOW: ID= 2(0052) 4.77 0.68 26.40 _____ V V I SSSSS U U AAA L
V V I SS U U AAAAA L
V V I SS U U AAAAA L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSS UUUUU A A L (v 6.2.2015) 000 TTTTT TTTTT H H Y Y M M 000 0 0 T T H H Y Y M MM 0 0 0 0 T T H H Y M M 0 0 000 T T H H Y M M 000 0 0 Developed and Distributed by Smart City Water Inc Copyright 2007 - 2022 Smart City Water Inc All rights reserved. ***** DETAILED OUTPUT ***** Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat Output filename: C:\Users\mornat\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\fa18c0dc-9848-4ac2-a0d1-24af616d6222\scena

C:\Users\mornat\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\fa18c0

Summary filename:

dc-9848-4ac2-a0d1-24af616d6222\scena

DATE: 08/19/2024 TIME: 12:07:51 CHICAGO STORM Ptotal= 86.68 mm IDF curve parameters: A=2353.333 B= 13.500 C= 0.877 used in: INTENSITY = A / $(t + B)^C$ Duration of storm = 12.00 hrs Storm time step = 5.00 Time to peak ratio = 0.38 RAIN ' TIME RAIN TIME TIME RAIN TIME mm/hr hrs RAIN mm/hr 3.18 mm/hr 0.08 1.04 3.08 3.39 6.08 5.10 9.08 1.62 9.17 3.17 3.63 6.17 4.81 9.17 1.60 0.25 0.33 3.25 4.56 4.33 4.21 9.33 1.10 6.33 0.42 1.12 3.42 4.58 6.42 4.12 9.42 1.51 0.50 0.58 3.50 5.03 6.50 3.93 1.49 0.67 1.19 3.67 6.21 6.67 3.59 9.67 1.44 0.75 1.22 3.75 3.83 7.04 3.45 1.42 0.92 1.28 3.92 9.51 3.19 1.00 1.31 4.00 11.46 7.00 3.07 10.00 1.35 1.08 1.34 1.37 4.08 4.17 14.31 18.78 2.96 2.87 10.08 10.17 1.31 1.25 1.41 4.25 26.57 7.25 2.77 10.25 1.29 7.33 7.42 7.50 1.33 1.45 4.33 42.60 2.68 10.33 1.28 1.49 4.42 2.53 1.50 182.13 10.50 1.24 1.58 1.57 4.58 101.91 7.58 2.45 10.58 1.22

```
4.83
                    1.83
                              1.72
                                                 30.58
                                                            7.83
                                                                      2.26
                                                                               10.83
                                                                                          1.18
                    1 92
                              1.78
                                                 23 92
                                                            7 92
                                                                      2 20
                                                                               10 92
                              1.84
                                                                               11.00
11.08
                    2.08
                                        5.08
                                                 16.28
                                                             8.08
                                                                       2.09
                                                                                          1.13
                    2.17
                              1.98
                                        5.17
                                                 13.94
                                                             8.17
                                                                      2.04
                                                                               11.17
                                                                                          1.12
                              2.06
                                                 12.14
10.73
                    2.42
                              2.23
                                        5.42
                                                  9.60
                                                            8.42
                                                                       1.91
                                                                               11.42
                                                                                          1.08
                                                  8.67
7.90
7.25
                    2.50
                              2.33
                                        5.50
5.58
                                                            8.50
                                                                       1.87
                                                                               11.50
                              2.44
                    2.67
                                        5.67
                                                            8.67
                                                                      1.79
                                                                               11.67
                                                                                          1.04
                              2.69 | 5.75
2.84 | 5.83
3.00 | 5.92
                    2.75
                                                  6.69
                                                            8.75
                                                                      1.76
                                                                               11.75
                                                                                          1.03
                                                                      1.72 | 11.83
1.69 | 11.92
 -----
 CALIB
Unit Hyd Qpeak (cms)=
     PEAK FLOW (cms)= 0.011
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 43.233
TOTAL RAINFALL (mm)= 86.678
                                    0.011 (i)
      RUNOFF COFFETCIENT
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
| CALIB
| NASHYD ( 0227)
|ID= 1 DT= 5.0 min
                         Area (ha)= 0.13 Curve Number (CN)= 82.3

Ia (mm)= 7.00 # of Linear Res.(N)= 3.00

U.H. Tp(hrs)= 0.22
     Unit Hyd Qpeak (cms)= 0.022
     PEAK FLOW (cms)= 0.017 (i)
     TIME TO PEAK (hrs)= 4.833

RUNOFF VOLUME (mm)= 47.207

TOTAL RAINFALL (mm)= 86.678

RUNOFF COEFFICIENT = 0.545
      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

STANDHYD (0205) Area (ha)= 0.56 Total Imp(%)= 50.00 Dir. Conn.(%)= 1.00 ID= 1 DT= 5.0 min PERVIOUS (i) **IMPERVIOUS** Surface Area (ha)= 0.28 1.00 0.28 5.00 Dep. Storage Average Slope (m)= Length Mannings n 0.013 0.250 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 5.00 1.21 (ii) 3.52 (ii) 0.33 0.26 *TOTALS* PEAK FLOW (cms)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)= 0.00 4.58 0.17 4.58 0.168 (iii) 4.58 (mm)= (mm)= NT = 57.82 85.68 58.10 TOTAL RATNEALL RUNOFF COEFFICIENT 0.99

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

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%

YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- (1) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 77.0 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.

CALIB STANDHYD (0226) ID= 1 DT= 5.0 min	Area (ha)= Total Imp(%)=	Dir. Conn.(%)=	55.00

IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 0.03 0.02 Dep. Storage Average Slope 5.00 1.00 Length (m)= 18.26 Mannings n 0.013 0.250

THAN THE STORAGE COEFFICIENT. NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0039)| 1 + 2 = 3 QPEAK (ha) (cms) (hrs) (mm) ID1= 1 (0202): + ID2= 2 (0205): 0.36 0.140 4.58 68.87 0.56 ID = 3 (0039): 0.92 0.308 4.58 62.31

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0039) AREA OPEAK TPEAK R.V. (cms) 0.308 ID1= 3 (0039): + ID2= 2 (0206): 2.57 0.270 4.83 41.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0039)| | 1 + 2 = 3 | (ha) (cms) (hrs) (mm) 46.87 ID1= 1 (0039): + ID2= 2 (0226): 3.49 0.410 4.58 ID = 3 (0039): 3.54 0.430 4.58 47.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0039)| 3 + 2 = 1 AREA OPEAK TPEAK R.V. ID1= 3 (0039): + ID2= 2 (0227): 0.13 0.017 4.83 47.21 ID = 1 (0039): 47.19 0.437

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

over (min) Storage Coeff. (min)= Unit Hyd. Tpeak (min)=

Unit Hyd. peak (cms)=

(cms)=

(hrs)= (mm)= (mm)=

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

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

Area

(ha)=

(m)=

(hrs)=

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

PEAK FLOW

TIME TO PEAK RUNOFF VOLUME TOTAL RAINFALL

STANDHYD (0202)

Surface Area

Dep. Storage Average Slope

Mannings n

TIME TO PEAK

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

over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=

Unit Hyd. peak (cms)=

RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT =

Length

ID= 1 DT= 5.0 min

RUNOFF COEFFICIENT

182.13

5.00

0.34

0.01

86.68

0.99

(ha)= 0.36

IMPERVIOUS

0.23

1.00

48.99

0.013

182.13

5.00

0.34

4.58

85.68

1.06 (ii) 5.00

Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00

PERVIOUS (i)

0.13 5.00 2.00

10.00

0.250

109.63

5.00

0.27

4.58

48.34

3.08 (ii)

5.00 0.59 (ii)

5.00 2.61 (ii)

0.01

86.68

0.56

TOTALS

4.58

86.68

TOTALS 0.140 (iii) 4.58

68.87

0.79

0.020 (iii)

ADD HYD (0039)| 1 + 2 = 3 AREA QPEAK TPEAK R.V. (cms) 0.437 ID1= 1 (0039): + ID2= 2 (0228): 0.71 0.083 4.92 50.12

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0039)| | 3 + 2 = 1 (ha) (cms) (hrs) (mm) 47.66

ID1= 3 (0039): + ID2= 2 (0229): 4.38 0.482 4.75 0.093 5.17 51.57 ID = 1 (0039): 5.44 0.536 4.83 48.42

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB | NASHYD (0223) | ID= 1 DT= 5.0 min Area (ha)= 0.70 Curve Number (CN)= 84.0 Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.24

Unit Hyd Qpeak (cms)= 0.110

PEAK FLOW (cms)= 0.094
TIME TO PEAK (hrs)= 4.833
RUNOFF VOLUME (mm)= 49.530
TOTAL RATNFALL (mm)= 86.678
RUNOFF COEFFICIENT = 0.571 0.094 (i)

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

CALIB | NASHYD (0224) | ID= 1 DT= 5.0 min Area (ha)= 0.64 Curve Number (CN)= 82.3 Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.31

Unit Hyd Opeak (cms)= 0.080

PEAK FLOW (cms)= 0.070 (i)
TIME TO PEAK (hrs)= 4.917
RUNOFF VOLUME (mm)= 47.252
TOTAL RAINFALL (mm)= 86.678
RUNOFF COEFFICIENT = 0.545

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

ADD HYD (0060)| 1 + 2 = 3 AREA OPEAK TPEAK R.V. (cms) 0.094 ID1= 1 (0223): + ID2= 2 (0224): 0.64 0.070 4.92 47.25 ID = 3 (0060): 1.34 0.161

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0200) (ha)= 9.08 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) (ha)= (mm)= (%)= 3.18 5.00 2.00 Surface Area Dep. Storage 5.90 1.00 Average Slope 2.00 Length Mannings n (m)= = 246.94 10.00 0.013 182.13 Max.Eff.Inten.(mm/hr)= 109.63 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 2.80 (ii) 5.00 4.82 (ii) 5.00 5.00 0.28 0.22 2.29 0.87 3.159 (iii) PEAK FLOW (cms)= TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 4.58 4.58 48.34 4.58 85.68 86.68 68.87 86.68 0.99 0.56 0.79

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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.

CALIB STANDHYD (0201) ID= 1 DT= 5.0 min Area (ha)= 0.68 Total Imp(%)= 85.00 Dir. Conn.(%)= 75.00 TMPERVTOUS PERVIOUS (i) 0.58 1.00 Surface Area 0.10 5.00 (mm)= (%)= (m)= Dep. Storage Average Slope 2.00 2.00 Length Mannings n 67.33 10.00 0.013 0.250 Max.Eff.Inten.(mm/hr)= 182.13 161.26 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 1.29 (ii) 5.00 2.56 (ii) 5.00 5.00 0.33 PEAK FLOW 0.26 0.05 0.306 (iii) (cms)= TIME TO PEAK (hr RUNOFF VOLUME (m TOTAL RAINFALL (m RUNOFF COEFFICIENT (hrs)= (mm)= (mm)= 4.58 85.68 4.58 86.68 86.68 0.99 0.63 0.90

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 77.0 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.

CALIB STANDHYD (0211) ID= 1 DT= 5.0 min (ha)= Area 1.01 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) Surface Area 0.66 0.35 (mm)= (%)= (m)= Dep. Storage Average Slope 1.00 5.00 Length 10.00 Mannings n 0.013 0.250

Max.Eff.Inten.(mm/hr)=	182.13	109.63	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.45 (ii)	3.47 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.33	0.26	
			TOTALS
PEAK FLOW (cms)=	0.28	0.11	0.385 (iii)
TIME TO PEAK (hrs)=	4.58	4.58	4.58
RUNOFF VOLUME (mm)=	85.68	48.34	68.87
TOTAL RAINFALL (mm)=	86.68	86.68	86.68
RUNOFF COEFFICIENT =	0.99	0.56	0.79

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 77.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EOUAL

	THAN THE S				OK EQUA	L		
(iii) PEAK FLOW				OW IF A	NY.		
`		5025 110	11100000	5715211	2011 21 7			
CALI	B							
	IDHYD (0220)		(ha)=					
ID= 1	DT= 5.0 min	Total	Imp(%)=	65.00	Dir.	Conn.(%)	= 55.00)
			IMPERVIO		PERVIOU			
	Surface Area				0.55			
	Dep. Storage				5.00			
	Average Slope		2.00		2.00			
	ength.		102.6					
M	Mannings n	=	0.01	3	0.250	1		
P	Max.Eff.Inten.(m				109.63			
		(min)						
	torage Coeff.							
	Jnit Hyd. Tpeak							
ι	Jnit Hyd. peak	(cms)=	0.32	2	0.25		******	
-		, ,					*TOTALS*	
	PEAK FLOW		0.4		0.17		0.595	(111)
	IME TO PEAK				4.58		4.58	
	RUNOFF VOLUME						65.57	
	OTAL RAINFALL				86.68		86.68	
۲	RUNOFF COEFFICIE	:N1 =	0.92	<u>.</u>	0.56		0.76	

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 77.0$ 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.

ADD HYD (0 1 + 2 = 3 ID1= 1 + ID2= 2	 (0200):	AREA (ha) 9.08 0.68	QPEAK (cms) 3.159 0.306	TPEAK (hrs) 4.58 4.58	R.V. (mm) 68.87 77.80
ID = 3	(0061): K FLOWS DO N	9.76	3.465	4.58	69.50

ADD HYD (0061) 3 + 2 = 1 AREA OPEAK TPEAK R.V. ID1= 3 (0061): + ID2= 2 (0211): 1.01 0.385 4.58 68.87 10.77

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

AREA QPEAK	TPEAK R.V.
(ha) (cms)	(hrs) (mm)
3.850	4.58 69.44
1.58 0.595	4.58 65.57
2.35 4.445	4.58 68.94
	(ha) (cms) 0.77 3.850 1.58 0.595

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0061)				
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0061):	12.35	4.445	4.58	68.94
+ ID2= 2 (0060):	1.34	0.161	4.83	48.44
ID = 1 (0061):	13.69	4.506	4.58	66.94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(2111) OVERFLOW IS OFF | IN= 2---> OUT= 1 | | DT= 5.0 min | STORAGE OUTFLOW (ha.m.) (cms) OUTFLOW (cms) **** WARNING : FIRST OUTFLOW IS NOT ZERO. 0.0070 0.1000 0.6890 0.5665 9.9999 0.1524 9.7399 0.6325 0.7004 0.7700 0.0100 0.2065 0.9250 0.0110 1.3030 0.2622 0.0130 0.3197 1.8620 0.8415 0.0140 0.1740 0 3788 2.6100 9 9149 AREA OPEAK TPEAK (hrs) 4.58 5.17 (ha) 13.690 (cms) 4.506 INFLOW : ID= 2 (0061) 0.650 13.690 OUTFLOW: ID= 1 (2111) 66.17

PEAK FLOW REDUCTION [Qout/Qin](%)= 14.41
TIME SHIFT OF PEAK FLOW (min)= 35.00 (min)= 35.00 (ha.m.)= 0.5542 MAXIMUM STORAGE USED

CALTR | STANDHYD (0203) | ID= 1 DT= 5.0 min Area (ha)= 0.22 Total Imp(%)= 80.00 Dir. Conn.(%)= 80.00 IMPERVIOUS PERVIOUS (i) 0.18 0.04

(mm)= (%)= (m)= Dep. Storage Average Slope 5.00 5.00 2.00 2.00 Length Mannings n 0.013 0.250 Max.Eff.Inten.(mm/hr)= over (min) Storage Coeff. (min)= Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)= 5.00 5.00 2.31 (ii) 0.92 (ii) 5.00 0.34

0.30 *TOTALS* PEAK FLOW (cms)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)= 0.099 (iii) 4.58 0.09 0.01 81.68 42.34 73.81 86.68 86.68 86.68

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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.

Area (ha)= 0.16 Total Imp(%)= 75.00 Dir. Conn.(%)= 55.00 STANDHYD (0204)

IMPERVIOUS PERVIOUS (i) Surface Area 0.12 0.04 (mm)= (%)= (m)= Dep. Storage Average Slope 1.00 5.00 Length Mannings n 0.013 0.250 Max.Eff.Inten.(mm/hr)= over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 5.00 0.83 (ii) 2.60 (ii) 5.00 0.29 *TOTALS* PEAK FLOW (cms)= (hrs)= 9.92 0.067 (iii) 4.58 TIME TO PEAK RUNOFF VOLUME (mm)= (mm)= NT = 85.68 55.84 72.25

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

ΤΟΤΔΙ ΒΔΤΝΕΔΙΙ

RUNOFF COEFFICIENT

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.

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

86.68

| ADD HYD (0040)| | 1 + 2 = 3 AREA (ha) 0.22 (cms) (hrs) 4.58 (mm) 73.81 ID1= 1 (0203): + ID2= 2 (0204): 0.099

ID = 3 (0040): 0.38 0.165 4.58 73.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0040)| | 3 + 2 = 1 | AREA QPEAK **TPEAK** R.V. (ha) 0.38 (cms) 0.165 (hrs) 4.58 ID1= 3 (0040): + ID2= 2 (2111): 13.69 0.650 5.17 66.17 ID = 1 (0040): 14.07 0.666 5.17 66.36

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ROUTEPIPE(0041, IN= 2---> OUT= 1 PIPE Number Diameter (mm)= 900.00 Length (m)= 50.00 Slope (m/m)= 0.005 Manning n = 0.013 DT= 5.0 min

INFLOW: ID= 2 (0040) 14.07

- TRAVEL TIME TABLE ------ME FLOW RATE VELOCITY VOLUME DEPTH TRAV.TIME (m) 0.05 0.09 (cu.m.) .642E+00 .178E+01 (cms) 0.0 (m/s) 0.53 0.83 0.14 .322E+01 0.1 1.07 0.78 0.19 0.24 .487F+01 1.28 0.28 .862E+01 0.3 1.61 0.52 0.33 .106F+02 9.4 1.74 0.48 0.38 0.43 .127E+02 0.6 1.97 0.47 .170E+02 0.7 2.06 0.41 0.52 .191E+02 2.13 0.62 .232E+02 1.0 2.24 0.37 0.66 .251E+02 1.1 2.28 0.37 .269E+02 1.2 2.29 0.76 0.36 0.81 .300E+02 1.4 2,27 0.37 .312E+02 1.4 2.21 rograph ----> <-pipe / channel-> TPEAK R.V. MAX DEPTH MAX VEL hydrograph ARFA **QPEAK**

0.67

5.17 66.36

OUTFLOW: ID= 1 (0041) 14.07 0.67 5.17 66.35

| CALIB | NASHYD (0210) | Area (ha)= 0.62 | ID= 1 DT= 5.0 min | Ia (mm)= 7.00 | U.H. Tp(hrs)= 0.21 Area (ha)= 0.62 Curve Number (CN)= 79.2 Ia (mm)= 7.00 # of Linear Res.(N)= 3.00

Unit Hyd Opeak (cms)= 0.112

PEAK FLOW (cms)= 0.076
TIME TO PEAK (hrs)= 4.833
RUNOFF VOLUME (mm)= 43.302
TOTAL RAINFALL (mm)= 86.678
RUNOFF COEFFICIENT = 0.500 0.076 (i)

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

CALTR | STANDHYD (0207) | ID= 1 DT= 5.0 min Area (ha)= 12.64 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00

IMPERVIOUS PERVIOUS (i) Surface Area 8.22 4.42 Dep. Storage Average Slope (mm)= (%)= (m)= 1.00 5.00 2.00 2.00 Length Mannings n 0.013 0.250

Max.Eff.Inten.(mm/hr)= 182.13 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 10.00 3.09 (ii) 5.11 (ii) 5.00

PEAK FLOW TIME TO PEAK RUNOFF VOLUME (cms)= 3.12 1.16 3.844 (iii) (hrs)= (mm)= (mm)= 4.58 85.68 4.67 48.34 4.58 68.87 TOTAL RAINFALL 86.68 86.68 86.68 RUNOFF COEFFICIENT

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 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.

| CALIB PERVIOUS (i) IMPERVIOUS (ha)= (mm)= (%)= (m)= Surface Area Dep. Storage Average Slope 9.64 5.00 2.00 1.20 2.00 Length Mannings n 10.00 110.75 0.013 Max.Eff.Inten.(mm/hr)= over (min) Storage Coeff. (min)= Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)= 182.13 109.63 5.00 5.00 1.74 (ii) 3.75 (ii) 5.00 5.00 *TOTALS* 0.690 (iii) 4.58 68.87 PEAK FLOW (cms)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 0.19 4.58 48.34 86.68 0.50 4.58 85.68 86.68 0.99 0.56 0.79

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 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.

CALIB STANDHYD (0221)	Area	(ha)= 4.96		
ID= 1 DT= 5.0 min	Total	Imp(%) = 65.00	Dir. Conn.(%)=	55.00
		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	3.22	1.74	
Dep. Storage	(mm)=	7.00	5.00	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	181.84	10.00	
Mannings n	=	0.013	0.250	

Max.Eff.Inten.(mm/hr)= over (min) Storage Coeff. (min)= Unit Hyd. Tpeak (min)= Unit Hyd. peak (cms)= 182.13 5.00 2.34 (ii) 109.63 5.00 4.35 (ii) 5.00 0.30 1.786 (iii) 4.58 65.57 0.49 (cms)= 1.29 PEAK FLOW PEAK FLOW (cms)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 4.58 79.68 86.68 4.58 48.34 86.68 86.68 0.92 0.56 0.76 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 Ia = Dep. Storage (Above)

(ii) TIME STOR (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

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

ALIB TANDHYD (0208)					Conn (%)-		a
/- I DI- 3.6 IIIII	IUCAI	Imp(%)-	05.00	DII.	COIII. (%)-	. 55.00	,
		IMPERVIO	ous	PERVIOL	JS (i)		
Surface Area	(ha)=	0.6	7	0.36	; ` ´		
Dep. Storage							
Average Slope							
		82.8					
Mannings n		0.01					
Max.Eff.Inten.(mn	ı/hr)=	182.1	3	109.63	:		
over (min)	5.00	3	5.00)		
Storage Coeff. (min)=	1.46	5 (ii)	3.48	(ii)		
Unit Hyd. Tpeak (
Unit Hyd. peak (cms)=	0.3	3	0.26			
					*	TOTALS'	*
PEAK FLOW (cms)=	0.28	3	0.11		0.393	(iii)
TIME TO PEAK (hrs)=	4.58	3	4.58	:	4.58	
RUNOFF VOLUME						65.57	
TOTAL RAINFALL						86.68	
RUNOFF COEFFICIEN				0.56		0.76	

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 77.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

(III) FLAK FLOW DO	ES NOT INCL	UDE BASEFL	OW IF AN	Y. 	
ADD HYD (0038)					
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.	
TD4 4 (0007)	(ha)	(cms)	(hrs)	(mm))
1 + 2 = 3 ID1= 1 (0207) + ID2= 2 (0208)	: 12.64	0.393	4.58	65.57	
ID = 3 (0038)			======		=
NOTE: PEAK FLOWS	DO NOT INCL	UDE BASEFL	OWS IF AM	NY.	
ADD HYD (0038)					
3 + 2 = 1	AREA	QPEAK	TPEAK	R.V.	
3 + 2 = 1 ID1= 3 (0038) + ID2= 2 (0209)	(ha)	(cms)	(hrs)	(mm))
ID1= 3 (0038)	: 13.67	4.237	4.58	68.62	
TD0 0 (0000)					
+ ID2= 2 (0209)	. 1.04	0.690	4.58	00.07	_
ID = 1 (0038)	: 15.51	4.927	4.58	68.65	=
ID = 1 (0038) NOTE: PEAK FLOWS	: 15.51	4.927	4.58	68.65	
ID = 1 (0038) NOTE: PEAK FLOWS	: 15.51 DO NOT INCL	4.927 UDE BASEFL	4.58 OWS IF AM	68.65 NY.	
ID = 1 (0038) NOTE: PEAK FLOWS	: 15.51 DO NOT INCL	4.927 UDE BASEFL	4.58 OWS IF AM	68.65 NY.	
ID = 1 (0038) NOTE: PEAK FLOWS	: 15.51 DO NOT INCL	4.927 UDE BASEFL	4.58 OWS IF AM	68.65 NY.	
ID = 1 (0038) NOTE: PEAK FLOWS ADD HYD (0038) 1 + 2 = 3 101 = 1 (0038) 101 = 2 (0221)	AREA (ha): 15.51: 4.96	4.927 UDE BASEFL QPEAK (cms) 4.927 1.786	4.58 OWS IF AN TPEAK (hrs) 4.58 4.58	68.65 NY. R.V. (mm) 68.65 65.57	-
ID = 1 (0038) NOTE: PEAK FLOWS	: 15.51 DO NOT INCL AREA (ha) : 15.51 : 4.96	4.927 UDE BASEFL QPEAK (cms) 4.927 1.786	4.58 OWS IF AP TPEAK (hrs) 4.58 4.58	68.65 NY. R.V. (mm) 68.65 65.57	-
ID = 1 (0038) NOTE: PEAK FLOWS ADD HYD (0038) 1 + 2 = 3 ID1= 1 (0038) + ID2= 2 (0221)	AREA (ha): 15.51: 4.96: 20.47	QPEAK (cms) 4.927 1.786	4.58 OWS IF AM TPEAK (hrs) 4.58 4.58	68.65 NY. R.V. (mm) 68.65 65.57	-
ID = 1 (0038) NOTE: PEAK FLOWS ADD HYD (0038) 1 + 2 = 3 ID1= 1 (0038) + ID2= 2 (0221) ID = 3 (0038) NOTE: PEAK FLOWS	AREA (ha): 15.51: 4.96: 20.47	4.927 UDE BASEFL	4.58 OWS IF AM TPEAK (hrs) 4.58 4.58	68.65 NY. R.V. (mm) 68.65 65.57	-
ID = 1 (0038) NOTE: PEAK FLOWS ADD HYD (0038) 1 + 2 = 3 ID1= 1 (0038) + ID2= 2 (0221) ID = 3 (0038) NOTE: PEAK FLOWS RESERVOIR(2099) IN= 2> OUT= 1	AREA (ha): 15.51 AREA (ha): 15.51 : 20.47 DO NOT INCL	4.927 UDE BASEFL QPEAK (cms) 4.927 1.786 6.713 UDE BASEFL	4.58 OWS IF AP TPEAK (hrs) 4.58 4.58 4.58 OWS IF AP	68.65 NY. R.V. (mm) 68.65 65.57 67.91	
ID = 1 (0038) NOTE: PEAK FLOWS ADD HYD (0038) 1 + 2 = 3 ID1= 1 (0038) + ID2= 2 (0221) ID = 3 (0038) NOTE: PEAK FLOWS RESERVOIR(2099) IN= 2> OUT= 1	AREA (ha): 15.51 AREA (ha): 15.51 : 20.47 DO NOT INCL	4.927 UDE BASEFL QPEAK (cms) 4.927 1.786 6.713 UDE BASEFL	4.58 OWS IF AP TPEAK (hrs) 4.58 4.58 4.58 OWS IF AP	68.65 NY. R.V. (mm) 68.65 65.57 67.91	
ID = 1 (0038) NOTE: PEAK FLOWS ADD HYD (0038) 1 + 2 = 3 ID1= 1 (0038) + ID2= 2 (0221) ID = 3 (0038) NOTE: PEAK FLOWS RESERVOIR(2099) IN= 2> OUT= 1	AREA (ha): 15.51 DO NOT INCL AREA (ha): 15.51 1.4.96 1.4.96 1.4.96 OVERFLOW OUTFLOW (cms)	4.927 QPEAK (cms) 4.927 1.786 6.713 UDE BASEFL STORAGE (ha.m.)	4.58 TPEAK (hrs) 4.58 4.58 4.58 0WS IF AN	R.V. (mm) 68.65 65.57 67.91	STORAGE (ha.m.)
ID = 1 (0038) NOTE: PEAK FLOWS ADD HYD (0038) 1 + 2 = 3 ID1= 1 (0038) + ID2= 2 (0221) ID = 3 (0038) NOTE: PEAK FLOWS RESERVOIR(2099) IN= 2> OUT= 1	AREA (ha): 15.51 DO NOT INCL AREA (ha): 15.51 1.4.96 1.4.96 1.4.96 OVERFLOW OUTFLOW (cms)	4.927 QPEAK (cms) 4.927 1.786 6.713 UDE BASEFL STORAGE (ha.m.)	4.58 TPEAK (hrs) 4.58 4.58 4.58 0WS IF AN	R.V. (mm) 68.65 65.57 67.91	STORAGE (ha.m.)
ID = 1 (0038) NOTE: PEAK FLOWS ADD HYD (0038) 1 + 2 = 3 ID1= 1 (0038) + ID2= 2 (0221) ID = 3 (0038) NOTE: PEAK FLOWS RESERVOIR(2099)	AREA (ha): 15.51 DO NOT INCL AREA (ha): 15.51 1.4.96 1.4.96 1.4.96 OVERFLOW OUTFLOW (cms)	4.927 QPEAK (cms) 4.927 1.786 6.713 UDE BASEFL STORAGE (ha.m.)	4.58 TPEAK (hrs) 4.58 4.58 OWS IF AP	R.V. (mm) 68.65 65.57 67.91 NY.	

	0.0147 0.0163 0.0177	0.4458 6 0.5420 6 0.6406 1	0.5592 0.8940 1.4269	1.2814 1.3964 1.5138
	AREA	QPEAK	TPEAK	R.V.
INFLOW: ID= 2 (00: OUTFLOW: ID= 1 (20:	(ha) 38) 20.470	(cms) 6.713	(hrs) 4.58	(mm) 67.91
OUTFLOW: ID= 1 (209	99) 20.470	0.270	6.17	64.24
TIME	SHIFT OF PEAK	CTION [Qout/Qi FLOW USED (H	(min) = 95.	99
ADD HYD (0049) 1 + 2 = 3	: 0.62 0	.076 4.83	43.30	
ID = 3 (0049)				
NOTE: PEAK FLOWS I		BASEFLOWS IF		
CALIB STANDHYD (0222) ID= 1 DT= 5.0 min	Area (ha)= Fotal Imp(%)=	1.38 65.00 Dir.	Conn.(%)=	55.00
	IMPERVI	OUS PERVIOL	JS (i)	
Surface Area (I	na)= 0.9	0 0.48		
Dep. Storage (nm)= 7.0	0 5.06 0 2.06		
Length	(m)= 95.9	2 10.00		
Dep. Storage (i Average Slope Length Mannings n	= 0.01	3 0.256)	
Max.Eff.Inten.(mm/	nr)= 182.1	3 109.63	3	
over (m		0 5.00		
Storage Coeff. (m:	in)= 1.5	9 (ii) 3.61 0 5.06	(ii)	
Unit Hyd. Tpeak (m: Unit Hyd. peak (cr				
OHIL Hyd. peak (Cr	115)= 6.3	3 0.23		OTALS*
PEAK FLOW (cr	ns)= 0.3	8 0.15		0.522 (iii)
TIME TO PEAK (hi	ac)_ 4 E	0 / 50		4.58
RUNOFF VOLUME (I	nm)= 79.6	8 48.34	ı	65.57
TOTAL RAINFALL (1 RUNOFF COEFFICIENT		8 48.34 8 86.68 2 0.56	3	86.68
KUNUFF CUEFFICIENT	= 0.9	2 0.56)	0.76

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 77.0 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.

| Junction Command(0051) |

ΔRFΔ OPEAK TPEAK R.V. INFLOW: ID= 2(0222) 1.38 OUTFLOW: ID= 2(0051) 1.38 (cms) 0.52 (hrs) (mm) 65.57 0.52 4.58 65.57

| CALIB | STANDHYD (0212) | Area (ha)= 4.77 | | ID= 1 DT= 5.0 min | Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00

		IMPERVIOUS	PERVIOUS	(i)	
Surface Area	(ha)=	3.10	1.67		
Dep. Storage	(mm)=	7.00	5.00		
Average Slope	(%)=	2.00	2.00		
Length	(m)=	178.33	10.00		
Mannings n	=	0.013	0.250		
Max.Eff.Inten.(n	nm/hr)=	182.13	109.63		
over	(min)	5.00	5.00		
Storage Coeff.	(min)=	2.31 (ii)	4.33	(ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00		
Unit Hyd. peak	(cms)=	0.30	0.23		
					TOTALS
PEAK FLOW	(cms)=	1.24	0.48		1.721 (iii)
TIME TO PEAK	(hrs)=	4.58	4.58		4.58
RUNOFF VOLUME	(mm)=	79.68	48.34		65.57
TOTAL RAINFALL	(mm)=	86.68	86.68		86.68
RUNOFF COEFFICIE	NT =	0.92	0.56		0.76

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 77.0 Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COFFFICIENT.

				d(0052)					
INF OUT	LOW : FLOW:	ID= ID=	2(2(0212) 0052)	AREA (ha) 4.77 4.77	(cms)	TPEA (hr 4.5	K R.V. s) (mm) 8 65.57 8 65.57	
						======		=======	
	V	v v v v	I	SS SS	U	U A U A A U AAAAA U A A U A A	L	(1	v 6.2.2015)
	ight.	0 0 0 and 1 2007	T T T Distr	T T T ibuted 22 Smar	H H H by Sma	H Y Y H YY H Y H Y rt City W	MM MM M M M M later In	0 0 0 0 000	М
	-			****	DET.	AILED	0 U	T P U T ** [,]	***

Summary filename:
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b9-4f1a-4ff1-ae5d-deaa08836af6\scena

DATE: 08/19/2024 TIME: 12:07:50 IISER · COMMENTS:

CHICAGO STORM
Ptotal= 55.97 mm -----

IDF curve parameters: A= 983.699 B= 8.100 C= 0.812

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

Duration of storm = 12.00 hrs Storm time step = 5.00 minTime to peak ratio = 0.38

TIME	RAIN	TIME	RAIN	' TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	' hrs	mm/hr	hrs	mm/hr
0.00	0.93	3.00	2.44	6.00	3.79	9.00	1.41
0.08	0.95	3.08	2.57	6.08	3.61	9.08	1.39
0.17	0.96	3.17	2.72	6.17	3.44	9.17	1.37
0.25	0.98	3.25	2.89	6.25	3.29	9.25	1.35
0.33	0.99	3.33	3.08	6.33	3.15	9.33	1.33
0.42	1.01	3.42	3.30	6.42	3.02	9.42	1.31
0.50	1.03	3.50	3.56	6.50	2.91	9.50	1.29
0.58	1.05	3.58	3.87	6.58	2.80	9.58	1.27
0.67	1.07	3.67	4.24	6.67	2.70	9.67	1.25
0.75	1.09	3.75	4.70	6.75	2.61	9.75	1.24
0.83	1.11	3.83	5.28	6.83	2.52	9.83	1.22
0.92	1.13	3.92	6.03	6.92	2.45	9.92	1.20
1.00	1.15	4.00	7.05	7.00	2.37	10.00	1.19
1.08	1.18	4.08	8.52	7.08	2.30	10.08	1.17
1.17	1.20	4.17	10.78	7.17	2.24	10.17	1.16
1.25	1.23	4.25	14.69	7.25	2.18	10.25	1.14
1.33	1.26	4.33	22.94	7.33	2.12	10.33	1.13
1.42	1.29	4.42	49.28	7.42	2.07	10.42	1.12
1.50	1.32	4.50	121.80	7.50	2.02	10.50	1.10
1.58	1.35	4.58	58.14	7.58	1.97	10.58	1.09
1.67	1.39	4.67	32.66	7.67	1.92	10.67	1.08
1.75	1.42	4.75	22.23	7.75	1.88	10.75	1.06
1.83	1.46	4.83	16.72	7.83	1.84	10.83	1.05

```
1.50
1.55
2.00
                     5.00
                               11.12
                                          8.00
                                                     1.76
                                                               11.00
                                                                           1.03
                                9.52
8.33
7.41
2.08
2.17
                                                              11.08
11.17
          1.59
                     5.08
                                          8.08
                                                     1 72
                                                                           1.02
          1.64
1.70
                     5.17
5.25
2.25
                                           8.25
                                                     1.66
                                                               11.25
                                                                           1.00
                    5.33
5.42
5.50
5.58
2.33
          1.75
                                6.68
                                           8.33
                                                     1.62
                                                               11.33
                                                                           0.99
2.42
2.50
2.58
          1.82
                                6.08
                                                     1.59
1.56
                                                              11.42
11.50
                                5.17
4.82
4.51
4.24
          1.96
                                          8.58
                                                     1.54
                                                               11.58
                                                                           0.96
          2.04
2.12
2.22
                    5.67
5.75
5.83
                                                                           0.95
0.94
0.93
2.67
                                          8.67
8.75
                                                     1.51
                                                              11.67
11.75
                                                               11.83
2.83
                                          8.83
                                                     1.46
          2.33
2.92
                    5.92
                                4.00
                                          8.92
                                                     1.44 11.92
                                                                           0.92
```

Unit Hyd Qpeak (cms)= 0.013

b9-4f1a-4ff1-ae5d-deaa08836af6\scena

PEAK FLOW TIME TO PEAK TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 20.645
TOTAL RAINFALL (mm)= 55.968
RUNOFF COEFFICIENT = 0.369

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

| CALIB | NASHYD (0227) | Area (ha)= 0.13 Curve Number (CN)= 82.3 | ID= 1 DT= 5.0 min | Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.022

PEAK FLOW (cms)= 0.007
TIME TO PEAK (hrs)= 4.833
RUNOFF VOLUME (mm)= 23.115
TOTAL RAINFALL (mm)= 55.968
RUNOFF COEFFICIENT = 0.413 0.007 (i)

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

```
| CALIB
| NASHYD ( 0228)
|ID= 1 DT= 5.0 min
                        Area (ha)= 0.71 Curve Number (CN)= 84.4
Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.31
     Unit Hyd Qpeak (cms)= 0.088
     PEAK FLOW (cms)= 0.036 (1)
TIME TO PEAK (hrs)= 4.917
RUNOFF VOLUME (mm)= 24.990
TOTAL RAINFALL (mm)= 55.968
RUNOFF COEFFICIENT = 0.447
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
.....
-----
Unit Hyd Qpeak (cms)= 0.080
     PEAK FLOW (cms)= 0.041 (i)
TIME TO PEAK (hrs)= 5.167
RUNOFF VOLUME (mm)= 25.951
TOTAL RAINFALL (mm)= 55.968
RUNOFF COEFFICIENT = 0.464
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
-----
Unit Hyd Qpeak (cms)= 0.391
     PEAK FLOW (cms)= 0.111 (1)
TIME TO PEAK (hrs)= 4.833
RUNOFF VOLUME (mm)= 19.526
TOTAL RAINFALL (mm)= 55.968
RUNOFF COEFFICIENT = 0.349
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

CALIB						
STANDHYD (0205)	Area	(ha)=	0.56		c (0/)	4.00
D= 1 DT= 5.0 min	Total	1mp(%)=	50.00	Dir.	Conn.(%)=	: 1.00
		IMPERVI	OUS	PERVIOL	IS (i)	
Surface Area	(ha)=			0.28		
Dep. Storage	(mm)=	1.0		5.00	,	
Dep. Storage Average Slope	(%)=	2.0	0	2.00)	
Length	(m)=	61.1	0	10.00		
Mannings n	=	0.01	3	0.250)	
Max.Eff.Inten.(mm/hr)=	121.8	0	105.99)	
Max.Eff.Inten.(over	(min)	5.0	0	5.00)	
Storage Coeff	(min)=	1 4	3 (ii)	4.43 5.00	(ii)	
Unit Hyd. Tpeak	(min)=					
Unit Hyd. peak	(cms)=	0.3	3	0.23		
	, ,		_			TOTALS*
	(cms)=	0.0		0.08		0.082 (iii)
TIME TO PEAK RUNOFF VOLUME	(hrs)=	4.5 54.9	8	4.58 31.13		4.58
TOTAL DATMEAL!	(mm)=	54.9	7			31.36 55.97
*** WARNING:FOR AR	GE COEFF EAS WITH	. IS SMAL	LER TH	AN TIME IOS BELC	STEP! W 20%	0.56
*** WARNING: STORA *** WARNING: FOR AR YOU SH (i) CN PROCED CN* =	GE COEFF EAS WITH OULD CONS URE SELEC	. IS SMAL IMPERVIO SIDER SPL CTED FOR Ia = Dep.	LER TH US RAT: ITTING PERVIO	AN TIME IOS BELO THE ARE US LOSSE ge (Abo	STEP! W 20% A. SS: ove)	
*** WARNING: STORA' *** WARNING: FOR AR YOU SH (i) CN PROCED CN* = (ii) TIME STEP	GE COEFF EAS WITH OULD CONS URE SELECTOR (DT) SHO	. IS SMAL IMPERVIO SIDER SPL CTED FOR Ia = Dep. DULD BE S	LER THA US RAT: ITTING PERVIO Stora MALLER	AN TIME IOS BELO THE ARE US LOSSE ge (Abo	STEP! W 20% A. SS: ove)	
*** WARNING: STORA *** WARNING:FOR AR YOU SH (i) CN PROCED CN* = (ii) TIME STEP THAN THE	GE COEFF EAS WITH OULD CONS URE SELEE 77.0 : (DT) SHO	. IS SMAL IMPERVIO SIDER SPL CTED FOR Ia = Dep. DULD BE S COEFFICIE	LER THA US RAT: ITTING PERVION Stora; MALLER NT.	AN TIME IOS BELC THE ARE US LOSSE ge (Abo OR EQUA	STEP! DW 20% EA. ES: DVE)	
*** WARNING: STORA *** WARNING: FOR AR YOU SH (i) CN PROCED CN* = (ii) TIME STEP	GE COEFF EAS WITH OULD CONS URE SELEE 77.0 : (DT) SHO	. IS SMAL IMPERVIO SIDER SPL CTED FOR Ia = Dep. DULD BE S COEFFICIE	LER THA US RAT: ITTING PERVION Stora; MALLER NT.	AN TIME IOS BELC THE ARE US LOSSE ge (Abo OR EQUA	STEP! DW 20% EA. ES: DVE)	
*** WARNING: STORA *** WARNING:FOR AR YOU SH (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW	GE COEFF EAS WITH OULD CONS URE SELEE 77.0 : (DT) SHO	. IS SMAL IMPERVIO SIDER SPL CTED FOR Ia = Dep. DULD BE S COEFFICIE	LER THA US RAT: ITTING PERVION Stora; MALLER NT.	AN TIME IOS BELC THE ARE US LOSSE ge (Abo OR EQUA	STEP! DW 20% EA. ES: DVE)	
*** WARNING: STORA *** WARNING:FOR AR YOU SH (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW	GE COEFF EAS WITH OULD CONS URE SELEG 77.0 : (DT) SHO STORAGE (DOES NO	IS SMAL IMPERVIO SIDER SPL CTED FOR Ia = Dep. DULD BE S COEFFICIE F INCLUDE	LER THA	AN TIME IOS BELC THE ARE US LOSSE GE (Abc OR EQUA	STEP! DW 20% EA. ES: DVE)	
*** WARNING: STORA *** WARNING:FOR AR YOU SH (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW	GE COEFF EAS WITH OULD CONS URE SELEC 77.0 : (DT) SHC DOES NO	. IS SMAL IMPERVIO SIDER SPL CTED FOR Ta = Dep. COLORER COLORER TINCLUDE (ha)=	LER THA	AN TIME IOS BELC THE ARE US LOSSE GE (Abc OR EQUA	STEP! DW 20% AA. SS: EVE) NV.	0.56
*** WARNING: STORA *** WARNING:FOR AR YOU SH (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALIB STANDHYD (0226) D= 1 DT= 5.0 min	GE COEFF EAS WITH OULD CONS URE SELEC 77.0 : (DT) SHC DOES NO	. IS SMAL IMPERVIO SIDER SPL CTED FOR Ta = Dep. COLORER COLORER TINCLUDE (ha)=	LER THA	AN TIME IOS BELC THE ARE US LOSSE GE (Abc OR EQUA	STEP! DW 20% AA. SS: EVE) NV.	0.56
*** WARNING: STORA *** WARNING:FOR AR YOU SH (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW	GE COEFF EAS WITH OULD CONS URE SELEC 77.0 : (DT) SHC DOES NO	. IS SMAL IMPERVIO SIDER SPL CTED FOR Ta = Dep. COLORER COLORER TINCLUDE (ha)=	LER TH. US RAT: ITTING PERVIOR Stora, MALLER NT. BASEFI 0.05 65.00	AN TIME IOS BELC THE ARE US LOSSE ge (Abc OR EQUA LOW IF A	STEP! W 20% A. S: S: vve) NL MNY. Conn.(%)=	0.56
*** WARNING: STORA *** WARNING:FOR AR YOU SH (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALIB STANDHYD (0226) D= 1 DT= S.0 min	GE COEFF EAS WITH OULD CONS URE SELEC 77.0 : (DT) SHC STORAGE (DOES NO' Area Total	IS SMAL IMPERVIGIOES SIDER SPL CTED FOR Ta = Dep. DULD BE S COEFFICIE T INCLUDE (ha)= Imp(%)=	LER TH. US RAT: ITTING PERVIOR Stora, MALLER NT. BASEF 0.05 65.00 OUS	AN TIME IOS BELC THE ARE US LOSSE ge (Abc OR EQUA LOW IF A	STEP! W 20% A. SS: NY Conn.(%)=	0.56
*** WARNING: STORA *** WARNING:FOR AR YOU SH (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALIB CALIB CALIB SUMPRISHED STANDHYD (0226) D= 1 DT= 5.0 min Surface Area Dep. Storage	GE COEFF EAS WITH OULD CON: URE SELE: 77.0 : (DT) SH STORAGE (DOES NO' Area Total (ha)= (mm)=	IS SMAL IMPERVIO SIDER SPL TED FOR Ia = Dep. JULD BE S COEFFICIE T INCLUDE (ha)= Imp(%)= IMPERVI 0.0	LER THA	AN TIME IOS BELC THE ARE US LOSSE GE (Abc OR EQUA LOW IF A Dir. PERVIOL	STEP! W 20% A. (S: (S: (Ve) LL L L L L L L L L L L L L L L L L L	0.56
*** WARNING: STORA *** WARNING:FOR AR YOU SH (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALIB CALIB CALIB SUMPRISHED STANDHYD (0226) D= 1 DT= 5.0 min Surface Area Dep. Storage	GE COEFF EAS WITH OULD CON: URE SELE: 77.0 : (DT) SH STORAGE (DOES NO' Area Total (ha)= (mm)=	IS SMAL IMPERVIO SIDER SPL TED FOR Ia = Dep. JULD BE S COEFFICIE T INCLUDE (ha)= Imp(%)= IMPERVI 0.0	LER THA	AN TIME IOS BELC THE ARE US LOSSE ge (Abc OR EQUA LOW IF A Dir. PERVIOL 0.02 5.00	STEP! W 20% A. (S: (S: (S) (S) (S) (S: (S) (S) (S) (S) (S) (S) (S) (S) (S) (S)	0.56
*** WARNING: STORA *** WARNING:FOR AR YOU SH (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALIB STANDHYD (0226) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length	GE COEFF EAS WITH OULD CON: URE SELE(77.0 : (DT) SHOSTORAGE(DOES NO: Area Total (ha)= (mm)= (%)= (m)=	IS SMAL IMPERVIO SIDER SPL TED FOR Ia = Dep. JULD BE S COEFFICITE T INCLUDE (ha)= Imp(%)= IMPERVI 0.0 1.0 2.0 18.2	LER TH. US RATI ITTING PERVIOL Stora, MALLER NT. BASEFI 0.05 65.00 OUS 3 0 0 6	Dir. PERVIOL 2.00 AN TIME AN TIME DIS BELC AN TIME STEP! W 20% A. SS: VVe) UL COnn.(%)=	0.56	
*** WARNING: STORA *** WARNING:FOR AR YOU SH (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALIB DD 1 DT= 5.0 min Surface Area Dep. Storage Average Slope	GE COEFF EAS WITH OULD CON: URE SELE(77.0 : (DT) SHOSTORAGE(DOES NO: Area Total (ha)= (mm)= (%)= (m)=	IS SMAL IMPERVIO SIDER SPL TED FOR Ia = Dep. JULD BE S COEFFICIE T INCLUDE (ha)= Imp(%)= IMPERVI 0.0	LER TH. US RATI ITTING PERVIOL Stora, MALLER NT. BASEFI 0.05 65.00 OUS 3 0 0 6	AN TIME IOS BELC THE ARE US LOSSE ge (Abc OR EQUA LOW IF A Dir. PERVIOL 0.02 5.00	STEP! W 20% A. SS: VVe) UL COnn.(%)=	0.56
*** WARNING: STORA **** WARNING:FOR AR YOU SH (i) CN PROCED CN* = (ii) TIME STEP THAN THE (iii) PEAK FLOW CALIB STANDHYD (0226) D= 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length	GE COEFF EAS WITH OULD CONS URE SELE(T7.0 : (DT) SH(STORAGE (DOES NO Area Total (ha)= (mm)= (%)= (m)= =	. IS SMAL IMPERVIO SIDER SPL TED FOR Ta = Dep. JULD BE S COEFFICIE F INCLUDE (ha)= Imp(%)= IMPERVI 0.0 1.0 2.0 0.01	LER THUS RATI	Dir. PERVIOL 2.00 AN TIME AN TIME DIS BELC AN TIME STEP! W 20% A. S: S: VVE) UL UNNY. COnn.(%)= (5) (1)	0.56	

Storage Coeff.	(min)=	0.69 (ii)	3.06 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00	
Unit Hyd. peak	(cms)=	0.34	0.27	
				TOTALS
PEAK FLOW	(cms)=	0.01	0.00	0.012 (iii)
TIME TO PEAK	(hrs)=	4.58	4.58	4.58
RUNOFF VOLUME	(mm)=	54.97	24.42	41.21
TOTAL RAINFALL	(mm)=	55.97	55.97	55.97
RUNOFF COEFFICIE	NT =	0.98	0.44	0.74

**** WA

- (i

(iii) PEAK FLOW [DOES NOT IN	CLUDE BASEFLO	OW IF ANY.	
CALIB				
STANDHYD (0202)	Area (ha)= 0.36		
ID= 1 DT= 5.0 min	Total Imp	(%)= 65.00	Dir. Conn.(%)	= 55.00
	IM	PERVIOUS F	PERVIOUS (i)	
Surface Area	(ha)=	0.23	0.13	
Dep. Storage				
Average Slope				
Length		48.99		
Mannings n	=	0.013	0.250	
Many ESS Tatan (m)	. (1)	121 00	F2 40	
Max.Eff.Inten.(mr		5.00	52.18	
Storage Coeff.				
Unit Hyd. Tpeak			5.00	
Unit Hyd. peak	(CMS)=	0.33	0.25	*TOTALS*
DEAK FLOU	/ \	0.07	0.02	
PEAK FLOW				0.085 (iii) 4.58
TIME TO PEAK			4.58	41.21
RUNOFF VOLUME TOTAL RAINFALL				41.21 55.97
RUNOFF COEFFICIE		55.97		0.74
KUNUFF CUEFFICIE	NI =	0.90	0.44	0.74
***** WARNING: STORAGE	COEFF. IS	SMALLER THAN	TIME STEP!	

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CM* = 77.0 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.

MOIT COLITICIENT	- 0.50	0.77	0.74	1 102
ARNING: STORAGE COE	EE TS SMALLER TH	IAN TIME STED!		===: ID :
AMMING. STOMAGE COL	III. 15 SHACCER II	IAN TINE STEET		10
(i) CN PROCEDURE SE				NOTE:
	Ia = Dep. Stora			
ii) TIME STEP (DT)		R OR EQUAL		
THAN THE STORAG				L ADD 10/D
ii) PEAK FLOW DOES	NOT INCLUDE BASEF	LOW IF ANY.		ADD HYD
				3 + 2
				ID1
3 I				+ ID2
OHYD (0202) Are	a (ha)= 0.36	5		===
DT= 5.0 min Tot	al Imp(%)= 65.00	Dir. Conn.	(%)= 55.00	ID :
	IMPERVIOUS	PERVIOUS (i)		NOTE:
ırface Area (ha)		0.13		
p. Storage (mm)		5.00		
rerage Slope (%)		2.00		
ength (m)		10.00		ADD HYD
nnings n	= 0.013	0.250		1 + 2
x.Eff.Inten.(mm/hr)	= 121.80	52.18		ID1:
over (min)		5.00		+ ID2
orage Coeff. (min)	= 1.25 (ii)			===:
nit Hyd. Tpeak (min)	= 5.00	5.00		ID :
nit Hyd. peak (cms)	= 0.33	0.25		
			TOTALS	NOTE:
AK FLOW (cms)		0.02	0.085 (iii)	
ME TO PEAK (hrs)		4.58	4.58	
JNOFF VOLUME (mm)		24.42	41.21	
OTAL RAINFALL (mm)		55.97	55.97	ADD HYD
NOFF COEFFICIENT	= 0.98	0.44	0.74	3 + 2
ARNING: STORAGE COE	EE TO CMALLED TH	AN TIME STED!		ID1:
MINITING. STORAGE COE	III + IS SMALLER IF	MN ITHE SIEF:		+ ID2
(i) CN PROCEDURE SE	LECTED FOR PERVIO	OUS LOSSES:		===

ADD HYD (00 1 + 2 = 3	l l	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
+ ID2= 2 (0202): 0205): ======	0.56	0.082	4.58	31.36	
	0039):			4.58		
NOTE: PEAK	FLOWS DO N	OT INCL	UDE BASEFL	OWS IF A	NY.	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	j	AREA	QPEAK	TPEAK	R.V.	
		(ha)	(cms)	(hrs)	(mm)	
ID1= 3 (0039):	0.92	0.167	4.58	35.22	
+ ID2= 2 (0206): =======					
					23.66	
ID = 1 (0039): FLOWS DO N					
NOTE: PEAK	FLOWS DO N	NOT INCL	UDE BASEFL	OWS IF A	W.	
NOTE: PEAK	FLOWS DO N	NOT INCL	UDE BASEFL	OWS IF A	W.	
NOTE: PEAK	FLOWS DO N 39) 0039):	AREA (ha) 3.49	QPEAK (cms) 0.204	OWS IF AN	R.V. (mm) 23.66	
NOTE: PEAK ADD HYD (00 1 + 2 = 3 ID1= 1 (+ ID2= 2 (FLOWS DO N	AREA (ha) 3.49 0.05	QPEAK (cms) 0.204 0.012	TPEAK (hrs) 4.58 4.58	R.V. (mm) 23.66 41.21	
NOTE: PEAK ADD HYD (00 1 + 2 = 3 ID1= 1 (+ ID2= 2 (FLOWS DO N	AREA (ha) 3.49 0.05	QPEAK (cms) 0.204 0.012	TPEAK (hrs) 4.58 4.58	R.V. (mm) 23.66 41.21	
NOTE: PEAK ADD HYD (00 1 + 2 = 3 ID1= 1 (+ ID2= 2 (PLOWS DO N 39)	AREA (ha) 3.49 0.05	QPEAK (cms) 0.204 0.012	TPEAK (hrs) 4.58 4.58	R.V. (mm) 23.66 41.21 ====== 23.91	
NOTE: PEAK ADD HYD (00 1 + 2 = 3 ID1= 1 (+ ID2= 2 (FLOWS DO N 39) 0039): 0226): 0039): FLOWS DO N	AREA (ha) 3.49 0.05 3.54	QPEAK (cms) 0.204 0.012 0.216 UDE BASEFL	TPEAK (hrs) 4.58 4.58 4.58	R.V. (mm) 23.66 41.21 23.91	
NOTE: PEAK ADD HYD (00 1 + 2 = 3 ID1= 1 (+ ID2= 2 (FLOWS DO N 39) 0039): 0226): 0039): FLOWS DO N	AREA (ha) 3.49 0.05 3.54	QPEAK (cms) 0.204 0.012 0.216 UDE BASEFL	TPEAK (hrs) 4.58 4.58 4.58	R.V. (mm) 23.66 41.21 23.91	
NOTE: PEAK ADD HYD (00 1 + 2 = 3 ID1= 1 (+ ID2= 2 (FLOWS DO N 39) 0039): 0226): 0039): FLOWS DO N	AREA (ha) 3.49 0.05 3.54	QPEAK (cms) 0.204 0.012 0.216 UDE BASEFL	TPEAK (hrs) 4.58 4.58 4.58	R.V. (mm) 23.66 41.21 23.91	
NOTE: PEAK ADD HYD (00 1 + 2 = 3 ID1= 1 (+ ID2= 2 (FLOWS DO N	AREA (ha) 3.49 0.05 3.54 HOT INCLU	QPEAK (cms) 0.204 0.012 0.216 QPEAK (cms) 0.216 QPEAK (cms)	TPEAK (hrs) 4.58 4.58 CWS IF AT	R.V. (mm) 23.66 41.21 ======= 23.91 NY.	
ADD HYD (000 1 + 2 = 3 ID1= 1 (+ ID2= 2 (FLOWS DO N	AREA (ha) 3.54 (ha) 3.54 (ha) 3.54 (ha) 3.54	QPEAK (cms) 0.204 0.216 UDE BASEFL QPEAK (cms) 0.216 0.216 0.216 0.007	TPEAK (hrs) 4.58 4.58 OWS IF AI	R.V. (mm) 23.66 41.21 23.91 WY	

```
| ADD HYD ( 0039)|
| 1 + 2 = 3
                           QPEAK
(cms)
0.219
                      AREA
                                    TPEAK
                                           R.V.
                                          (mm)
23.88
                      (ha)
3.67
                                    (hrs)
4.58
    ID1= 1 ( 0039):
+ ID2= 2 ( 0228):
                      0.71
                            0.036
                                    4.92
                                          24.99
     ID = 3 ( 0039):
                     4.38 0.229
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0039)|
| 3 + 2 = 1
                      AREA QPEAK
(ha) (cms)
                                    (hrs)
4.58
                                          (mm)
24.06
    ID1= 3 ( 0039):
+ ID2= 2 ( 0229):
                           0.229
                     5.44 0.235
     ID = 1 ( 0039):
                                   4.58
                                          24.43
   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-----
Unit Hyd Qpeak (cms)= 0.110
   (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
Unit Hyd Qpeak (cms)= 0.080
   PEAK FLOW
             (cms)= 0.030 (i)
```

TIME TO PEAK (hrs)= 4.917
RUNOFF VOLUME (mm)= 23.138
TOTAL RAINFALL (mm)= 55.968
RUNOFF COEFFICIENT = 0.413

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

| ADD HYD (0060)| | 1 + 2 = 3 AREA QPEAK TPEAK (mm) 24.61 (hrs) (ha) 0.70 (cms) ID1= 1 (0223): + ID2= 2 (0224): 0.041 4.83 0.030 4.92 23.14 ID = 3 (0060): 1.34 0.069 4.92 23.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
STANDHYD (0200)	Area	(ha)= !	9.08		
ID= 1 DT= 5.0 min	Total	Imp(%) = 6	5.00 Dir.	Conn.(%)= 55.00	9
		IMPERVIOU:	S PERVIOU	S (i)	
Surface Area	(ha)=	5.90	3.18		
Dep. Storage	(mm)=	1.00	5.00		
Average Slope	(%)=	2.00	2.00		
Length	(m)=	246.04	10.00		
Mannings n	=	0.013	0.250		
Max.Eff.Inten.(mr	n/hr)=	121.80	52.18		
over ((min)	5.00	10.00		
Storage Coeff.	(min)=	3.29	(ii) 5.66	(ii)	
Unit Hyd. Tpeak	(min)=	5.00	10.00		
Unit Hyd. peak	(cms)=	0.27	0.15		
				*TOTALS	*
PEAK FLOW	(cms)=	1.45	0.38	1.672	(iii)
TIME TO PEAK	(hrs)=	4.58	4.67	4.58	
RUNOFF VOLUME	(mm)=	54.97	24.42	41.22	
TOTAL RAINFALL	(mm)=	55.97	55.97	55.97	
RUNOFF COEFFICIEN	NT =	0.98	0.44	0.74	

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^*=77.0$ 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.

CALIB	. !				
STANDHYD (0201			0.68		
ID= 1 DT= 5.0 mir	n Total	Imp(%)= :	85.00 Dir.	Conn.(%)= 75.00	a
		IMPERVIO	JS PERVIOL	JS (i)	
Surface Area	(ha)=	0.58	0.16)	
Dep. Storage	(mm)=	1.00	5.00	9	
Average Slope	(%)=	2.00	2.00)	
Length	(m)=	67.33	10.00)	
Mannings n	=	0.013	0.256)	
Max.Eff.Inter	n.(mm/hr)=	121.80	80.76	•	
0\	/er (min)	5.00	5.00	9	
Storage Coeff	f. (min)=	1.51	(ii) 3.00) (ii)	
Unit Hyd. Tpe	eak (min)=	5.00	5.00	9	
Unit Hyd. pea	ak (cms)=	0.33	0.28	3	
				*TOTALS	k
PEAK FLOW	(cms)=	0.17	0.0	0.194	(iii)
TIME TO PEAK	(hrs)=	4.58	4.58	3 4.58	
RUNOFF VOLUME	(mm)=	54.97	28.49	48.35	
TOTAL RAINFAL	L (mm)=	55.97	55.97	55.97	
RUNOFF COEFF3	CIENT =	0.98	0.53	L 0.86	

***** WARNING: STORAGE COFFE TS SMALLER THAN TIME STED!

***** WARNING: STORAG	iF COFFF	. IS SMALLER II	HAN IIME SIEP!		
CN* = 7 (ii) TIME STEP	77.0 (DT) SHO STORAGE	COEFFICIENT.	age (Above) R OR EQUAL		
CALIB					
STANDHYD (0211)	Area	(ha)= 1.0°	1		
ID= 1 DT= 5.0 min				55.00	
		, ()			
		IMPERVIOUS	PERVIOUS (i)		
Surface Area	(ha)=	0.66	0.35		
Dep. Storage	(mm)=	1.00	5.00		
Average Slope	(%)=	2.00	2.00		
Length	(m)=	82.06	10.00		
Mannings n	=	0.013	0.250		
Max.Eff.Inten.(m	m/hr)=	121.80	52.18		
over (min) 5.00 5.00					

Storage Coeff. (mir	n)= 1.70 (ii	i) 4.07 (ii)	
Unit Hyd. Tpeak (mir	1)= 5.00	5.00	
Unit Hyd. peak (cms	s)= 0.32	0.24	
			TOTALS
PEAK FLOW (cms	s)= 0.18	0.05	0.232 (iii)
TIME TO PEAK (hrs	5)= 4.58	4.58	4.58
RUNOFF VOLUME (mm	n)= 54.97	24.42	41.22
TOTAL RAINFALL (mr	1)= 55.97	55.97	55.97
RUNOFF COEFFICIENT	= 0.98	0.44	0.74

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 77.0 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.

(III) FLAK FLO		INCLUDE DASI	ILOW IT ANT.		
l CALIB	-				
STANDHYD (0220)	Anna	(ha)- 1 [:0		
ID= 1 DT= 5.0 min				*_ EE 00	
110- 1 01- 3.0 11111	- IOCAI	IIIb(%)- 03.6	DIT. COMIT.	w)- 33.00	
		IMPERVIOUS	PERVIOUS (i)		
Surface Area	(ha)=	1.03	0.55		
Dep. Storage					
Average Slope					
Length		102.63			
Mannings n		0.013			
· ·					
Max.Eff.Inten.	(mm/hr)=	121.80	52.18		
ove	r (min)	5.00	5.00		
Storage Coeff.	(min)=	1.95 (ii	i) 4.32 (ii)		
Unit Hyd. Tpea	k (min)=	5.00	5.00		
Unit Hyd. peak	(cms)=	0.31	0.23		
				TOTALS	
PEAK FLOW	(cms)=	0.28	0.08	0.356 (iii)	
TIME TO PEAK				4.58	
RUNOFF VOLUME		48.97		37.92	
TOTAL RAINFALL				55.97	
RUNOFF COEFFIC	IENT =	0.87	0.44	0.68	
***** WARNING: STOR	AGE COEFF.	IS SMALLER 1	THAN TIME STEP!		

- - (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CN* = 77.0 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.

```
AREA QPEAK
                                 (ha)
                                          (cms)
                                                     (hrs)
4.58
                                                             (mm)
41.22
      ID1= 1 ( 0200):
+ ID2= 2 ( 0201):
                                        1.672
0.194
      ID = 3 ( 0061):
                               9.76 1.866
                                                   4.58
                                                            41.72
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0061)|
| 3 + 2 = 1 |
| ID1= 3 ( 0061):
+ ID2= 2 ( 0211):
                                       QPEAK
(cms)
1.866
                                 AREA
                                                     TPEAK
                                                               R.V.
                                                    (hrs)
4.58
                                1.01
                                         0.232
                                                    4.58
                                                              41.22
      ID = 1 ( 0061): 10.77 2.098
                                                   4.58
                                                              41.67
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
| ADD HYD ( 0061)|
| 1 + 2 = 3
                               AREA
(ha)
10.77
                                          (cms)
                                                     (hrs)
                                                             (mm)
41.67
      ID1= 1 ( 0061):
+ ID2= 2 ( 0220):
                                        2.098
                                                     4.58
       ID = 3 ( 0061):
                               12.35 2.454
                                                    4.58
                                                             41.19
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
ADD HYD ( 0061)
3 + 2 = 1
                                AREA QPEAK
(ha) (cms)
12.35 2.454
                                                    TPFAK
                                                               R.V.
                                                    (hrs)
4.58
      ID1= 3 ( 0061):
+ ID2= 2 ( 0060):
                                1.34
                                         0.069
                                                    4.92
                                                              23.91
      ID = 1 ( 0061):
                               13.69 2.478
    NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

T= 5.0 min	OUTFL	.OW STOR	RAGE	OUTFLOW	STORAGE
	(cms			(cms)	(ha.m.)
**** WARNING : F					
			2492	0.4840	0.5022
	0.00			0.6890	0.5665
	0.00		1524	0.7300	0.6325
	0.01		2065	0.9250	0.7004
	0.01			1.3030	0.7700
	0.01		3197	1.8620	0.8415
		.40 0.3 '40 0.4		2.6100 0.0000	0.9149
	0.17	40 0.4	+390	0.0000	0.0000
		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (13.690	2.478		
OUTFLOW: ID= 1 (2111)	13.690	0.091	6.67	38.73
	IME SHIFT AXIMUM ST	OF PEAK FI		(min)=1: (ha.m.)=	25.00 0.4081
ηη 		UKAGE U			
		(ha)= 6			
ALIB	Area		a.22	r. Conn.(%	
ALIB TANDHYD (0203)	Area Total I	(ha)= 6 imp(%)= 86	0.22 0.00 Di	r. Conn.(%	
ALIB TANDHYD (0203) = 1 DT= 5.0 min	Area Total I	(ha)= 6 mp(%)= 86 IMPERVIOUS	0.22 0.00 Di	r. Conn.(%	
ALIB TANDHYD (0203) = 1 DT= 5.0 min	Area Total I (ha)=	(ha)= 6 mp(%)= 86 IMPERVIOUS 0.18	0.22 0.00 Di 5 PERV	r. Conn.(% IOUS (i) .04	
ALIB TANDHYD (0203) 1 DT= 5.0 min Surface Area Dep. Storage	Area Total I (ha)= (mm)=	(ha)= (mp(%)= 86 IMPERVIOUS 0.18 5.00	0.22 0.00 Di 5 PERV 0	r. Conn.(% IOUS (i) .04	
ALIB TANDHYD (0203) = 1 DT= 5.0 min Surface Area Dep. Storage Average Slope	Area Total I (ha)= (mm)= (%)=	(ha)= 6 mp(%)= 86 IMPERVIOUS 0.18 5.00 2.00	0.22 0.00 Dir 5 PERV: 0 5	r. Conn.(% IOUS (i) .04 .00	
ALIB TANDHYD (0203) 1 DT= 5.0 min Surface Area Dep. Storage	Area Total I (ha)= (mm)=	(ha)= (mp(%)= 86 IMPERVIOUS 0.18 5.00	0.22 0.00 Dir 5 PERV: 0 5 2	r. Conn.(% IOUS (i) .04	
ALIB (0203) = 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n	Area Total I (ha)= (mm)= (%)= (m)= =	(ha)= (mp(%)= 86 IMPERVIOUS 0.18 5.00 2.00 38.30 0.013	0.22 0.00 Dir 5 PERV 0 5 2 10	r. Conn.(% IOUS (i) .04 .00 .00 .00	
ALIB 0203) 1 DT= 5.0 min	Area Total I (ha)= (mm)= (%)= (m)= = nm/hr)=	(ha)= (mp(%)= 86 IMPERVIOUS 0.18 5.00 2.00 38.30 0.013	0.22 0.00 Din 5 PERV 0 5 2 10 0.3	r. Conn.(% IOUS (i) .04 .00 .00 .00	
ALIB 0223) = 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mover	Area Total I (ha)= (mm)= (%)= (m)= = nm/hr)= (min)	(ha)= (mp(%)= 86 IMPERVIOUS 0.18 5.00 2.00 38.30 0.013 121.80 5.00	0.22 0.00 Dir 5 PERV: 0 5 2 10 0.3	r. Conn.(% IOUS (i) .04 .09 .09 .250	
ALIB 0203 = 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mover Storage Coeff.	Area Total I (ha)= (mm)= (%)= (m)= = nm/hr)= (min) (min)=	(ha)= (imp(%)= 80 IMPERVIOUS 0.18 5.00 2.00 38.30 0.013 121.80 5.00 1.08	0.22 0.00 Din 5 PERV. 0 5 2 10 0.3 35 (ii) 2	r. Conn.(% IOUS (i) .04 .00 .00 .00 .00 .00 .14 .00 .71 (ii)	
ALIB 2023] = 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(n over Storage Coeff. Unit Hyd. Tpeak	Area Total I (ha)= (mm)= (%)= (m)= = nm/hr)= (min) (min)=	(ha)= (mp(%)= 86 IMPERVIOUS 0.18 5.00 2.00 38.30 0.013 121.80 5.00	3.22 3.00 Din 5 PERV: 0 5 2 10 0 33 5 (ii) 2 5	r. Conn.(% IOUS (i) .04 .09 .09 .250	
ALIB 0203 = 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(mover Storage Coeff.	Area Total I (ha)= (mm)= (%)= (m)= = nm/hr)= (min) (min)=	(ha)= 6 (imp(%)= 86 3.22 3.00 Din 5 PERV: 0 5 2 10 0 33 5 (ii) 2 5	r. Conn.(% IOUS (i) .04 .00 .00 .00 .00 .14 .00 .71 (ii)		
ALIB 2023] = 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(n over Storage Coeff. Unit Hyd. Tpeak	Area Total I (ha)= (mm)= (%)= (m)= = nm/hr)= (min) (min)=	(ha)= 6 (imp(%)= 86 3.22 3.00 Did 5 PERV. 0 5 2 10 0.3 33 (ii) 2	r. Conn.(% IOUS (i) .04 .00 .00 .00 .00 .14 .00 .71 (ii))= 80.00	
ALIB ALIB TANOHYD (0203) 1 DT= 5.0 min Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(n over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak	Area Total I (ha)= (mm)= (%)= (m)= = mm/hr)= (min)= (min)= (min)=	(ha)= (mp(%)= 86 mp(%)= 86	0.22 0.00 Din 5 PERVIS 0 0.3 2 10 0.3 33 5 (ii) 2	r. Conn.(% IOUS (i) .04 .09 .00 .08 .00 .250 .14 .00 .00 .29)= 80.00 *TOTALS*
ALIB 2023) 1 DT= 5.0 min Surface Area Dep. Storage Average Slope Length Mannings n Max.Eff.Inten.(n over Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak	Area Total I (ha)= (mm)= (%)= (m)= (min)= (min)= (min)= (cms)= (cms)=	(ha)= 80 mp(%)=	0.22 0.00 Din 5 PERV. 0 0 5 2 10 0.3 33 5 (ii) 2 5 0	r. Conn.(% IOUS (i) .04 .00 .00 .00 .00 .14 .00 .71 (ii) .00 .29	*TOTALS* 0.064 (iii)
ALIB ALIB TANOHYD (0203) 1 DT= 5.0 min Company Area Total I (ha)= (%)= (%)= (min)= (min)= (min)= (cms)= (cms)= (cms)=	(ha)= (mp(%)= 88 (mp(%	3.22 2.00 Dir 5 PERV' 0 5 2 10 0.3 33 5 (ii) 2 5 0	r. Conn.(% IOUS (i) .04 .09 .00 .00 .00 .00 .14 .00 .71 (ii) .00 .29	*TOTALS* 0.064 (iii) 4.58	
ALIB [2023] = 1 DT= 5.0 min 2023] = 1 DT= 5.0 min 2025 202	Area Total I (ha)= (mm)= (%)= (m)= (min)= (min)= (min)= (cms)= (hrs)= (mm)= (mm)=	(ha)= 6 mp(%)= 86 mp(%)= 86 5.00 2.00 38.30 0.013 121.80 5.00 1.08 5.00 0.34 0.06 4.58 5.0.97	0.22 0.00 Din 5 PERV: 0 0 5 2 10 0.: 33 5 (ii) 2 6 0 4 20	r. Conn.(% IOUS (i) .04 .00 .00 .00 .00 .14 .00 .71 (ii) .00 .29	*TOTALS*

(i)	CN PF	ROCED	URE SI	ELECTED	FOR	PERVIO	JS I	LOSS	SES:
`-'						. Storag			
(ii)	TIME	STEP	(DT)	SHOULD	BE :	SMALLER	OR	EQU	JAL
	THAN	THE	STORAG	GE COEF	ICI	ENT.			
(iii)	PEAK	FLOW	DOES	NOT IN	CLUD	E BASEFI	_OW	IF	ANY.

(i

CALIB							
STANDHYD (0204)	Area	(ha)=	0.16				
ID= 1 DT= 5.0 min					Conn.(%):	= 55.0	0
					,		
		IMPERVI	ous	PERVIOU	S (i)		
Surface Area	(ha)=	0.1	2	0.04			
Dep. Storage	(mm)=	1.00	9	5.00			
Average Slope				2.00			
Length							
Mannings n	=	0.01	3	0.250	1		
Max.Eff.Inten.(mm/hr)=	121.80	9	91.30			
over	(min)	5.00	9	5.00			
Storage Coeff.	(min)=	0.9	8 (ii)	3.05	(ii)		
Unit Hyd. Tpeak	(min)=	5.00	9	5.00			
Unit Hyd. peak	(cms)=	0.3	4	0.27			
						*TOTALS	*
PEAK FLOW	(cms)=	0.0	3	0.01		0.041	(iii)
TIME TO PEAK	(hrs)=	4.5	8	4.58		4.58	
RUNOFF VOLUME	(mm)=	54.9	7	29.68		43.58	
TOTAL RAINFALL	(mm)=	55.9	7	55.97		55.97	
RUNOFF COEFFICI	ENT =	0.9	8	0.53		0.78	
***** WARNING: STORA	GE COEFF	. IS SMALI	LER TH	AN TIME	STEP!		
(i) CN PROCED	IRE SELE	TED FOR I	PERVIO	IS LOSSE	ς.		

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

 CM* = 77.0 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.

ADD HYD (0040)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0203):	0.22	0.064	4.58	44.87
+ ID2= 2 (0204):	0.16	0.041	4.58	43.58
ID = 3 (0040):	0.38	0.104	4.58	44.33

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | ADD HYD (0040)| | 3 + 2 = 1 R.V. (mm) 44.33 AREA QPEAK TPEAK (hrs) 4.58 (ha) (cms) ID1= 3 (0040): + ID2= 2 (2111): 0.38 0.104 13.69 0.091 6.67 38.73 ID = 1 (0040): 14.07 0.113 4.58 38.88 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ROUTEPIPE(0041) IN= 2---> OUT= 1 DT= 5.0 min PIPE Number PIPE Number = 1.00 Diameter (mm)= 900.00 Length (m)= 50.00 Slope (m/m)= 0.005 Manning n = 0.013 <----- TRAVEL TIME TABLE -----DEPTH VOLUME (m) (cu.m.) 0.05 .642E+00 FLOW RATE (cms) VELOCITY TRAV.TIME (m/s) 0.53 1.56 0.0 0.09 0.14 0.0 0.1 0.1 .178E+01 0.83 1.00 .322E+01 .487E+01 0.19 1.28 0.24 .668E+01 0.2 1.45 0.57 0.28 0.33 .862F+01 1.61 0.38 .127E+02 0.5 1.86 0.45 0.6 0.7 0.8 0.43 .148F+02 1.97 9.42 .170E+02 .191E+02 0.57 .212E+02 0.9 2.20 0.38 1.0 1.1 1.2 2.24 0.37 0.37 .232E+02 2.29 0.71 .269E+02 0.36 0.76 .286E+02 1.3 2.29 0.36 .300E+02 2.27 0.90 .318E+02 1.3 2.01 0.41 <---- hydrograph ---> <-pipe / channel->
QPEAK TPEAK R.V. MAX DEPTH MAX VEL
(cms) (hrs) (mm) (m) (m/s)
0.11 4.58 38.88 0.18 1.23 (ha) INFLOW: ID= 2 (0040) OUTFLOW: ID= 1 (0041) 14.07

Area (ha)= 0.62 Curve Number (CN)= 79.2 Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.21 0210) ID= 1 DT= 5.0 min

Unit Hyd Opeak (cms)= 0.112

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

CALIB STANDHYD (0207) ID= 1 DT= 5.0 min Area (ha)= 12.64 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 8.22 4.42 5.00 (mm)= (%)= (m)= Dep. Storage Average Slope 1.00 2.00 2.00 Length Mannings n 0.013 0.250 Max.Eff.Inten.(mm/hr)= 121.80 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 10.00 3.63 (ii) 6.00 (ii) 0.25 0.15 *TOTALS* PEAK FLOW (cms)=
TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 0.51 4.67 2.264 (iii) 4.58 4.58 54.97 24.42 41.22 55.97 55.97 55.97

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 77.0$ 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.

CALIB STANDHYD (0209) Area (ha)= 1.84 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 ID= 1 DT= 5.0 min IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 1.20 0.64 5.00 (mm)= (%)= (m)= Dep. Storage Average Slope 1.00 Length Mannings n 0.013 0.250 Max.Eff.Inten.(mm/hr)= over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 5.00 2.04 (ii) 4.41 (ii) 5.00 0.23 *TOTALS* PEAK FLOW TIME TO PEAK RUNOFF VOLUME 0.09 4.58 24.42 0.412 (iii) 4.58 41.22 (cms)= (hrs)= 0.32 4.58 54.97 RUNOFF VOLUME (mm)= TOTAL RAINFALL (mm)= RUNOFF COEFFICIENT = 55.97 55.97 55.97 0.98

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- (1) CN* = 77.0 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.

CALIB STANDHYD (0221) ID= 1 DT= 5.0 min (ha)= 4.96 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) Surface Area Dep. Storage Average Slope (ha)= (mm)= (%)= 1.74 3.22 7.00 2.00 2.00 Length Mannings n (m)= 181.84 10.00 0.013 0.250 Max.Eff.Inten.(mm/hr)= 52.18 121.80

Storage Coeff. Unit Hyd. Tpeak Unit Hyd. peak	(min)=	2.75 (ii) 5.00 0.28	5.11 (ii) 10.00 0.16	*TOTALS*
PEAK FLOW	(cms)=	0.83	0.21	0.955 (iii)
TIME TO PEAK	(hrs)=	4.58	4.67	4.58
RUNOFF VOLUME	(mm)=	48.97	24.42	37.92
TOTAL RAINFALL	(mm)=	55.97	55.97	55.97
RUNOFF COEFFICIE	NT =	0.87	0.44	0.68

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: $CN^* = 77.0$ Ia = Dep. Storage (Above) (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
- THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW	DOES NO	r INCLUDE I	BASEFLOW IF	ANY.		
CALIB						
STANDHYD (0208)	Area	(ha)=	1 03			
ID= 1 DT= 5.0 min				Conn (%)-	55 00	
110- 1 01- 3.0 1111	TOCAL	Imp(////	55.00 DII.	COIIII. (70)=	33.00	
		IMPERVIO	IS PERVIO	OUS (i)		
Surface Area	(ha)=					
Dep. Storage				-		
Average Slope						
Length			10.6			
Mannings n	` '=	0.013	0.25	10		
_						
Max.Eff.Inten.(mm/hr)=	121.80	52.1	.8		
over	(min)	5.00	5.6	10		
Storage Coeff.	(min)=	1.71	(ii) 4.6	8 (ii)		
Unit Hyd. Tpeak	(min)=	5.00	5.6	10		
Unit Hyd. peak	(cms)=	0.32	0.2	·4		
					OTALS*	
PEAK FLOW					0.236	(iii)
TIME TO PEAK					4.58	
RUNOFF VOLUME					37.92	
TOTAL RAINFALL					55.97	
RUNOFF COEFFICI	ENT =	0.87	0.4	14	0.68	
***** WADNITNG: STOPA	GE COEEE	TC CMALL	ED THAN TIME	STEDI		

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
- CN* = 77.0 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.

ADD HYD (0038)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0207):	12.64	2.264	4.58	41.22
+ ID2= 2 (0208):	1.03	0.236	4.58	37.92
ID = 3 (0038):	13.67	2.500	4.58	40.97

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0038) 3 + 2 = 1	AREA	OPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0038):	13.67	2.500	4.58	40.97
+ ID2= 2 (0209):	1.84	0.412	4.58	41.22
ID = 1 (0038):	15.51	2.913	4.58	41.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0038) 1 + 2 = 3	AREA (ha) 15.51	QPEAK (cms) 2.913	TPEAK (hrs) 4.58	R.V. (mm) 41.00
+ ID2= 2 (0221):	4.96	0.955	4.58	37.92
ID = 3 (0038):	20.47	3.867	4.58	40.25

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

DESERVATO (0000)	01/5051-011	T.C. 0.F.F			
RESERVOIR(2099)	OVERFLOW	12 OFF			
IN= 2> OUT= 1					
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW	STORAGE	
	(cms)	(ha.m.)	(cms)	(ha.m.)	
	0.0000	0.0000	0.0508	0.7415	
	0.0049	0.0845	0.1103	0.8448	
	0.0085	0.1713	0.1869	0.9504	
	0.0110	0.2604	0.2773	1.0584	
	0.0130	0.3519	0.3797	1.1687	
	0.0147	0.4458	0.5592	1.2814	
	0.0163	0.5420	0.8940	1.3964	

0.0177 0.6406 1.4269 1.5138 AREA QPEAK (ha) 20.470 20.470 (hrs) 4.58 INFLOW: ID= 2 (0038) OUTFLOW: ID= 1 (2099) 11.92 0.046 ADD HYD (0049) | 1 + 2 = 3 | QPEAK (cms) (ha) (hrs) (mm) 36.94 ID1= 1 (2099): + ID2= 2 (0210): 20.47 0.046 11.92 4.83 ID = 3 (0049): 21.09 0.048 11.75 36.46 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | STANDHYD (0222) | ID= 1 DT= 5.0 min Area (ha)= 1.38 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) Surface Area (ha)= 0.90 7.00 0.48 5.00 Dep. Storage Average Slope (m)= Length Mannings n 0.013 0.250 Max.Eff.Inten.(mm/hr)= 5.00 4.24 (ii) over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 1.87 (ii) 0.32 0.24 LOW (CMS)=
IME TO PEAK (hrs)=
RUNOFF VOLUME
TOTAL RAINFALL
RUNOFF COEFET *TOTALS* 0.25 4.58 48.97 0.313 (iii) 4.58 0.07 4.58 24.42 37.92 55.97 55.97

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 77.0 Ia = Dep. Storage (Above)

(ii) TIME STOR (OT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY. | Junction Command(0051) | QPEAK R.V. (ha) (cms) (hrs) 4.58 INFLOW: ID= 2(0222) 1.38 OUTFLOW: ID= 2(0051) 1.38 0.31 37.92 CALIB STANDHYD (0212) Area (ha)= 4.77Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00IMPERVIOUS PERVIOUS (i) 3.10 7.00 1.67 5.00 Surface Area (mm)= (%)= (m)= = Dep. Storage Average Slope 2.00 2.00 Length Mannings n 178.33 10.00 0.250 0.013 Max.Eff.Inten.(mm/hr)= 121.80 52.18 over (min)
Storage Coeff. (min)=
Unit Hyd. Tpeak (min)=
Unit Hyd. peak (cms)= 5.00 2.71 (ii) 10.00 5.08 (ii) 0.29 0.16 *TOTAL S* 0.920 (iii) TIME TO PEAK (hrs)=
RUNOFF VOLUME (mm)=
TOTAL RAINFALL (mm)=
RUNOFF COEFFICIENT = 4.58 4.67 4.58 48.97 55.97 0.87 24.42 37.92 0.44 0.68 ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP! (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: (1) CN* = 77.0 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.

| Junction Command(0052) | (hrs) 4.58 (mm) (ha) 4.77 (cms) INFLOW : ID= 2(0212) 0.92 37.92 OUTFLOW: ID= 2(0052) 4.77 0.92 4.58 37.92 _____ I SSSSS U U A L
I SS U U A A L
I SS U U AAAAA L
I SS U U A A L
I SSS U U A A L
I SSSSS UUUUU A A LLLLL (v 6.2.2015) VV TTTTT TTTTT H H Y Y M M 000 T T H H Y Y MM MM 0 O T T H H Y M M 0 O T T H H Y M M 000 000 0 0 Developed and Distributed by Smart City Water Inc Copyright 2007 - 2022 Smart City Water Inc All rights reserved. ***** DETAILED OUTPUT ***** Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat Output filename: C:\Users\mornat\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\7c91f7 05-0219-4523-8738-c97090e68a7b\scena C:\Users\mornat\AppData\Local\Civica\VH5\4c7d3ae7-f914-4c04-9b62-f883467b2a44\7c91f7 05-0219-4523-8738-c97090e68a7b\scena DATE: 08/19/2024 TIME: 12:07:50 COMMENTS:

	-
** SIMULATION : Huri	
READ STORM Ptotal= 0.00 mm	Filename: C:\Users\mornat\AppD ata\Local\Temp\ 881d00f7-2df9-448c-966b-9f6c4458abcf\17cacc8e Comments: Huricane Hazel- 48hr
TIME hrs	RAIN TIME RAIN 'TIME RAIN TIME RAIN mm/hr hrs mm/hr hrs mm/hr
ID= 1 DT= 5.0 min NOTE: RAINFA TIME hrs	Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.34 LL WAS TRANSFORMED TO 5.0 MIN. TIME STEP. TRANSFORMED HYETOGRAPH RAIN TIME RAIN ' TIME RAIN TIME RAIN mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
CALIB NASHYD (0227) ID= 1 DT= 5.0 min NOTE: RAINFA	Area (ha)= 0.13 Curve Number (CN)= 82.3 Ia (mm)= 7.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.22 ULL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
TIME hrs	TRANSFORMED HYETOGRAPH RAIN TIME RAIN TIME RAIN TIME RAIN mm/hr hrs mm/hr hrs mm/hr
CALIB	

```
Area (ha)= 0.71 Curve Number (CN)= 84.4
Ia (mm)= 7.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.31
NASHYD ( 0228)
ID= 1 DT= 5.0 min
           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
 CALIB
                             Area (ha)= 1.06
Ia (mm)= 7.00
U.H. Tp(hrs)= 0.51
  NASHYD
             ( 0229)
                                                           Curve Number (CN)= 85.4
ID= 1 DT= 5.0 min
                                                         # of Linear Res.(N)= 3.00
           NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                                         --- TRANSFORMED HYETOGRAPH ----
                     TIME RAIN TIME RAIN TIME RAIN TIME RAIN TIME hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs
                                                                                      hrs mm/hr
| CALIB
                             Area (ha)= 2.57
Ia (mm)= 7.00
U.H. Tp(hrs)= 0.25
  NASHYD
             ( 0206)
                                                          Curve Number (CN)= 77.5
# of Linear Res.(N)= 3.00
ID= 1 DT= 5.0 min
           NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                      ---- TRANSFORMED HYETOGRAPH ----
TIME RAIN | TIME RAIN | TIME RAIN |
hrs mmm/hr | hrs mmm/hr | hrs mmm/hr |
hrs mm/hr | hrs mm/hr |
| CALIB
                             Area (ha)= 0.56
Total Imp(%)= 50.00 Dir. Conn.(%)= 1.00
  STANDHYD ( 0205)
ID= 1 DT= 5.0 min
                                                        PERVIOUS (i)
                                      IMPERVIOUS
                                        0.28
1.00
                                                          0.28
5.00
                            (mm)=
     Dep. Storage
                             (%)=
(m)=
      Average Slope
                                            2.00
                                                             2.00
```

61.10

0.250 Mannings n 0.013 NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP. - TRANSFORMED HYETOGRAPH ----TIME RAIN TIME RAIN TIME RAIN TIME hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr hrs RAIN ****** ERROR: RAINFALL INCREMENT = 0, COMMAND ABORTED. -----CALIB STANDHYD (0226) ID= 1 DT= 5.0 min Area (ha)= 0.05 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) 0.03 0.02 5.00 Surface Area Dep. Storage (mm)= Average Slope Length (%)= (m)= 2.00 2.00 18.26 0.250 0.013 Mannings n 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 hrs mm/hr ****** ERROR: RAINFALL INCREMENT = 0, COMMAND ABORTED. -----CALIR | STANDHYD (0202) | ID= 1 DT= 5.0 min Area (ha)= 0.36 Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) (ha)= Surface Area 0.23 0.13 Dep. Storage Average Slope (mm)= (%)= 1.00 5.00 2.00 48.99 2.00 (m)=Length 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 TIME hrs mm/hr hrs mm/hr hrs mm/hr hrs ****** ERROR: RAINFALL INCREMENT = 0, COMMAND ABORTED. -----| ADD HYD (0039)| | 1 + 2 = 3 AREA QPEAK (cms) TPEAK R.V. (ha) (hrs) (mm) 0.00 ID1= 1 (0202): + ID2= 2 (0205): 0.000 0.00 0.36 0.56 0.000 0.00 0.00 ID = 3 (0039): 0.92 0.000 0.00 0.00 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0039)| 3 + 2 = 1 QPEAK R.V. (ha) (cms) (hrs) (mm) ID1= 3 (0039): + ID2= 2 (0206): 0 92 0 000 9 99 0 00 0.000 2.57 ID = 1 (0039): 3.49 0.000 0.00 0.00 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0039)| 1 + 2 = 3 ARFA **OPEAK** TPFAK R.V. (cms) 0.000 (mm) 0.00 (hrs) ID1= 1 (0039): + ID2= 2 (0226): 0.05 0.000 0.00 0.00 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. | ADD HYD (0039)| | 3 + 2 = 1 (ha) (cms) (hrs) (mm) ID1= 3 (0039): + ID2= 2 (0227): 0.000 0.00 0.00

ID = 1 (0039): 3.67 0.000 0.00 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0039) AREA QPEAK TPEAK R.V. (ha) (cms) (hrs) (mm) ID1= 1 (0039): + ID2= 2 (0228): 3.67 0.000 0.00 0.00 0.71 ID = 3 (0039): 4.38 0.000 0.00 0.00 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0039) 3 + 2 = 1 QPEAK AREA TPEAK R.V. (cms) 0.000 (mm) 0.00 ID1= 3 (0039): + ID2= 2 (0229): 1.06 0.000 0.00 0.00 ID = 1 (0039): 5.44 0.000 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. 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 CALIB CALIB NASHYD (0224) ID= 1 DT= 5.0 min Area (ha)= 0.64 Curve Number (CN)= 82.3 Ia (mm)= 7.00 # 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 |
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr
```

| ADD HYD (0060)| | 1 + 2 = 3 AREA TPEAK OPEAK R.V. _____ (ha) 0.70 (cms) (hrs) (mm) 0.00 ID1= 1 (0223): + ID2= 2 (0224): 0.000 0.64 0.00 0.00 ID = 3 (0060): 1.34 0.000 0.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Surface Area (ha)= 5.90 3.18
Dep. Storage (mm)= 1.00 5.00
Average Slope (%)= 2.00 2.00
Length (m)= 246.04 10.00
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 |

****** ERROR: RAINFALL INCREMENT = 0, COMMAND ABORTED.

verage Slope (mm)= 1.00 5.00 verage Slope (%)= 2.00 2.00 ength (m)= 67.33 10.00

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

****** ERROR: RAINFALL INCREMENT = 0, COMMAND ABORTED.

.....

 Surface Area
 (ha)=
 0.66
 0.35

 Dep. Storage
 (mm)=
 1.00
 5.00

 Average Slope
 (%)=
 2.00
 2.00

 Length
 (m)=
 82.06
 10.00

 Mannings n
 =
 0.013
 0.250

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

---- TRANSFORMED HYETOGRAPH ---TIME RAIN | TIME RAIN | TIME RAIN
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr

****** ERROR: RAINFALL INCREMENT = 0, COMMAND ABORTED.

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

---- TRANSFORMED HYETOGRAPH ----

TIME RAIN TIME RAIN TIME RAIN TIME RAIN TIME RAIN hrs mm/hr hrs mm/hr hrs mm/hr

****** ERROR: RAINFALL INCREMENT = 0, COMMAND ABORTED.

| ADD HYD (0061)| | 1 + 2 = 3 AREA QPEAK (cms) TPEAK R.V. (ha) (hrs) (mm) 0.00 ID1= 1 (0200): + ID2= 2 (0201): 0.000 0.00 9.08 0.68 0.000 0.00 0.00 ID = 3 (0061): 9.76 0.000 0.00 0.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0061) QPEAK (ha) (cms) (hrs) (mm) ID1= 3 (0061): + ID2= 2 (0211): 9 76 0 000 9 99 0 00 0.000 1.01 0.000 ID = 1 (0061): 10.77 0.00 0.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0061) | AREA QPEAK TPEAK R.V. | (ha) (cms) (hrs) (mm) | ID1= 3 (0061): 12.35 0.000 0.00 0.00 0.00 | h ID2= 2 (0060): 1.34 0.000 0.00 0.00

ID = 1 (0061): 13.69 0.000 0.00 0.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(2111) IN= 2---> OUT= 1 DT= 5.0 min OVERFLOW IS OFF STORAGE (ha.m.) OUTFLOW (cms) (cms) (ha.m.) **** WARNING : FIRST OUTFLOW IS NOT ZERO. 0.0070 0.1000 0.6890 0.5665 0.0090 0.1524 0.7300 0.6325 0.0100 0.0110 0.2065 0.2622 0.9250 1.3030 0.7004 0.7700 0.0130 0.3197 1.8620 0.8415 9.9149 0.3788 2.6100 0.9149 AREA OPEAK TPEAK (hrs) 0.00 0.00 (ha) 13.690

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.

CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

Surface Area	(ha)=	0.18	0.04
Dep. Storage	(mm)=	5.00	5.00
Average Slope	(%)=	2.00	2.00
Length	(m)=	38.30	10.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO $\,$ 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----IME RAIN | TIME RAIN | TIME RAIN hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr ****** ERROR: RAINFALL INCREMENT = 0, COMMAND ABORTED. -----CALIB STANDHYD (0204) Area (ha)= 0.16 ID= 1 DT= 5.0 min Total Imp(%)= 75.00 Dir. Conn.(%)= 55.00 IMPERVIOUS PERVIOUS (i) 0.12 1.00 2.00 0.04 5.00 2.00 Surface Area (ha)= Dep. Storage Average Slope (mm)= (%)= Length (m)= 32.66 10.00 0.250 Mannings n 0.013 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 ****** ERROR: RAINFALL INCREMENT = 0, COMMAND ABORTED. ______ ADD HYD (0040)| 1 + 2 = 3 (ha) (cms) (hrs) (mm) ID1= 1 (0203): + ID2= 2 (0204): à. 22 ดโดดด à. 99 คิดด ID = 3 (0040): 0.38 0.000 0.00 0.00 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY. ADD HYD (0040)| 3 + 2 = 1 ARFA QPEAK TPFAK R.V. (cms) 0.000 (ha) 0.38 (mm) 0.00 ID1= 3 (0040): + ID2= 2 (2111): 13.69 0.000 0.00 0.00 ID = 1 (0040): 14.07 0.00 NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
ROUTEPIPE( 0041)
 ROUTEPIPE( ...
IN= 2---> OUT= 1
                         PIPE Number = 1.00
Diameter (mm) = 900.00
Length (m) = 50.00
Slope (m/m) = 0.005
Manning n = 0.013
 DT= 5.0 min
    <----- TRAVEL TIME TABLE -----
                 VOLUME
                            FLOW RATE
                                                       TRAV.TIME
                 (cu.m.)
       (m)
                              (cms)
                                            (m/s)
0.53
                                                          min
      ค.คร
                .642F+00
                                ค.ค
                                                           1.56
      0.09
0.14
                .178E+01
.322E+01
                                0.1
                                              1.07
      0.19
                .487E+01
                                0.1
                                             1.28
                                                           0.65
                                             1.45
1.61
      0.24
                668F+01
                                a 2
                                                           0.57
      0.33
                .106E+02
                                0.4
                                             1.74
                                                           0.48
      0.38
                .127E+02
                                0.5
                                             1.86
                                                           0.45
      0.43
0.47
                .148E+02
.170E+02
                                0.6
0.7
                                              2.06
                                                            0.41
      0.52
                .191E+02
                                0.8
                                             2.13
                                                           0.39
                .212E+02
.232E+02
                                             2.20
                                                           0.38
0.37
       0.57
      0.66
                .251E+02
                                1.1
                                             2.28
                                                           0.37
      0.71
                .269F+02
                                1.2
                                              2.29
                                                            0.36
      0.81
                .300E+02
                                1.4
                                              2.27
                                                           0.37
      0.85
                .312E+02
                                1.4
                                             2.21
                                                           0.38
      0.90
                .318E+02
                               1.3
                                                            0.41
    **** WARNING: INFLOW HYDROGRAPH IS DRY!!
_____
 CALIB
NASHYD
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
 CALIB
| STANDHYD ( 0207) | Area (ha)= 12.64
```

```
|ID= 1 DT= 5.0 min | Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00
                              TMPERVIOUS
                                            PERVIOUS (i)
                                  8.22
                                             4.42
5.00
     Dep. Storage
                      (mm)=
    Average Slope
                                  2.00
                                                2.00
                      (m)=
                                              0.250
                                 0.013
     Mannings n
        NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.
                               ---- TRANSFORMED HYETOGRAPH ----
                 TIME RAIN TIME RAIN TIME RAIN TIME
****** ERROR: RAINFALL INCREMENT = 0, COMMAND ABORTED.
 -----
 CALTR
| STANDHYD ( 0209)
| ID= 1 DT= 5.0 min
                      Area (ha)= 1.84
Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00
                              IMPERVIOUS PERVIOUS (i)
                                1.20
     Surface Area
                                               0.64
    Dep. Storage
Average Slope
                      (mm)=
(%)=
(m)=
                                  1.00
                                               5.00
                                110.75
     Length
    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
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs
****** ERROR: RAINFALL INCREMENT = 0, COMMAND ABORTED.
------
CALIB
| STANDHYD ( 0221)
|ID= 1 DT= 5.0 min
                       Area
                               (ha)= 4.96
                       Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00
                                            PERVIOUS (i)
                              IMPERVIOUS
                                                1.74
5.00
2.00
    Surface Area
                      (ha)=
                                  3.22
7.00
                      (mm)=
(%)=
    Dep. Storage
Average Slope
```

```
Length
                       (m)=
=
     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
****** ERROR: RAINFALL INCREMENT = 0, COMMAND ABORTED.
 STANDHYD ( 0208)
                       Area
                               (ha)=
                                       1.03
ID= 1 DT= 5.0 min
                       Total Imp(%)= 65.00 Dir. Conn.(%)= 55.00
                              IMPERVIOUS
                                             PERVIOUS (i)
     Surface Area
                      (ha)=
                                  0.67
                                                0.36
                      (mm)=
(%)=
(m)=
    Dep. Storage
Average Slope
                                  7.00
                                               5.00
     Length
Mannings n
                                 82.87
                                               10.00
                                 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
                                                                           RAIN
****** ERROR: RAINFALL INCREMENT = 0, COMMAND ABORTED.
______
| ADD HYD ( 0038)|
| 1 + 2 = 3
                             (ha)
                                      (cms)
                                               (hrs)
                                                         (mm)
     ID1= 1 ( 0207):
+ ID2= 2 ( 0208):
                            12.64
                                    0.000
                                               0.00
                                                        0.00
       ID = 3 ( 0038): 13.67 0.000
                                               0.00
                                                        0.00
     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
ADD HYD ( 0038)
```

	(ha)	(cmc)	TPEAK (hps)	R.V (mm	
ID1= 3 (0038	(ha)): 13.67	(CIIIS)	(111.2)	0.00	
+ ID2= 2 (0209		0.000		0.00	
+ 102- 2 (0203					
ID = 1 (0038					
NOTE: PEAK FLOWS	DO NOT INCL	UDE BASEFL	OWS IF AN	Y.	
DD HYD (0038) 1 + 2 = 3	ADEA	ODEAK	TDEAK	D 14	
1 + 2 = 3	AREA (ha)	(cmc)	(bps)	K.V	
TD1= 1 / AA20	(IIa) \- 1E E1	0 000	0.00	0 00	,
1 + 2 = 3 ID1= 1 (0038 + ID2= 2 (0221). 15.51). 4.96	0.000	0.00	0.00	
		=======		=====	=
ID = 3 (0038): 20.47	0.000	0.00	0.00	
NOTE: PEAK FLOWS	DO NOT INCL	UDE BASEFL	OWS IF AN	Υ.	
ESERVOIR(2099)	OVERFLOW :	TC NEE			
N= 2> OUT= 1	OVERFLOW	13 OFF			
T= 5.0 min	OUTELOW	STORAGE	I OUTF	LOM	STORAGE
1- 3.0 min	OUTFLOW (cms)	(ha m)	(cm		(ha.m.)
	0.0000	0.0000	9 9	508	0.7415
	0 0010	0 08/15	I a 1	103	0 8448
		0.0845			0.8448
	0.0085	0.1713	0.1	869	0.8448 0.9504
	0.0085	0.1713	0.1	869	0.8448 0.9504
	0.0085 0.0110 0.0130	0.1713 0.2604 0.3519	0.1 0.2 0.3	869 773 797	0.8448 0.9504 1.0584 1.1687
	0.0085 0.0110 0.0130	0.1713 0.2604 0.3519	0.1 0.2 0.3	869 773 797	0.8448 0.9504 1.0584 1.1687
	0.0085 0.0110 0.0130 0.0147 0.0163	0.1713 0.2604 0.3519 0.4458 0.5420	0.1 0.2 0.3 0.5 0.8	869 773 797 592 940	0.8448 0.9504 1.0584 1.1687 1.2814 1.3964
	0.0085 0.0110 0.0130 0.0147 0.0163	0.1713 0.2604 0.3519	0.1 0.2 0.3 0.5 0.8	869 773 797 592 940	0.8448 0.9504 1.0584 1.1687
	0.0085 0.0110 0.0130 0.0147 0.0163 0.0177	0.1713 0.2604 0.3519 0.4458 0.5420 0.6406	0.1 0.2 0.3 0.5 0.8 1.4	869 773 797 592 940 269	0.8448 0.9504 1.0584 1.1687 1.2814 1.3964 1.5138
	0.0085 0.0110 0.0130 0.0147 0.0163 0.0177	0.1713 0.2604 0.3519 0.4458 0.5420 0.6406	0.1 0.2 0.3 0.5 0.8 1.4	869 773 797 592 940 269	0.8448 0.9504 1.0584 1.1687 1.2814 1.3964 1.5138
INFLOW : ID= 2 (0	0.0085 0.0110 0.0130 0.0147 0.0163 0.0177	0.1713 0.2604 0.3519 0.4458 0.5420 0.6406	0.1 0.2 0.3 0.5 0.8 1.4	869 773 797 592 940 269	0.8448 0.9504 1.0584 1.1687 1.2814 1.3964 1.5138
INFLOW : ID= 2 (0 OUTFLOW: ID= 1 (2	0.0085 0.0110 0.0130 0.0147 0.0163 0.0177	0.1713 0.2604 0.3519 0.4458 0.5420 0.6406	0.1 0.2 0.3 0.5 0.8 1.4	869 773 797 592 940 269	0.8448 0.9504 1.0584 1.1687 1.2814 1.3964 1.5138
PEA	0.0085 0.0110 0.0130 0.0147 0.0163 0.0177 ARI (h:	0.1713 0.2604 0.3519 0.4458 0.5420 0.6406 EA QPE a) (cm 470 6470	0.1 0.2 0.3 0.5 0.8 1.4 EAK TP ns) (h 0.000 0.000	869 773 797 592 940 269 EAK rs) 0.00 0.00	0.8448 0.9504 1.0584 1.1687 1.2814 1.3964 1.5138 R.V. (mm) 0.00
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APPENDIX GUtility Correspondence

From: Yang Xiao

To: Kapolnas, Stephen; Jim Sorley; Anthony Lastella

Cc: <u>Mammel, Suzanne</u>; <u>Zach Lindley</u>

Subject: RE: 161414394_Smithville Stage 3A Hydro Coordination

Date: Thursday, December 21, 2023 11:29:56 AM

Attachments: New Subdvision Development Information Fillable.pdf

You don't often get email from yang.xiao@npei.ca. Learn why this is important

Hi Steve.

There is no capacity issue. NPEI have 3 phase overhead 27.6kv & 8.3kv circuits in the vicinity.

For new subdivision development, please submit the attached form.

Otherwise, submit Service Request Application Form https://www.npei.ca/forms/forms-and-information

Regards, Yang

From: Kapolnas, Stephen <Steve.Kapolnas@stantec.com>

Sent: Thursday, December 21, 2023 9:56 AM

To: Yang Xiao <yang.xiao@npei.ca>; Jim Sorley <jim.sorley@npei.ca>; Anthony Lastella

<Anthony.Lastella@npei.ca>

Cc: Mammel, Suzanne <Suzanne.Mammel@stantec.com> **Subject:** 161414394_Smithville Stage 3A Hydro Coordiantion

Hi.

We are working on a proposed subdivision in Smithville, Ontario, West Lincoln. As you may be aware Smithville is expanding their urban boundaries and our projected site is within Stage 3A (see attachment 1). Attached shows an outlined area of the initial stage within Stage 3A, block plan 9.

We would like to confirm if NPEI has the appropriate infrastructure /capacity in place to service the initial stage (highlighted in blue).

Do you have any servicing concerns for the proposed development from a capacity/infrastructure standpoint and let us know if the initial stage can be accommodated?

If you have any questions, don't hesitate to ask.

Regards

Steve Kapolnas, P.Eng.

Project Engineer

Direct: 519 585-7365

Stephen.Kapolnas@stantec.com

Stantec 100-300 Hagey Boulevard Waterloo ON N2L 0A4

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Yang Xiao Engineering Technician (905) 356-2681 ext 6239 yang.xiao@npei.ca



Register for our updated MyAccount before March 31, 2024 to be enrolled in eBiling and we'll donate \$10 a local charitable organization! To sign up <u>Click Here</u>

For more information about NPEI and the Programs and Services that we offer, please click on our New Customer Info Guide Click Here

For Niagara Peninsula Energy Customers please <u>Click Here</u> to participate in our online customer service survey! (powered by SurveyMonkey)

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 From:
 Sarah Smith

 To:
 Kapolnas, Stephen

 Cc:
 Mammel, Suzanne

Subject: FW: 161414394_Smithville Stage 3A Gas Coordination

Date: Monday, January 8, 2024 1:04:37 PM

Attachments: 144262DP-Stage 1.pdf

Hi Stephen,

Adam forwarded me your email. I will be your contact for anything in West Lincoln.

We have existing main on the north side of Townline Rd in front of the outlined area in blue. If you applied today for the outlined area only, we would likely be able to accommodate your gas requirements.

However,

- 1. We do not reserve gas. So just because today gas may be available doesn't mean it will be when you apply in the future.
- 2. Larger customers (including developers) who apply in the West Lincoln area often need some kind of reinforcement for their projects. I just wanted to make you aware for the remainder of your larger development could require some kind of reinforcement, but we won't know until you apply and provide further details.
- 3. I think it is worth mentioning that the Ontario Energy Board have made a decision as of Dec 21, 2023 regarding our proposed rate case. We are anticipating some changes as of January 2025 which will likely affect the costing feasibility parameters. We are encouraging developers to read the OEB decision if you haven't already.

If you have any further questions, please don't hesitate to reach out.

Thank you,

Sarah Smith

Sr Analyst New Business Projects Southeast Region/Niagara Operations

ENBRIDGE

TEL 905-641-6716 | FAX: 905-984-4976 | <u>sarah.smith@enbridge.com</u> 3401 Schmon Parkway, Thorold, ON L2V 4Y6

enbridge.com

Safety. Integrity. Respect. Inclusion.

From: Adam Chitussi < Adam. Chitussi@enbridge.com>

Sent: Tuesday, January 2, 2024 9:37 AM

To: Sarah Smith <Sarah.Smith@enbridge.com>

Subject: FW: 161414394_Smithville Stage 3A Gas Coordiantion

From: Kapolnas, Stephen < <u>Steve.Kapolnas@stantec.com</u>>

Sent: Thursday, December 21, 2023 4:17 PM

To: Adam Chitussi < <u>Adam.Chitussi@enbridge.com</u>>

Cc: Mammel, Suzanne < <u>Suzanne.Mammel@stantec.com</u>>

Subject: [External] 161414394_Smithville Stage 3A Gas Coordination

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Hi,

We are working on a proposed subdivision in Smithville, Ontario, West Lincoln. As you may be aware Smithville is expanding their urban boundaries and our projected site is within Stage 3A (see attachment 1). Attached shows an outlined area of the initial stage within Stage 3A, block plan 9.

We would like to confirm if Enbridge has the appropriate infrastructure /capacity in place to service the initial stage (highlighted in blue).

Do you have any servicing concerns for the proposed development from a capacity/infrastructure standpoint and let us know if the initial stage can be accommodated?

If you have any questions, don't hesitate to ask.

Regards

Steve Kapolnas, P.Eng.

Project Engineer

Direct: 519 585-7365

Stephen.Kapolnas@stantec.com

Stantec

100-300 Hagey Boulevard Waterloo ON N2L 0A4

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From: Stratychuk, Craig
To: Telfer, Christine

Cc:Kapolnas, Stephen; Thompson, Susan; Rioux, KarenSubject:RE: 161414394_Smithville Stage 3A Bell Coordination

Date: Wednesday, August 9, 2023 8:36:37 AM

Attachments: <u>image001.pnq</u>

Hey Christine.. long time no chat.

Yes, Smithville (West Lincoln) is handled by our office... and we will be more than happy to help The regular IM for the area is away on vacation for a couple weeks, but I had a look on his behalf.

Good Morning Steve

We certainly have infrastructure in place in the area to service this location, but as any new build, we would have to go through our internal governance process for approvals before commitment to build

Aside from what you have already provided, any information is greatly appreciated. (potential lots, timing etc)

Craig Stratychuk Specialist, Network Provisioning 63 King St, Floor 3 St.

Catharines

Mobile# (289)219-3326 Office# (905)988-1239



From: Telfer, Christine <christine.telfer@bell.ca>

Sent: August-09-23 7:26 AM

To: Stratychuk, Craig <craig.stratychuk@bell.ca>

Cc: Steve.kapolnas@stantec.com; Thompson, Susan <s.thompson@bell.ca>; Rioux, Karen

<karen.rioux@bell.ca>

Subject: FW: 161414394_Smithville Stage 3A Bell Coordination

Morning Craig,

Hope all is well with you.

Not sure if Smithville is part of your territory, but I think it is out of the St. Catherine's cell. Could you pass the below email on to whomever the IM is for Smithville?

Have a good day.

Chris

Christine Telfer Bell Canada, Implementation Manager 86 Market St.,P.O. Box 938
Brantford, ON N3T 2Z8
(519)751-3055
<u>christine.telfer@bell.ca</u>
"Good judgement comes from experience; and experience, well, that comes from bad judgment. Anonymous

From: Kapolnas, Stephen < Steve.Kapolnas@stantec.com>

Sent: August-08-23 4:30 PM

To: Rioux, Karen < <u>karen.rioux@bell.ca</u>>; Thompson, Susan < <u>s.thompson@bell.ca</u>>; Telfer, Christine < <u>christine.telfer@bell.ca</u>>

Cc: Mammel, Suzanne < <u>Suzanne.Mammel@stantec.com</u>>

Subject: [EXT]FW: 161414394_Smithville Stage 3A Bell Coordination

Hi,

We are working on a proposed subdivision in Smithville, Ontario, West Lincoln. As you may be aware Smithville is expanding their urban boundaries and our projected site is within Stage 3A (see attachment 1). Attached shows an outlined area of stage 3A along with a redline highlight of the projected site. Within the month, we hope to have a block plan to circulate.

We would like to confirm if Bell has the appropriate infrastructure /capacity in place to service the projected site within stage 3A and Stage 3A entirely (highlighted in blue). Stage 3A is approximately 63.5ha and the project site (highlighted in red) is approximately 11ha.

Do you have any servicing concerns for the proposed development from a capacity/infrastructure standpoint?

If you have any questions, don't hesitate to ask.

Regards

Steve Kapolnas, P.Eng.

Project Engineer

Direct: 519 585-7365

Stephen.Kapolnas@stantec.com

Stantec

100-300 Hagey Boulevard Waterloo ON N2L 0A4

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From: Rick Kabel

To: Kapolnas, Stephen; Ronald Gibson
Cc: Craig, Krueger@cogeco.com

Subject: Re: 161414473_Smithville Stage 3A Utility Coordination

Date: Tuesday, July 2, 2024 8:37:48 AM

Hi Stephen

Cogeco has infrastructure in the area and are able to service this proposed new subdivision.

Ron Gibson is our Network Delivery Coordinator for Smithville and will be able to answer any other

questions or concerns for this new build. He is presently on vacation but will be back on July 8th.

Thanks

On Fri, 28 Jun 2024 at 16:26, Kapolnas, Stephen < Steve. Kapolnas@stantec.com > wrote:

Hi,

We are working on a proposed subdivision in Smithville, Ontario, West Lincoln. As you may be aware Smithville is expanding their urban boundaries and our projected site is within Stage 3A (see attachment 1). Attached shows an outlined area of the initial stage within Stage 3A, block plan 9.

We would like to confirm if Cogeco has the appropriate infrastructure /capacity in place to service the initial stage (highlighted in blue) and the entire Block Plan.

Do you have any servicing concerns for the proposed development from a capacity/infrastructure standpoint and let us know if the initial stage can be accommodated?

If you have any questions, don't hesitate to ask.

Regards

Steve Kapolnas, P.Eng.

Project Engineer

Direct: 519 585-7365

Stephen.Kapolnas@stantec.com

Stantec 100-300 Hagey Boulevard Waterloo ON N2L 0A4

RICK KABEL

Network Delivery Coordinator Niagara

289 241-0223

7170 McLeod Road Niagara Falls, Ontario L2G 3H2 Canada cogeco.ca









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